FINAL

the future of southern california
Murrieta
General Plan Update

Murrieta General Plan 2035 and Environmental Impact Report

Technical Appendices

July 19, 2011

RBF CONSULTING

GENERAL PLAN 2035 AND ENVIRONMENTAL IMPACT REPORT TECHNICAL APPENDICES

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Notice of Preparation

Murrieta
the future of southern california

NOTICE OF PREPARATION

To: Interested Agencies and Organizations
(Refer to Attached Distribution List)

Subject: Notice of Preparation of a Draft Environmental Impact Report

Lead Agency:

Agency Name: City of Murrieta
One Town Square
24601 Jefferson Avenue
City/State/Zip: Murrieta, California 90622
Contact: Mr. Greg Smith
Phone: 951.461.6414

Consulting Firm:

Firm Name: RBF Consulting
Street Address: 14725 Alton Parkway
City/State/Zip: Irvine, California 92618
Contact: Collette L. Morse, AICP
Phone: 949.472.3505

The **CITY OF MURRIETA** will be the Lead Agency and will prepare an environmental impact report for the project identified below. We need to know the views of your agency as to the scope and content of the environmental information which is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency will need to use the EIR prepared by our agency when considering your permit or other approval for the project.

The project description, location, and the potential environmental effects are contained in the attached materials. A copy of the Initial Study Checklist is not attached.

Due to the time limits mandated by State law, your response must be sent at the earliest possible date but ***not later than 30 days*** after receipt of this notice (***comment period ends December 21, 2010***).

Please send your response to **Greg Smith, Associate Planner** at the address shown above. We will need the name for a contact person in your agency.

Project Title: Murrieta General Plan Update

Project Location: City of Murrieta (City (nearest)) Riverside (County)

Project Description: **(brief)**
The General Plan Update is a comprehensive update of the 1994 General Plan. The work program includes a comprehensive update of the General Plan. The purpose of the General Plan Update is to provide the City Council, Planning Commission, City Staff, and the entire community with a comprehensive and internally consistent plan to guide the City's decision-making and development processes through 2035.

Date: November 19, 2010

Signature:
Greg Smith
Title: Associate Planner

Telephone: 951.461.6414

General Plan Update EIR – Notice of Preparation Distribution List

State Clearinghouse
Office of Planning & Research
1400 Tenth Street, RM 121
Sacramento, CA 95814-5502
(15 copies)

California Highway Patrol
8118 Lincoln Ave.
Riverside, CA 92504

US Postal Service
AIS Coordinator
4150 Chicago Ave.
Riverside, CA 92507-9503

U.S. Department of the Army
Army Corps of Engineers
Environmental Resources Branch
P O Box 2711
Los Angeles, CA 90053-2325
Attn: Eric Stein

U.S. Fish & Wildlife Service
Ecological Svcs - Carlsbad Field Office
6010 Hidden Valley Rd
Carlsbad, CA 92009
Attn: Michelle Shaughnessy

CALTRANS District 8
Planning & Local Assistance
464 W. 4th Street, 6th Fl. MS 722
San Bernardino, CA 92401-1400

California Department of Fish and Game
Attn: Leslie MacNair
3602 Inland Empire Blvd #C-220
Ontario, CA 91764

Regional Water Quality Control Board
Santa Ana Region (8)
3737 Main Street, Suite 500
Riverside, CA 92501-3339
Attn: Kurt Berchtold

Dept. of Toxic Substances Control
CEQA Tracking Center
PO Box 806
Sacramento, CA 95812-0806

State of California
Dept. of Toxic Substance Control
5796 Corporate Avenue
Cypress, CA 90630

Regional Water Quality Control Board
San Diego Region (9)
9174 Sky Park Court, Suite 100
San Diego, CA 92123
(858) 467-2952

Air Resources Board
Ray Menebroker
PO Box 2815
Sacramento, CA 95812

State of California
Department of Conservation
801 K Street, MS 13-71
Sacramento, CA 95814-3500

Western Riverside Council of Governments
4080 Lemon Street, 3rd Floor, MS 1032
Riverside, CA 92501-3609
Attn: Rick Bishop
(951) 258-5077

South Coast AQMD
21865 East Copley Drive
Diamond Bar, CA 91765-4182
Attn: Steve Smith, Program Supervisor
Local Government-CEQA

Southern California Assoc. of Governments
818 West 7th St, 12th floor
Los Angeles, CA 90017-3435
Attn: Intergovernmental Review
(213) 236-1800

SCAG Riverside County Regional Office
3403 10th Street, Suite 805
Riverside, CA 92501
(951) 784-1513

County of Riverside Transportation Dept.
P.O. Box 1090
Riverside, CA 92502-1090
Attn: Trans. Planning Manager

Airport Land Use Commission
c/o Riverside County Planning
4080 Lemon Street, 9th Floor
Riverside, CA 92502
Attn: John Guerin

County of Riverside
Dept. of Environmental Health
PO Box 7600
Riverside, CA 92513-7600

Riverside Transit Agency
1825 Third Street
P.O. Box 59968
Riverside, CA 92517-1968
Attn: Michael McCoy

Riverside County Planning Dept.
P O Box 1409
4080 Lemon Street, 9th Floor
Riverside, CA 92502-1409
Attn: Carolyn Syms-Luna, Planning Director

Riverside Co Flood Control District
1995 Market Street
Riverside, CA 92501
Attn: Shaheen Mooaman

Riverside County Transportation Commission
4080 Lemon Street, 3rd Floor
PO Box 12008
Riverside, CA 92502-2208
Attn: Shirley Medina
(951) 787-7141

City of Murrieta Fire Department
41825 Juniper St
Murrieta, CA 92562
Attn: Gary Whisenand, Division Chief

City of Murrieta Police Department
24701 Jefferson Ave.
Murrieta, CA 92562
Attn: Lt. Dennis Vrooman

City of Temecula
Planning Department
43200 Business Park Drive
Temecula, CA 92590
Attn: Patrick Richardson

City of Menifee
Community Development Department
29714 Haun Road
Menifee, CA 92586
Attn: Carmen Cave
(951) 672-6777

City of Wildomar
Planning Department
23873 Clinton Keith Road, Suite 201
Wildomar, CA 92595
Attn: Matthew Bassi
(951) 677-7751

City of Lake Elsinore
Community Development Department
130 South Main Street
Lake Elsinore, CA 92530
Attn: Robert Brady
(951) 674-3124

Murrieta Valley Unified School District
41870 McAlby Court
Murrieta, CA 92562
Attn: Charlene Stone

Menifee Union School District
30205 Menifee Rd
Menifee, CA 92584
Attn: Robert Wolfe
(951) 672-1851

Western Municipal Water District
450 E. Alessandro Boulevard
Riverside, CA 92508
Attn: Keith G. Owens
(951) 789-5029

Rancho California Water District
42135 Winchester Road
Temecula, CA 92590
Attn: Andy Webster
(951) 296-6900

Elsinore Valley Municipal Water District
31315 Chaney Street
Lake Elsinore, CA 92531
(951) 674-3146

Metropolitan Water District of SCA
PO Box 54153
Los Angeles, CA 90054

Eastern Municipal Water District
2270 Trumble Road
Perris, CA 92572-8300
Attn: Warren Beck, P.E.
(951) 928-3777

Southern California Edison
26100 Menifee Road
Romoland, CA 92588
Attn: Robert Lopez

Waste Management of Inland Valley
800 S. Temescal Street
Corona, CA 92879-2858

Southern California Gas Co.
Engineering Dept.
P O Box 220
Riverside, CA 92506
Attn: Technical Supervisor

Verizon of California
1980 Orange Tree Lane, Ste 100
Redlands, CA 92374
Attn: Houston Henderson

Adelphia Cable
26495 Ynez Rd.
Temecula, CA 92590

Eastern Information Center
Anthropology Department
University of California
Riverside, CA 92521-0418

Cal-Tech/Mount Palomar Observatory
M.S. 105-24
Pasadena, CA 91125
Attn: Robert Brucato, Assistant Director

San Bernardino County Museum
2024 Orange Tree Lane
Redlands, CA 92374
Attn: Scott Springer

Audubon Society
3969 Linwood Place
Riverside, CA 92506
Attn: Larry LaPre

Union for a River
Greenbelt Environment
26785 Camino Seco
Temecula, CA 92590
Attn.: Ray Johnson

Endangered Habitats League
8424-A Santa Monica Blvd
Los Angeles, CA 90069-4267
Attn: Dan Silver

Elsinore-Murrieta-Anza Resource
Conservation District
29071 Calle Del Buho
Murrieta, CA 92563-5650
Robert D. Wheeler, Director

Building Industry Association
3600 Lime Street, Ste 312
Riverside, CA 92501
Attn: Mark Knorringa

Anna Hoover, Cultural Resources
Pechanga Band of Luiseno Indians
P O Box 1477
Temecula, CA 92593

Cahuilla Band of Indians
PO Box 391760
Anza, CA 92539

Soboba Indian Reservation
PO Box 487
San Jacinto, CA 92383

United Murrieta Neighborhoods
39565 Calle San Clemente
Murrieta, CA 92562
Attn: Cheryl Bryant

Los Alamos Neighborhood Association
37100 Los Alamos Rd.
Murrieta, CA 92563

Menifee Valley Un-inc. Community
33320 Merritt Rd.
Menifee, CA 92584
Attn: Mark Miller

NOTICE OF PREPARATION

CITY OF MURRIETA
GENERAL PLAN UPDATE
ENVIRONMENTAL IMPACT REPORT

LEAD AGENCY:

City of Murrieta
Community Development Department
One Town Square
24601 Jefferson Avenue
Murrieta, California 92562
Contact: Mr. Greg Smith, Associate Planner
951.461.6414

PREPARED BY:

RBF Consulting
14725 Alton Parkway
Irvine, California 92618

Contacts: Ms. Collette Morse, AICP
949.472.3505

November 19, 2010

JN 10-106976

PROJECT INFORMATION PACKET

I. INTRODUCTION

Pursuant to *CEQA Guidelines* Section 15082, the City of Murrieta has distributed this Notice of Preparation/Project Information Packet for the Murrieta General Plan Update and Program EIR. The General Plan Update involves a process of revising the City's existing 1994 General Plan.

The sections that follow describe the City's location in the region, summarize the General Plan Update document, and list the issue areas to be evaluated through a Program EIR, which will be prepared in accordance with *CEQA Guidelines* Section 15168.

II. REGIONAL LOCATION

The City of Murrieta is located in southeastern Riverside County, and is comprised of 26,852 acres (41.96 square miles) of which 21,511 acres (33.61 square miles) is located within the City Limits and 5,341 acres (8.34 square miles) is located within the City's Sphere of Influence. Surrounding cities include Menifee to the north, Temecula to the south and east, Wildomar to the west, and unincorporated Riverside County to the north, south, and east. The San Diego County border is just south of Temecula, and Orange County lies on the other side of the Santa Ana Mountains to the west. Regional access to the City is provided by the Interstates 15 and 215; refer to Exhibit 1, Regional Location Map.

III. GENERAL PLAN UPDATE PROJECT DESCRIPTION

The Murrieta General Plan is a policy document designed to guide the City of Murrieta in achieving its social, physical, and economic goals. This General Plan places particular emphasis on economic development and addresses both current and emerging planning and community topics, such as Global Climate Change, Sustainability, and Healthy Communities. These topics will be developed with the preparation of a Climate Action Plan and a Healthy Community Element.

The General Plan is Murrieta's fundamental policy document regarding community and economic development of the City. The General Plan describes Murrieta's goals and policies regarding land use, economic development, circulation, conservation, recreation and open space, air quality, noise, infrastructure, safety, and healthy community. Along with these goals and policies is an implementation program to guide the execution of the goals and policies.

This General Plan supersedes the 1994 Murrieta General Plan, which consists of the following eight State mandated and optional elements:

- Land Use
- Housing
- Circulation
- Conservation and Open Space
- Safety
- Noise
- Air Quality
- Economic Development.

This update to the General Plan may contain similar goals, policies, or other components of the previous plan; however, this version has been tailored to meet the issues and needs of the City at the present time and foreseeable future. The Murrieta General Plan is not a static reflection of general goals and polices; it is a dynamic, practical document with strategies for community development and enhancement, specifically focused on economic development and achieving the overall vision identified by the community.

During the General Plan Update, community members were afforded a number of ways to share their thoughts about Murrieta today and Murrieta in the future. The ten community priorities below describe the vision that members of the public provided for the future of their community, which guided the goals and policies in the General Plan.

Natural Environment	*Protect the natural beauty of the mountains, hills, and waterways.*
Rural Areas	*Preserve elements of Murrieta's rural heritage.*
Community Character	*Protect and foster a strong sense of community and safety, as well as the "home town" feeling.*
Recreation and Culture	*Provide abundant parks and facilities for recreational activities, and cultural amenities.*
Historic Downtown Murrieta	*Create a vibrant, prosperous Historic Downtown that serves as a community center and provides a variety of quality shopping and dining experiences.*
Governance	*Promote community involvement and provide for a fiscally sound future.*
Sustainable Economy	*Pursue economic vitality and longevity by attracting higher education and growing a base of clean industry, while maintaining the current housing affordability.*
Transportation	*Improve roadway networks to reduce traffic, and provide a citywide system of bicycle lanes and recreational trails that improve accessibility without a car.*
Infrastructure and Services	*Improve health care within the City, and continue to provide excellent school, police, fire, library, and recreation services.*
Youth Amenities	*Provide ample activities for all ages of youth, and jobs for teens.*

Although a majority of the City is developed, approximately 36 percent of the City is currently vacant. Single-family residential uses represent approximately 30 percent of the City. Less then six percent of the City is developed with commercial, commercial office, industrial, and public/institutional uses; refer to Table 1, Existing Land Use Summary.

Table 1
Existing Land Use Summary

Land Use	Acres	Percent of Area
Single Family Residential	6,421.99	29.85
Multiple Family Residential	253.31	1.18
Mobile Homes	1,036.26	4.82
Agricultural	977.18	4.54
Commercial	667.07	3.10
Commercial Office	109.96	0.51
Industrial	242.82	1.13
Public/Institutional	168.11	0.78
Cemetery	9.84	0.05
Golf Course	518.83	2.41
Vacant	7,750.10	36.03
Roadways/Infrastructure	3,355.52	15.60
Total	**21,511.00**	**100.00**

The General Plan Update will focus on guiding the development of vacant land, specifically focusing on opportunities for economic development. Before starting the General Plan Update, the Murrieta City Council identified economic development as the City's top priority. To achieve this vision, the City seeks to encourage private sector investment in the creation of higher paying jobs, income, and wealth through economic diversification. The City is focusing its efforts to attract a variety of businesses, higher educational institutions, and health care facilities. A full range of quality new development will be part of this effort, including retail centers, corporate/technology parks, hotels, and upscale restaurants.

The General Plan Update aligns City policy with this emphasis on economic development, by directing public investments in infrastructure and promoting the development of shovel-ready sites. It targets key locations for changes in land use and zoning that support the development of medical, educational, commercial, and business clusters. The General Plan Update identifies the following five Focus Areas targeted for land use change; refer to Exhibit 2, General Plan Update Focus Areas:

- North Murrieta Business Corridor
- Clinton Keith/Mitchell Area
- Golden Triangle North
- South Murrieta Business Corridor
- Multiple Use Area 3 (MU-3)

These areas included key locations along freeway corridors that are suitable for major land development and redevelopment to carry out the City Council's economic development strategy, including areas around Loma Linda University Medical Center-Murrieta and the Murrieta Education Center. They also include rural residential areas north of Clinton Keith Road that are adjacent to major new development along I-215.

The anticipated growth over existing conditions is:

- Addition of 3,346 dwelling units
- Addition of 22,156,784 square feet of non-residential uses

The non-residential uses include:

- Addition of 2,655,023 square feet of business park uses
- Addition of 14,807,287 square feet of professional and office uses
- Addition of 3,663,446 square feet of commercial uses
- Addition of 2,028 square feet of civic and institutional uses

The General Plan Update will include the following 11 State-mandated and optional elements:

- Land Use
- Economic Development
- Circulation
- Conservation
- Recreation and Open Space
- Air Quality
- Noise
- Infrastructure
- Safety
- Healthy Community
- Housing (The Housing Element is being updated in a separate process but will be part of the new General Plan).

IV. ENVIRONMENTAL IMPACT REPORT PROJECT DESCRIPTION

The Program EIR shall evaluate potential environmental impacts resulting from the following revisions to the City's General Plan, including, but not limited to:

- Update of the City's land use database.
- Update of the City's traffic model.
- Revision to the General Plan noise and air quality databases upon the new traffic model runs.
- Revisions to maps, figures, text, charts, and tables to reflect updated data/information.

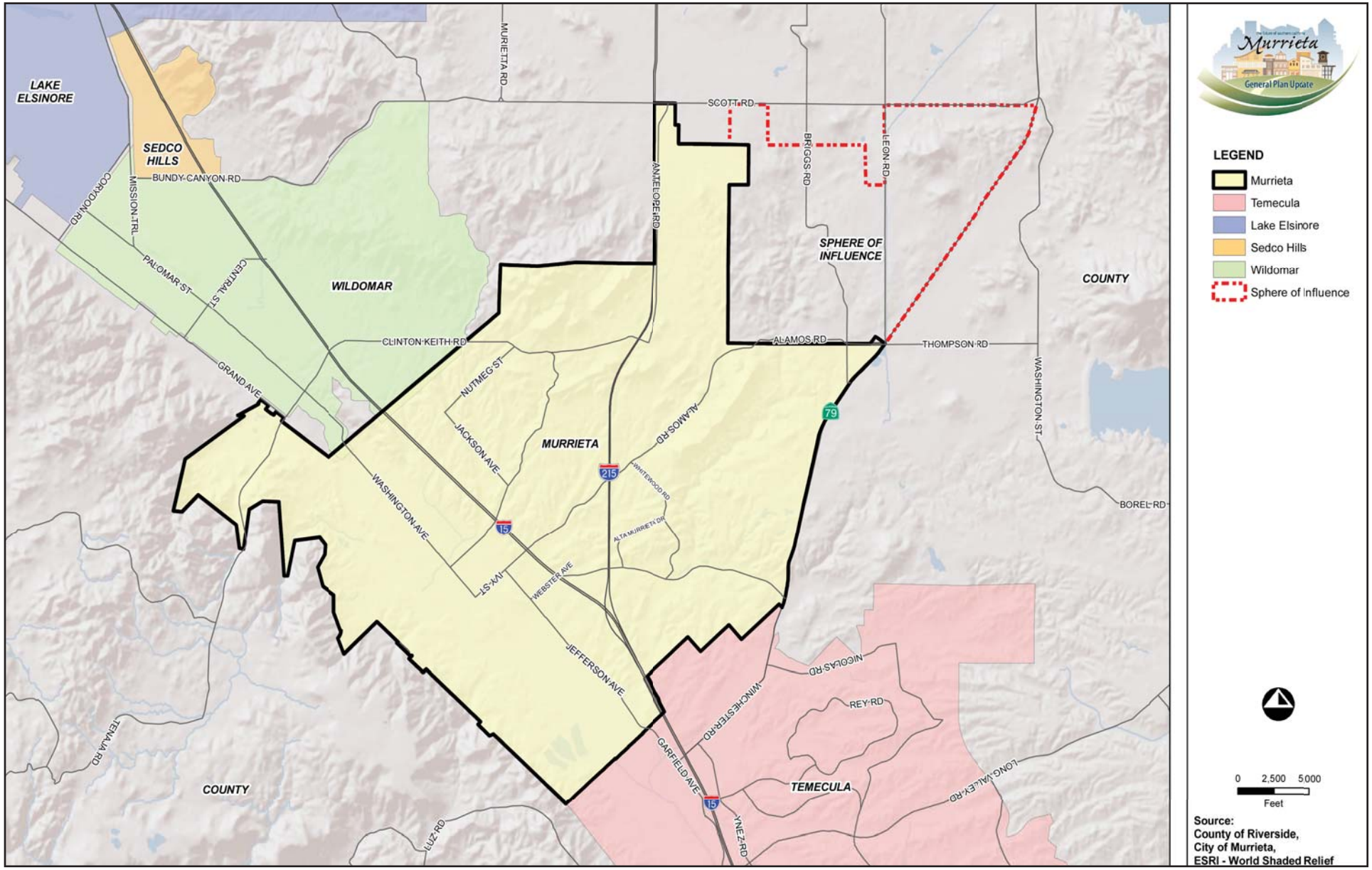
The Murrieta General Plan was last comprehensively updated in 1994. The General Plan Update supersedes the 1994 General Plan and is based upon the community's vision for Murrieta and expresses the community's long-term goals. The goal of the Update is to guide future development of vacant and underutilized land in order to capitalize on existing development activities and achieve the City's goals for economic development.

V. POTENTIAL ENVIRONMENTAL EFFECTS

The EIR will focus on the following environmental issues:

- Aesthetics
- Agriculture and Forestry Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Geology and Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Noise
- Population and Housing
- Public Services
- Recreation
- Transportation and Traffic
- Utilities and Service Systems

Due to the decision to prepare an Environmental Impact Report, an Initial Study was not prepared. This option is permitted under *CEQA Guidelines* Section 15063(a), which states that if the Lead Agency determines an EIR will be required for a project, the Lead Agency may skip further initial review and begin work on the EIR.



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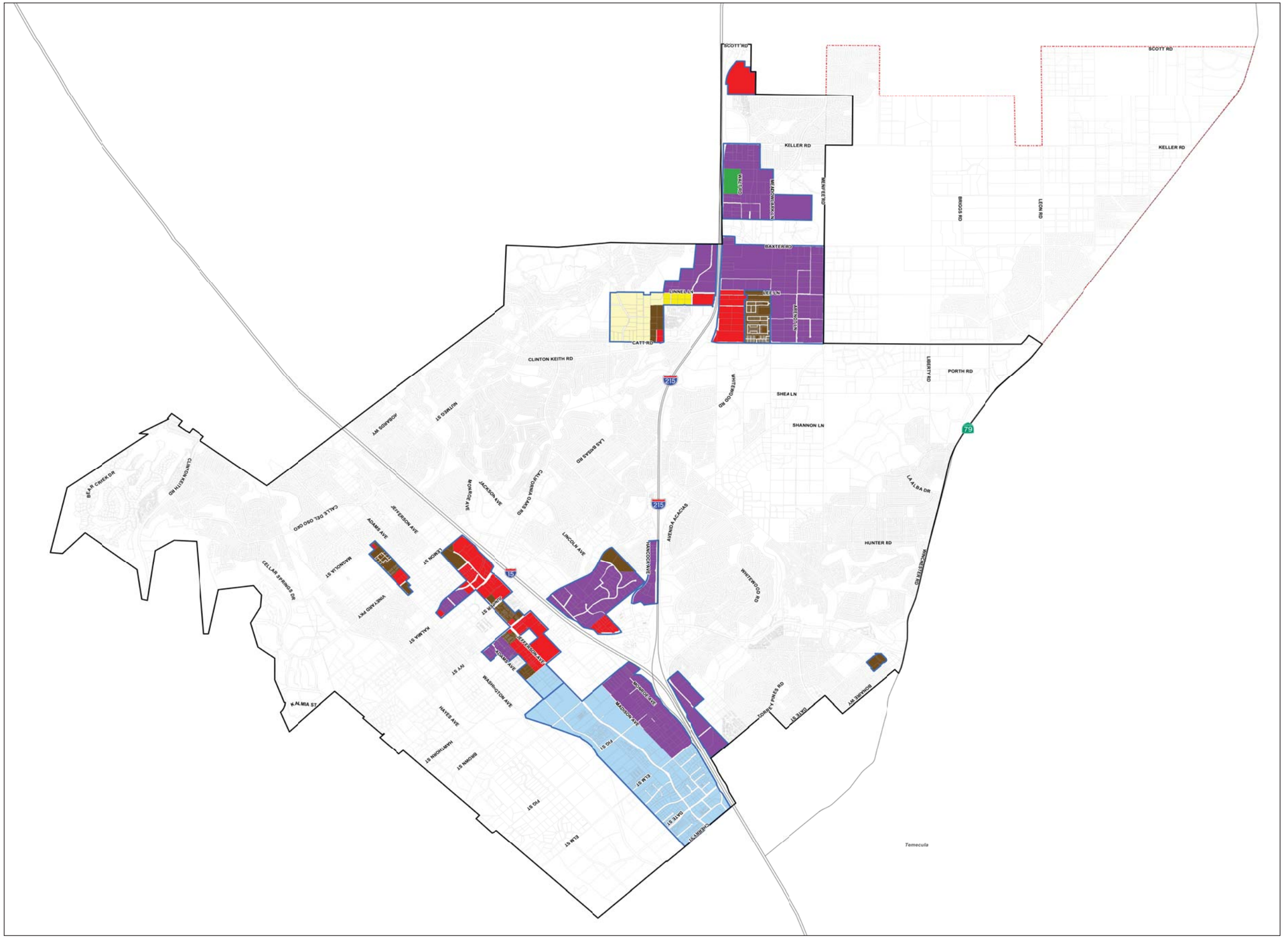
11/10 • JN 10-106976

Regional Location Map

Exhibit 1



LEGEND

Recommended Scenario

- Rural Residential
- Single Family Residential
- Multiple Family Residential
- Commercial
- Business Park
- Professional and Office
- Parks and Open Space
- Parcels
- Focus Areas
- Sphere of Influence
- City Boundary

0 750 1,500
Feet

Source: City of Murrieta, October 15, 2010.

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General Plan Update Focus Areas

Exhibit 2

Appendix B:

Notice of Preparation Comments

STATE OF CALIFORNIA
Governor's Office of Planning and Research
State Clearinghouse and Planning Unit

Arnold Schwarzenegger
Governor

Cathleen Cox
Acting Director

Notice of Preparation

November 22, 2010

To: Reviewing Agencies

Re: Murrieta General Plan Update
SCH# 2010111084

Attached for your review and comment is the Notice of Preparation (NOP) for the Murrieta General Plan Update draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Greg Smith
City of Murrieta
24601 Jefferson Ave
Murrieta, CA 90622

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

Scott Morgan
Director, State Clearinghouse

Attachments
cc: Lead Agency

CITY OF MURRIETA
NOV 29
RECEIVED
PLANNING

Document Details Report
State Clearinghouse Data Base

SCH# 2010111084
Project Title Murrieta General Plan Update
Lead Agency Murrieta, City of

Type NOP Notice of Preparation

Description Comprehensive General Plan Update. Anticipated growth over existing conditions +3,346 dwelling units and +22,156,783sf of non-residential uses. The non-residential uses include: +2,655,023sf of business park uses; +14,807,287sf of professional and office uses; +3,662,446sf of commercial uses; and 2,028sf of civic and institutional uses.

Lead Agency Contact

Name Greg Smith
Agency City of Murrieta
Phone 951-461-6414 **Fax**
email
Address 24601 Jefferson Ave
City Murrieta **State** CA **Zip** 90622

Project Location

County Riverside
City Murrieta
Region
Cross Streets
Lat / Long
Parcel No.
Township **Range** **Section** **Base**

Proximity to:

Highways Hwy 15, 215
Airports Yes
Railways
Waterways Yes
Schools Yes
Land Use Multiple General Plan and Zoning Designations

Project Issues Aesthetic/Visual; Agricultural Land; Air Quality; Archaeologic-Historic; Biological Resources; Cumulative Effects; Drainage/Absorption; Economics/Jobs; Forest Land/Fire Hazard; Geologic/Seismic; Growth Inducing; Landuse; Minerals; Noise; Population/Housing Balance; Public Services; Recreation/Parks; Schools/Universities; Septic System; Sewer Capacity; Soil Erosion/Compaction/Grading; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wetland/Riparian

Reviewing Agencies Resources Agency; Department of Conservation; California Energy Commission; Cal Fire; Department of Parks and Recreation; Department of Water Resources; Office of Emergency Management Agency, California; Department of Fish and Game, Region 6; Caltrans, Division of Aeronautics; Public Utilities Commission; Native American Heritage Commission; California Highway Patrol; Department of Housing and Community Development; Caltrans, District 8; Regional Water Quality Control Board, Region 9

Date Received 11/22/2010 **Start of Review** 11/22/2010 **End of Review** 12/21/2010

Note: Blanks in data fields result from insufficient information provided by lead agency.

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH # 2010111034

Project Title: Murrieta General Plan Update

Lead Agency: City of Murrieta — Contact Person: Mr. Greg Smith
Mailing Address: 24601 Jefferson Avenue — Phone: 951.461.6414
City: Murrieta — Zip: 90622 — County: Riverside

Project Location: County: Riverside — City/Nearest Community: Murrieta
Cross Streets: — Zip Code:
Longitude/Latitude (degrees, minutes and seconds): ___° ___' ___" N / ___° ___' ___" W — Total Acres: 26,852
Assessor's Parcel No.: — Section: — Twp.: — Range: — Base:
Within 2 Miles: State Hwy #: 15, 215 — Waterways: Yes
Airports: Yes — Railways: — Schools: Yes

RECEIVED
NOV 22 2010
STATE CLEARING HOUSE

Document Type:

CEQA: ☑ NOP ☐ Draft EIR — NEPA: ☐ NOI — Other: ☐ Joint Document
☐ Early Cons ☐ Supplement/Subsequent EIR ☐ EA ☐ Final Document
☐ Neg Dec (Prior SCH No.) ☐ Draft EIS ☐ Other:
☐ Mit Neg Dec Other: ☐ FONSI

Local Action Type:

☑ General Plan Update ☐ Specific Plan ☐ Rezone ☐ Annexation
☐ General Plan Amendment ☐ Master Plan ☐ Prezone ☐ Redevelopment
☐ General Plan Element ☐ Planned Unit Development ☐ Use Permit ☐ Coastal Permit
☐ Community Plan ☐ Site Plan ☐ Land Division (Subdivision, etc.) ☐ Other:

Development Type:

☐ Residential: Units 3346 Acres
☐ Office: Sq.ft. 14,8 M Acres Employees
☐ Commercial: Sq.ft. 3.6 M Acres Employees
☐ Industrial: Sq.ft. 2.6 M Acres Employees
☐ Educational:
☐ Recreational:
☐ Water Facilities: Type MGD

☐ Transportation: Type
☐ Mining: Mineral
☐ Power: Type MW
☐ Waste Treatment: Type MGD
☐ Hazardous Waste: Type
☐ Other:

Project Issues Discussed in Document:

☑ Aesthetic/Visual ☐ Fiscal ☑ Recreation/Parks ☑ Vegetation
☑ Agricultural Land ☐ Flood Plain/Flooding ☑ Schools/Universities ☑ Water Quality
☑ Air Quality ☑ Forest Land/Fire Hazard ☑ Septic Systems ☑ Water Supply/Groundwater
☑ Archeological/Historical ☑ Geologic/Seismic ☑ Sewer Capacity ☑ Wetland/Riparian
☑ Biological Resources ☑ Minerals ☑ Soil Erosion/Compaction/Grading ☑ Growth Inducement
☐ Coastal Zone ☑ Noise ☑ Solid Waste ☑ Land Use
☑ Drainage/Absorption ☑ Population/Housing Balance ☑ Toxic/Hazardous ☑ Cumulative Effects
☑ Economic/Jobs ☑ Public Services/Facilities ☑ Traffic/Circulation ☐ Other:

Present Land Use/Zoning/General Plan Designation:

Multiple General Plan and Zoning Designations

Project Description: *(please use a separate page if necessary)*

Comprehensive General Plan Update. Anticipated growth over existing conditions: +3,346 dwelling units and +22,156,783 square feet of non-residential uses. The non-residential uses include: +2,655,023 sf of business park uses; +14,807,287 sf of professional and office uses; +3,662,446 sf of commercial uses; and 2,028 sf of civic and institutional uses.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

NOP Distribution List

2C

County: Riverside

SCH# 2010111084

Resources Agency

- [x] **Resources Agency** Nadell Gayou
- [ ] **Dept. of Boating & Waterways** Mike Sotelo
- [ ] **California Coastal Commission** Elizabeth A. Fuchs
- [ ] **Colorado River Board** Gerald R. Zimmerman
- [x] **Dept. of Conservation** Rebecca Salazar
- [x] **California Energy Commission** Eric Knight
- [x] **Cal Fire** Allen Robertson
- [ ] **Central Valley Flood Protection Board** James Herota
- [ ] **Office of Historic Preservation** Wayne Donaldson
- [x] **Dept of Parks & Recreation** Environmental Stewardship Section
- [ ] **California Department of Resources, Recycling & Recovery** Sue O'Leary
- [ ] **S.F. Bay Conservation & Dev't. Comm.** Steve McAdam
- [x] **Dept. of Water Resources** Resources Agency Nadell Gayou
- [ ] _____ Conservancy

Fish and Game

- [ ] **Depart. of Fish & Game** Scott Flint Environmental Services Division
- [ ] **Fish & Game Region 1** Donald Koch
- [ ] **Fish & Game Region 1E** Laurie Harnsberger
- [ ] **Fish & Game Region 2** Jeff Drongesen
- [ ] **Fish & Game Region 3** Charles Armor
- [ ] **Fish & Game Region 4** Julie Vance
- [ ] **Fish & Game Region 5** Don Chadwick Habitat Conservation Program
- [x] **Fish & Game Region 6** Gabrina Gatchel Habitat Conservation Program
- [ ] **Fish & Game Region 6 I/M** Brad Henderson Inyo/Mono, Habitat Conservation Program
- [ ] **Dept. of Fish & Game M** George Isaac Marine Region

Other Departments

- [ ] **Food & Agriculture** Steve Shaffer Dept. of Food and Agriculture
- [ ] **Depart. of General Services** Public School Construction
- [ ] **Dept. of General Services** Anna Garbeff Environmental Services Section
- [ ] **Dept. of Public Health** Bridgette Binning Dept. of Health/Drinking Water

Independent Commissions,Boards

- [ ] **Delta Protection Commission** Linda Flack
- [x] **Cal EMA (Emergency Management Agency)** Dennis Castrillo
- [ ] **Governor's Office of Planning & Research** State Clearinghouse
- [x] **Native American Heritage Comm.** Debbie Treadway
- [x] **Public Utilities Commission** Leo Wong
- [ ] **Santa Monica Bay Restoration** Guangyu Wang
- [ ] **State Lands Commission** Marina Brand
- [ ] **Tahoe Regional Planning Agency (TRPA)** Cherry Jacques

Business, Trans & Housing

- [x] **Caltrans - Division of Aeronautics** Sandy Hesnard
- [ ] **Caltrans - Planning** Terri Pencovic
- [x] **California Highway Patrol** Scott Loetscher Office of Special Projects
- [x] **Housing & Community Development** CEQA Coordinator Housing Policy Division

Dept. of Transportation

- [ ] **Caltrans, District 1** Rex Jackman
- [ ] **Caltrans, District 2** Marcelino Gonzalez
- [ ] **Caltrans, District 3** Bruce de Terra
- [ ] **Caltrans, District 4** Lisa Carboni
- [ ] **Caltrans, District 5** David Murray
- [ ] **Caltrans, District 6** Michael Navarro
- [ ] **Caltrans, District 7** Elmer Alvarez
- [x] **Caltrans, District 8** Dan Kopulsky
- [ ] **Caltrans, District 9** Gayle Rosander
- [ ] **Caltrans, District 10** Tom Dumas
- [ ] **Caltrans, District 11** Jacob Armstrong
- [ ] **Caltrans, District 12** Chris Herre

Cal EPA

Air Resources Board

- [ ] Airport Projects Jim Lerner
- [ ] Transportation Projects Douglas Ito
- [ ] Industrial Projects Mike Tollstrup

- [ ] **State Water Resources Control Board** Regional Programs Unit Division of Financial Assistance

- [ ] **State Water Resources Control Board** Student Intern, 401 Water Quality Certification Unit Division of Water Quality

- [ ] **State Water Resouces Control Board** Steven Herrera Division of Water Rights

- [ ] **Dept. of Toxic Substances Control** CEQA Tracking Center

- [ ] **Department of Pesticide Regulation** CEQA Coordinator

Regional Water Quality Control Board (RWQCB)

- [ ] **RWQCB 1** Cathleen Hudson North Coast Region (1)
- [ ] **RWQCB 2** Environmental Document Coordinator San Francisco Bay Region (2)
- [ ] **RWQCB 3** Central Coast Region (3)
- [ ] **RWQCB 4** Teresa Rodgers Los Angeles Region (4)
- [ ] **RWQCB 5S** Central Valley Region (5)
  - [ ] **RWQCB 5F** Central Valley Region (5) Fresno Branch Office
  - [ ] **RWQCB 5R** Central Valley Region (5) Redding Branch Office
- [ ] **RWQCB 6** Lahontan Region (6)
  - [ ] **RWQCB 6V** Lahontan Region (6) Victorville Branch Office
- [ ] **RWQCB 7** Colorado River Basin Region (7)
- [ ] **RWQCB 8** Santa Ana Region (8)
- [x] **RWQCB 9** San Diego Region (9)

- [ ] **Other** _____

Last Updated on 03/24/10

WARREN D. WILLIAMS
General Manager-Chief Engineer

1995 MARKET STREET
RIVERSIDE, CA 92501
951.955.1200
FAX 951.788.9965
www.rcflood.org

134606

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

December 21, 2010

Mr. Greg Smith
City of Murrieta
One Town Square
24601 Jefferson Avenue
Murrieta, CA 90622

Dear Mr. Smith:

Re: Notice of Preparation of a Draft Environmental Impact Report

This letter is written in response to the Notice of Preparation of a Draft Environmental Impact Report. The purpose of the proposed project is to update the City of Murrieta's General Plan. The General Plan Update will provide the City Council, Planning Commission, City Staff and the entire community with a comprehensive and internally consistent plan to guide the City's decision-making and development processes through 2035.

The Riverside County Flood Control and Water Conservation District (District) has reviewed the DEIR and has the following comments:

The proposed project is located within the Murrieta Master Drainage Plan (MDP). When fully implemented, the MDP facilities will provide flood protection to relieve those areas within the plan of the most serious flooding problems and will provide adequate drainage outlets. The DEIR should fully evaluate any potential impacts to proposed MDP facilities. The District's MDP facility maps can be viewed online under Programs and Services at www.rcflood.org. To obtain further information on the MDP and the proposed facilities, please contact Andrew Kim at 951.955.3743 or me at 951.955.1345.

Very truly yours,

Edwin Quinonez

EDWIN QUINONEZ
Senior Civil Engineer

c: Riverside County Planning Department
Attn: Kathleen Browne

AJK:EQ:blj

ARNOLD SCHWARZENEGGER
GOVERNOR

MATTHEW R. BETTENHAUSEN
SECRETARY

Cal EMA
CALIFORNIA EMERGENCY
MANAGEMENT AGENCY

November 30, 2010

Greg Smith
City of Murrieta
24601 Jefferson Avenue
Murrieta, CA 90622

RE: Notice of Preparation for a Draft Environmental Impact Report for the City of Murrieta's General Plan Update

Dear Mr. Smith:

Thank you for the opportunity to comment on your Notice of Preparation for a Draft Environmental Impact Report (DEIR) for the city's general plan update. In preparing the general plan and accompanying DEIR, the city should examine the sections of state planning law that involve potential hazards the city may face. For your information, I have underlined specific sections of state planning law where identification and analysis of hazards are discussed (see Attachment A).

Prior to the release of the draft general plan or within the DEIR, city staff or your consultants should examine each of the requirements in state planning law and determine if there are hazard issues within the community which the general plan should address. A table in the DEIR (or general plan) which identifies these specific issues and where they are addressed in the general plan would be helpful in demonstrating the city has complied with these requirements. If the DEIR determines that state planning law requirements have not been met, it should recommend that these issues be addressed in the general plan as a mitigation measure.

We note that state planning law includes a requirement for consultations with state agencies in regard to information related to hazards. Cal EMA would be happy to share all available information at our disposal to facilitate the city's ability to comply with state planning and environmental laws.

If you have any questions about these comments, please contact Andrew Rush at (916) 845-8269 or andrew.rush@calema.ca.gov.

Sincerely,

Dennis Castrillo
Environmental Officer

cc: State Clearinghouse

CITY OF MURRIETA
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PLANNING DEPT

3650 SCHRIEVER AVENUE • MATHER, CA 95655
RECOVERY BRANCH
(916) 845-8200 [OFFICE] • (916) 845-8385 [FAX]

Attachment A
Hazards and State Planning Law Requirements

General Plan Consistency

65300.5. In construing the provisions of this article, the Legislature intends that the general plan and elements and parts thereof comprise an integrated, internally consistent and compatible statement of policies for the adopting agency.

Seven Mandated Elements

65302. The general plan shall consist of a statement of development policies and shall include a diagram or diagrams and text setting forth objectives, principles, standards, and plan proposals. The plan shall include the following elements:

(a) A land use element that designates the proposed general distribution and general location and extent of the uses of the land for housing, business, industry, open space, including agriculture, natural resources, recreation, and enjoyment of scenic beauty, education, public buildings and grounds, solid and liquid waste disposal facilities, and other categories of public and private uses of land. The location and designation of the extent of the uses of the land for public and private uses shall consider the identification of land and natural resources pursuant to paragraph (3) of subdivision (d). The land use element shall include a statement of the standards of population density and building intensity recommended for the various districts and other territory covered by the plan. The land use element shall identify and annually review those areas covered by the plan that are subject to flooding identified by flood plain mapping prepared by the Federal Emergency Management Agency (FEMA) or the Department of Water Resources. The land use element shall also do both of the following:

(1) Designate in a land use category that provides for timber production those parcels of real property zoned for timberland production pursuant to the California Timberland Productivity Act of 1982, Chapter 6.7 (commencing with Section 51100) of Part 1 of Division 1 of Title 5.

(2) Consider the impact of new growth on military readiness activities carried out on military bases, installations, and operating and training areas, when proposing zoning ordinances or designating land uses covered by the general plan for land, or other territory adjacent to military facilities, or underlying designated military aviation routes and airspace.

(A) In determining the impact of new growth on military readiness activities, information provided by military facilities shall be considered. Cities and counties shall address military impacts based on information from the military and other sources.

(B) The following definitions govern this paragraph:

(i) "Military readiness activities" mean all of the following:

(I) Training, support, and operations that prepare the men and women of the military for combat.

(II) Operation, maintenance, and security of any military installation.

(III) Testing of military equipment, vehicles, weapons, and sensors for proper operation or suitability for combat use.

(ii) "Military installation" means a base, camp, post, station, yard, center, homeport facility for any ship, or other activity under the jurisdiction of the United States Department of Defense as defined in paragraph (1) of subsection (e) of Section 2687 of Title 10 of the United States Code.

(b) A circulation element consisting of the general location and extent of existing and proposed major thoroughfares, transportation routes, terminals, any military airports and ports, and other local public utilities and facilities, all correlated with the land use element of the plan.

(c) A housing element as provided in Article 10.6 (commencing with Section 65580).

(d) (1) A conservation element for the conservation, development, and utilization of natural resources including water and its hydraulic force, forests, soils, rivers and other waters, harbors, fisheries, wildlife, minerals, and other natural resources. The conservation element shall consider the effect of development within the jurisdiction, as described in the land use element, on natural resources located on public lands, including military installations. That portion of the conservation element including waters shall be developed in coordination with any countywide water agency and with all district and city agencies, including flood management, water conservation, or groundwater agencies that have developed, served, controlled, managed, or conserved water of any type for any purpose in the county or city for which the plan is prepared. Coordination shall include the discussion and evaluation of any water supply and demand information described in Section 65352.5, if that information has been submitted by the water agency to the city or county.

(2) The conservation element may also cover all of the following:

(A) The reclamation of land and waters.

(B) Prevention and control of the pollution of streams and other waters.

(C) Regulation of the use of land in stream channels and other areas required for the accomplishment of the conservation plan.

(D) Prevention, control, and correction of the erosion of soils, beaches, and shores.

(E) Protection of watersheds.

(F) The location, quantity and quality of the rock, sand and gravel resources.

(3) Upon the next revision of the housing element on or after January 1, 2009, the conservation element shall identify rivers, creeks, streams, flood corridors, riparian habitats, and land that may accommodate floodwater for purposes of groundwater recharge and stormwater management.

(e) An open-space element as provided in Article 10.5 (commencing with Section 65560).

(f) (1) A noise element which shall identify and appraise noise problems in the community. The noise element shall recognize the guidelines established by the Office of Noise Control in the State Department of Health Care Services and shall analyze and quantify, to the extent practicable, as determined by the legislative body, current and projected noise levels for all of the following sources:

(A) Highways and freeways.

(B) Primary arterials and major local streets.

(C) Passenger and freight on-line railroad operations and ground rapid transit systems.

(D) Commercial, general aviation, heliport, helistop, and military airport operations, aircraft overflights, jet engine test stands, and all other ground facilities and maintenance functions related to airport operation.

(E) Local industrial plants, including, but not limited to, railroad classification yards.

(F) Other ground stationary noise sources, including, but not limited to, military installations, identified by local agencies as contributing to the community noise environment.

(2) Noise contours shall be shown for all of these sources and stated in terms of community noise equivalent level (CNEL) or day-night average level (Ldn). The noise contours shall be prepared on the basis of noise monitoring or following generally accepted noise modeling techniques for the various sources identified in paragraphs (1) to (6), inclusive.

(3) The noise contours shall be used as a guide for establishing a pattern of land uses in the land use element that minimizes the exposure of community residents to excessive noise.

(4) The noise element shall include implementation measures and possible solutions that address existing and foreseeable noise problems, if any. The adopted noise element shall serve as a guideline for compliance with the state's noise insulation standards.

(g) (1) A safety element for the protection of the community from any unreasonable risks associated with the effects of seismically induced surface rupture, ground shaking, ground failure, tsunami, seiche, and dam failure; slope instability leading to mudslides and landslides; subsidence, liquefaction, and other seismic hazards identified pursuant to Chapter 7.8 (commencing with Section 2690) of Division 2 of the Public Resources Code, and other geologic hazards known to the legislative body; flooding; and wild land and urban fires. The safety element shall include mapping of known seismic and other geologic hazards. It shall also address evacuation routes, military installations, peakload water supply requirements, and minimum road widths and clearances around structures, as those items relate to identified fire and geologic hazards.

(2) The safety element, upon the next revision of the housing element on or after January 1, 2009, shall also do the following:

(A) Identify information regarding flood hazards, including, but not limited to, the following:

(i) Flood hazard zones. As used in this subdivision, "flood hazard zone" means an area subject to flooding that is delineated as either a special hazard area or an area of moderate or minimal hazard on an official flood insurance rate map issued by the Federal Emergency Management Agency. The identification of a flood hazard zone does not imply that areas outside the flood hazard zones or uses permitted within flood hazard zones will be free from flooding or flood damage.

(ii) National Flood Insurance Program maps published by FEMA.

(iii) Information about flood hazards that is available from the United States Army Corps of Engineers.

(iv) Designated floodway maps that are available from the Central Valley Flood Protection Board.

(v) Dam failure inundation maps prepared pursuant to Section 8589.5 that are available from the Office of Emergency Services.

(vi) Awareness Floodplain Mapping Program maps and 200-year flood plain maps that are or may be available from, or accepted by, the Department of Water Resources.

(vii) Maps of levee protection zones.

(viii) Areas subject to inundation in the event of the failure of project or nonproject levees or floodwalls.

(ix) Historical data on flooding, including locally prepared maps of areas that are subject to flooding, areas that are vulnerable to flooding after wildfires, and sites that have been repeatedly damaged by flooding.

(x) Existing and planned development in flood hazard zones, including structures, roads, utilities, and essential public facilities.

(xi) Local, state, and federal agencies with responsibility for flood protection, including special districts and local offices of emergency services.

(B) Establish a set of comprehensive goals, policies, and objectives based on the information identified pursuant to subparagraph (A), for the protection of the community from the unreasonable risks of flooding, including, but not limited to:

(i) Avoiding or minimizing the risks of flooding to new development.

(ii) Evaluating whether new development should be located in flood hazard zones, and identifying construction methods or other methods to minimize damage if new development is located in flood hazard zones.

(iii) Maintaining the structural and operational integrity of essential public facilities during flooding.

(iv) Locating, when feasible, new essential public facilities outside of flood hazard zones, including hospitals and health care facilities, emergency shelters, fire stations, emergency command centers, and emergency communications facilities or identifying construction methods or other methods to minimize damage if these facilities are located in flood hazard zones.

(v) Establishing cooperative working relationships among public agencies with responsibility for flood protection.

(C) Establish a set of feasible implementation measures designed to carry out the goals, policies, and objectives established pursuant to subparagraph (B).

(3) After the initial revision of the safety element pursuant to paragraph (2), upon each revision of the housing element, the planning agency shall review and, if necessary, revise the safety element to identify new information that was not available during the previous revision of the safety element.

(4) Cities and counties that have flood plain management ordinances that have been approved by FEMA that substantially comply with this section, or have substantially equivalent provisions to this subdivision in their general plans, may use that information in the safety element to comply with this subdivision, and shall summarize and incorporate by reference into the safety element the other general plan provisions or the flood plain ordinance, specifically showing how each requirement of this subdivision has been met.

(5) Prior to the periodic review of its general plan and prior to preparing or revising its safety element, each city and county shall consult the California Geological Survey of the Department of Conservation, the Central Valley Flood Protection Board, if the city or county is located within the boundaries of the Sacramento and San Joaquin Drainage District, as set forth in Section 8501 of the Water Code, and the Office of Emergency Services for the purpose of including information known by and available to the department, the office, and the board required by this subdivision.

(6) To the extent that a county's safety element is sufficiently detailed and contains appropriate policies and programs for adoption by a city, a city may adopt that portion of the county's safety element that pertains to the city's planning area in satisfaction of the requirement imposed by this subdivision.

Consistency with Airport Land Use Plans

65302.3. (a) The general plan, and any applicable specific plan prepared pursuant to Article 8 (commencing with Section 65450), shall be consistent with the plan adopted or amended pursuant to Section 21675 of the Public Utilities Code.

Review of Safety Element

65302.5. (a) At least 45 days prior to adoption or amendment of the safety element, each county and city shall submit to the Division of Mines and Geology of the Department of Conservation

one copy of a draft of the safety element or amendment and any technical studies used for developing the safety element. The division may review drafts submitted to it to determine whether they incorporate known seismic and other geologic hazard information, and report its findings to the planning agency within 30 days of receipt of the draft of the safety element or amendment pursuant to this subdivision. The legislative body shall consider the division's findings prior to final adoption of the safety element or amendment unless the division's findings are not available within the above prescribed time limits or unless the division has indicated to the city or county that the division will not review the safety element. If the division's findings are not available within those prescribed time limits, the legislative body may take the division's findings into consideration at the time it considers future amendments to the safety element. Each county and city shall provide the division with a copy of its adopted safety element or amendments. The division may review adopted safety elements or amendments and report its findings. All findings made by the division shall be advisory to the planning agency and legislative body.

(1) The draft element of or draft amendment to the safety element of a county or a city's general plan shall be submitted to the State Board of Forestry and Fire Protection and to every local agency that provides fire protection to territory in the city or county at least 90 days prior to either of the following:

(A) The adoption or amendment to the safety element of its general plan for each county that contains state responsibility areas.

(B) The adoption or amendment to the safety element of its general plan for each city or county that contains a very high fire hazard severity zone as defined pursuant to subdivision (b) of Section 51177.

(2) A county that contains state responsibility areas and a city or county that contains a very high fire hazard severity zone as defined pursuant to subdivision (b) of Section 51177, shall submit for review the safety element of its general plan to the State Board of Forestry and Fire Protection and to every local agency that provides fire protection to territory in the city or county in accordance with the following dates as specified, unless the local government submitted the element within five years prior to that date:

(A) Local governments within the regional jurisdiction of the San Diego Association of Governments: December 31, 2010.

(B) Local governments within the regional jurisdiction of the Southern California Association of Governments: December 31, 2011.

(C) Local governments within the regional jurisdiction of the Association of Bay Area Governments: December 31, 2012.

(D) Local governments within the regional jurisdiction of the Council of Fresno County Governments, the Kern County Council of Governments, and the Sacramento Area Council of Governments: June 30, 2013.

(E) Local governments within the regional jurisdiction of the Association of Monterey Bay Area Governments: December 31, 2014.

(F) All other local governments: December 31, 2015.

(3) The State Board of Forestry and Fire Protection shall, and a local agency may, review the draft or an existing safety element and report its written recommendations to the planning agency within 60 days of its receipt of the draft or existing safety element. The State Board of Forestry and Fire Protection and local agency shall review the draft or existing safety element and may

offer written recommendations for changes to the draft or existing safety element regarding both of the following:
(A) Uses of land and policies in state responsibility areas and very high fire hazard severity zones that will protect life, property, and natural resources from unreasonable risks associated with wildland fires.
(B) Methods and strategies for wildland fire risk reduction and prevention within state responsibility areas and very high hazard severity zones.
(b) Prior to the adoption of its draft element or draft amendment, the board of supervisors of the county or the city council of a city shall consider the recommendations made by the State Board of Forestry and Fire Protection and any local agency that provides fire protection to territory in the city or county. If the board of supervisors or city council determines not to accept all or some of the recommendations, if any, made by the State Board of Forestry and Fire Protection or local agency, the board of supervisors or city council shall communicate in writing to the State Board of Forestry and Fire Protection or to the local agency, its reasons for not accepting the recommendations.

Open Space Plans

65560. (a) "Local open-space plan" is the open-space element of a county or city general plan adopted by the board or council, either as the local open-space plan or as the interim local open-space plan adopted pursuant to Section 65563.
(b) "Open-space land" is any parcel or area of land or water that is essentially unimproved and devoted to an open-space use as defined in this section, and that is designated on a local, regional or state open-space plan as any of the following:
(1) Open space for the preservation of natural resources including, but not limited to, areas required for the preservation of plant and animal life, including habitat for fish and wildlife species; areas required for ecologic and other scientific study purposes; rivers, streams, bays and estuaries; and coastal beaches, lakeshores, banks of rivers and streams, and watershed lands.
(2) Open space used for the managed production of resources, including but not limited to, forest lands, rangeland, agricultural lands and areas of economic importance for the production of food or fiber; areas required for recharge of groundwater basins; bays, estuaries, marshes, rivers and streams which are important for the management of commercial fisheries; and areas containing major mineral deposits, including those in short supply.
(3) Open space for outdoor recreation, including but not limited to, areas of outstanding scenic, historic and cultural value; areas particularly suited for park and recreation purposes, including access to lakeshores, beaches, and rivers and streams; and areas which serve as links between major recreation and open-space reservations, including utility easements, banks of rivers and streams, trails, and scenic highway corridors.
(4) Open space for public health and safety, including, but not limited to, areas which require special management or regulation because of hazardous or special conditions such as earthquake fault zones, unstable soil areas, flood plains, watersheds, areas presenting high fire risks, areas required for the protection of water quality and water reservoirs and areas required for the protection and enhancement of air quality.

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

December 8, 2010

Greg Smith, Associate Planner
City of Murrieta
One Town Square
24601 Jefferson Avenue
Murrieta, CA 90622

Notice of Preparation of a CEQA Document for the
Murrieta General Plan Update

The South Coast Air Quality Management District (SCAQMD) appreciates the opportunity to comment on the above-mentioned document. The SCAQMD's comments are recommendations regarding the analysis of potential air quality impacts from the proposed project that should be included in the draft environmental impact report (EIR). Please send the SCAQMD a copy of the Draft EIR upon its completion. Note that copies of the Draft EIR that are submitted to the State Clearinghouse are not forwarded to the SCAQMD. Please forward a copy of the Draft EIR directly to SCAQMD at the address in our letterhead. **In addition, please send with the draft EIR all appendices or technical documents related to the air quality and greenhouse gas analyses and electronic versions of all air quality modeling and health risk assessment files. These include original emission calculation spreadsheets and modeling files (not Adobe PDF files). Without all files and supporting air quality documentation, the SCAQMD will be unable to complete its review of the air quality analysis in a timely manner. Any delays in providing all supporting air quality documentation will require additional time for review beyond the end of the comment period.**

Air Quality Analysis

The SCAQMD adopted its California Environmental Quality Act (CEQA) Air Quality Handbook in 1993 to assist other public agencies with the preparation of air quality analyses. The SCAQMD recommends that the Lead Agency use this Handbook as guidance when preparing its air quality analysis. Copies of the Handbook are available from the SCAQMD's Subscription Services Department by calling (909) 396-3720. Alternatively, the lead agency may wish to consider using the California Air Resources Board (CARB) approved URBEMIS 2007 Model. This model is available on the SCAQMD Website at: www.urbemis.com.

The Lead Agency should identify any potential adverse air quality impacts that could occur from all phases of the project and all air pollutant sources related to the project. Air quality impacts from both construction (including demolition, if any) and operations should be calculated. Construction-related air quality impacts typically include, but are not limited to, emissions from the use of heavy-duty equipment from grading, earth-loading/unloading, paving, architectural coatings, off-road mobile sources (e.g., heavy-duty construction equipment) and on-road mobile sources (e.g., construction worker vehicle trips, material transport trips). Operation-related air quality impacts may include, but are not limited to, emissions from stationary sources (e.g., boilers), area sources (e.g., solvents and coatings), and vehicular trips (e.g., on- and off-road tailpipe emissions and entrained dust). Air quality impacts from indirect sources, that is, sources that generate or attract vehicular trips should be included in the analysis.

The SCAQMD has developed a methodology for calculating PM2.5 emissions from construction and operational activities and processes. In connection with developing PM2.5 calculation methodologies, the SCAQMD has also developed both regional and localized significance thresholds. The SCAQMD requests that the lead agency quantify PM2.5 emissions and compare the results to the recommended PM2.5 significance thresholds. Guidance for calculating PM2.5 emissions and PM2.5 significance thresholds can be found at the following internet address: http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html.

CITY OF MURRIETA
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In addition to analyzing regional air quality impacts the SCAQMD recommends calculating localized air quality impacts and comparing the results to localized significance thresholds (LSTs). LST's can be used in addition to the recommended regional significance thresholds as a second indication of air quality impacts when preparing a CEQA document. Therefore, when preparing the air quality analysis for the proposed project, it is recommended that the lead agency perform a localized significance analysis by either using the LSTs developed by the SCAQMD or performing dispersion modeling as necessary. Guidance for performing a localized air quality analysis can be found at http://www.aqmd.gov/ceqa/handbook/LST/LST.html.

In the event that the proposed project generates or attracts vehicular trips, especially heavy-duty diesel-fueled vehicles, it is recommended that the lead agency perform a mobile source health risk assessment. Guidance for performing a mobile source health risk assessment ("Health Risk Assessment Guidance for Analyzing Cancer Risk from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis") can be found on the SCAQMD's CEQA web pages at the following internet address: http://www.aqmd.gov/ceqa/handbook/mobile_toxic/mobile_toxic.html. An analysis of all toxic air contaminant impacts due to the decommissioning or use of equipment potentially generating such air pollutants should also be included.

Mitigation Measures

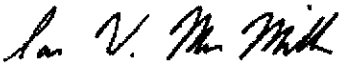
In the event that the project generates significant adverse air quality impacts, CEQA requires that all feasible mitigation measures that go beyond what is required by law be utilized during project construction and operation to minimize or eliminate significant adverse air quality impacts. To assist the Lead Agency with identifying possible mitigation measures for the project, please refer to Chapter 11 of the SCAQMD CEQA Air Quality Handbook for sample air quality mitigation measures. Additional mitigation measures can be found on the SCAQMD's CEQA web pages at the following internet address: www.aqmd.gov/ceqa/handbook/mitigation/MM_intro.html Additionally, SCAQMD's Rule 403 – Fugitive Dust, and the Implementation Handbook contain numerous measures for controlling construction-related emissions that should be considered for use as CEQA mitigation if not otherwise required. Other measures to reduce air quality impacts from land use projects can be found in the SCAQMD's Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning. This document can be found at the following internet address: http://www.aqmd.gov/prdas/aqguide/aqguide.html. In addition, guidance on siting incompatible land uses can be found in the California Air Resources Board's Air Quality and Land Use Handbook: A Community Perspective, which can be found at the following internet address: http://www.arb.ca.gov/ch/handbook.pdf. CARB's Land Use Handbook is a general reference guide for evaluating and reducing air pollution impacts associated with new projects that go through the land use decision-making process. Pursuant to state CEQA Guidelines §15126.4 (a)(1)(D), any impacts resulting from mitigation measures must also be discussed.

Data Sources

SCAQMD rules and relevant air quality reports and data are available by calling the SCAQMD's Public Information Center at (909) 396-2039. Much of the information available through the Public Information Center is also available via the SCAQMD's World Wide Web Homepage (http://www.aqmd.gov).

The SCAQMD is willing to work with the Lead Agency to ensure that project-related emissions are accurately identified, categorized, and evaluated. If you have any questions regarding this letter, please call Ian MacMillan, Program Supervisor, CEQA Section, at (909) 396-3244.

Sincerely,



Ian MacMillan
Program Supervisor, CEQA Inter-Governmental Review
Planning, Rule Development & Area Sources

IM
RVC101123-07
Control Number

Linda S. Adams
Secretary for
Environmental Protection

Department of Toxic Substances Control

Maziar Movassaghi
Acting Director
5796 Corporate Avenue
Cypress, California 90630

Arnold Schwarzenegger
Governor

December 14, 2010

Mr. Greg Smith
City of Murrieta Planning Department
One Town Square
24601 Jefferson Avenue
Murrieta, California 90622

NOTICE OF PREPARATION OF ENVIRONMENTAL IMPACT REPORT (NOP) FOR MURRIETA GENERAL PLAN UPDATE

Dear Mr. Smith:

The Department of Toxic Substances Control (DTSC) has received your submitted Notice of Preparation of the Environmental Impact Report for the above-mentioned project. The following project description is stated in your document: "The General Plan Update is a comprehensive update of the 1994 General Plan. The work program includes a comprehensive update of the General Plan. The purpose of the General Plan Update is to provide the City Council, Planning Commission, City Staff, and the entire community with a comprehensive and internally consistent plan to guide the City's decision-making and development processes through 2035".

Based on the review of the submitted document DTSC has the following comments:

1) The EIR should evaluate whether conditions within the project area may pose a threat to human health or the environment. Following are the databases of some of the regulatory agencies:

- National Priorities List (NPL): A list maintained by the United States Environmental Protection Agency (U.S.EPA).
- Envirostor (formerly CalSites): A Database primarily used by the California Department of Toxic Substances Control, accessible through DTSC's website (see below).

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- Resource Conservation and Recovery Information System (RCRIS): A database of RCRA facilities that is maintained by U.S. EPA.
- Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS): A database of CERCLA sites that is maintained by U.S.EPA.
- Solid Waste Information System (SWIS): A database provided by the California Integrated Waste Management Board which consists of both open as well as closed and inactive solid waste disposal facilities and transfer stations.
- GeoTracker: A List that is maintained by Regional Water Quality Control Boards.
- Local Counties and Cities maintain lists for hazardous substances cleanup sites and leaking underground storage tanks.
- The United States Army Corps of Engineers, 911 Wilshire Boulevard, Los Angeles, California, 90017, (213) 452-3908, maintains a list of Formerly Used Defense Sites (FUDS).

2) The EIR should identify the mechanism to initiate any required investigation and/or remediation for any site that may be contaminated, and the government agency to provide appropriate regulatory oversight. If necessary, DTSC would require an oversight agreement in order to review such documents.

3) Any environmental investigations, sampling and/or remediation for a site should be conducted under a Workplan approved and overseen by a regulatory agency that has jurisdiction to oversee hazardous substance cleanup. The findings of any investigations, including any Phase I or II Environmental Site Assessment Investigations should be summarized in the document. All sampling results in which hazardous substances were found above regulatory standards should be clearly summarized in a table. All closure, certification or remediation approval reports by regulatory agencies should be included in the EIR.

4) If buildings, other structures, asphalt or concrete-paved surface areas are being planned to be demolished, an investigation should also be conducted for the presence of other hazardous chemicals, mercury, and asbestos containing materials (ACMs). If other hazardous chemicals, lead-based paints (LPB) or products, mercury or ACMs are identified, proper precautions should be taken

during demolition activities. Additionally, the contaminants should be remediated in compliance with California environmental regulations and policies.

5) Future project construction may require soil excavation or filling in certain areas. Sampling may be required. If soil is contaminated, it must be properly disposed and not simply placed in another location onsite. Land Disposal Restrictions (LDRs) may be applicable to such soils. Also, if the project proposes to import soil to backfill the areas excavated, sampling should be conducted to ensure that the imported soil is free of contamination.

6) Human health and the environment of sensitive receptors should be protected during any construction or demolition activities. If necessary, a health risk assessment overseen and approved by the appropriate government agency should be conducted by a qualified health risk assessor to determine if there are, have been, or will be, any releases of hazardous materials that may pose a risk to human health or the environment.

7) If it is determined that hazardous wastes are, or will be, generated by the proposed operations, the wastes must be managed in accordance with the California Hazardous Waste Control Law (California Health and Safety Code, Division 20, Chapter 6.5) and the Hazardous Waste Control Regulations (California Code of Regulations, Title 22, Division 4.5). If it is determined that hazardous wastes will be generated, the facility should also obtain a United States Environmental Protection Agency Identification Number by contacting (800) 618-6942. Certain hazardous waste treatment processes or hazardous materials, handling, storage or uses may require authorization from the local Certified Unified Program Agency (CUPA). Information about the requirement for authorization can be obtained by contacting your local CUPA.

8) DTSC can provide cleanup oversight through an Environmental Oversight Agreement (EOA) for government agencies that are not responsible parties, or a Voluntary Cleanup Agreement (VCA) for private parties. For additional information on the EOA or VCA, please see www.dtsc.ca.gov/SiteCleanup/Brownfields, or contact Ms. Maryam Tasnif-Abbasi, DTSC's Voluntary Cleanup Coordinator, at (714) 484-5489.

If you have any questions regarding this letter, please contact me at ashami@dtsc.ca.gov, or by phone at (714) 484-5472.

Sincerely,

Al Shami
Project Manager
Brownfields and Environmental Restoration Program

cc: Governor's Office of Planning and Research
State Clearinghouse
P.O. Box 3044
Sacramento, California 95812-3044
state.clearinghouse@opr.ca.gov.

CEQA Tracking Center
Department of Toxic Substances Control
Office of Environmental Planning and Analysis
P.O. Box 806
Sacramento, California 95812
ADelacr1@dtsc.ca.gov

CEQA # 3079

Riverside Transit Agency
1825 Third Street
P.O. Box 59968
Riverside, CA 92517-1968
Phone: (951) 565-5000
Fax: (951) 565-5001

December 16, 2010

Mr. Greg Smith
City of Murrieta
One Town Square
24601 Jefferson Avenue
Murrieta, California 90622

RE: Notice of Preparation of a Draft Environmental Impact Report for a General Plan Update

Dear Mr. Smith:

Thank you for the opportunity for the Riverside Transit Agency (RTA) to review the notice of preparation for the Draft Environmental Impact Report.

RTA provides service to five routes in Murrieta and others are planned for the future. Given that the General Plan will focus on development, global climate change and sustainability it is important that transit be considered. RTA recommends the following:

1) Allow bus stops the proper space for buses to board and align passengers.
   a) A general purpose lane with a width of 20 feet allows the bus to not impede traffic when stopped (See Attachment A).
   b) Provide a bus turnout for bus stops that do not have adequate clearance from the flow of traffic while stopped.
2) Assure streets are constructed to accommodate buses.
   a) Consider vehicular line-of-sight when considering bus stop location (See Attachment B). A stop location that is on the far-side of the intersection is preferable.
   b) Consider use of bus pads to mitigate street deterioration (See Attachment C).
3) Construct sidewalks that are ADA compliant so that the sidewalk connects directly with the curb for all existing and potential bus stops (See Attachment D).
4) Include installation of bus stop amenities at waiting locations such as shelters, benches and trash receptacles.
5) Provide right-of-way for pedestrian connectivity for easy access to stops and mobility throughout (See Attachment E).

Should it be needed, greater details of these items are available. Technical information on bus stops can be found on RTA's website at http://www.riversidetransit.com/about/guidelines.htm.

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Please do not hesitate to contact me with any questions by phone at (951)565-5130, fax at (951)565-5131 or email at mstanley@riversidetransit.com.

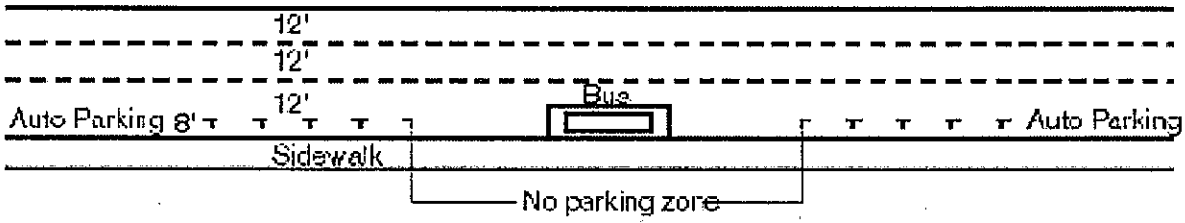
Sincerely,

Mark Stanley
Director of Planning

MS/ar

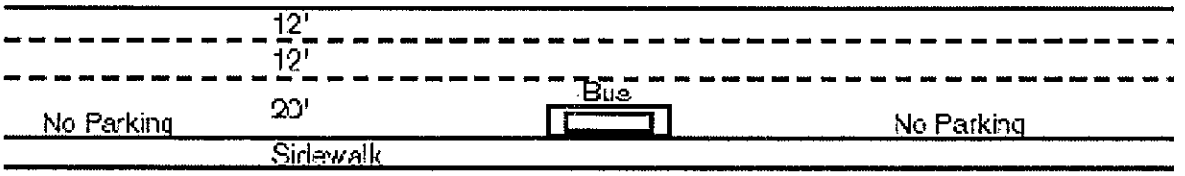
Attachment A:

FIGURE 19 – **Placement of on-street bus stops** – Not to scale



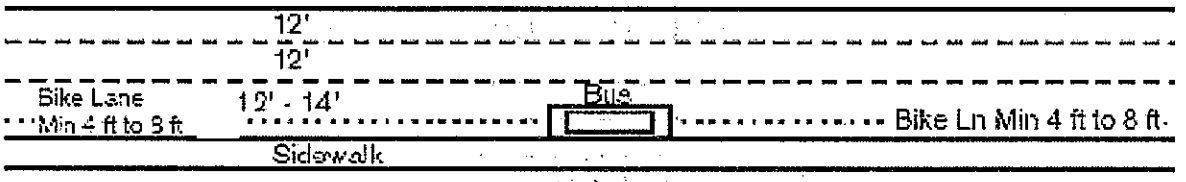
Case 1: Bus stop in parking lane

If combined width of parking and outside travel lanes is less than 20', turnout may be necessary.*



Case 2: Bus stop in extra-wide curb lane

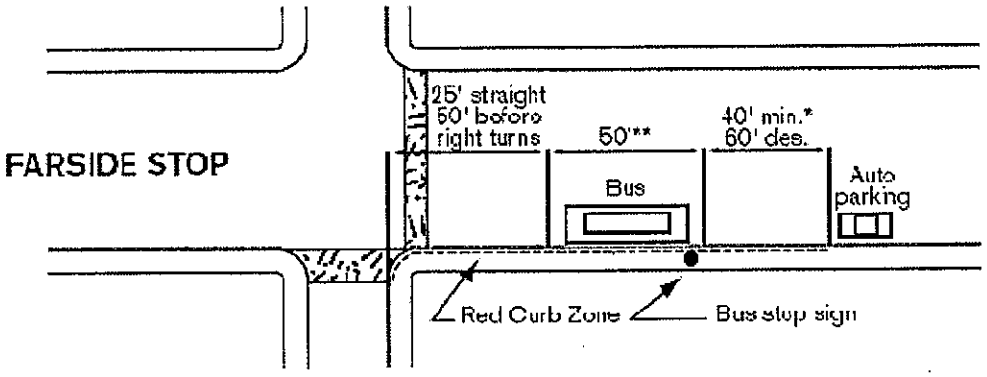
If curb lane is less than 20', turnout may be necessary.*



Case 3: Bus stop in bike lane

If combined width of bike lane and outside lane is less than 20', turnout may be necessary.*

Attachment B:



* 40' minimum for low speed and low volume streets 60' desirable for high speed and high volume streets.

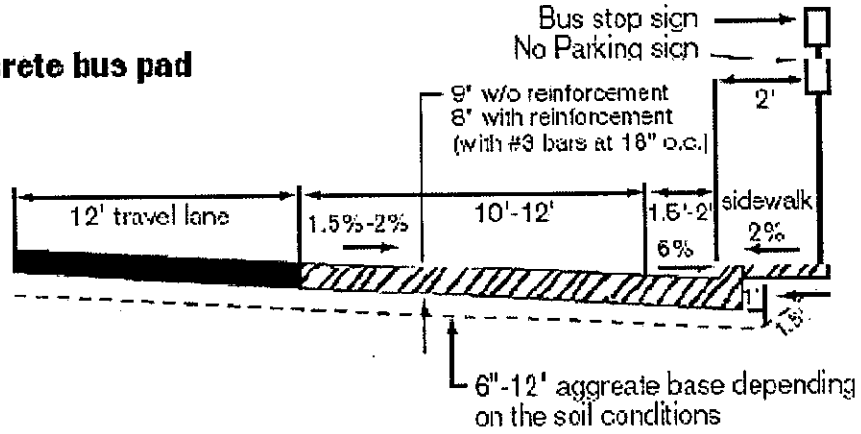
** This 50' berth is for a single large 40' long vehicle. For articulated vehicles, a 70' berth is necessary. These dimensions are for one bus position only; if more positions are required at a stop, see Figure 9 on how to estimate the length needed for multiple berths.

Attachment C:

FIGURE 15

Dimensions for concrete bus pad

Not to scale

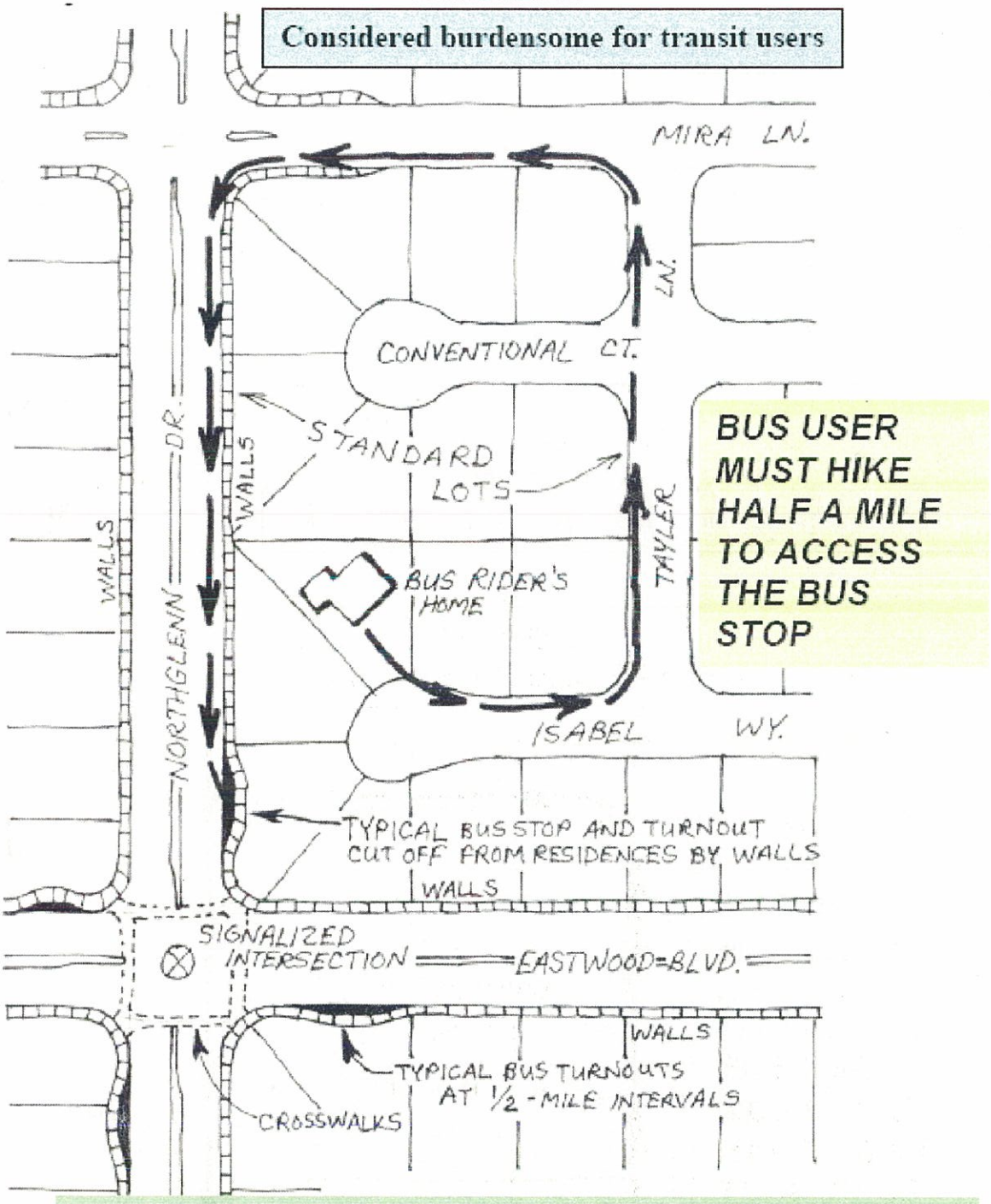


Attachment D:

(Sidewalks separated from the street by grass are not ADA compliant for bus stops)

Attachment E:

Considered burdensome for transit users



This style of conventional subdivision design requires the transit user to make a circuitous and time-wasting hike to reach the bus stop. For an easy, off-the-shelf solution, please see the modifications on the next page.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Road
Carlsbad, California 92011

FACSIMILE TRANSMITTAL FORM

Date Sent: 12/17/10	***No. of Pages:*** 3	***Time Sent:*** *(Pacific Time)*

TO: Greg Smith ***Fax No.:*** 951 698 3416

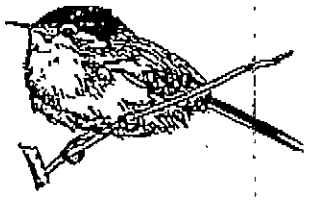
FROM: Karin Cleary-Rose ***Fax No: (760) 431-5902*** ***Phone No.: (760) 431-9440***

SUBJECT: NOP for General Plan Update

COMMENTS:

If you have any have problems receiving this fax, please call (760) 431-9440, extension 284. Thank you.

California Gnatcatcher



The mission of the U.S. Fish and Wildlife Service is working with others to conserve, protect, and enhance fish and wildlife and their habitats for the continuing benefit of the American people.

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U. S. Fish and Wildlife Service
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Road, Suite 101
Carlsbad, California 92011
(760) 431-9440
FAX (760) 431-9618

California Department of Fish and Game
Inland Deserts Region
3602 Inland Empire Blvd., Suite C-220
Ontario, California 91764
(909) 484-0459
FAX (909) 481-2945

In Reply Refer To:
FWS/CDFG-11B0106-11TA0167

DEC 17 2010

Mr. Greg Smith
Associate Planner
City of Murrieta
One Town Square
24601 Jefferson Avenue
Murrieta, California 90622

Subject: Notice of Preparation of a Draft Environmental Impact Report (DEIR) for the city of Murrieta General Plan Update

Dear Mr. Smith:

The California Department of Fish and Game (Department) and the U.S. Fish and Wildlife Service (Service), hereafter collectively referred to as the Wildlife Agencies, have reviewed the subject notice of preparation (NOP). The City of Murrieta (City) is preparing to update its 1994 General Plan, and the City has determined an Environmental Impact Report (EIR) should be prepared. The General Plan Update will focus on guiding development of vacant land, specifically focusing on opportunities for economic development. The EIR will evaluate potential environmental impacts resulting from revisions to the City's General Plan.

The primary concern and mandate of the Service is the protection of public fish and wildlife resources and their habitats. The Service has legal responsibility for the welfare of migratory birds, anadromous fish, and endangered animals and plants occurring in the United States. The Service is also responsible for administering the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq.*). The Department is a trustee agency under the California Environmental Quality Act (CEQA) and is responsible for ensuring appropriate conservation of fish and wildlife resources including rare, threatened, and endangered plant and animal species, pursuant to the California Endangered Species Act, and administers the Natural Community Conservation Planning Program (NCCP).

On June 22, 2004, the Service issued a section 10(a)(1)(B) permit for the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). The Department also issued Natural Community Conservation Plan Approval and Take Authorization for the MSHCP as per Section 2800, et seq., of the California Fish and Game Code. The MSHCP establishes a multiple species conservation program to minimize and mitigate habitat loss and the incidental take of covered species in association with activities covered under the permit. Under the MSHCP,

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Permittees conduct covered activities consistent with the MSHCP, its associated Implementing Agreement, and section 10(a)(1)(B) permit issued.

The City is an MSHCP Permittee, and the City and its Sphere of Influence are within the MSHCP Plan Area. Section 15125(d) of the Guidelines for the Implementation of the California Environmental Quality Act requires that an EIR discuss any inconsistencies between a proposed project and applicable general plans and regional plans, including habitat conservation plans and natural community conservation plans. The NOP did not discuss the MSHCP or identify portions of the City that are expected to contribute to MHSCP reserve assembly.

The City has identified five General Plan Update focus areas targeted for land use change. There are three important MSCHP reserve features located within the focus areas. Land use changes are proposed within the MSHCP Criteria Cells for Proposed Constrained Linkages 16, 15, and 13. The Wildlife Agencies request that the DEIR for the proposed General Plan Update address the effects of any proposed changes in land use designations within the Criteria Cells on MSHCP implementation and reserve assembly, including cost.

Proposed Constrained Linkages 13 and 15 consist of Murrieta and Warm Springs Creeks, respectively. The MSHCP Guidelines Pertaining to the Urban Wildlands Interface require that the quantity and quality of runoff discharged to the MSHCP Conservation Area not be altered in an adverse way when compared with existing conditions. We also request that the DEIR address any potential effects from land use changes under the proposed General Plan Update to the quantity and quality of surface water available to Warm Springs and Murrieta Creeks.

We appreciate the opportunity to provide comments on the notice of preparation. If you should have any questions regarding our comments, please contact Kavin Cleary-Rose at the Service (760) 431- 9440, extension 228 or Leslie MacNair of the Department (949) 458-1754.

Sincerely,

Kennon A. Corey
Assistant Field Supervisor
U.S. Fish and Wildlife Service

Leslie MacNair
Staff Environmental Scientist
California Department of Fish and Game

cc:
Charles Landry, RCA, Riverside, California

CITY OF MENIFEE

Planning Department

Carmen Cave · Community Development Director

Wallace W. Edgerton
Mayor

Fred Twyman
Mayor Pro Tem

John V. Denver
Councilmember

Darcy Kuenzi
Councilmember

Scott A. Mann
Councilmember

December 20, 2010

Greg Smith
City of Murrieta
One Town Square
24601 Jefferson Avenue
Murrieta, CA 90622

RE: **City of Menifee Planning Department Comments on the NOP for the Draft Environmental Impact Report for the City of Murrieta General Plan**

Dear Mr. Smith:

Thank you for providing an opportunity for the City of Menifee Planning Department to review the Notice of Preparation (NOP) for the EIR for the City of Murrieta General Plan.

The Planning Department is concerned with potential impacts to regional transportation corridors within the project vicinity, specifically possible impacts to the interchanges along Interstate 215. The DEIR should identify mitigation measures for impacts to regional transportation corridors. The City of Menifee reserves the right to comment further on these and other portions of the EIR.

Thank you again for the opportunity to review the Notice of Preparation. Please forward any subsequent environmental documents regarding the project to my attention at this office.

Sincerely,

City of Menifee Planning Department

Lisa Gordon, Senior Planner

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29714 Haun Road
Menifee, CA 92586
Phone 951.672.6777
Fax 951.679.3843
www.cityofmenifee.us

Regional Conservation Authority
Western Riverside County

Board of Directors

Chairman
Gary Thomasian
City of Murrieta

Vice Chairman
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Kevin Bash
City of Norco

William Batey
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Mike Gardner
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Robin Lowe
City of Hemet

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City of Banning

Melissa Melendez
City of Lake Elsinore

Eugene Montanez
City of Corona

Jeff Stone
County of Riverside

John Tavaglione
County of Riverside

Mark Yarbrough
City of Perris

Executive Staff

Charles Landry
Executive Director

3403 10th Street, Suite 320
Riverside, California 92501

P.O. Box 1667
Riverside, California 92502-1667

Phone: (951) 955-9700
Fax: (951) 955-8873
www.wrc-rca.org

December 20, 2010

Greg Smith
City of Murrieta
Community Development Department
One Town Square
24601 Jefferson Avenue
Murrieta, California 90622

RE: CITY'S NOTICE OF PREPARATION FOR THE MURRIETA GENERAL PLAN UPDATE AND PROGRAM EIR

Dear Mr. Smith,

The Regional Conservation Authority (RCA) is aware that the City is proposing a General Plan Update. However, the RCA did not receive a copy of the Notice of Preparation (NOP) the City issued on November 19, 2010.

Since the City of Murrieta is a Permittee to the Multiple Species Habitat Conservation Plan (MSHCP), the City will need to ensure that the forthcoming Draft Environmental Impact Report (DEIR) on the proposed General Plan Update addresses consistency with the MSHCP, including Reserve Assembly and special survey requirements. Specifically, the land designations shown on Exhibit 2 of the General Plan Update Focus Areas (see attached) included with the NOP should not conflict with the Reserve Assembly Goals of the MSHCP. The City should be aware that Proposed Constrained Linkage 16 is located within areas designated as Professional and Office on Exhibit 2.

The RCA appreciates the continued efforts that the City has made to continue to implement the MSHCP, and looks forward to receiving a copy of the DEIR during its 45-day public review period.

Sincerely,

Charles Landry
Executive Director

Attachments: General Plan Update Focus Areas

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Santa Margarita Group
31915 Rancho California Road
Ste. 200-133, Temecula, Ca. 92591
(951)506-9607; fax (951)506-4497
Email: sierraclubsmg@gmail.com
www.sierraclubsmg.org

December 20, 2010

City of Murrieta
One Town Square
24601 Jefferson Street,
Murrieta, CA
90622

Attention: Mr Greg Smith, Murrieta City Associate Planner

Subject: Draft Environmental Impact Report for the City of Murrieta General Plan Update

Dear Mr Smith,

Further to our meeting with you, other members of Murrieta City staff and Councilman Alan Long, the Santa Margarita Group of the Sierra Club wishes to make some comments regarding the General Plan update currently underway. We recognize that the City's arroyos and watercourses have been protected over the years and commend the great care taken to protect species and habitats in these areas. Our comments are meant to be taken in that context.

First, we ask that the City of Murrieta's updated General Plan incorporate the recommendations made in the County City Arroyo Committee report of 2006 to ensure, as stated in the NOP, water quality and the preservation of waterways. The recommendations would comply or enhance goal CXV-4 which states "The City seeks to restore the natural function and aesthetic value of creeks while providing flood control measures and opportunities for recreation." A summary of those items follow, while the County's full report - which is not included due to length, can be found here http://www.tlma.co.riverside.ca.us/planning/content/geninfo/CCACPolicyStudy.pdf or on the enclosed disk.

The County of Riverside is currently in the process of adopting these same recommendations in its General Plan update, the draft of which is viewable on its website. It is our hope that the City of Murrieta, in the interests of consistency and best practices regarding water quality, preservation of valuable natural resources and hydrology, do the same.

Second, that the City of Murrieta create, as stated in the plan, a comprehensive map of the city's watercourses that would include the owners, conservation efforts and managers of all watercourses.

Third, that Murrieta develops methods to steward and protect these stretches so that HOAs, landowners, groups and youth can participate and become educated in the importance of preserving these watercourses.

A focus of our Sierra Club group is the protection of wildlife corridors. These riparian areas are an important part of these corridors. We ask that connection and protection from fragmentation should be a priority in the GP's environmental section.

Best regards,

Teri Biancardi

Teri Biancardi, Executive Committee
Santa Margarita Group, Sierra Club
30400 Via Norte,
Temecula, CA 92591

1.3 ARROYO-WATERSHED POLICY AND PLANNING RECOMMENDATIONS

A watershed is a region or area bounded peripherally by a divide and draining ultimately to a particular watercourse or water body, in this case, the Santa Ana River. Watersheds are important sociological and ecological linkages between all living things and the watercourse and landscape in which they are associated. In order to protect watercourses in their natural and semi-natural state, protect water quality and wildlife, restore important overall watershed function in urbanizing areas, and to avoid the need to channelize watercourses, the CCAC makes the following recommendations.

Among the most important are the need for bridging systems and protective setbacks. Setbacks to watercourses and steep arroyos are ungraded and undeveloped buffers between development and watercourses that serve to protect watercourses, riparian areas, and adjacent slopes from a variety of negative impacts. When planning subdivisions, incorporating setbacks and bridging systems rather than culvert pipe and fill crossings over U.S. Army Corps of Engineers-delineated Waters of the U.S. and California Department of Fish and Game (CDFG)-delineated Waters of the State can avoid the need for time consuming permitting processes, and thus provide savings on construction costs.

Recommendation 1: Consistent Illegal Grading Policy

The CCAC recommends that the City and County adopt a consistent policy with respect to illegal grading. The City may wish to consider the addition of higher effective penalties, such as the land use restrictions imposed by the County, to achieve compliance with abatement requests following illegal grading of watercourses, banks, and protective vegetation. In addition, it is important to require property owners to mitigate any damage to a watercourse or its buffering riparian and upland vegetation to encourage compliance. Similarly, the County may wish to consider the addition of effective penalties for any grading begun without a permit. Penalties with a substantial deterrent effect should facilitate the job of code compliance officers in encouraging landowners to comply with existing regulations.

Recommendation 2: Watercourse Layer Preservation Tool

The CCAC is providing the City of Riverside and County of Riverside the GIS Watercourse Layer and Riparian Layer to be combined into a Watercourse Protection Map with the recommendation that this spatial information will be considered and used to "flag" projects prior to issuance of permits on parcels traversed by watercourses.

Recommendation 3: Cooperative Arroyo Planning Areas and Conservation Zoning

A Watercourse Layer that is enforced through a zoning ordinance will protect stream function and riparian habitat from new land use modifications, while providing for additional flood flow capacity unimpeded by manmade constructs. The Watercourse Layer Map can also provide a foundation for establishing County-City Cooperative Arroyo Planning Areas as well as strengthened conservation zoning in both City and County jurisdictions.

Recommendation 4: Model Setback Policy

The CCAC recommends that a flexible model for setback policy be included in the ordinance. The setback model needs to take into account variable topography, slope, the permeability of substrates, flow velocity, and the dynamic nature of stream meandering. The steeper the land, the higher the velocity of runoff, and the lower the filtering of chemical pollutants and sediments carried in runoff. Wildlife habitat, corridor value, and recreational uses also need to be considered. Land uses, slope, substrate type and erosion sensitivity are all important in determining appropriate setbacks.

Recommendation 5: Setbacks to Golf Courses

Adequate setbacks to arroyos and watercourses of at least 50 feet from new golf courses or modifications of existing golf courses should be required because of the copious water, fertilizer, and pesticides used to maintain greens and fairways. Too much direct runoff can also cause failure of banks. Water should not be allowed to drain directly into streams without first being cleansed and allowed to infiltrate through a bioswale or other water quality/water infiltration feature. In addition, turf grasses, including hybrid Bermuda, invade riparian banks and channels and should be setback sufficiently to deter invasion. Furthermore, golf play into riparian habitat is detrimental to sensitive wildlife.

Recommendation 6: Associating Slope, Lot Size, and Setback Distance

CCAC recommends the City and County consider zoning land along all watercourses in a way that provides a minimum lot size and a minimum setback width suitable for extended protection of watercourses. Land divisions should not be approved unless each lot has a suitable building site outside of the required setback to a watercourse and 100 year flood plain.

CCAC suggests modifying the County Land Use Ordinance using a model similar to the City of Riverside's *Title 17 Grading.* In Title 17, a minimum 50-foot protective setback to an arroyo begins at the point where the slope flattens out to less than 30% slope as determined by a **Sectional Slope Analysis** (rather than Average Natural Slope, see glossary). This could be modified so that all structures would be setback far enough so that fuel modification does not have to occur on steep slopes of arroyos or in the protective setbacks.

The CCAC recommends setback width take into consideration the overall topography and geology of arroyos and watercourses. Suggested setback and lot sizes should be determined using the **Sectional Slope Analysis (SSA)** of the parcel, as determined by a qualified engineer. CCAC recommends development of a model that varies setbacks and parcel sizes according to steepness of slope, type of watercourse, underlying substrate, and wildlife value of a watercourse and its corridor such as that presented in Table 1-1.

Table 1-1. Recommended Lot Size and Setback Schedule

Sectional Slope Analysis (% Slope)	Minimum Lot Size (acres)	Minimum Setback from 100-Year Floodplain to Graded Pads (feet)	Minimum Setback from top edge of slope to graded pad when slope > 30% (feet)	Setback w/ Unstable Substrate, Impervious Soil, or Bedrock (feet)	Setback w/ Wildlife Corridor for Terrestrial Species* (feet)	Setback w/ Fuel Modification Zone ** (feet)	Setback w/ Trail (feet)
0 to 15%	1	50	n/a	75 to 100 ft	Add 250 ft	Add 100 ft	Add 25 ft
>15 to 20%	2	50	n/a	75 to 100 ft	Add 250 ft	Add 100 ft	Add 25 ft
>20 to 25%	5	75	n/a	115 to 150 ft	Add 225 ft	Add 100 ft	Add 25 ft
>25 to 30%	10	100	n/a	150 to 200 ft	Add 200 ft	Add 100 ft	Add 25 ft
>30 to 40%	20	150	50	225 to 300 ft	Add 150 ft	Add 100 ft	Add 25 ft
>40%	No Building Allowed						

*Increase from outer edge of minimum setback. If watercourse is deeply incised with steep slopes, add enough distance for wildlife to escape high storm flows even if watercourse is not targeted as major wildlife corridor.

**Increase so that any structure is 100 ft from outer edge of vegetated setback (already adjusted for unstable or impervious substrate) to structures

Recommendation 7: Design Guidelines for Bridging Systems

Bridging systems should provide crossings over rather than within watercourses and should avoid impacts to channels and riparian resources. CCAC recommends that design guidelines for economical and ecological "bridging" systems be studied, prioritized, and incorporated by both the City and County. Crossings should be aesthetically pleasing and open to allow the free movement of water, wildlife, and watercourse maintenance teams.

Recommendation 8: Conservation Easements and Conservation Lots

Conservation lands can be easements or lots in fee title that are dedicated as open space for conservation of native plants, animals, and natural resources. Easement boundaries should conform to setback conditions to preserve the natural boundary of a watercourse and take into consideration the dynamic nature of the watercourse. Only "see through" fencing should be permitted and limited to the outside of setbacks. Fuel modification should occur only in non-sloped portions of easement outside of setback with no planting of invasive species or removal of native species. No lighting of OHV use shall occur within the watercourse area. Homeowner's Associations should employ an experienced non-profit conservation group to manage /maintain the conservation easement. Alternatively, developers can provide for a conservation lot in fee title to a conservation organization with an endowment to finance management of the conservation lot. All new developments must provide for a 100 ft fuel modification zone within the footprint of the developed portions of parcels, and shall not depend on fuel modification within conservation easement and conservation lots.

Recommendation 9: Water Quality Protection

Stormwater detention basins, recharge basins, water quality basins, or similar larger scale water capture devices should be incorporated into projects according to the conditions of the site and project scope. In the event such facilities are used, sensitive design and placement for ecological and aesthetic conditions should be required. If at all possible, such facilities should be designed for multiple purposes such as parks, playgrounds, street medians, or habitat, and so on. Facilities should treat water before entering a watercourse. They should not be in a watercourse. Biofiltration measures should also be incorporated into the site plan and site design, such as the use of engineered bio-swales that incorporate plants that slow and filter urban water runoff before entering an arroyo or watercourse.

Recommendation 10: Arroyos/Watercourses as Neighborhood Amenities

Rather than situating houses with backyards protruding into arroyos or watercourses, and allowing fire clearance on steep slopes, houses should face arroyos or watercourses with the street and trail between homes and top border of arroyo or watercourse. This scenario provides a scenic area to the public and a firebreak between homes and native vegetation while providing protection to arroyo and watercourse resources.

Recommendation 11: Stormwater Management and Runoff Reduction as a Design Element

All new and redeveloping projects in the arroyo planning areas as well as throughout the City and adjacent County areas should incorporate site specific and regional measures to improve stormwater management, increase groundwater recharge, and reduce urban runoff towards a post-development goal of "no net gain in runoff." Some measures include:

- Use of permeable paving materials for many surfaces that require hard materials rather than traditional impervious materials.
- Relocate sidewalks away from roadways or direct their runoff into an open drainage system (vegetated swale) that leads to an infiltration area.
- Build narrower residential streets or restrict parking and sidewalk areas to one side of the road to create open pervious spaces for stormwater infiltration.
- Incorporate low, pervious areas into landscaped parking lot islands and landscaped strips to reduce runoff volume and filter pollutants.
- Use multi-functional open drainage systems in lieu of more conventional curb-and-gutter systems such as a curb and swale system, concave street medians that capture water, and cul-de-sac circles that provide a concave, landscaped circle to capture water.
- Home and public area landscape design that incorporates water capture, permeable areas with vegetation to filter water and recharge groundwater, and other measures including the use of native plant species and/or noninvasive California friendly plant species.
- Controlled irrigation systems that provide only the amount of water required and result in no overspray or runoff.
- Creative capture of rooftop runoff for irrigation and use of green roof designs.

Recommendation 12: Restrict Use of Septic Systems on the Slopes of Arroyos and Watercourses Outside of Graded Pads

CCAC recommends that the City and County require septic systems and leach fields to be located away from sensitive steep slopes of arroyos and watercourses and require generous setbacks (at least 100 feet from leach fields to edge of a watercourse) to prevent groundwater or surface water pollution. In addition, CCAC recommends the requirement of minimum lot sizes of at least two (2) acres along arroyos and other major watercourses in hilly areas and one (1) acre in areas with < 18% slope along watercourses to ensure adequate space for setbacks.

Recommendation 13: Restrict New Sewage Pump Stations Adjacent to Watercourses

To eliminate problematic overflow of sewage from malfunctioning pumping stations, CCAC recommends that all new sewage pumping stations be located away from watercourses. In the event that locations are limited to an area adjacent to a watercourse, provide appropriate Best Management Practices (BMPs) that result in strong protection for watercourses in the event of an accidental sewage overflow.

Recommendation 14: Restrict Fencing in Arroyos and Watercourse Channels

No arroyo, watercourse channel or bank should be fenced or otherwise obstructed. Free flow of water and debris is necessary. Fencing causes debris dams that can dam or divert streams. Watercourses are also important habitat and movement corridors for wildlife. Fencing obstructs free travel of many native animals. The perimeter of arroyos and watercourses should not use fencing that interferes with the free travel of most animals among the segments of networks of open spaces. To eliminate impacts from fencing in sensitive arroyo and watercourse areas, it is important to prohibit fencing across arroyos, require any residential fencing to be placed on graded pads only, and require that any security fencing for public facilities be placed immediately around the facility only considering water flow and wildlife movement needs.

Recommendation 15: Restrict New Golf Course Development within the Boundaries of Arroyos, Watercourses, and Wetlands

New golf courses need to protect wetlands and watercourses. Developers should plan projects such that housing, structures, and greens are outside of the boundaries of arroyos, watercourses and wetlands. Golf courses can have value as firebreaks between homes and native vegetation, but they are problematic to water quality and other beneficial uses. To eliminate impacts to watercourses from golf courses, the CCAC recommends the following:

- Require a minimum 50- to 100-foot setback to watercourses with riparian vegetation for all golf course activities.
- Orient fairways parallel to or away from watercourses to avoid hitting balls into riparian areas.
- Use Best Management Practices (BMPs) and water filtration and infiltration areas to capture, treat, and/or slow runoff before it enters watercourses.
- Utilize Integrated Pest Management measures that reduce the use of chemicals that impact water and habitat quality in watercourses through runoff.

- Use high-efficiency irrigation systems, regionally-appropriate non-invasive landscape species, minimal turf, and other water use efficiency BMPs to reduce on-site water usage and dry weather runoff.
- Encourage and assist existing golf courses to install water quality, stormwater, and water use efficiency Best Management Practices (BMPs) that protect riparian corridors, reduce irrigation and stormwater runoff, and treat runoff water before it enters watercourses.

Recommendation 16: Restrict Domestic Animal and Farm Livestock Keeping in Arroyos and Watercourses

Keeping domesticated animals and livestock in arroyos and watercourses results in significant loss of native vegetation, denuded landscapes that are prone to erosion, and water quality impacts due to concentrated animal wastes. The CCAC recommends that the City and County require review and permits for animal keeping near arroyos and watercourses so that the uses can be analyzed and approved according to site-specific circumstances and probable impacts.

Recommendation 17: Restrict Animal Grazing Farm Stock

Under limited conditions, the grazing of farm stock such as horses, cattle, sheep, and goats or other farm stock (not including hogs) can be acceptable but would require large parcels of land (open range areas, hundreds of acres). Grazing animals compact soils and reduce vegetative cover on slopes of watercourses leading to a decrease in infiltration and increase erosion potential. The CCAC recommends that the City and County require review and permits for animal grazing near arroyos and watercourses so that the uses can be analyzed and approved according to site-specific circumstances and probable impacts.

Recommendation 18: Restrict Nurseries and Agriculture from Placement in Arroyos and Watercourses

Agricultural uses including nurseries, orchards, and other crops often result in significant impacts such as cleared lands, erosion, introduction of non-native invasive species, and runoff water containing pesticides and fertilizers. Placement of these uses should not jeopardize watercourses. Agricultural uses should be avoided or should be very limited in and next to arroyos and watercourses to limit runoff of pesticides and require review and permits for new agricultural land adjacent to arroyos and watercourses so that the uses can be analyzed and approved according to site-specific circumstances and probable impacts. The CCAC also recommends that the City and County encourage existing agricultural uses to install agricultural Best Management Practices (BMPs) that protect riparian corridors, reduce agricultural runoff, and treat runoff water before it enters watercourses.

Recommendation 19: Restrict Telecommunications Towers and Utility Infrastructure within Arroyos and Watercourses

Watercourses are often used inappropriately as conduits for telecommunication and utility infrastructure. Such uses result in increased, inappropriate access to watercourses, habitat damage, and facilities in floodplains that require special flood protection measures. The CCAC recommends that the City and County prohibit telecommunications and utility agency equipment and facilities from being placed in or along arroyos and watercourses and prohibit any new

access to existing or future telecommunication or utility facility or corridor from being placed through or in an arroyo or watercourse. Fuel modification areas should be placed away from watercourses and adjacent slopes and locations of occupied structures should be restricted in accordance with fuel modification requirement of State and Local Governments.

1.4 ARROYO, WATERCOURSE, AND WATERSHED MANAGEMENT NEEDS

- **Development a comprehensive Riverside Arroyo Watershed Management Plan (Plan).** The plan should address the connection between land use decisions and habitat, water quality, stormwater management, and overall watershed function. The necessary challenge will be to incorporate these approaches into the long-term general plan and zoning process within the City and County of Riverside. This should be a multi-objective, stakeholder-based Plan to identify short-term actions and long-term strategies for effective and responsible watershed management.
- **Conduct an "at-risk assessment" regarding planned and potential land use conversions from open space to a developed purpose.** The assessment should take into account potential impacts of such conversions to existing conditions regarding stormwater runoff, water quality, habitat and open space, and recreation needs of the City of Riverside and adjacent County unincorporated areas.
- **Establish various levels of governance and coordination on a watershed basis.** This could include the creation of a decision tree, a multi-agency involvement task force, and the establishment of a stakeholder watershed council
- **Conduct an objective evaluation of the effectiveness of existing protection measures and their implementation.** Assess the City of Riverside's existing grading ordinance, Proposition R, and Measure C, and the County of Riverside's protection measures in protecting arroyo, hillside, and watershed resources in the project area

1.5 NEXT STEPS FOR CCAC

According to the goals in establishing the CCAC, next steps and immediate future roles include:

- Work with City and County staff to refine policy recommendations that further the goal of establishing consistent policies for land use and watershed management in areas that affect both jurisdictions.
- Refine GIS program and documentation and provide to City and County.
- Implementation of Riparian Vegetation Layer within GIS Mapping Project.
- Develop GIS models for delineating watercourse setbacks and riparian buffers.
- Promote programs and educational materials to enhance community awareness about the importance watercourse preservation and methods to achieve a healthy watershed.

Johnson & Sedlack
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December 21, 2010

Mr. Greg Smith, Associate Planner
City of Murrieta
One Town Square
24601 Jefferson Avenue
Murrieta, CA 90622

Dr. Mr. Smith:

This firm submits the following NOP Comments on behalf of the Elsinore Murrieta Anza Resource Conservation District and the Sierra Club.

The EIR for the project should provide a range of alternatives, specifically for those areas where substantial changes are proposed from existing land uses as well as for changes to existing policies. We are particularly concerned with changes to the implementation of the MSHCP as well as maintaining connectivity of natural areas.

The General Plan and EIR should also include a climate action plan with the requirements of the climate action plan providing land use and development alternatives to be analyzed in the alternatives section.

The EIR should consider not just the "natural beauty" of natural areas but also their functionality for wildlife, wildlife corridors and functional riparian areas. The EIR should also discuss plans for recharge of aquifers and methods of preventing overdraft of existing aquifers.

The EIR and General Plan should evaluate the health effects of diesel particulates and develop strategies to maintain adequate buffers between areas of high diesel emission concentration, e.g. freeways and warehouse areas, and residential areas.

The General Plan and EIR should evaluate policies designed to ensure that there will be adequate funding for development of transportation resources within the City including those facilities within the Jurisdiction of CALTRANS.

The General Plan and EIR should provide policies to ensure that noise emissions, including during construction, do not exceed thresholds including the requirement for the use of temporary sound walls during construction.

Johnson & Sedlack
ATTORNEYS *at* LAW

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Thank you for your consideration.

Sincerely,

Johnson & Sedlack

By:
Raymond W. Johnson, Esq. AICP

COUNTY OF RIVERSIDE
TRANSPORTATION AND LAND MANAGEMENT AGENCY
Transportation Department

Juan C. Perez, P.E., T.E.
Director of Transportation

December 21, 2010

Greg Smith, Associate Planner
City of Murrieta
One Town Square
24601 Jefferson Avenue
Murrieta, CA 90622

RE: Notice of Preparation of Environmental Impact Report for the General Plan Update

Dear Mr. Smith:

Thank you for sending the Riverside County Transportation Department the Notice of Preparation (NOP) of an Environmental Impact Report (EIR) for the City of Murrieta General Plan Update.

The General Plan Update could result in the intensification of land uses, which in turn could lead to increases in traffic volumes. The Transportation Department would request that the traffic study for the General Plan Update address potential impacts and mitigation measures on all roadways in the County General Plan that might be affected.

If a modeling process is to be used for the traffic analysis, model inputs and assumptions should be thoroughly documented. Please be aware that the recently developed Riverside County Traffic Analysis Model (RIVTAM) is the suggested model for transportation planning purposes countywide.

Thank you again for the opportunity to review the NOP. We look forward to receiving the Draft EIR and the traffic analysis for the General Plan Update.

Sincerely,

Farah Khorashadi

Farah Khorashadi
Engineering Division Manager

FK:rg

CITY OF MURRIETA
DEC 22 2010
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December 21, 2010

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RE: SCAG Comments on the Notice of Preparation of a Draft Environmental Impact Report for the City of Murrieta General Plan Update [I20100348]

Dear Mr. Smith,

Thank you for submitting the **Notice of Preparation of a Draft Environmental Impact Report for the City of Murrieta General Plan Update [I20100348]** to the Southern California Association of Governments (SCAG) for review and comment. SCAG is the authorized regional agency for Inter-Governmental Review of Programs proposed for federal financial assistance and direct development activities, pursuant to Presidential Executive Order 12372 (replacing A-95 Review). Additionally, pursuant to Public Resources Code Section 21083(d) SCAG reviews Environmental Impact Reports of projects of regional significance for consistency with regional plans per the California Environmental Quality Act Guidelines, Sections 15125(d) and 15206(a)(1). SCAG is also the designated Regional Transportation Planning Agency and as such is responsible for both preparation of the Regional Transportation Plan (RTP) and Federal Transportation Improvement Program (FTIP) under California Government Code Section 65080 and 65082.

SCAG staff has reviewed this project and determined that the proposed project is regionally significant per California Environmental Quality Act (CEQA) Guidelines, Sections 15125 and/or 15206. The proposed project is an update of the City of Murrieta General Plan, a policy document designed to guide the City of Murrieta in achieving its social, physical, and economic goals.

Policies of SCAG's Regional Transportation Plan (RTP) and Compass Growth Visioning (CGV) that may be applicable to your project are outlined in the attachment. The RTP, CGV, and table of policies can be found on the SCAG web site at: http://scag.ca.gov/igr. For ease of review, we would encourage you to use a side-by-side comparison of all SCAG policies with a discussion of the consistency, non-consistency or non-applicability of the policy and supportive analysis in a table format (example attached).

The attached policies are meant to provide guidance for considering the proposed project within the context of our regional goals and policies. We also encourage the use of the SCAG List of Mitigation Measures extracted from the RTP to aid with demonstrating consistency with regional plans and policies. **When available, please send environmental documentation ONLY to SCAG's main office in Los Angeles and provide a minimum of 45 days for SCAG to review.** If you have any questions regarding the attached comments, please contact Bernard Lee at (213) 236-1895 or leeb@scag.ca.gov. Thank you.

Sincerely,

Jacob Lieb, Manager
Environmental and Assessment Services

COMMENTS ON THE NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE CITY OF MURRIETA GENERAL PLAN UPDATE [I20100348]

PROJECT LOCATION

The City of Murrieta is located in southeastern Riverside County, and is comprised of 26,851 acres (41.96 square miles) of which 21,511 acres (33.61 square miles) is located within the City Limits and 5,341 acres (8.34 square miles) is located within the City's Sphere of Influence. Surrounding cities include Menifee to the north, Temecula to the south and east, Wildomar to the west, and unincorporated Riverside County to the north, south, and east. The San Diego County border is just south of Temecula, and Orange County lies on the other side of the Santa Ana Mountains to the west. Regional access to the City is provided by the Interstates 15 and 215.

PROJECT DESCRIPTION

The Murrieta General Plan is a policy document designed to guide the City of Murrieta in achieving its social, physical, and economic goals. This General Plan places particular emphasis on economic development and addresses both current and emerging planning and community topics, such as Global Climate Change, Sustainability, and Healthy Communities. These topics will be developed with the preparation of a Climate Action Plan and a Healthy Community Element.

The General Plan is Murrieta's fundamental policy document regarding community and economic development of the City. The General Plan describes Murrieta's goals and policies regarding land use, economic development, circulation, conservation, recreation and open space, air quality, noise, infrastructure, safety, and healthy community. Along with these goals and policies is an implementation program to guide the execution of the goals and policies.

The General Plan supersedes the 1994 Murrieta General Plan, which consists of the following eight State mandated and optional elements:

- Land Use
- Housing
- Circulation
- Conservation and Open Space
- Safety
- Noise
- Air Quality
- Economic Development

This update to the General Plan may contain similar goals, policies, or other components of the previous plan; however, this version has been tailored to meet the issues and needs of the City at the present time and foreseeable future. The Murrieta General Plan is not a static reflection of general goals and policies; it is a dynamic, practical document with strategies for community development and enhancement, specifically focused on economic development and achieving the overall vision identified by the community.

CONSISTENCY WITH REGIONAL TRANSPORTATION PLAN

Regional Growth Forecasts

The DEIR should reflect the most current SCAG forecasts, which are the 2008 RTP (May 2008) Population, Household and Employment forecasts. The forecasts for your region, subregion and city are as follows:

Adopted SCAG Regionwide Forecasts[1]

	2010	2015	2020	2025	2030	2035
Population	19,418,344	20,465,830	21,468,948	22,395,121	23,255,377	24,057,286
Households	6,086,986	6,474,074	6,840,328	7,156,645	7,449,484	7,710,722
Employment	8,349,453	8,811,406	9,183,029	9,546,773	9,913,376	10,287,125

Adopted WRCOG Subregion Forecasts[1]

	2010	2015	2020	2025	2030	2035
Population	1,735,426	1,918,962	2,096,544	2,262,992	2,414,256	2,550,867
Households	546,047	609,219	671,933	727,622	780,743	828,547
Employment	588,523	691,260	797,626	901,163	1,005,923	1,098,233

Adopted City of Murrieta Forecasts[1]

	2010	2015	2020	2025	2030	2035
Population	103,726	109,715	114,370	119,689	123,549	127,961
Households	34,744	36,664	37,564	39,078	40,391	41,895
Employment	21,019	23,008	25,181	27,364	29,616	31,540

1. The 2008 RTP growth forecast at the regional, subregional, and city level was adopted by the Regional Council in May 2008. City totals are the sum of small area data and should be used for advisory purposes only.

The **2008 Regional Transportation Plan (RTP)** also has goals and policies that may be pertinent to this proposed project. This RTP links the goal of sustaining mobility with the goals of fostering economic development, enhancing the environment, reducing energy consumption, promoting transportation-friendly development patterns, and encouraging fair and equitable access to residents affected by socio-economic, geographic and commercial limitations. The RTP continues to support all applicable federal and state laws in implementing the proposed project. Among the relevant goals and policies of the RTP are the following:

Regional Transportation Plan Goals:

RTP G1 *Maximize mobility and accessibility for all people and goods in the region.*
RTP G2 *Ensure travel safety and reliability for all people and goods in the region.*
RTP G3 *Preserve and ensure a sustainable regional transportation system.*
RTP G4 *Maximize the productivity of our transportation system.*
RTP G5 *Protect the environment, improve air quality and promote energy efficiency.*
RTP G6 *Encourage land use and growth patterns that complement our transportation investments.*
RTP G7 *Maximize the security of our transportation system through improved system monitoring, rapid recovery planning, and coordination with other security agencies.*

GROWTH VISIONING

The fundamental goal of the **Compass Growth Visioning** effort is to make the SCAG region a better place to live, work and play for all residents regardless of race, ethnicity or income class. Thus, decisions

regarding growth, transportation, land use, and economic development should be made to promote and sustain for future generations the region's mobility, livability and prosperity. The following "Regional Growth Principles" are proposed to provide a framework for local and regional decision making that improves the quality of life for all SCAG residents. Each principle is followed by a specific set of strategies intended to achieve this goal.

Principle 1: Improve mobility for all residents.

GV P1.1 *Encourage transportation investments and land use decisions that are mutually supportive.*
GV P1.2 *Locate new housing near existing jobs and new jobs near existing housing.*
GV P1.3 *Encourage transit-oriented development.*
GV P1.4 *Promote a variety of travel choices*

Principle 2: Foster livability in all communities.

GV P2.1 *Promote infill development and redevelopment to revitalize existing communities.*
GV P2.2 *Promote developments, which provide a mix of uses.*
GV P2.3 *Promote "people scaled," walkable communities.*
GV P2.4 *Support the preservation of stable, single-family neighborhoods.*

Principle 3: Enable prosperity for all people.

GV P3.1 *Provide, in each community, a variety of housing types to meet the housing needs of all income levels.*
GV P3.2 *Support educational opportunities that promote balanced growth.*
GV P3.3 *Ensure environmental justice regardless of race, ethnicity or income class.*
GV P3.4 *Support local and state fiscal policies that encourage balanced growth*
GV P3.5 *Encourage civic engagement.*

Principle 4: Promote sustainability for future generations.

GV P4.1 *Preserve rural, agricultural, recreational, and environmentally sensitive areas*
GV P4.2 *Focus development in urban centers and existing cities.*
GV P4.3 *Develop strategies to accommodate growth that uses resources efficiently, eliminate pollution and significantly reduce waste.*
GV P4.4 *Utilize "green" development techniques*

CONCLUSION

As the clearinghouse for regionally significant projects per Executive Order 12372, SCAG reviews the consistency of local plans, projects, and programs with regional plans. This activity is based on SCAG's responsibilities as a regional planning organization pursuant to state and federal laws and regulations. Guidance provided by these reviews is intended to assist local agencies and project sponsors to take actions that contribute to the attainment of regional goals and policies.

All feasible measures needed to mitigate any potentially negative regional impacts associated with the proposed project should be implemented and monitored, as required by CEQA. We recommend that you review the SCAG List of Mitigation Measures for additional guidance, and encourage you to follow them, where applicable to your project. The SCAG List of Mitigation Measures may be found here: http://www.scag.ca.gov/igr/documents/SCAG_IGRMMRP_2008.pdf

SUGGESTED SIDE BY SIDE FORMAT - COMPARISON TABLE OF SCAG POLICIES

For ease of review, we would encourage the use of a side-by-side comparison of all SCAG policies with a discussion of the consistency, non-consistency or not applicable of the policy and supportive analysis in a table format. All policies and goals must be evaluated as to impacts. Suggested format is as follows:

The complete table can be found at: http://www.scag.ca.gov/igr/

- Click on ***"Demonstrating Your Project's Consistency With SCAG Policies"***
- Scroll down to ***"Table of SCAG Policies for IGR"***

SCAG Regional Transportation Plan Goals and Compass Growth Visioning Principles		
Regional Transportation Plan Goals		
Goal/ Principle Number	**Policy Text**	**Statement of Consistency, Non-Consistency, or Not Applicable**
RTP G1	Maximize mobility and accessibility for all people and goods in the region.	***Consistent:*** *Statement as to why* ***Not-Consistent:*** *Statement as to why* *or* ***Not Applicable:*** *Statement as to why*
RTP G2	Ensure travel safety and reliability for all people and goods in the region.	***Consistent:*** *Statement as to why* ***Not-Consistent:*** *Statement as to why* *or* ***Not Applicable:*** *Statement as to why*
RTP G3	Preserve and ensure a sustainable regional transportation system.	***Consistent:*** *Statement as to why* ***Not-Consistent:*** *Statement as to why* *or* ***Not Applicable:*** *Statement as to why*
Etc.	Etc.	Etc.

PECHANGA CULTURAL RESOURCES
Temecula Band of Luiseño Mission Indians

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Director:
Gary DuBois

Coordinator:
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Cultural Analyst:
Anna Hoover

Monitor Supervisor:
Jim McPherson

December 22, 2010

VIA E-Mail and USPS

Mr. Greg Smith
City of Murrieta, Project Planner
One Town Square
24601 Jefferson Avenue
Murrieta, CA 90622

Re: Pechanga Tribe Comments on the Notice of Preparation of a Draft Environmental Impact Report (DEIR) for the General Plan Update Project

Dear Mr. Smith:

This comment letter is submitted by the Pechanga Band of Luiseño Indians (hereinafter, "the Tribe"), a federally recognized Indian tribe and sovereign government, in response to the NOP of a DEIR dated November 19, 2010 from the City of Murrieta. The Tribe formally requests, pursuant to Public Resources Code §21092.2, to be notified and involved in the entire CEQA environmental review process for the duration of the above referenced project (the "Project"), and that these comments be part of the record of approval for this Project. If you have not already done so, please add the Tribe to your distribution list(s) for public notices and circulation of all documents, including environmental review documents, archeological reports, and all documents pertaining to this Project. The Tribe further requests to be directly notified of all public hearings and scheduled approvals concerning this Project and requests that these comments be made part of the record of approval for this Project.

CITY OF MURRIETA MUST INCLUDE INVOLVEMENT OF AND CONSULTATION WITH THE PECHANGA TRIBE IN ITS ENVIRONMENTAL REVIEW PROCESS

It has been the intent of the Federal Government[1] and the State of California[2] that Indian tribes be consulted with regard to issues which impact cultural and spiritual resources, as well as other governmental concerns. The responsibility to consult with Indian tribes stems from the unique government-to-government relationship between the United States and Indian tribes. This

[1] See Executive Memorandum of April 29, 1994 on Government-to-Government Relations with Native American Tribal Governments; Executive Order 13175 of November 6, 2000 on Consultation and Coordination with Indian Tribal Governments; and Executive Memorandum of September 23, 2004 on Government-to-Government Relationship with Tribal Governments.

[2] See California Public Resource Code §5097.9 et seq.; California Government Code §§65351,65352,65352.3 and 65352.4

arises when tribal interests are affected by the actions of governmental agencies and departments. In this case, it is undisputed that the project lies within the Pechanga Tribe's traditional territory. Therefore, in order to comply with CEQA and other applicable Federal and California law, it is imperative that the City and the Project Applicant consult with the Tribe in order to guarantee an adequate basis of knowledge for an appropriate evaluation of the project effects, as well as generating adequate mitigation measures.

PECHANGA CULTURAL AFFILIATION TO PROJECT AREA

The Pechanga Tribe has a legal and cultural interest in the proper treatment of sacred places and all Luiseño cultural resources. The Tribe is concerned about both the protection of unique and irreplaceable cultural resources, such as sacred sites, Luiseño village sites and archaeological items which would be displaced by development, and on the proper and lawful treatment of cultural items, Native American human remains and sacred items likely to be discovered in the course of development and improvements within the City.

The Pechanga Tribe asserts that the entirety of the City of Murrieta is within the Tribe's, aboriginal territory as evidenced by the existence of Luiseño place names, *tóota yixélval* (rock art, pictographs, petroglyphs), and extensive Luiseño artifact records. This culturally sensitive area is affiliated with the Pechanga Band of Luiseño Indians because of the Tribe's cultural ties to this area as well as extensive history on projects within the City. From our knowledge, the Pechanga Tribe has traditionally been the City's consulting and lead-designated Tribe.

The Pechanga Tribe's knowledge of our ancestral boundaries is based on reliable information passed down to us from our elders; published academic works in the areas of anthropology, history and ethno-history; and through recorded ethnographic and linguistic accounts. Of the many anthropologists and historians who have presented boundaries of the Luiseño traditional territory, none have excluded the Murrieta area from their descriptions (Sparkman 1908; Kroeber 1925; White 1963; Harvey 1974; Oxendine 1983; Smith and Freers 1994), and such territory descriptions correspond almost identically with that communicated to the Pechanga people by our elders. While historic accounts and anthropological and linguistic theories are important in determining traditional Luiseño territory, the most critical sources of information used to define our traditional territories are our songs, creation accounts, and oral traditions.

Luiseño history originates with the creation of all things at *'éxva Teméeku*, the present day City of Temecula, and dispersing out to all corners of creation (what is today known as Luiseño territory). It was at Temecula that the Luiseño deity *Wuyóot* lived and taught the people, and here that he became sick, finally expiring at Lake Elsinore. Many of our songs relate the tale of the people taking the dying *Wuyóot* to the many hot springs at Elsinore, where he died (DuBois 1908). He was cremated at *'éxva Teméeku*. It is the Luiseño creation account that connects Elsinore to Temecula, and thus to the Temecula people who were evicted and moved to

the Pechanga Reservation, now known as the Pechanga Band of Luiseño Mission Indians (the Pechanga Tribe). This connection between Elsinore and Temecula also includes Murrieta as an important location for passage between these Cities as well as a known location for subsistence resources and a system of significant villages.

While only briefly outlined here, the Tribe has specific information about the lands within the City of Murrieta and its sphere of influence, based upon our songs and stories, and our indigenous place names, which cannot be found in sources outside the Tribe. We also maintain further information gathered from academic works that demonstrate that the Luiseño people who occupied what we know today as Murrieta are ancestors of the present-day Luiseño/Pechanga people, and as such, Pechanga is culturally affiliated to this geographic area.

The Tribe has a specific interest in this Project because of our cultural ties to this geographic area and has a long modern day history of involvement with projects in the City. The Tribe has been involved with almost all development projects throughout the City of Murrieta including the existing Golden City Specific Plan and Physicians Hospital Project; Linnel Lane; Lincoln Ranch; Copper Canyon; Greer Ranch; the Ivy Street and Guava Street Bridge Projects; the Wynfield Projects; the Murrieta Hot Springs Road Widening; Murrieta 18 and 30; Murrieta Vista High School; Murrieta Fire Station #5 and North Murrieta Business Park Projects. Moreover, Pechanga was named MLD for discovery of human remains on at least two projects in west Murrieta and has been the designated/lead Tribe exclusively within the City boundaries for many years.

The Tribe welcomes the opportunity to meet with the City to further explain and provide documentation concerning our specific cultural affiliation to lands within your jurisdiction.

CULTURAL RESOURCES SHOULD BE EVALUATED IN THE DEIR

The Tribe is concerned about both the protection of unique and irreplaceable cultural resources, such as Luiseño village sites, sacred sites and archaeological items which would be displaced by ground disturbing work conducted within Luiseño territory, and on the proper and lawful treatment of cultural items, Native American human remains and sacred items likely to be discovered in the course of the work. Given the extensive, well-documented evidence of Luiseño ancestors within the City and its sphere of influence, inadvertent discoveries are foreseeable impacts and thus need to be appropriately mitigated for within the confines of the Project.

Because the City is rich in cultural resources, CEQA requires a thorough evaluation of the possible impacts to cultural resources that may occur from proposed policies and development decisions. Any lack of investigation regarding the entire study area is contrary to the mandates of CEQA to evaluate potential project impacts. The Tribe contends that a thorough and current cultural resources assessment should be required as part of the EIR for the Project. Further, the

Tribe requests to continue to be involved in all assessment and evaluation done by the City and to participate as a partner in interpreting the results and updating as necessary any policies based upon those results.

The Pechanga Tribe requests that the City take steps for the protection of future inadvertent finds as well as known sites in the process of preparing the DEIR. Additional surveys may reveal significant archaeological resources and sites which may be eligible for inclusion in the historic site register, may contain human remains and/or may be sacred Luiseño sites. The Pechanga Tribe believes that only after the completion of more extensive surveys by both the City and the Pechanga Tribe will a complete assessment of impacts be accurate. Further, we believe that such assessments must include the Tribe as our traditional knowledge is invaluable in assisting the City and its consultants regarding the meaning and importance of places and cultural items. As such, we request that the City require tribal monitors to be present during any surveys or archaeological testing that might be required as part of the environmental review of this update.

PECHANGA TRIBAL INVOLVEMENT

The Tribe officially requests to continue consultation with the City and to receive official notice of all actions concerning this Project pursuant to the Tribal Traditional Cultural Properties law and CEQA. To continue this consultation, the Tribe requests copies of all available documents pertaining to the cultural resource and archaeological impacts of this Project, including environmental documents, archaeological reports, proposed mitigation measures and conditions of approval. The Pechanga Tribe may request that the City adopt specific procedures and policies concerning the protection, preservation and mitigation of sacred places once we have had an opportunity to review the potential environmental impacts.

The Pechanga Tribe will itself be engaging in further assessments, in consultation with tribal elders, to identify more specific information about resources within the City boundaries. The Tribe may also offer additional proposed language as consultation and the project progresses.

The Pechanga Tribe looks forward to working together with the City of Murrieta in protecting the invaluable Pechanga cultural resources found in the Project area. Please contact me at 951-770-8100 X8104 if you have any questions or concerns. Thank you.

Sincerely,

Anna Hoover

Anna M. Hoover

Cultural Analyst

cc: Pechanga Office of the General Counsel

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City Of Murrieta
One Town Square
24601 Jefferson Avenue
Murrieta, CA 90622

Attn: Mr. Greg Smith

RE: NOP response for Murrieta General Plan Update

December 20, 2010

Dear Sir:

It should be made clear that the Vacant Land percentage shown in NOP Table 2 (p. 3) includes as a major part land that has been set aside for environmental protection, and agreed to by the participants in the MSHCP process. The whole purpose of that process was not only to protect valuable environment but also **to remove the uncertainty and painful process** that had previously dogged the heels of those who wished to develop land.

As one of the three-dozen persons who worked for three years on the MSHCP Committee, and as one of the twelve persons who occupied a seat on the Coordinating Committee, which oversaw the three large committees of the RCIP, I oppose any attempt to go back to the old system. Murrieta appears to be heading in that very expensive and cumbersome direction, judging by the reception being expressed for the Proposed Los Alamos General Plan Goals and Policies for the Los Alamos Specific Pan, submitted by the (citizens') Committee for Quality Life in Murrieta (CQLM), October 20, 2010.

The reasoning behind the Proposal is specious as described by Goal 2 and Policies 2.01, 2.02, 2.03, 2.04, and 2.08. The land west of the Hogbacks is not in general contention, but the land to the east certainly is. That land is in the heart of one of the MSHCP Core Areas, and is not only distinguished by the riparian corridor of Warm Springs Creek but also by the non-riparian lands in the area, which are hosts to a variety of protected animals and plants.

Before the City of Murrieta embodies the concepts of the Specific Plan Proposal in its General Plan, they should give careful thought to the consequences of abandoning the system that was devised through so much care, consideration, argument, and painful grinding work. Though some may think it is possible to have your cake and eat it too, most of us know that is not really possible.

The second issue I want to raise is this. The central and overwhelmingly important issue for Southern California is <u>water</u>, both its quality and its supply. The views I heard expressed by Murrieta and others at the November 10, 2010, hearing held in Temecula by the San Diego Regional Water Quality Control Board, and regarding the new Municipal Stormwater (MS4) Permit, suggest irresponsible thinking that is twenty years out of date

and certainly out of contact with the reality of our problems in the Santa Margarita Watershed. I do not see where in the new General Plan is the focus and importance the water issue deserves.

Respectfully yours,

Robert D. Wheeler, Ph.D. (Economics)
29071 Calle del Buho
Murrieta, CA 92563

CITIZENS for QUALITY LIFE in MURRIETA-CQLM

Max Miller, Chairman; Mike O'Donnell, Co-Chairman; Gayle Vergara, Secretary;
Shawn Horwitz, Recording Treasurer; MaryAnn S. Miller, Reporting Treasurer;
Joyce Dodd, Historian - FACE BOOK -Citizens for Quality Life in Murrieta-CQLM
cqlm.2010@yahoo.com WEB SITE Citizens for Quality Life in Murrieta-cqlm
www.cqlm.net (951) 505-7428

==========

December 20, 2010

Greg Smith, Associate Planner
City of Murrieta
One Town Square
24601 Jefferson Avenue
Murrieta, CA 90622

RE: Notice of Preparation – General Plan Update

Dear Mr. Smith:

We appreciate the opportunity to comment on the Notice of Preparation for the Environmental Impact Report (EIR) associated with the City's General Plan Update. This letter represents the collective thoughts of the Citizens for Quality of Life in Murrieta (CQLM). Our group is comprised primarily of residents and property owners in the Los Alamos Hills area of the City. Individual members of the community may submit additional letters.

Our group and community have long advocated that the City develop and adopt a Specific Plan for our community that reflects its unique qualities. The General Plan and associated EIR should reflect the needs of our community. Specifically, Los Alamos Hills is a rural community surrounded by suburban development and the accompanying issues such as traffic, noise, air pollution, and public safety. We believe development and implementation of a Specific Plan for Los Alamos Hills will address these issues while preserving private property rights. The group has received verbal commitments from the City and staff that inclusion of a Specific Plan for Los Alamos Hills is acceptable and will be included in both the General Plan Update and the associated EIR.

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Draft Policies and Goals for the Specific Plan (attached) have been developed that articulate the future growth patterns and objectives of the Los Alamos Hills community. We request these be formally included in the General Plan Update and the EIR. We have also attached a Specific Plan Land Use Map. We have received verbal commitments from the City for its inclusion in the General Plan Update and EIR and want to reiterate our request that the Los Alamos Hills Specific Plan area be designated as such in the General Plan Land Use Map

We recently became aware of the City's effort to update the City Housing Element which includes locating two (2) VERY HIGH density projects within our community. This type of density is entirely inconsistent with our rural community! We strongly request that staff remove these VERY HIGH density areas from the General Plan Update and exclude them from the EIR analysis of the General Plan Update. Neither of these sites, known as five (5) and six (6), are logical applications of land planning principles. High-density development should be located adjacent to the urban core of the community or similar high intensity areas, rather than a rural community such as Los Alamos Hills. Portions of each appear to be located in environmentally sensitive wetland areas of Adobe Creek and Warm Springs Creek. Further, these sites are within the airport influence area for take-off and landings and likely conflict with the Airport's Land Use Compatibility Plan.

As part of the broader General Plan Update review and in anticipation of the Specific Plan for the area, we request that the EIR analysis considers how the City's growth will affect the provision of Water and Sewer services, change traffic patterns and safety, Police and Fire response times, pedestrian and trail safety, air quality impacts, and the provision of public open space versus private property rights in the Los Alamos Hills area. These issues must be analyzed, especially in light of the General Plan Update including the Specific Plan designation for the Los Alamos Hills community. Further, including the Specific Plan designation in the General Plan assists staff and the decision-makers in evaluating these issues!

To date, Los Alamos Hills has provided nearly 45% of its community as public open space; therefore, consideration should be given to impact on private property rights and distribution of the City's open space requirement to other portions of the City.

The City's General Plan Update and EIR should include a thorough analysis of the financial impacts of implementing the goals and policies of the General Plan. Given the extremely difficult economic times that our nation and community are experiencing, it is extremely important that our citizens be provided information relative to the cost of implementing the General Plan. This analysis should occur on a neighborhood-by-neighborhood basis, including Los Alamos Hills.

Further, the analysis should evaluate all possible funding tools and mechanisms legally available to the City and each neighborhood which might help mitigate the financial burden resulting from implementation of the General Plan Update. Analysis and consideration should be given to establishing capital accounts for collecting funds needed to implement General Plan goals and policies, by neighborhood. Finally, there should be goals and policies to encourage City staff to actively pursue all Federal, State, and County grant opportunities as well as other funding sources.

We respectfully request that each of the issues be included in the City's General Plan Update and the associated EIR and thoroughly analyzed for review and comment by the citizens of Murrieta. We appreciate your attention to these issues and look forward to reviewing the General Plan Update and EIR.

Sincerely,

Citizens for Quality of Life in Murrieta - CQLM

Max Miller - Chairman

Cc: Randon Lane, Mayor

Doug McAlliser, Mayor Pro-tem

Rick Gibbs, City Council

Kelly Bennett, City Council

Alan Long, City Council

Rick Dudley, City Manager

MaryAnn Shushan Miller

35510 Los Alamos Rd., Murrieta, CA 92563 (951) 505-7428

December 20, 2010

Greg Smith, Associate Planner
City of Murrieta
One Town Square
24601 Jefferson Avenue
Murrieta, A 90622

Re: Notice of Preparation – General Plan Update

Dear Mr. Smith:

I appreciate this opportunity to comment on the Notice of Preparation for the Environmental Impact Report (EIR) associated with the City's General Plan Update.

I reside in the Los Alamos Hills Specific Plan Area. I believe that the implementation of the Los Alamos Hills Specific Plan will help preserve our personal property 5th amendment rights ," fair compensation".

I request analysis of the impacts regarding the following:

A) Multi-species Habitat Conservation Plan (MSHCP) was adopted by the City of Murrieta in 2003.
B) The MSHCP is integral to the General Plan as it acts as another de facto zoning and entitlement.
C) The City has approximately 40% of the Los Alamos Hills Specific Plan community in conservation covering a geographical area shown on Exhibit A.
D) The City and the RCA report on the status of conservation under the City and RCA MSHCP reporting requirements.
E) The City has designated approximately 2/3 of the City's state mandate for (subsidized) Affordable Housing in the Los Alamos Hills Specific Plan Area.

In specific, an analysis of the impact to Los Alamos Hills Community caused by the contribution of conservation land as reported by the RCA in the Los Alamos Hills community. This conservation has benefitted development of land in the greater Murrieta City as a whole, and there is measurable impact of the MSHCP on the Los Alamos Hills Community.

1) What is the range of conservation lands required in the agreement between the RCA and the City of Murrieta?
2) How many acres are currently under conservation in the City of Murrieta?
3) Of the acres currently under conservation, how many of those acres are from the Los Alamos Specific Plan area as shown in Exhibit A?
4) Of the balance of the low range of the requirement for conservation land, where does the City in its "home rule" propose acquiring the land to fulfill this requirement?

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5) How many private property buildable lots will be available for participation in an infrastructure base pro-rata contribution with the balance of the acres available for full development?
6) To compensate for the Los Alamos Hills infrastructure for lost funding base and loss of ground water from area wells due to overburdening of conservation land coupled with adjacent, approved higher density housing, how will the City pursue funding to mitigate and replace these losses?
7) Funds collected from entitlement fees within the Los Alamos Hills SP area, Development Agreements, Federal, State, Special District and other funding vehicles should be deposited in a Los Alamos Hills infrastructure Capital Acct for exclusive use in the Los Alamos Hills' core Specific Plan area.

B) Analysis should be done in the EIR regarding the subsidized, affordable, low income housing designation in Los Alamos Hills Specific Plan rural area. The State Senate Bill mandating this requirement, states that the goal of this mandate is to relocate over 300,000 homeless individuals from inner cities to other communities. The stated causes for this homelessness is, prison release, drug addiction and mental illness. The cost of overburdening of services in the inner cities is to be shared by other urban areas. This burden of clustering by the possible addition of 1600 dwelling units in the Los Alamos Specific Plan area will have a severe impact as follows:

1) Analysis of the impact on roads, conservation lands, infrastructure (roads and water) and public safety in the Los Alamos Hills Specific Plan area should be included.

2) Analysis of the impact to the rural, 2 ½ acre , 1 acre, and 5-10 DU to the acre home sites' air quality, noise levels, peaceful life style, including natural beauty, and property values in the Los Alamos Hills Specific Plan area should be included.

I respectfully request that each of these issues be included in the City's General Plan Update and the associated EIR and thoroughly analyzed for review and comment by the Citizens of Murrieta. I appreciate your attention to these issues and look forward to reviewing the General Plan Update and EIR.

Very truly yours,

Mary C Shushan Miller

MaryAnn Shushan Miller

Cc: Randon Lane, Mayor

Doug McAllister, Mayor Pro-tem

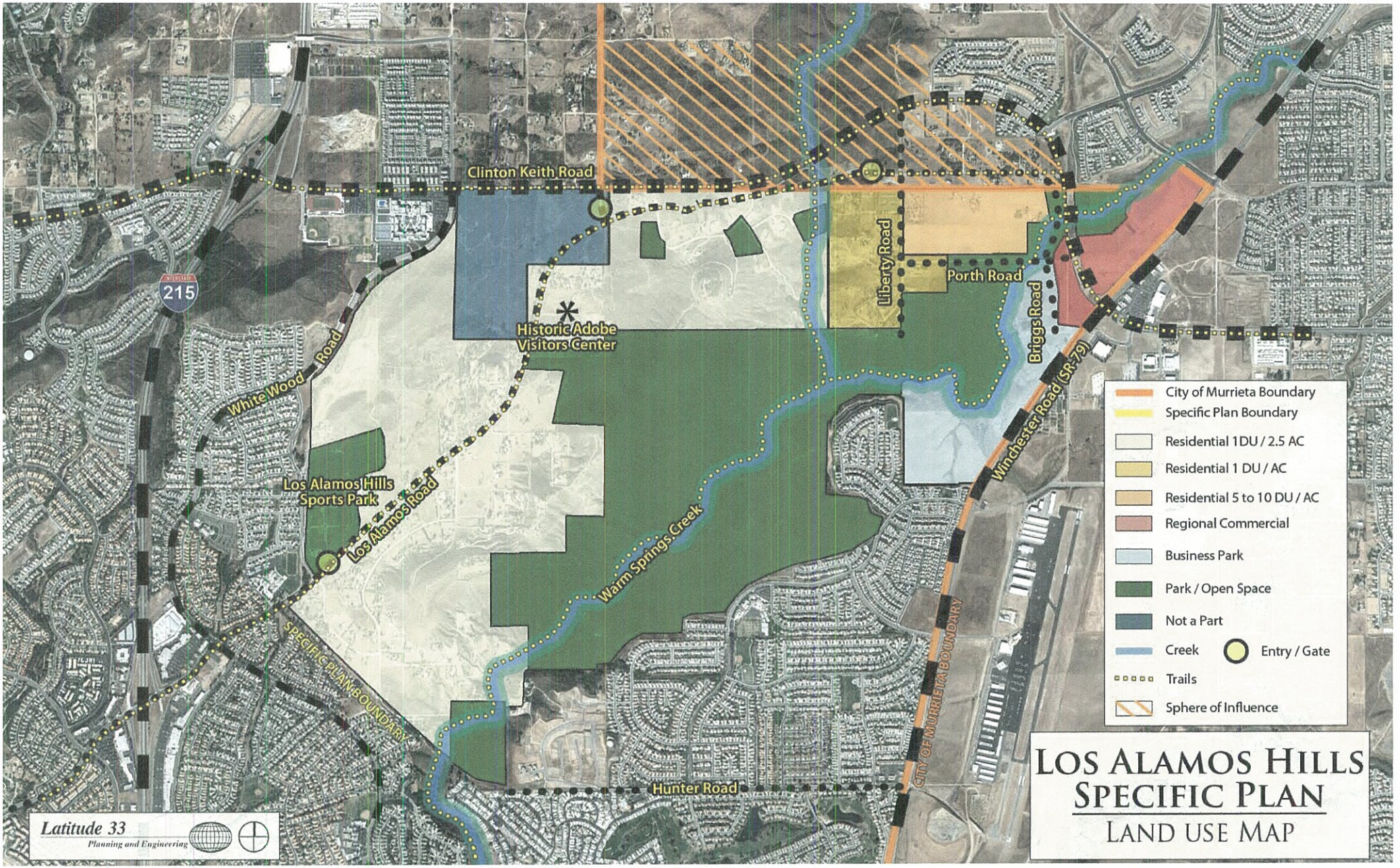
Rick Gibbs, Councilman

Kelly Bennett, Councilwoman

Alan Long, Councilman

Rick Dudley, City Manager

Mary Lanier, Community Development Director


Clinton Keith Road
Liberty Road
Porth Road
Briggs Road
Winchester Road (SR-79)
215
Historic Adobe
Visitors Center
White Wood Road
Los Alamos Hills
Sports Park
Los Alamos Road
Warm Springs Creek
SPECIFIC PLAN BOUNDARY
CITY OF MURRIETA BOUNDARY
Hunter Road
City of Murrieta Boundary
Specific Plan Boundary
Residential 1DU / 2.5 AC
Residential 1 DU / AC
Residential 5 to 10 DU / AC
Regional Commercial
Business Park
Park / Open Space
Not a Part
Creek
Entry / Gate
Trails
Sphere of Influence
LOS ALAMOS HILLS
SPECIFIC PLAN
LAND USE MAP
Latitude 33
Planning and Engineering

Jim Kelly
10650 Treena Street, Suite 111
San Diego, CA 92131

December 20, 2010

Greg Smith, Associate Planner
City of Murrieta
One Town Square
24601 Jefferson Avenue
Murrieta, CA 90622

RE: Notice of Preparation – General Plan Update

Dear Mr. Smith:

Thank you for the opportunity to comment on the Notice of Preparation for the Environmental Impact Report (EIR) associated with the City's General Plan Update. I own property located on Porth Road and Liberty Road in the City of Murrieta.

I recently became aware of the City's effort to update the City Housing Element which proposes to locate two (2) VERY HIGH density projects, one (Site #6) which is literally next door to my property and the other (Site #5) which is less then half a mile southeast of my property. This type of density is entirely inconsistent with existing development and with the development proposed by the proposed Specific Plan being advocated by residents and property owners of the Los Alamos Hills area.

I strongly request that staff remove these VERY HIGH density areas from the Housing Element and General Plan Update. Neither of these sites (#5 and #6) makes sense from a land planning perspective. High-density development should be located adjacent to the urban core of the community or similar high intensity areas. Portions of each appear to be located in environmentally sensitive wetland areas of Adobe Creek and Warm Springs Creek. Further, these sites are within the airport influence area for take-off and landings and likely conflict with the Airport's Land Use Compatibility Plan. Finally, housing product of this type and density would require huge City and state subsidies and would devastate the value of adjacent properties and undermine the quality of life for the entire community.

Thank you for your attention to this issue.

Sincerely,

Jim Kelly

cc: Mary Lanier
City Council

Appendix C:

Traffic and Impact Analysis

CITY OF MURRIETA GENERAL PLAN UPDATE
TRAFFIC IMPACT ANALYSIS

Submitted by:

ITERIS®

Submitted to:

RBF Consulting

September 8, 2011

16J09-1636

DOCUMENT VERSION CONTROL

Comment	Date	Version No.
Draft for Review	January 10, 2011	1.00
Comments Incorporated	January 28,2011	1.01
Additional Comments Incorporated	February 2, 2011	1.02
Final Document	September 8, 2011	1.10

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1.0 INTRODUCTION

1.1 PURPOSE OF THE REPORT AND STUDY OBJECTIVES

The main purposes for this traffic impact analysis of the update of the City of Murrieta General Plan were to access the transportation impacts of the following:

1. Existing Conditions;
2. Buildout of the current General Plan land uses;
3. Buildout of the Recommended Scenario land use plan;
4. Buildout of the Scenario B land use plan.

The analysis used buildout (2035) land uses in the regional area, and as part of the study, daily and peak hour volumes were developed in order to assess potential traffic impacts to roadways and intersections in Murrieta.

The study also recommends improvements to roadway links and intersections in order to meet City policies regarding levels of service (LOS). These have been incorporated into the proposed Draft Circulation Plan.

2.0 GENERAL METHODOLOGY

Traffic volumes used in the study were developed through the use of a travel demand model, which is specific to the City of Murrieta, and consistent with the Riverside County Traffic Analysis Model (RivTAM), and the Southern California Association of Governments (SCAG) travel demand model.

The development of the Murrieta focused travel demand model is based on the Year 2008 Riverside Traffic Analysis Model (RivTAM) in TransCAD platform. The purpose for the development of this focused and detailed model is for use in General Plan traffic forecasting. The Murrieta focused model covers all of the six counties in the SCAG region. New zone structure with 925 zones was designed to detail the Murrieta area and to aggregate a set of zones outside of the area. The model roadway network within the City and sphere area was expanded to include roadways classified as Collector and above, as shown in the City of Murrieta General Plan Circulation Element.

The structure of the Murrieta Model is consistent with the RivTAM model to ensure the compatibility between the two models. Building on RivTAM also minimizes the time and effort needed to maintain and update Murrieta as new elements of the RivTAM model are put into the model job stream. Specifically, the model consists of traditional four step modeling process including trip generation, trip distribution, mode split, and traffic assignment. Two model scenarios were included in the Murrieta Model, namely the base year 2009 and the forecast year 2035. Given the updated zone structure, corresponding modifications regarding the input data tables and matrices in the four steps were conducted for both of the model scenarios. The validation for base year 2009 was followed to ensure the results match with the both RivTAM model and traffic counts.

The validated model was then used to forecast future volumes for the different scenarios. Peak hour turning model volumes were developed for study intersections using NCHRP methodology.

2.1 FORECAST METHODOLOGY

Development of the Murrieta Model includes four main steps: 1) subdivision of traffic analysis zones, 2) highway and transit network development, 3) trip generation, and 4) trip distribution, mode split, and trip assignment. These processes are discussed in detail below.

2.1.1 *SUBDIVISION OF TRAFFIC ANALYSIS ZONES*

Traffic Analysis Zones (TAZ) are geographic areas dividing a planning region into relatively similar areas of land use and land activity. Traffic analysis zones in the Murrieta area were determined and established with input from City of Murrieta staff. **Figure 1** shows the Murrieta Model traffic analysis zone boundaries in the City area, with zone numbers indicated.

A focused model is usually developed for a specific area based on the regional model and has a multi-tier zone system. The multi-tier zone system in Murrieta Model was defined as follows:

1. Aggregated TAZ at Combined Statistical Areas (CSA) level
2. Area adjacent to the first tier area (15-20 miles from the study area)
3. Area adjacent to the study area, which covers the next 15 miles buffer outside the study area
4. Murrieta study area with smaller size Traffic Analysis Zones (TAZ)

Figure 2 illustrates the four-tier zone system. Based on the City's zone structure and land use, RivTAM TAZs were further divided into 247 TAZs within the forth tier, with 23 zones being spare zones. Spare zones are reserved zones for probable future use. They currently generate zero trips. The third tier with 203 TAZs kept the same zone structure as the RivTAM mode. The second tier is a more aggregated RivTAM TAZ adjacent to tier 1. The aggregation based on CSA level generated 352 TAZs located in the first tier. Summary of the TAZ statistics in the Murrieta Model is presented in **Table 1**. Accordingly, centroid connectors in all the tiers were rebuilt to match with the new zone system.

TABLE 1 – MURRIETA MODEL ZONE SYSTEM STRUCTURE

Modeling Area	TAZ	
	Number of Zones	Sequence
Imperial County	10	1-10
Los Angeles County	220	11-230
Orange County	34	231-264
Riverside County	532	265-796
San Bernardino Valley	38	797-834
Murrieta (Portion of Riverside County)	(247)	(401-647)
Ventura County	8	835-842
External/Cordon Zones	40	843-882
Airport Zones	12	883-894
Port Zones	31	895-925
Total	***925***	***1-925***

FIGURE 1 CITY OF MURRIETA TRAFFIC ANALYSIS ZONE LOCATIONS

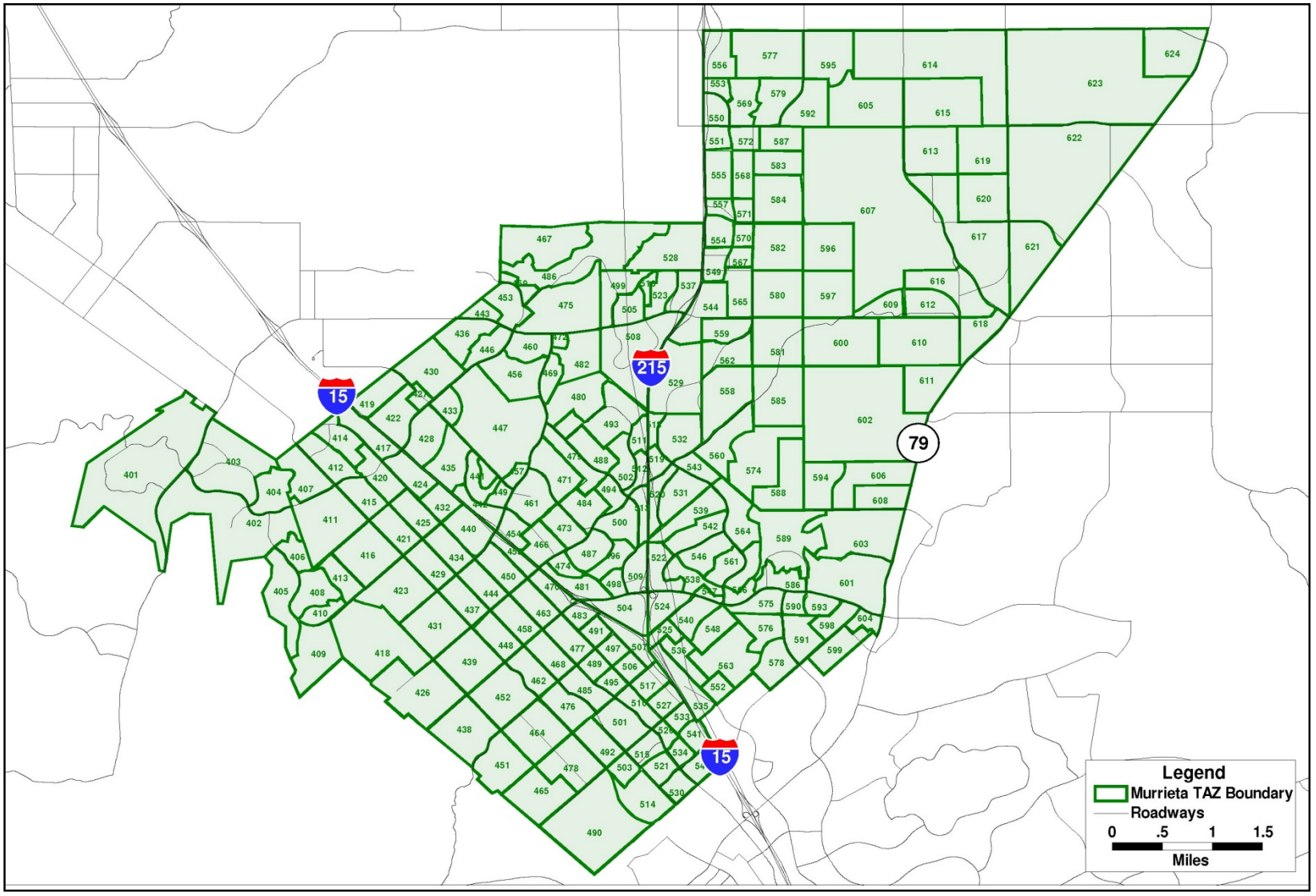
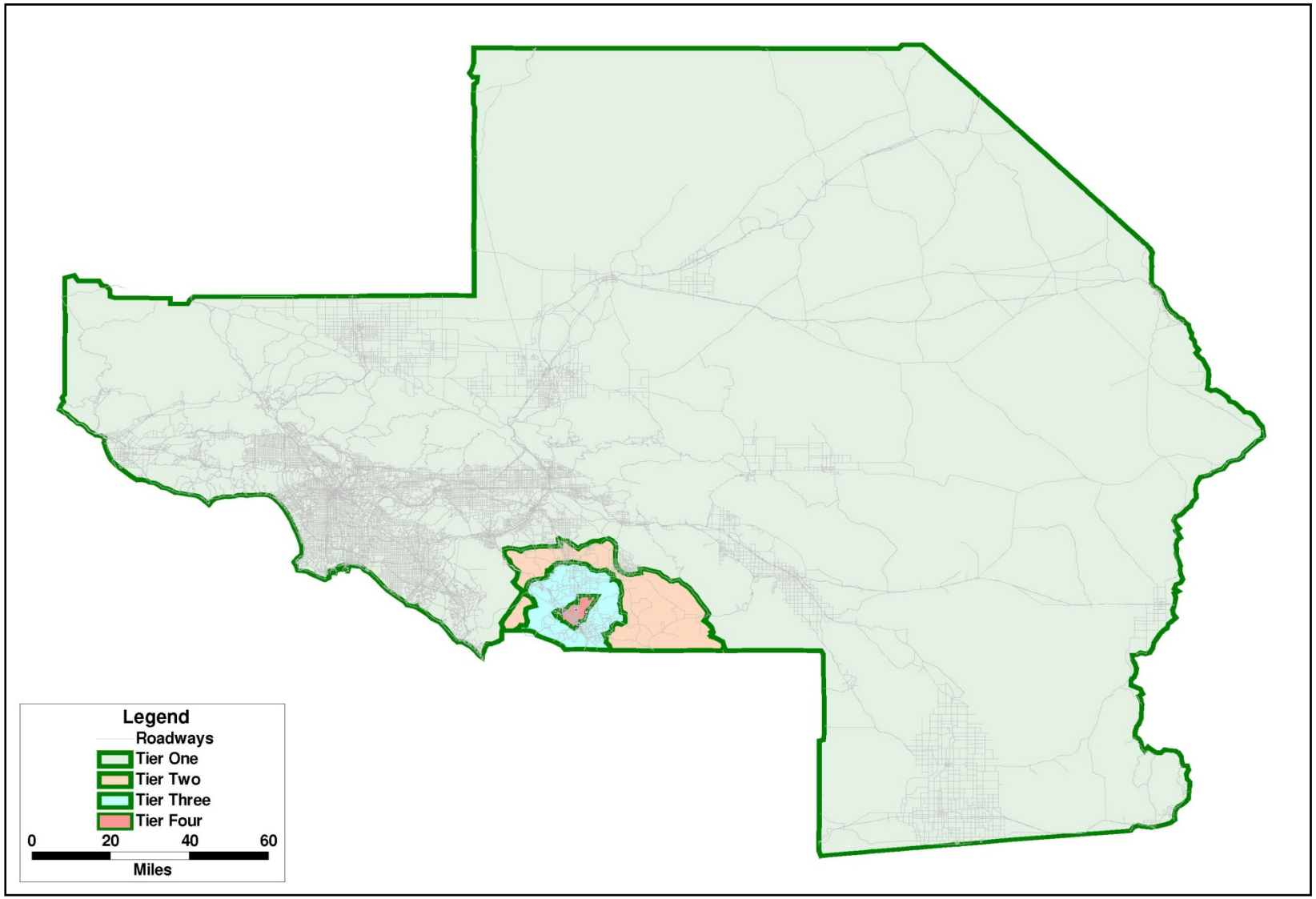


FIGURE 2 FOUR-TIER ZONE SYSTEM IN MURRIETA MODEL



2.1.2 *HIGHWAY AND TRANSIT NETWORK DEVELOPMENT*

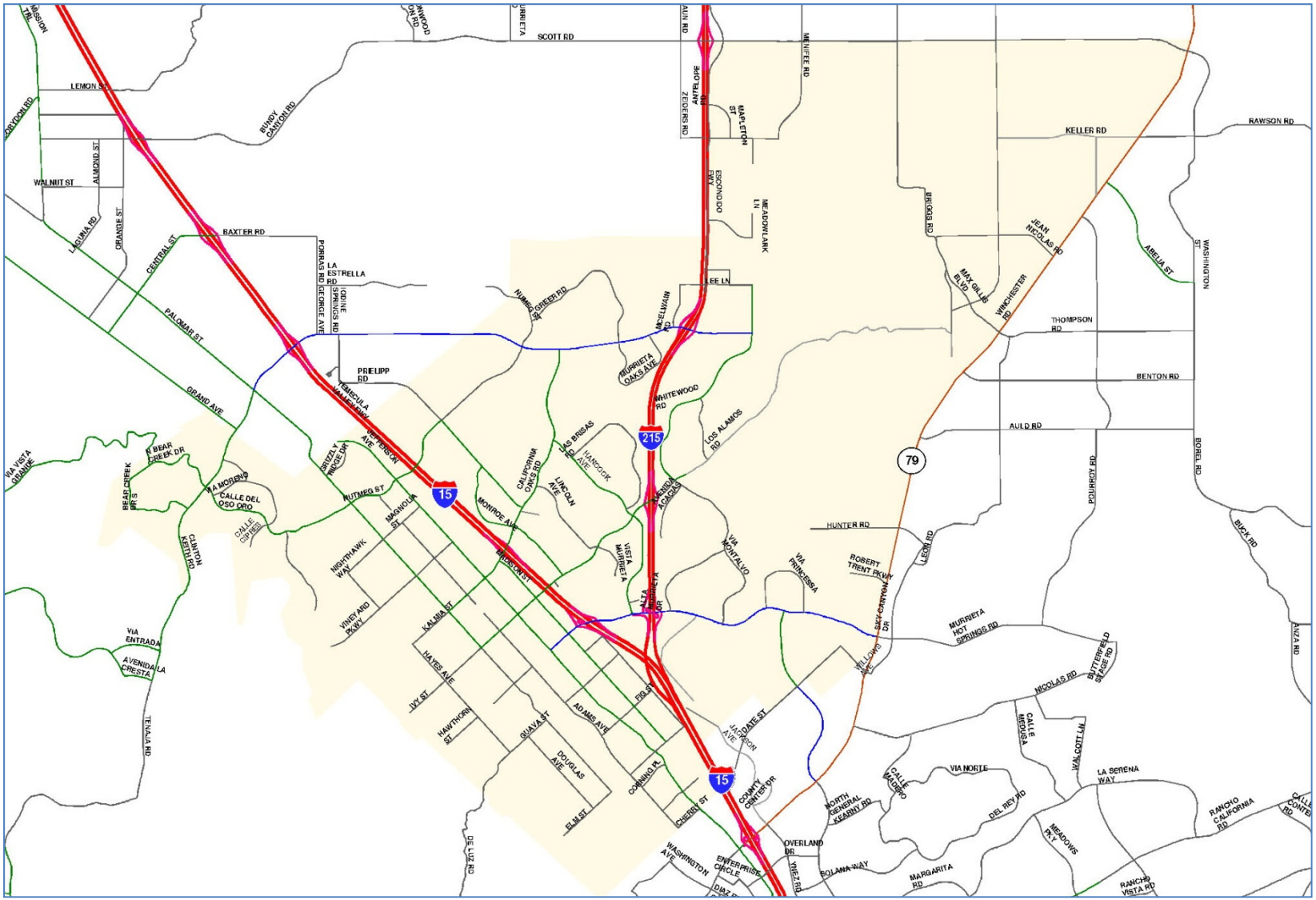
Accurate transportation model calibration and validation requires that the transportation highway network represents the same time horizon as the land-use data that is used to estimate travel demand. The RivTAM 2008 Base Year model highway network was used to develop the 2009 Murrieta Model highway network. The highway network was conflated[1] using the network editing features and the GIS capabilities of TransCAD, and was aligned using the roadways street centerline file. Roadway links and new centroid connectors for the new traffic analysis zones were added to the highway network. Generally, all the streets currently existing in the Murrieta General Plan Circulation Element were included in the model network. Local residential streets were generally not included in the network. **Figure 3** shows a snapshot of the Murrieta Model highway network.

Highway network attributes such as speed, functional classification, facility type, capacity, and number of lanes were updated to reflect the existing conditions in the city area. No modifications or changes were made to the RivTAM highway network in the region outside the city.

The existing RivTAM transit network was also modified to ensure its compatibility with the new highway network. Several transit routes were modified to lie on the modified roadway network; however the routes were maintained the same.

[1] Conflating is a process where a stylized network is overlaid on GIS mapping and adjusted to fit the more geographically correct GIS map.

FIGURE 3 EXISTING HIGHWAY NETWORK (2008)



2.1.3 *TRIP GENERATION*

The trip generation model estimates trip-ends for a typical weekday. A production trip end is where a trip begins from the home of the trip maker and an attraction trip-end is where a trip ends. Trip generation models are based on Socio-Economic Data (SED), in which commercial, warehouse and industrial sites are represented in terms of number of employees instead of square-footage or acreage of the development in land use models. Similar to RivTAM, 52 socioeconomic variables describing population, household, school enrollments, household income, workers, and employment were used as the major inputs for the trip generation model.

The SED data for the study area were processed using two approaches due to the data availability.

The City of Murrieta provided the population and employment data for the Murrieta zones, which presented a more refined distribution pattern of population and employment compared with RivTAM model. Therefore, the SED data from the city of Murrieta was converted to RivTAM data format and used as SED input for the Murrieta zones.

For the third tier, no change for the SED data was made since the Murrieta Model kept the same zone system as the RivTAM. As mentioned, the first tier was based on CSA, where a set of zones in SCAG were grouped to one zone. Accordingly, the SED was aggregated into the corresponding new zones.

In addition to SED input, several tables and matrices describing additional demographic characteristics used in trip generation model were also adjusted according to the Murrieta zone system. The detailed description for the input data and methodology of estimating trip production and attraction can refer to the RivTAM model validation report.

2.1.4 *TRIP DISTRIBUTION, MODE SPLIT AND TRIP ASSIGNMENT*

The trip distribution process allocates the zonal person trips generated by the trip generation model to movements between zone pairs based on the travel time/cost between the zones. The mode split determines the number of trips taking a variety of travel mode including non-motorized mode, auto mode, and transit mode. The trip assignment model loads trips to the roadway network. Similarly, there was no change in term of model structure and methodologies in these three processes. Note that several related tables and matrices in these three steps were updated according to the new zone system.

Since the City of Murrieta is very close to the San Diego County border, the daily volumes generated by the San Diego cordon station were compared to Caltrans 2008 average daily

counts and were accordingly adjusted in the existing model to generate the correct number of daily trips.

2.1.5 *TRAFFIC ASSIGNMENT VALIDATION*

The final step in the four step travel demand modeling process is the assignment of the vehicle trip tables to the highway network. The traffic assignment process chooses the specific travel route between zone pairs for any given trip for each of the peak and off-peak time periods. The selection of a particular route is based upon travel times reflecting the traffic volume, roadway capacity and speed relationships. The procedure used in the Murrieta Model is an equilibrium traffic assignment process, whereby the trip table is loaded incrementally to account for capacity restraint and travel time variations that occur when particular network links become congested. The Highway Assignment process is the last and typically the most iterative part of validation/calibration of a travel demand model. To validate the model outputs, base-year ground counts were compared to the modeled traffic volumes on the highway network. The average daily traffic (ADT) volumes for the arterial roadways were obtained from various sources including Caltrans, the City, prior studies, and collecting new counts. The primary source for freeway mainline traffic volume data is Caltrans 2008 count database.

Screenline analysis was used in the validation of trip assignment. Screenlines are imaginary lines drawn across several sections of various roadways to assess the performance of the model by comparing the total model assigned volumes and total actual counts for those roadway sections. All model links (segments) that are crossed by a screenline form a group of roadways within a corridor for which the total model produced volumes and ground traffic counts are aggregated and compared. For the Murrieta model, all screenlines have the assigned volumes within the acceptable industry validation standards and FHWA criteria. The model was also evaluated using the Root Mean Square Error (RMSE) methodology, which is a quadratic scoring rule which measures the average magnitude of the error. It was found that the RMSE for the individual screenlines and the total screenlines is well below the suggested threshold and the model shows good fit with the ground counts. In order to compare the aggregate statistics on the validity of the traffic assignment across all points in the model regardless of specific corridors or screenlines, model predicted vs. counted traffic volumes were compared on model segments with available traffic counts. The model shows good correlation between actual and observed volumes. An analysis of a final measure of comparison for the fit between observed traffic counts and estimated model volumes is the Coefficient of Determination (R^2). The recommended value of R^2 is greater than 0.88. The computed value of R^2 was estimated to be 0.96 for the Murrieta model, which shows that the model performance is within a very reasonable boundary, representing an excellent fit.

2.1.6 *TRAFFIC VOLUME POST-PROCESSING*

In order to post process the daily link volumes, model growth between the existing and future models was added to the average daily counts, where counts were available. Future forecast traffic volumes for the study intersections were developed using the approach/departure volumes from the Murrieta 2035 Model. The AM and PM peak period forecast traffic volumes were converted to peak hour volumes by applying standard peak hour conversion factors (0.38 for three hours in the AM and 0.28 for four hours in the PM peak periods). Then the intersection turning movements were developed using the "Iterative" methodology as described in the "National Cooperative Highway Research Program Report (NCHRP) 255: Highway Traffic Data for Urbanized Area Project Planning and Design," Chapter 8. The method uses the base year turning volume percentages (from the traffic counts) and the projected growth (difference) in the intersection's approach/departure volumes between the existing and future models, then proceeds through an iterative computational technique to produce a balanced, final set of adjusted future year turning volumes.

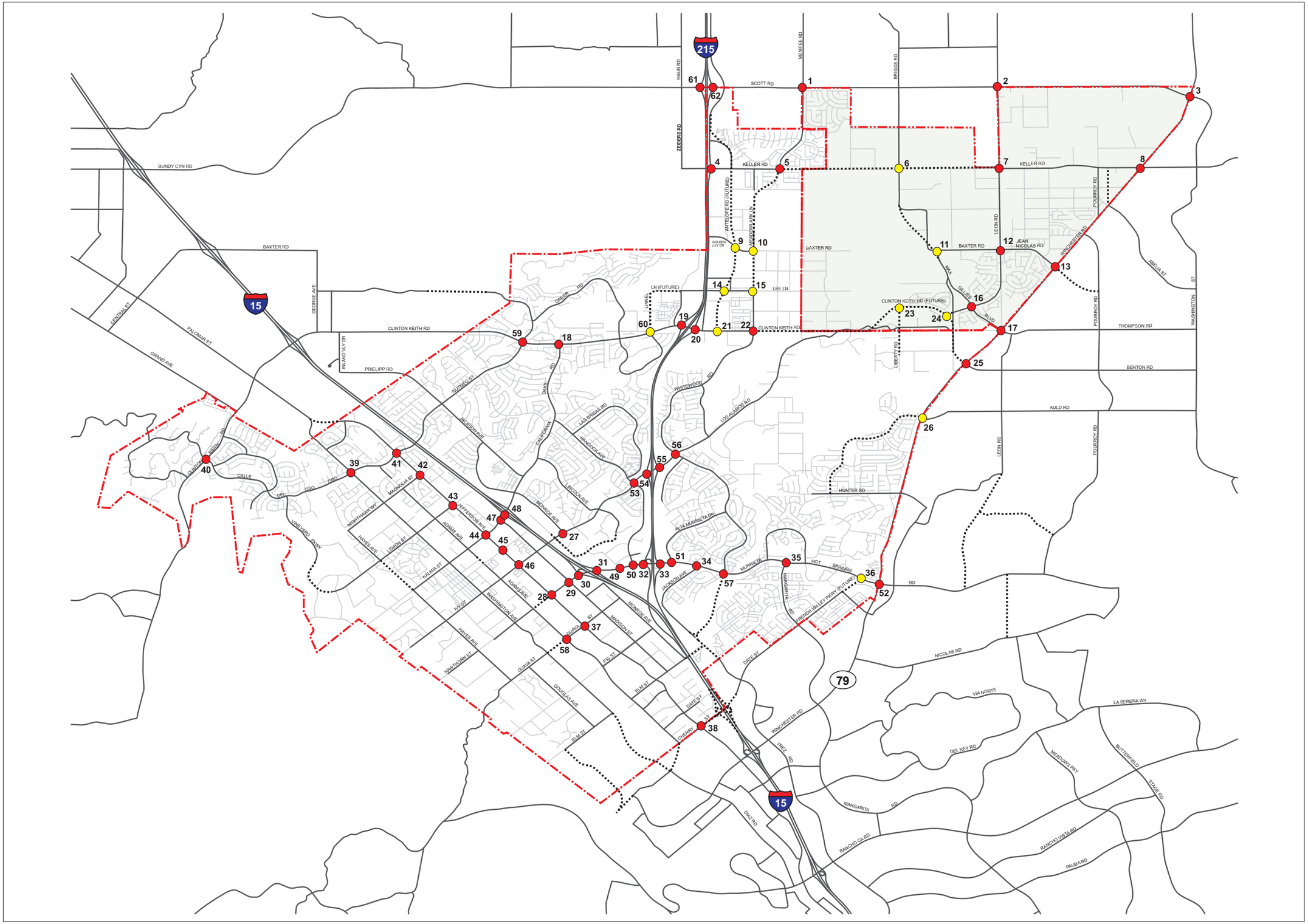
2.2 STUDY INTERSECTIONS

A total of 62 existing and future intersections in the City of Murrieta were identified as study intersections. Under the future scenarios, the intersections of Madison Avenue at Kalmia Street and I-15 SB Ramps at Kalmia Street will be reconfigured and combined into one intersection. Therefore, under the future scenarios, a total of 61 intersections were analyzed. A list of the study intersections and a map of their locations are provided in **Table 2** and **Figure 4**, respectively.

TABLE 2 - LIST OF STUDY INTERSECTIONS

Int. No.	Intersection	Status
1	Menifee Rd / Scott Rd	Existing
2	Leon Rd / Scott Rd	Existing
3	Winchester Rd - SR-79 / Scott Rd	Existing
4	Antelope Rd / Keller Rd	Existing
5	Menifee-Meadowlark Rd/ Keller Rd	Existing
6	Briggs Rd / Keller Rd	Future
7	Leon Rd / Keller Rd	Existing
8	Winchester Rd - SR-79 / Keller Rd	Existing
9	Antelope Rd / Golden City Drive – Baxter Rd	Future
10	Whitewood-Meadowlark/ Golden City Dr – Baxter Rd	Future
11	Briggs Rd / Baxter Rd – Jean Nicholas	Future
12	Leon Rd / Jean Nicholas	Existing
13	Winchester Rd - SR-79 / Nicholas - Skyview	Existing
14	Antelope Rd / Linnel Lane Extension	Future
15	Whitewood-Meadowlark/ Linnel Lane Extension	Future
16	Leon Rd / Max Gillis Rd	Existing
17	Winchester Rd - SR-79 / Max Gillis - Thompson	Existing
18	California Oaks Rd / Clinton Keith Rd	Existing

Int. No.	Intersection	Status
19	I-215 SB Off-Ramp / Clinton Keith Rd	Existing
20	I-215 NB Off-Ramp / Clinton Keith Rd	Existing
21	Antelope Rd / Clinton Keith Rd	Under Construction
22	Meadowlark – Whitewood Rd / Clinton Keith Rd	Existing
23	Liberty Rd / Clinton Keith Rd	Future
24	Leon Rd / Clinton Keith Rd	Future
25	Winchester Rd - SR-79 / Clinton Keith Rd - Benton Rd	Existing
26	Winchester Rd - SR-79 / Via Mira Mosa – Auld Rd	Existing
27	Monroe Ave / Los Alamos	Existing
28	Jefferson Ave / Murrieta Hot Springs Rd	Existing
29	Madison Ave / Murrieta Hot Springs Rd	Existing
30	I-15 SB Off-Ramp / Murrieta Hot Springs Rd	Existing
31	I-15 NB Off-Ramp / Murrieta Hot Springs Rd	Existing
32	I-215 SB Off-Ramp / Murrieta Hot Springs Rd	Existing
33	I-215 NB Off-Ramp / Murrieta Hot Springs Rd	Existing
34	Jackson Ave / Murrieta Hot Springs Rd	Existing
35	Margarita Rd/ Murrieta Hot Springs Rd	Existing
36	French Valley – Date St / Murrieta Hot Springs Rd	Future
37	Jefferson Ave / Guava St	Existing
38	Jefferson Ave / Cherry St	Existing
39	Washington Ave / Calle del Oso Oro – Nutmeg St	Existing
40	Clinton Keith Rd / Calle de Oso Oro – Bear Creek Dr	Existing
41	Jefferson Ave / Nutmeg St	Existing
42	Jefferson Ave / Magnolia St	Existing
43	Jefferson Ave / Lemon St	Existing
44	Jefferson Ave / Kalmia St	Existing
45	Jefferson Ave / Juniper St	Existing
46	Jefferson Ave / Ivy St – Los Alamos Rd	Existing
47	Madison Ave / Kalmia St	Existing
48	I-15 SB Ramps / Kalmia St	Existing
49	Monroe Ave / Murrieta Hot Springs Rd	Existing
50	Hancock Ave / Murrieta Hot Springs Rd	Existing
51	Alta Murrieta Dr / Murrieta Hot Springs Rd	Existing
52	Winchester Rd - SR-79 / Murrieta Hot Springs Rd	Existing
53	Hancock Ave / Los Alamos Rd	Existing
54	I-215 SB Ramps / Los Alamos Rd	Existing
55	I-215 NB Ramps / Los Alamos Rd	Existing
56	Whitewood Rd / Los Alamos Rd	Existing
57	Whitewood Rd / Murrieta Hot Springs Rd	Existing
58	Adams Ave / Guava St	Existing
59	Nutmeg St / Clinton Keith Rd	Existing
60	Murrieta Oaks Ave - Mitchell Rd / Clinton Keith Rd	Existing
61	I-215 SB Ramps / Scott Rd	Existing
62	I-215 NB Ramps / Scott Rd	Existing



LEGEND

- Existing Study Intersection
- Future Study Intersection
- City of Murrieta Boundary
- Sphere of Influence
- Future Roadway Alignment

0 1 2 Miles

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Study Intersections

Figure 4

2.3 ROADWAY LOS VOLUME-TO-CAPACITY (V/C) RATIOS

Roadway segments are evaluated by comparing average daily traffic (ADT) volumes to street capacity. Capacity is a measure of the ability of the street system to meet and serve the demands placed on it. It is generally considered the most practical measure of how well the mobility needs of the City are being met.

The capacity of the road is affected by a number of factors, including street width, roadway design, number of travel lanes, number of roadway intersections, number of driveways, presence of on-street parking, and traffic signal cycle length.

The City of Murrieta's Level of Service standards, as published in the City's General Plan, Chapter IV, is LOS C for roadway segments. **Tables 3** and **4** below depict the maximum daily capacity values for each roadway type and the level of service ranges for roadway segments, respectively.

TABLE 3 – DAILY ROADWAY CAPACITY VALUES

Facility	Number of Lanes	Maximum Two-Way Volume (ADT)		
		LOS C	LOS D	LOS E
Freeway	4	61,200	68,900	76,500
Freeway	6	94,000	105,800	117,500
Freeway	8	128,400	144,500	160,500
Freeway	10	160,500	180,500	200,600
Expressway	4	32,700	36,800	40,900
Expressway	6	49,000	55,200	61,300
Multi-Modal Corridor	4	28,700	32,300	35,900
Multi-Modal Corridor	6	43,100	48,500	53,900
Augmented Urban Arterial	8	57,400	64,600	71,800
Urban Arterial	6	43,100	48,500	53,900
Arterial	4	28,700	32,300	35,900
Arterial	6	43,100	48,500	53,900
Major	4	27,300	30,700	34,100
Secondary	4	20,700	23,300	25,900
Collector	2	10,400	11,700	13,000

Notes:
1. All capacity figures are based on optimum conditions and are intended as guidelines for planning purposed only.
2. Maximum two-way ADT values are based on the 1999 Modified Highway Capacity Manual Level of Service Tables as defined in the Riverside County Congestion Management Program.

TABLE 4 – ROADWAY SEGMENT LEVEL OF SERVICE CRITERIA

Level of Service	Volume-to-Capacity Ratio
A	0 – 0.60
B	> 0.60 – 0.70
C	> 0.70 – 0.80
D	> 0.80 – 0.90
E	> 0.90 – 1.00
F	> 1.00

2.4 INTERSECTION LEVEL OF SERVICE (LOS) CRITERIA

Intersection operations are evaluated using a Level of Service system. The concept of level of service is used to characterize how well the roadway network operates. These evaluations are based on empirical data collected and reported in the 2000 Highway Capacity Manual, which is maintained by the Transportation Research Board, as directed by the "Traffic Impact Analysis Preparation Guide" for the City of Murrieta. The 2000 Highway Capacity Manual utilizes a methodology that accesses the average control delay at intersections. This methodology results in level of service measurements, indicating the quality of traffic flow and using letter grades from A (best) to F (worst). The City of Murrieta's Level of Service standards, as published in the City's General Plan, Chapter IV, is LOS D for peak hour intersection operations, and LOS E at freeway interchanges. The level of service ranges for signalized and unsignalized intersections are provided below in **Tables 5** and **6**.

TABLE 5 – SIGNALIZED INTERSECTION LEVEL OF SERVICE CRITERIA

Level of Service	Description	Control Delay/Veh (sec/veh)
A	Excellent operation. All approaches to the intersection appear quite open, turning movements are easily made, and nearly all drivers find freedom of operation.	≤ 10
B	Very good operation. Many drivers begin to feel somewhat restricted within platoons of vehicles. This represents stable flow. An approach to an intersection may occasionally be fully utilized and traffic queues start to form.	> 10 – 20
C	Good operation. Occasionally drivers may have to wait more than 60 seconds, and back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted.	> 20 – 35
D	Fair operation. Cars are sometimes required to wait more than 60 seconds during short peaks. There are no long-standing traffic queues. This level is typically associated with design practice for peak periods.	> 35 – 55
E	Poor operation. Some long-standing vehicular queues develop on critical approaches to intersections. Delays may be up to several minutes.	> 55 – 80
F	Forced flow. Represents jammed conditions. Backups from locations downstream or on the cross street may restrict or prevent movement of vehicles out of the intersection approach lanes; therefore, volumes carried are not predictable. Potential for stop and go type traffic flow.	> 80

Source: *Highway Capacity Manual*, Transportation Research Board, 2000.

TABLE 6 – UNSIGNALIZED INTERSECTION LEVEL OF SERVICE CRITERIA

Level of Service	Average Control Delay (sec/veh)
A	0 – 10
B	> 10 – 15
C	> 15 – 25
D	> 25 – 35
E	> 35 – 50
F	> 50

Source: *Highway Capacity Manual*, Transportation Research Board, 2000.

3.0 EXISTING CONDITIONS ANALYSIS

3.1 ROADWAY SEGMENTS

Using the City of Murrieta's 2008 daily traffic volumes (shown in **Figure 5**) and the maximum daily roadway capacity values, daily volume-to-capacity ratios have been determined for locations where daily traffic volumes were available. The general locations of the roadway segments that currently operate at an unacceptable level of service (LOS D, E or F) per the City of Murrieta's Level of Service standards are shown below. A map of the 2008 roadway volume-to-capacity ratios is shown in **Figure 6**.

Level of Service D

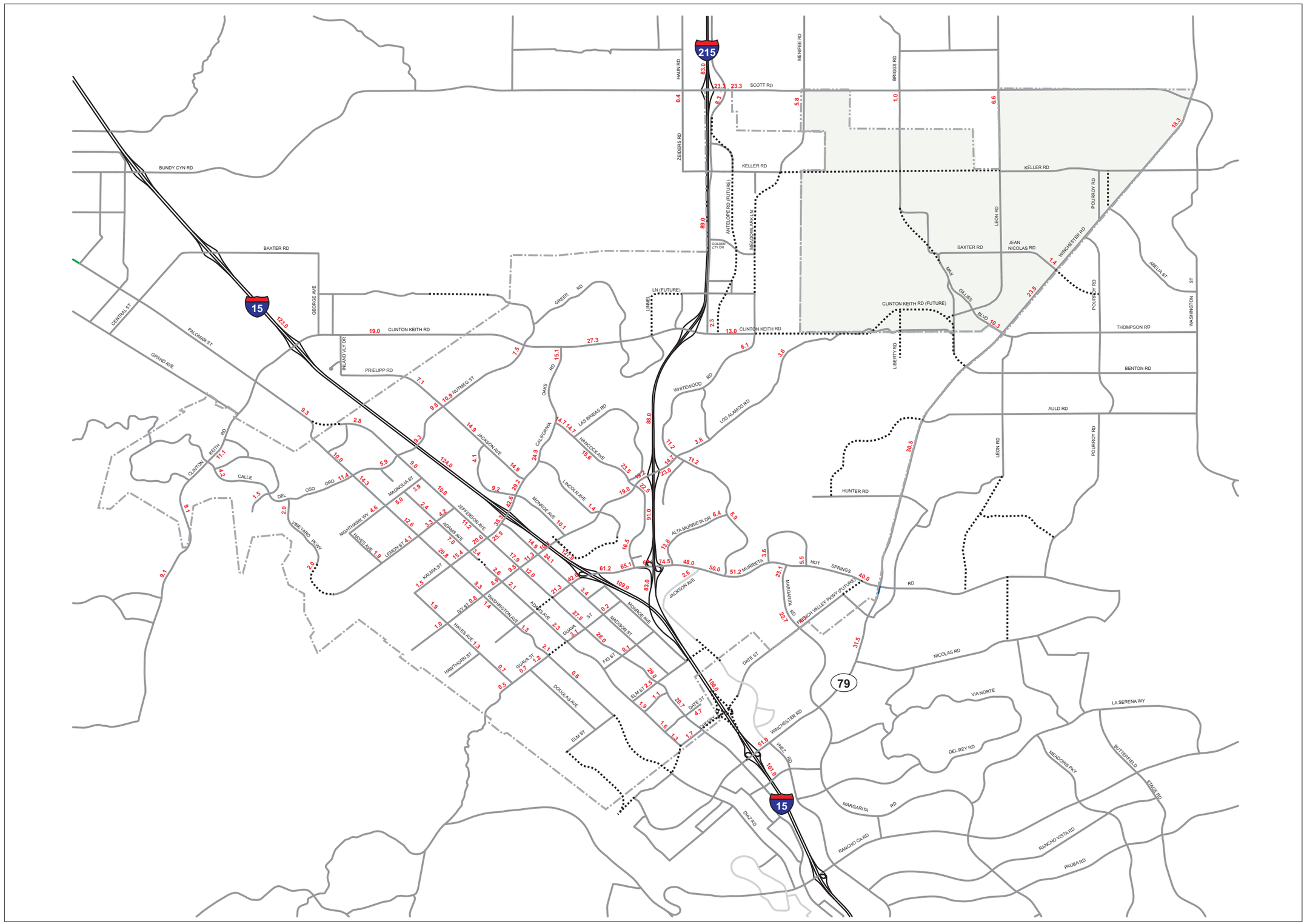
- Kalmia Street between Monroe Avenue and Jackson Avenue
- Jefferson Avenue north of Kalmia Street, and north of Elm Street
- Murrieta Hot Springs Road immediately east of I-15
- Nutmeg Street east of Jackson Avenue
- Winchester Road south of Auld Road.

Level of Service E

- Kalmia Street between Madison Street and I-15
- Murrieta Hot Springs Road immediately west of Hancock Avenue
- Murrieta Hot Springs Road from Jackson Avenue to east of Whitewood Road.

LOS F

- California Oaks Road between I-15 and Monroe Avenue
- Kalmia Street west of Adams Avenue
- Murrieta Hot Springs Road at I-215 and west of Winchester Road.



LEGEND

17.6 ADT Volume (in Thousands)

City of Murrieta Boundary

Sphere of Influence

2008 Average Daily Traffic Volumes

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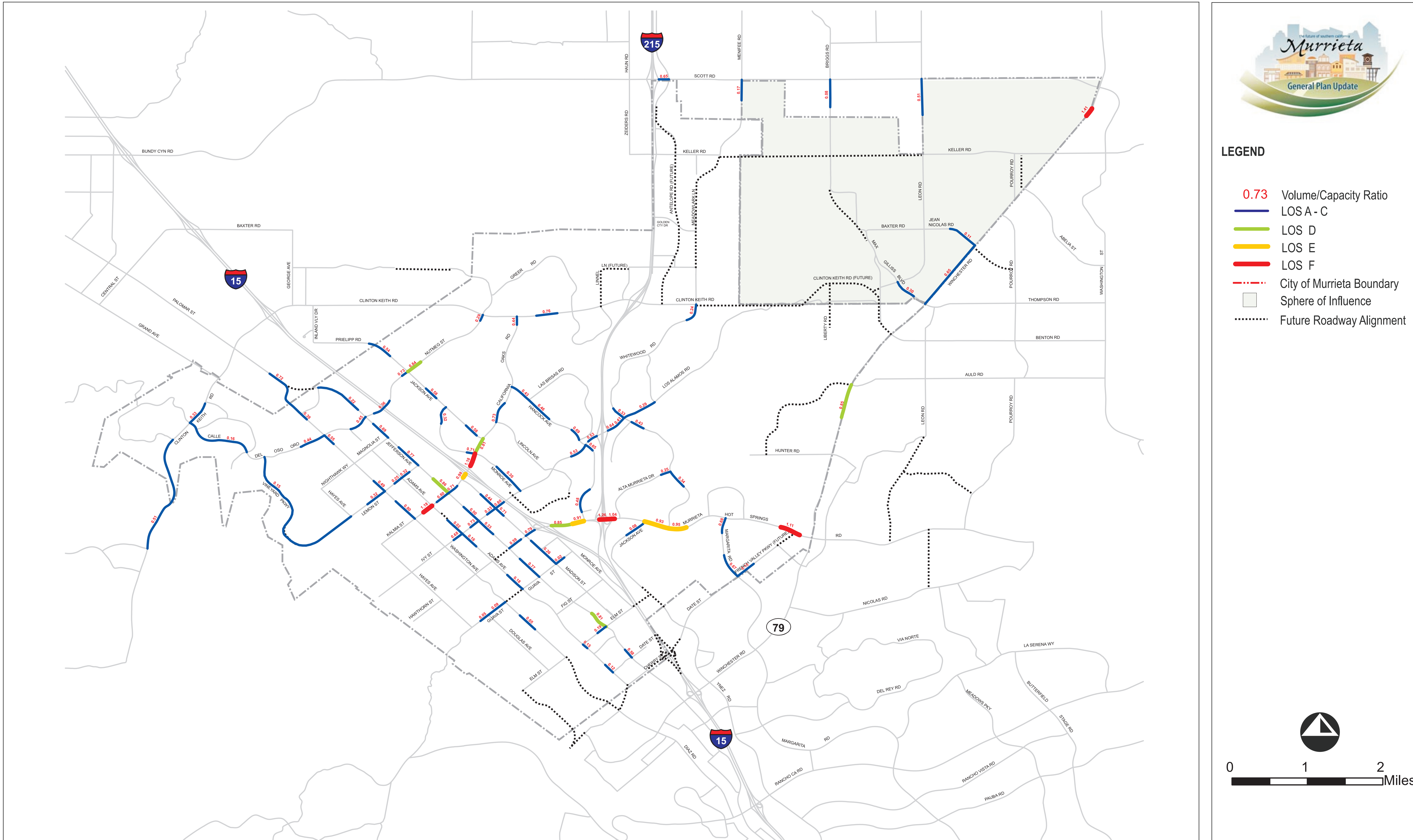
Figure 5



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2008 Daily Volume-to-Capacity Ratios

Figure 6

3.2 INTERSECTIONS

A total of 62 intersections (51 existing intersections and 11 future intersections) in the City of Murrieta were identified as study intersections. Of the 51 existing study intersections, 40 study intersections are currently signalized and 11 are currently stop controlled. Stop sign controlled intersections include side-street stop sign controlled (two-way stop where the major street operates freely) or all-way stop sign controlled intersections (all approaches must stop for stop signs). A list of the 62 study intersections and a map of their locations are provided in **Table 7** and were previously illustrated in **Figure 4**.

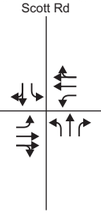
TABLE 7 - LIST OF STUDY INTERSECTIONS

Int. No.	Intersection	Existing Traffic Control	Status
1	Menifee Rd / Scott Rd	Signalized	Existing
2	Leon Rd / Scott Rd	All-Way Stop	Existing
3	Winchester Rd - SR-79 / Scott Rd	Signalized	Existing
4	Antelope Rd / Keller Rd	Signalized	Existing
5	Menifee-Meadowlark Rd/ Keller Rd	Signalized	Existing
6	Briggs Rd / Keller Rd	-	Future
7	Leon Rd / Keller Rd	Two-Way Stop	Existing
8	Winchester Rd - SR-79 / Keller Rd	Two-Way Stop	Existing
9	Antelope Rd / Golden City Drive – Baxter Rd	-	Future
10	Whitewood-Meadowlark/ Golden City Dr – Baxter Rd	-	Future
11	Briggs Rd / Baxter Rd – Jean Nicholas	-	Future
12	Leon Rd / Jean Nicholas	Two-Way Stop	Existing
13	Winchester Rd - SR-79 / Nicholas - Skyview	Signalized	Existing
14	Antelope Rd / Linnel Lane Extension	-	Future
15	Whitewood-Meadowlark/ Linnel Lane Extension	-	Future
16	Leon Rd / Max Gillis Rd	Signalized	Existing
17	Winchester Rd - SR-79 / Max Gillis - Thompson	Signalized	Existing
18	California Oaks Rd / Clinton Keith Rd	Signalized	Existing
19	I-215 SB Off-Ramp / Clinton Keith Rd	Signalized	Existing
20	I-215 NB Off-Ramp / Clinton Keith Rd	Signalized	Existing
21	Antelope Rd / Clinton Keith Rd	-	Under Construction
22	Meadowlark – Whitewood Rd / Clinton Keith Rd	Signalized	Existing
23	Liberty Rd / Clinton Keith Rd	-	Future
24	Leon Rd / Clinton Keith Rd	-	Future
25	Winchester Rd - SR-79 / Clinton Keith Rd - Benton Rd	Signalized	Existing
26	Winchester Rd - SR-79 / Via Mira Mosa – Auld Rd	Signalized	Existing
27	Monroe Ave / Los Alamos	Signalized	Existing
28	Jefferson Ave / Murrieta Hot Springs Rd	Signalized	Existing
29	Madison Ave / Murrieta Hot Springs Rd	Signalized	Existing
30	I-15 SB Off-Ramp / Murrieta Hot Springs Rd	Signalized	Existing
31	I-15 NB Off-Ramp / Murrieta Hot Springs Rd	Signalized	Existing

Int. No.	Intersection	Existing Traffic Control	Status
32	I-215 SB Off-Ramp / Murrieta Hot Springs Rd	Signalized	Existing
33	I-215 NB Off-Ramp / Murrieta Hot Springs Rd	Signalized	Existing
34	Jackson Ave / Murrieta Hot Springs Rd	Signalized	Existing
35	Margarita Rd/ Murrieta Hot Springs Rd	Signalized	Existing
36	French Valley – Date St / Murrieta Hot Springs Rd	-	Future
37	Jefferson Ave / Guava St	Signalized	Existing
38	Jefferson Ave / Cherry St	Signalized	Existing
39	Washington Ave / Calle del Oso Oro – Nutmeg St	Signalized	Existing
40	Clinton Keith Rd / Calle de Oso Oro – Bear Creek Dr	Signalized	Existing
41	Jefferson Ave / Nutmeg St	Signalized	Existing
42	Jefferson Ave / Magnolia St	All-Way Stop	Existing
43	Jefferson Ave / Lemon St	Signalized	Existing
44	Jefferson Ave / Kalmia St	Signalized	Existing
45	Jefferson Ave / Juniper St	Signalized	Existing
46	Jefferson Ave / Ivy St – Los Alamos Rd	Signalized	Existing
47	Madison Ave / Kalmia St	Signalized	Existing
48	I-15 SB Ramps / Kalmia St	Signalized	Existing
49	Monroe Ave / Murrieta Hot Springs Rd	Signalized	Existing
50	Hancock Ave / Murrieta Hot Springs Rd	Signalized	Existing
51	Alta Murrieta Dr / Murrieta Hot Springs Rd	Signalized	Existing
52	Winchester Rd - SR-79 / Murrieta Hot Springs Rd	Signalized	Existing
53	Hancock Ave / Los Alamos Rd	Signalized	Existing
54	I-215 SB Ramps / Los Alamos Rd	Signalized	Existing
55	I-215 NB Ramps / Los Alamos Rd	Signalized	Existing
56	Whitewood Rd / Los Alamos Rd	Signalized	Existing
57	Whitewood Rd / Murrieta Hot Springs Rd	Signalized	Existing
58	Adams Ave / Guava St	Signalized	Existing
59	Nutmeg St / Clinton Keith Rd	Signalized	Existing
60	Murrieta Oaks Ave - Mitchell Rd / Clinton Keith Rd	Signalized	Existing
61	I-215 SB Ramps / Scott Rd	Signalized	Existing
62	I-215 NB Ramps / Scott Rd	Signalized	Existing

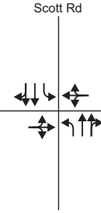
Existing lane configurations and traffic volumes are illustrated in **Figures 7** and **8**, respectively. **Table 8** provides the existing conditions level of service results for the 51 existing study intersections. As shown, all 51 existing study intersections currently operate at an acceptable level of service of LOS D or better.

#1 Menifee Rd/
Scott Rd



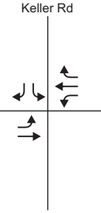
#2 Leon Rd/
Scott Rd

#3 Winchester Rd - SR-79/
Scott Rd



#4 Antelope Rd/
Keller Rd

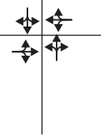
#5 Menifee-Meadowlark Rd/
Keller Rd



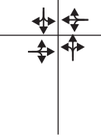
#6 Briggs Rd/
Keller Rd

Future Intersection

#7 Leon Rd/
Keller Rd



#8 Winchester Rd - SR-79/
Keller Rd



#9 Antelope Rd/
Golden City Drive - Baxter Rd

Future Intersection

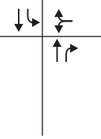
#10 Whitewood-Meadowlark/
Golden City Dr - Baxter Rd

Future Intersection

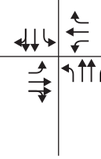
#11 Briggs Rd/
Baxter Rd - Jean Nicholas

Future Intersection

#12 Leon Rd/
Jean Nicholas



#13 Winchester Rd - SR-79/
Nicholas - Skyview

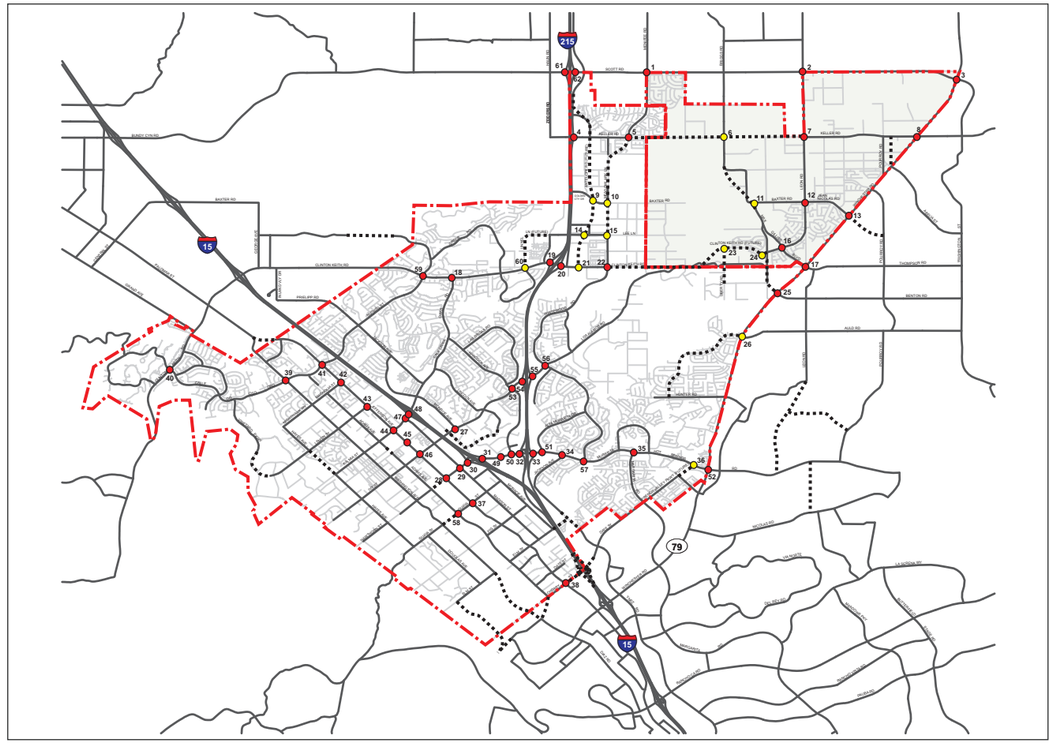


#14 Antelope Rd/
Linnel Lane Extension

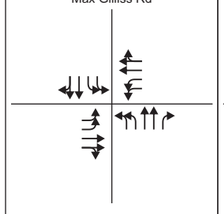
Future Intersection

#15 Whitewood-Meadowlark/
Linnel Lane Extension

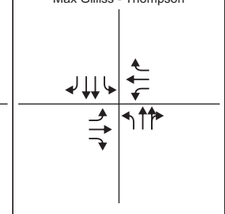
Future Intersection



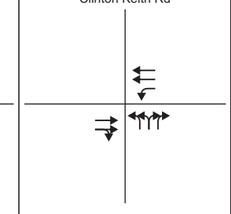
#16 Leon Rd/
Max Gilliss Rd



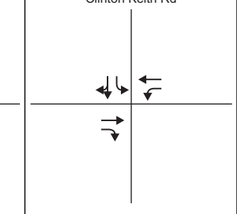
#17 Winchester Rd - SR-79/
Max Gilliss - Thompson



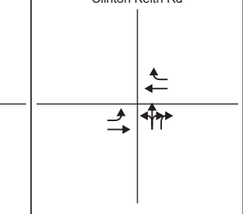
#18 California Oaks Rd/
Clinton Keith Rd



#19 I-215 SB Off-Ramp/
Clinton Keith Rd



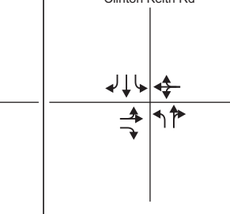
#20 I-215 NB Off-Ramp/
Clinton Keith Rd



#21 Antelope Rd/
Clinton Keith Rd

Future Intersection

#22 Meadowlark-Whitewood Rd/
Clinton Keith Rd



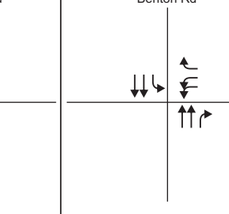
#23 Liberty Rd/
Clinton Keith Rd

Future Intersection

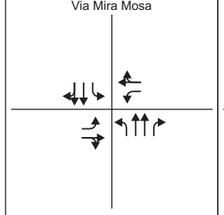
#24 Leon Rd /
Clinton Keith Rd

Future Intersection

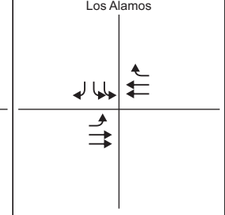
#25 Winchester Rd - SR-79/
Benton Rd



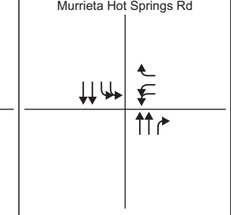
#26 Winchester Rd - SR-79/
Via Mira Mosa



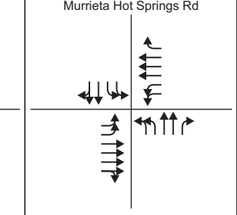
#27 Monroe Ave/
Los Alamos



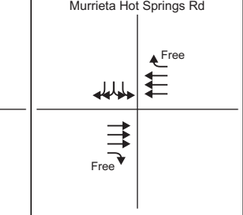
#28 Jefferson Ave/
Murrieta Hot Springs Rd



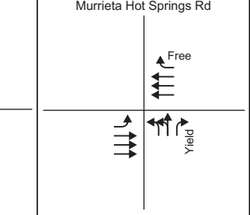
#29 Madison Ave/
Murrieta Hot Springs Rd



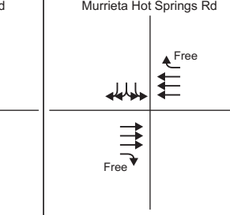
#30 I-15 SB Off-Ramp/
Murrieta Hot Springs Rd



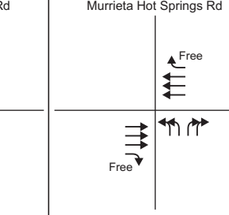
#31 I-15 NB Off-Ramp/
Murrieta Hot Springs Rd



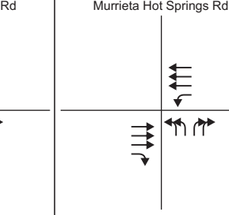
#32 I-215 SB Off-Ramp/
Murrieta Hot Springs Rd



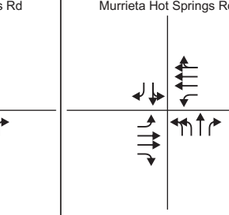
#33 I-215 NB Off-Ramp/
Murrieta Hot Springs Rd



#34 Jackson Ave/
Murrieta Hot Springs Rd



#35 Margarita Rd/
Murrieta Hot Springs Rd



the future of southern california
Murrieta
General Plan Update

LEGEND

- Through Lane
- Turn Lane
- Shared Lane

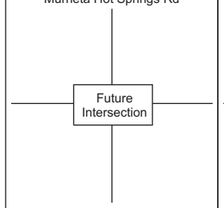
ITERIS

11/09 JN 10-106976

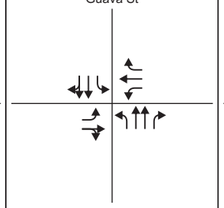
Existing Lane Configurations

Figure 7A

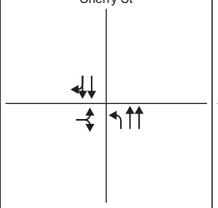
#36 French Valley-Date St/
Murrieta Hot Springs Rd



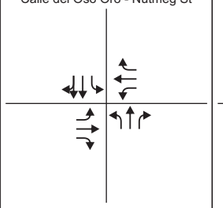
#37 Jefferson Ave/
Guava St



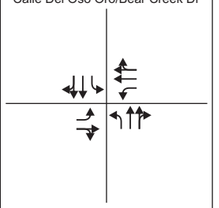
#38 Jefferson Ave/
Cherry St



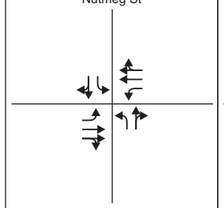
#39 Washington Ave/
Calle del Oso Oro - Nutmeg St



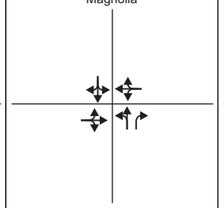
#40 Clinton Keith Rd/
Calle Del Oso Oro/Bear Creek Dr



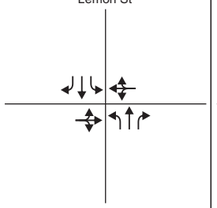
#41 Jefferson Ave/
Nutmeg St



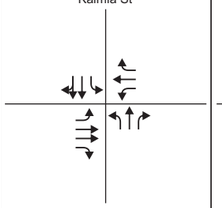
#42 Jefferson Ave/
Magnolia



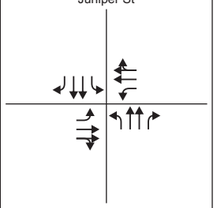
#43 Jefferson Ave/
Lemon St



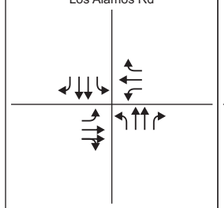
#44 Jefferson Ave/
Kalmia St



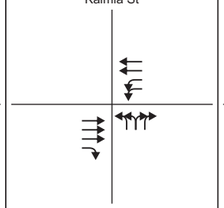
#45 Jefferson Ave/
Juniper St



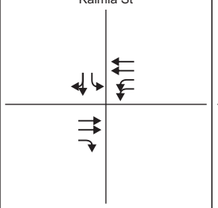
#46 Jefferson Ave/
Los Alamos Rd



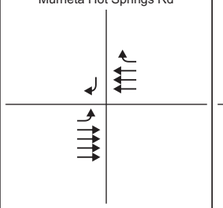
#47 Madison Ave/
Kalmia St



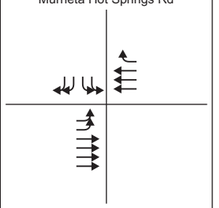
#48 I-15 SB Ramps/
Kalmia St



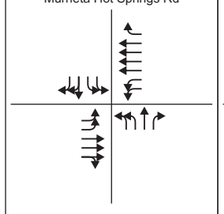
#49 Monroe Ave/
Murrieta Hot Springs Rd



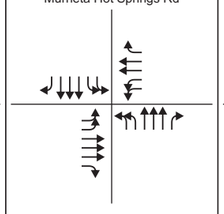
#50 Hancock Ave/
Murrieta Hot Springs Rd



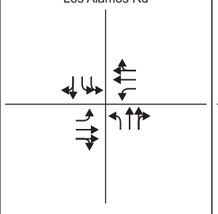
#51 Alta Murrieta Dr/
Murrieta Hot Springs Rd



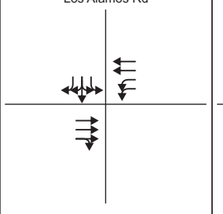
#52 Winchester Rd (SR - 79)/
Murrieta Hot Springs Rd



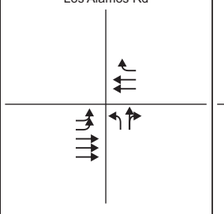
#53 Hancock Ave/
Los Alamos Rd



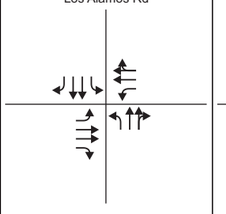
#54 I-215 SB Ramps/
Los Alamos Rd



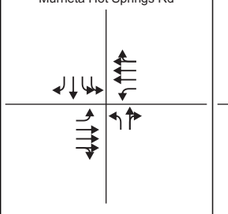
#55 I-215 NB Ramps/
Los Alamos Rd



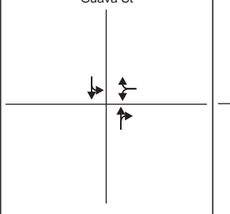
#56 Whitewood Rd/
Los Alamos Rd



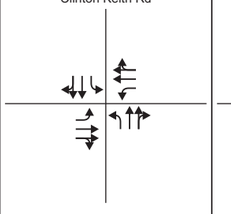
#57 Whitewood Rd/
Murrieta Hot Springs Rd



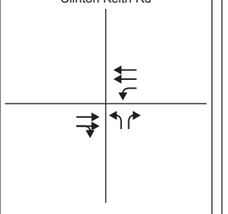
#58 Adams Ave/
Guava St



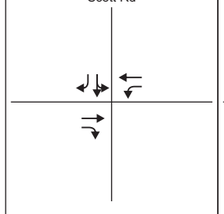
#59 Nutmeg St/
Clinton Keith Rd



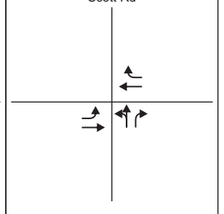
#60 Mitchell Rd/
Clinton Keith Rd

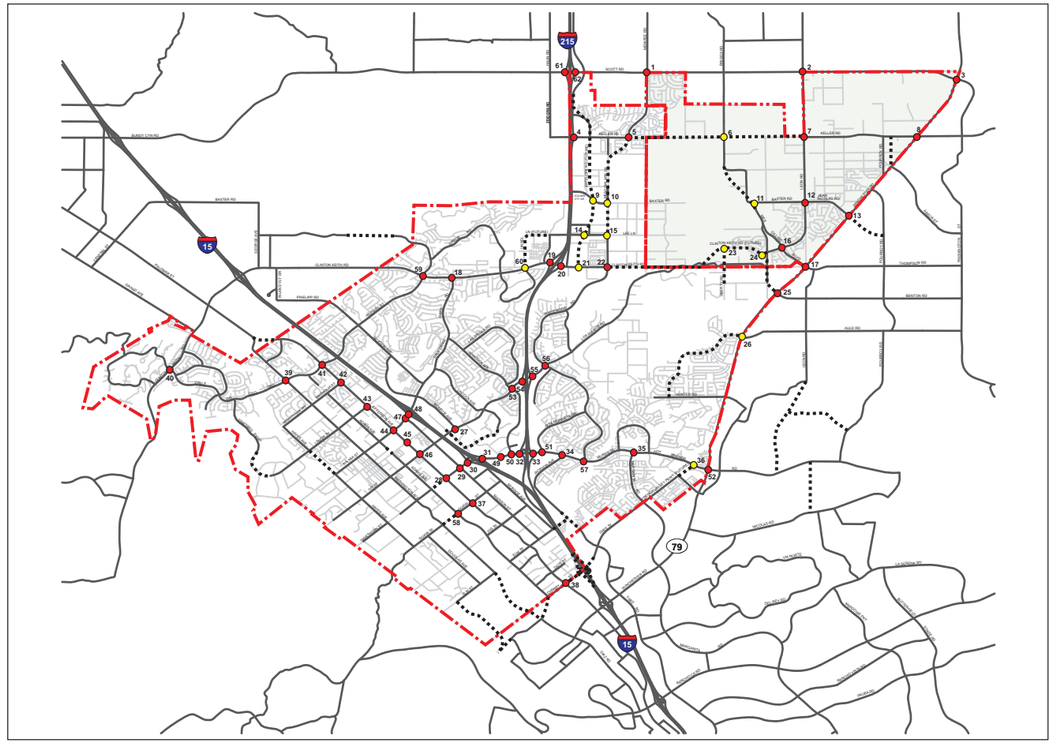


#61 I-215 NB Ramps/
Scott Rd



#62 I-215 SB Ramps/
Scott Rd





the future of southern california
Murrieta
General Plan Update

LEGEND

- Through Lane
- Turn Lane
- Shared Lane

Existing Lane Configurations

Figure 7B

#1 Menifee Rd / Scott Rd
100/107 64/43 80/48
85/102 543/459 69/48
74/145 364/545 54/159
75/48 167/97 77/65

#2 Leon Rd / Scott Rd
15/7 19/10 4/2
3/5 210/204 11/6
4/7 195/181 240/261
14/12 224/277 6/15

#3 Winchester Rd - SR-79 / Scott Rd
52/80 777/553 142/123
155/171 64/59 3/0
86/81 74/60 55/67
91/75 433/891 9/3

#4 Antelope Rd / Keller Rd
9/7 115/93 18/19
29/19 17/2 270/72
8/10 2/5 8/7
6/14 112/315 110/271

#5 Menifee-Meadowlark Rd/ Keller Rd
121/48 11/12
10/10 31/20
105/119 19/32

#6 Briggs Rd / Keller Rd
Future Intersection

#7 Leon Rd / Keller Rd
244/240 4/7
6/3 1/0 1/5
0/1
0/1 238/258 0/4

#8 Winchester Rd - SR-79 / Keller Rd
0/2 793/624
0/3 0/1
1/1
0/1 502/913 0/3

#9 Antelope Rd / Golden City Drive - Baxter Rd
Future Intersection

#10 Whitewood-Meadowlark/ Golden City Dr - Baxter Rd
Future Intersection

#11 Briggs Rd / Baxter Rd - Jean Nicholas
Future Intersection

#12 Leon Rd / Jean Nicholas
230/224 16/24
71/34 27/8
15/19 208/229

#13 Winchester Rd - SR-79 / Nicholas - Skyview
35/18 953/632 0/2
0/3 0/1
26/25 29/22
48/78 474/1120 0/2

#14 Antelope Rd / Linnel Lane Extension
Future Intersection

#15 Whitewood-Meadowlark/ Linnel Lane Extension
Future Intersection

#16 Leon Rd / Max Gilliss Rd
127/39 43/22 196/197
132/212 345/216 96/98
91/18 387/70 146/25
30/62 173/84 101/168

#17 Winchester Rd - SR-79 / Max Gilliss - Thompson
45/32 972/636 12/25
6/10 212/103 158/132
33/44 58/115 508/294
496/1197 358/409 115/251

#18 California Oaks Rd / Clinton Keith Rd
508/608 437/312
493/602 113/89
111/162 339/554

#19 I-215 SB Off-Ramp / Clinton Keith Rd
388/629 2/2 88/46
368/405 207/77
786/710 514/403

#20 I-215 NB Off-Ramp / Clinton Keith Rd
100/81 489/261
467/455 486/274
0/1 128/241 432/88

#21 Antelope Rd / Clinton Keith Rd
Future Intersection

#22 Meadowlark-Whitewood Rd / Clinton Keith Rd
141/62 161/78
1/0 7/1 34/0
136/161 4/3 173/152
76/380 154/248 30/3

#23 Liberty Rd / Clinton Keith Rd
Future Intersection

#24 Leon Rd / Clinton Keith Rd
Future Intersection

#25 Winchester Rd - SR-79 / Benton Rd
1369/865 267/255
142/357 301/280
762/1497 168/526

#26 Winchester Rd - SR-79 / Via Mira Mosa
104/55 1540/1069 167/42
28/86 16/16 184/304
128/58 18/11 37/27
12/24 789/1893 409/204

#27 Monroe Ave / Los Alamos
142/83 288/179
302/134 507/447
70/167 315/946

#28 Jefferson Ave / Murrieta Hot Springs Rd
555/329 226/275
190/246 652/289
203/965 185/976

#29 Madison Ave / Murrieta Hot Springs Rd
87/67 120/212 210/459
127/162 710/424 354/419
68/206 318/868 43/103
28/63 63/286 147/562

#30 I-15 SB Off-Ramp / Murrieta Hot Springs Rd
397/276 773/842
47/112 956/1078
446/1599 194/366

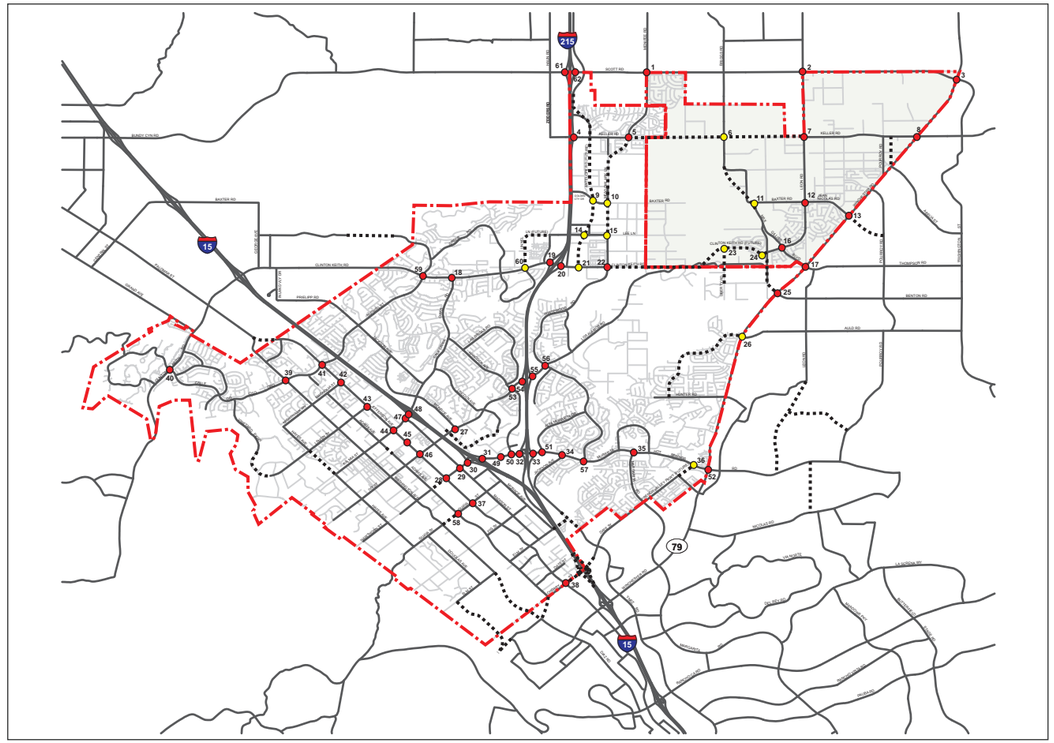
#31 I-15 NB Off-Ramp / Murrieta Hot Springs Rd
693/985 840/852
115/485 1068/1942
91/180 235/275

#32 I-215 SB Off-Ramp / Murrieta Hot Springs Rd
420/236 526/603
378/238 1343/1535
1105/2103 53/139

#33 I-215 NB Off-Ramp / Murrieta Hot Springs Rd
466/571 1591/1748
1444/2300 115/104
163/496 151/77

#34 Jackson Ave / Murrieta Hot Springs Rd
1439/1577 69/136
1217/1968 24/43
52/111 66/90

#35 Margarita Rd/ Murrieta Hot Springs Rd
92/1 15/3 20/9
5/7 999/973 197/186
22/18 782/1241 581/687
131/225 8/20 674/879



Murrieta General Plan Update

LEGEND

- Existing Study Intersection
- Future Study Intersection
- City of Murrieta Boundary
- Sphere of Influence
- Future Roadway Alignment
- 31/20 AM Peak Hr/PM Peak Hr

ITERIS

Existing Peak Hour Turning Movement Volumes

Figure 8A

#36 French Valley-Date St / Murrieta Hot Springs Rd

Future Intersection

#37 Jefferson Ave / Guava St

1198/560 10/16 16/19 30/9 11/75 319/1995

#38 Jefferson Ave / Cherry St

28/9 742/880 10/4 50/76 105/55 553/1372

#39 Washington Ave / Calle del Oso Oro - Nutmeg St

57/35 264/278 53/64 31/89 109/258 162/124 36/20 223/121 551/275 226/327 199/319 101/113

#40 Clinton Keith Rd / Calle Del Oso Oro/Bear Creek Dr

75/105 157/233 31/83 64/53 26/37 64/75 69/67 37/22 2/3 2/1 262/255 155/35

#41 Jefferson Ave / Nutmeg St

7/9 93/44 11/14 22/29 250/227 261/125 15/11 181/179 178/94 80/221 32/84 136/195

#42 Jefferson Ave / Magnolia

143/38 428/264 5/4 1/7 6/7 17/5 124/67 3/7 95/33 56/96 164/480 6/9

#43 Jefferson Ave / Lemon St

61/6 501/324 1/2 2/4 3/4 1/4 21/7 1/0 82/37 76/78 257/616 0/1

#44 Jefferson Ave / Kalmia St

52/11 273/186 265/168 200/298 428/458 138/128 19/20 518/515 207/198 115/191 126/326 97/233

#45 Jefferson Ave / Juniper St

31/28 526/392 37/47 23/45 78/47 8/10 54/48 84/53 79/55 69/61 258/738 15/74

#46 Jefferson Ave / Ivy St/Los Alamos Rd

37/36 441/297 152/148 132/132 120/161 171/98 27/44 145/245 102/129 100/180 171/627 39/402

#47 Madison Ave / Kalmia St

772/952 310/383 765/1020 107/172 108/190 237/537

#48 Madison Ave/ I-15 SB Ramps / Kalmia St

278/361 2/2 305/359 773/987 412/385 483/1109 373/408

#49 Monroe Ave / Murrieta Hot Springs Rd

71/130 25/30 1463/1574 125/227 1097/2111

#50 Hancock Ave / Murrieta Hot Springs Rd

147/183 264/569 464/421 1346/1465 227/237 884/1924

#51 Alta Murrieta Dr / Murrieta Hot Springs Rd

297/412 94/132 61/208 107/112 1350/1293 72/119 249/717 995/1697 235/499 175/394 57/195 14/45

#52 Winchester Rd (SR-79) / Murrieta Hot Springs Rd

536/498 1408/1064 128/122 37/62 340/412 268/273 512/611 318/522 137/207 118/250 729/1689 135/204

#53 Hancock Ave / Los Alamos Rd

156/65 246/222 526/459 293/295 711/537 226/163 125/198 601/965 66/62 51/149 143/559 93/290

#54 I-215 SB Ramps / Los Alamos Rd

497/408 1/3 119/192 899/738 250/160 801/1441 426/287

#55 I-215 NB Ramps / Los Alamos Rd

72/165 951/774 242/394 670/1181 209/129 1/4 107/175

#56 Whitewood Rd / Los Alamos Rd

254/162 110/196 11/13 6/18 270/207 33/70 124/269 226/353 64/265 126/197 90/343 59/64

#57 Whitewood Rd / Murrieta Hot Springs Rd

63/93 20/7 353/316 241/417 1556/1776 23/21 31/101 1106/1903 4/6 4/6 38/5 43/16

#58 Adams Ave / Guava St

67/22 94/77 44/90 3/7 13/86 2/26

#59 Nutmeg St / Clinton Keith Rd

39/21 55/23 101/61 39/73 404/397 206/210 17/52 357/533 79/69 69/48 34/61 201/192

#60 Mitchell Rd / Clinton Keith Rd

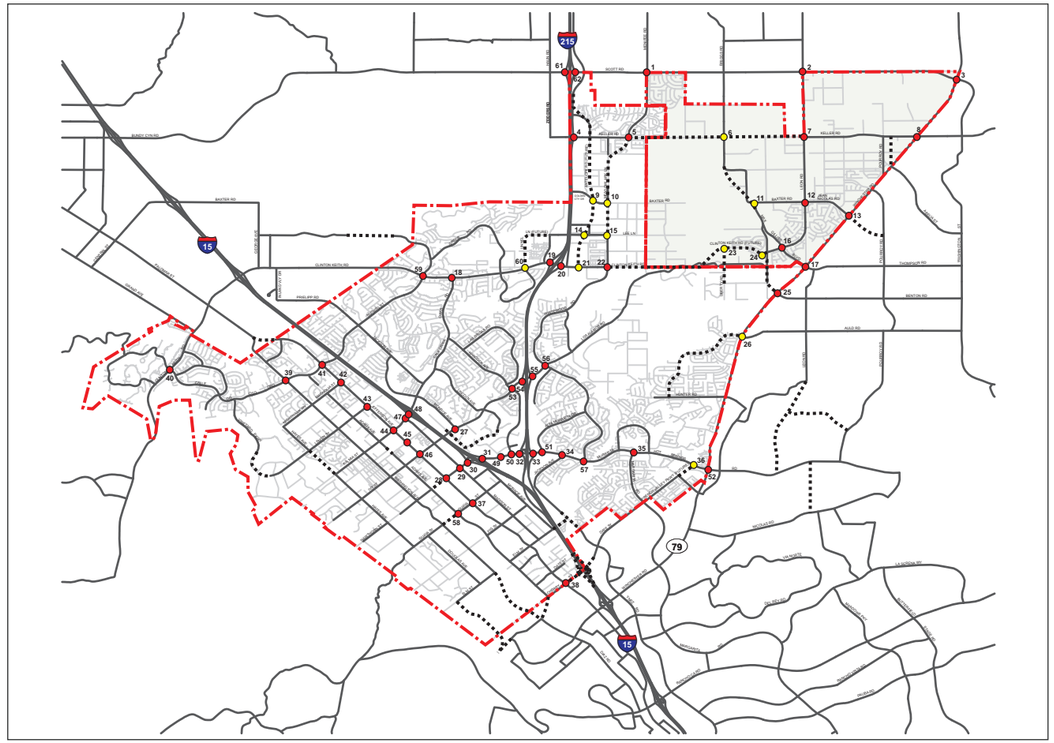
752/946 158/93 862/1100 254/37 122/32 212/67

#61 I-215 SB Ramps / Scott Rd

88/114 4/4 258/334 501/603 447/465 535/580 320/165

#62 I-215 NB Ramps / Scott Rd

380/364 792/913 108/112 603/780 145/182 12/6 349/468



LEGEND

- Existing Study Intersection
- Future Study Intersection
- City of Murrieta Boundary
- Sphere of Influence
- Future Roadway Alignment
- 31/20 AM Peak Hr/PM Peak Hr

TABLE 8 – EXISTING LEVEL OF SERVICE

Int. No.	Intersection	AM Peak Hour		PM Peak Hour	
		LOS	Ave Del/Veh	LOS	Ave Del/Veh
1	Menifee Rd / Scott Rd	B	19.8	B	18.0
2	Leon Rd / Scott Rd	B	12.4	B	13.4
3	Winchester Rd - SR-79 / Scott Rd	C	20.7	B	18.5
4	Antelope Rd / Keller Rd	B	10.4	B	13.5
5	Menifee-Meadowlark Rd/ Keller Rd	A	8.1	A	8.2
6	Briggs Rd / Keller Rd	N/A	N/A	N/A	N/A
7	Leon Rd / Keller Rd	B	10.2	B	11.6
8	Winchester Rd - SR-79 / Keller Rd	B	14.2	C	23.0
9	Antelope Rd / Golden City Drive – Baxter Rd	N/A	N/A	N/A	N/A
10	Whitewood-Meadowlark/ Golden City Dr – Baxter Rd	N/A	N/A	N/A	N/A
11	Briggs Rd / Baxter Rd – Jean Nicholas	N/A	N/A	N/A	N/A
12	Leon Rd / Jean Nicholas	B	10.7	B	10.2
13	Winchester Rd - SR-79 / Nicholas - Skyview	A	4.0	A	5.1
14	Antelope Rd / Linnel Lane Extension	N/A	N/A	N/A	N/A
15	Whitewood-Meadowlark/ Linnel Lane Extension	N/A	N/A	N/A	N/A
16	Leon Rd / Max Gillis Rd	C	24.6	C	25.4
17	Winchester Rd - SR-79 / Max Gillis - Thompson	D	37.1	C	25.6
18	California Oaks Rd / Clinton Keith Rd	C	21.7	C	22.4
19	I-215 SB Off-Ramp / Clinton Keith Rd	C	23.9	C	26.1
20	I-215 NB Off-Ramp / Clinton Keith Rd	C	26.2	C	23.1
21	Antelope Rd / Clinton Keith Rd	N/A	N/A	N/A	N/A
22	Meadowlark – Whitewood Rd / Clinton Keith Rd	B	10.5	B	13.4
23	Liberty Rd / Clinton Keith Rd	N/A	N/A	N/A	N/A
24	Leon Rd / Clinton Keith Rd	N/A	N/A	N/A	N/A
25	Winchester Rd - SR-79 / Clinton Keith Rd - Benton Rd	B	14.4	C	21.2
26	Winchester Rd - SR-79 / Via Mira Mosa – Auld Rd	B	14.2	B	14.4
27	Monroe Ave / Los Alamos	B	15.0	B	12.4
28	Jefferson Ave / Murrieta Hot Springs Rd	C	21.2	C	20.7
29	Madison Ave / Murrieta Hot Springs Rd	C	25.3	C	34.2
30	I-15 SB Off-Ramp / Murrieta Hot Springs Rd	B	17.7	B	18.9
31	I-15 NB Off-Ramp / Murrieta Hot Springs Rd	B	11.8	B	15.3
32	I-215 SB Off-Ramp / Murrieta Hot Springs Rd	B	16.0	B	14.5
33	I-215 NB Off-Ramp / Murrieta Hot Springs Rd	A	5.4	A	10.0
34	Jackson Ave / Murrieta Hot Springs Rd	A	4.3	A	6.2
35	Margarita Rd/ Murrieta Hot Springs Rd	B	19.2	C	23.7
36	French Valley – Date St / Murrieta Hot Springs Rd	N/A	N/A	N/A	N/A
37	Jefferson Ave / Guava St	A	2.0	A	1.4
38	Jefferson Ave / Cherry St	C	15.2	C	15.0
39	Washington Ave / Calle del Oso Oro – Nutmeg St	C	29.2	C	26.8
40	Clinton Keith Rd / Calle de Oso Oro – Bear Creek Dr	B	13.6	B	16.2
41	Jefferson Ave / Nutmeg St	B	13.2	B	12.9
42	Jefferson Ave / Magnolia	C	18.2	C	21.2
43	Jefferson Ave / Lemon St	B	10.9	A	6.6

Int. No.	Intersection	AM Peak Hour		PM Peak Hour	
		LOS	Ave Del/Veh	LOS	Ave Del/Veh
44	Jefferson Ave / Kalmia St	C	26.2	C	26.7
45	Jefferson Ave / Juniper St	B	18.6	B	13.8
46	Jefferson Ave / Ivy St – Los Alamos Rd	C	27.9	C	25.2
47	Madison Ave / Kalmia St	B	16.2	C	20.3
48	I-15 SB Ramps / Kalmia St	C	20.4	C	21.0
49	Monroe Ave / Murrieta Hot Springs Rd	C	15.8	C	23.8
50	Hancock Ave / Murrieta Hot Springs Rd	B	11.7	B	14.7
51	Alta Murrieta Dr / Murrieta Hot Springs Rd	C	21.3	C	28.1
52	Winchester Rd (SR-79) / Murrieta Hot Springs Rd	C	24.0	C	26.4
53	Hancock Ave / Los Alamos Rd	C	28.4	C	34.5
54	I-215 SB Ramps / Los Alamos Rd	B	18.0	B	15.6
55	I-215 NB Ramps / Los Alamos Rd	B	15.4	B	15.0
56	Whitewood Rd / Los Alamos Rd	C	26.7	C	26.0
57	Whitewood Rd / Murrieta Hot Springs Rd	B	12.6	A	9.7
58	Adams Ave / Guava St	A	8.6	A	9.3
59	Nutmeg St / Clinton Keith Rd	C	20.6	C	21.0
60	Murrieta Oaks Ave - Mitchell Rd / Clinton Keith Rd	B	14.5	A	5.8
61	I-215 SB Ramps / Scott Rd	C	23.2	C	25.6
62	I-215 NB Ramps / Scott Rd	B	18.0	C	23.4

4.0 BUILDOUT CONDITIONS ANALYSIS

The Buildout Conditions analysis section includes the following three scenarios:

1. Existing General Plan buildout scenario – this is what would occur if no changes were made to the current General Plan land uses. Two versions of the Existing General Plan buildout scenario were modeled:
    a. Without the Whitewood Road extension between Murrieta Hot Springs Road and Jackson Avenue;
    b. With the Whitewood Road extension between Murrieta Hot Springs Road and Jackson Avenue.
2. Recommended scenario – this is the recommended land use plan for the General Plan update.
3. Scenario B – this scenario is similar to the Recommended scenario land use plan, the primary differences are additional multi-family housing in the Clinton Keith Road / Mitchell Road and the North Murrieta Business Corridor Focus Areas.

The land uses contained within each land use scenario were converted into SED data, and input into the Murrieta travel demand model. The data is summarized for the City and sphere areas in **Table 9**.

TABLE 9 – SOCIOECONOMIC DATA (SED) SUMMARY

	Population			Households			Employment		
	City	Sphere	Total	City	Sphere	Total	City	Sphere	Total
Existing Conditions	101,315	8,326	109,641	33,771	2,762	36,533	19,888	mm[1]	19,888
General Plan Buildout Scenario	122,792	25,499	148,291	41,133	8,489	49,622	93,502	3,086	96,588
Recommended Scenario	133,261	25,499	158,760	44,484	8,489	52,973	130,153	3,086	133,239
Scenario B	156,421	25,499	181,920	52,204	8,489	60,693	118,412	3,086	121,498
Note: 1. Minimal number									

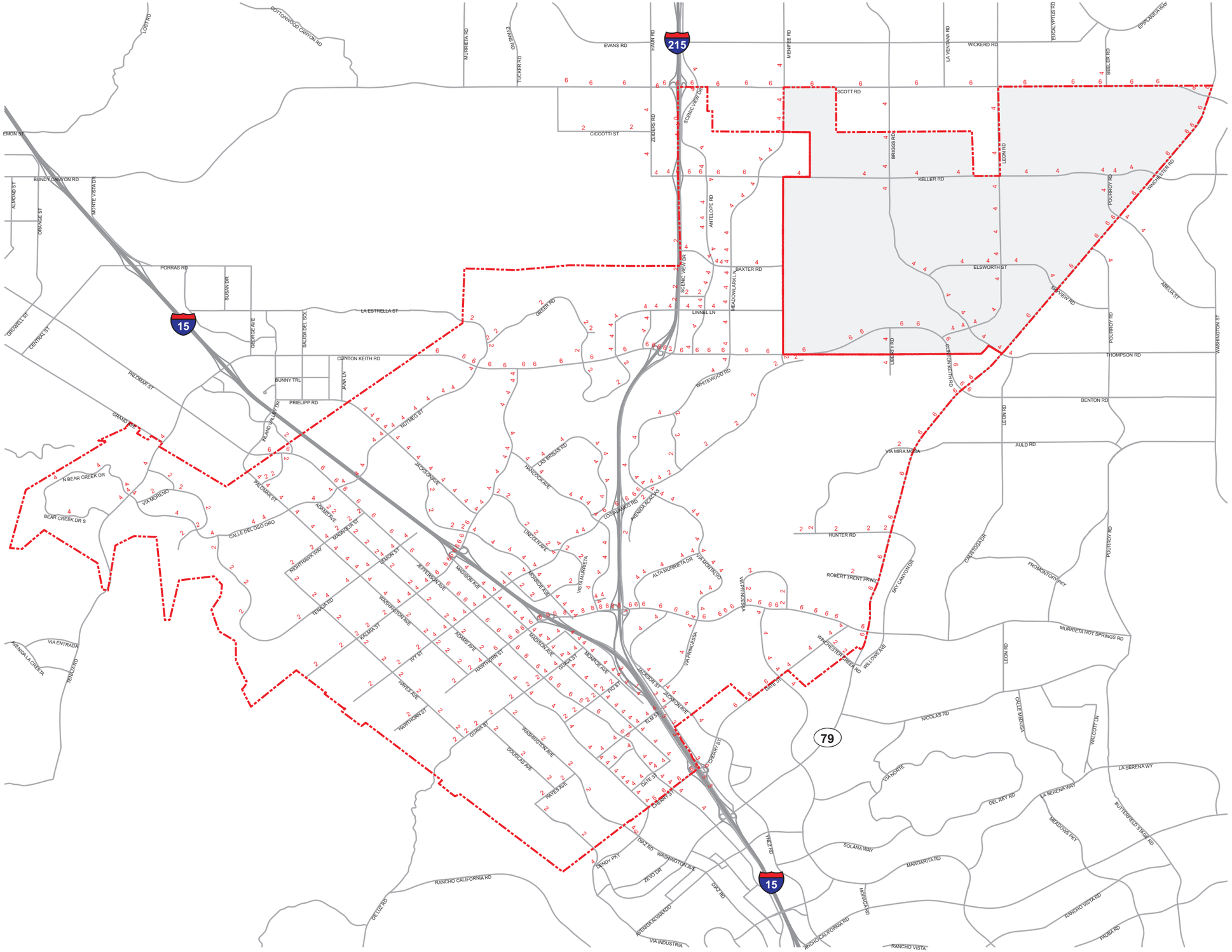
The future roadway network generally conforms to the current adopted Murrieta Circulation Element. The City has identified changes to the roadway network; these have been incorporated into the travel demand model. Other changes in the model were made in order to reflect how the roadways generally function. Changes include:

- Jefferson Avenue from Lemon Street to north of Nutmeg Street – modeled as six-lanes;
- Keller Road between Menifee Road and Briggs Road added as a Secondary;
- Removal of connection of Linnel Lane to Greer Road;
- Removal of connection of Liberty Road to Winchester Road;
- Removal of the connection of Monroe Avenue at Elm Street;
- Removal of Hunter Road as a Collector from west of Via Mira Mosa to Whitewood Road;
- Extension of Whitewood Road as a Major between Murrieta Hot Springs Road and Jackson Avenue (when modeled);
- Hayes Avenue from Guava Street to Kalmia Avenue, and between Nighthawk Way and Vineyard Parkway – modeled as a Collector;
- Washington Avenue from Hawthorn Street to Kalmia Avenue – modeled as a Collector;
- Nighthawk Way/Magnolia Street between Hayes Avenue to Jefferson Street – modeled as a Collector;
- Kalmia Street from west City boundary to Washington Avenue; Ivy Street from West City Limits to Washington Avenue; portions of Hawthorne Street from west City boundary to Adams Avenue; Douglas Avenue from Elm Street to Guava Street; Washington Avenue from south City boundary to Elm Street; Date Street from Adams Avenue to Madison Avenue; Corning Place between Adams Avenue and Jefferson Avenue; Adams Avenue between Ivy Street and Magnolia Street, and

south of Calle del Oso Oro; Fig Street between Adams Avenue and Monroe Avenue – all modeled as Collectors;

- Elm Street between Hayes Avenue and Washington Avenue; and Hayes Avenue between south City boundary and Elm Avenue – modeled as Secondaries;
- Nutmeg Street between Clinton Keith Road and north City boundary; Lincoln Avenue between Los Alamos Road and California Oaks Road; Vista Murrieta from Monroe Avenue to Los Alamos Road; and Greer Road between Clinton Keith Road the Greer Ranch Entry Gate – all modeled as Collectors;
- McElwain Road between Clinton Keith Road and Linnel Lane – modeled as Secondary
- Linnel Lane between Meadowlark Road and City boundary; Somers Road between old Antelope Road and Antelope Road; Keller Road between Menifee Road and Briggs Road – all modeled as Secondaries;
- Ruth Ellen Way between Whitewood Road and Los Alamos Road; Los Alamos Road from east of Whitewood Road to south of Clinton Keith Road; Via Mira Mosa between Winchester Road and Hunter Road; Liberty Road south of Clinton Keith Road – all modeled as Collectors.

Other than the extension of Whitewood Road between Jackson Avenue and Murrieta Hot Springs Road, the buildout model network is consistent throughout all buildout scenarios. The resultant travel demand model volumes were post-processed to obtain roadway link and intersection volumes. The number of travel lanes in the buildout model is shown in **Figure 9**.



LEGEND

- 4 — Future Number of Lanes (2-Way)
- City of Murrieta Boundary
- Sphere of Influence

0 1 2 Miles

ITERIS

11/09 JN 10-106976

Future Roadway Lanes

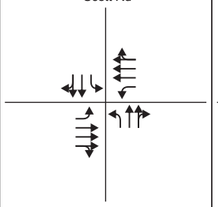
Figure 9

For intersections, the buildout intersection lane configurations incorporate the General Plan buildout number of through lanes; and assume a separate left turn lane and a shared right turn lane. If intersections, or legs of intersections, have already been built to their maximum configuration or already designed; these lanes were incorporated.

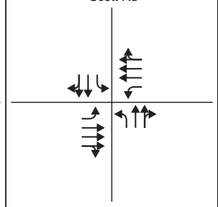
As part of improvements planned for the I-15 Southbound off-ramp at Kalmia Street/California Oaks Road, the southbound ramp will be relocated opposite Madison Avenue. Therefore, the levels of service for the Madison Avenue at Kalmia Street intersection is not shown in future level of service tables.

The intersection lane configurations used for the analysis of the three buildout scenarios is shown in **Figure 10**. Intersection traffic control assumed for future conditions is shown in **Table 10**.

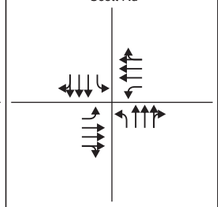
#1 Menifee Rd / Scott Rd



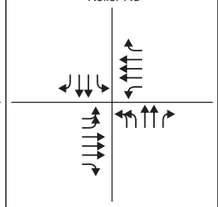
#2 Leon Rd / Scott Rd



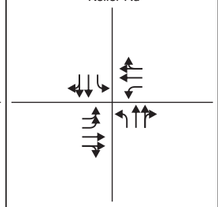
#3 Winchester Rd - SR-79 / Scott Rd



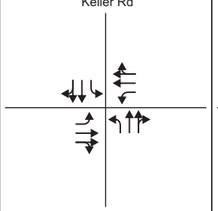
#4 Antelope Rd / Keller Rd



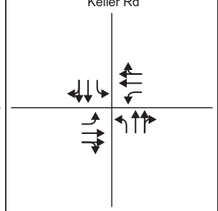
#5 Menifee-Meadowlark Rd/ Keller Rd



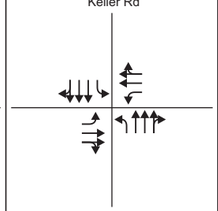
#6 Briggs Rd / Keller Rd



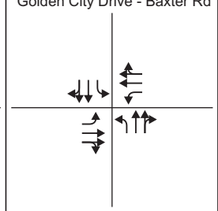
#7 Leon Rd / Keller Rd



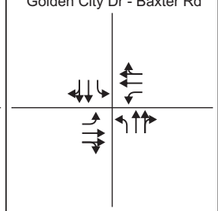
#8 Winchester Rd - SR-79 / Keller Rd



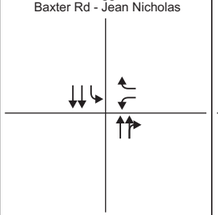
#9 Antelope Rd / Golden City Drive - Baxter Rd



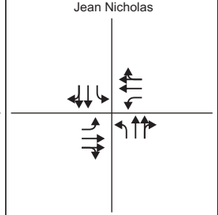
#10 Whitewood-Meadowlark/ Golden City Dr - Baxter Rd



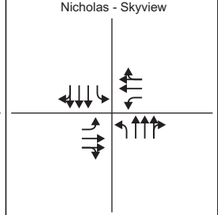
#11 Briggs Rd / Baxter Rd - Jean Nicholas



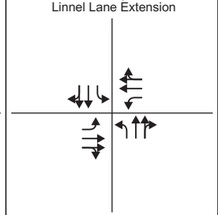
#12 Leon Rd / Jean Nicholas



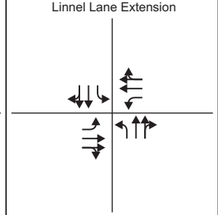
#13 Winchester Rd - SR-79 / Nicholas - Skyview



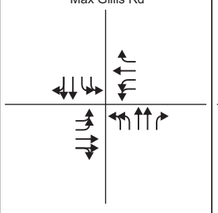
#14 Antelope Rd / Linnel Lane Extension



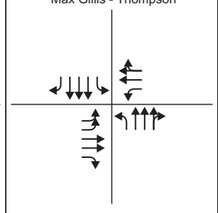
#15 Whitewood-Meadowlark/ Linnel Lane Extension



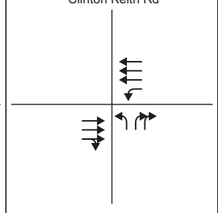
#16 Leon Rd / Max Gillis Rd



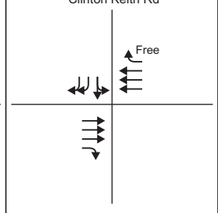
#17 Winchester Rd - SR-79 / Max Gillis - Thompson



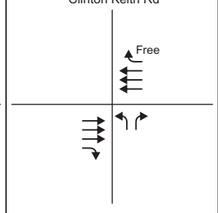
#18 California Oaks Rd / Clinton Keith Rd



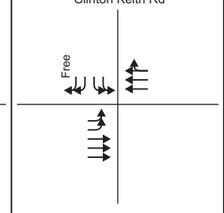
#19 I-215 SB Off-Ramp / Clinton Keith Rd



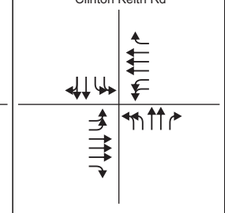
#20 I-215 NB Off-Ramp / Clinton Keith Rd



#21 Antelope Rd / Clinton Keith Rd



#22 Meadowlark-Whitewood Rd / Clinton Keith Rd



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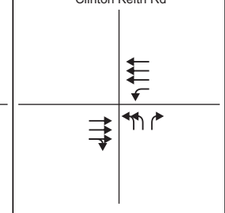

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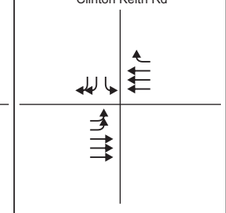
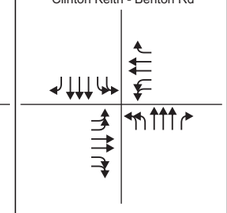


#25 Winchester Rd - SR-79 / Clinton Keith - Benton Rd



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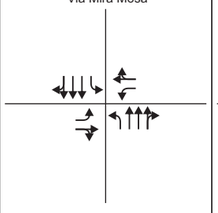
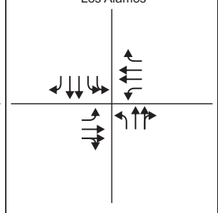
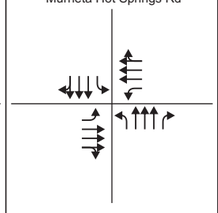


#27 Monroe Ave / Los Alamos



#28 Jefferson Ave / Murrieta Hot Springs Rd



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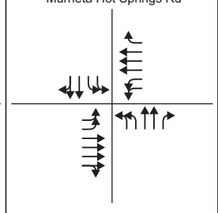

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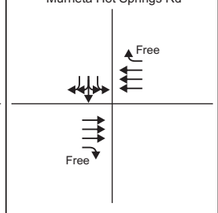
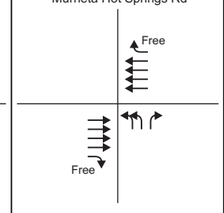
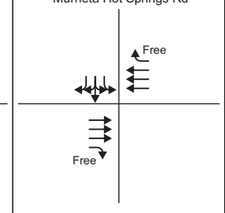


#31 I-15 NB Off-Ramp / Murrieta Hot Springs Rd



#32 I-215 SB Off-Ramp / Murrieta Hot Springs Rd



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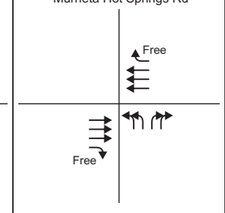
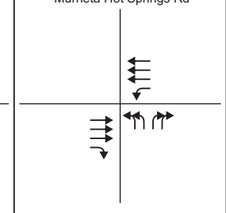
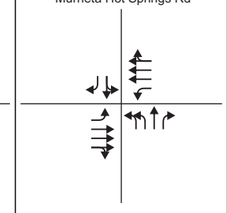
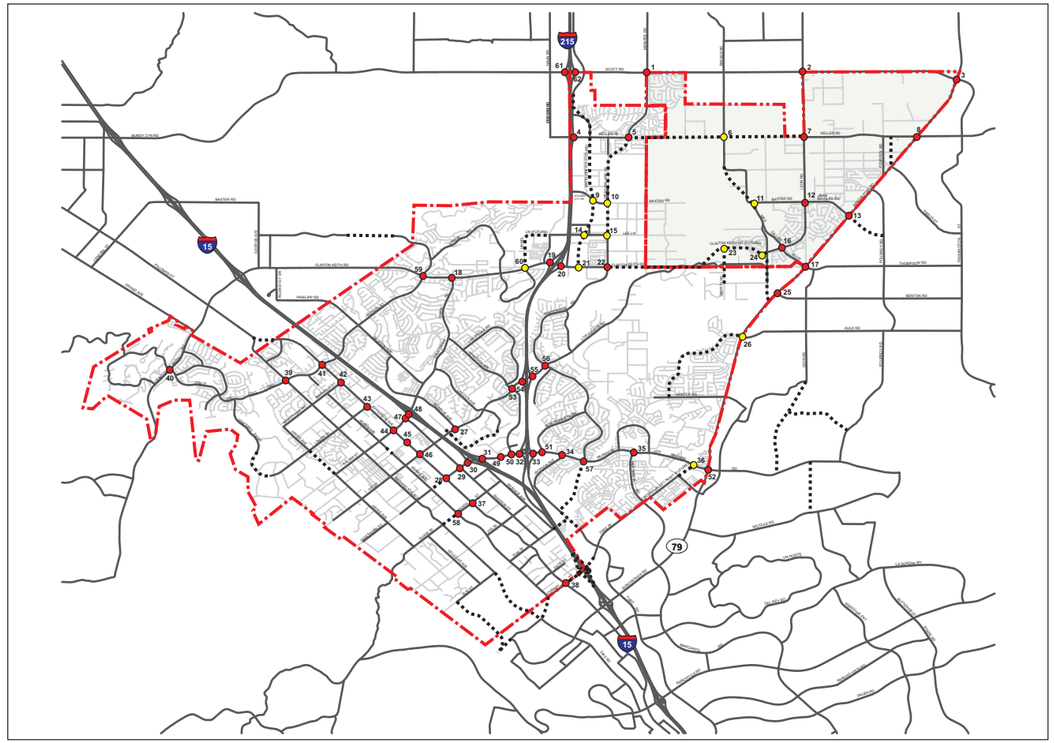


#34 Jackson Ave / Murrieta Hot Springs Rd



#35 Margarita Rd/ Murrieta Hot Springs Rd





Murrieta
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LEGEND

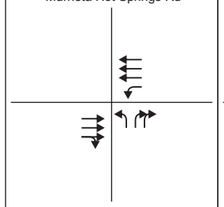
- Through Lane
- Turn Lane
- Shared Lane
- * Assumed Lane Configuration

ITERIS innovative by better visibility

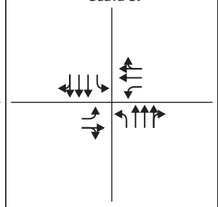
Future 2035 Lane Configurations

Figure 10A

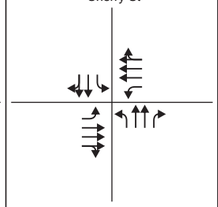
#36 French Valley-Date St / Murrieta Hot Springs Rd



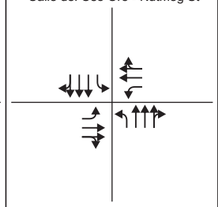
#37 Jefferson Ave / Guava St



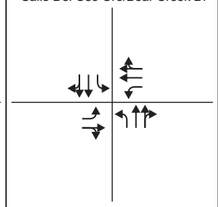
#38 Jefferson Ave / Cherry St



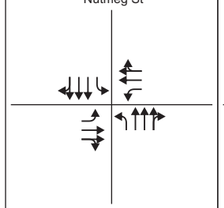
#39 Washington Ave / Calle del Oso Oro - Nutmeg St



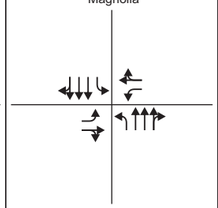
#40 Clinton Keith Rd / Calle Del Oso Oro/Bear Creek Dr



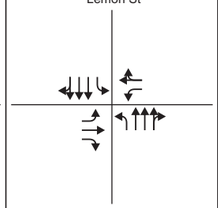
#41 Jefferson Ave / Nutmeg St



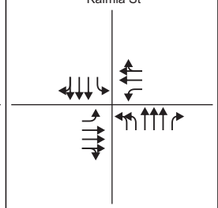
#42 Jefferson Ave / Magnolia



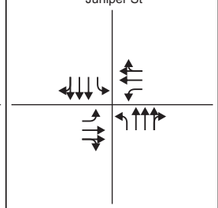
#43 Jefferson Ave / Lemon St



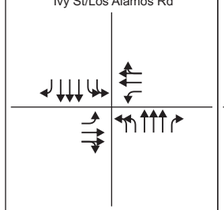
#44 Jefferson Ave / Kalmia St



#45 Jefferson Ave / Juniper St



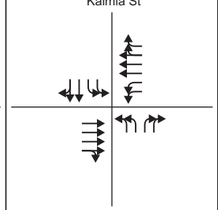
#46 Jefferson Ave / Ivy St/Los Alamos Rd



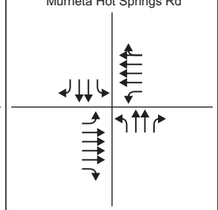
#47 Madison Ave / Kalmia St

Combined With Intersection #48

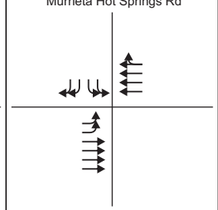
#48 Madison Ave - I-15 SB Ramps / Kalmia St



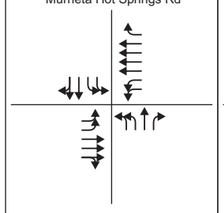
#49 Monroe Ave / Murrieta Hot Springs Rd



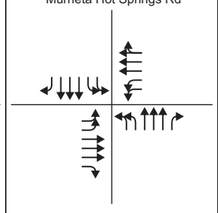
#50 Hancock Ave / Murrieta Hot Springs Rd



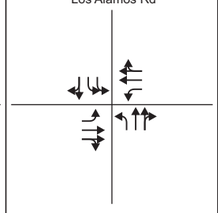
#51 Alta Murrieta Dr / Murrieta Hot Springs Rd



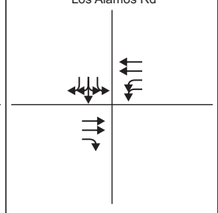
#52 Winchester Rd (SR-79) / Murrieta Hot Springs Rd



#53 Hancock Ave / Los Alamos Rd



#54 I-215 SB Ramps / Los Alamos Rd



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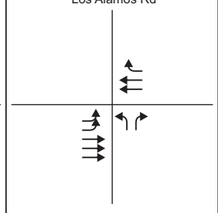
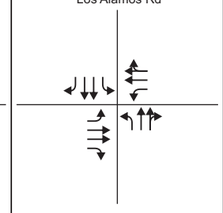
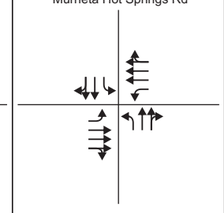


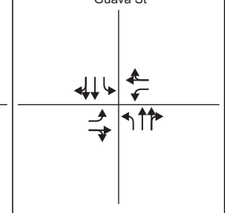
#56 Whitewood Rd / Los Alamos Rd



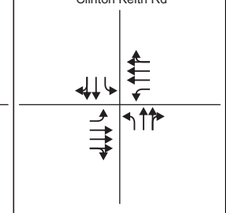
#57 Whitewood Rd / Murrieta Hot Springs Rd



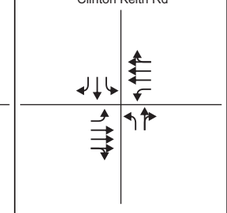
#58 Adams Ave / Guava St



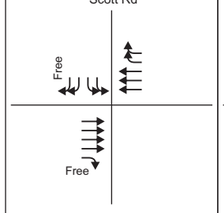
#59 Nutmeg St / Clinton Keith Rd



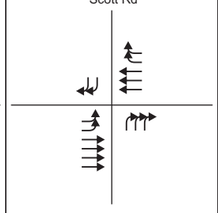
#60 Mitchell Rd / Clinton Keith Rd

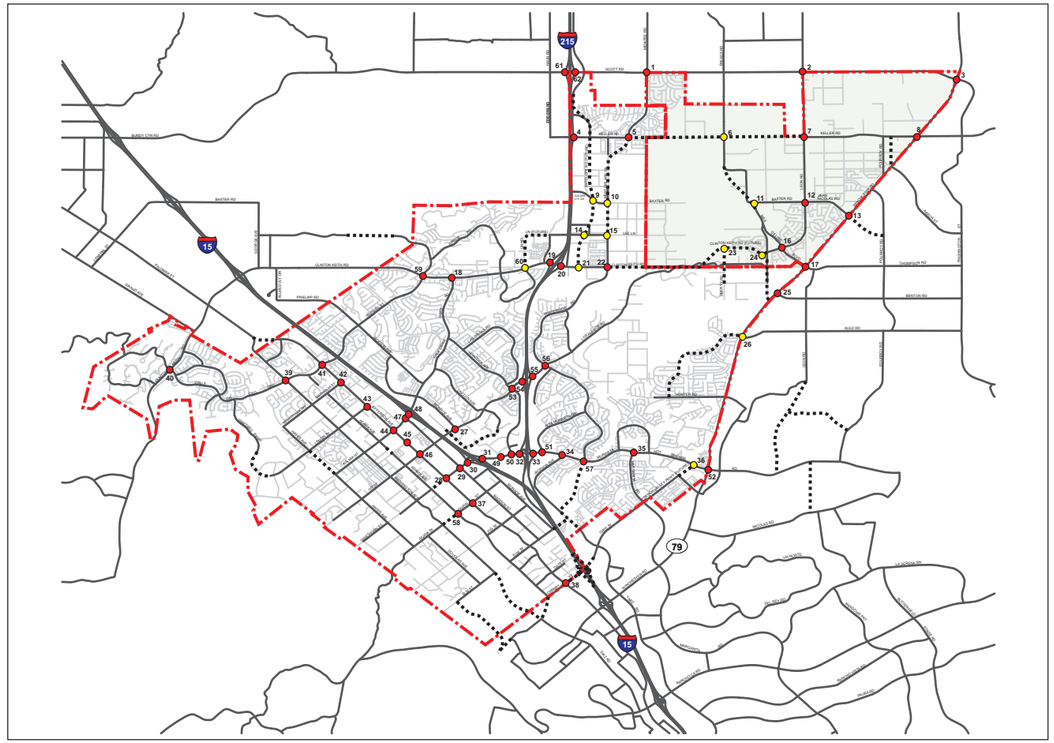


#61 I-215 SB Ramps / Scott Rd



#62 I-215 NB Ramps / Scott Rd





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LEGEND

- → Through Lane
- ↘ Turn Lane
- ↘→ Shared Lane
- * Assumed Lane Configuration

ITERIS innovative for better mobility

Future 2035 Lane Configurations

Figure 10B

TABLE 10 – FUTURE INTERSECTION TRAFFIC CONTROL

Int. No.	Intersection	Future Traffic Control
1	Menifee Rd / Scott Rd	Signalized
2	Leon Rd / Scott Rd	Signalized
3	Winchester Rd - SR-79 / Scott Rd	Signalized
4	Antelope Rd / Keller Rd	Signalized
5	Menifee-Meadowlark Rd/ Keller Rd	Signalized
6	Briggs Rd / Keller Rd	Signalized
7	Leon Rd / Keller Rd	Signalized
8	Winchester Rd - SR-79 / Keller Rd	Signalized
9	Antelope Rd / Golden City Drive – Baxter Rd	Signalized
10	Whitewood-Meadowlark/ Golden City Dr – Baxter Rd	Signalized
11	Briggs Rd / Baxter Rd – Jean Nicholas	Signalized
12	Leon Rd / Jean Nicholas	Signalized
13	Winchester Rd - SR-79 / Nicholas - Skyview	Signalized
14	Antelope Rd / Linnel Lane Extension	Signalized
15	Whitewood-Meadowlark/ Linnel Lane Extension	Signalized
16	Leon Rd / Max Gillis Rd	Signalized
17	Winchester Rd - SR-79 / Max Gillis - Thompson	Signalized
18	California Oaks Rd / Clinton Keith Rd	Signalized
19	I-215 SB Off-Ramp / Clinton Keith Rd	Signalized
20	I-215 NB Off-Ramp / Clinton Keith Rd	Signalized
21	Antelope Rd / Clinton Keith Rd	Signalized
22	Meadowlark – Whitewood Rd / Clinton Keith Rd	Signalized
23	Liberty Rd / Clinton Keith Rd	Signalized
24	Leon Rd / Clinton Keith Rd	Signalized
25	Winchester Rd - SR-79 / Benton Rd	Signalized
26	Winchester Rd - SR-79 / Via Mira Mosa – Auld Rd	Signalized
27	Monroe Ave / Los Alamos	Signalized
28	Jefferson Ave / Murrieta Hot Springs Rd	Signalized
29	Madison Ave / Murrieta Hot Springs Rd	Signalized
30	I-15 SB Off-Ramp / Murrieta Hot Springs Rd	Signalized
31	I-15 NB Off-Ramp / Murrieta Hot Springs Rd	Signalized
32	I-215 SB Off-Ramp / Murrieta Hot Springs Rd	Signalized
33	I-215 NB Off-Ramp / Murrieta Hot Springs Rd	Signalized
34	Jackson Ave / Murrieta Hot Springs Rd	Signalized
35	Margarita Rd/ Murrieta Hot Springs Rd	Signalized
36	French Valley – Date St / Murrieta Hot Springs Rd	Signalized
37	Jefferson Ave / Guava St	Signalized
38	Jefferson Ave / Cherry St	Signalized
39	Washington Ave / Calle del Oso Oro – Nutmeg St	Signalized
40	Clinton Keith Rd / Calle de Oso Oro – Bear Creek Dr	Signalized
41	Jefferson Ave / Nutmeg St	Signalized
42	Jefferson Ave / Magnolia St	Signalized
43	Jefferson Ave / Lemon St	Signalized
44	Jefferson Ave / Kalmia St	Signalized
45	Jefferson Ave / Juniper St	Signalized

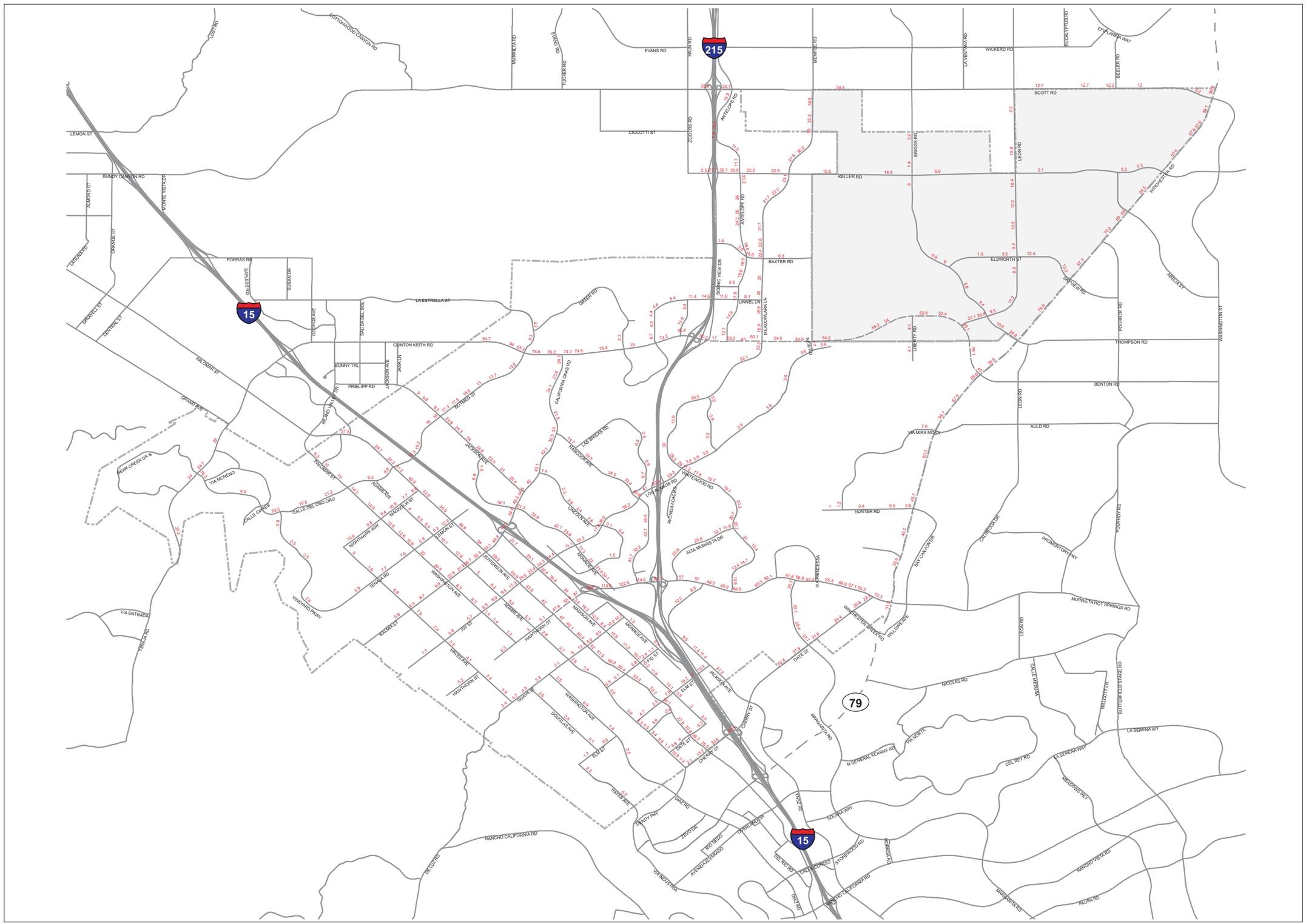
Int. No.	Intersection	Future Traffic Control
46	Jefferson Ave / Ivy St – Los Alamos Rd	Signalized
47	Madison Ave / Kalmia St	N/A
48	I-15 SB Ramps / Kalmia St	Signalized
49	Monroe Ave / Murrieta Hot Springs Rd	Signalized
50	Hancock Ave / Murrieta Hot Springs Rd	Signalized
51	Alta Murrieta Dr / Murrieta Hot Springs Rd	Signalized
52	Winchester Rd - SR-79 / Murrieta Hot Springs Rd	Signalized
53	Hancock Ave / Los Alamos Rd	Signalized
54	I-215 SB Ramps / Los Alamos Rd	Signalized
55	I-215 NB Ramps / Los Alamos Rd	Signalized
56	Whitewood Rd / Los Alamos Rd	Signalized
57	Whitewood Rd / Murrieta Hot Springs Rd	Signalized
58	Adams Ave / Guava St	Signalized
59	Nutmeg St / Clinton Keith Rd	Signalized
60	Mitchell Rd / Clinton Keith Rd	Signalized
61	I-215 SB Ramps / Scott Rd	Signalized
62	I-215 NB Ramps / Scott Rd	Signalized

4.1 EXISTING GENERAL PLAN BUILDOUT SCENARIO

Levels of service associated with the buildout of the Existing General Plan were calculated for both roadway links and intersections. Two scenarios were modeled: without the extension of Whitewood Road between Jackson Avenue and Murrieta Hot Springs Road in place; and with the extension of Whitewood Road between Jackson Avenue and Murrieta Hot Springs Road in place.

4.1.1 *ROADWAY LOS WITHOUT WHITEWOOD ROAD EXTENSION*

Using the Existing General Plan buildout scenario daily traffic volumes (shown in **Figure 11**) and the maximum daily roadway capacity values, daily volume-to-capacity ratios have been determined for the scenario without the Whitewood Road extension. The following roadway segments are projected to operate at an unacceptable level of service (LOS D, E or F) per the City of Murrieta's Level of Service standards. The daily volume-to-capacity ratios are shown in **Figure 12**.



LEGEND

17.6 ADT Volume (in Thousands)

City of Murrieta Boundary

Sphere of Influence

2035 Average Daily Traffic Volumes - Existing General Plan (Without Whitewood Rd Extension)

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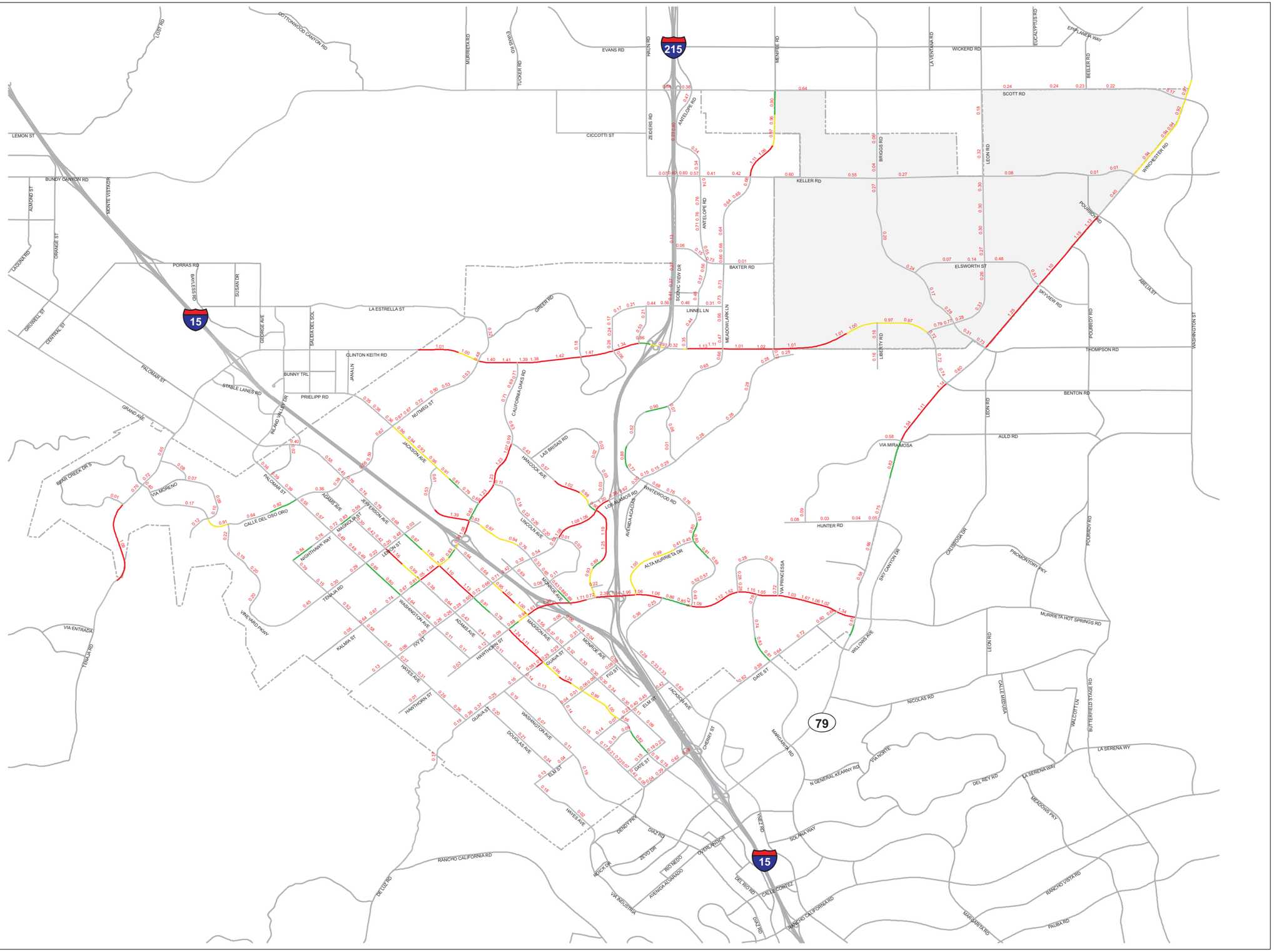
11/09 JN 10-106976

Figure 11



LEGEND

- 0.87 Daily Volume/Capacity Ratio
- LOS D
- LOS E
- LOS F
- City of Murrieta Boundary
- Sphere of Influence

0 1 2 Miles

2035 Daily Volume-to-Capacity Ratios - Existing General Plan (Without Whitewood Rd Extension)

ITERIS

11/09 JN 10-106976

Figure 12

Level of Service D

- Portions of Jefferson Avenue, Whitewood Road, Winchester Road, and Washington Avenue, among others

Level of Service E

- Portions of Jefferson Avenue, Monroe Avenue, Jackson Avenue, Alta Murrieta Drive, and Clinton Keith Road, among others.

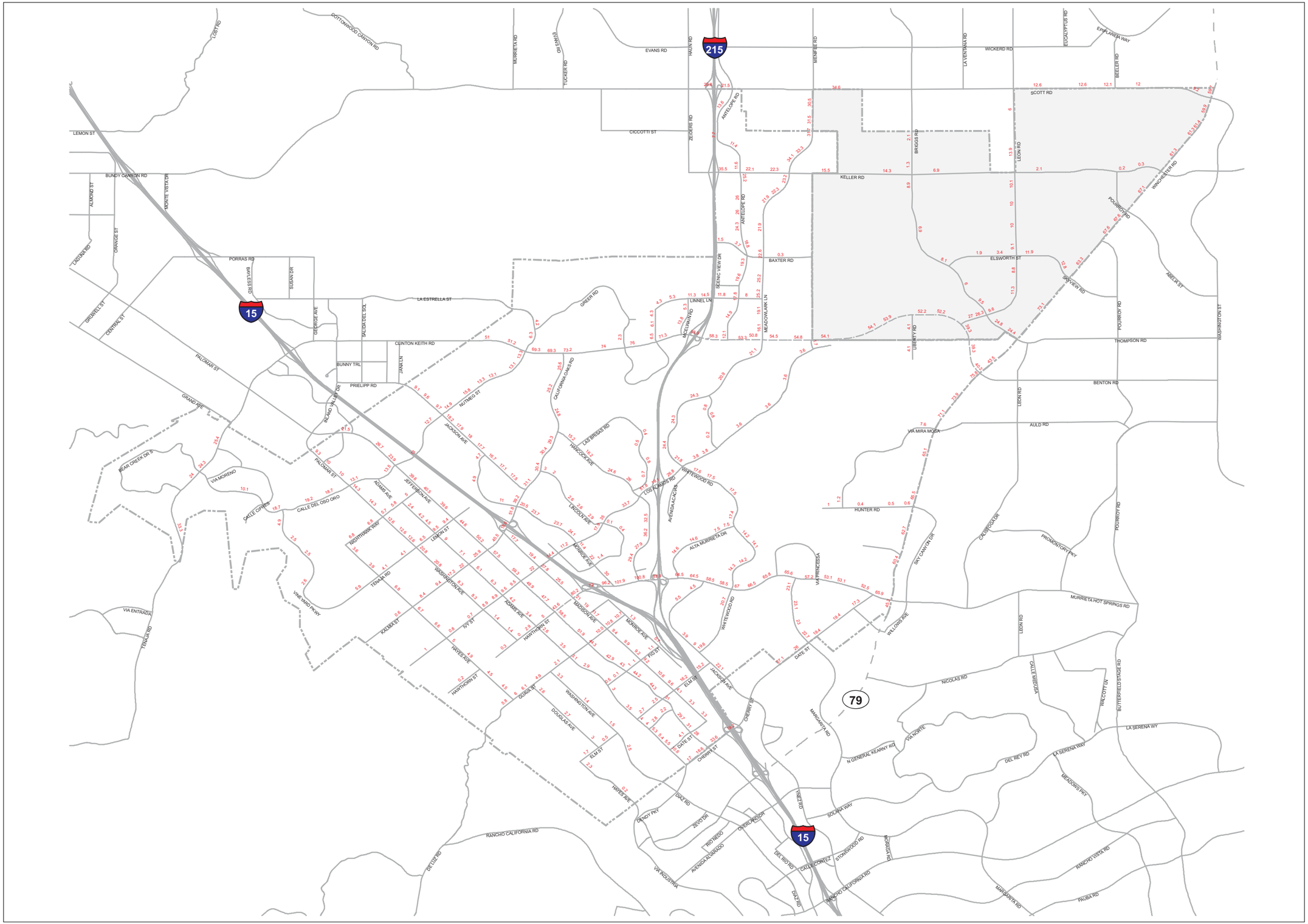
LOS F

- Portions of Jefferson Avenue, Clinton Keith Road, California Oaks Road, Los Alamos Road, Hancock Avenue, Winchester Road, Menifee Road, and Kalmia Street, among others.

4.1.2 *ROADWAY LOS WITH WHITEWOOD ROAD EXTENSION*

Using the Existing General Plan buildout scenario daily traffic volumes (shown in **Figure 13**) and the maximum daily roadway capacity values, daily volume-to-capacity ratios have been determined for the scenario with the Whitewood Road extension in place. The following roadway segments are projected to operate at an unacceptable level of service (LOS D, E or F) per the City of Murrieta's Level of Service standards. The daily volume-to-capacity ratios are shown in **Figure 14**.

A comparison of the Existing General Plan With and Without the Whitewood Road Extension can be used show how traffic volumes change with the roadway extension. With the extension in place, roadway levels of service are projected to be higher on portions of Murrieta Hot Spring Road, California Oaks Road, Hancock Road and Alta Murrieta Road, among others. Without the extension in place, roadway levels of service are projected to be lower, or improved (than if the extension was in place), on portions of Winchester Road.



LEGEND

17.6 ADT Volume (in Thousands)

City of Murrieta Boundary

Sphere of Influence

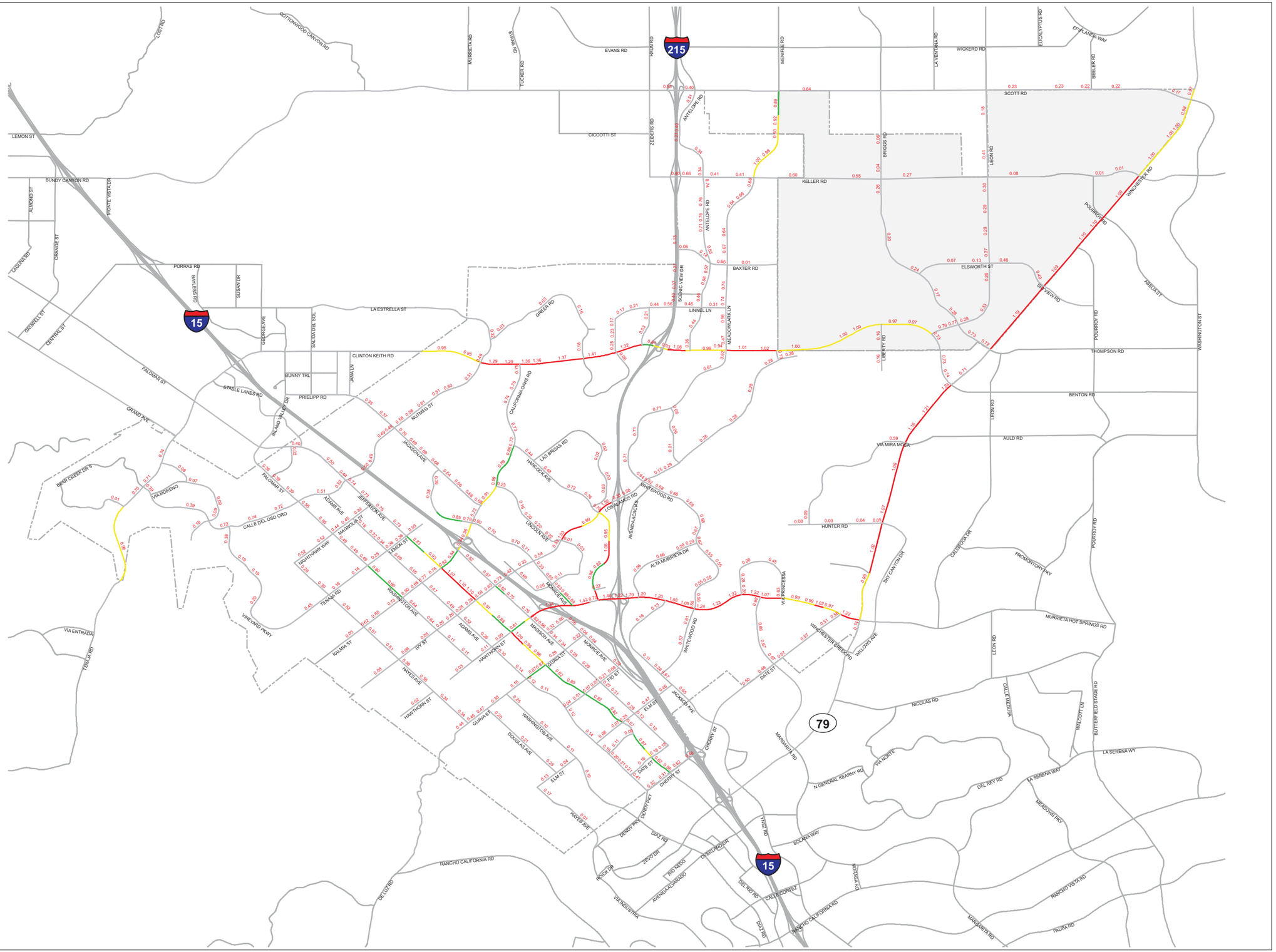
0 1 2 Miles

2035 Average Daily Traffic Volumes - Existing General Plan

ITERIS

11/09 JN 10-106976

Figure 13



2035 Daily Volume-to-Capacity Ratios - Existing General Plan

ITERIS

11/09 JN 10-106976

Figure 14

Level of Service D

- Portions of Madison Avenue, Jefferson Avenue, Guava Street, Hancock Avenue, California Oaks Road, and Monroe Avenue, among others.

Level of Service E

- Portions of Jefferson Avenue, California Oaks Road, Clinton Keith Road, Murrieta Hot Springs Road, Winchester Road, Menifee Road, and Hancock Road, among others.

LOS F

- Portions of Murrieta Hot Springs Road, Jefferson Avenue, Clinton Keith Road, Winchester Road, Los Alamos Road, among others.

4.1.3 *INTERSECTION LOS*

Existing General Plan Buildout Scenario traffic volumes are illustrated in **Figure 15**. **Table 11** provides the level of service results for the 61 future study intersections. As shown, all future study areas are projected to operate at level of service of LOS D or better except at the following twelve locations:

1 Menifee Rd / Scott Rd
3 Winchester Rd - SR-79 / Scott Rd
4 Antelope Rd / Keller Rd
10 Whitewood-Meadowlark/ Golden City Dr – Baxter Rd
20 I-215 NB Off-Ramp / Clinton Keith Rd
22 Meadowlark – Whitewood Rd / Clinton Keith Rd
25 Winchester Rd - SR-79 / Benton Rd
28 Jefferson Ave / Murrieta Hot Springs Rd
29 Madison Ave / Murrieta Hot Springs Rd
44 Jefferson Ave / Kalmia St
52 Winchester Rd (SR-79) / Murrieta Hot Springs Rd
53 Hancock Ave / Los Alamos Rd
54 I-215 SB Ramps / Los Alamos Rd
57 Whitewood Rd / Murrieta Hot Springs Rd
59 Nutmeg St / Clinton Keith Rd

#1 Menifee Rd / Scott Rd

89 (90) 638 (308) 238 (183)
258 (538) 508 (555) 719 (491)
99 (219) 499 (850) 248 (466)
280 (266) 408 (573) 428 (803)

#2 Leon Rd / Scott Rd

526 (398) 285 (192) 96 (62)
161 (155) 376 (385) 8 (4)
401 (575) 448 (495) 344 (441)
97 (515) 182 (367) 2 (15)

#3 Winchester Rd - SR-79 / Scott Rd

74 (132) 2477 (1909) 935 (1146)
984 (1083) 157 (219) 16 (0)
113 (110) 174 (269) 63 (111)
118 (120) 1449 (2428) 54 (27)

#4 Antelope Rd / Keller Rd

298 (484) 297 (76) 159 (79)
33 (109) 511 (426) 633 (186)
400 (722) 711 (807) 831 (227)
55 (623) 39 (379) 269 (728)

#5 Menifee-Meadowlark Rd/ Keller Rd

621 (293) 919 (819) 136 (126)
150 (184) 339 (300) 196 (202)
567 (783) 180 (295) 352 (361)
21 (63) 283 (775) 247 (543)

#6 Briggs Rd / Keller Rd

21 (83) 9 (51) 0 (1)
1 (4) 308 (283) 6 (9)
2 (11) 149 (261) 384 (609)
275 (310) 18 (85) 53 (102)

#7 Leon Rd / Keller Rd

122 (76) 570 (609) 2 (0)
2 (3) 33 (181) 3 (15)
4 (80) 66 (19) 182 (270)
125 (66) 309 (837) 11 (0)

#8 Winchester Rd - SR-79 / Keller Rd

1 (1) 2559 (2148) 4 (12)
49 (30) 10 (13) 12 (13)
1 (0) 9 (20) 1 (1)
1593 (2596) 27 (37)

#9 Antelope Rd / Golden City Drive - Baxter Rd

22 (14) 808 (831) 215 (230)
402 (691) 209 (92) 377 (279)
0 (3) 33 (182) 6 (33)
1 (2) 51 (286) 319 (800)

#10 Whitewood-Meadowlark/ Golden City Dr - Baxter Rd

639 (762) 872 (538)
1 (2) 15 (7) 1 (0)
19 (263) 3 (12) 475 (875)
297 (208) 407 (1107) 3 (3)

#11 Briggs Rd / Baxter Rd - Jean Nicholas

363 (525) 60 (34)
54 (113) 2 (16)
151 (384) 27 (85)

#12 Leon Rd / Jean Nicholas

47 (12) 503 (556) 186 (236)
231 (368) 26 (144) 161 (117)
2 (2) 175 (103) 16 (13)
7 (3) 180 (524) 126 (233)

#13 Winchester Rd - SR-79 / Nicholas - Skyview

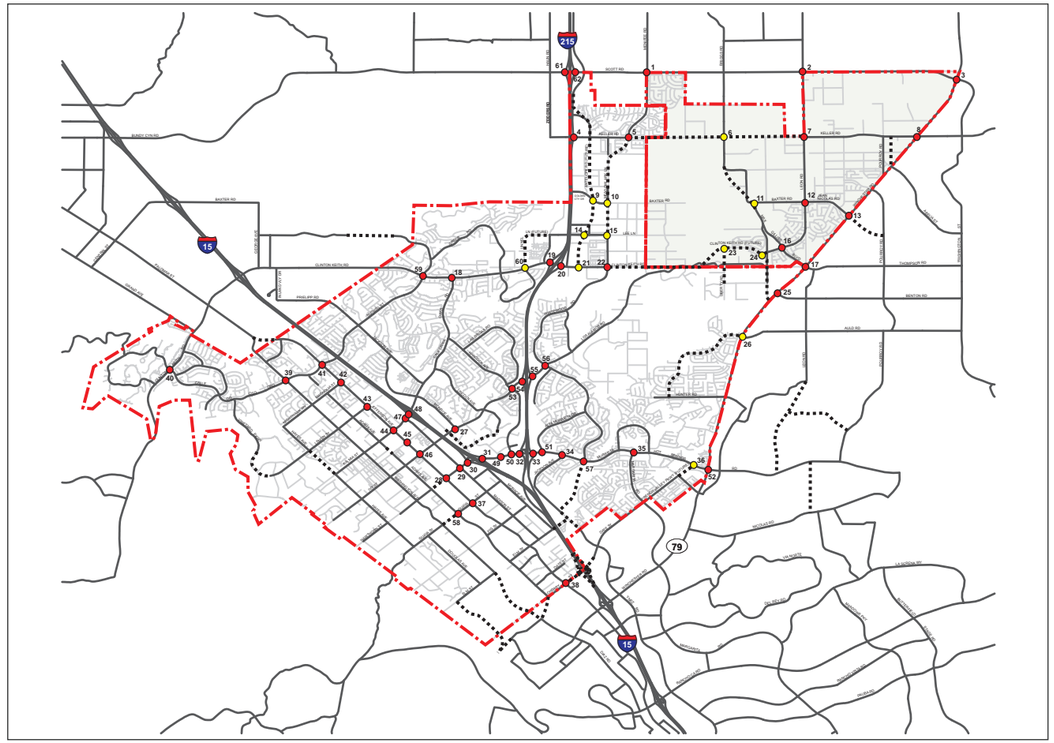
26 (17) 2705 (1966) 18 (66)
173 (110) 322 (415) 123 (141)
35 (33) 297 (538) 138 (112)
134 (207) 1425 (2617) 334 (191)

#14 Antelope Rd / Linnel Lane Extension

364 (519) 522 (640) 37 (97)
220 (231) 258 (160) 18 (10)
65 (164) 197 (532) 137 (175)
23 (16) 400 (460) 60 (75)

#15 Whitewood-Meadowlark/ Linnel Lane Extension

454 (379) 813 (1049) 3 (5)
16 (27) 14 (8) 1 (1)
97 (340) 13 (29) 184 (339)
28 (13) 665 (901) 5 (4)



#16 Leon Rd / Max Gillis Rd

129 (148) 282 (261) 345 (368)
173 (359) 274 (326) 493 (461)
98 (97) 440 (164) 618 (373)
411 (495) 118 (409) 417 (485)

#17 Winchester Rd - SR-79 / Max Gillis - Thompson

604 (550) 2110 (1298) 127 (306)
50 (98) 279 (243) 34 (37)
622 (651) 137 (291) 245 (124)
152 (202) 1324 (2469) 38 (88)

#18 California Oaks Rd / Clinton Keith Rd

1680 (2389) 706 (477)
2182 (2183) 298 (132)
216 (309) 542 (1008)

#19 I-215 SB Off-Ramp / Clinton Keith Rd

417 (626) 0 (1) 57 (34)
225 (145) 1860 (2165)
2167 (2385) 509 (650)

#20 I-215 NB Off-Ramp / Clinton Keith Rd

265 (265) 2136 (2404)
1555 (1391) 302 (271)
122 (347) 0 (1) 1233 (384)

#21 Antelope Rd / Clinton Keith Rd

514 (627) 26 (39)
238 (211) 1308 (1684)
253 (136) 1768 (1706)

#22 Meadowlark-Whitewood Rd / Clinton Keith Rd

567 (321) 117 (226) 296 (495)
195 (869) 988 (768) 865 (430)
636 (162) 997 (1279) 106 (379)
55 (596) 37 (207) 784 (691)

#23 Liberty Rd / Clinton Keith Rd

1999 (2007) 34 (16)
1998 (2141) 169 (122)
14 (54) 72 (191)

#24 Leon Rd / Clinton Keith Rd

1180 (1031) 127 (131)
518 (834) 669 (996)
461 (481) 1597 (1831)

#25 Winchester Rd - SR-79 / Benton Rd

353 (480) 1977 (1001) 86 (55)
30 (69) 514 (683) 316 (230)
45 (69) 502 (556) 1122 (1481)
1337 (2525) 431 (598) 332 (712)

#26 Winchester Rd - SR-79 / Via Mira Mosa

228 (363) 2662 (2142) 331 (125)
30 (136) 19 (39) 176 (223)
349 (243) 51 (32) 91 (52)
27 (62) 1572 (3221) 841 (238)

#27 Monroe Ave / Los Alamos

194 (63) 446 (347) 5 (15) 269
438 (464) 959 (954) 62 (98)
42 (207) 321 (1442) 127 (176)
27 (28) 206 (450) 176 (277)

#28 Jefferson Ave / Murrieta Hot Springs Rd

75 (66) 1199 (1005) 8 (15) 650
699 (752) 99 (97) 931 (648)
13 (33) 82 (187) 24 (121)
13 (7) 981 (2262) 579 (1299)

#29 Madison Ave / Murrieta Hot Springs Rd

141 (123) 144 (252) 150 (335)
79 (199) 1759 (1291) 647 (824)
140 (398) 1141 (1650) 260 (318)
140 (326) 79 (599) 322 (1158)

#30 I-15 SB Off-Ramp / Murrieta Hot Springs Rd

394 (412) 813 (685)
47 (112) 2235 (2333)
1348 (2604) 225 (495)

#31 I-15 NB Off-Ramp / Murrieta Hot Springs Rd

627 (1673) 1455 (1736)
2144 (3038) 181 (315)
281 (197) 73 (259)

#32 I-215 SB Off-Ramp / Murrieta Hot Springs Rd

438 (377) 541 (454)
378 (238) 2529 (2497)
1944 (3355) 53 (139)

#33 I-215 NB Off-Ramp / Murrieta Hot Springs Rd

679 (1369) 2578 (2514)
1588 (2317) 115 (104)
347 (82) 19 (479)

#34 Jackson Ave / Murrieta Hot Springs Rd

2010 (2590) 159 (205)
1218 (1896) 43 (62)
70 (243) 51 (183)

#35 Margarita Rd/ Murrieta Hot Springs Rd

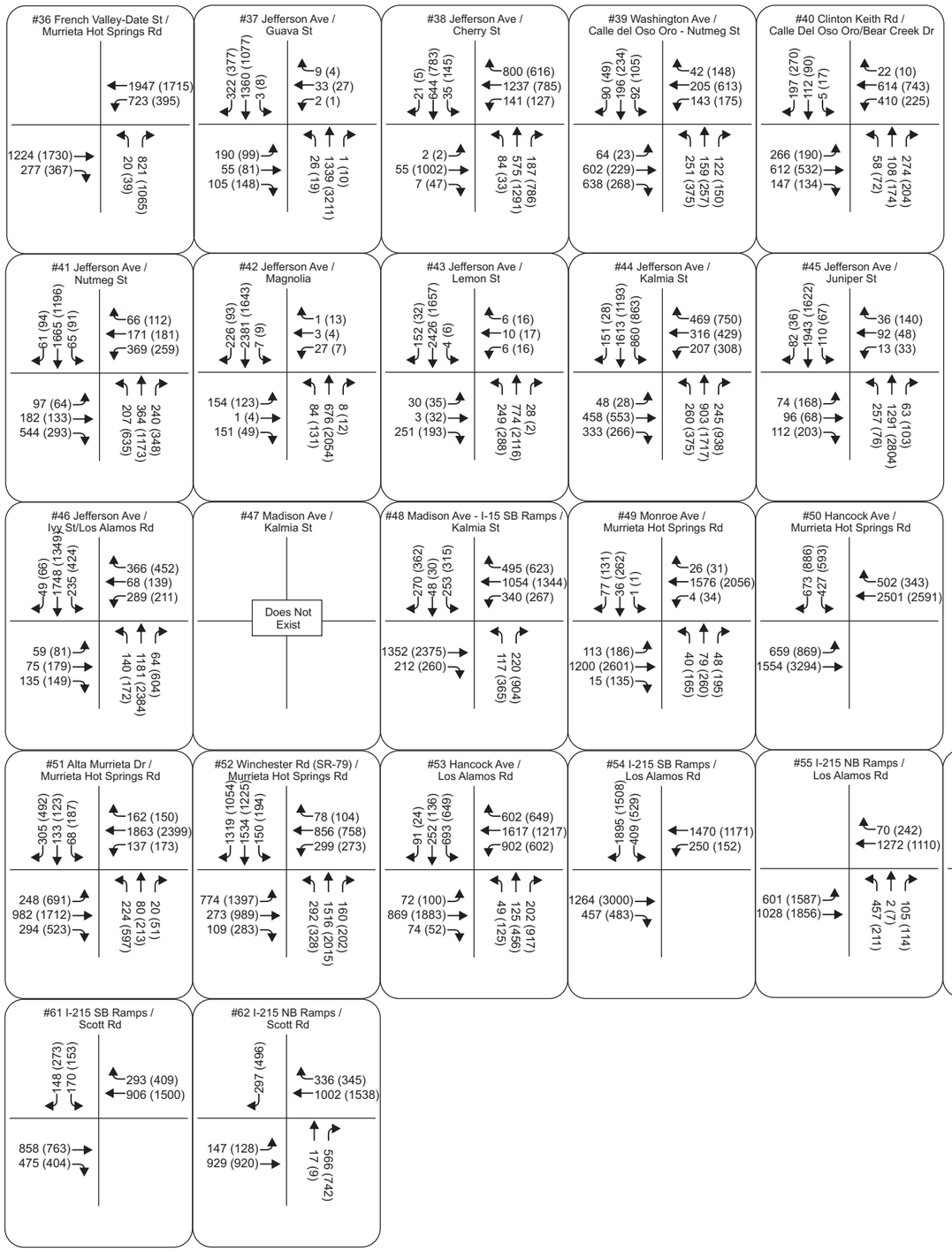
9 (146) 80 (80) 177 (196) 42
71 (40) 1723 (1659) 302 (302)
163 (47) 749 (1676) 462 (506)
616 (920) 60 (70) 128 (411)

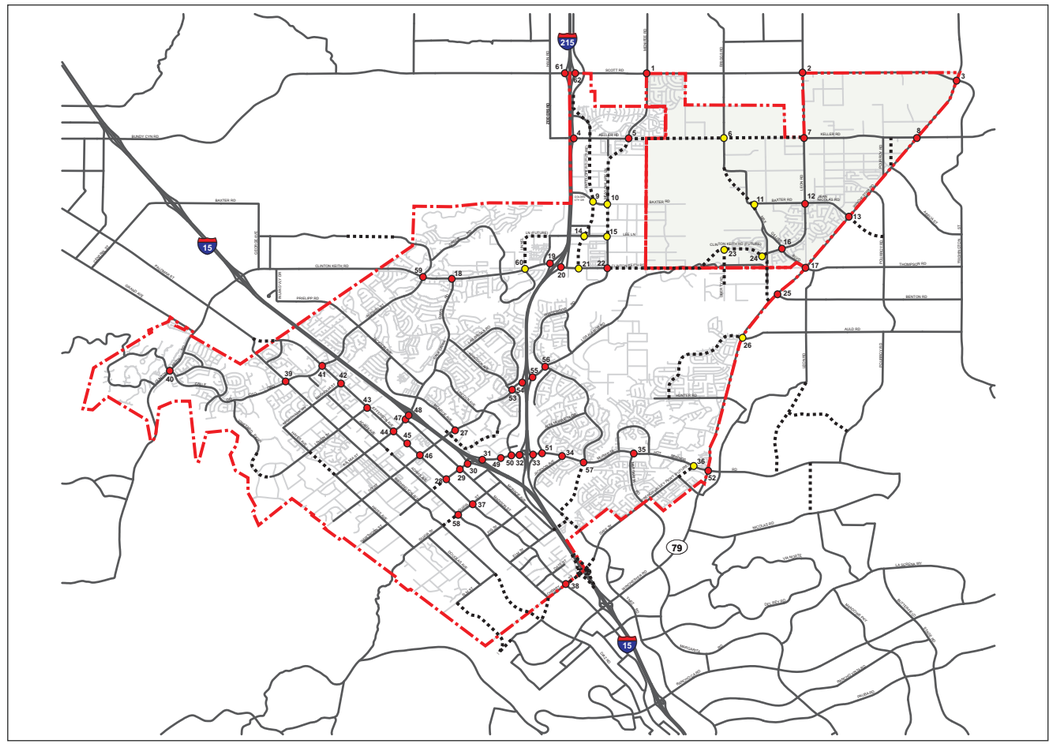
LEGEND

- Existing Study Intersection
- Future Study Intersection
- City of Murrieta Boundary
- Sphere of Influence
- Future Roadway Alignment
- ←31/20 AM Peak Hr/PM Peak Hr

2035 Peak Hour Turning Movement Volumes - Existing General Plan

Figure 15A





LEGEND

- Existing Study Intersection
- Future Study Intersection
- City of Murrieta Boundary
- Sphere of Influence
- Future Roadway Alignment
- 31/20 AM Peak Hr/PM Peak Hr

2035 Peak Hour Turning Movement Volumes - Existing General Plan

Figure 15B

TABLE 11 – EXISTING GENERAL PLAN BUILDOUT LEVEL OF SERVICE

Int. No.	Intersection	AM Peak Hour		PM Peak Hour	
		LOS	Ave Del/Veh	LOS	Ave Del/Veh
1	Menifee Rd / Scott Rd	D	47.3	E	72.8
2	Leon Rd / Scott Rd	C	28.5	D	45.9
3	Winchester Rd - SR-79 / Scott Rd	F	177.0	F	287.5
4	Antelope Rd / Keller Rd	E	66.4	D	35.1
5	Menifee-Meadowlark Rd/ Keller Rd	C	30.6	C	33.1
6	Briggs Rd / Keller Rd	B	16.9	B	19.0
7	Leon Rd / Keller Rd	B	16.6	B	16.0
8	Winchester Rd - SR-79 / Keller Rd	A	1.4	A	1.2
9	Antelope Rd / Golden City Drive – Baxter Rd	B	16.8	D	39.2
10	Whitewood-Meadowlark/ Golden City Dr – Baxter Rd	D	37.0	E	65.7
11	Briggs Rd / Baxter Rd – Jean Nicholas	B	11.0	B	10.5
12	Leon Rd / Jean Nicholas	C	23.0	C	23.3
13	Winchester Rd - SR-79 / Nicholas - Skyview	B	18.8	C	24.6
14	Antelope Rd / Linnel Lane Extension	B	19.4	C	22.1
15	Whitewood-Meadowlark/ Linnel Lane Extension	B	10.1	B	15.8
16	Leon Rd / Max Gillis Rd	D	38.0	C	32.8
17	Winchester Rd - SR-79 / Max Gillis - Thompson	C	25.1	D	35.3
18	California Oaks Rd / Clinton Keith Rd	C	32.7	C	20.6
19	I-215 SB Off-Ramp / Clinton Keith Rd	A	8.2	B	12.2
20	I-215 NB Off-Ramp / Clinton Keith Rd	F	83.2	B	13.4
21	Antelope Rd / Clinton Keith Rd	A	4.3	A	2.7
22	Meadowlark – Whitewood Rd / Clinton Keith Rd	D	54.9	E	62.9
23	Liberty Rd / Clinton Keith Rd	A	2.5	A	6.2
24	Leon Rd / Clinton Keith Rd	B	19.3	C	20.7
25	Winchester Rd - SR-79 / Benton Rd	D	41.0	E	63.2
26	Winchester Rd - SR-79 / Via Mira Mosa – Auld Rd	C	24.1	C	27.7
27	Monroe Ave / Los Alamos	C	23.9	C	28.0
28	Jefferson Ave / Murrieta Hot Springs Rd	F	116.4	F	173.6
29	Madison Ave / Murrieta Hot Springs Rd	C	26.2	F	128.8
30	I-15 SB Off-Ramp / Murrieta Hot Springs Rd	B	16.0	B	14.4
31	I-15 NB Off-Ramp / Murrieta Hot Springs Rd	A	5.8	A	8.2
32	I-215 SB Off-Ramp / Murrieta Hot Springs Rd	B	12.4	B	10.6
33	I-215 NB Off-Ramp / Murrieta Hot Springs Rd	A	5.6	A	9.5
34	Jackson Ave / Murrieta Hot Springs Rd	A	5.3	A	9.1
35	Margarita Rd/ Murrieta Hot Springs Rd	C	24.4	D	50.5
36	French Valley – Date St / Murrieta Hot Springs Rd	B	12.7	B	17.6
37	Jefferson Ave / Guava St	A	9.8	A	7.9
38	Jefferson Ave / Cherry St	C	21.0	C	30.7
39	Washington Ave / Calle del Oso Oro – Nutmeg St	C	26.5	C	27.2
40	Clinton Keith Rd / Calle de Oso Oro – Bear Creek Dr	C	21.5	B	16.2
41	Jefferson Ave / Nutmeg St	D	52.0	D	37.6
42	Jefferson Ave / Magnolia	B	10.4	A	7.8
43	Jefferson Ave / Lemon St	B	18.2	B	13.7

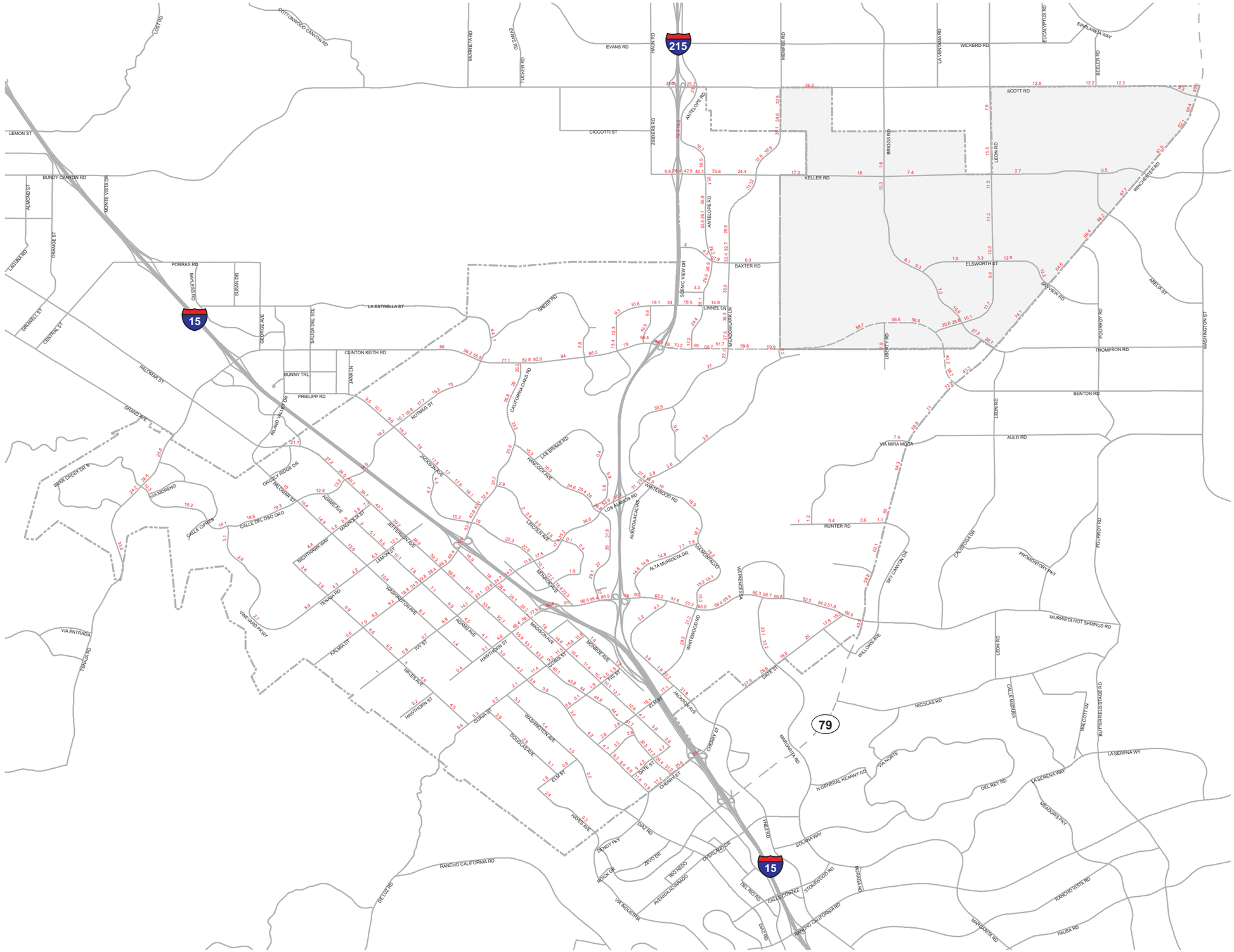
Int. No.	Intersection	AM Peak Hour		PM Peak Hour	
		LOS	Ave Del/Veh	LOS	Ave Del/Veh
44	Jefferson Ave / Kalmia St	D	43.2	F	129.1
45	Jefferson Ave / Juniper St	B	15.5	B	15.5
46	Jefferson Ave / Ivy St – Los Alamos Rd	C	24.1	C	30.9
47	Madison Ave / Kalmia St	N/A	N/A	N/A	N/A
48	I-15 SB Ramps / Kalmia St	C	29.0	C	30.4
49	Monroe Ave / Murrieta Hot Springs Rd	A	7.9	B	16.4
50	Hancock Ave / Murrieta Hot Springs Rd	B	17.7	B	19.0
51	Alta Murrieta Dr / Murrieta Hot Springs Rd	C	23.7	D	53.7
52	Winchester Rd (SR-79) / Murrieta Hot Springs Rd	F	90.6	F	91.7
53	Hancock Ave / Los Alamos Rd	E	64.0	F	224.1
54	I-215 SB Ramps / Los Alamos Rd	E	58.3	F	145.6
55	I-215 NB Ramps / Los Alamos Rd	C	26.1	C	23.1
56	Whitewood Rd / Los Alamos Rd	C	26.5	C	29.5
57	Whitewood Rd / Murrieta Hot Springs Rd	C	27.8	E	67.7
58	Adams Ave / Guava St	B	11.5	B	13.3
59	Nutmeg St / Clinton Keith Rd	E	60.8	D	51.6
60	Mitchell Rd / Clinton Keith Rd	B	14.6	C	26.2
61	I-215 SB Ramps / Scott Rd	A	7.3	A	8.4
62	I-215 NB Ramps / Scott Rd	B	15.9	B	16.2

4.2 RECOMMENDED SCENARIO (PROPOSED GENERAL PLAN LAND USES)

Levels of service associated with the buildout of the Recommended Land Use scenario were calculated for both roadway links and intersections.

4.2.1 *ROADWAY LOS*

Using the Recommended Scenario daily traffic volumes (shown in **Figure 16**) and the maximum daily roadway capacity values, daily volume-to-capacity ratios have been determined. The following roadway segments are projected to operate at an unacceptable level of service (LOS D, E or F) per the City of Murrieta's Level of Service standards. The daily volume-to-capacity ratios are shown in **Figure 17**.



LEGEND

17.6 ADT Volume (in Thousands)

City of Murrieta Boundary

Sphere of Influence

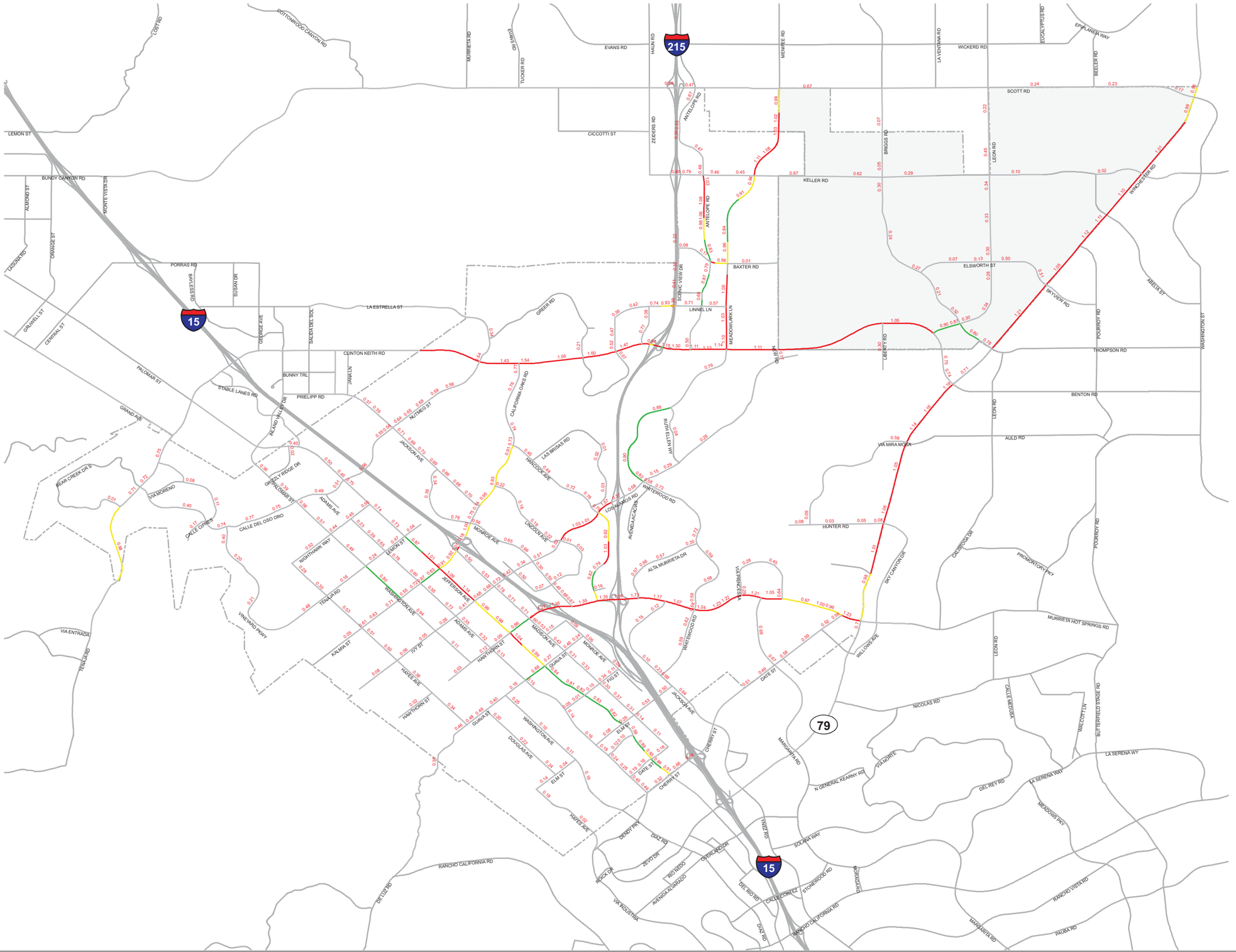
0 1 2 Miles

2035 Average Daily Traffic Volumes - Recommended Scenario

ITERIS

11/09 JN 10-106976

Figure 16



LEGEND

- 0.87 Daily Volume/Capacity Ratio
- LOS D
- LOS E
- LOS F
- City of Murrieta Boundary
- Sphere of Influence

0 1 2 Miles

2035 Daily Volume-to-Capacity Ratios - Recommended Scenario

ITERIS

11/09 JN 10-106976

Figure 17

Level of Service D

- Portions of Jefferson Avenue, Washington Avenue, Meadowlark Lane/Menifee Road, Leon Road, and Whitewood Road, among others.

Level of Service E

- Portions of Jefferson Avenue, California Oaks Road, Murrieta Hot Springs Road, Clinton Keith Road, Hancock Avenue, and Meadowlark Lane/Menifee Road, among others.

LOS F

- Portions of Jefferson Avenue, Los Alamos Road, Clinton Keith Road, Winchester Road, Murrieta Hot Springs Road, Meadowlark Lane/Menifee Road, and Antelope Road, among others.

4.2.2 *INTERSECTION LOS*

The Recommended Scenario peak hour traffic volumes are illustrated in **Figure 18**. **Table 12** provides the level of service results for the 61 study intersections. As shown, all 61 study intersections are projected to operate at level of service of LOS D or better, except for the following 18 locations.

1 Menifee Rd / Scott Rd
3 Winchester Rd - SR-79 / Scott Rd
4 Antelope Rd / Keller Rd
5 Menifee-Meadowlark Rd/ Keller Rd
9 Antelope Rd / Golden City Drive – Baxter Rd
10 Whitewood-Meadowlark/ Golden City Dr – Baxter Rd
18 California Oaks Rd / Clinton Keith Rd
20 I-215 NB Off-Ramp / Clinton Keith Rd
22 Meadowlark – Whitewood Rd / Clinton Keith Rd
28 Jefferson Ave / Murrieta Hot Springs Rd
29 Madison Ave / Murrieta Hot Springs Rd
44 Jefferson Ave / Kalmia St
52 Winchester Rd (SR-79) / Murrieta Hot Springs Rd
53 Hancock Ave / Los Alamos Rd
54 I-215 SB Ramps / Los Alamos Rd
57 Whitewood Rd / Murrieta Hot Springs Rd
59 Nutmeg St / Clinton Keith Rd
60 Mitchell Rd / Clinton Keith Rd

#1 Menifee Rd / Scott Rd

93 (99) ↓ 845 (284) ↓ 253 (196)
↑ 251 (566) ← 479 (546) ← 864 (408)
102 (272) → 510 (967) → 316 (458) ↓
↑ 374 (860) ↑ 358 (672) ↑ 238 (291)

#2 Leon Rd / Scott Rd

489 (373) ↓ 444 (209) ↓ 101 (63)
↑ 157 (155) ← 360 (374) ← 14 (4)
353 (580) → 438 (525) → 498 (505) ↓
↑ 2 (18) ↑ 196 (411) ↑ 104 (563)

#3 Winchester Rd - SR-79 / Scott Rd

75 (128) ↓ 2658 (1872) ↓ 951 (1119)
↑ 963 (1066) ← 151 (222) ← 17 (0)
117 (113) → 178 (286) → 68 (119) ↓
↑ 51 (29) ↑ 1376 (2492) ↑ 110 (126)

#4 Antelope Rd / Keller Rd

447 (563) ↓ 584 (72) ↓ 241 (74)
↑ 27 (167) ← 467 (658) ← 758 (228)
405 (828) → 791 (753) → 1203 (209) ↓
↑ 328 (870) ↑ 43 (556) ↑ 66 (923)

#5 Menifee-Meadowlark Rd/ Keller Rd

680 (363) ↓ 1301 (680) ↓ 133 (86)
↑ 125 (121) ← 400 (392) ← 299 (176)
495 (765) → 199 (314) → 565 (468) ↓
↑ 251 (822) ↑ 226 (1077) ↑ 23 (174)

#6 Briggs Rd / Keller Rd

47 (81) ↓ 40 (50) ↓ 0 (1)
↑ 1 (6) ← 344 (295) ← 15 (9)
1 (20) → 72 (347) → 492 (765) ↓
↑ 53 (105) ↑ 17 (122) ↑ 346 (300)

#7 Leon Rd / Keller Rd

156 (78) ↓ 868 (688) ↓ 4 (1)
↑ 5 (3) ← 65 (190) ← 7 (17)
2 (88) → 60 (81) → 106 (281) ↓
↑ 18 (1) ↑ 330 (926) ↑ 111 (62)

#8 Winchester Rd - SR-79 / Keller Rd

3 (1) ↓ 2774 (2103) ↓ 5 (6)
↑ 50 (25) ← 20 (16) ← 13 (10)
1 (2) → 10 (59) → 1 (2) ↓
↑ 25 (28) ↑ 1512 (2693) ↑ 1 (1)

#9 Antelope Rd / Golden City Drive - Baxter Rd

27 (25) ↓ 1070 (974) ↓ 381 (216)
↑ 604 (896) ← 203 (178) ← 397 (354)
1 (5) → 75 (202) → 11 (46) ↓
↑ 515 (941) ↑ 88 (428) ↑ 1 (4)

#10 Whitewood-Meadowlark/ Golden City Dr - Baxter Rd

880 (978) ↓ 955 (596)
↑ 2 (2) ← 15 (7) ← 1 (0)
59 (319) → 4 (12) → 739 (967) ↓
↑ 2 (3) ↑ 316 (280) ↑ 689 (1410)

#11 Briggs Rd / Baxter Rd - Jean Nicholas

534 (659) ↓ 38 (46)
↑ 75 (87) ← 9 (10)
↑ 43 (89) ↑ 206 (430)

#12 Leon Rd / Jean Nicholas

53 (11) ↓ 649 (553) ↓ 261 (327)
↑ 249 (446) ← 22 (123) ← 157 (114)
2 (2) → 145 (128) → 13 (12) ↓
↑ 126 (263) ↑ 183 (530) ↑ 5 (2)

#13 Winchester Rd - SR-79 / Nicholas - Skyview

33 (17) ↓ 2896 (2052) ↓ 22 (79)
↑ 166 (125) ← 327 (439) ← 106 (150)
37 (37) → 330 (650) → 132 (118) ↓
↑ 338 (209) ↑ 1381 (2680) ↑ 138 (196)

#14 Antelope Rd / Linnel Lane Extension

530 (525) ↓ 487 (1075) ↓ 99 (49)
↑ 220 (426) ← 120 (562) ← 6 (58)
199 (117) → 507 (363) → 125 (394) ↓
↑ 96 (99) ↑ 757 (637) ↑ 21 (42)

#15 Whitewood-Meadowlark/ Linnel Lane Extension

183 (229) ↓ 1152 (1315) ↓ 281 (143)
↑ 324 (779) ← 144 (775) ← 45 (223)
33 (22) → 556 (335) → 114 (154) ↓
↑ 678 (636) ↑ 797 (619) ↑ 18 (41)

#16 Leon Rd / Max Gillis Rd

152 (127) ↓ 363 (259) ↓ 383 (355)
↑ 182 (365) ← 322 (344) ← 631 (565)
100 (100) → 470 (199) → 767 (465) ↓
↑ 396 (605) ↑ 107 (437) ↑ 417 (546)

#17 Winchester Rd - SR-79 / Max Gillis - Thompson

729 (649) ↓ 2198 (1319) ↓ 140 (294)
↑ 39 (87) ← 298 (242) ← 31 (32)
609 (759) → 165 (310) → 279 (140) ↓
↑ 46 (80) ↑ 1300 (2443) ↑ 200 (226)

#18 California Oaks Rd / Clinton Keith Rd

↑ 1675 (2820) ← 773 (439)
2680 (2396) → 307 (112) ↓
↑ 669 (1024) ↑ 204 (312)

#19 I-215 SB Off-Ramp / Clinton Keith Rd

420 (608) ↓ 58 (47)
↑ 227 (219) ← 2089 (2369)
2401 (2930) → 496 (784) ↓

#20 I-215 NB Off-Ramp / Clinton Keith Rd

↑ 233 (314) ← 2305 (2836)
1797 (1562) → 334 (280) ↓
↑ 1393 (492) ↑ 162 (409)

#21 Antelope Rd / Clinton Keith Rd

426 (916) ↓ 15 (174)
↑ 296 (427) ← 1643 (1645)
388 (117) → 1869 (2128) ↓

#22 Meadowlark-Whitewood Rd / Clinton Keith Rd

715 (730) ↓ 134 (412) ↓ 212 (767)
↑ 594 (1031) ← 1187 (701) ← 943 (314)
1386 (352) → 486 (1452) → 82 (506) ↓
↑ 1083 (589) ↑ 133 (748) ↑ 230 (337)

#23 Liberty Rd / Clinton Keith Rd

↑ 2610 (2078) ← 44 (41)
1615 (2323) → 205 (323) ↓
↑ 217 (286) ↑ 65 (81)

#24 Leon Rd / Clinton Keith Rd

1537 (1218) ↓ 144 (143)
↑ 561 (877) ← 858 (913)
396 (638) → 1420 (1950) ↓

#25 Winchester Rd - SR-79 / Benton Rd

400 (485) ↓ 2041 (1004) ↓ 96 (75)
↑ 32 (92) ← 614 (720) ← 344 (241)
38 (83) → 470 (704) → 978 (1387) ↓
↑ 368 (738) ↑ 1366 (2486) ↑ 490 (462)

#26 Winchester Rd - SR-79 / Via Mira Mosa

234 (356) ↓ 2788 (2094) ↓ 316 (107)
↑ 29 (129) ← 19 (40) ← 177 (229)
358 (229) → 49 (28) → 95 (54) ↓
↑ 798 (228) ↑ 1593 (3255) ↑ 28 (69)

#27 Monroe Ave / Los Alamos

208 (61) ↓ 475 (281) ↓ 569 (235)
↑ 473 (467) ← 994 (975) ← 63 (84)
46 (229) → 351 (1460) → 134 (165) ↓
↑ 188 (264) ↑ 223 (469) ↑ 28 (29)

#28 Jefferson Ave / Murrieta Hot Springs Rd

77 (70) ↓ 1236 (1025) ↓ 919 (814)
↑ 921 (891) ← 93 (90) ← 876 (581)
15 (40) → 76 (210) → 21 (111) ↓
↑ 495 (1226) ↑ 1074 (2300) ↑ 10 (6)

#29 Madison Ave / Murrieta Hot Springs Rd

156 (116) ↓ 184 (247) ↓ 183 (342)
↑ 74 (189) ← 1769 (1185) ← 754 (791)
117 (346) → 1137 (1505) → 271 (279) ↓
↑ 324 (1218) ↑ 67 (600) ↑ 127 (316)

#30 I-15 SB Off-Ramp / Murrieta Hot Springs Rd

421 (422) ↓ 808 (974)
↑ 47 (112) ← 2301 (2188)
1385 (2533) → 215 (487) ↓

#31 I-15 NB Off-Ramp / Murrieta Hot Springs Rd

↑ 598 (1637) ← 1546 (1582)
2202 (2848) → 210 (370) ↓
↑ 60 (239) ↑ 292 (213)

#32 I-215 SB Off-Ramp / Murrieta Hot Springs Rd

524 (362) ↓ 483 (470)
↑ 378 (238) ← 2599 (2338)
1838 (3377) → 53 (139) ↓

#33 I-215 NB Off-Ramp / Murrieta Hot Springs Rd

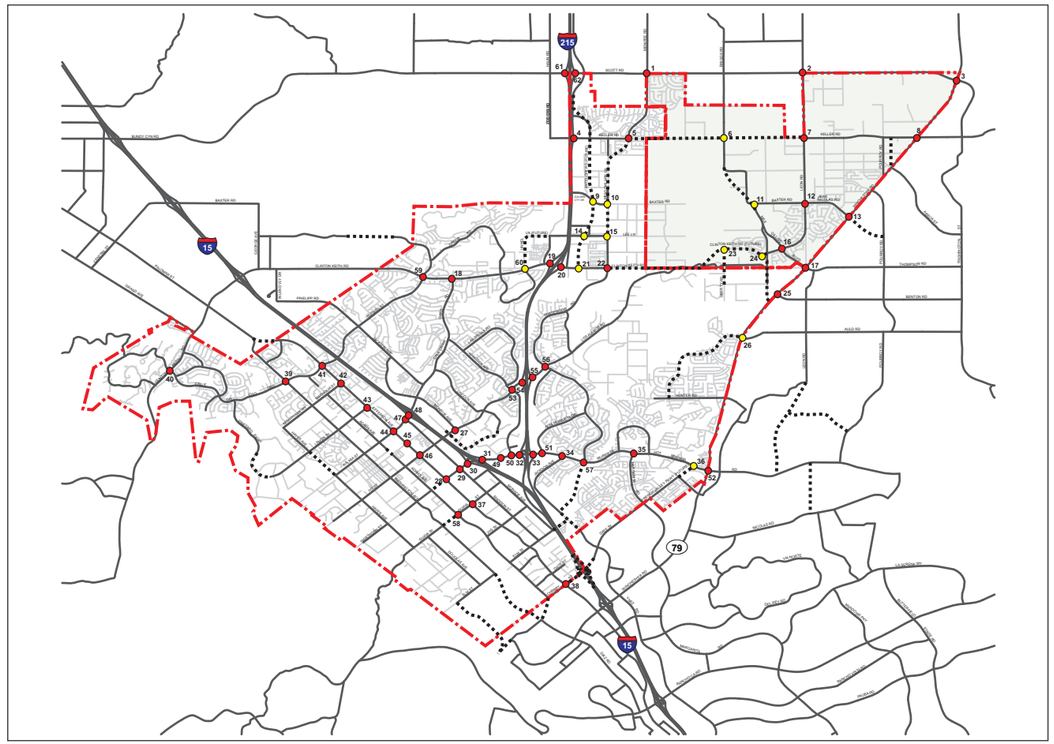
↑ 663 (1383) ← 2623 (2361)
1583 (2331) → 115 (104) ↓
↑ 24 (465) ↑ 343 (84)

#34 Jackson Ave / Murrieta Hot Springs Rd

↑ 2024 (2568) ← 149 (213)
1217 (1910) → 38 (59) ↓
↑ 52 (169) ↑ 68 (201)

#35 Margarita Rd/ Murrieta Hot Springs Rd

7 (150) ↓ 17 (77) ↓ 41 (185)
↑ 71 (38) ← 1793 (1609) ← 302 (273)
161 (51) → 750 (1752) → 462 (538) ↓
↑ 128 (383) ↑ 60 (69) ↑ 640 (933)



Murrieta General Plan Update

LEGEND

- Existing Study Intersection
- Future Study Intersection
- City of Murrieta Boundary
- Sphere of Influence
- Future Roadway Alignment
- ←31/20 AM Peak Hr/PM Peak Hr

ITERIS

2035 Peak Hour Turning Movement Volumes - Recommended Scenario

Figure 18A

#36 French Valley-Date St / Murrieta Hot Springs Rd

1182 (1808) → 269 (343) ↓
2004 (1697) ← 805 (453) ↓
829 (1110) ↑ 19 (32) ↱

#37 Jefferson Ave / Guava St

306 (349) ↓ 1420 (1174) ↓ 7 (11) ↓
10 (16) ← 32 (71) ← 2 (2) ↰
176 (103) → 108 (86) → 89 (133) ↓
3 (10) ↑ 1363 (3281) ↑ 22 (14) ↑

#38 Jefferson Ave / Cherry St

22 (6) ↓ 640 (861) ↓ 37 (196) ↓
893 (666) ← 1311 (793) ← 147 (122) ←
1 (2) → 48 (1060) → 6 (40) ↓
196 (823) ↑ 620 (1226) ↑ 86 (29) ↑

#39 Washington Ave / Calle del Oso Oro - Nutmeg St

88 (55) ↓ 218 (236) ↓ 88 (93) ↓
38 (163) ← 189 (635) ← 151 (164) ←
64 (28) → 602 (209) → 742 (276) ↓
126 (134) ↑ 164 (306) ↑ 262 (421) ↑

#40 Clinton Keith Rd / Calle Del Oso Oro/Bear Creek Dr

192 (271) ↓ 115 (90) ↓ 4 (16) ↓
19 (9) ← 598 (747) ← 420 (226) ←
269 (187) → 613 (520) → 172 (142) ↓
268 (208) ↑ 107 (179) ↑ 63 (80) ↑

#41 Jefferson Ave / Nutmeg St

69 (97) ↓ 1887 (1155) ↓ 96 (103) ↓
67 (145) ← 171 (223) ← 366 (300) ←
93 (61) → 223 (133) → 509 (249) ↓
272 (377) ↑ 321 (1208) ↑ 181 (624) ↑

#42 Jefferson Ave / Magnolia

247 (106) ↓ 2543 (1578) ↓ 8 (10) ↓
1 (14) ← 3 (5) ← 27 (7) ←
158 (159) → 1 (5) → 155 (56) ↓
8 (11) ↑ 637 (2070) ↑ 81 (137) ↑

#43 Jefferson Ave / Lemon St

166 (38) ↓ 2585 (1607) ↓ 4 (5) ↓
6 (13) ← 13 (21) ← 8 (16) ←
31 (42) → 3 (39) → 334 (270) ↓
28 (2) ↑ 733 (2124) ↑ 320 (418) ↑

#44 Jefferson Ave / Kalmia St

170 (34) ↓ 1732 (1203) ↓ 967 (978) ↓
556 (869) ← 355 (533) ← 223 (313) ←
55 (34) → 502 (658) → 349 (281) ↓
246 (951) ↑ 957 (1763) ↑ 261 (412) ↑

#45 Jefferson Ave / Juniper St

173 (98) ↓ 2027 (1603) ↓ 71 (48) ↓
22 (82) ← 101 (72) ← 7 (18) ←
137 (338) → 99 (90) → 188 (378) ↓
35 (67) ↑ 1298 (2787) ↑ 471 (192) ↑

#46 Jefferson Ave / Ivy St/Los Alamos Rd

72 (113) ↓ 1823 (1448) ↓ 327 (457) ↓
400 (494) ← 121 (274) ← 363 (259) ←
49 (90) → 95 (224) → 129 (187) ↓
111 (685) ↑ 1336 (2389) ↑ 259 (312) ↑

#47 Madison Ave / Kalmia St

Does Not Exist

#48 Madison Ave - I-15 SB Ramps / Kalmia St

272 (379) ↓ 51 (27) ↓ 250 (306) ↓
505 (614) ← 1139 (1505) ← 386 (265) ←
1459 (2534) → 245 (265) ↓
219 (898) ↑ 119 (392) ↑

#49 Monroe Ave / Murrieta Hot Springs Rd

50 (110) ↓ 47 (239) ↓ 1 (1) ↓
21 (26) ← 1552 (2043) ← 7 (37) ←
101 (164) → 1156 (2579) → 34 (154) ↓
48 (199) ↑ 73 (236) ↑ 46 (178) ↑

#50 Hancock Ave / Murrieta Hot Springs Rd

598 (820) ↓ 379 (598) ↓
566 (311) ← 2602 (2482) ←
697 (755) → 1520 (3291) →

#51 Alta Murrieta Dr / Murrieta Hot Springs Rd

313 (493) ↓ 130 (128) ↓ 69 (195) ↓
169 (153) ← 1871 (2320) ← 131 (173) ←
258 (698) → 982 (1702) → 282 (518) ↓
19 (53) ↑ 82 (221) ↑ 221 (587) ↑

#52 Winchester Rd (SR-79) / Murrieta Hot Springs Rd

1426 (1115) ↓ 1461 (1162) ↓ 191 (195) ↓
83 (99) ← 897 (754) ← 276 (244) ←
768 (1478) → 265 (1036) → 95 (280) ↓
155 (195) ↑ 1507 (1970) ↑ 288 (334) ↑

#53 Hancock Ave / Los Alamos Rd

93 (26) ↓ 252 (115) ↓ 793 (657) ↓
614 (703) ← 1682 (1361) ← 916 (538) ←
71 (105) → 969 (1967) → 72 (46) ↓
221 (871) ↑ 120 (438) ↑ 48 (124) ↑

#54 I-215 SB Ramps / Los Alamos Rd

2037 (1534) ↓ 405 (537) ↓
1506 (1263) ← 220 (146) ←
1419 (3121) →
478 (446) ↓

#55 I-215 NB Ramps / Los Alamos Rd

160 (331) ←
1185 (1182) ←
591 (1589) → 1233 (1996) →
377 (171) ↑ 550 (229) ↑

#56 Whitewood Rd / Los Alamos Rd

617 (567) ↓ 432 (578) ↓ 26 (35) ↓
34 (48) ← 241 (228) ← 48 (65) ←
823 (867) → 232 (361) → 109 (298) ↓
38 (34) ↑ 372 (582) ↑ 83 (139) ↑

#57 Whitewood Rd / Murrieta Hot Springs Rd

102 (233) ↓ 536 (266) ↓ 260 (362) ↓
166 (457) ← 2105 (2240) ← 514 (401) ←
32 (166) → 1001 (1645) → 132 (172) ↓
241 (529) ↑ 240 (314) ↑ 50 (434) ↑

#58 Adams Ave / Guava St

40 (205) ↓ 21 (39) ↓ 101 (91) ↓
108 (165) ← 256 (261) ← 3 (8) ←
23 (59) → 324 (243) → 46 (181) ↓
21 (27) ↑ 97 (222) ↑ 78 (37) ↑

#59 Nutmeg St / Clinton Keith Rd

67 (58) ↓ 54 (32) ↓ 425 (318) ↓
156 (380) ← 1317 (2056) ← 386 (552) ←
50 (92) → 2123 (1775) → 110 (61) ↓
484 (484) ↑ 41 (83) ↑ 67 (65) ↑

#60 Mitchell Rd / Clinton Keith Rd

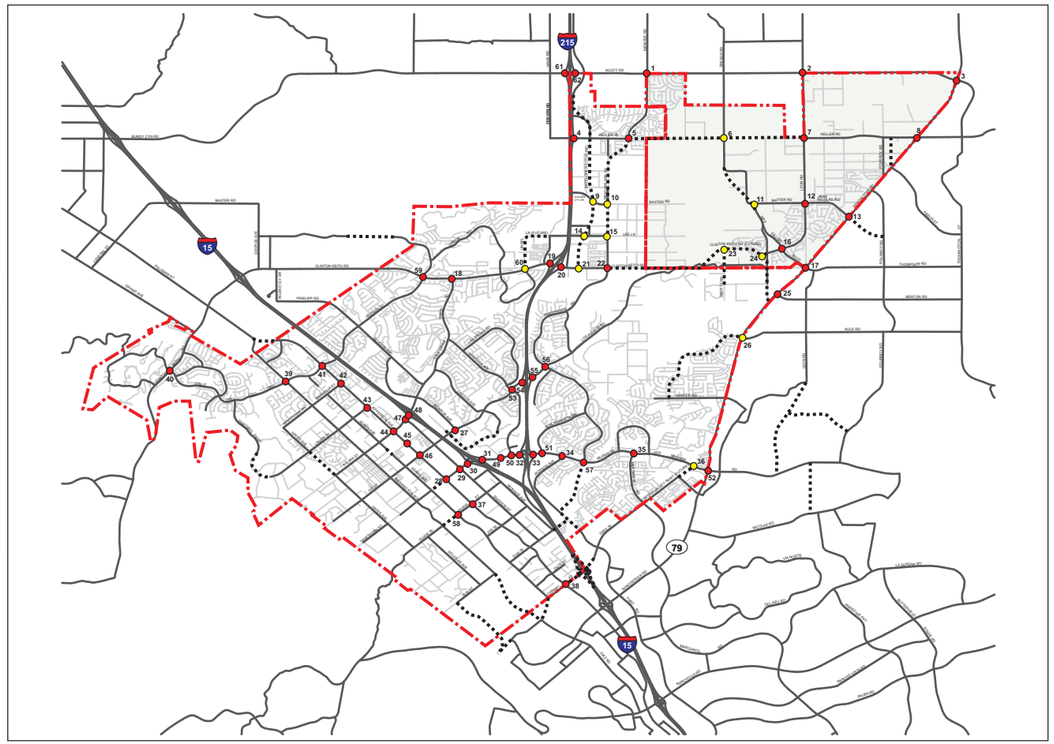
196 (900) ↓ 619 (180) ↓ 116 (103) ↓
405 (395) ← 2088 (2766) ← 78 (27) ←
203 (135) → 2903 (3159) → 312 (18) ↓
85 (19) ↑ 241 (134) ↑ 101 (16) ↑

#61 I-215 SB Ramps / Scott Rd

104 (261) ↓ 246 (160) ↓
384 (445) ← 866 (1529) ←
1052 (756) → 385 (392) ↓

#62 I-215 NB Ramps / Scott Rd

259 (368) ↓
329 (395) ← 978 (1761) ←
156 (80) → 1199 (1012) →
600 (963) ↑ 15 (7) ↑



Murrieta General Plan Update

LEGEND

- Existing Study Intersection
- Future Study Intersection
- City of Murrieta Boundary
- Sphere of Influence
- Future Roadway Alignment
- 31/20 AM Peak Hr/PM Peak Hr

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2035 Peak Hour Turning Movement Volumes - Recommended Scenario

Figure 18B

TABLE 12 – RECOMMENDED SCENARIO LEVEL OF SERVICE

Int. No.	Intersection	AM Peak Hour		PM Peak Hour	
		LOS	Ave Del/Veh	LOS	Ave Del/Veh
1	Menifee Rd / Scott Rd	E	68.3	F	86.3
2	Leon Rd / Scott Rd	C	27.9	D	46.7
3	Winchester Rd - SR-79 / Scott Rd	F	177.4	F	284.5
4	Antelope Rd / Keller Rd	F	158.6	D	49.9
5	Menifee-Meadowlark Rd/ Keller Rd	E	68.8	D	47.6
6	Briggs Rd / Keller Rd	B	18.5	B	19.0
7	Leon Rd / Keller Rd	B	12.3	C	26.2
8	Winchester Rd - SR-79 / Keller Rd	A	1.6	A	1.6
9	Antelope Rd / Golden City Drive – Baxter Rd	C	25.2	F	89.2
10	Whitewood-Meadowlark/ Golden City Dr – Baxter Rd	F	107.7	F	113.6
11	Briggs Rd / Baxter Rd – Jean Nicholas	A	8.8	A	8.3
12	Leon Rd / Jean Nicholas	C	22.1	C	26.4
13	Winchester Rd - SR-79 / Nicholas - Skyview	B	19.7	C	28.5
14	Antelope Rd / Linnel Lane Extension	C	22.1	C	28.5
15	Whitewood-Meadowlark/ Linnel Lane Extension	C	26.0	D	43.7
16	Leon Rd / Max Gillis Rd	D	51.9	D	40.3
17	Winchester Rd - SR-79 / Max Gillis - Thompson	C	27.1	D	37.8
18	California Oaks Rd / Clinton Keith Rd	E	60.7	C	20.7
19	I-215 SB Off-Ramp / Clinton Keith Rd	A	7.9	B	11.5
20	I-215 NB Off-Ramp / Clinton Keith Rd	F	124.7	B	17.1
21	Antelope Rd / Clinton Keith Rd	A	5.1	A	4.5
22	Meadowlark – Whitewood Rd / Clinton Keith Rd	F	145.9	F	121.7
23	Liberty Rd / Clinton Keith Rd	A	7.4	B	10.0
24	Leon Rd / Clinton Keith Rd	C	26.0	C	28.6
25	Winchester Rd - SR-79 / Clinton Keith Rd - Benton Rd	D	38.8	D	53.7
26	Winchester Rd - SR-79 / Via Mira Mosa – Auld Rd	C	24.1	C	25.1
27	Monroe Ave / Los Alamos	C	24.5	C	27.5
28	Jefferson Ave / Murrieta Hot Springs Rd	F	133.3	F	206.4
29	Madison Ave / Murrieta Hot Springs Rd	C	26.6	F	129.6
30	I-15 SB Off-Ramp / Murrieta Hot Springs Rd	B	16.1	B	14.3
31	I-15 NB Off-Ramp / Murrieta Hot Springs Rd	A	5.7	A	7.9
32	I-215 SB Off-Ramp / Murrieta Hot Springs Rd	B	12.5	B	10.8
33	I-215 NB Off-Ramp / Murrieta Hot Springs Rd	A	5.6	A	9.4
34	Jackson Ave / Murrieta Hot Springs Rd	A	5.1	A	8.5
35	Margarita Rd/ Murrieta Hot Springs Rd	C	24.6	D	49.2
36	French Valley – Date St / Murrieta Hot Springs Rd	B	12.9	B	18.4
37	Jefferson Ave / Guava St	A	9.4	A	7.9
38	Jefferson Ave / Cherry St	C	21.8	D	37.8
39	Washington Ave / Calle del Oso Oro – Nutmeg St	C	27.6	C	27.5
40	Clinton Keith Rd / Calle de Oso Oro – Bear Creek Dr	C	23.7	B	16.5
41	Jefferson Ave / Nutmeg St	D	51.1	D	36.0
42	Jefferson Ave / Magnolia	B	10.7	A	9.4
43	Jefferson Ave / Lemon St	C	28.2	B	18.3

Int. No.	Intersection	AM Peak Hour		PM Peak Hour	
		LOS	Ave Del/Veh	LOS	Ave Del/Veh
44	Jefferson Ave / Kalmia St	E	59.3	F	159.9
45	Jefferson Ave / Juniper St	C	23.4	C	22.3
46	Jefferson Ave / Ivy St – Los Alamos Rd	C	26.8	D	35.8
47	Madison Ave / Kalmia St	N/A	N/A	N/A	N/A
48	I-15 SB Ramps / Kalmia St	C	29.4	C	30.9
49	Monroe Ave / Murrieta Hot Springs Rd	A	8.0	B	16.2
50	Hancock Ave / Murrieta Hot Springs Rd	B	17.6	B	17.6
51	Alta Murrieta Dr / Murrieta Hot Springs Rd	C	23.8	D	51.9
52	Winchester Rd (SR-79) / Murrieta Hot Springs Rd	F	107.8	F	104.8
53	Hancock Ave / Los Alamos Rd	F	84.6	F	223.1
54	I-215 SB Ramps / Los Alamos Rd	E	77.2	F	157.8
55	I-215 NB Ramps / Los Alamos Rd	C	25.5	C	24.4
56	Whitewood Rd / Los Alamos Rd	D	44.4	D	44.6
57	Whitewood Rd / Murrieta Hot Springs Rd	C	28.3	F	88.7
58	Adams Ave / Guava St	B	12.2	B	14.3
59	Nutmeg St / Clinton Keith Rd	F	96.5	E	78.4
60	Mitchell Rd / Clinton Keith Rd	C	20.4	F	120.7
61	I-215 SB Ramps / Scott Rd	A	8.5	A	8.1
62	I-215 NB Ramps / Scott Rd	B	15.9	B	16.2

4.3 SCENARIO B (GENERAL PLAN LAND USE ALTERNATIVE)

Analysis of Scenario B was conducted. Scenario B is similar to the Recommended Scenario; the primary differences are additional multi-family housing in the Clinton Keith Road / Mitchell Road and the North Murrieta Business Corridor Focus Areas. Levels of service associated with the buildout of Scenario B were calculated for both roadway links and intersections.

4.3.1 *ROADWAY LOS*

Using the Scenario B daily traffic volumes (shown in **Figure 19**) and the maximum daily roadway capacity values, daily volume-to-capacity ratios have been determined. The following roadway segments are projected to operate at an unacceptable level of service (LOS D, E or F) per the City of Murrieta's Level of Service standards. The daily volume-to-capacity ratios are shown in **Figure 20**.

Level of Service D

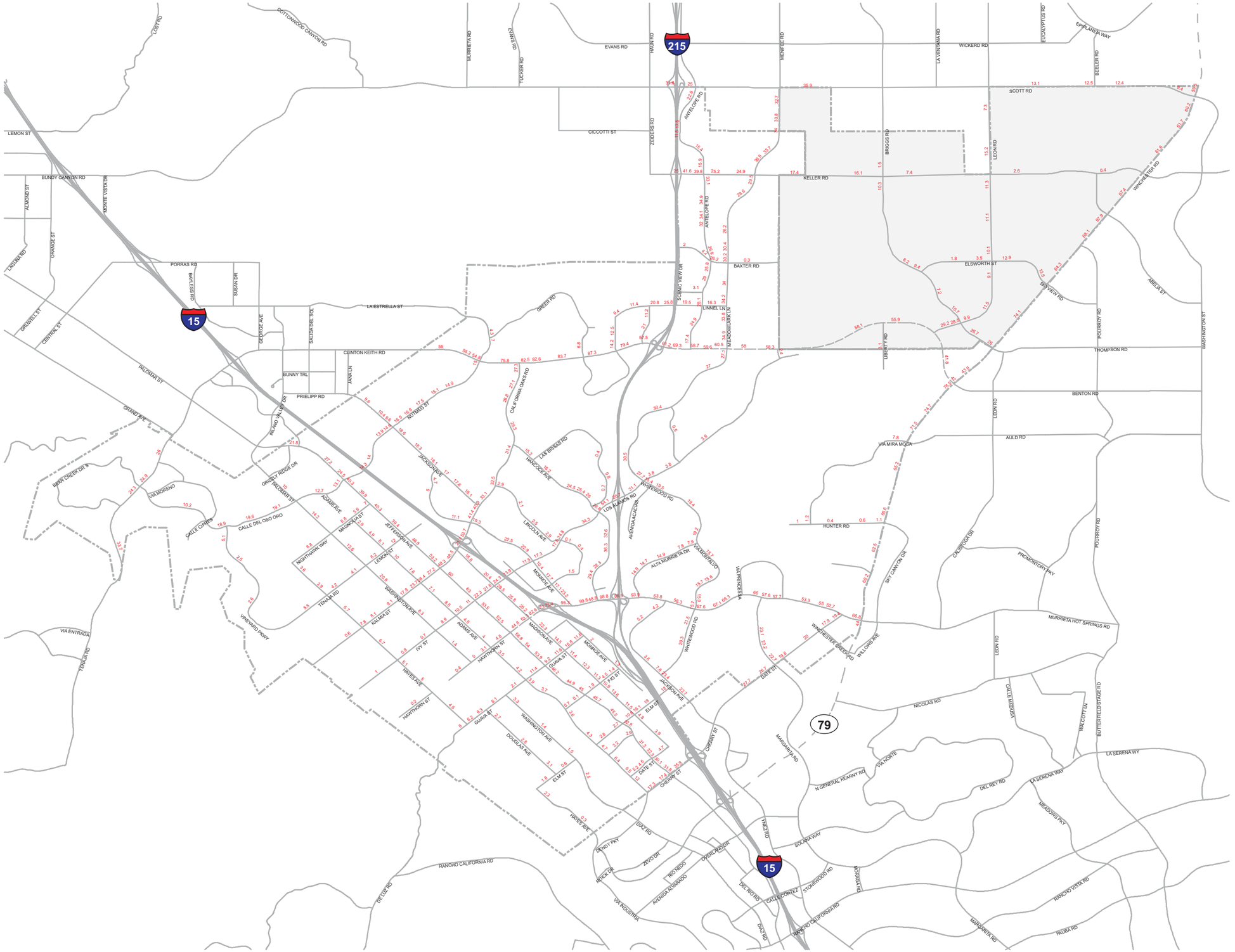
- Portions of Washington Avenue, Jefferson Avenue, Kalmia Street, Whitewood Road, Hancock Road, and Menifee Road, among others.

Level of Service E

- Portions of Jefferson Avenue, California Oaks Road, Murrieta Hot Springs Road, Meadowlark Lane/Menifee Road, and Winchester Road, among others.

LOS F

- Portions of Jefferson Avenue, Murrieta Hot Springs Road, Los Alamos Road, Winchester Road, and Clinton Keith Road, among others..



LEGEND

17.6 ADT Volume (in Thousands)

City of Murrieta Boundary

Sphere of Influence

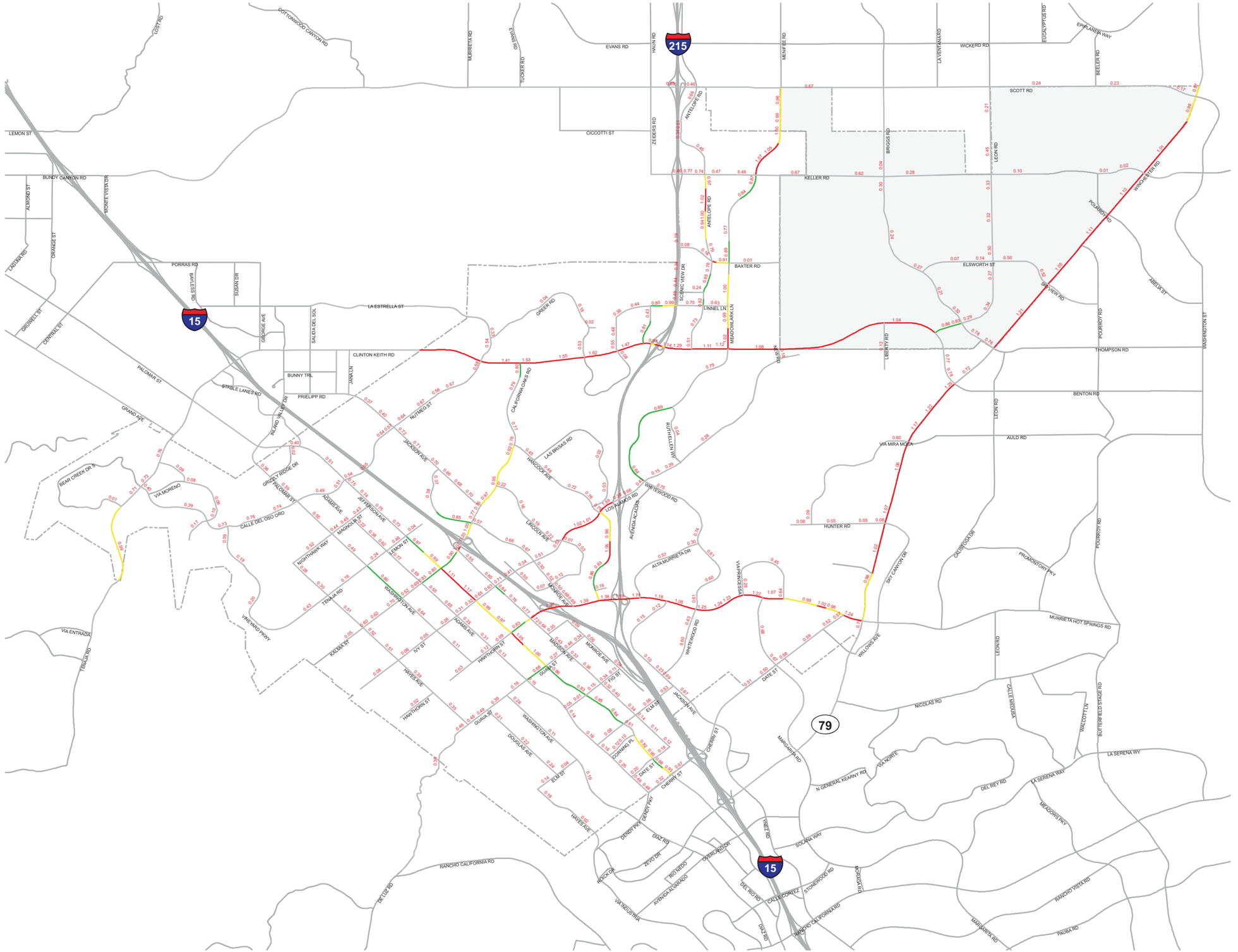
0 1 2 Miles

ITERIS

11/09 JN 10-106976

2035 Average Daily Traffic Volumes - Scenario B

Figure 19



LEGEND

- 0.87 Daily Volume/Capacity Ratio
- LOS D
- LOS E
- LOS F
- City of Murrieta Boundary
- Sphere of Influence

0 1 2 Miles

2035 Daily Volume-to-Capacity Ratios - Scenario B

ITERIS

11/09 JN 10-106976

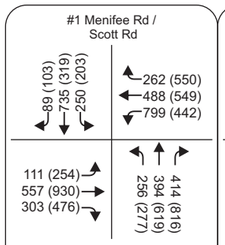
Figure 20

4.3.2 *INTERSECTION LOS*

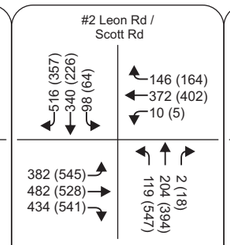
The Scenario B traffic volumes are illustrated in **Figure 21**. **Table 13** provides the level of service results for the 61 study intersections. As shown, all 61 study intersections are projected to operate at level of service of LOS D or better except for the following 18 locations.

1	Menifee Rd / Scott Rd
3	Winchester Rd - SR-79 / Scott Rd
4	Antelope Rd / Keller Rd
9	Antelope Rd / Golden City Drive – Baxter Rd
10	Whitewood-Meadowlark/ Golden City Dr – Baxter Rd
18	California Oaks Rd / Clinton Keith Rd
20	I-215 NB Off-Ramp / Clinton Keith Rd
22	Meadowlark – Whitewood Rd / Clinton Keith Rd
25	Winchester Rd - SR-79 / Clinton Keith Rd - Benton Rd
28	Jefferson Ave / Murrieta Hot Springs Rd
29	Madison Ave / Murrieta Hot Springs Rd
44	Jefferson Ave / Kalmia St
52	Winchester Rd (SR-79) / Murrieta Hot Springs Rd
53	Hancock Ave / Los Alamos Rd
54	I-215 SB Ramps / Los Alamos Rd
57	Whitewood Rd / Murrieta Hot Springs Rd
59	Nutmeg St / Clinton Keith Rd
60	Mitchell Rd / Clinton Keith Rd

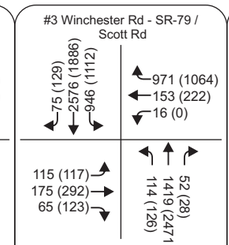
#1 Menifee Rd / Scott Rd



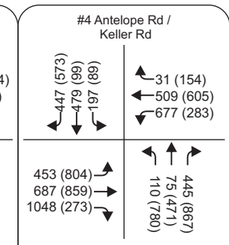
#2 Leon Rd / Scott Rd



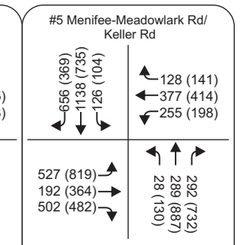
#3 Winchester Rd - SR-79 / Scott Rd



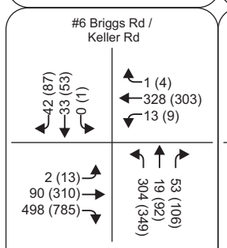
#4 Antelope Rd / Keller Rd



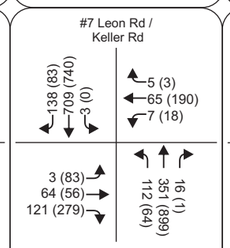
#5 Menifee-Meadowlark Rd/ Keller Rd



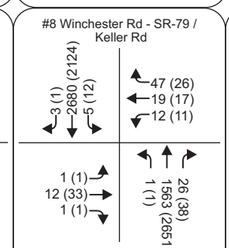
#6 Briggs Rd / Keller Rd



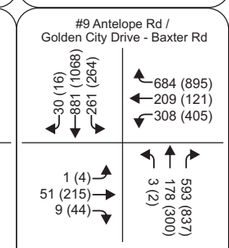
#7 Leon Rd / Keller Rd



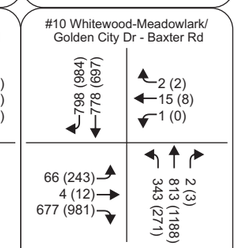
#8 Winchester Rd - SR-79 / Keller Rd



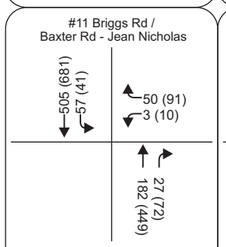
#9 Antelope Rd / Golden City Drive - Baxter Rd



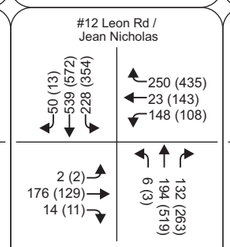
#10 Whitewood-Meadowlark/ Golden City Dr - Baxter Rd



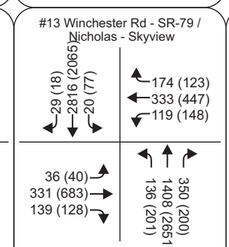
#11 Briggs Rd / Baxter Rd - Jean Nicholas



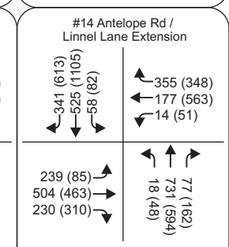
#12 Leon Rd / Jean Nicholas



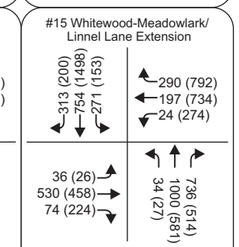
#13 Winchester Rd - SR-79 / Nicholas - Skyview

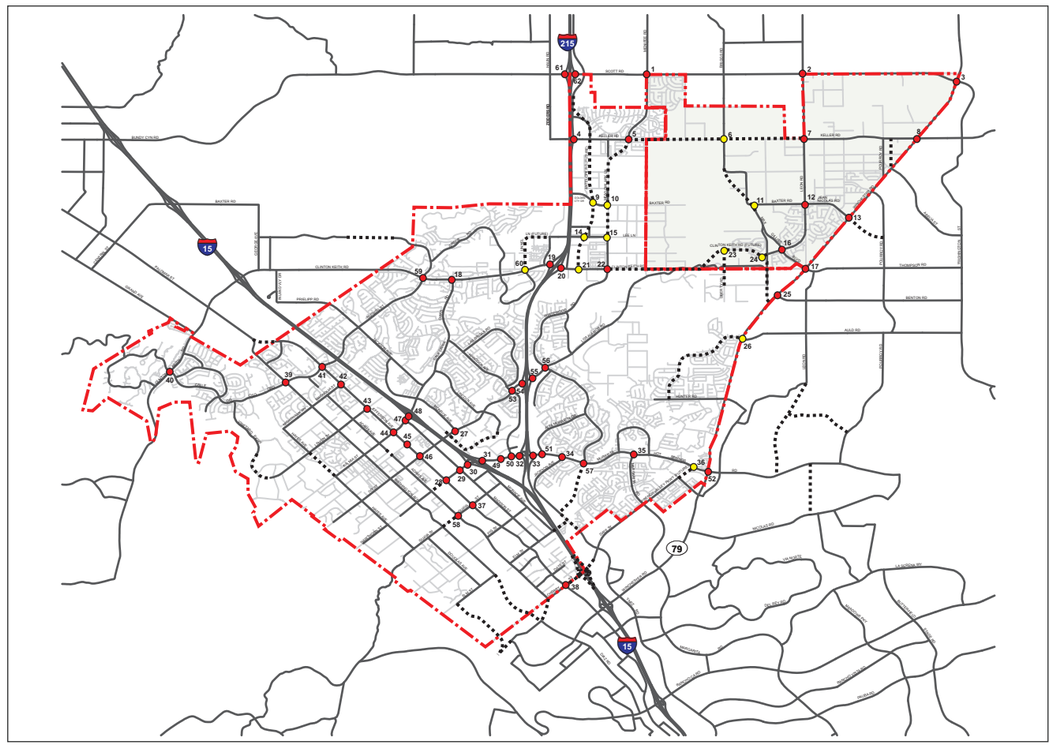


#14 Antelope Rd / Linnel Lane Extension



#15 Whitewood-Meadowlark/ Linnel Lane Extension

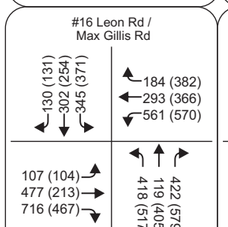




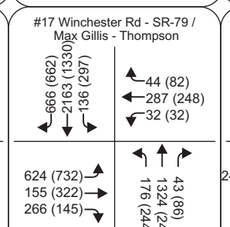
LEGEND

- Existing Study Intersection
- Future Study Intersection
- City of Murrieta Boundary
- Sphere of Influence
- Future Roadway Alignment
- 31/20 AM Peak Hr/PM Peak Hr

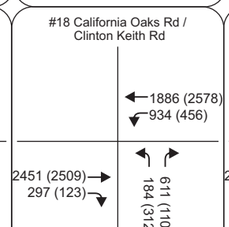
#16 Leon Rd / Max Gillis Rd



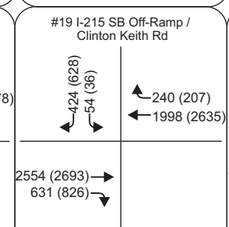
#17 Winchester Rd - SR-79 / Max Gillis - Thompson



#18 California Oaks Rd / Clinton Keith Rd



#19 I-215 SB Off-Ramp / Clinton Keith Rd



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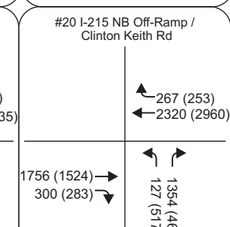
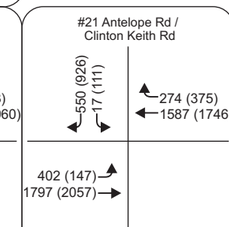
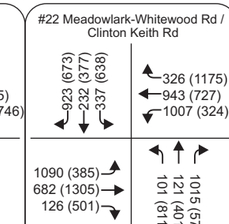


#21 Antelope Rd / Clinton Keith Rd



#22 Meadowlark-Whitewood Rd / Clinton Keith Rd



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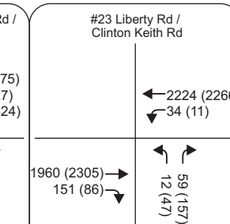

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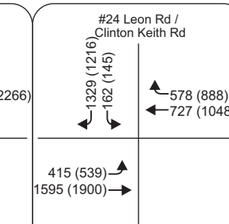
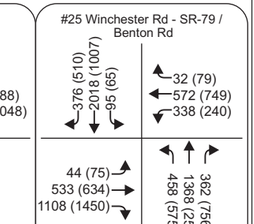


#25 Winchester Rd - SR-79 / Benton Rd



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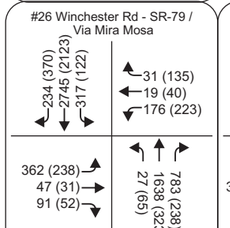
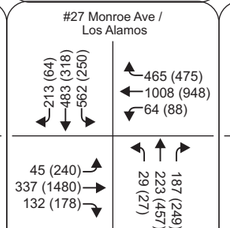
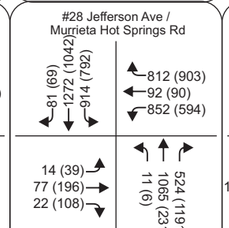


#27 Monroe Ave / Los Alamos



#28 Jefferson Ave / Murrieta Hot Springs Rd



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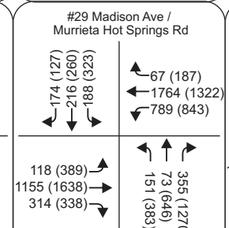

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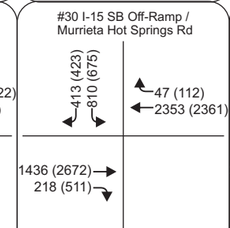

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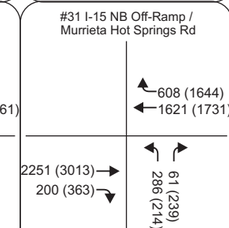

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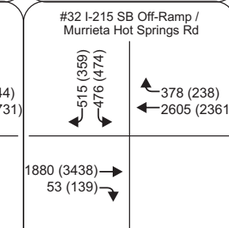

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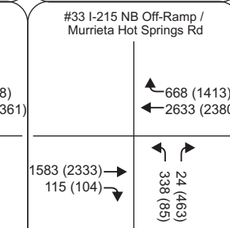
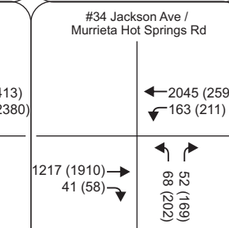
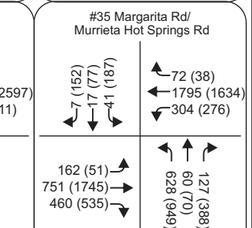


#34 Jackson Ave / Murrieta Hot Springs Rd



#35 Margarita Rd/ Murrieta Hot Springs Rd



2035 Peak Hour Turning Movement Volumes - Scenario B

Figure 21A

#36 French Valley-Date St / Murrieta Hot Springs Rd

1242 (1789) → 291 (362) ↓ | ← 2012 (1723) ↓ 771 (445) | ↑ 20 (34) ↱ 832 (1093)

#37 Jefferson Ave / Guava St

305 (332) ↓ 1468 (1223) ↓ 8 (20) ↓ | ← 10 (16) ← 32 (77) ← 2 (2) | 169 (80) → 115 (134) → 86 (117) ↓ | ↑ 23 (15) ↑ 1420 (3304) ↱ 3 (21)

#38 Jefferson Ave / Cherry St

21 (7) ↓ 640 (888) ↓ 36 (210) ↓ | ← 882 (651) ← 1294 (816) ← 146 (111) | 1 (2) → 47 (1073) → 6 (39) ↓ | ↑ 87 (32) ↑ 628 (1267) ↱ 194 (821)

#39 Washington Ave / Calle del Oso Oro - Nutmeg St

89 (55) ↓ 197 (235) ↓ 86 (93) ↓ | ← 40 (148) ← 200 (621) ← 142 (160) | 64 (26) → 592 (212) → 675 (281) ↓ | ↑ 264 (395) ↑ 162 (266) ↱ 123 (126)

#40 Clinton Keith Rd / Calle Del Oso Oro/Bear Creek Dr

195 (271) ↓ 114 (90) ↓ 5 (17) ↓ | ← 20 (10) ← 615 (753) ← 422 (228) | 267 (188) → 618 (528) → 160 (140) ↓ | ↑ 60 (77) ↑ 107 (177) ↱ 273 (207)

#41 Jefferson Ave / Nutmeg St

66 (97) ↓ 1819 (1190) ↓ 64 (108) ↓ | ← 72 (136) ← 176 (206) ← 382 (286) | 96 (59) → 202 (133) → 511 (245) ↓ | ↑ 357 (1204) ↑ 193 (612) ↱ 265 (389)

#42 Jefferson Ave / Magnolia

242 (109) ↓ 2498 (1589) ↓ 8 (10) ↓ | ← 1 (14) ← 3 (5) ← 28 (7) | 166 (148) → 1 (5) → 155 (52) ↓ | ↑ 81 (141) ↑ 668 (2078) ↱ 8 (12)

#43 Jefferson Ave / Lemon St

155 (40) ↓ 2549 (1607) ↓ 4 (6) ↓ | ← 6 (14) ← 12 (21) ← 8 (16) | 35 (41) → 3 (38) → 344 (251) ↓ | ↑ 282 (424) ↑ 756 (2136) ↱ 28 (2)

#44 Jefferson Ave / Kalmia St

153 (28) ↓ 1732 (1210) ↓ 954 (905) ↓ | ← 524 (844) ← 341 (486) ← 236 (353) | 49 (29) → 496 (604) → 349 (281) ↓ | ↑ 258 (391) ↑ 930 (1782) ↱ 266 (1026)

#45 Jefferson Ave / Juniper St

172 (84) ↓ 2046 (1660) ↓ 69 (46) ↓ | ← 21 (88) ← 100 (58) ← 7 (18) | 135 (358) → 100 (83) → 195 (371) ↓ | ↑ 485 (150) ↑ 1291 (2837) ↱ 36 (60)

#46 Jefferson Ave / Ivy St/Los Alamos Rd

52 (110) ↓ 1866 (1480) ↓ 310 (474) ↓ | ← 421 (496) ← 82 (258) ← 354 (257) | 53 (75) → 88 (188) → 129 (154) ↓ | ↑ 166 (294) ↑ 1321 (2396) ↱ 95 (687)

#47 Madison Ave / Kalmia St

Does Not Exist

#48 Madison Ave - I-15 SB Ramps / Kalmia St

260 (357) ↓ 56 (28) ↓ 259 (322) ↓ | ← 512 (606) ← 1127 (1499) ← 437 (281) | 1453 (2478) → 258 (248) ↓ | ↑ 114 (379) ↱ 226 (968)

#49 Monroe Ave / Murrieta Hot Springs Rd

53 (117) ↓ 56 (250) ↓ 1 (1) ↓ | ← 24 (27) ← 1601 (2083) ← 8 (37) | 109 (170) → 1196 (2625) → 37 (154) ↓ | ↑ 44 (178) ↑ 79 (240) ↱ 49 (200)

#50 Hancock Ave / Murrieta Hot Springs Rd

652 (894) ↓ 398 (583) ↓ | ← 548 (303) ← 2617 (2518) | 708 (827) → 1542 (3365) →

#51 Alta Murrieta Dr / Murrieta Hot Springs Rd

325 (496) ↓ 129 (128) ↓ 69 (194) ↓ | ← 166 (154) ← 1900 (2354) ← 127 (174) | 260 (701) → 982 (1703) → 280 (520) ↓ | ↑ 224 (597) ↑ 80 (223) ↱ 19 (53)

#52 Winchester Rd (SR-79) / Murrieta Hot Springs Rd

1400 (1117) ↓ 1467 (1167) ↓ 154 (201) ↓ | ← 81 (98) ← 894 (756) ← 281 (245) | 809 (1437) → 276 (1044) → 103 (276) ↓ | ↑ 287 (340) ↑ 1481 (1979) ↱ 151 (203)

#53 Hancock Ave / Los Alamos Rd

92 (25) ↓ 266 (124) ↓ 740 (658) ↓ | ← 600 (694) ← 1687 (1301) ← 981 (585) | 71 (106) → 943 (2012) → 80 (51) ↓ | ↑ 49 (124) ↑ 120 (453) ↱ 214 (916)

#54 I-215 SB Ramps / Los Alamos Rd

2007 (1542) ↓ 397 (532) ↓ | ← 1591 (1247) ← 236 (136) | 1348 (3236) → 464 (443) ↓

#55 I-215 NB Ramps / Los Alamos Rd

← 140 (329) ← 1326 (1139) | 571 (1617) → 1169 (2080) → | ↑ 510 (246) ↱ 269 (159)

#56 Whitewood Rd / Los Alamos Rd

725 (538) ↓ 540 (562) ↓ 31 (38) ↓ | ← 29 (46) ← 247 (211) ← 52 (62) | 656 (911) → 225 (412) → 111 (307) ↓ | ↑ 86 (147) ↑ 322 (646) ↱ 40 (41)

#57 Whitewood Rd / Murrieta Hot Springs Rd

121 (236) ↓ 594 (263) ↓ 277 (360) ↓ | ← 144 (490) ← 2115 (2251) ← 483 (395) | 30 (179) → 986 (1631) → 135 (170) ↓ | ↑ 54 (445) ↑ 227 (344) ↱ 239 (533)

#58 Adams Ave / Guava St

42 (208) ↓ 20 (42) ↓ 100 (95) ↓ | ← 99 (162) ← 267 (253) ← 3 (8) | 21 (58) → 326 (243) → 47 (188) ↓ | ↑ 76 (241) ↑ 70 (39) ↱ 18 (31)

#59 Nutmeg St / Clinton Keith Rd

72 (54) ↓ 57 (31) ↓ 424 (315) ↓ | ← 167 (369) ← 1467 (1860) ← 421 (515) | 46 (99) → 1869 (1885) → 103 (64) ↓ | ↑ 75 (64) ↑ 44 (87) ↱ 497 (510)

#60 Mitchell Rd / Clinton Keith Rd

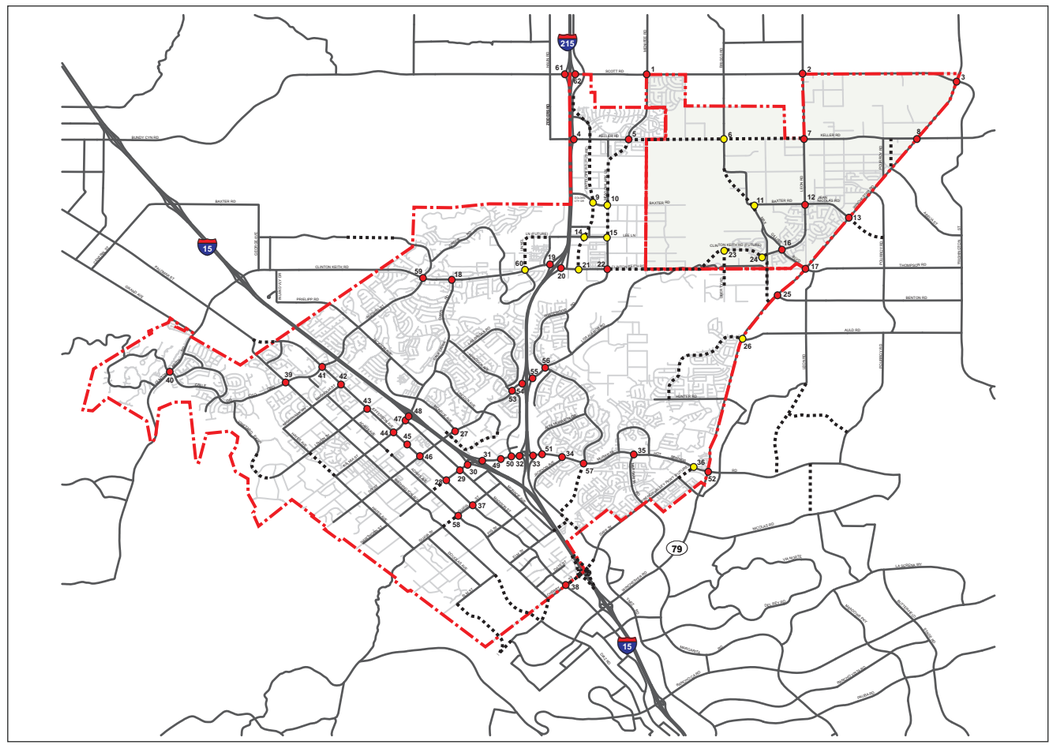
339 (826) ↓ 121 (172) ↓ 40 (74) ↓ | ← 351 (496) ← 2191 (2770) ← 82 (28) | 140 (220) → 2911 (3209) → 262 (25) ↓ | ↑ 105 (14) ↑ 208 (148) ↱ 106 (13)

#61 I-215 SB Ramps / Scott Rd

123 (259) ↓ 210 (160) ↓ | ← 338 (458) ← 929 (1482) | 1031 (756) → 430 (412) ↓

#62 I-215 NB Ramps / Scott Rd

281 (400) ↓ | ← 329 (382) ← 1036 (1708) | 155 (93) → 1192 (1001) → | ↑ 15 (7) ↱ 615 (896)



Murrieta General Plan Update

LEGEND

- Existing Study Intersection
- Future Study Intersection
- City of Murrieta Boundary
- Sphere of Influence
- Future Roadway Alignment
- ←31/20 AM Peak Hr/PM Peak Hr

ITERIS

2035 Peak Hour Turning Movement Volumes - Scenario B

Figure 21B

TABLE 13 –SCENARIO B LEVEL OF SERVICE

Int. No.	Intersection	AM Peak Hour		PM Peak Hour	
		LOS	Ave Del/Veh	LOS	Ave Del/Veh
1	Menifee Rd / Scott Rd	E	60.0	E	79.7
2	Leon Rd / Scott Rd	C	28.6	D	43.0
3	Winchester Rd - SR-79 / Scott Rd	F	177.3	F	281.2
4	Antelope Rd / Keller Rd	F	130.8	D	48.0
5	Menifee-Meadowlark Rd/ Keller Rd	D	45.1	D	42.2
6	Briggs Rd / Keller Rd	B	17.2	C	20.7
7	Leon Rd / Keller Rd	B	13.7	B	15.6
8	Winchester Rd - SR-79 / Keller Rd	A	1.5	A	1.4
9	Antelope Rd / Golden City Drive – Baxter Rd	C	25.3	F	83.1
10	Whitewood-Meadowlark/ Golden City Dr – Baxter Rd	E	72.5	F	121.3
11	Briggs Rd / Baxter Rd – Jean Nicholas	A	8.2	A	7.9
12	Leon Rd / Jean Nicholas	C	23.0	C	26.4
13	Winchester Rd - SR-79 / Nicholas - Skyview	B	19.8	C	29.3
14	Antelope Rd / Linnel Lane Extension	C	24.6	C	28.1
15	Whitewood-Meadowlark/ Linnel Lane Extension	C	27.4	D	40.7
16	Leon Rd / Max Gillis Rd	D	44.9	D	39.7
17	Winchester Rd - SR-79 / Max Gillis - Thompson	C	26.2	D	37.3
18	California Oaks Rd / Clinton Keith Rd	E	67.3	C	23.6
19	I-215 SB Off-Ramp / Clinton Keith Rd	A	7.7	B	12.5
20	I-215 NB Off-Ramp / Clinton Keith Rd	F	116.7	B	17.8
21	Antelope Rd / Clinton Keith Rd	A	5.4	A	3.8
22	Meadowlark – Whitewood Rd / Clinton Keith Rd	F	106.9	F	137.7
23	Liberty Rd / Clinton Keith Rd	A	2.0	A	4.7
24	Leon Rd / Clinton Keith Rd	C	22.2	C	29.2
25	Winchester Rd - SR-79 / Clinton Keith Rd - Benton Rd	D	43.3	E	63.5
26	Winchester Rd - SR-79 / Via Mira Mosa – Auld Rd	C	24.3	C	27.3
27	Monroe Ave / Los Alamos	C	24.5	C	27.6
28	Jefferson Ave / Murrieta Hot Springs Rd	F	122.9	F	201.4
29	Madison Ave / Murrieta Hot Springs Rd	C	27.7	F	148.3
30	I-15 SB Off-Ramp / Murrieta Hot Springs Rd	B	16.1	B	14.3
31	I-15 NB Off-Ramp / Murrieta Hot Springs Rd	A	5.5	A	7.7
32	I-215 SB Off-Ramp / Murrieta Hot Springs Rd	B	12.3	B	10.9
33	I-215 NB Off-Ramp / Murrieta Hot Springs Rd	A	5.5	A	9.4
34	Jackson Ave / Murrieta Hot Springs Rd	A	5.3	A	8.5
35	Margarita Rd/ Murrieta Hot Springs Rd	C	24.5	D	50.2
36	French Valley – Date St / Murrieta Hot Springs Rd	B	13.1	B	18.0
37	Jefferson Ave / Guava St	A	9.1	A	9.1
38	Jefferson Ave / Cherry St	C	21.8	D	37.5
39	Washington Ave / Calle del Oso Oro – Nutmeg St	C	26.7	C	27.3
40	Clinton Keith Rd / Calle de Oso Oro – Bear Creek Dr	C	23.8	B	16.4
41	Jefferson Ave / Nutmeg St	D	52.4	D	35.1
42	Jefferson Ave / Magnolia	B	10.7	A	9.0
43	Jefferson Ave / Lemon St	C	25.8	B	17.8

Int. No.	Intersection	AM Peak Hour		PM Peak Hour	
		LOS	Ave Del/Veh	LOS	Ave Del/Veh
44	Jefferson Ave / Kalmia St	E	56.4	F	158.6
45	Jefferson Ave / Juniper St	C	23.5	C	21.9
46	Jefferson Ave / Ivy St – Los Alamos Rd	C	26.2	D	35.3
47	Madison Ave / Kalmia St	N/A	N/A	N/A	N/A
48	I-15 SB Ramps / Kalmia St	C	31.8	C	32.7
49	Monroe Ave / Murrieta Hot Springs Rd	A	8.3	B	16.4
50	Hancock Ave / Murrieta Hot Springs Rd	B	18.0	B	18.0
51	Alta Murrieta Dr / Murrieta Hot Springs Rd	C	24.1	D	53.6
52	Winchester Rd (SR-79) / Murrieta Hot Springs Rd	F	107.1	F	102.6
53	Hancock Ave / Los Alamos Rd	F	83.2	F	238.4
54	I-215 SB Ramps / Los Alamos Rd	E	77.7	F	168.4
55	I-215 NB Ramps / Los Alamos Rd	C	25.0	C	24.4
56	Whitewood Rd / Los Alamos Rd	D	40.2	D	44.7
57	Whitewood Rd / Murrieta Hot Springs Rd	C	28.4	F	90.3
58	Adams Ave / Guava St	B	11.7	B	14.6
59	Nutmeg St / Clinton Keith Rd	F	88.0	F	81.0
60	Mitchell Rd / Clinton Keith Rd	C	26.2	F	115.0
61	I-215 SB Ramps / Scott Rd	A	7.6	A	8.2
62	I-215 NB Ramps / Scott Rd	B	15.8	B	16.0

5.0 RECOMMENDED SCENARIO ROADWAY IMPROVEMENTS

For the Recommended Scenario, improvements are recommended for the buildout roadway network and for intersection capacity augmentation; so that the roadways and intersection meet City level of service standards. Adequate intersection performance during peak traffic hours can be ensured with enhanced intersection geometrics which satisfy turning movement and through traffic capacity demands. In many instances, this may require additional left turn lanes, and right turn deceleration lanes on intersection approaches of the major roadway.

5.1.1 *ROADWAY IMPROVEMENTS*

The Recommended Scenario, roadway link improvements that were contained in the travel demand model include:

- Jefferson Avenue from Lemon Avenue to north of Nutmeg Street as an Arterial Street;
- Removal of the Linnel Lane extension between Greer Road and Mitchell Road;
- Inclusion of the Whitewood Road extension between Jackson Avenue and Murrieta Hot Springs Road;
- Adding the missing link of Keller Road between Menifee Road and Briggs Road;
- Upgrading of several roadway facilities to Collector and Secondary roads, in the area of Murrieta west of I-15, to better reflect how they operate;
- Changes to other roadway classifications (both upgrades and downgrades) within the City.

With these improvements, the Recommended Scenario is projected to have roadway links that exceed the City of Murrieta Standards, and thus experience a project related impact. These include, but are not limited to:

Level of Service D

- Portions of Jefferson Avenue, Washington Avenue, Meadowlark Lane/Menifee Road, Leon Road, and Whitewood Road, among others.

Level of Service E

- Portions of Jefferson Avenue, California Oaks Road, Murrieta Hot Springs Road, Clinton Keith Road, Hancock Avenue, and Meadowlark Lane/Menifee Road, among others.

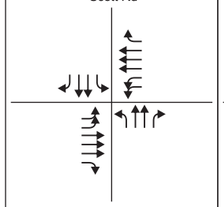
LOS F

- Portions of Jefferson Avenue, Los Alamos Road, Clinton Keith Road, Winchester Road, Murrieta Hot Springs Road, Meadowlark Lane/Menifee Road, and Antelope Road, among others.

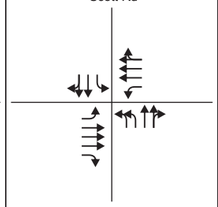
5.1.2 *INTERSECTION IMPROVEMENTS*

Enhanced intersection geometrics and upgraded signal operations (such as protected phasing and overlap phasing) have been identified and are shown in **Figure 22**. The projected level of service for the Recommended Scenario with Enhanced Geometrics is shown in **Table 14** below.

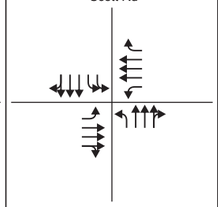
#1 Menifee Rd / Scott Rd



#2 Leon Rd / Scott Rd



#3 Winchester Rd - SR-79 / Scott Rd



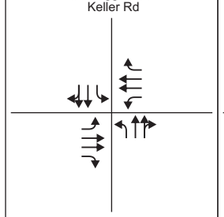
#4 Antelope Rd / Keller Rd

No Enhanced Geometrics Required

#5 Menifee-Meadowlark Rd/ Keller Rd

No Enhanced Geometrics Required

#6 Briggs Rd / Keller Rd



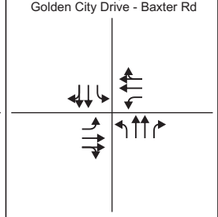
#7 Leon Rd / Keller Rd

No Enhanced Geometrics Required

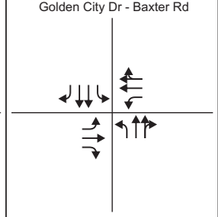
#8 Winchester Rd - SR-79 / Keller Rd

No Enhanced Geometrics Required

#9 Antelope Rd / Golden City Drive - Baxter Rd



#10 Whitewood-Meadowlark/ Golden City Dr - Baxter Rd



#11 Briggs Rd / Baxter Rd - Jean Nicholas

No Enhanced Geometrics Required

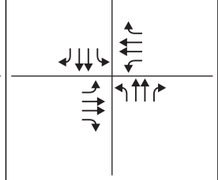
#12 Leon Rd / Jean Nicholas

No Enhanced Geometrics Required

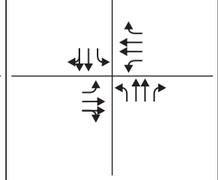
#13 Winchester Rd - SR-79 / Nicholas - Skyview

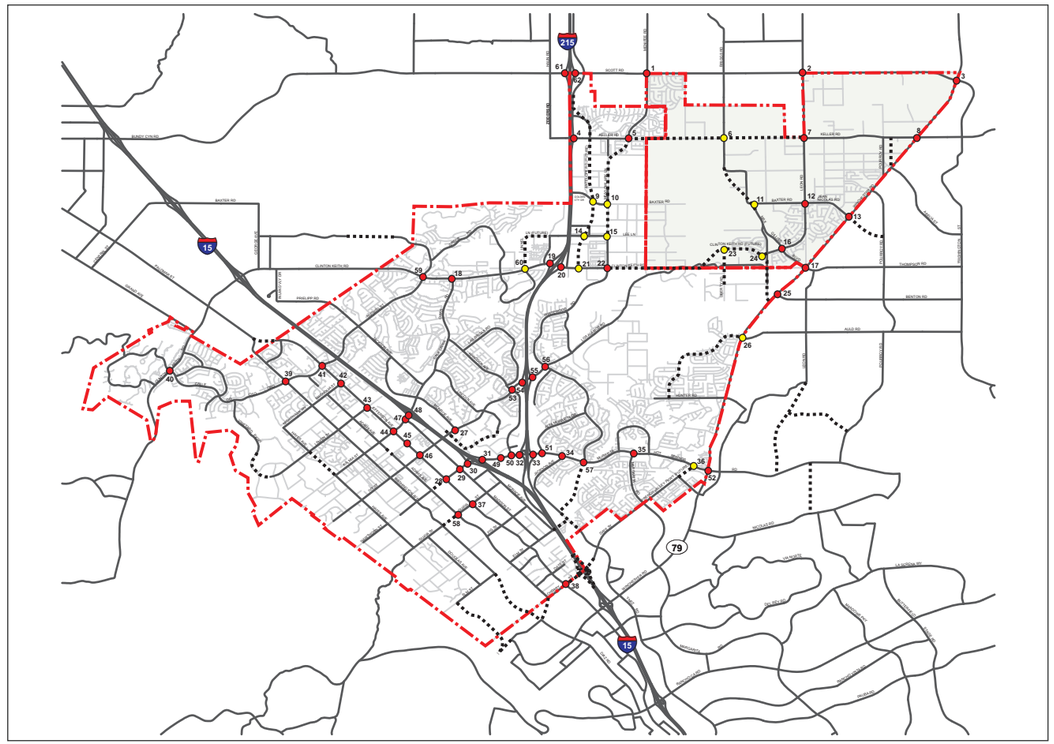
No Enhanced Geometrics Required

#14 Antelope Rd / Linnel Lane Extension



#15 Whitewood-Meadowlark/ Linnel Lane Extension





#16 Leon Rd / Max Gillis Rd

No Enhanced Geometrics Required

#17 Winchester Rd - SR-79 / Max Gillis - Thompson

No Enhanced Geometrics Required

#18 California Oaks Rd / Clinton Keith Rd

No Enhanced Geometrics Required

#19 I-215 SB Off-Ramp / Clinton Keith Rd

No Enhanced Geometrics Required

#20 I-215 NB Off-Ramp / Clinton Keith Rd

No Enhanced Geometrics Required

#21 Antelope Rd / Clinton Keith Rd

No Enhanced Geometrics Required

#22 Meadowlark-Whitewood Rd / Clinton Keith Rd

No Enhanced Geometrics Required

#23 Liberty Rd / Clinton Keith Rd

No Enhanced Geometrics Required

#24 Leon Rd / Clinton Keith Rd

No Enhanced Geometrics Required

#25 Winchester Rd - SR-79 / Clinton Keith - Benton Rd

No Enhanced Geometrics Required

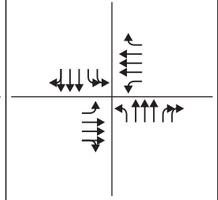
#26 Winchester Rd - SR-79 / Via Mira Mosa

No Enhanced Geometrics Required

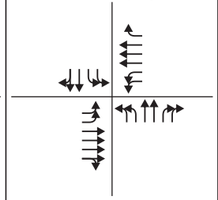
#27 Monroe Ave / Los Alamos

No Enhanced Geometrics Required

#28 Jefferson Ave / Murrieta Hot Springs Rd



#29 Madison Ave / Murrieta Hot Springs Rd



#30 I-15 SB Off-Ramp / Murrieta Hot Springs Rd

No Enhanced Geometrics Required

#31 I-15 NB Off-Ramp / Murrieta Hot Springs Rd

No Enhanced Geometrics Required

#32 I-215 SB Off-Ramp / Murrieta Hot Springs Rd

No Enhanced Geometrics Required

#33 I-215 NB Off-Ramp / Murrieta Hot Springs Rd

No Enhanced Geometrics Required

#34 Jackson Ave / Murrieta Hot Springs Rd

No Enhanced Geometrics Required

#35 Margarita Rd/ Murrieta Hot Springs Rd

No Enhanced Geometrics Required

Murrieta General Plan Update

LEGEND

- Through Lane
- Turn Lane
- Shared Lane
- * Assumed Lane Configuration

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Future 2035 With Enhancement Lane Configurations

Figure 22A

#36 French Valley-Date St / Murrieta Hot Springs Rd

No Enhanced Geometrics Required

#37 Jefferson Ave / Guava St

No Enhanced Geometrics Required

#38 Jefferson Ave / Cherry St

No Enhanced Geometrics Required

#39 Washington Ave / Calle del Oso Oro - Nutmeg St

No Enhanced Geometrics Required

#40 Clinton Keith Rd / Calle Del Oso Oro/Bear Creek Dr

No Enhanced Geometrics Required

#41 Jefferson Ave / Nutmeg St

No Enhanced Geometrics Required

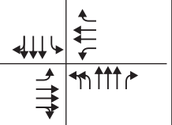
#42 Jefferson Ave / Magnolia

No Enhanced Geometrics Required

#43 Jefferson Ave / Lemon St

No Enhanced Geometrics Required

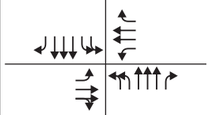
#44 Jefferson Ave / Kalmia St



#45 Jefferson Ave / Juniper St

No Enhanced Geometrics Required

#46 Jefferson Ave / Ivy St/Los Alamos Rd



#47 Madison Ave / Kalmia St

Combined With Intersection #48

#48 Madison Ave - I-15 SB Ramps / Kalmia St

No Enhanced Geometrics Required

#49 Monroe Ave / Murrieta Hot Springs Rd

No Enhanced Geometrics Required

#50 Hancock Ave / Murrieta Hot Springs Rd

No Enhanced Geometrics Required

#51 Alta Murrieta Dr / Murrieta Hot Springs Rd

No Enhanced Geometrics Required

#52 Winchester Rd (SR-79) / Murrieta Hot Springs Rd

No Enhanced Geometrics Required

#53 Hancock Ave / Los Alamos Rd

No Enhanced Geometrics Required

#54 I-215 SB Ramps / Los Alamos Rd

No Enhanced Geometrics Required

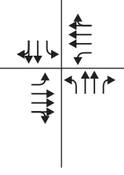
#55 I-215 NB Ramps / Los Alamos Rd

No Enhanced Geometrics Required

#56 Whitewood Rd / Los Alamos Rd

No Enhanced Geometrics Required

#57 Whitewood Rd / Murrieta Hot Springs Rd



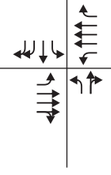
#58 Adams Ave / Guava St

No Enhanced Geometrics Required

#59 Nutmeg St / Clinton Keith Rd

No Enhanced Geometrics Required

#60 Mitchell Rd / Clinton Keith Rd

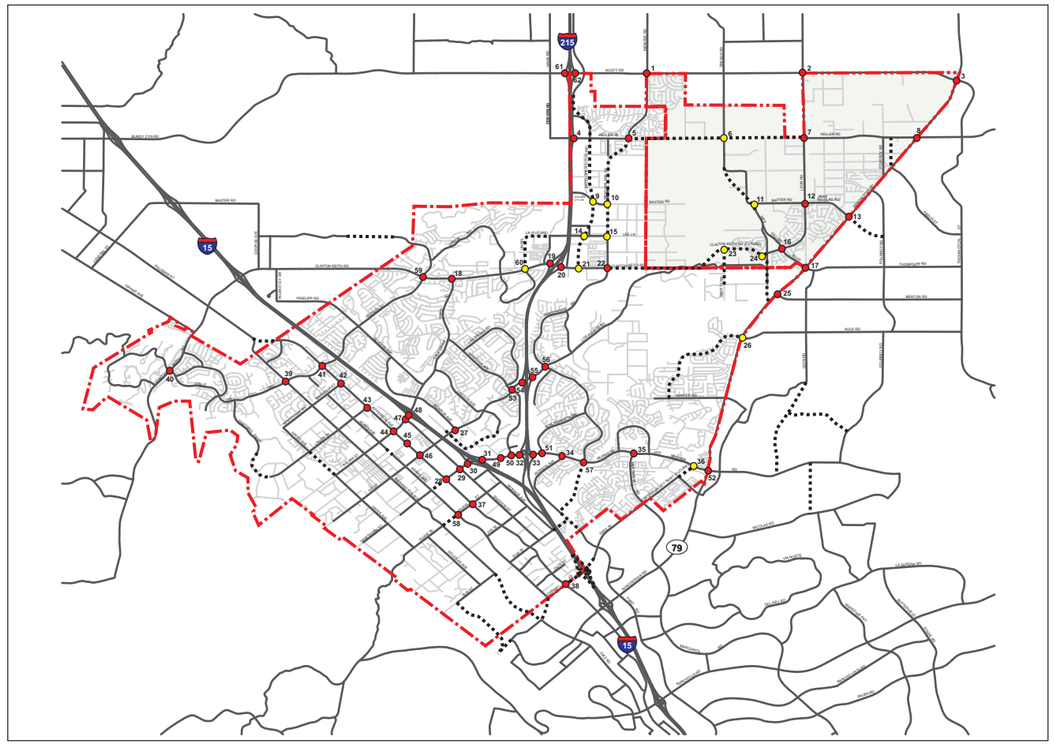


#61 I-215 SB Ramps / Scott Rd

No Enhanced Geometrics Required

#62 I-215 NB Ramps / Scott Rd

No Enhanced Geometrics Required



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Murrieta
General Plan Update

LEGEND

- Through Lane
- Turn Lane
- Shared Lane
- * Assumed Lane Configuration

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Future 2035 With Enhancement Lane Configurations

Figure 22B

TABLE 14–RECOMMENDED SCENARIO WITH ENHANCED GEOMETRICS LEVEL OF SERVICE

Int. No.	Intersection	Recommended Scenario				Recommended Scenario with Enhanced Geometrics				Project Impact	Residual Impact
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour			
		LOS	Ave Del/ Veh	LOS	Ave Del/ Veh	LOS	Ave Del/ Veh	LOS	Ave Del/ Veh		
1	Menifee Rd / Scott Rd	E	68.3	F	86.3	C	29.5	C	31.2	Yes	No
2	Leon Rd / Scott Rd	C	27.9	D	46.7	C	26.6	C	32.5		
3	Winchester Rd - SR-79 / Scott Rd	F	177.4	F	284.5	F	132.7	F	187.8	Yes	Yes
4	Antelope Rd / Keller Rd	F	158.6	D	49.9					Yes	Yes
5	Menifee-Meadowlark Rd/ Keller Rd	E	68.8	D	47.6					Yes	Yes
6	Briggs Rd / Keller Rd	B	18.5	B	19.0	B	13.6	B	13.7		
7	Leon Rd / Keller Rd	B	12.3	C	26.2						
8	Winchester Rd - SR-79 / Keller Rd	A	1.6	A	1.6						
9	Antelope Rd / Golden City Drive – Baxter Rd	C	25.2	F	89.2	C	20.3	E	55.2	Yes	Yes
10	Whitewood-Meadowlark/ Golden City Dr – Baxter Rd	F	107.7	F	113.6	E	75.8	F	108.0	Yes	Yes
11	Briggs Rd / Baxter Rd – Jean Nicholas	A	8.8	A	8.3						
12	Leon Rd / Jean Nicholas	C	22.1	C	26.4						
13	Winchester Rd - SR-79 / Nicholas - Skyview	B	19.7	C	28.5						
14	Antelope Rd / Linnel Lane Extension	C	22.1	C	28.5	C	21.4	C	23.4		
15	Whitewood-Meadowlark/ Linnel Lane Extension	C	26.0	D	43.7	C	24.6	D	38.7		
16	Leon Rd / Max Gillis Rd	D	51.9	D	40.3						
17	Winchester Rd - SR-79 / Max Gillis - Thompson	C	27.1	D	37.8						
18	California Oaks Rd / Clinton Keith Rd	E	60.7	C	20.7					Yes	Yes
19	I-215 SB Off-Ramp / Clinton Keith Rd	A	7.9	B	11.5						
20	I-215 NB Off-Ramp / Clinton Keith Rd	F	124.7	B	17.1					Yes	Yes
21	Antelope Rd / Clinton Keith Rd	A	5.1	A	4.5						
22	Meadowlark – Whitewood Rd / Clinton Keith Rd	F	145.9	F	121.7					Yes	Yes
23	Liberty Rd / Clinton Keith Rd	A	7.4	B	10.0						
24	Leon Rd / Clinton Keith Rd	C	26.0	C	28.6						
25	Winchester Rd - SR-79 / Clinton Keith Rd - Benton Rd	D	38.8	D	53.7						
26	Winchester Rd - SR-79 / Via Mira Mosa – Auld Rd	C	24.1	C	25.1						

Int. No.	Intersection	Recommended Scenario				Recommended Scenario with Enhanced Geometrics				Project Impact	Residual Impact
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour			
		LOS	Ave Del/ Veh	LOS	Ave Del/ Veh	LOS	Ave Del/ Veh	LOS	Ave Del/ Veh		
27	Monroe Ave / Los Alamos	C	24.5	C	27.5						
28	Jefferson Ave / Murrieta Hot Springs Rd	F	133.3	F	206.4	E	56.1	F	115.8	Yes	Yes
29	Madison Ave / Murrieta Hot Springs Rd	C	26.6	F	129.6	C	23.5	D	51.1	Yes	No
30	I-15 SB Off-Ramp / Murrieta Hot Springs Rd	B	16.1	B	14.3						
31	I-15 NB Off-Ramp / Murrieta Hot Springs Rd	A	5.7	A	7.9						
32	I-215 SB Off-Ramp / Murrieta Hot Springs Rd	B	12.5	B	10.8						
33	I-215 NB Off-Ramp / Murrieta Hot Springs Rd	A	5.6	A	9.4						
34	Jackson Ave / Murrieta Hot Springs Rd	A	5.1	A	8.5						
35	Margarita Rd/ Murrieta Hot Springs Rd	C	24.6	D	49.2						
36	French Valley – Date St / Murrieta Hot Springs Rd	B	12.9	B	18.4						
37	Jefferson Ave / Guava St	A	9.4	A	7.9						
38	Jefferson Ave / Cherry St	C	21.8	D	37.8						
39	Washington Ave / Calle del Oso Oro – Nutmeg St	C	27.6	C	27.5						
40	Clinton Keith Rd / Calle de Oso Oro – Bear Creek Dr	C	23.7	B	16.5						
41	Jefferson Ave / Nutmeg St	D	51.1	D	36.0						
42	Jefferson Ave / Magnolia	B	10.7	A	9.4						
43	Jefferson Ave / Lemon St	C	28.2	B	18.3						
44	Jefferson Ave / Kalmia St	E	59.3	F	159.9	E	60.3	F	158.5	Yes	Yes
45	Jefferson Ave / Juniper St	C	23.4	C	22.3						
46	Jefferson Ave / Ivy St – Los Alamos Rd	C	26.8	D	35.8	C	26.8	D	36.5		
47	Madison Ave / Kalmia St	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
48	I-15 SB Ramps / Kalmia St	C	29.4	C	30.9						
49	Monroe Ave / Murrieta Hot Springs Rd	A	8.0	B	16.2						
50	Hancock Ave / Murrieta Hot Springs Rd	B	17.6	B	17.6						
51	Alta Murrieta Dr / Murrieta Hot Springs Rd	C	23.8	D	51.9						
52	Winchester Rd (SR-79) / Murrieta Hot Springs Rd	F	107.8	F	104.8					Yes	Yes
53	Hancock Ave / Los Alamos Rd	F	84.6	F	223.1					Yes	Yes
54	I-215 SB Ramps / Los Alamos Rd	E	77.2	F	157.8					Yes	Yes
55	I-215 NB Ramps / Los Alamos Rd	C	25.5	C	24.4						

Int. No.	Intersection	Recommended Scenario				Recommended Scenario with Enhanced Geometrics				Project Impact	Residual Impact
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour			
		LOS	Ave Del/ Veh	LOS	Ave Del/ Veh	LOS	Ave Del/ Veh	LOS	Ave Del/ Veh		
56	Whitewood Rd / Los Alamos Rd	D	44.4	D	44.6						
57	Whitewood Rd / Murrieta Hot Springs Rd	C	28.3	F	88.7	C	24.3	D	51.6	Yes	No
58	Adams Ave / Guava St	B	12.2	B	14.3						
59	Nutmeg St / Clinton Keith Rd	F	96.5	E	78.4					Yes	Yes
60	Mitchell Rd / Clinton Keith Rd	C	20.4	F	120.7	B	18.7	C	29.6	Yes	No
61	I-215 SB Ramps / Scott Rd	A	8.5	A	8.1						
62	I-215 NB Ramps / Scott Rd	B	15.9	B	16.2						

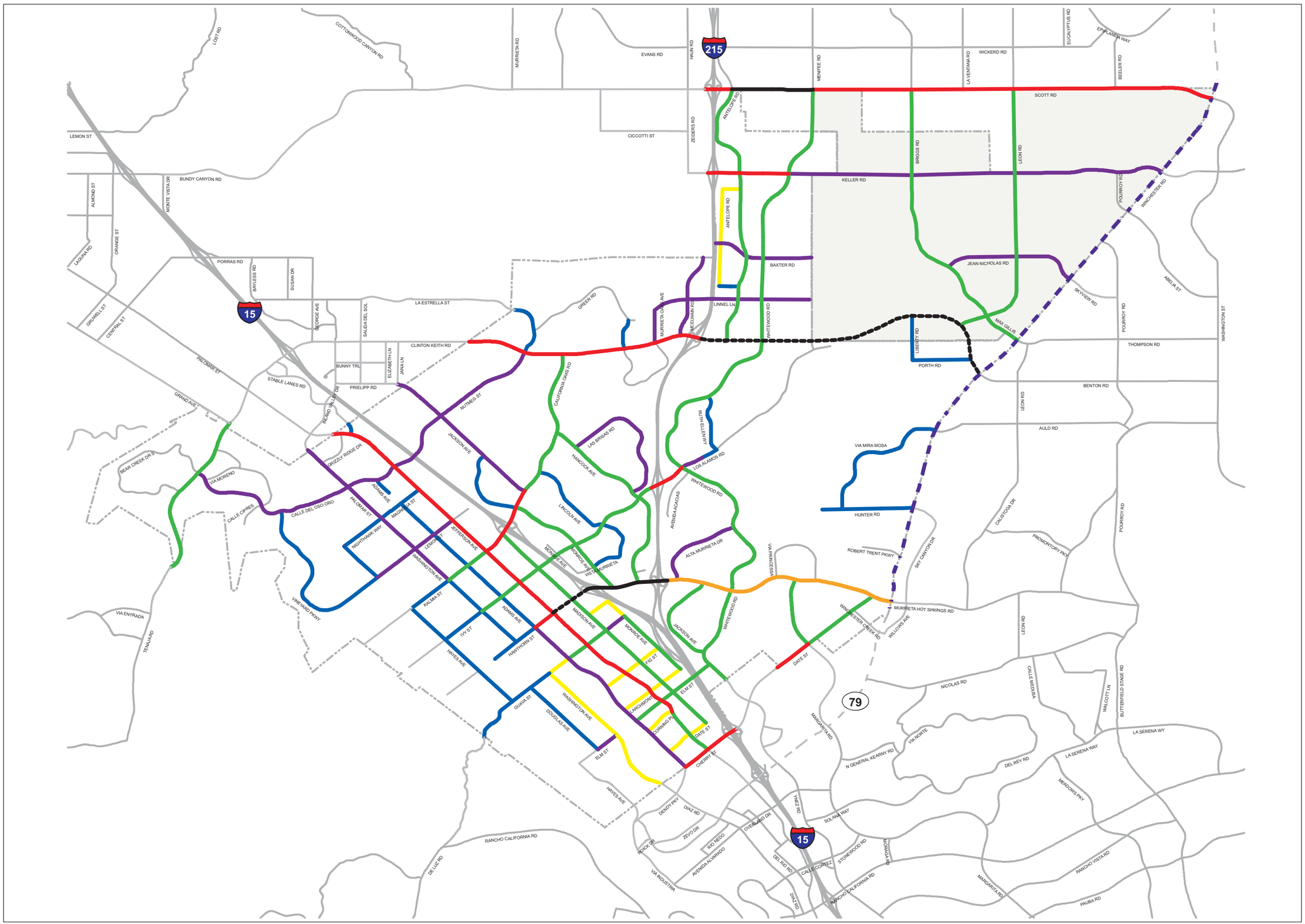
As noted before in Table 13, the Recommended scenario is shown to have 18 intersections that are projected to operate at levels of service that exceed the City's standards, and thus have a project related impact. The locations are:

1 Menifee Rd / Scott Rd
3 Winchester Rd - SR-79 / Scott Rd
4 Antelope Rd / Keller Rd
5 Menifee-Meadowlark Rd/ Keller Rd
9 Antelope Rd / Golden City Drive – Baxter Rd
10 Whitewood-Meadowlark/ Golden City Dr – Baxter Rd
18 California Oaks Rd / Clinton Keith Rd
20 I-215 NB Off-Ramp / Clinton Keith Rd
22 Meadowlark – Whitewood Rd / Clinton Keith Rd
28 Jefferson Ave / Murrieta Hot Springs Rd
29 Madison Ave / Murrieta Hot Springs Rd
44 Jefferson Ave / Kalmia St
52 Winchester Rd (SR-79) / Murrieta Hot Springs Rd
53 Hancock Ave / Los Alamos Rd
54 I-215 SB Ramps / Los Alamos Rd
57 Whitewood Rd / Murrieta Hot Springs Rd
59 Nutmeg St / Clinton Keith Rd
60 Mitchell Rd / Clinton Keith Rd

After enhanced geometrics are applied to the intersections under the Recommended scenario, 14 intersections are projected to still operate at levels of service that exceed the City's standards, and thus have a cumulative impact. These locations area:

3 Winchester Rd - SR-79 / Scott Rd
4 Antelope Rd / Keller Rd
5 Menifee-Meadowlark Rd/ Keller Rd
9 Antelope Rd / Golden City Drive – Baxter Rd
10 Whitewood-Meadowlark/ Golden City Dr – Baxter Rd
18 California Oaks Rd / Clinton Keith Rd
20 I-215 NB Off-Ramp / Clinton Keith Rd
22 Meadowlark – Whitewood Rd / Clinton Keith Rd
28 Jefferson Ave / Murrieta Hot Springs Rd
44 Jefferson Ave / Kalmia St
52 Winchester Rd (SR-79) / Murrieta Hot Springs Rd
53 Hancock Ave / Los Alamos Rd
54 I-215 SB Ramps / Los Alamos Rd
59 Nutmeg St / Clinton Keith Rd

The proposed City of Murrieta Circulation Element roadway plan is shown in **Figure 23**.



LEGEND

* Curb to Curb / R/W

County of Riverside Expressway	110' / 184'
Augmented Urban Arterial	126' / 150'
Multi-Modal Transp. Corridor	86' / 134'
Urban Arterial	110' / 134'
Arterial	86' / 110'
Major	76' / 100'
Secondary	64' / 88'
Industrial Collector	56' / 78'
Collector	44' / 66'
Selected Roadways Shown for Clarity	
City of Murrieta Boundary	
Sphere of Influence	

* Per City Standard Drawings

0 1 2 Miles

ITERIS

11/09 JN 10-106976

Functional Classifications

Figure 23

APPENDIX A: TRAFFIC COUNTS

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: Whitewood Rd-Meadowlark Lane
E/W: Clinton Keith Road
Weather: Sunny

File Name : MURWHCKAM
Site Code : 9311135
Start Date : 12/9/2009
Page No : 1

Groups Printed- Total Volume

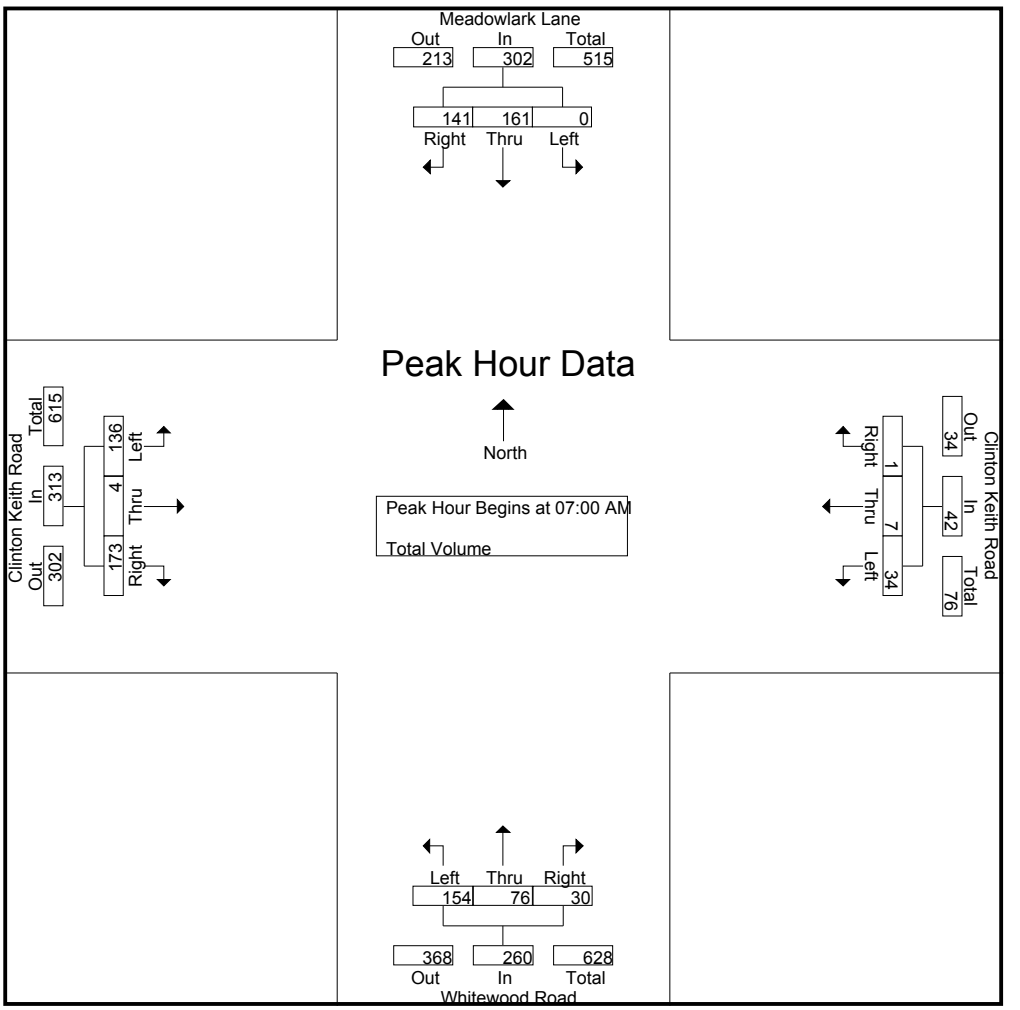
	Meadowlark Lane Southbound				Clinton Keith Road Westbound				Whitewood Road Northbound				Clinton Keith Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	40	48	88	5	2	1	8	61	25	3	89	28	1	66	95	280
07:15 AM	0	73	42	115	29	2	0	31	56	34	27	117	61	3	65	129	392
07:30 AM	0	26	30	56	0	1	0	1	15	9	0	24	34	0	31	65	146
07:45 AM	0	22	21	43	0	2	0	2	22	8	0	30	13	0	11	24	99
Total	0	161	141	302	34	7	1	42	154	76	30	260	136	4	173	313	917
08:00 AM	0	18	32	50	0	0	0	0	20	8	0	28	11	0	24	35	113
08:15 AM	0	21	29	50	1	0	0	1	32	10	1	43	15	0	22	37	131
08:30 AM	1	19	19	39	0	0	1	1	29	18	0	47	8	0	15	23	110
08:45 AM	0	16	18	34	0	0	0	0	17	7	0	24	18	0	19	37	95
Total	1	74	98	173	1	0	1	2	98	43	1	142	52	0	80	132	449
Grand Total	1	235	239	475	35	7	2	44	252	119	31	402	188	4	253	445	1366
Apprch %	0.2	49.5	50.3		79.5	15.9	4.5		62.7	29.6	7.7		42.2	0.9	56.9		
Total %	0.1	17.2	17.5	34.8	2.6	0.5	0.1	3.2	18.4	8.7	2.3	29.4	13.8	0.3	18.5	32.6	

	Meadowlark Lane Southbound				Clinton Keith Road Westbound				Whitewood Road Northbound				Clinton Keith Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	40	**48**	88	5	**2**	**1**	8	**61**	25	3	89	28	1	**66**	95	280
07:15 AM	0	**73**	42	**115**	**29**	2	0	**31**	56	**34**	**27**	**117**	**61**	**3**	65	**129**	**392**
07:30 AM	0	26	30	56	0	1	0	1	15	9	0	24	34	0	31	65	146
07:45 AM	0	22	21	43	0	2	0	2	22	8	0	30	13	0	11	24	99
Total Volume	0	161	141	302	34	7	1	42	154	76	30	260	136	4	173	313	917
% App. Total	0	53.3	46.7		81	16.7	2.4		59.2	29.2	11.5		43.5	1.3	55.3		
PHF	.000	.551	.734	.657	.293	.875	.250	.339	.631	.559	.278	.556	.557	.333	.655	.607	.585

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: Whitewood Rd-Meadowlark Lane
E/W: Clinton Keith Road
Weather: Sunny

File Name : MURWHCKAM
Site Code : 9311135
Start Date : 12/9/2009
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	40	**48**	88	5	**2**	**1**	8	**61**	25	3	89	28	1	**66**	95
+15 mins.	0	**73**	42	**115**	**29**	2	0	**31**	56	**34**	**27**	**117**	**61**	**3**	65	**129**
+30 mins.	0	26	30	56	0	1	0	1	15	9	0	24	34	0	31	65
+45 mins.	0	22	21	43	0	2	0	2	22	8	0	30	13	0	11	24
Total Volume	0	161	141	302	34	7	1	42	154	76	30	260	136	4	173	313
% App. Total	0	53.3	46.7		81	16.7	2.4		59.2	29.2	11.5		43.5	1.3	55.3	
PHF	.000	.551	.734	.657	.293	.875	.250	.339	.631	.559	.278	.556	.557	.333	.655	.607

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: Whitewood RD-Meadowlark Lane
E/W: Clinton Keith Road
Weather: Sunny

File Name : MURWHCKPM
Site Code : 9311135
Start Date : 12/9/2009
Page No : 1

Groups Printed- Total Volume

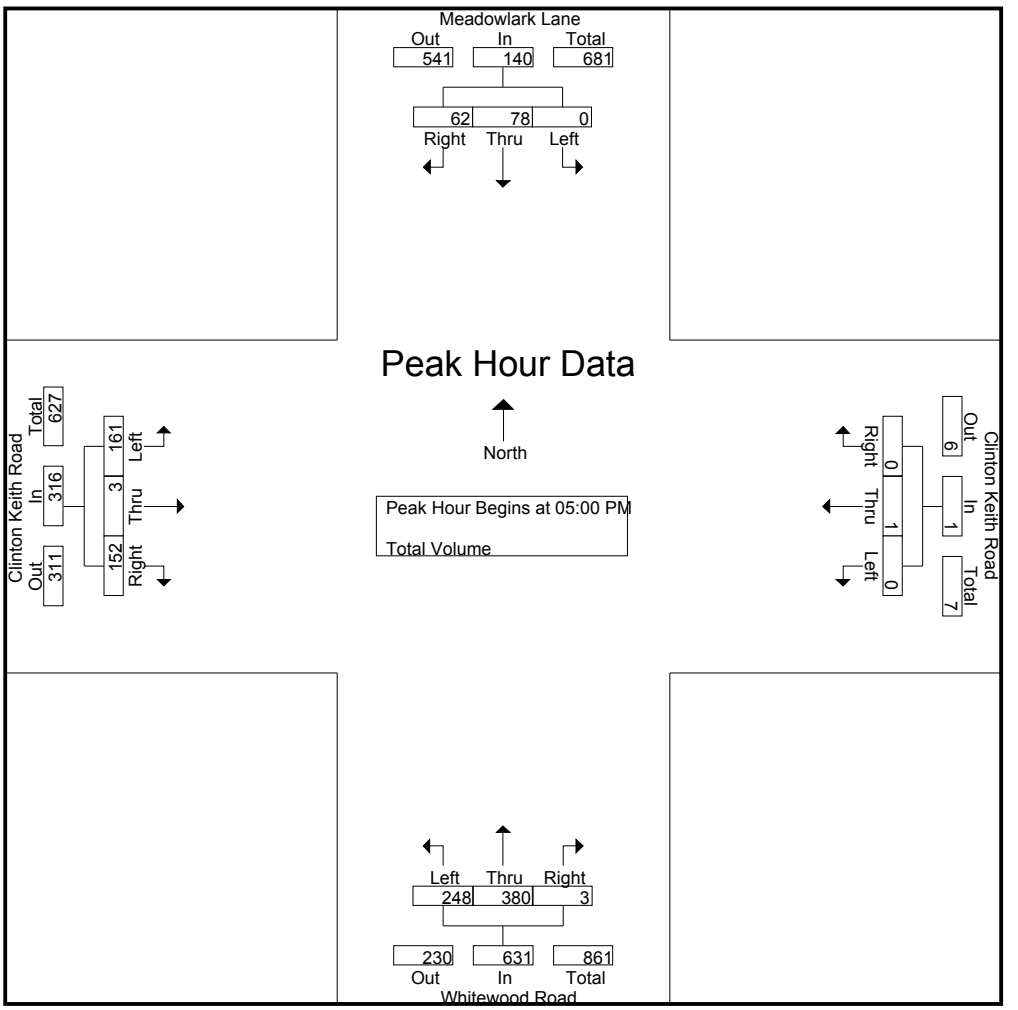
	Meadowlark Lane Southbound				Clinton Keith Road Westbound				Whitewood Road Northbound				Clinton Keith Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	23	22	45	0	0	1	1	47	53	1	101	44	0	25	69	216
04:15 PM	0	23	14	37	0	0	0	0	47	70	0	117	34	0	32	66	220
04:30 PM	0	20	27	47	0	0	0	0	65	61	1	127	47	2	44	93	267
04:45 PM	0	22	25	47	0	0	1	1	53	84	1	138	48	0	38	86	272
Total	0	88	88	176	0	0	2	2	212	268	3	483	173	2	139	314	975
05:00 PM	0	18	26	44	0	0	0	0	65	84	0	149	31	0	53	84	277
05:15 PM	0	25	11	36	0	0	0	0	45	80	2	127	42	0	50	92	255
05:30 PM	0	23	15	38	0	1	0	1	70	97	1	168	39	1	26	66	273
05:45 PM	0	12	10	22	0	0	0	0	68	119	0	187	49	2	23	74	283
Total	0	78	62	140	0	1	0	1	248	380	3	631	161	3	152	316	1088
Grand Total	0	166	150	316	0	1	2	3	460	648	6	1114	334	5	291	630	2063
Apprch %	0	52.5	47.5		0	33.3	66.7		41.3	58.2	0.5		53	0.8	46.2		
Total %	0	8	7.3	15.3	0	0	0.1	0.1	22.3	31.4	0.3	54	16.2	0.2	14.1	30.5	

	Meadowlark Lane Southbound				Clinton Keith Road Westbound				Whitewood Road Northbound				Clinton Keith Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	18	**26**	**44**	0	0	0	0	65	84	0	149	31	0	**53**	84	277
05:15 PM	0	**25**	11	36	0	0	0	0	45	80	**2**	127	42	0	50	**92**	255
05:30 PM	0	23	15	38	0	**1**	0	**1**	**70**	97	1	168	39	1	26	66	273
05:45 PM	0	12	10	22	0	0	0	0	68	**119**	0	**187**	**49**	**2**	23	74	**283**
Total Volume	0	78	62	140	0	1	0	1	248	380	3	631	161	3	152	316	1088
% App. Total	0	55.7	44.3		0	100	0		39.3	60.2	0.5		50.9	0.9	48.1		
PHF	.000	.780	.596	.795	.000	.250	.000	.250	.886	.798	.375	.844	.821	.375	.717	.859	.961

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: Whitewood RD-Meadowlark Lane
E/W: Clinton Keith Road
Weather: Sunny

File Name : MURWHCKPM
Site Code : 9311135
Start Date : 12/9/2009



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				05:00 PM				04:30 PM			
+0 mins.	0	**23**	22	45	0	0	**1**	**1**	65	84	0	149	47	**2**	44	**93**
+15 mins.	0	23	14	37	0	0	0	0	45	80	**2**	127	**48**	0	38	86
+30 mins.	0	20	**27**	**47**	0	0	0	0	**70**	97	1	168	31	0	**53**	84
+45 mins.	0	22	25	47	0	0	1	1	68	**119**	0	**187**	42	0	50	92
Total Volume	0	88	88	176	0	0	2	2	248	380	3	631	168	2	185	355
% App. Total	0	50	50		0	0	100		39.3	60.2	0.5		47.3	0.6	52.1	
PHF	.000	.957	.815	.936	.000	.000	.500	.500	.886	.798	.375	.844	.875	.250	.873	.954

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: Menifee Road
E/W: Keller Road
Weather: Sunny

File Name : MURMEKEAM
Site Code : 9311043
Start Date : 12/10/2009

Groups Printed- Total Volume

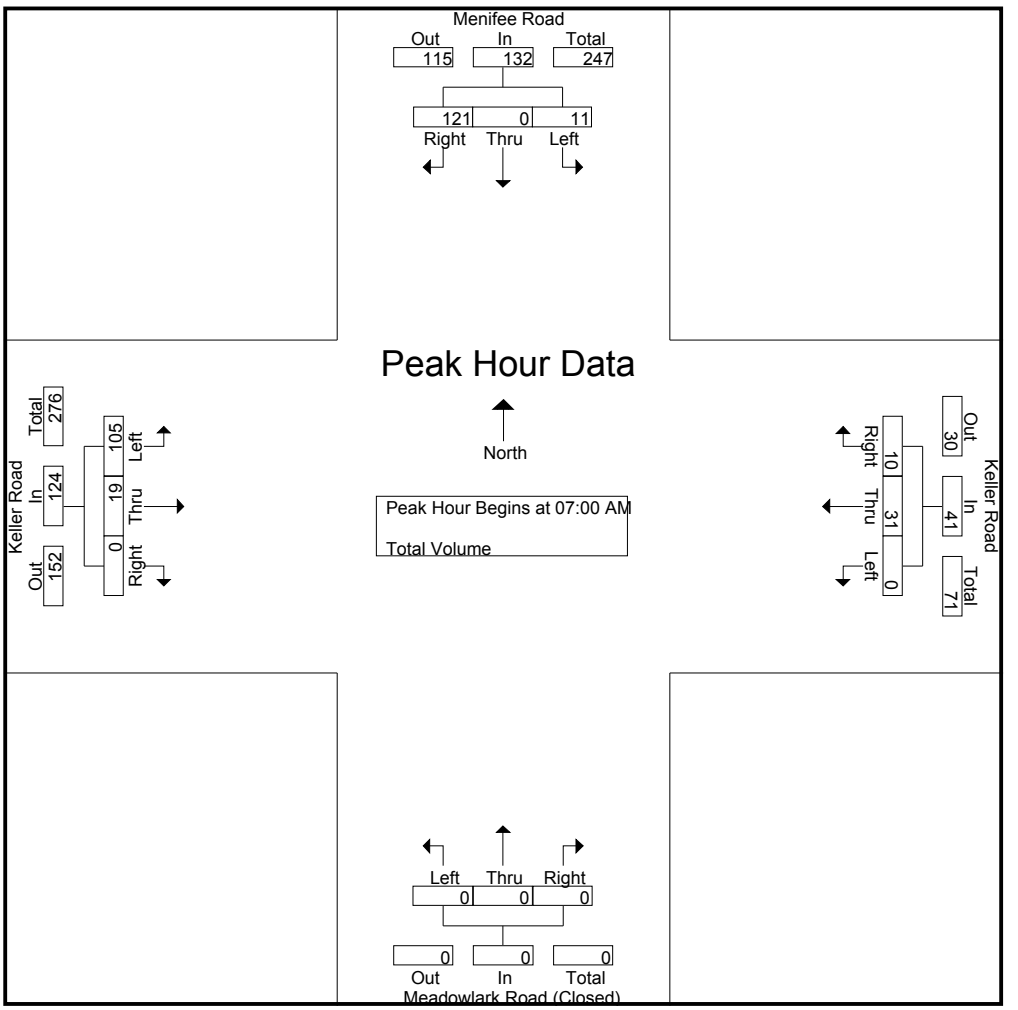
	Menifee Road Southbound				Keller Road Westbound				Meadowlark Road (Closed) Northbound				Keller Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	1	0	18	19	0	6	2	8	0	0	0	0	8	3	0	11	38
07:15 AM	2	0	41	43	0	12	3	15	0	0	0	0	23	2	0	25	83
07:30 AM	5	0	33	38	0	7	5	12	0	0	0	0	57	7	0	64	114
07:45 AM	3	0	29	32	0	6	0	6	0	0	0	0	17	7	0	24	62
Total	11	0	121	132	0	31	10	41	0	0	0	0	105	19	0	124	297
08:00 AM	1	0	15	16	0	3	1	4	0	0	0	0	10	2	0	12	32
08:15 AM	0	0	17	17	0	6	6	12	0	0	0	0	7	2	0	9	38
08:30 AM	3	0	15	18	0	7	4	11	0	0	0	0	6	2	0	8	37
08:45 AM	3	0	13	16	0	2	1	3	0	0	0	0	6	2	0	8	27
Total	7	0	60	67	0	18	12	30	0	0	0	0	29	8	0	37	134
Grand Total	18	0	181	199	0	49	22	71	0	0	0	0	134	27	0	161	431
Apprch %	9	0	91		0	69	31		0	0	0		83.2	16.8	0		
Total %	4.2	0	42	46.2	0	11.4	5.1	16.5	0	0	0	0	31.1	6.3	0	37.4	

	Menifee Road Southbound				Keller Road Westbound				Meadowlark Road (Closed) Northbound				Keller Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	1	0	18	19	0	6	2	8	0	0	0	0	8	3	0	11	38
07:15 AM	2	0	**41**	**43**	0	**12**	3	**15**	0	0	0	0	23	2	0	25	83
07:30 AM	**5**	0	33	38	0	7	**5**	12	0	0	0	0	**57**	**7**	0	**64**	**114**
07:45 AM	3	0	29	32	0	6	0	6	0	0	0	0	17	7	0	24	62
Total Volume	11	0	121	132	0	31	10	41	0	0	0	0	105	19	0	124	297
% App. Total	8.3	0	91.7		0	75.6	24.4		0	0	0		84.7	15.3	0		
PHF	.550	.000	.738	.767	.000	.646	.500	.683	.000	.000	.000	.000	.461	.679	.000	.484	.651

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: Menifee Road
E/W: Keller Road
Weather: Sunny

File Name : MURMEKEAM
Site Code : 9311043
Start Date : 12/10/2009
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:15 AM			
+0 mins.	1	0	18	19	0	6	2	8	0	0	0	0	23	2	0	25
+15 mins.	2	0	**41**	**43**	0	**12**	3	**15**	0	0	0	0	**57**	**7**	0	**64**
+30 mins.	**5**	0	33	38	0	7	**5**	12	0	0	0	0	17	7	0	24
+45 mins.	3	0	29	32	0	6	0	6	0	0	0	0	10	2	0	12
Total Volume	11	0	121	132	0	31	10	41	0	0	0	0	107	18	0	125
% App. Total	8.3	0	91.7		0	75.6	24.4		0	0	0		85.6	14.4	0	
PHF	.550	.000	.738	.767	.000	.646	.500	.683	.000	.000	.000	.000	.469	.643	.000	.488

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: Menifee Road
E/W: Keller Road
Weather: Sunny

File Name : MURMEKEPM
Site Code : 9311043
Start Date : 12/10/2009

Groups Printed- Total Volume

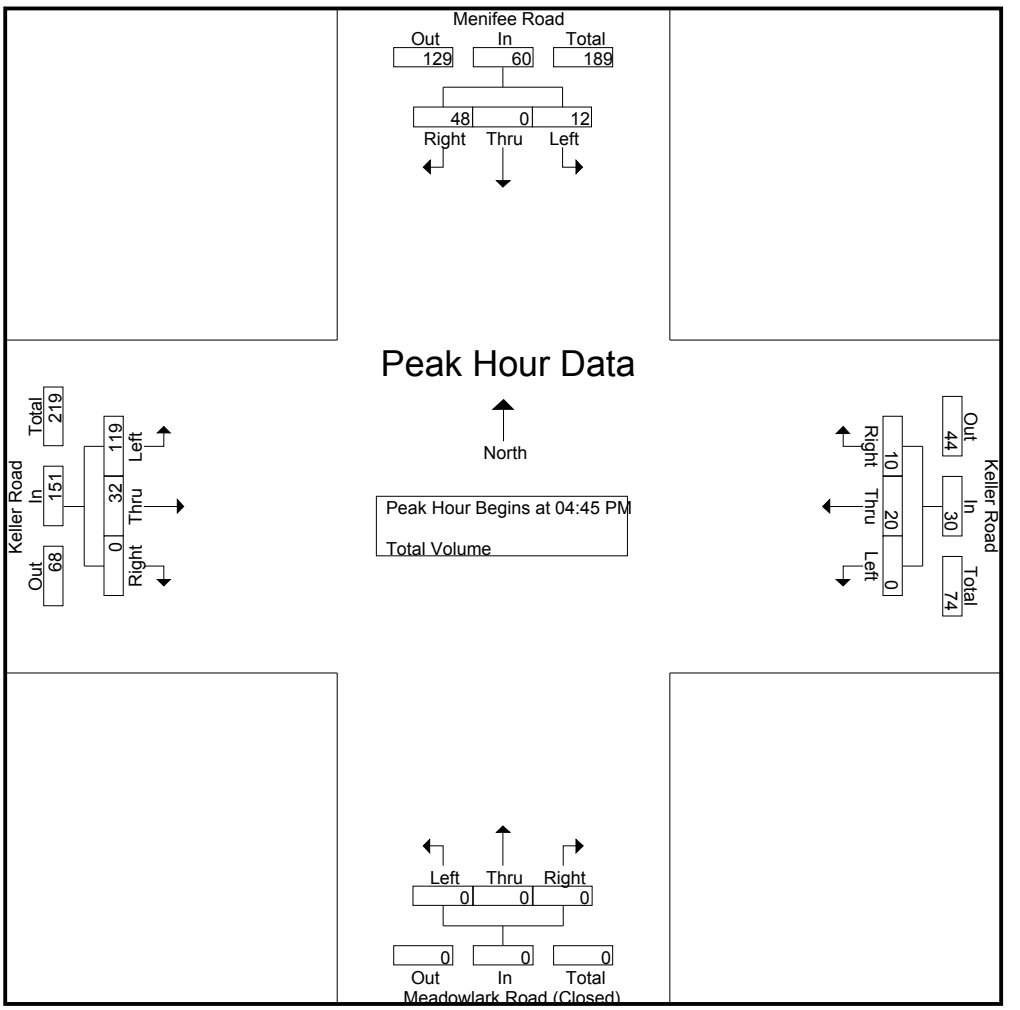
	Menifee Road Southbound				Keller Road Westbound				Meadowlark Road (Closed) Northbound				Keller Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	6	0	9	15	0	2	1	3	0	0	0	0	22	3	0	25	43
04:15 PM	2	0	19	21	0	4	0	4	0	0	0	0	30	6	0	36	61
04:30 PM	2	0	16	18	0	4	1	5	0	0	0	0	23	4	0	27	50
04:45 PM	3	0	10	13	0	7	2	9	0	0	0	0	31	11	0	42	64
Total	13	0	54	67	0	17	4	21	0	0	0	0	106	24	0	130	218
05:00 PM	2	0	14	16	0	3	1	4	0	0	0	0	23	7	0	30	50
05:15 PM	3	0	12	15	0	3	1	4	0	0	0	0	31	9	0	40	59
05:30 PM	4	0	12	16	0	7	6	13	0	0	0	0	34	5	0	39	68
05:45 PM	2	0	7	9	0	6	1	7	0	0	0	0	31	13	0	44	60
Total	11	0	45	56	0	19	9	28	0	0	0	0	119	34	0	153	237
Grand Total	24	0	99	123	0	36	13	49	0	0	0	0	225	58	0	283	455
Apprch %	19.5	0	80.5		0	73.5	26.5		0	0	0		79.5	20.5	0		
Total %	5.3	0	21.8	27	0	7.9	2.9	10.8	0	0	0	0	49.5	12.7	0	62.2	

	Menifee Road Southbound				Keller Road Westbound				Meadowlark Road (Closed) Northbound				Keller Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	3	0	10	13	0	**7**	2	9	0	0	0	0	31	**11**	0	**42**	64
05:00 PM	2	0	**14**	**16**	0	3	1	4	0	0	0	0	23	7	0	30	50
05:15 PM	3	0	12	15	0	3	1	4	0	0	0	0	31	9	0	40	59
05:30 PM	**4**	0	12	16	0	7	**6**	**13**	0	0	0	0	**34**	5	0	39	**68**
Total Volume	12	0	48	60	0	20	10	30	0	0	0	0	119	32	0	151	241
% App. Total	20	0	80		0	66.7	33.3		0	0	0		78.8	21.2	0		
PHF	.750	.000	.857	.938	.000	.714	.417	.577	.000	.000	.000	.000	.875	.727	.000	.899	.886

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: Menifee Road
E/W: Keller Road
Weather: Sunny

File Name : MURMEKEPM
Site Code : 9311043
Start Date : 12/10/2009
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:15 PM				04:45 PM				04:00 PM				05:00 PM			
+0 mins.	2	0	**19**	**21**	0	**7**	2	9	0	0	0	0	23	7	0	30
+15 mins.	2	0	16	18	0	3	1	4	0	0	0	0	31	9	0	40
+30 mins.	**3**	0	10	13	0	3	1	4	0	0	0	0	**34**	5	0	39
+45 mins.	2	0	14	16	0	7	**6**	**13**	0	0	0	0	31	**13**	0	**44**
Total Volume	9	0	59	68	0	20	10	30	0	0	0	0	119	34	0	153
% App. Total	13.2	0	86.8		0	66.7	33.3		0	0	0		77.8	22.2	0	
PHF	.750	.000	.776	.810	.000	.714	.417	.577	.000	.000	.000	.000	.875	.654	.000	.869

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: Margarita Road
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURMARMHSAM
Site Code : 9311099
Start Date : 12/8/2009
Page No : 1

Groups Printed- Total Volume

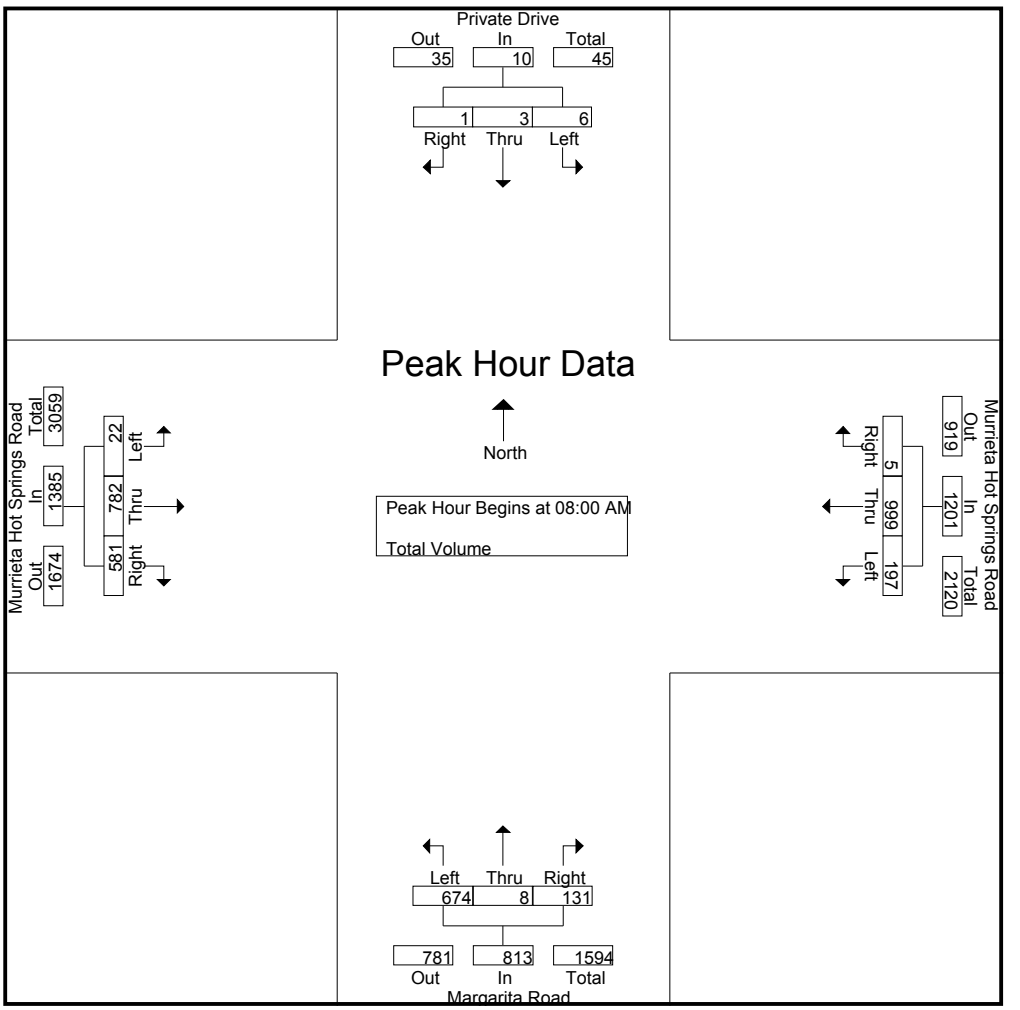
	Private Drive Southbound				Murrieta Hot Springs Road Westbound				Margarita Road Northbound				Murrieta Hot Springs Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	30	344	0	374	172	0	20	192	1	147	89	237	803
07:15 AM	0	0	0	0	46	337	4	387	114	0	15	129	2	194	93	289	805
07:30 AM	0	0	1	1	47	254	0	301	85	0	28	113	6	196	130	332	747
07:45 AM	0	2	2	4	71	251	2	324	82	1	29	112	8	235	151	394	834
Total	0	2	3	5	194	1186	6	1386	453	1	92	546	17	772	463	1252	3189
08:00 AM	2	0	0	2	66	235	0	301	143	0	39	182	2	193	124	319	804
08:15 AM	1	0	0	1	53	278	1	332	154	3	35	192	2	192	144	338	863
08:30 AM	0	2	0	2	43	223	1	267	166	2	36	204	9	189	143	341	814
08:45 AM	3	1	1	5	35	263	3	301	211	3	21	235	9	208	170	387	928
Total	6	3	1	10	197	999	5	1201	674	8	131	813	22	782	581	1385	3409
Grand Total	6	5	4	15	391	2185	11	2587	1127	9	223	1359	39	1554	1044	2637	6598
Apprch %	40	33.3	26.7		15.1	84.5	0.4		82.9	0.7	16.4		1.5	58.9	39.6		
Total %	0.1	0.1	0.1	0.2	5.9	33.1	0.2	39.2	17.1	0.1	3.4	20.6	0.6	23.6	15.8	40	

	Private Drive Southbound				Murrieta Hot Springs Road Westbound				Margarita Road Northbound				Murrieta Hot Springs Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	2	0	0	2	**66**	235	0	301	143	0	**39**	182	2	193	124	319	804
08:15 AM	1	0	0	1	53	**278**	1	**332**	154	**3**	35	192	2	192	144	338	863
08:30 AM	0	**2**	0	2	43	223	1	267	166	2	36	204	**9**	189	143	341	814
08:45 AM	**3**	1	**1**	**5**	35	263	**3**	301	**211**	3	21	**235**	9	**208**	**170**	**387**	**928**
Total Volume	6	3	1	10	197	999	5	1201	674	8	131	813	22	782	581	1385	3409
% App. Total	60	30	10		16.4	83.2	0.4		82.9	1	16.1		1.6	56.5	41.9		
PHF	.500	.375	.250	.500	.746	.898	.417	.904	.799	.667	.840	.865	.611	.940	.854	.895	.918

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: Margarita Road
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURMARMHSAM
Site Code : 9311099
Start Date : 12/8/2009



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00 AM				07:00 AM				08:00 AM				07:45 AM			
+0 mins.	2	0	0	2	30	**344**	0	374	143	0	**39**	182	8	**235**	**151**	**394**
+15 mins.	1	0	0	1	46	337	**4**	**387**	154	**3**	35	192	2	193	124	319
+30 mins.	0	**2**	0	2	47	254	0	301	166	2	36	204	2	192	144	338
+45 mins.	**3**	1	**1**	**5**	**71**	251	2	324	**211**	3	21	**235**	**9**	189	143	341
Total Volume	6	3	1	10	194	1186	6	1386	674	8	131	813	21	809	562	1392
% App. Total	60	30	10		14	85.6	0.4		82.9	1	16.1		1.5	58.1	40.4	
PHF	.500	.375	.250	.500	.683	.862	.375	.895	.799	.667	.840	.865	.583	.861	.930	.883

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: Margarita Road
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURMARMHSPM
Site Code : 9311099
Start Date : 12/8/2009
Page No : 1

Groups Printed- Total Volume

	Private Drive Southbound				Murrieta Hot Springs Road Westbound				Margarita Road Northbound				Murrieta Hot Springs Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	1	4	5	44	225	1	270	230	4	43	277	13	297	195	505	1057
04:15 PM	2	7	4	13	53	208	4	265	199	6	54	259	8	282	160	450	987
04:30 PM	9	5	17	31	47	246	3	296	199	5	47	251	4	293	184	481	1059
04:45 PM	3	2	3	8	46	245	0	291	239	6	52	297	4	295	186	485	1081
Total	14	15	28	57	190	924	8	1122	867	21	196	1084	29	1167	725	1921	4184
05:00 PM	5	5	2	12	55	237	2	294	220	5	68	293	6	296	169	471	1070
05:15 PM	3	3	4	10	38	245	2	285	221	4	58	283	4	357	148	509	1087
05:30 PM	9	3	4	16	56	199	0	255	218	3	75	296	5	262	119	386	953
05:45 PM	4	4	0	8	49	206	0	255	209	3	54	266	5	280	145	430	959
Total	21	15	10	46	198	887	4	1089	868	15	255	1138	20	1195	581	1796	4069
Grand Total	35	30	38	103	388	1811	12	2211	1735	36	451	2222	49	2362	1306	3717	8253
Apprch %	34	29.1	36.9		17.5	81.9	0.5		78.1	1.6	20.3		1.3	63.5	35.1		
Total %	0.4	0.4	0.5	1.2	4.7	21.9	0.1	26.8	21	0.4	5.5	26.9	0.6	28.6	15.8	45	

	Private Drive Southbound				Murrieta Hot Springs Road Westbound				Margarita Road Northbound				Murrieta Hot Springs Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**9**	**5**	**17**	**31**	47	**246**	**3**	**296**	199	5	47	251	4	293	184	481	1059
04:45 PM	3	2	3	8	46	245	0	291	**239**	**6**	52	**297**	4	295	**186**	485	1081
05:00 PM	5	5	2	12	**55**	237	2	294	220	5	**68**	293	**6**	296	169	471	1070
05:15 PM	3	3	4	10	38	245	2	285	221	4	58	283	4	**357**	148	**509**	**1087**
Total Volume	20	15	26	61	186	973	7	1166	879	20	225	1124	18	1241	687	1946	4297
% App. Total	32.8	24.6	42.6		16	83.4	0.6		78.2	1.8	20		0.9	63.8	35.3		
PHF	.556	.750	.382	.492	.845	.989	.583	.985	.919	.833	.827	.946	.750	.869	.923	.956	.988

Counts Unlimited Inc.
25286 Jaclyn Avenue
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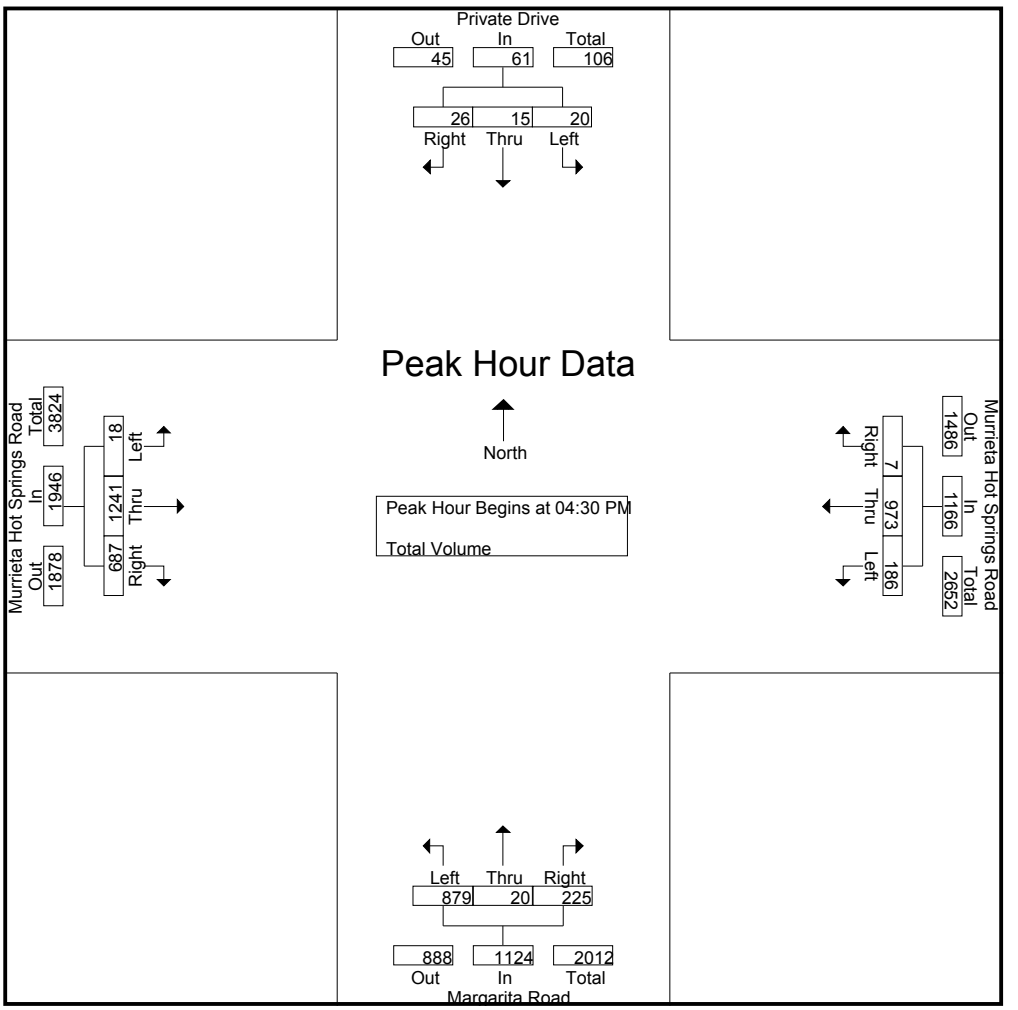
951-485-7934

City of Murrieta
N/S: Margarita Road
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURMARMHSPM
Site Code : 9311099
Start Date : 12/8/2009



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:15 PM				04:30 PM				04:45 PM				04:30 PM			
+0 mins.	2	**7**	4	13	47	**246**	**3**	**296**	**239**	**6**	52	**297**	4	293	184	481
+15 mins.	**9**	5	**17**	**31**	46	245	0	291	220	5	68	293	4	295	**186**	485
+30 mins.	3	2	3	8	**55**	237	2	294	221	4	58	283	**6**	296	169	471
+45 mins.	5	5	2	12	38	245	2	285	218	3	**75**	296	4	**357**	148	**509**
Total Volume	19	19	26	64	186	973	7	1166	898	18	253	1169	18	1241	687	1946
% App. Total	29.7	29.7	40.6		16	83.4	0.6		76.8	1.5	21.6		0.9	63.8	35.3	
PHF	.528	.679	.382	.516	.845	.989	.583	.985	.939	.750	.843	.984	.750	.869	.923	.956

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: Madison Avenue
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURMAMHSAM
Site Code : 9311044
Start Date : 12/8/2009

Groups Printed- Total Volume

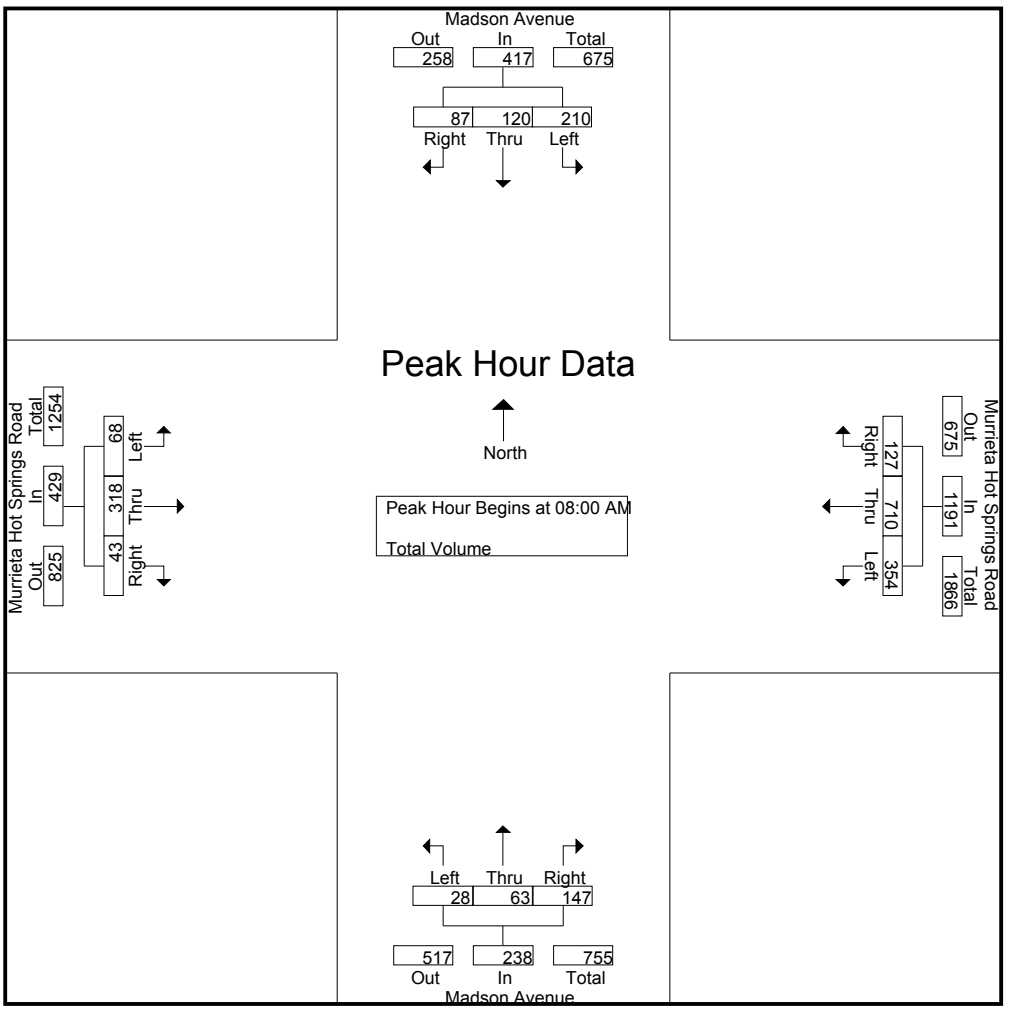
	Madson Avenue Southbound				Murrieta Hot Springs Road Westbound				Madson Avenue Northbound				Murrieta Hot Springs Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	23	30	8	61	35	77	22	134	4	15	25	44	10	38	8	56	295
07:15 AM	45	20	7	72	50	130	23	203	5	12	18	35	12	49	8	69	379
07:30 AM	35	29	16	80	62	160	33	255	7	13	26	46	5	62	3	70	451
07:45 AM	43	22	15	80	84	226	18	328	4	20	37	61	6	48	2	56	525
Total	146	101	46	293	231	593	96	920	20	60	106	186	33	197	21	251	1650
08:00 AM	41	25	17	83	72	195	40	307	5	11	16	32	11	63	5	79	501
08:15 AM	45	21	20	86	71	168	25	264	4	15	33	52	15	72	4	91	493
08:30 AM	71	25	25	121	94	166	27	287	7	12	53	72	17	100	14	131	611
08:45 AM	53	49	25	127	117	181	35	333	12	25	45	82	25	83	20	128	670
Total	210	120	87	417	354	710	127	1191	28	63	147	238	68	318	43	429	2275
Grand Total	356	221	133	710	585	1303	223	2111	48	123	253	424	101	515	64	680	3925
Apprch %	50.1	31.1	18.7		27.7	61.7	10.6		11.3	29	59.7		14.9	75.7	9.4		
Total %	9.1	5.6	3.4	18.1	14.9	33.2	5.7	53.8	1.2	3.1	6.4	10.8	2.6	13.1	1.6	17.3	

	Madson Avenue Southbound				Murrieta Hot Springs Road Westbound				Madson Avenue Northbound				Murrieta Hot Springs Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	41	25	17	83	72	**195**	**40**	307	5	11	16	32	11	63	5	79	501
08:15 AM	45	21	20	86	71	168	25	264	4	15	33	52	15	72	4	91	493
08:30 AM	**71**	25	**25**	121	94	166	27	287	7	12	**53**	72	17	**100**	14	**131**	611
08:45 AM	53	**49**	25	**127**	**117**	181	35	**333**	**12**	**25**	45	**82**	**25**	83	**20**	128	**670**
Total Volume	210	120	87	417	354	710	127	1191	28	63	147	238	68	318	43	429	2275
% App. Total	50.4	28.8	20.9		29.7	59.6	10.7		11.8	26.5	61.8		15.9	74.1	10		
PHF	.739	.612	.870	.821	.756	.910	.794	.894	.583	.630	.693	.726	.680	.795	.538	.819	.849

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: Madison Avenue
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURMAMHSAM
Site Code : 9311044
Start Date : 12/8/2009
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00 AM				08:00 AM				08:00 AM				08:00 AM			
+0 mins.	41	25	17	83	72	**195**	**40**	307	5	11	16	32	11	63	5	79
+15 mins.	45	21	20	86	71	168	25	264	4	15	33	52	15	72	4	91
+30 mins.	**71**	25	**25**	121	94	166	27	287	7	12	**53**	72	17	**100**	14	**131**
+45 mins.	53	**49**	25	**127**	**117**	181	35	**333**	**12**	**25**	45	**82**	**25**	83	**20**	128
Total Volume	210	120	87	417	354	710	127	1191	28	63	147	238	68	318	43	429
% App. Total	50.4	28.8	20.9		29.7	59.6	10.7		11.8	26.5	61.8		15.9	74.1	10	
PHF	.739	.612	.870	.821	.756	.910	.794	.894	.583	.630	.693	.726	.680	.795	.538	.819

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: Madison Avenue
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURMAMHSPM
Site Code : 9311044
Start Date : 12/8/2009
Page No : 1

Groups Printed- Total Volume

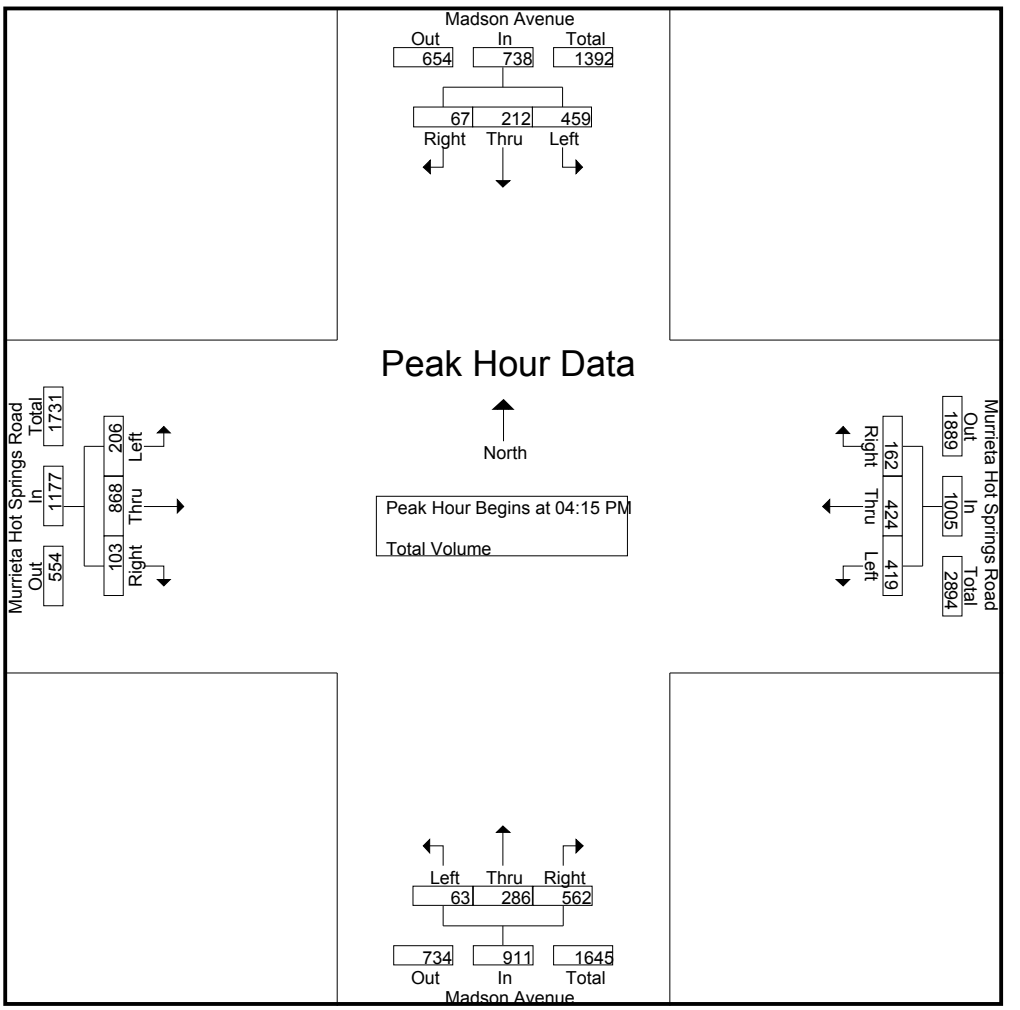
	Madson Avenue Southbound				Murrieta Hot Springs Road Westbound				Madson Avenue Northbound				Murrieta Hot Springs Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	121	65	19	205	99	93	39	231	18	58	112	188	41	166	21	228	852
04:15 PM	107	54	27	188	99	118	41	258	11	80	144	235	48	197	38	283	964
04:30 PM	129	53	14	196	116	109	47	272	21	74	143	238	52	186	23	261	967
04:45 PM	100	52	13	165	111	119	45	275	17	63	118	198	51	228	18	297	935
Total	457	224	73	754	425	439	172	1036	67	275	517	859	192	777	100	1069	3718
05:00 PM	123	53	13	189	93	78	29	200	14	69	157	240	55	257	24	336	965
05:15 PM	89	37	8	134	115	97	33	245	8	66	143	217	63	237	26	326	922
05:30 PM	112	42	17	171	120	75	31	226	18	59	131	208	46	176	15	237	842
05:45 PM	69	42	6	117	121	87	34	242	19	58	112	189	42	152	25	219	767
Total	393	174	44	611	449	337	127	913	59	252	543	854	206	822	90	1118	3496
Grand Total	850	398	117	1365	874	776	299	1949	126	527	1060	1713	398	1599	190	2187	7214
Apprch %	62.3	29.2	8.6		44.8	39.8	15.3		7.4	30.8	61.9		18.2	73.1	8.7		
Total %	11.8	5.5	1.6	18.9	12.1	10.8	4.1	27	1.7	7.3	14.7	23.7	5.5	22.2	2.6	30.3	

	Madson Avenue Southbound				Murrieta Hot Springs Road Westbound				Madson Avenue Northbound				Murrieta Hot Springs Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	107	**54**	**27**	188	99	118	41	258	11	**80**	144	235	48	197	**38**	283	964
04:30 PM	**129**	53	14	**196**	**116**	109	**47**	272	**21**	74	143	238	52	186	23	261	**967**
04:45 PM	100	52	13	165	111	**119**	45	**275**	17	63	118	198	51	228	18	297	935
05:00 PM	123	53	13	189	93	78	29	200	14	69	**157**	**240**	**55**	**257**	24	**336**	965
Total Volume	459	212	67	738	419	424	162	1005	63	286	562	911	206	868	103	1177	3831
% App. Total	62.2	28.7	9.1		41.7	42.2	16.1		6.9	31.4	61.7		17.5	73.7	8.8		
PHF	.890	.981	.620	.941	.903	.891	.862	.914	.750	.894	.895	.949	.936	.844	.678	.876	.990

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: Madison Avenue
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURMAMHSPM
Site Code : 9311044
Start Date : 12/8/2009



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:15 PM				04:30 PM			
+0 mins.	121	**65**	19	**205**	99	93	39	231	11	**80**	144	235	52	186	23	261
+15 mins.	107	54	**27**	188	99	118	41	258	**21**	74	143	238	51	228	18	297
+30 mins.	**129**	53	14	196	**116**	109	**47**	272	17	63	118	198	55	**257**	24	**336**
+45 mins.	100	52	13	165	111	**119**	45	**275**	14	69	**157**	**240**	**63**	237	**26**	326
Total Volume	457	224	73	754	425	439	172	1036	63	286	562	911	221	908	91	1220
% App. Total	60.6	29.7	9.7		41	42.4	16.6		6.9	31.4	61.7		18.1	74.4	7.5	
PHF	.886	.862	.676	.920	.916	.922	.915	.942	.750	.894	.895	.949	.877	.883	.875	.908

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: Jefferson Avenue
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURJEMHSAM
Site Code : 9311017
Start Date : 12/8/2009

Groups Printed- Total Volume

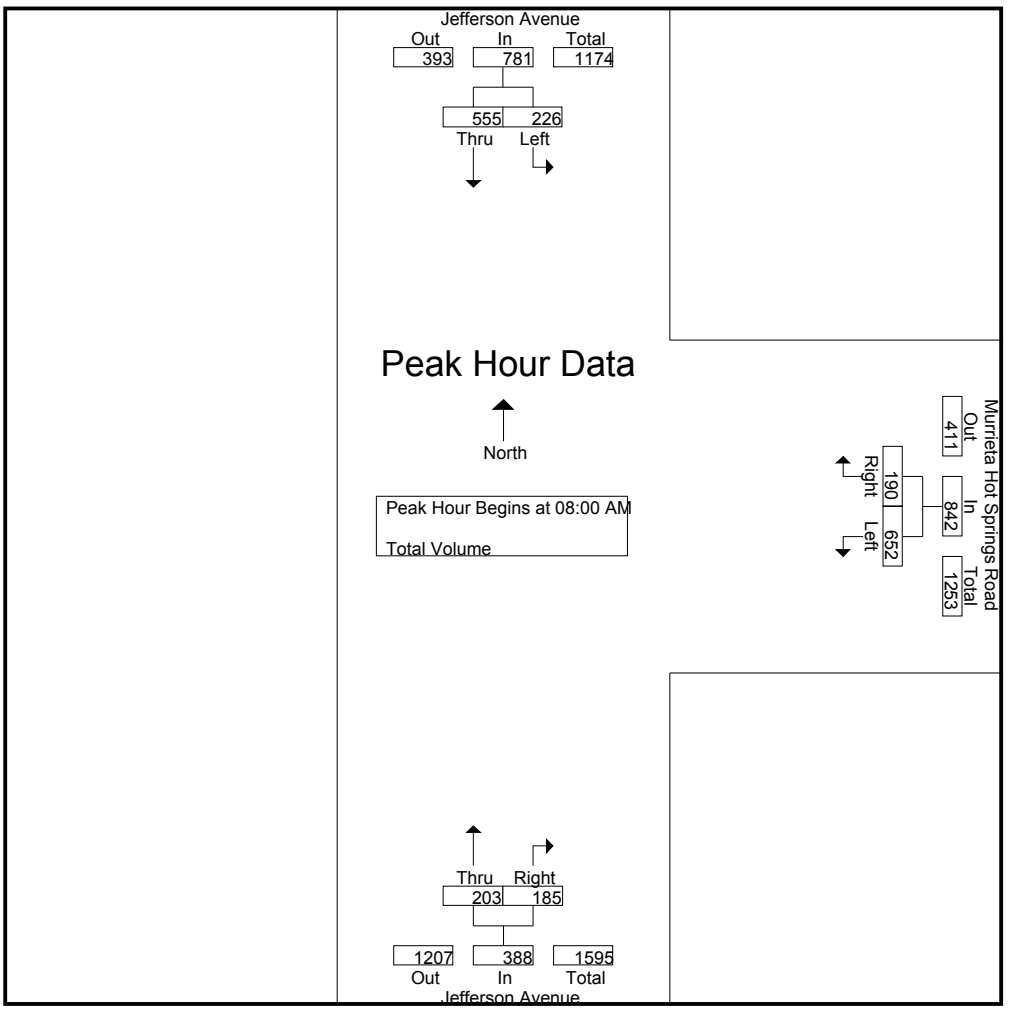
	Jefferson Avenue Southbound			Murrieta Hot Springs Road Westbound			Jefferson Avenue Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
07:00 AM	31	63	94	103	26	129	25	27	52	275
07:15 AM	34	108	142	106	24	130	23	29	52	324
07:30 AM	48	131	179	157	16	173	23	26	49	401
07:45 AM	30	158	188	217	40	257	25	29	54	499
Total	143	460	603	583	106	689	96	111	207	1499
08:00 AM	46	134	180	189	44	233	41	31	72	485
08:15 AM	43	141	184	139	47	186	52	37	89	459
08:30 AM	71	129	200	147	53	200	52	56	108	508
08:45 AM	66	151	217	177	46	223	58	61	119	559
Total	226	555	781	652	190	842	203	185	388	2011
Grand Total	369	1015	1384	1235	296	1531	299	296	595	3510
Apprch %	26.7	73.3		80.7	19.3		50.3	49.7		
Total %	10.5	28.9	39.4	35.2	8.4	43.6	8.5	8.4	17	

	Jefferson Avenue Southbound			Murrieta Hot Springs Road Westbound			Jefferson Avenue Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	46	134	180	**189**	44	**233**	41	31	72	485
08:15 AM	43	141	184	139	47	186	52	37	89	459
08:30 AM	**71**	129	200	147	**53**	200	52	56	108	508
08:45 AM	66	**151**	**217**	177	46	223	**58**	**61**	**119**	**559**
Total Volume	226	555	781	652	190	842	203	185	388	2011
% App. Total	28.9	71.1		77.4	22.6		52.3	47.7		
PHF	.796	.919	.900	.862	.896	.903	.875	.758	.815	.899

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: Jefferson Avenue
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURJEMHSAM
Site Code : 9311017
Start Date : 12/8/2009



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00 AM			07:45 AM			08:00 AM		
+0 mins.	46	134	180	**217**	40	**257**	41	31	72
+15 mins.	43	141	184	189	44	233	52	37	89
+30 mins.	**71**	129	200	139	47	186	52	56	108
+45 mins.	66	**151**	**217**	147	**53**	200	**58**	**61**	**119**
Total Volume	226	555	781	692	184	876	203	185	388
% App. Total	28.9	71.1		79	21		52.3	47.7	
PHF	.796	.919	.900	.797	.868	.852	.875	.758	.815

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: Jefferson Avenue
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURJEMHSPM
Site Code : 9311017
Start Date : 12/8/2009

Groups Printed- Total Volume

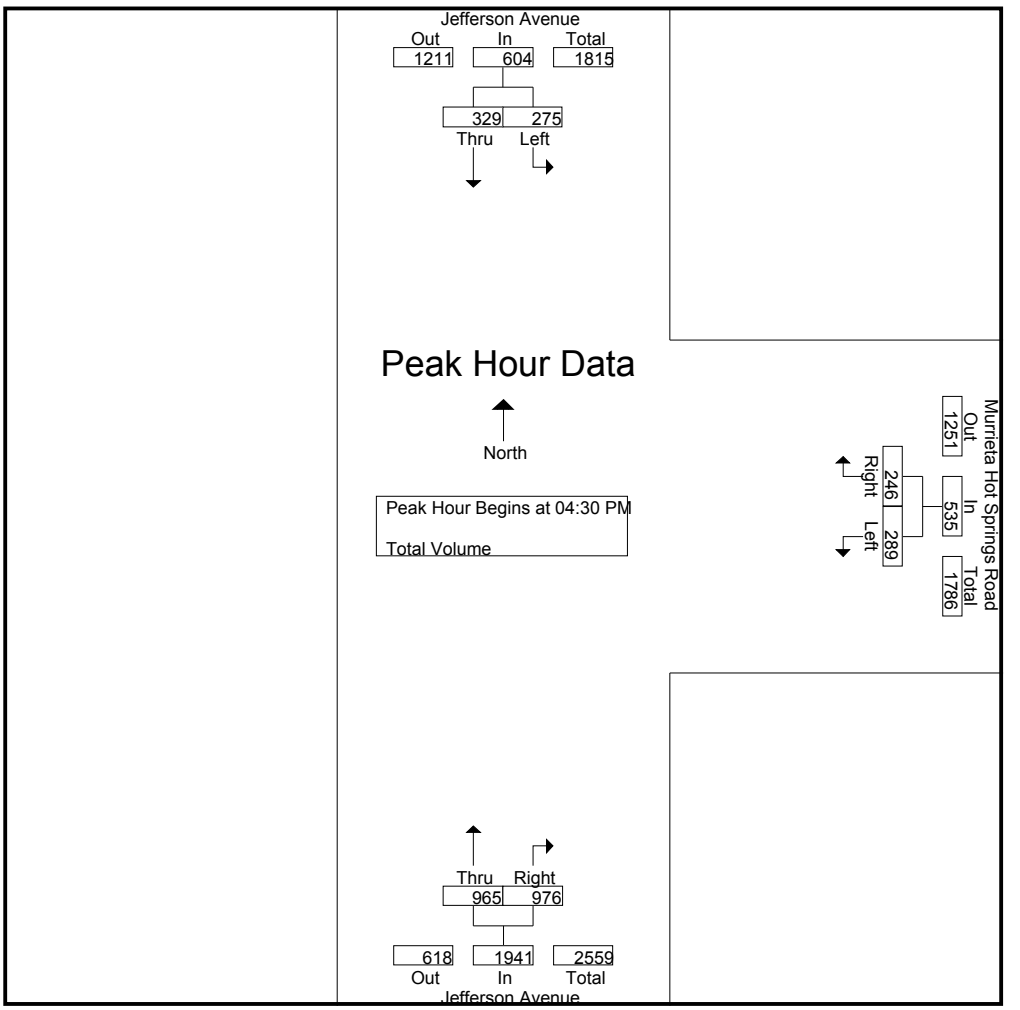
	Jefferson Avenue Southbound			Murrieta Hot Springs Road Westbound			Jefferson Avenue Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
04:00 PM	77	101	178	103	60	163	157	187	344	685
04:15 PM	84	111	195	106	59	165	189	186	375	735
04:30 PM	73	92	165	81	62	143	174	202	376	684
04:45 PM	59	83	142	79	66	145	227	219	446	733
Total	293	387	680	369	247	616	747	794	1541	2837
05:00 PM	84	79	163	88	65	153	250	282	532	848
05:15 PM	59	75	134	41	53	94	314	273	587	815
05:30 PM	57	64	121	80	41	121	215	211	426	668
05:45 PM	58	67	125	68	49	117	214	166	380	622
Total	258	285	543	277	208	485	993	932	1925	2953
Grand Total	551	672	1223	646	455	1101	1740	1726	3466	5790
Apprch %	45.1	54.9		58.7	41.3		50.2	49.8		
Total %	9.5	11.6	21.1	11.2	7.9	19	30.1	29.8	59.9	

	Jefferson Avenue Southbound			Murrieta Hot Springs Road Westbound			Jefferson Avenue Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	73	**92**	**165**	81	62	143	174	202	376	684
04:45 PM	59	83	142	79	**66**	145	227	219	446	733
05:00 PM	**84**	79	163	**88**	65	**153**	250	**282**	532	**848**
05:15 PM	59	75	134	41	53	94	**314**	273	**587**	815
Total Volume	275	329	604	289	246	535	965	976	1941	3080
% App. Total	45.5	54.5		54	46		49.7	50.3		
PHF	.818	.894	.915	.821	.932	.874	.768	.865	.827	.908

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: Jefferson Avenue
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURJEMHSPM
Site Code : 9311017
Start Date : 12/8/2009



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM			04:00 PM			04:45 PM		
+0 mins.	77	101	178	103	60	163	227	219	446
+15 mins.	**84**	**111**	**195**	**106**	59	**165**	250	**282**	532
+30 mins.	73	92	165	81	62	143	**314**	273	**587**
+45 mins.	59	83	142	79	**66**	145	215	211	426
Total Volume	293	387	680	369	247	616	1006	985	1991
% App. Total	43.1	56.9		59.9	40.1		50.5	49.5	
PHF	.872	.872	.872	.870	.936	.933	.801	.873	.848

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: Jefferson Avenue
E/W: Guava Street
Weather: Sunny

File Name : MURJEGUAM
Site Code : 9311037
Start Date : 12/8/2009

Groups Printed- Total Volume

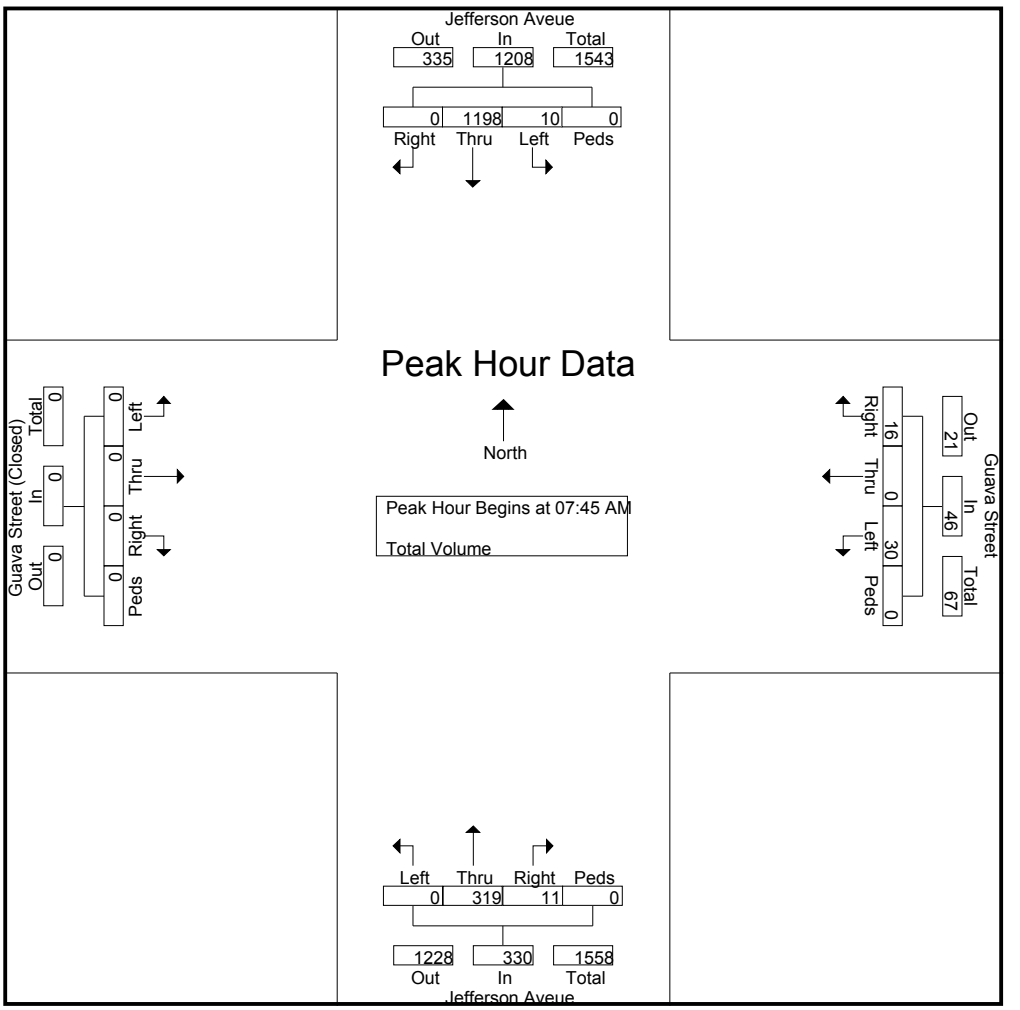
	Jefferson Aveue Southbound					Guava Street Westbound					Jefferson Aveue Northbound					Guava Street (Closed) Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	3	162	0	0	165	3	0	1	0	4	0	46	2	0	48	0	0	0	0	0	217
07:15 AM	1	204	0	0	205	10	0	0	0	10	0	54	1	0	55	0	0	0	0	0	270
07:30 AM	2	270	0	0	272	6	0	1	0	7	0	52	4	0	56	0	0	0	0	0	335
07:45 AM	2	373	0	0	375	10	0	0	0	10	0	57	1	0	58	0	0	0	0	0	443
Total	8	1009	0	0	1017	29	0	2	0	31	0	209	8	0	217	0	0	0	0	0	1265
08:00 AM	1	322	0	0	323	6	0	5	0	11	0	67	6	0	73	0	0	0	0	0	407
08:15 AM	1	252	0	0	253	9	0	6	0	15	0	84	2	0	86	0	0	0	0	0	354
08:30 AM	6	251	0	0	257	5	0	5	0	10	0	111	2	0	113	0	0	0	0	0	380
08:45 AM	5	314	0	0	319	6	0	6	0	12	0	106	6	0	112	0	0	0	0	0	443
Total	13	1139	0	0	1152	26	0	22	0	48	0	368	16	0	384	0	0	0	0	0	1584
Grand Total	21	2148	0	0	2169	55	0	24	0	79	0	577	24	0	601	0	0	0	0	0	2849
Apprch %	1	99	0	0		69.6	0	30.4	0		0	96	4	0		0	0	0	0		
Total %	0.7	75.4	0	0	76.1	1.9	0	0.8	0	2.8	0	20.3	0.8	0	21.1	0	0	0	0	0	

	Jefferson Aveue Southbound					Guava Street Westbound					Jefferson Aveue Northbound					Guava Street (Closed) Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	2	**373**	0	0	**375**	**10**	0	0	0	10	0	57	1	0	58	0	0	0	0	0	**443**
08:00 AM	1	322	0	0	323	6	0	5	0	11	0	67	**6**	0	73	0	0	0	0	0	407
08:15 AM	1	252	0	0	253	9	0	**6**	0	**15**	0	84	2	0	86	0	0	0	0	0	354
08:30 AM	**6**	251	0	0	257	5	0	5	0	10	0	**111**	2	0	**113**	0	0	0	0	0	380
Total Volume	10	1198	0	0	1208	30	0	16	0	46	0	319	11	0	330	0	0	0	0	0	1584
% App. Total	0.8	99.2	0	0		65.2	0	34.8	0		0	96.7	3.3	0		0	0	0	0		
PHF	.417	.803	.000	.000	.805	.750	.000	.667	.000	.767	.000	.718	.458	.000	.730	.000	.000	.000	.000	.000	.894

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: Jefferson Avenue
E/W: Guava Street
Weather: Sunny

File Name : MURJEGUAM
Site Code : 9311037
Start Date : 12/8/2009
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:30 AM					08:00 AM					08:00 AM					07:00 AM				
+0 mins.	**2**	270	0	0	272	6	0	5	0	11	0	67	**6**	0	73	0	0	0	0	0
+15 mins.	2	**373**	0	0	**375**	**9**	0	**6**	0	**15**	0	84	2	0	86	0	0	0	0	0
+30 mins.	1	322	0	0	323	5	0	5	0	10	0	**111**	2	0	**113**	0	0	0	0	0
+45 mins.	1	252	0	0	253	6	0	6	0	12	0	106	6	0	112	0	0	0	0	0
Total Volume	6	1217	0	0	1223	26	0	22	0	48	0	368	16	0	384	0	0	0	0	0
% App. Total	0.5	99.5	0	0		54.2	0	45.8	0		0	95.8	4.2	0		0	0	0	0	
PHF	.750	.816	.000	.000	.815	.722	.000	.917	.000	.800	.000	.829	.667	.000	.850	.000	.000	.000	.000	.000

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: Jefferson Avenue
E/W: Guava Street
Weather: Sunny

File Name : MURJEGUPM
Site Code : 9311037
Start Date : 12/8/2009

Groups Printed- Total Volume

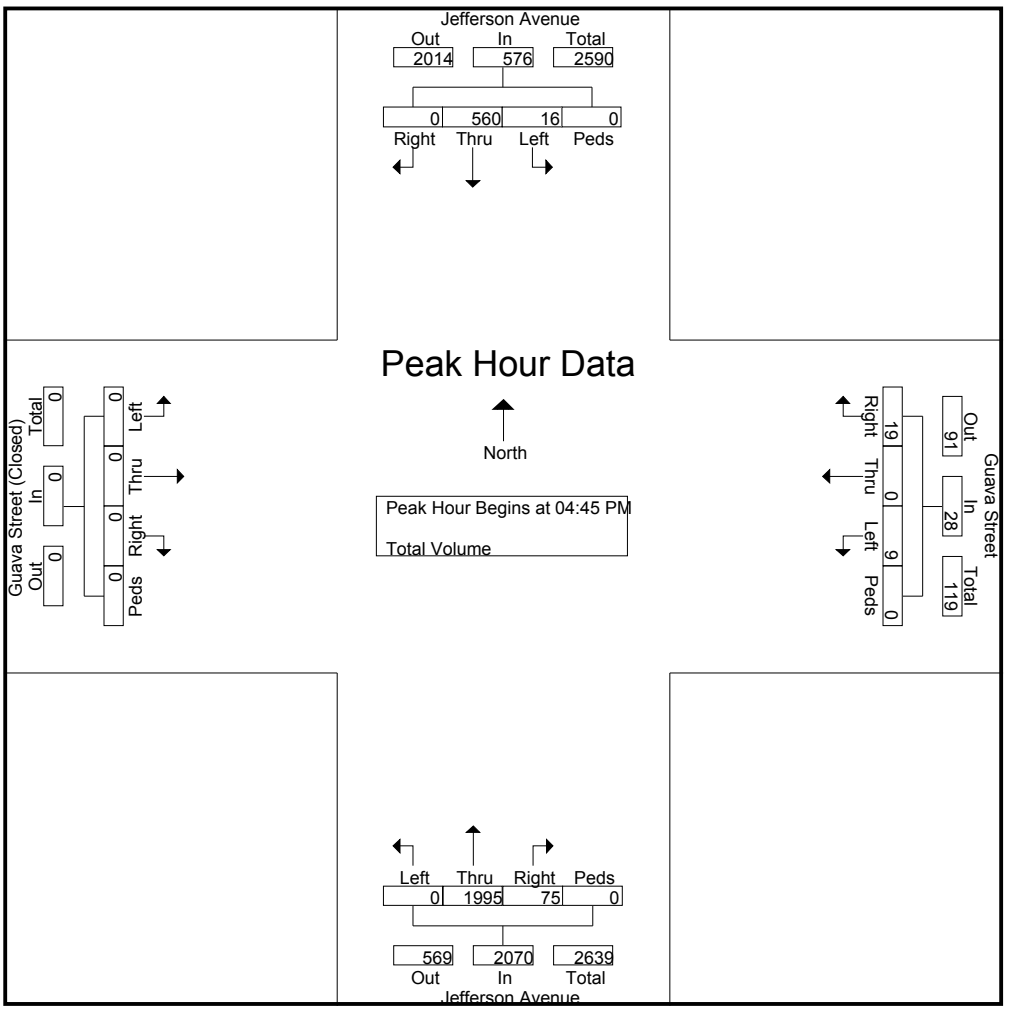
	Jefferson Avenue Southbound					Guava Street Westbound					Jefferson Avenue Northbound					Guava Street (Closed) Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
04:00 PM	4	172	0	0	176	5	0	7	0	12	0	361	15	0	376	0	0	0	0	0	564
04:15 PM	2	198	0	0	200	6	0	6	0	12	0	337	17	0	354	0	0	0	0	0	566
04:30 PM	4	174	0	0	178	3	0	3	0	6	0	359	22	0	381	0	0	0	0	0	565
04:45 PM	3	160	0	0	163	0	0	4	0	4	0	445	14	0	459	0	0	0	0	0	626
Total	13	704	0	0	717	14	0	20	0	34	0	1502	68	0	1570	0	0	0	0	0	2321
05:00 PM	5	153	0	0	158	3	0	6	0	9	0	553	25	0	578	0	0	0	0	0	745
05:15 PM	2	127	0	0	129	5	0	4	0	9	0	573	23	0	596	0	0	0	0	0	734
05:30 PM	6	120	0	0	126	1	0	5	0	6	0	424	13	0	437	0	0	0	0	0	569
05:45 PM	4	134	0	0	138	3	0	3	0	6	0	362	5	0	367	0	0	0	0	0	511
Total	17	534	0	0	551	12	0	18	0	30	0	1912	66	0	1978	0	0	0	0	0	2559
Grand Total	30	1238	0	0	1268	26	0	38	0	64	0	3414	134	0	3548	0	0	0	0	0	4880
Apprch %	2.4	97.6	0	0		40.6	0	59.4	0		0	96.2	3.8	0		0	0	0	0		
Total %	0.6	25.4	0	0	26	0.5	0	0.8	0	1.3	0	70	2.7	0	72.7	0	0	0	0	0	

	Jefferson Avenue Southbound					Guava Street Westbound					Jefferson Avenue Northbound					Guava Street (Closed) Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	3	**160**	0	0	**163**	0	0	4	0	4	0	445	14	0	459	0	0	0	0	0	626
05:00 PM	5	153	0	0	158	3	0	**6**	0	**9**	0	553	**25**	0	578	0	0	0	0	0	**745**
05:15 PM	2	127	0	0	129	**5**	0	4	0	9	0	**573**	23	0	**596**	0	0	0	0	0	734
05:30 PM	**6**	120	0	0	126	1	0	5	0	6	0	424	13	0	437	0	0	0	0	0	569
Total Volume	16	560	0	0	576	9	0	19	0	28	0	1995	75	0	2070	0	0	0	0	0	2674
% App. Total	2.8	97.2	0	0		32.1	0	67.9	0		0	96.4	3.6	0		0	0	0	0		
PHF	.667	.875	.000	.000	.883	.450	.000	.792	.000	.778	.000	.870	.750	.000	.868	.000	.000	.000	.000	.000	.897

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: Jefferson Avenue
E/W: Guava Street
Weather: Sunny

File Name : MURJEGUPM
Site Code : 9311037
Start Date : 12/8/2009
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM					04:00 PM					04:45 PM					04:00 PM				
+0 mins.	**4**	172	0	0	176	5	0	**7**	0	**12**	0	445	14	0	459	0	0	0	0	0
+15 mins.	2	**198**	0	0	**200**	**6**	0	6	0	12	0	553	**25**	0	578	0	0	0	0	0
+30 mins.	4	174	0	0	178	3	0	3	0	6	0	**573**	23	0	**596**	0	0	0	0	0
+45 mins.	3	160	0	0	163	0	0	4	0	4	0	424	13	0	437	0	0	0	0	0
Total Volume	13	704	0	0	717	14	0	20	0	34	0	1995	75	0	2070	0	0	0	0	0
% App. Total	1.8	98.2	0	0		41.2	0	58.8	0		0	96.4	3.6	0		0	0	0	0	
PHF	.813	.889	.000	.000	.896	.583	.000	.714	.000	.708	.000	.870	.750	.000	.868	.000	.000	.000	.000	.000

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: Jefferson Avenue
E/W: Cherry Street
Weather: Cloudy

File Name : MURJECHAM
Site Code : 9311043
Start Date : 12/9/2009
Page No : 1

Groups Printed- Total Volume

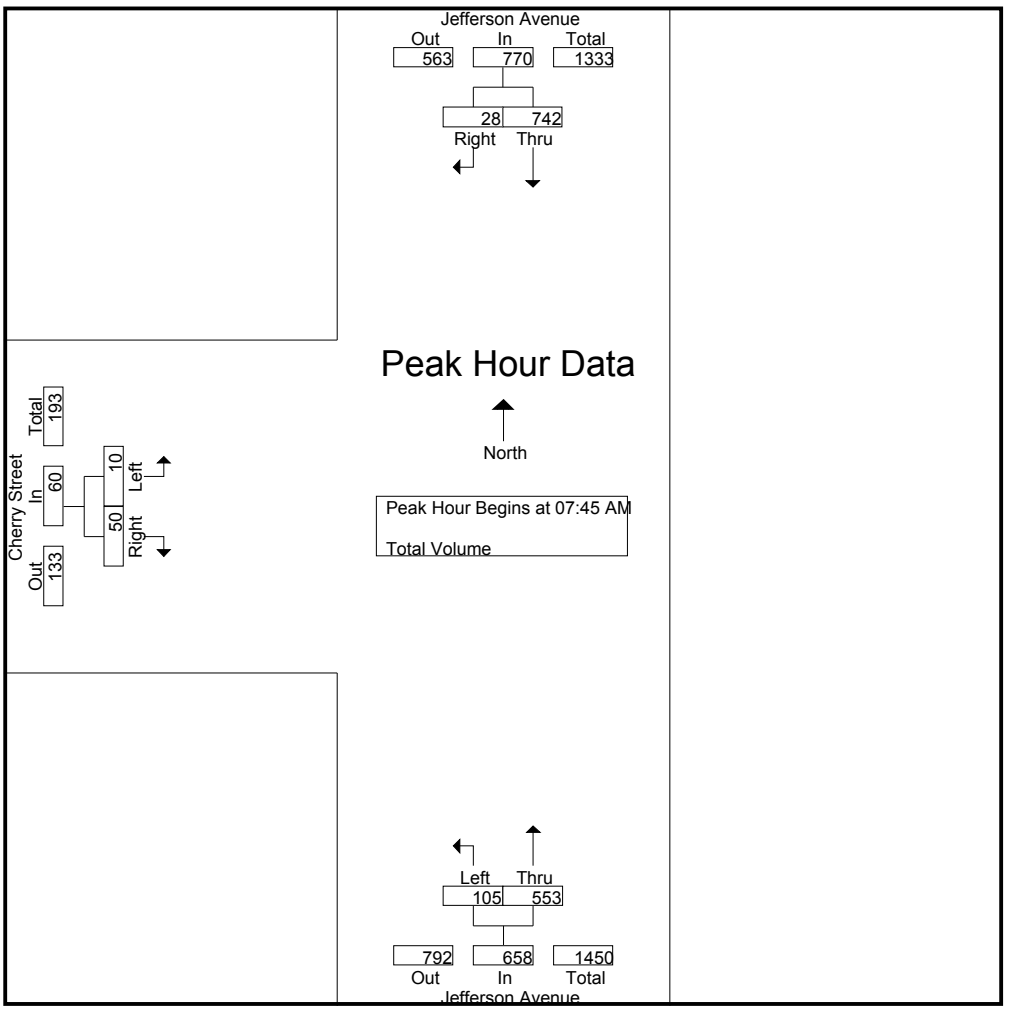
	Jefferson Avenue Southbound			Jefferson Avenue Northbound			Cherry Street Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
07:00 AM	93	2	95	10	67	77	0	4	4	176
07:15 AM	111	2	113	23	69	92	0	4	4	209
07:30 AM	151	4	155	25	83	108	0	7	7	270
07:45 AM	207	6	213	25	137	162	2	11	13	388
Total	562	14	576	83	356	439	2	26	28	1043
08:00 AM	179	9	188	25	145	170	1	7	8	366
08:15 AM	194	7	201	23	129	152	4	14	18	371
08:30 AM	162	6	168	32	142	174	3	18	21	363
08:45 AM	162	0	162	18	163	181	0	15	15	358
Total	697	22	719	98	579	677	8	54	62	1458
Grand Total	1259	36	1295	181	935	1116	10	80	90	2501
Apprch %	97.2	2.8		16.2	83.8		11.1	88.9		
Total %	50.3	1.4	51.8	7.2	37.4	44.6	0.4	3.2	3.6	

	Jefferson Avenue Southbound			Jefferson Avenue Northbound			Cherry Street Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	**207**	6	**213**	25	137	162	2	11	13	**388**
08:00 AM	179	**9**	188	25	**145**	170	1	7	8	366
08:15 AM	194	7	201	23	129	152	**4**	14	18	371
08:30 AM	162	6	168	**32**	142	**174**	3	**18**	**21**	363
Total Volume	742	28	770	105	553	658	10	50	60	1488
% App. Total	96.4	3.6		16	84		16.7	83.3		
PHF	.896	.778	.904	.820	.953	.945	.625	.694	.714	.959

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: Jefferson Avenue
E/W: Cherry Street
Weather: Cloudy

File Name : MURJECHAM
Site Code : 9311043
Start Date : 12/9/2009
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:45 AM			08:00 AM			08:00 AM		
+0 mins.	**207**	6	**213**	25	145	170	1	7	8
+15 mins.	179	**9**	188	23	129	152	**4**	14	18
+30 mins.	194	7	201	**32**	142	174	3	**18**	**21**
+45 mins.	162	6	168	18	**163**	**181**	0	15	15
Total Volume	742	28	770	98	579	677	8	54	62
% App. Total	96.4	3.6		14.5	85.5		12.9	87.1	
PHF	.896	.778	.904	.766	.888	.935	.500	.750	.738

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: Jefferson Avenue
E/W: Cherry Street
Weather: Cloudy

File Name : MURJECHPM
Site Code : 9311043
Start Date : 12/9/2009

Groups Printed- Total Volume

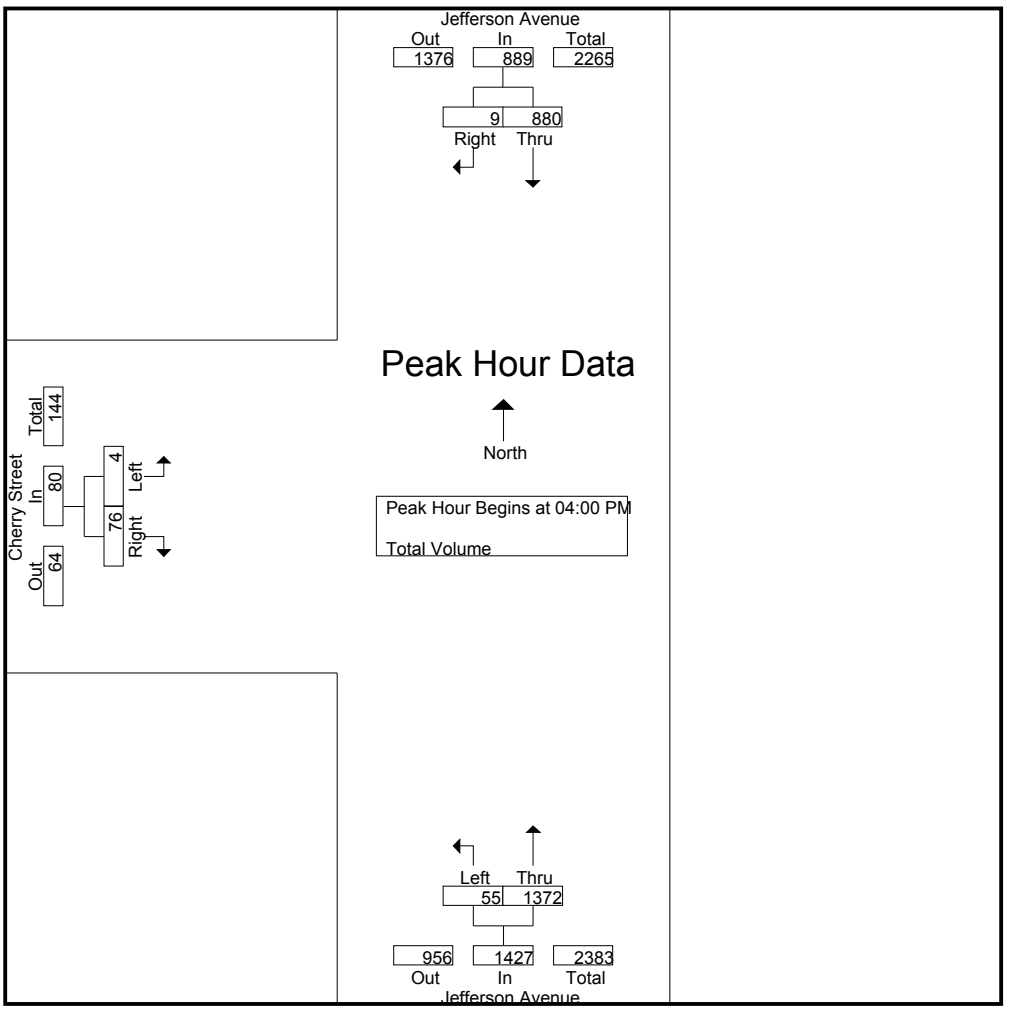
	Jefferson Avenue Southbound			Jefferson Avenue Northbound			Cherry Street Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
04:00 PM	249	3	252	17	319	336	2	26	28	616
04:15 PM	209	2	211	20	353	373	2	13	15	599
04:30 PM	235	2	237	9	364	373	0	18	18	628
04:45 PM	187	2	189	9	336	345	0	19	19	553
Total	880	9	889	55	1372	1427	4	76	80	2396
05:00 PM	220	3	223	12	343	355	1	13	14	592
05:15 PM	164	3	167	8	421	429	1	12	13	609
05:30 PM	158	1	159	8	343	351	0	14	14	524
05:45 PM	175	3	178	10	231	241	1	8	9	428
Total	717	10	727	38	1338	1376	3	47	50	2153
Grand Total	1597	19	1616	93	2710	2803	7	123	130	4549
Apprch %	98.8	1.2		3.3	96.7		5.4	94.6		
Total %	35.1	0.4	35.5	2	59.6	61.6	0.2	2.7	2.9	

	Jefferson Avenue Southbound			Jefferson Avenue Northbound			Cherry Street Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	**249**	**3**	**252**	17	319	336	**2**	**26**	**28**	616
04:15 PM	209	2	211	**20**	353	**373**	2	13	15	599
04:30 PM	235	2	237	9	**364**	373	0	18	18	**628**
04:45 PM	187	2	189	9	336	345	0	19	19	553
Total Volume	880	9	889	55	1372	1427	4	76	80	2396
% App. Total	99	1		3.9	96.1		5	95		
PHF	.884	.750	.882	.688	.942	.956	.500	.731	.714	.954

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: Jefferson Avenue
E/W: Cherry Street
Weather: Cloudy

File Name : MURJECHPM
Site Code : 9311043
Start Date : 12/9/2009



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM			04:30 PM			04:00 PM		
+0 mins.	**249**	**3**	**252**	9	364	373	**2**	**26**	**28**
+15 mins.	209	2	211	9	336	345	2	13	15
+30 mins.	235	2	237	**12**	343	355	0	18	18
+45 mins.	187	2	189	8	**421**	**429**	0	19	19
Total Volume	880	9	889	38	1464	1502	4	76	80
% App. Total	99	1		2.5	97.5		5	95	
PHF	.884	.750	.882	.792	.869	.875	.500	.731	.714

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: Jackson Avenue
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURJAMHSAM
Site Code : 9311098
Start Date : 12/8/2009

Groups Printed- Total Volume

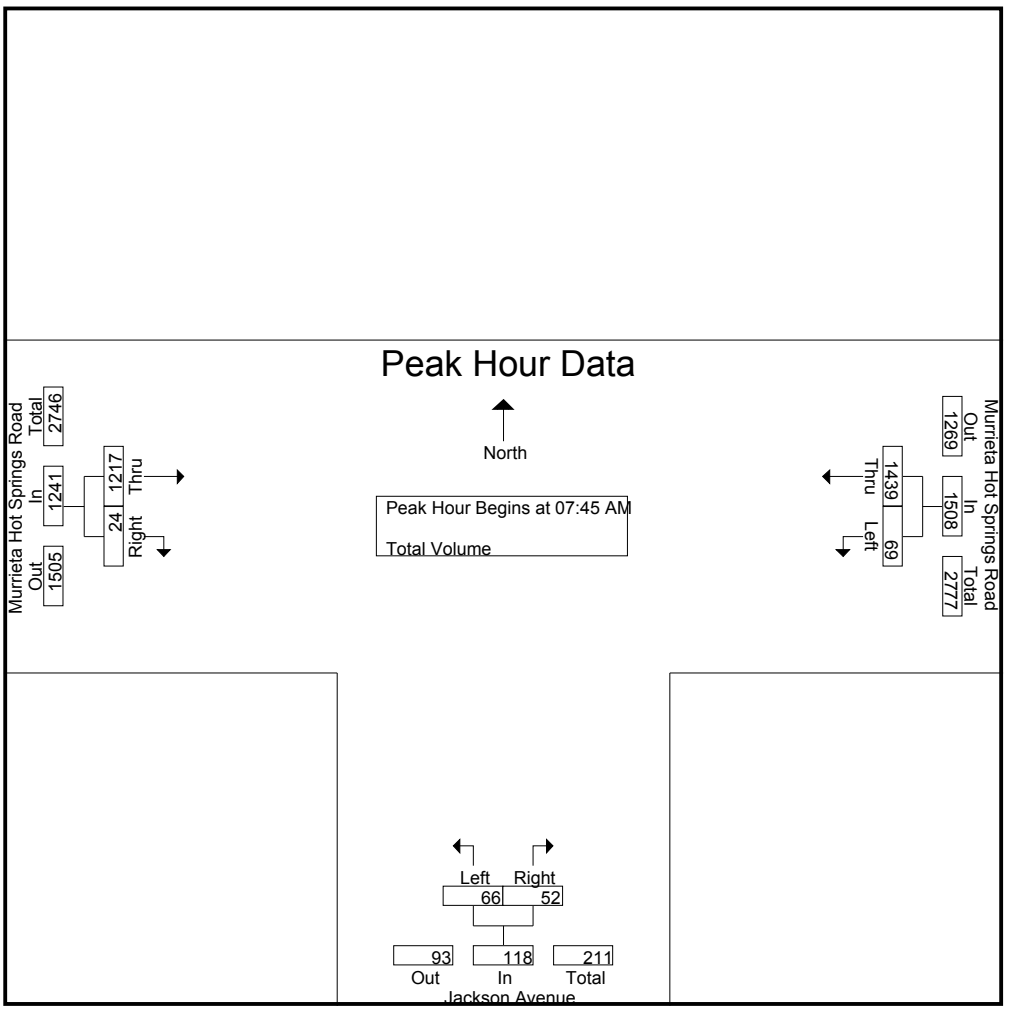
	Murrieta Hot Springs Road Westbound			Jackson Avenue Northbound			Murrieta Hot Springs Road Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
07:00 AM	6	460	466	12	8	20	173	6	179	665
07:15 AM	12	415	427	8	4	12	221	1	222	661
07:30 AM	12	317	329	10	8	18	275	5	280	627
07:45 AM	11	359	370	11	20	31	342	9	351	752
Total	41	1551	1592	41	40	81	1011	21	1032	2705
08:00 AM	16	322	338	23	9	32	279	3	282	652
08:15 AM	18	381	399	17	11	28	269	9	278	705
08:30 AM	24	377	401	15	12	27	327	3	330	758
08:45 AM	34	396	430	15	14	29	268	9	277	736
Total	92	1476	1568	70	46	116	1143	24	1167	2851
Grand Total	133	3027	3160	111	86	197	2154	45	2199	5556
Apprch %	4.2	95.8		56.3	43.7		98	2		
Total %	2.4	54.5	56.9	2	1.5	3.5	38.8	0.8	39.6	

	Murrieta Hot Springs Road Westbound			Jackson Avenue Northbound			Murrieta Hot Springs Road Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	11	359	370	11	**20**	31	**342**	**9**	**351**	752
08:00 AM	16	322	338	**23**	9	**32**	279	3	282	652
08:15 AM	18	**381**	399	17	11	28	269	9	278	705
08:30 AM	**24**	377	**401**	15	12	27	327	3	330	**758**
Total Volume	69	1439	1508	66	52	118	1217	24	1241	2867
% App. Total	4.6	95.4		55.9	44.1		98.1	1.9		
PHF	.719	.944	.940	.717	.650	.922	.890	.667	.884	.946

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: Jackson Avenue
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURJAMHSAM
Site Code : 9311098
Start Date : 12/8/2009
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM			07:45 AM			07:45 AM		
+0 mins.	6	**460**	**466**	11	**20**	31	**342**	**9**	**351**
+15 mins.	**12**	415	427	**23**	9	**32**	279	3	282
+30 mins.	12	317	329	17	11	28	269	9	278
+45 mins.	11	359	370	15	12	27	327	3	330
Total Volume	41	1551	1592	66	52	118	1217	24	1241
% App. Total	2.6	97.4		55.9	44.1		98.1	1.9	
PHF	.854	.843	.854	.717	.650	.922	.890	.667	.884

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: Jackson Avenue
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURJAMHSPM
Site Code : 9311098
Start Date : 12/8/2009

Groups Printed- Total Volume

	Murrieta Hot Springs Road Westbound			Jackson Avenue Northbound			Murrieta Hot Springs Road Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
04:00 PM	33	432	465	14	28	42	438	8	446	953
04:15 PM	17	355	372	32	21	53	464	18	482	907
04:30 PM	28	398	426	17	26	43	474	13	487	956
04:45 PM	34	359	393	22	28	50	504	9	513	956
Total	112	1544	1656	85	103	188	1880	48	1928	3772
05:00 PM	36	428	464	28	26	54	474	13	487	1005
05:15 PM	38	392	430	23	31	54	516	8	524	1008
05:30 PM	21	394	415	21	15	36	439	14	453	904
05:45 PM	25	349	374	16	28	44	445	10	455	873
Total	120	1563	1683	88	100	188	1874	45	1919	3790
Grand Total	232	3107	3339	173	203	376	3754	93	3847	7562
Apprch %	6.9	93.1		46	54		97.6	2.4		
Total %	3.1	41.1	44.2	2.3	2.7	5	49.6	1.2	50.9	

	Murrieta Hot Springs Road Westbound			Jackson Avenue Northbound			Murrieta Hot Springs Road Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	28	398	426	17	26	43	474	**13**	487	956
04:45 PM	34	359	393	22	28	50	504	9	513	956
05:00 PM	36	**428**	**464**	**28**	26	**54**	474	13	487	1005
05:15 PM	**38**	392	430	23	**31**	54	**516**	8	**524**	**1008**
Total Volume	136	1577	1713	90	111	201	1968	43	2011	3925
% App. Total	7.9	92.1		44.8	55.2		97.9	2.1		
PHF	.895	.921	.923	.804	.895	.931	.953	.827	.959	.973

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
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City of Murrieta
N/S: Jackson Avenue
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURJAMHSPM
Site Code : 9311098
Start Date : 12/8/2009
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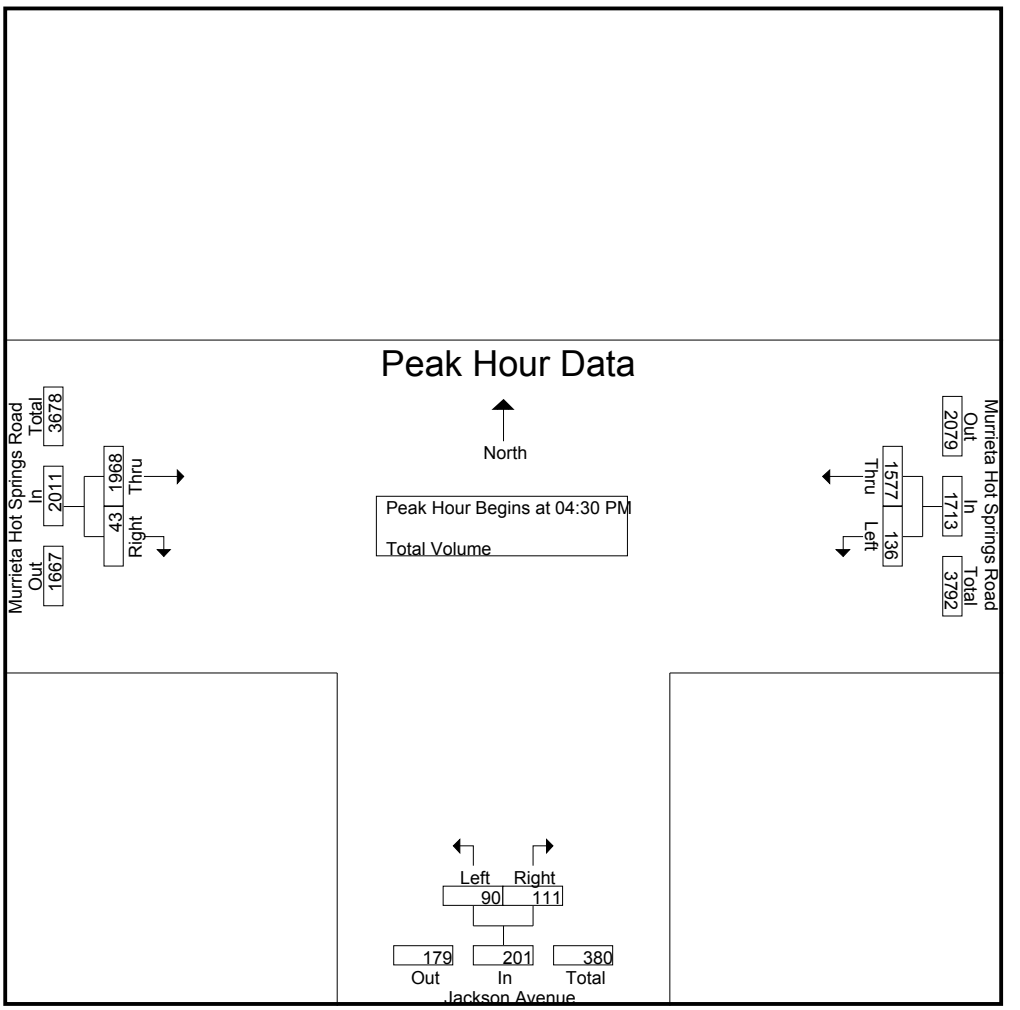

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:30 PM			04:30 PM			04:30 PM		
+0 mins.	28	398	426	17	26	43	474	**13**	487
+15 mins.	34	359	393	22	28	50	504	9	513
+30 mins.	36	**428**	**464**	**28**	26	**54**	474	13	487
+45 mins.	**38**	392	430	23	**31**	54	**516**	8	**524**
Total Volume	136	1577	1713	90	111	201	1968	43	2011
% App. Total	7.9	92.1		44.8	55.2		97.9	2.1	
PHF	.895	.921	.923	.804	.895	.931	.953	.827	.959

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: California Oaks Road
E/W: Clinton Keith Road
Weather: Sunny

File Name : MURCOCKAM
Site Code : 9311025
Start Date : 12/9/2009

Groups Printed- Total Volume

	Clinton Keith Road Westbound			California Oaks Road Northbound			Clinton Keith Road Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
07:00 AM	52	132	184	13	52	65	176	14	190	439
07:15 AM	79	127	206	14	42	56	120	19	139	401
07:30 AM	92	123	215	19	57	76	166	16	182	473
07:45 AM	75	129	204	21	66	87	127	21	148	439
Total	298	511	809	67	217	284	589	70	659	1752
08:00 AM	70	111	181	15	67	82	140	25	165	428
08:15 AM	143	146	289	24	87	111	126	34	160	560
08:30 AM	119	146	265	33	102	135	108	36	144	544
08:45 AM	105	105	210	39	83	122	119	18	137	469
Total	437	508	945	111	339	450	493	113	606	2001
Grand Total	735	1019	1754	178	556	734	1082	183	1265	3753
Apprch %	41.9	58.1		24.3	75.7		85.5	14.5		
Total %	19.6	27.2	46.7	4.7	14.8	19.6	28.8	4.9	33.7	

	Clinton Keith Road Westbound			California Oaks Road Northbound			Clinton Keith Road Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	70	111	181	15	67	82	**140**	25	**165**	428
08:15 AM	**143**	**146**	**289**	24	87	111	126	34	160	**560**
08:30 AM	119	146	265	33	**102**	**135**	108	**36**	144	544
08:45 AM	105	105	210	**39**	83	122	119	18	137	469
Total Volume	437	508	945	111	339	450	493	113	606	2001
% App. Total	46.2	53.8		24.7	75.3		81.4	18.6		
PHF	.764	.870	.817	.712	.831	.833	.880	.785	.918	.893

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
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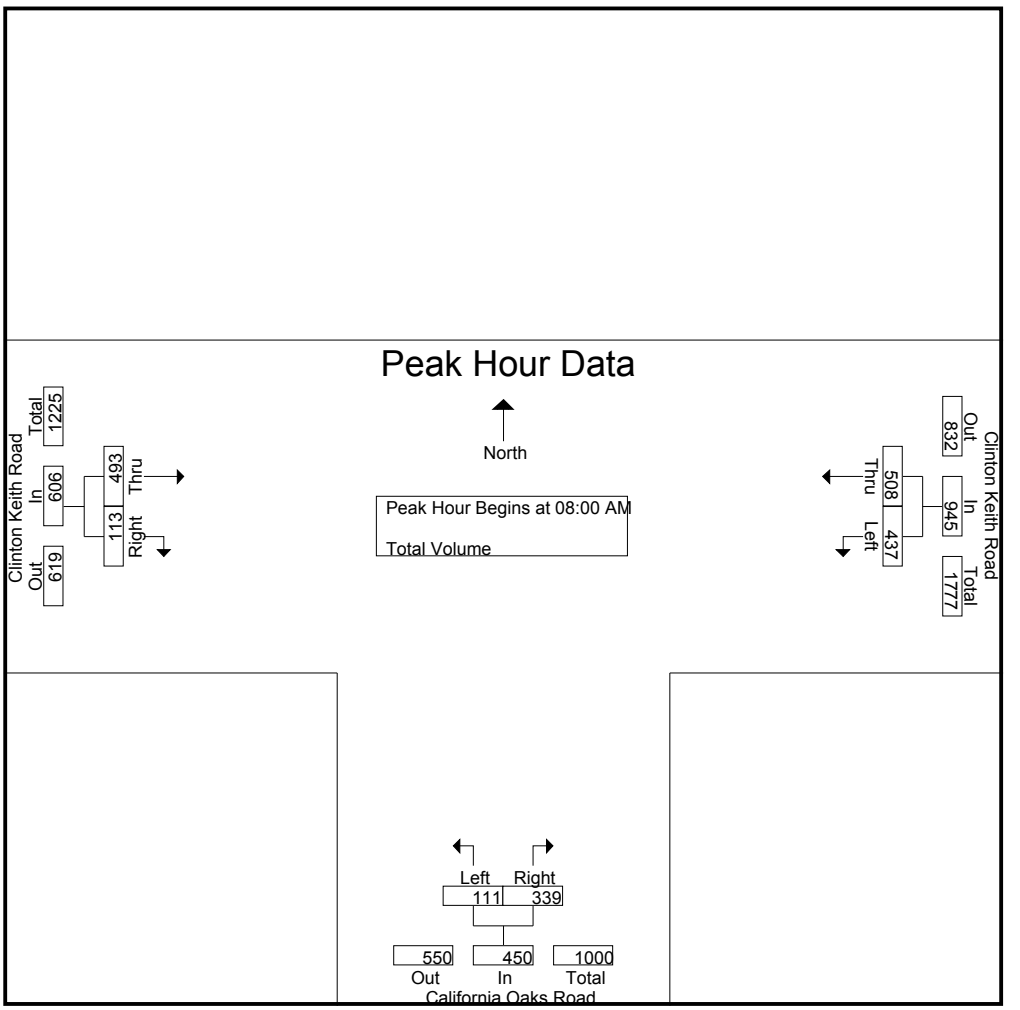
City of Murrieta
N/S: California Oaks Road
E/W: Clinton Keith Road
Weather: Sunny

File Name : MURCOCKAM
Site Code : 9311025
Start Date : 12/9/2009



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00 AM			08:00 AM			07:00 AM		
+0 mins.	70	111	181	15	67	82	**176**	14	**190**
+15 mins.	**143**	**146**	**289**	24	87	111	120	19	139
+30 mins.	119	146	265	33	**102**	**135**	166	16	182
+45 mins.	105	105	210	**39**	83	122	127	**21**	148
Total Volume	437	508	945	111	339	450	589	70	659
% App. Total	46.2	53.8		24.7	75.3		89.4	10.6	
PHF	.764	.870	.817	.712	.831	.833	.837	.833	.867

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: California Oaks Road
E/W: Clinton Keith Road
Weather: Sunny

File Name : MURCOCKPM
Site Code : 9311025
Start Date : 12/9/2009

Groups Printed- Total Volume

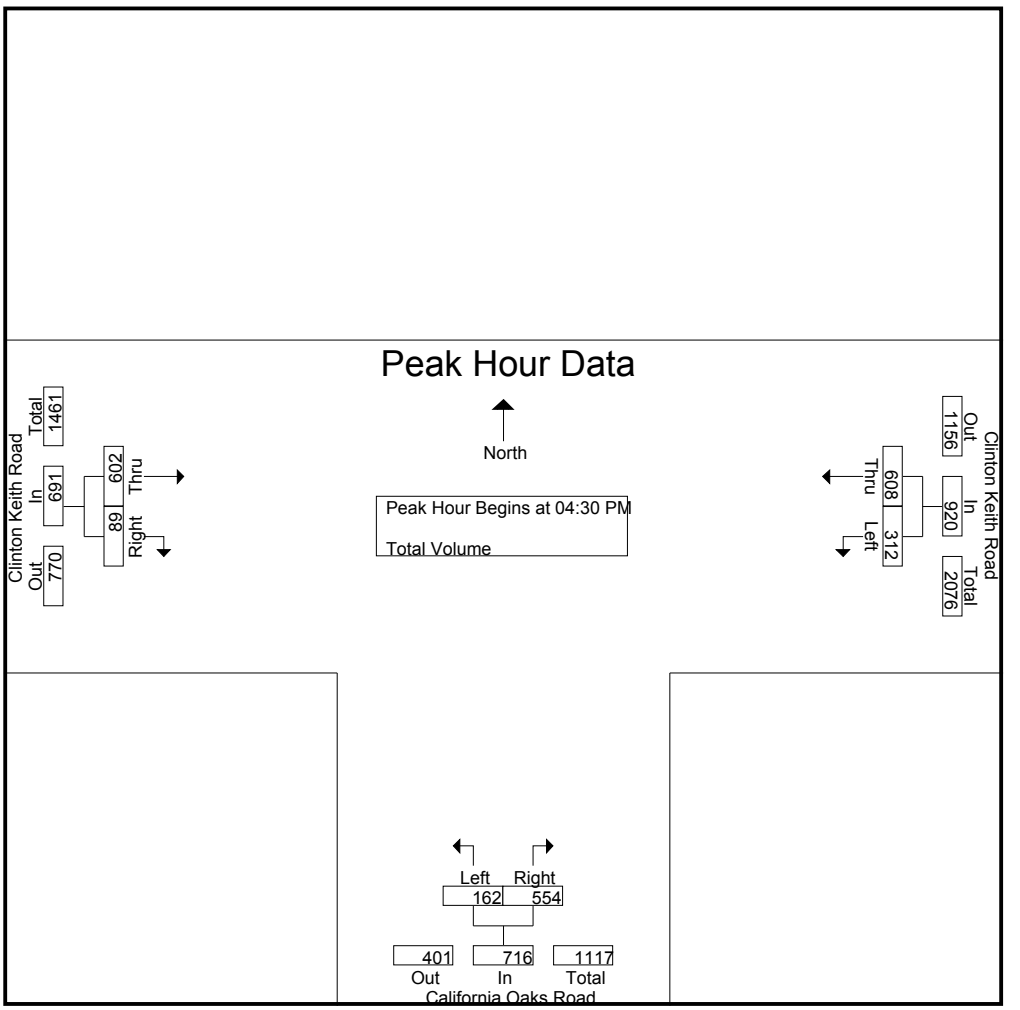
	Clinton Keith Road Westbound			California Oaks Road Northbound			Clinton Keith Road Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
04:00 PM	90	148	238	31	115	146	119	25	144	528
04:15 PM	66	152	218	34	103	137	140	29	169	524
04:30 PM	83	155	238	39	121	160	160	21	181	579
04:45 PM	62	124	186	48	133	181	152	22	174	541
Total	301	579	880	152	472	624	571	97	668	2172
05:00 PM	85	157	242	38	148	186	151	26	177	605
05:15 PM	82	172	254	37	152	189	139	20	159	602
05:30 PM	90	136	226	39	142	181	155	16	171	578
05:45 PM	62	141	203	39	138	177	132	29	161	541
Total	319	606	925	153	580	733	577	91	668	2326
Grand Total	620	1185	1805	305	1052	1357	1148	188	1336	4498
Apprch %	34.3	65.7		22.5	77.5		85.9	14.1		
Total %	13.8	26.3	40.1	6.8	23.4	30.2	25.5	4.2	29.7	

	Clinton Keith Road Westbound			California Oaks Road Northbound			Clinton Keith Road Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	83	155	238	39	121	160	**160**	21	**181**	579
04:45 PM	62	124	186	**48**	133	181	152	22	174	541
05:00 PM	**85**	157	242	38	148	186	151	**26**	177	**605**
05:15 PM	82	**172**	**254**	37	**152**	**189**	139	20	159	602
Total Volume	312	608	920	162	554	716	602	89	691	2327
% App. Total	33.9	66.1		22.6	77.4		87.1	12.9		
PHF	.918	.884	.906	.844	.911	.947	.941	.856	.954	.962

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: California Oaks Road
E/W: Clinton Keith Road
Weather: Sunny

File Name : MURCOCKPM
Site Code : 9311025
Start Date : 12/9/2009



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM			04:45 PM			04:15 PM		
+0 mins.	85	157	242	**48**	133	181	140	**29**	169
+15 mins.	82	**172**	**254**	38	148	186	**160**	21	**181**
+30 mins.	**90**	136	226	37	**152**	**189**	152	22	174
+45 mins.	62	141	203	39	142	181	151	26	177
Total Volume	319	606	925	162	575	737	603	98	701
% App. Total	34.5	65.5		22	78		86	14	
PHF	.886	.881	.910	.844	.946	.975	.942	.845	.968

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murieta
N/S: Antelope Road
E/W: Keller Road
Weather: Sunny

File Name : MURANKEAM
Site Code : 9311099
Start Date : 12/9/2009
Page No : 1

Groups Printed- Total Volume

	Antelope Road Southbound				Keller Road Westbound				Antelope Road Northbound				Keller Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	4	23	4	31	69	4	8	81	3	17	18	38	3	1	0	4	154
07:15 AM	3	21	1	25	69	9	6	84	0	31	37	68	5	1	4	10	187
07:30 AM	2	33	1	36	80	2	11	93	2	32	37	71	0	0	2	2	202
07:45 AM	9	38	3	50	52	2	4	58	1	32	18	51	0	0	2	2	161
Total	18	115	9	142	270	17	29	316	6	112	110	228	8	2	8	18	704
08:00 AM	0	33	5	38	32	3	4	39	1	10	12	23	1	0	1	2	102
08:15 AM	0	17	0	17	40	0	2	42	3	17	8	28	3	0	2	5	92
08:30 AM	2	14	1	17	22	0	6	28	4	18	13	35	1	1	1	3	83
08:45 AM	6	29	1	36	26	1	0	27	0	12	10	22	1	1	4	6	91
Total	8	93	7	108	120	4	12	136	8	57	43	108	6	2	8	16	368
Grand Total	26	208	16	250	390	21	41	452	14	169	153	336	14	4	16	34	1072
Apprch %	10.4	83.2	6.4		86.3	4.6	9.1		4.2	50.3	45.5		41.2	11.8	47.1		
Total %	2.4	19.4	1.5	23.3	36.4	2	3.8	42.2	1.3	15.8	14.3	31.3	1.3	0.4	1.5	3.2	

	Antelope Road Southbound				Keller Road Westbound				Antelope Road Northbound				Keller Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	4	23	**4**	31	69	4	8	81	**3**	17	18	38	3	**1**	0	4	154
07:15 AM	3	21	1	25	69	**9**	6	84	0	31	**37**	68	**5**	1	**4**	**10**	187
07:30 AM	2	33	1	36	**80**	2	**11**	**93**	2	**32**	37	**71**	0	0	2	2	**202**
07:45 AM	**9**	**38**	3	**50**	52	2	4	58	1	32	18	51	0	0	2	2	161
Total Volume	18	115	9	142	270	17	29	316	6	112	110	228	8	2	8	18	704
% App. Total	12.7	81	6.3		85.4	5.4	9.2		2.6	49.1	48.2		44.4	11.1	44.4		
PHF	.500	.757	.563	.710	.844	.472	.659	.849	.500	.875	.743	.803	.400	.500	.500	.450	.871

Counts Unlimited Inc.
25286 Jaclyn Avenue
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City of Murieta
N/S: Antelope Road
E/W: Keller Road
Weather: Sunny

File Name : MURANKEAM
Site Code : 9311099
Start Date : 12/9/2009
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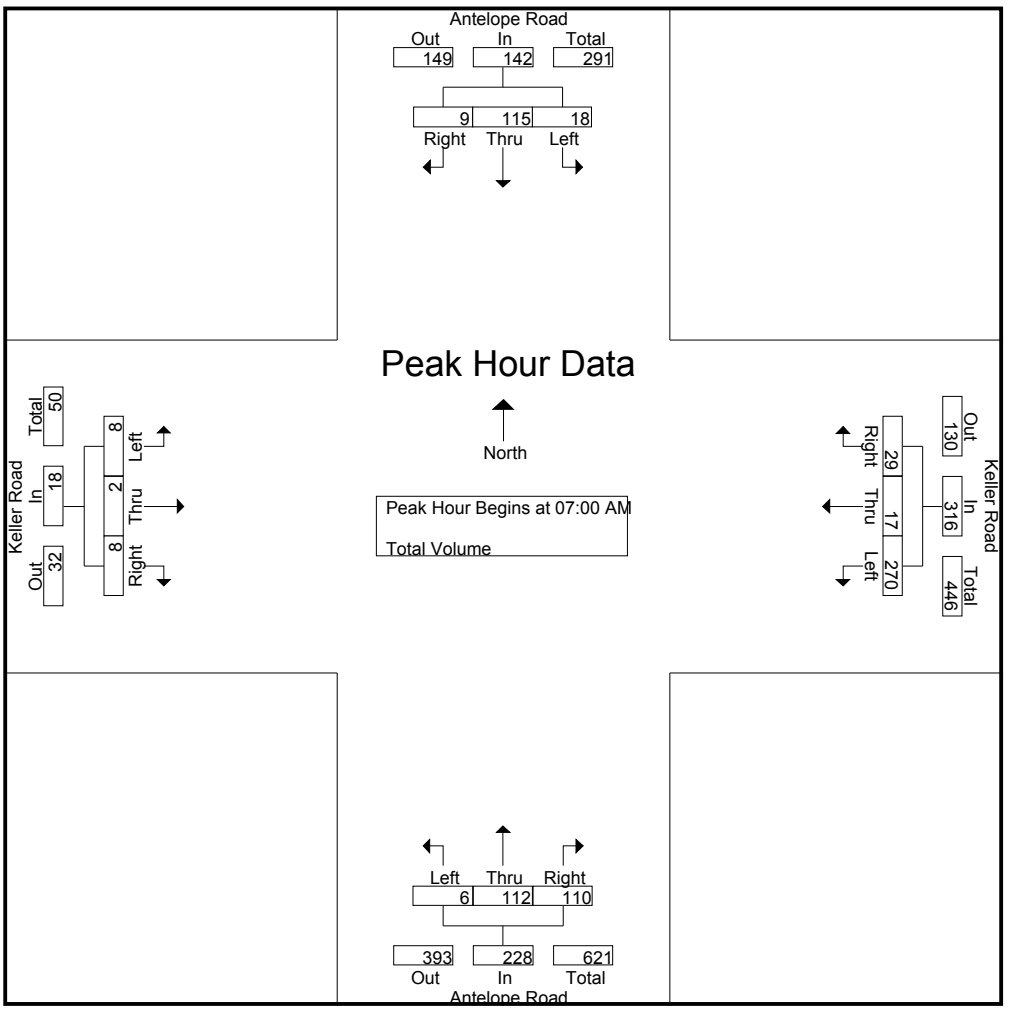

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:15 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	3	21	1	25	69	4	8	81	**3**	17	18	38	3	**1**	0	4
+15 mins.	2	33	1	36	69	**9**	6	84	0	31	**37**	68	**5**	1	**4**	**10**
+30 mins.	**9**	**38**	3	**50**	**80**	2	**11**	**93**	2	**32**	37	**71**	0	0	2	2
+45 mins.	0	33	**5**	38	52	2	4	58	1	32	18	51	0	0	2	2
Total Volume	14	125	10	149	270	17	29	316	6	112	110	228	8	2	8	18
% App. Total	9.4	83.9	6.7		85.4	5.4	9.2		2.6	49.1	48.2		44.4	11.1	44.4	
PHF	.389	.822	.500	.745	.844	.472	.659	.849	.500	.875	.743	.803	.400	.500	.500	.450

Counts Unlimited Inc.
25286 Jaclyn Avenue
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City of Murieta
N/S: Antelope Road
E/W: Keller Road
Weather: Sunny

File Name : MURANKEPM
Site Code : 9311099
Start Date : 12/9/2009
Page No : 1

Groups Printed- Total Volume

	Antelope Road Southbound				Keller Road Westbound				Antelope Road Northbound				Keller Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	2	19	2	23	24	2	5	31	4	55	55	114	1	0	0	1	169
04:15 PM	5	20	3	28	26	0	4	30	5	54	45	104	1	1	1	3	165
04:30 PM	10	30	2	42	13	1	4	18	2	47	55	104	2	1	1	4	168
04:45 PM	7	26	2	35	23	0	2	25	1	61	67	129	5	3	2	10	199
Total	24	95	9	128	86	3	15	104	12	217	222	451	9	5	4	18	701
05:00 PM	4	32	4	40	23	1	5	29	4	68	69	141	4	0	5	9	219
05:15 PM	6	30	1	37	26	1	3	30	3	74	64	141	4	4	1	9	217
05:30 PM	4	14	2	20	11	0	5	16	1	83	67	151	1	0	1	2	189
05:45 PM	5	17	0	22	12	0	6	18	6	90	71	167	1	1	0	2	209
Total	19	93	7	119	72	2	19	93	14	315	271	600	10	5	7	22	834
Grand Total	43	188	16	247	158	5	34	197	26	532	493	1051	19	10	11	40	1535
Apprch %	17.4	76.1	6.5		80.2	2.5	17.3		2.5	50.6	46.9		47.5	25	27.5		
Total %	2.8	12.2	1	16.1	10.3	0.3	2.2	12.8	1.7	34.7	32.1	68.5	1.2	0.7	0.7	2.6	

	Antelope Road Southbound				Keller Road Westbound				Antelope Road Northbound				Keller Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	4	**32**	**4**	**40**	23	**1**	5	29	4	68	69	141	**4**	0	**5**	**9**	**219**
05:15 PM	**6**	30	1	37	**26**	1	3	**30**	3	74	64	141	4	**4**	1	9	217
05:30 PM	4	14	2	20	11	0	5	16	1	83	67	151	1	0	1	2	189
05:45 PM	5	17	0	22	12	0	**6**	18	**6**	**90**	**71**	**167**	1	1	0	2	209
Total Volume	19	93	7	119	72	2	19	93	14	315	271	600	10	5	7	22	834
% App. Total	16	78.2	5.9		77.4	2.2	20.4		2.3	52.5	45.2		45.5	22.7	31.8		
PHF	.792	.727	.438	.744	.692	.500	.792	.775	.583	.875	.954	.898	.625	.313	.350	.611	.952

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murieta
N/S: Antelope Road
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File Name : MURANKEPM
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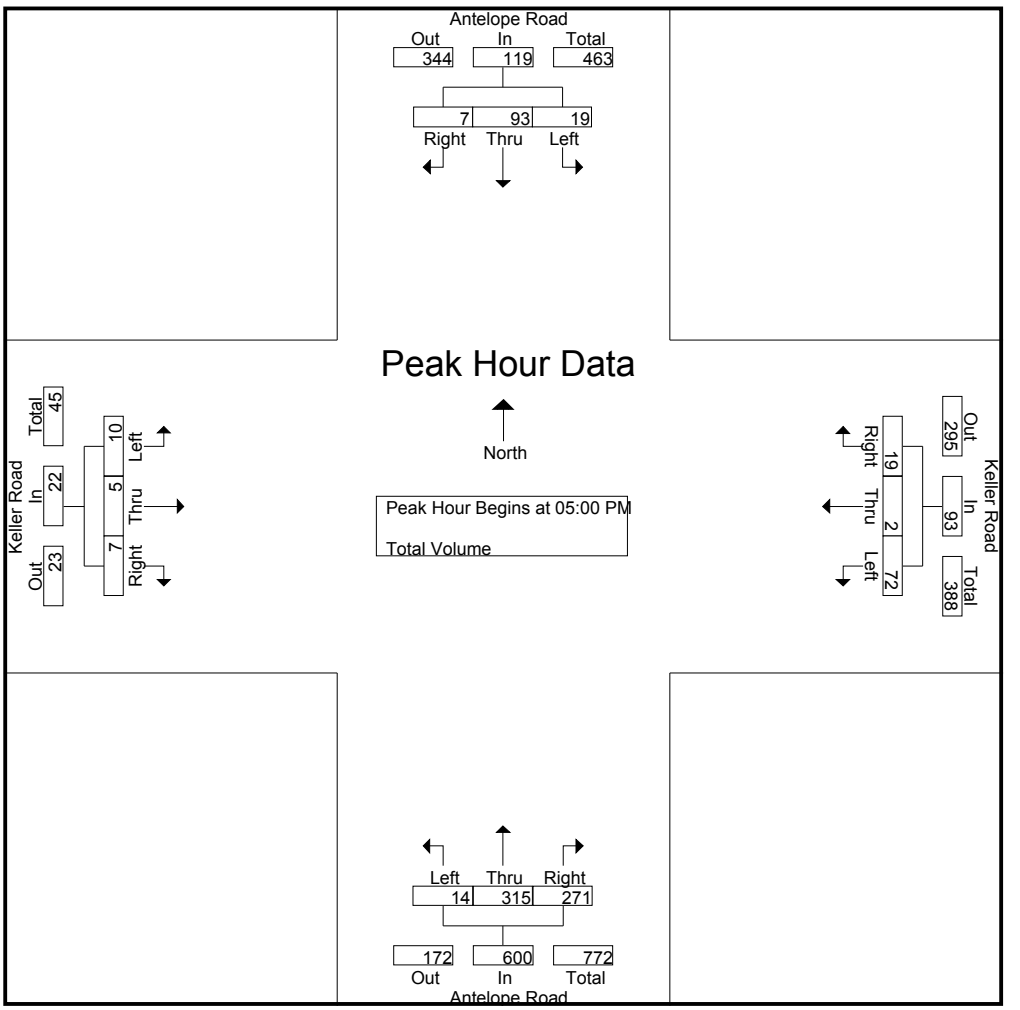


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:30 PM				04:00 PM				05:00 PM				04:30 PM			
+0 mins.	**10**	30	2	**42**	24	**2**	**5**	**31**	4	68	69	141	2	1	1	4
+15 mins.	7	26	2	35	**26**	0	4	30	3	74	64	141	**5**	3	2	**10**
+30 mins.	4	**32**	**4**	40	13	1	4	18	1	83	67	151	4	0	**5**	9
+45 mins.	6	30	1	37	23	0	2	25	**6**	**90**	**71**	**167**	4	**4**	1	9
Total Volume	27	118	9	154	86	3	15	104	14	315	271	600	15	8	9	32
% App. Total	17.5	76.6	5.8		82.7	2.9	14.4		2.3	52.5	45.2		46.9	25	28.1	
PHF	.675	.922	.563	.917	.827	.375	.750	.839	.583	.875	.954	.898	.750	.500	.450	.800

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: I-215 Southbound Ramps
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MUR215SMHSAM
Site Code : 9311066
Start Date : 12/8/2009
Page No : 1

Groups Printed- Total Volume

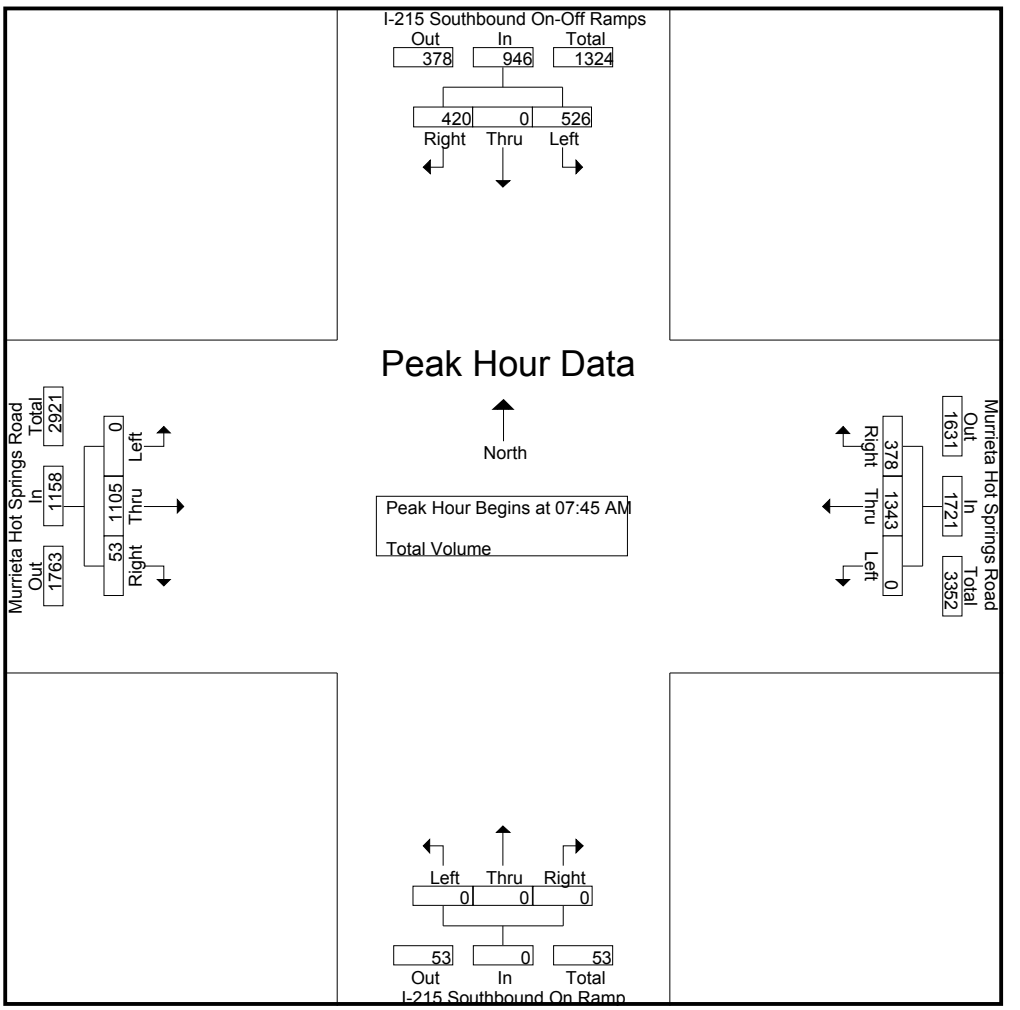
	I-215 Southbound On-Off Ramps Southbound				Murrieta Hot Springs Road Westbound				I-215 Southbound On Ramp Northbound				Murrieta Hot Springs Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	87	0	69	156	0	244	94	338	0	0	0	0	0	146	9	155	649
07:15 AM	106	0	74	180	0	319	110	429	0	0	0	0	0	183	15	198	807
07:30 AM	121	0	99	220	0	294	95	389	0	0	0	0	0	254	15	269	878
07:45 AM	137	0	125	262	0	333	92	425	0	0	0	0	0	309	15	324	1011
Total	451	0	367	818	0	1190	391	1581	0	0	0	0	0	892	54	946	3345
08:00 AM	124	0	86	210	0	313	103	416	0	0	0	0	0	231	14	245	871
08:15 AM	108	0	86	194	0	357	97	454	0	0	0	0	0	270	10	280	928
08:30 AM	157	0	123	280	0	340	86	426	0	0	0	0	0	295	14	309	1015
08:45 AM	122	0	111	233	0	402	62	464	0	0	0	0	0	283	17	300	997
Total	511	0	406	917	0	1412	348	1760	0	0	0	0	0	1079	55	1134	3811
Grand Total	962	0	773	1735	0	2602	739	3341	0	0	0	0	0	1971	109	2080	7156
Apprch %	55.4	0	44.6		0	77.9	22.1		0	0	0		0	94.8	5.2		
Total %	13.4	0	10.8	24.2	0	36.4	10.3	46.7	0	0	0	0	0	27.5	1.5	29.1	

	I-215 Southbound On-Off Ramps Southbound				Murrieta Hot Springs Road Westbound				I-215 Southbound On Ramp Northbound				Murrieta Hot Springs Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	137	0	**125**	262	0	333	92	425	0	0	0	0	0	**309**	**15**	**324**	1011
08:00 AM	124	0	86	210	0	313	**103**	416	0	0	0	0	0	231	14	245	871
08:15 AM	108	0	86	194	0	**357**	97	**454**	0	0	0	0	0	270	10	280	928
08:30 AM	**157**	0	123	**280**	0	340	86	426	0	0	0	0	0	295	14	309	**1015**
Total Volume	526	0	420	946	0	1343	378	1721	0	0	0	0	0	1105	53	1158	3825
% App. Total	55.6	0	44.4		0	78	22		0	0	0		0	95.4	4.6		
PHF	.838	.000	.840	.845	.000	.940	.917	.948	.000	.000	.000	.000	.000	.894	.883	.894	.942

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: I-215 Southbound Ramps
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MUR215SMHSAM
Site Code : 9311066
Start Date : 12/8/2009



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:45 AM				08:00 AM				07:00 AM				07:45 AM			
+0 mins.	137	0	**125**	262	0	313	**103**	416	0	0	0	0	0	**309**	**15**	**324**
+15 mins.	124	0	86	210	0	357	97	454	0	0	0	0	0	231	14	245
+30 mins.	108	0	86	194	0	340	86	426	0	0	0	0	0	270	10	280
+45 mins.	**157**	0	123	**280**	0	**402**	62	**464**	0	0	0	0	0	295	14	309
Total Volume	526	0	420	946	0	1412	348	1760	0	0	0	0	0	1105	53	1158
% App. Total	55.6	0	44.4		0	80.2	19.8		0	0	0		0	95.4	4.6	
PHF	.838	.000	.840	.845	.000	.878	.845	.948	.000	.000	.000	.000	.000	.894	.883	.894

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: I-215 Southbound Ramps
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MUR215SMHSPM
Site Code : 9311066
Start Date : 12/8/2009
Page No : 1

Groups Printed- Total Volume

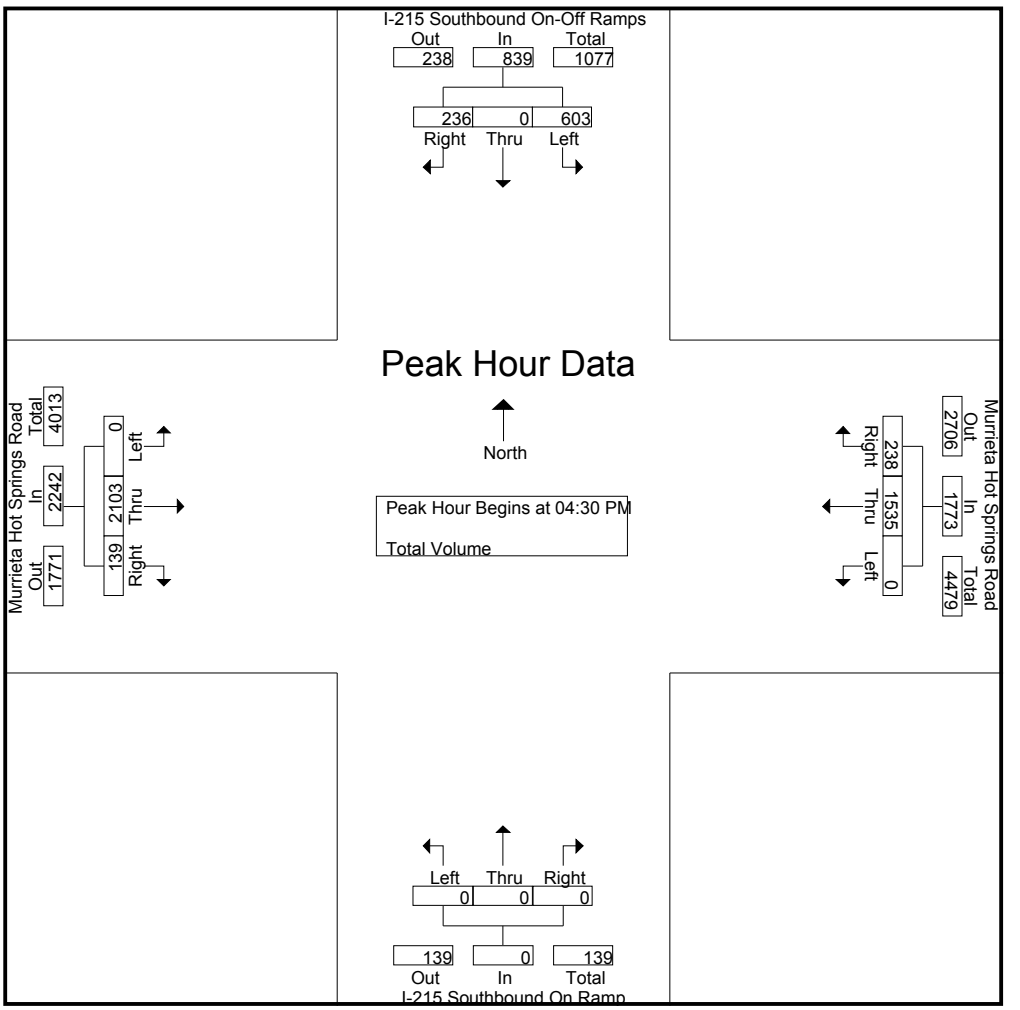
	I-215 Southbound On-Off Ramps Southbound				Murrieta Hot Springs Road Westbound				I-215 Southbound On Ramp Northbound				Murrieta Hot Springs Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	122	0	51	173	0	429	47	476	0	0	0	0	0	477	27	504	1153
04:15 PM	171	0	66	237	0	397	72	469	0	0	0	0	0	480	30	510	1216
04:30 PM	138	0	60	198	0	352	64	416	0	0	0	0	0	505	48	553	1167
04:45 PM	167	0	74	241	0	368	58	426	0	0	0	0	0	505	25	530	1197
Total	598	0	251	849	0	1546	241	1787	0	0	0	0	0	1967	130	2097	4733
05:00 PM	136	0	58	194	0	397	59	456	0	0	0	0	0	564	41	605	1255
05:15 PM	162	0	44	206	0	418	57	475	0	0	0	0	0	529	25	554	1235
05:30 PM	131	0	62	193	0	386	63	449	0	0	0	0	0	492	20	512	1154
05:45 PM	163	0	51	214	0	339	65	404	0	0	0	0	0	449	26	475	1093
Total	592	0	215	807	0	1540	244	1784	0	0	0	0	0	2034	112	2146	4737
Grand Total	1190	0	466	1656	0	3086	485	3571	0	0	0	0	0	4001	242	4243	9470
Apprch %	71.9	0	28.1		0	86.4	13.6		0	0	0		0	94.3	5.7		
Total %	12.6	0	4.9	17.5	0	32.6	5.1	37.7	0	0	0	0	0	42.2	2.6	44.8	

	I-215 Southbound On-Off Ramps Southbound				Murrieta Hot Springs Road Westbound				I-215 Southbound On Ramp Northbound				Murrieta Hot Springs Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	138	0	60	198	0	352	**64**	416	0	0	0	0	0	505	**48**	553	1167
04:45 PM	**167**	0	**74**	**241**	0	368	58	426	0	0	0	0	0	505	25	530	1197
05:00 PM	136	0	58	194	0	397	59	456	0	0	0	0	0	**564**	41	**605**	**1255**
05:15 PM	162	0	44	206	0	**418**	57	**475**	0	0	0	0	0	529	25	554	1235
Total Volume	603	0	236	839	0	1535	238	1773	0	0	0	0	0	2103	139	2242	4854
% App. Total	71.9	0	28.1		0	86.6	13.4		0	0	0		0	93.8	6.2		
PHF	.903	.000	.797	.870	.000	.918	.930	.933	.000	.000	.000	.000	.000	.932	.724	.926	.967

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: I-215 Southbound Ramps
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MUR215SMHSPM
Site Code : 9311066
Start Date : 12/8/2009



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:15 PM				04:45 PM				04:00 PM				04:30 PM			
+0 mins.	**171**	0	66	237	0	368	58	426	0	0	0	0	0	505	**48**	553
+15 mins.	138	0	60	198	0	397	59	456	0	0	0	0	0	505	25	530
+30 mins.	167	0	**74**	**241**	0	**418**	57	**475**	0	0	0	0	0	**564**	41	**605**
+45 mins.	136	0	58	194	0	386	**63**	449	0	0	0	0	0	529	25	554
Total Volume	612	0	258	870	0	1569	237	1806	0	0	0	0	0	2103	139	2242
% App. Total	70.3	0	29.7		0	86.9	13.1		0	0	0		0	93.8	6.2	
PHF	.895	.000	.872	.902	.000	.938	.940	.951	.000	.000	.000	.000	.000	.932	.724	.926

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: I-215 Southbound Ramps
E/W: Clinton Keith Road
Weather: Sunny

File Name : MUR215SCKAM
Site Code : 9311136
Start Date : 12/9/2009

Groups Printed- Total Volume

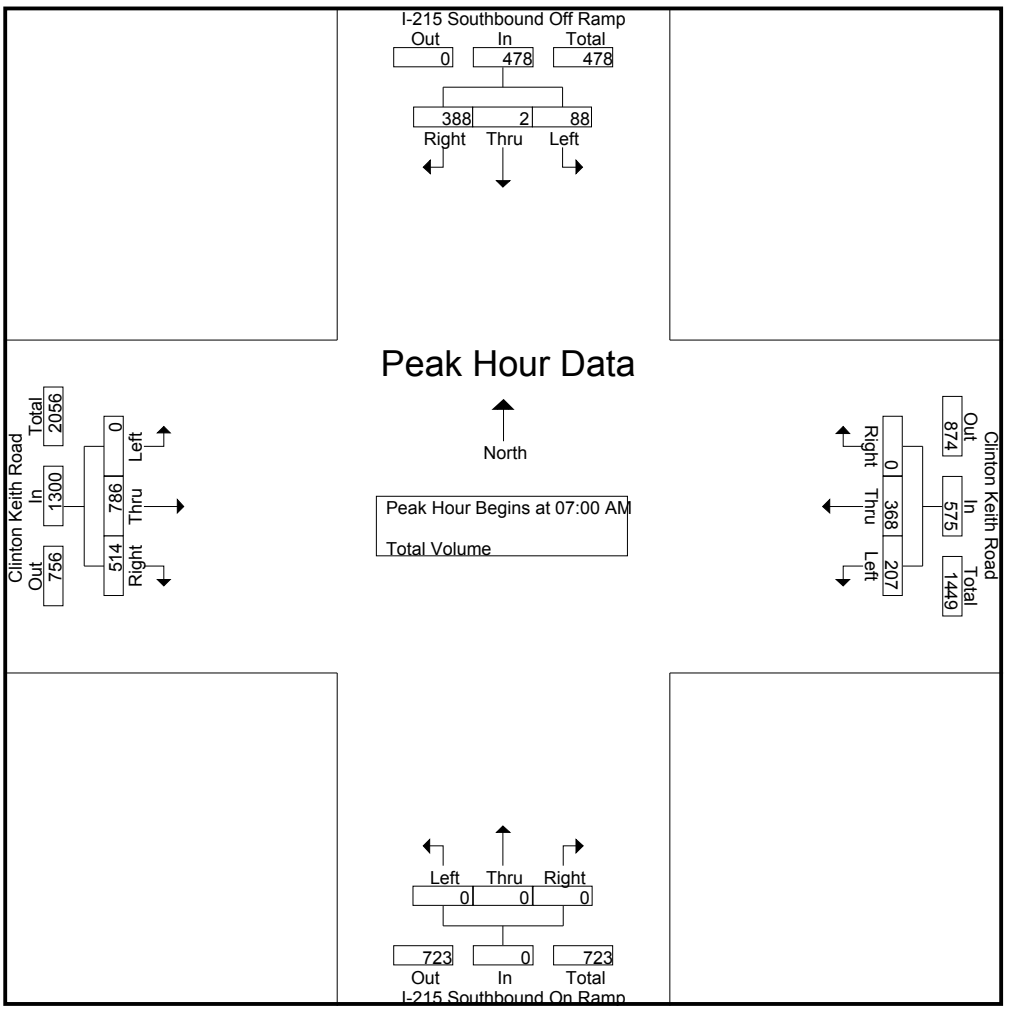
	I-215 Southbound Off Ramp Southbound				Clinton Keith Road Westbound				I-215 Southbound On Ramp Northbound				Clinton Keith Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	46	0	84	130	46	105	0	151	0	0	0	0	0	245	102	347	628
07:15 AM	33	1	88	122	86	100	0	186	0	0	0	0	0	217	137	354	662
07:30 AM	5	0	111	116	59	102	0	161	0	0	0	0	0	170	137	307	584
07:45 AM	4	1	105	110	16	61	0	77	0	0	0	0	0	154	138	292	479
Total	88	2	388	478	207	368	0	575	0	0	0	0	0	786	514	1300	2353
08:00 AM	4	0	91	95	30	84	0	114	0	0	0	0	0	150	109	259	468
08:15 AM	7	0	128	135	19	76	0	95	0	0	0	0	1	138	153	292	522
08:30 AM	5	0	120	125	14	93	0	107	0	0	0	0	0	150	107	257	489
08:45 AM	6	2	129	137	13	62	0	75	0	0	0	0	0	159	101	260	472
Total	22	2	468	492	76	315	0	391	0	0	0	0	1	597	470	1068	1951
Grand Total	110	4	856	970	283	683	0	966	0	0	0	0	1	1383	984	2368	4304
Apprch %	11.3	0.4	88.2		29.3	70.7	0		0	0	0		0	58.4	41.6		
Total %	2.6	0.1	19.9	22.5	6.6	15.9	0	22.4	0	0	0	0	0	32.1	22.9	55	

	I-215 Southbound Off Ramp Southbound				Clinton Keith Road Westbound				I-215 Southbound On Ramp Northbound				Clinton Keith Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	**46**	0	84	**130**	46	**105**	0	151	0	0	0	0	0	**245**	102	347	628
07:15 AM	33	**1**	88	122	**86**	100	0	**186**	0	0	0	0	0	217	137	**354**	**662**
07:30 AM	5	0	**111**	116	59	102	0	161	0	0	0	0	0	170	137	307	584
07:45 AM	4	1	105	110	16	61	0	77	0	0	0	0	0	154	**138**	292	479
Total Volume	88	2	388	478	207	368	0	575	0	0	0	0	0	786	514	1300	2353
% App. Total	18.4	0.4	81.2		36	64	0		0	0	0		0	60.5	39.5		
PHF	.478	.500	.874	.919	.602	.876	.000	.773	.000	.000	.000	.000	.000	.802	.931	.918	.889

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: I-215 Southbound Ramps
E/W: Clinton Keith Road
Weather: Sunny

File Name : MUR215SCKAM
Site Code : 9311136
Start Date : 12/9/2009



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	4	0	91	95	46	**105**	0	151	0	0	0	0	0	**245**	102	347
+15 mins.	**7**	0	128	135	**86**	100	0	**186**	0	0	0	0	0	217	137	**354**
+30 mins.	5	0	120	125	59	102	0	161	0	0	0	0	0	170	137	307
+45 mins.	6	**2**	**129**	**137**	16	61	0	77	0	0	0	0	0	154	**138**	292
Total Volume	22	2	468	492	207	368	0	575	0	0	0	0	0	786	514	1300
% App. Total	4.5	0.4	95.1		36	64	0		0	0	0		0	60.5	39.5	
PHF	.786	.250	.907	.898	.602	.876	.000	.773	.000	.000	.000	.000	.000	.802	.931	.918

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: I-215 Southbound Ramps
E/W: Clinton Keith Road
Weather: Sunny

File Name : MUR215SCKPM
Site Code : 9311136
Start Date : 12/9/2009

Groups Printed- Total Volume

	I-215 Southbound Off Ramp Southbound				Clinton Keith Road Westbound				I-215 Southbound On Ramp Northbound				Clinton Keith Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	12	0	140	152	19	108	0	127	0	0	0	0	0	178	95	273	552
04:15 PM	13	0	154	167	12	112	0	124	0	0	0	0	0	162	86	248	539
04:30 PM	17	1	142	160	16	106	0	122	0	0	0	0	0	183	95	278	560
04:45 PM	13	1	120	134	15	102	0	117	0	0	0	0	0	176	97	273	524
Total	55	2	556	613	62	428	0	490	0	0	0	0	0	699	373	1072	2175
05:00 PM	9	0	168	177	26	106	0	132	0	0	0	0	0	170	92	262	571
05:15 PM	11	1	176	188	23	102	0	125	0	0	0	0	0	191	111	302	615
05:30 PM	13	0	165	178	13	95	0	108	0	0	0	0	0	173	103	276	562
05:45 PM	15	0	147	162	13	102	0	115	0	0	0	0	0	152	93	245	522
Total	48	1	656	705	75	405	0	480	0	0	0	0	0	686	399	1085	2270
Grand Total	103	3	1212	1318	137	833	0	970	0	0	0	0	0	1385	772	2157	4445
Apprch %	7.8	0.2	92		14.1	85.9	0		0	0	0		0	64.2	35.8		
Total %	2.3	0.1	27.3	29.7	3.1	18.7	0	21.8	0	0	0	0	0	31.2	17.4	48.5	

	I-215 Southbound Off Ramp Southbound				Clinton Keith Road Westbound				I-215 Southbound On Ramp Northbound				Clinton Keith Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	**13**	**1**	120	134	15	102	0	117	0	0	0	0	0	176	97	273	524
05:00 PM	9	0	168	177	**26**	**106**	0	**132**	0	0	0	0	0	170	92	262	571
05:15 PM	11	1	**176**	**188**	23	102	0	125	0	0	0	0	0	**191**	**111**	**302**	**615**
05:30 PM	13	0	165	178	13	95	0	108	0	0	0	0	0	173	103	276	562
Total Volume	46	2	629	677	77	405	0	482	0	0	0	0	0	710	403	1113	2272
% App. Total	6.8	0.3	92.9		16	84	0		0	0	0		0	63.8	36.2		
PHF	.885	.500	.893	.900	.740	.955	.000	.913	.000	.000	.000	.000	.000	.929	.908	.921	.924

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
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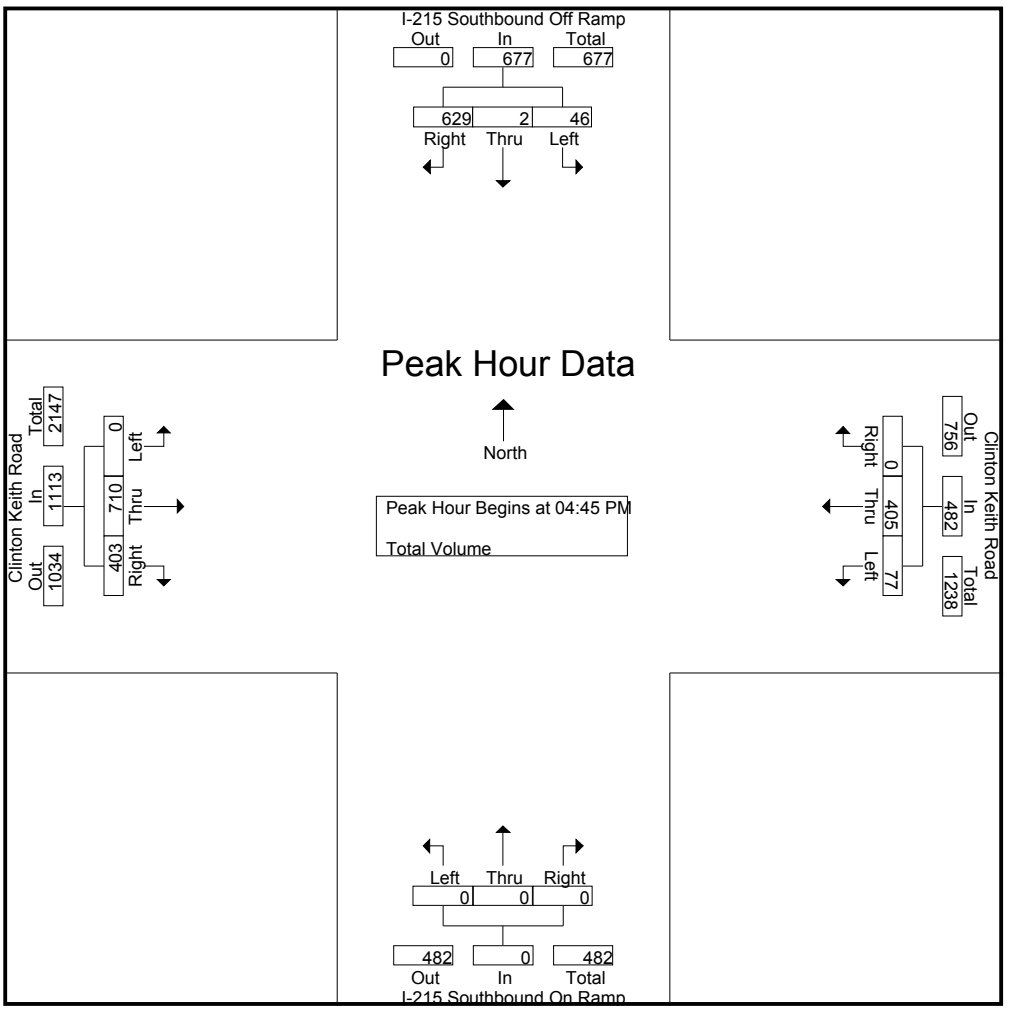
City of Murrieta
N/S: I-215 Southbound Ramps
E/W: Clinton Keith Road
Weather: Sunny

File Name : MUR215SCKPM
Site Code : 9311136
Start Date : 12/9/2009



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM				04:30 PM				04:00 PM				04:30 PM			
+0 mins.	9	0	168	177	16	**106**	0	122	0	0	0	0	0	183	95	278
+15 mins.	11	**1**	**176**	**188**	15	102	0	117	0	0	0	0	0	176	97	273
+30 mins.	13	0	165	178	**26**	106	0	**132**	0	0	0	0	0	170	92	262
+45 mins.	**15**	0	147	162	23	102	0	125	0	0	0	0	0	**191**	**111**	**302**
Total Volume	48	1	656	705	80	416	0	496	0	0	0	0	0	720	395	1115
% App. Total	6.8	0.1	93		16.1	83.9	0		0	0	0		0	64.6	35.4	
PHF	.800	.250	.932	.938	.769	.981	.000	.939	.000	.000	.000	.000	.000	.942	.890	.923

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: I-215 Northbound Ramps
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MUR215NMHSAM
Site Code : 9311063
Start Date : 12/8/2009
Page No : 1

Groups Printed- Total Volume

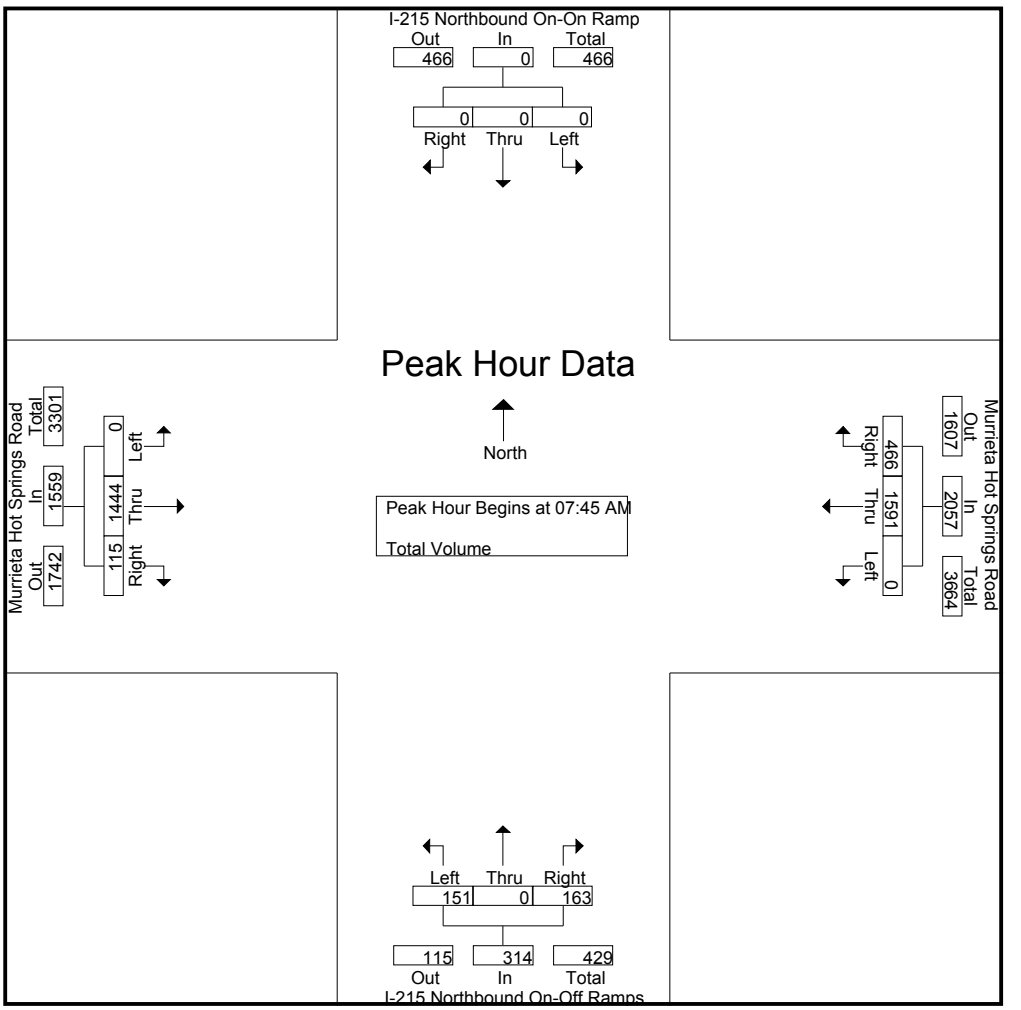
	I-215 Northbound On-On Ramp Southbound				Murrieta Hot Springs Road Westbound				I-215 Northbound On-Off Ramps Northbound				Murrieta Hot Springs Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	321	279	600	13	0	18	31	0	198	30	228	859
07:15 AM	0	0	0	0	0	408	179	587	24	0	19	43	0	247	38	285	915
07:30 AM	0	0	0	0	0	352	114	466	24	0	38	62	0	324	22	346	874
07:45 AM	0	0	0	0	0	409	98	507	34	0	52	86	0	414	31	445	1038
Total	0	0	0	0	0	1490	670	2160	95	0	127	222	0	1183	121	1304	3686
08:00 AM	0	0	0	0	0	373	119	492	29	0	39	68	0	304	23	327	887
08:15 AM	0	0	0	0	0	412	145	557	60	0	33	93	0	335	36	371	1021
08:30 AM	0	0	0	0	0	397	104	501	28	0	39	67	0	391	25	416	984
08:45 AM	0	0	0	0	0	442	117	559	28	0	65	93	0	341	32	373	1025
Total	0	0	0	0	0	1624	485	2109	145	0	176	321	0	1371	116	1487	3917
Grand Total	0	0	0	0	0	3114	1155	4269	240	0	303	543	0	2554	237	2791	7603
Apprch %	0	0	0		0	72.9	27.1		44.2	0	55.8		0	91.5	8.5		
Total %	0	0	0	0	0	41	15.2	56.1	3.2	0	4	7.1	0	33.6	3.1	36.7	

	I-215 Northbound On-On Ramp Southbound				Murrieta Hot Springs Road Westbound				I-215 Northbound On-Off Ramps Northbound				Murrieta Hot Springs Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	0	409	98	507	34	0	**52**	86	0	**414**	31	**445**	**1038**
08:00 AM	0	0	0	0	0	373	119	492	29	0	39	68	0	304	23	327	887
08:15 AM	0	0	0	0	0	**412**	**145**	**557**	**60**	0	33	**93**	0	335	**36**	371	1021
08:30 AM	0	0	0	0	0	397	104	501	28	0	39	67	0	391	25	416	984
Total Volume	0	0	0	0	0	1591	466	2057	151	0	163	314	0	1444	115	1559	3930
% App. Total	0	0	0		0	77.3	22.7		48.1	0	51.9		0	92.6	7.4		
PHF	.000	.000	.000	.000	.000	.965	.803	.923	.629	.000	.784	.844	.000	.872	.799	.876	.947

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: I-215 Northbound Ramps
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MUR215NMHSAM
Site Code : 9311063
Start Date : 12/8/2009



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				08:00 AM				07:45 AM			
+0 mins.	0	0	0	0	0	321	**279**	**600**	29	0	39	68	0	**414**	31	**445**
+15 mins.	0	0	0	0	0	408	179	587	**60**	0	33	**93**	0	304	23	327
+30 mins.	0	0	0	0	0	352	114	466	28	0	39	67	0	335	**36**	371
+45 mins.	0	0	0	0	0	**409**	98	507	28	0	**65**	93	0	391	25	416
Total Volume	0	0	0	0	0	1490	670	2160	145	0	176	321	0	1444	115	1559
% App. Total	0	0	0		0	69	31		45.2	0	54.8		0	92.6	7.4	
PHF	.000	.000	.000	.000	.000	.911	.600	.900	.604	.000	.677	.863	.000	.872	.799	.876

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: I-215 Northbound Ramps
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MUR215NMHSPM
Site Code : 9311063
Start Date : 12/8/2009
Page No : 1

Groups Printed- Total Volume

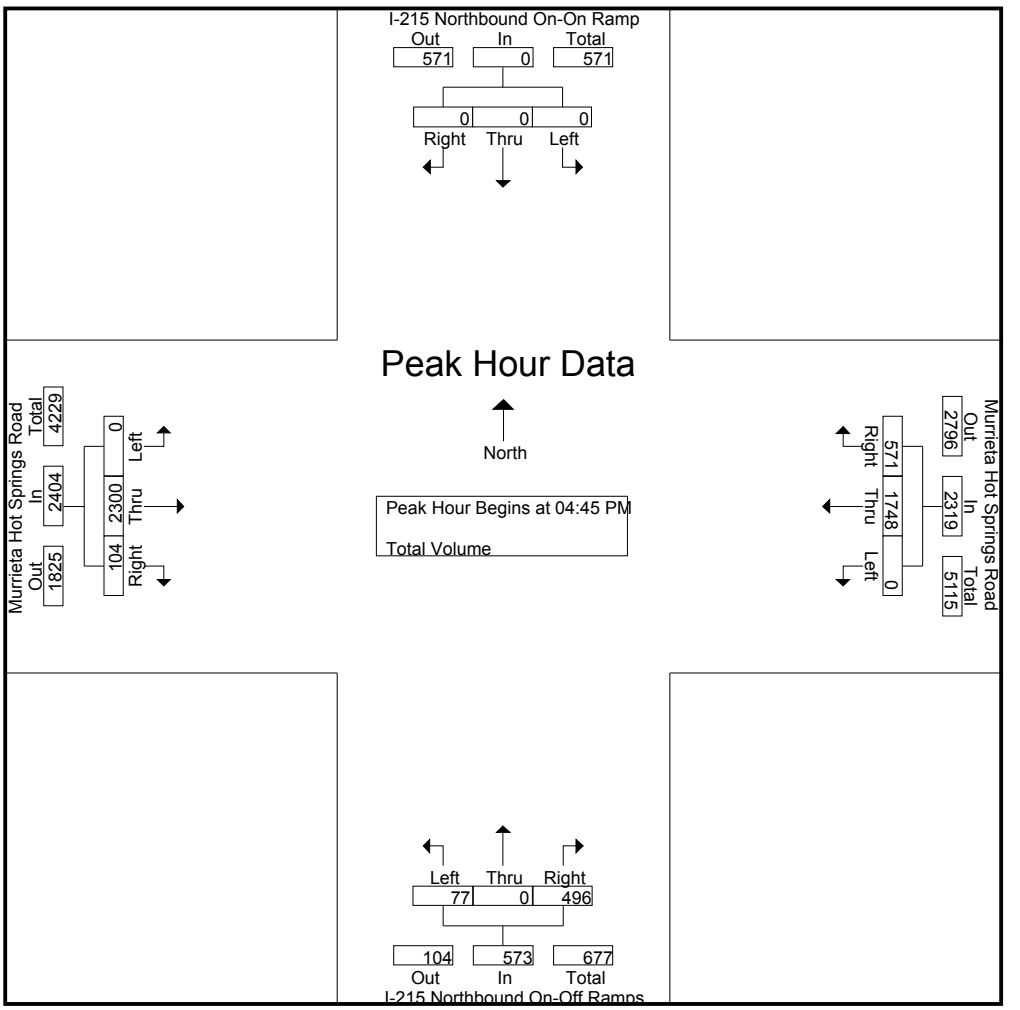
	I-215 Northbound On-On Ramp Southbound				Murrieta Hot Springs Road Westbound				I-215 Northbound On-Off Ramps Northbound				Murrieta Hot Springs Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	432	123	555	32	0	116	148	0	531	59	590	1293
04:15 PM	0	0	0	0	0	449	133	582	20	0	129	149	0	544	50	594	1325
04:30 PM	0	0	0	0	0	397	121	518	22	0	121	143	0	557	39	596	1257
04:45 PM	0	0	0	0	0	401	149	550	29	0	147	176	0	574	24	598	1324
Total	0	0	0	0	0	1679	526	2205	103	0	513	616	0	2206	172	2378	5199
05:00 PM	0	0	0	0	0	451	150	601	19	0	104	123	0	586	25	611	1335
05:15 PM	0	0	0	0	0	458	144	602	17	0	120	137	0	595	28	623	1362
05:30 PM	0	0	0	0	0	438	128	566	12	0	125	137	0	545	27	572	1275
05:45 PM	0	0	0	0	0	382	161	543	29	0	150	179	0	535	12	547	1269
Total	0	0	0	0	0	1729	583	2312	77	0	499	576	0	2261	92	2353	5241
Grand Total	0	0	0	0	0	3408	1109	4517	180	0	1012	1192	0	4467	264	4731	10440
Apprch %	0	0	0		0	75.4	24.6		15.1	0	84.9		0	94.4	5.6		
Total %	0	0	0	0	0	32.6	10.6	43.3	1.7	0	9.7	11.4	0	42.8	2.5	45.3	

	I-215 Northbound On-On Ramp Southbound				Murrieta Hot Springs Road Westbound				I-215 Northbound On-Off Ramps Northbound				Murrieta Hot Springs Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	0	0	0	401	149	550	**29**	0	**147**	**176**	0	574	24	598	1324
05:00 PM	0	0	0	0	0	451	**150**	601	19	0	104	123	0	586	25	611	1335
05:15 PM	0	0	0	0	0	**458**	144	**602**	17	0	120	137	0	**595**	**28**	**623**	**1362**
05:30 PM	0	0	0	0	0	438	128	566	12	0	125	137	0	545	27	572	1275
Total Volume	0	0	0	0	0	1748	571	2319	77	0	496	573	0	2300	104	2404	5296
% App. Total	0	0	0		0	75.4	24.6		13.4	0	86.6		0	95.7	4.3		
PHF	.000	.000	.000	.000	.000	.954	.952	.963	.664	.000	.844	.814	.000	.966	.929	.965	.972

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: I-215 Northbound Ramps
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MUR215NMHSPM
Site Code : 9311063
Start Date : 12/8/2009
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:45 PM				04:00 PM				04:30 PM			
+0 mins.	0	0	0	0	0	401	149	550	**32**	0	116	148	0	557	**39**	596
+15 mins.	0	0	0	0	0	451	**150**	601	20	0	129	149	0	574	24	598
+30 mins.	0	0	0	0	0	**458**	144	**602**	22	0	121	143	0	586	25	611
+45 mins.	0	0	0	0	0	438	128	566	29	0	**147**	**176**	0	**595**	28	**623**
Total Volume	0	0	0	0	0	1748	571	2319	103	0	513	616	0	2312	116	2428
% App. Total	0	0	0		0	75.4	24.6		16.7	0	83.3		0	95.2	4.8	
PHF	.000	.000	.000	.000	.000	.954	.952	.963	.805	.000	.872	.875	.000	.971	.744	.974

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: I-215 Northbound Ramps
E/W: Clinton Keith Road
Weather: Sunny

File Name : MUR215NCKAM
Site Code : 9311137
Start Date : 12/9/2009
Page No : 1

Groups Printed- Total Volume

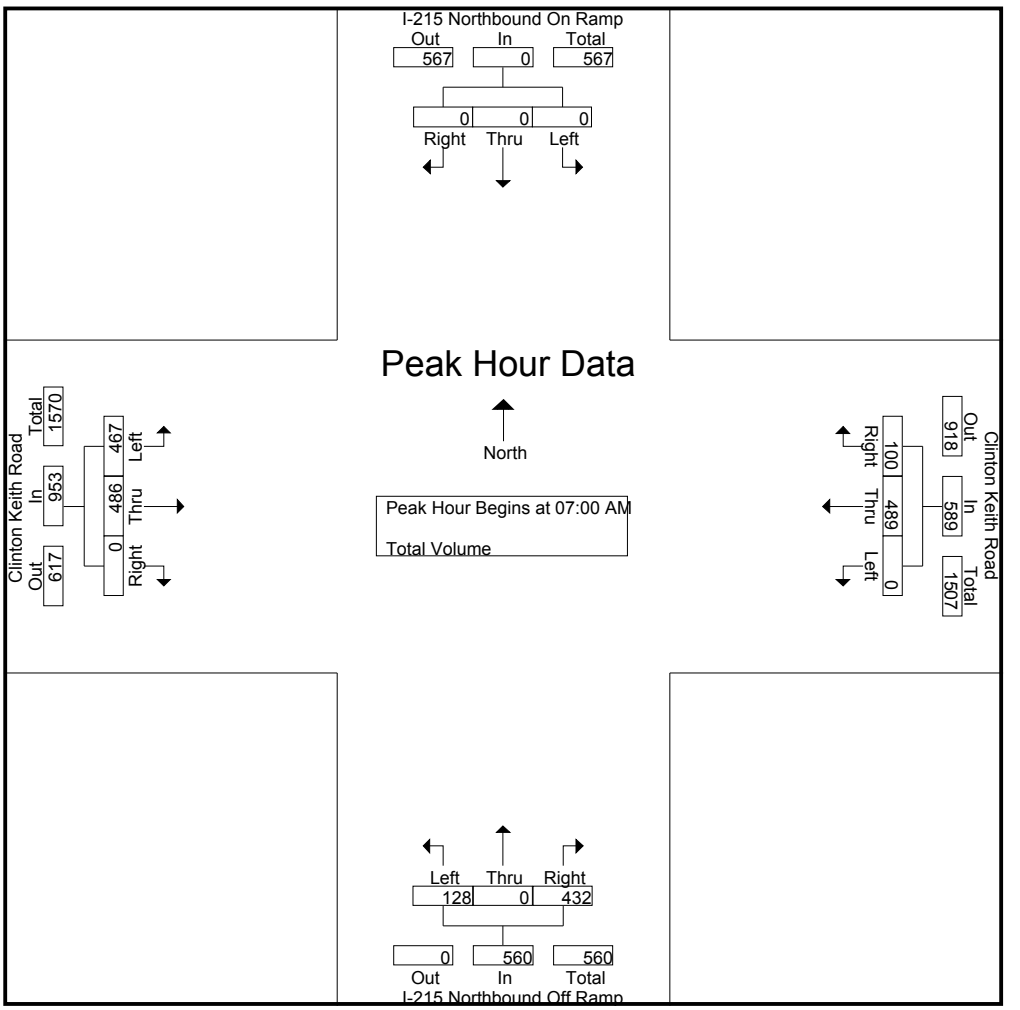
	I-215 Northbound On Ramp Southbound				Clinton Keith Road Westbound				I-215 Northbound Off Ramp Northbound				Clinton Keith Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	127	37	164	27	0	193	220	71	228	0	299	683
07:15 AM	0	0	0	0	0	170	37	207	25	0	205	230	95	192	0	287	724
07:30 AM	0	0	0	0	0	150	18	168	35	0	24	59	163	41	0	204	431
07:45 AM	0	0	0	0	0	42	8	50	41	0	10	51	138	25	0	163	264
Total	0	0	0	0	0	489	100	589	128	0	432	560	467	486	0	953	2102
08:00 AM	0	0	0	0	0	59	6	65	40	0	12	52	115	34	0	149	266
08:15 AM	0	0	0	0	0	50	7	57	51	1	6	58	125	34	0	159	274
08:30 AM	0	0	0	0	0	53	5	58	50	0	8	58	139	18	0	157	273
08:45 AM	0	0	0	0	0	32	6	38	50	0	12	62	138	30	0	168	268
Total	0	0	0	0	0	194	24	218	191	1	38	230	517	116	0	633	1081
Grand Total	0	0	0	0	0	683	124	807	319	1	470	790	984	602	0	1586	3183
Apprch %	0	0	0		0	84.6	15.4		40.4	0.1	59.5		62	38	0		
Total %	0	0	0	0	0	21.5	3.9	25.4	10	0	14.8	24.8	30.9	18.9	0	49.8	

	I-215 Northbound On Ramp Southbound				Clinton Keith Road Westbound				I-215 Northbound Off Ramp Northbound				Clinton Keith Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	127	**37**	164	27	0	193	220	71	**228**	0	**299**	683
07:15 AM	0	0	0	0	0	**170**	37	**207**	25	0	**205**	**230**	95	192	0	287	**724**
07:30 AM	0	0	0	0	0	150	18	168	35	0	24	59	**163**	41	0	204	431
07:45 AM	0	0	0	0	0	42	8	50	**41**	0	10	51	138	25	0	163	264
Total Volume	0	0	0	0	0	489	100	589	128	0	432	560	467	486	0	953	2102
% App. Total	0	0	0		0	83	17		22.9	0	77.1		49	51	0		
PHF	.000	.000	.000	.000	.000	.719	.676	.711	.780	.000	.527	.609	.716	.533	.000	.797	.726

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: I-215 Northbound Ramps
E/W: Clinton Keith Road
Weather: Sunny

File Name : MUR215NCKAM
Site Code : 9311137
Start Date : 12/9/2009
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	127	**37**	164	27	0	193	220	71	**228**	0	**299**
+15 mins.	0	0	0	0	0	**170**	37	**207**	25	0	**205**	**230**	95	192	0	287
+30 mins.	0	0	0	0	0	150	18	168	35	0	24	59	**163**	41	0	204
+45 mins.	0	0	0	0	0	42	8	50	**41**	0	10	51	138	25	0	163
Total Volume	0	0	0	0	0	489	100	589	128	0	432	560	467	486	0	953
% App. Total	0	0	0		0	83	17		22.9	0	77.1		49	51	0	
PHF	.000	.000	.000	.000	.000	.719	.676	.711	.780	.000	.527	.609	.716	.533	.000	.797

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: I-215 Northbound Ramps
E/W: Clinton Keith Road
Weather: Sunny

File Name : MUR215NCKPM
Site Code : 9311137
Start Date : 12/9/2009
Page No : 1

Groups Printed- Total Volume

	I-215 Northbound On Ramp Southbound				Clinton Keith Road Westbound				I-215 Northbound Off Ramp Northbound				Clinton Keith Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	67	19	86	69	1	23	93	129	63	0	192	371
04:15 PM	0	0	0	0	0	57	24	81	69	0	22	91	111	60	0	171	343
04:30 PM	0	0	0	0	0	65	18	83	56	0	25	81	117	74	0	191	355
04:45 PM	0	0	0	0	0	72	20	92	47	0	18	65	98	77	0	175	332
Total	0	0	0	0	0	261	81	342	241	1	88	330	455	274	0	729	1401
05:00 PM	0	0	0	0	0	93	16	109	39	0	14	53	102	67	0	169	331
05:15 PM	0	0	0	0	0	54	14	68	51	2	20	73	132	65	0	197	338
05:30 PM	0	0	0	0	0	51	14	65	48	0	17	65	135	52	0	187	317
05:45 PM	0	0	0	0	0	58	12	70	55	1	19	75	92	67	0	159	304
Total	0	0	0	0	0	256	56	312	193	3	70	266	461	251	0	712	1290
Grand Total	0	0	0	0	0	517	137	654	434	4	158	596	916	525	0	1441	2691
Apprch %	0	0	0		0	79.1	20.9		72.8	0.7	26.5		63.6	36.4	0		
Total %	0	0	0	0	0	19.2	5.1	24.3	16.1	0.1	5.9	22.1	34	19.5	0	53.5	

	I-215 Northbound On Ramp Southbound				Clinton Keith Road Westbound				I-215 Northbound Off Ramp Northbound				Clinton Keith Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	67	19	86	**69**	**1**	23	**93**	**129**	63	0	**192**	**371**
04:15 PM	0	0	0	0	0	57	**24**	81	69	0	22	91	111	60	0	171	343
04:30 PM	0	0	0	0	0	65	18	83	56	0	**25**	81	117	74	0	191	355
04:45 PM	0	0	0	0	0	**72**	20	**92**	47	0	18	65	98	**77**	0	175	332
Total Volume	0	0	0	0	0	261	81	342	241	1	88	330	455	274	0	729	1401
% App. Total	0	0	0		0	76.3	23.7		73	0.3	26.7		62.4	37.6	0		
PHF	.000	.000	.000	.000	.000	.906	.844	.929	.873	.250	.880	.887	.882	.890	.000	.949	.944

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
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City of Murrieta
N/S: I-215 Northbound Ramps
E/W: Clinton Keith Road
Weather: Sunny

File Name : MUR215NCKPM
Site Code : 9311137
Start Date : 12/9/2009
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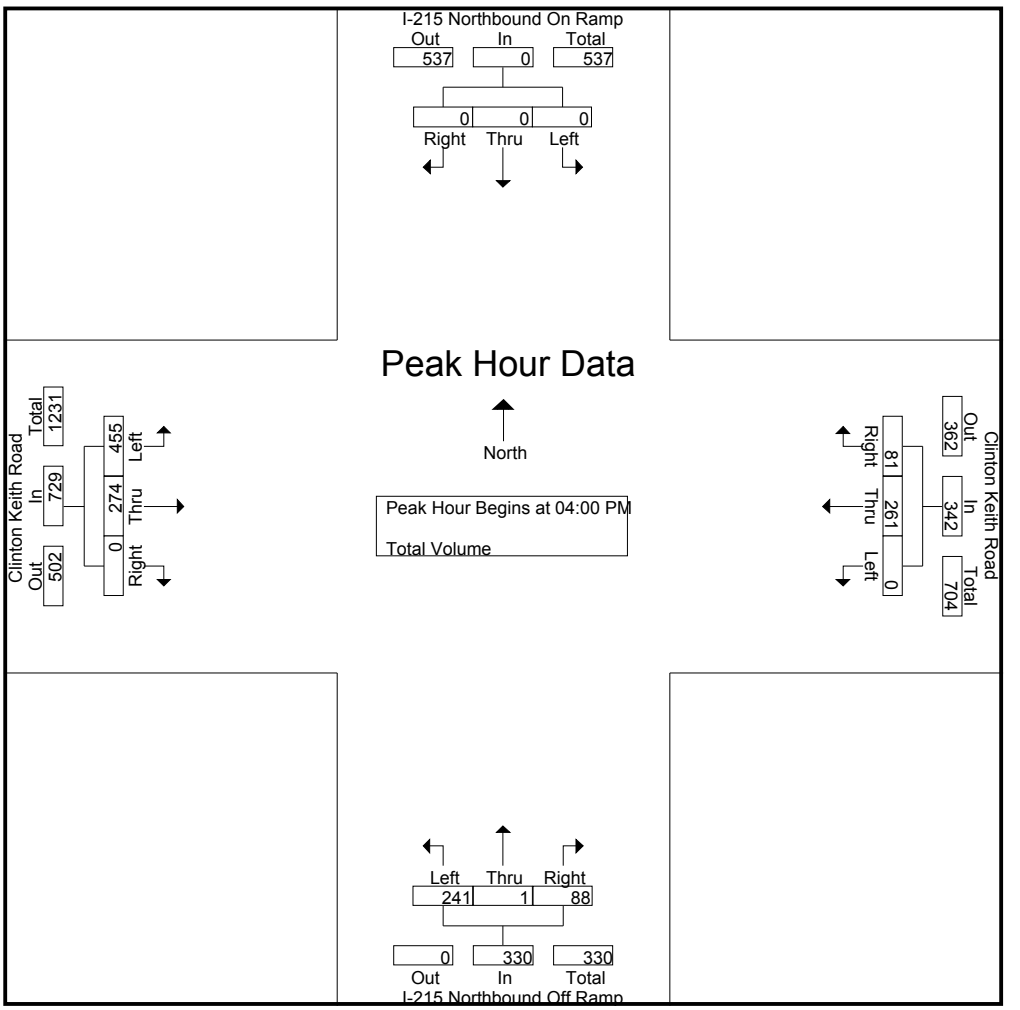


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:15 PM				04:00 PM				04:30 PM			
+0 mins.	0	0	0	0	0	57	**24**	81	**69**	**1**	23	**93**	117	74	0	191
+15 mins.	0	0	0	0	0	65	18	83	69	0	22	91	98	**77**	0	175
+30 mins.	0	0	0	0	0	72	20	92	56	0	**25**	81	102	67	0	169
+45 mins.	0	0	0	0	0	**93**	16	**109**	47	0	18	65	**132**	65	0	**197**
Total Volume	0	0	0	0	0	287	78	365	241	1	88	330	449	283	0	732
% App. Total	0	0	0		0	78.6	21.4		73	0.3	26.7		61.3	38.7	0	
PHF	.000	.000	.000	.000	.000	.772	.813	.837	.873	.250	.880	.887	.850	.919	.000	.929

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: I-15 Southbound Ramps
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MUR15SMHSAM
Site Code : 9311028
Start Date : 12/8/2009

Groups Printed- Total Volume

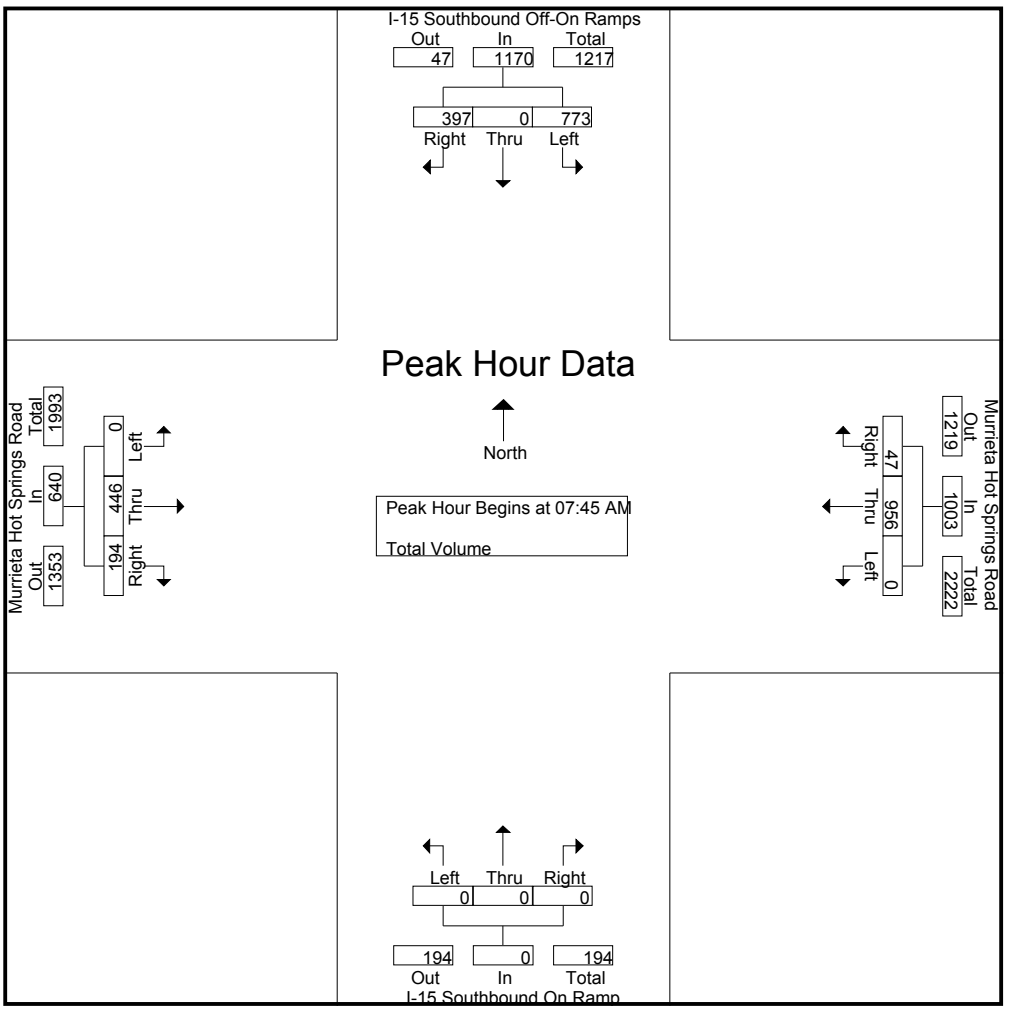
	I-15 Southbound Off-On Ramps Southbound				Murrieta Hot Springs Road Westbound				I-15 Southbound On Ramp Northbound				Murrieta Hot Springs Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	114	0	53	167	0	123	8	131	0	0	0	0	0	66	35	101	399
07:15 AM	127	0	72	199	0	132	17	149	0	0	0	0	0	70	42	112	460
07:30 AM	180	0	117	297	0	157	13	170	0	0	0	0	0	72	51	123	590
07:45 AM	249	0	122	371	0	264	12	276	0	0	0	0	0	94	40	134	781
Total	670	0	364	1034	0	676	50	726	0	0	0	0	0	302	168	470	2230
08:00 AM	182	0	111	293	0	224	12	236	0	0	0	0	0	80	47	127	656
08:15 AM	175	0	82	257	0	220	9	229	0	0	0	0	0	108	41	149	635
08:30 AM	167	0	82	249	0	248	14	262	0	0	0	0	0	164	66	230	741
08:45 AM	187	0	113	300	0	317	15	332	0	0	0	0	0	133	47	180	812
Total	711	0	388	1099	0	1009	50	1059	0	0	0	0	0	485	201	686	2844
Grand Total	1381	0	752	2133	0	1685	100	1785	0	0	0	0	0	787	369	1156	5074
Apprch %	64.7	0	35.3		0	94.4	5.6		0	0	0		0	68.1	31.9		
Total %	27.2	0	14.8	42	0	33.2	2	35.2	0	0	0	0	0	15.5	7.3	22.8	

	I-15 Southbound Off-On Ramps Southbound				Murrieta Hot Springs Road Westbound				I-15 Southbound On Ramp Northbound				Murrieta Hot Springs Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:30 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	**249**	0	**122**	**371**	0	**264**	12	**276**	0	0	0	0	0	94	40	134	**781**
08:00 AM	182	0	111	293	0	224	12	236	0	0	0	0	0	80	47	127	656
08:15 AM	175	0	82	257	0	220	9	229	0	0	0	0	0	108	41	149	635
08:30 AM	167	0	82	249	0	248	**14**	262	0	0	0	0	0	**164**	**66**	**230**	741
Total Volume	773	0	397	1170	0	956	47	1003	0	0	0	0	0	446	194	640	2813
% App. Total	66.1	0	33.9		0	95.3	4.7		0	0	0		0	69.7	30.3		
PHF	.776	.000	.814	.788	.000	.905	.839	.909	.000	.000	.000	.000	.000	.680	.735	.696	.900

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: I-15 Southbound Ramps
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MUR15SMHSAM
Site Code : 9311028
Start Date : 12/8/2009
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:30 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:30 AM				07:45 AM				07:00 AM				07:45 AM			
+0 mins.	180	0	117	297	0	**264**	12	**276**	0	0	0	0	0	94	40	134
+15 mins.	**249**	0	**122**	**371**	0	224	12	236	0	0	0	0	0	80	47	127
+30 mins.	182	0	111	293	0	220	9	229	0	0	0	0	0	108	41	149
+45 mins.	175	0	82	257	0	248	**14**	262	0	0	0	0	0	**164**	**66**	**230**
Total Volume	786	0	432	1218	0	956	47	1003	0	0	0	0	0	446	194	640
% App. Total	64.5	0	35.5		0	95.3	4.7		0	0	0		0	69.7	30.3	
PHF	.789	.000	.885	.821	.000	.905	.839	.909	.000	.000	.000	.000	.000	.680	.735	.696

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: I-15 Southbound Ramps
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MUR15SMHSPM
Site Code : 9311028
Start Date : 12/8/2009

Groups Printed- Total Volume

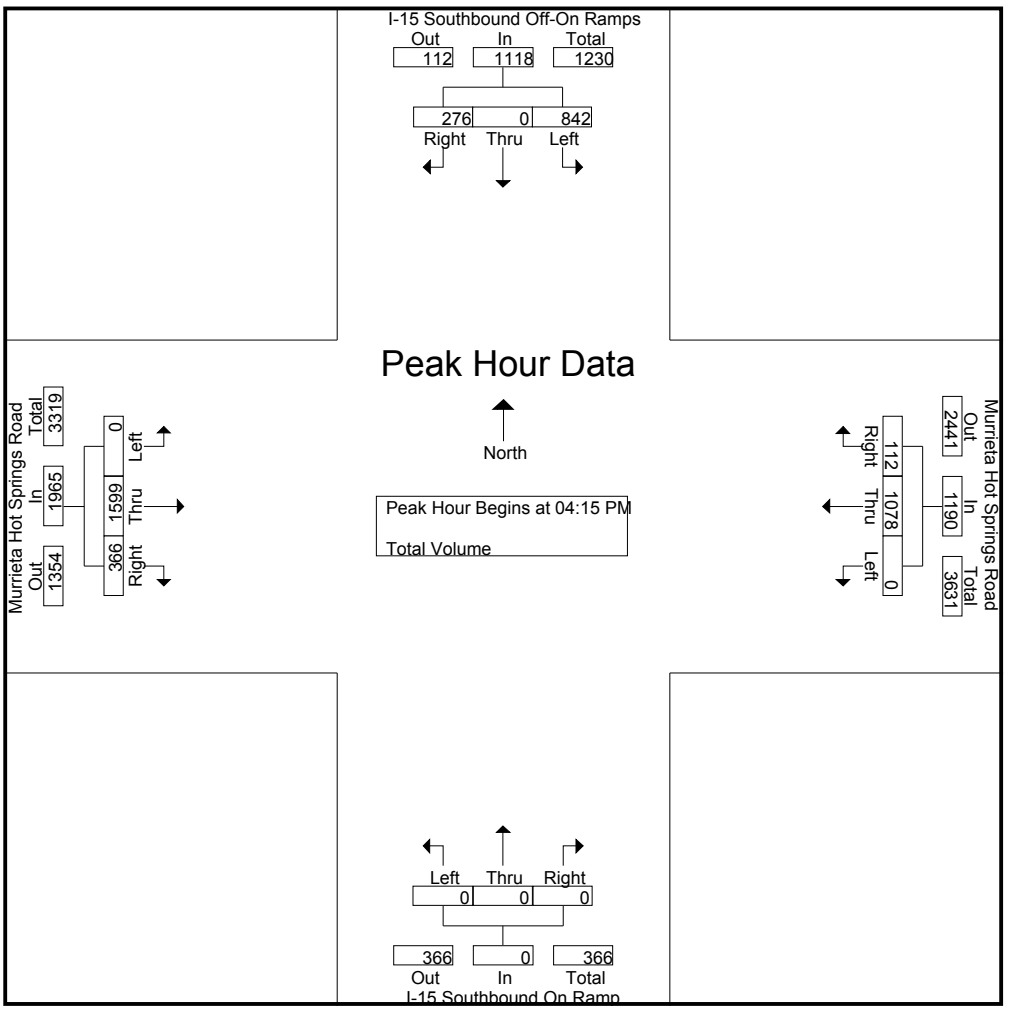
	I-15 Southbound Off-On Ramps Southbound				Murrieta Hot Springs Road Westbound				I-15 Southbound On Ramp Northbound				Murrieta Hot Springs Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	187	0	69	256	0	279	28	307	0	0	0	0	0	342	75	417	980
04:15 PM	216	0	74	290	0	287	30	317	0	0	0	0	0	394	83	477	1084
04:30 PM	203	0	77	280	0	280	23	303	0	0	0	0	0	381	83	464	1047
04:45 PM	209	0	74	283	0	273	23	296	0	0	0	0	0	396	88	484	1063
Total	815	0	294	1109	0	1119	104	1223	0	0	0	0	0	1513	329	1842	4174
05:00 PM	214	0	51	265	0	238	36	274	0	0	0	0	0	428	112	540	1079
05:15 PM	200	0	52	252	0	269	24	293	0	0	0	0	0	448	59	507	1052
05:30 PM	217	0	61	278	0	217	37	254	0	0	0	0	0	355	78	433	965
05:45 PM	189	0	55	244	0	263	15	278	0	0	0	0	0	316	56	372	894
Total	820	0	219	1039	0	987	112	1099	0	0	0	0	0	1547	305	1852	3990
Grand Total	1635	0	513	2148	0	2106	216	2322	0	0	0	0	0	3060	634	3694	8164
Apprch %	76.1	0	23.9		0	90.7	9.3		0	0	0		0	82.8	17.2		
Total %	20	0	6.3	26.3	0	25.8	2.6	28.4	0	0	0	0	0	37.5	7.8	45.2	

	I-15 Southbound Off-On Ramps Southbound				Murrieta Hot Springs Road Westbound				I-15 Southbound On Ramp Northbound				Murrieta Hot Springs Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	**216**	0	74	**290**	0	**287**	30	**317**	0	0	0	0	0	394	83	477	**1084**
04:30 PM	203	0	**77**	280	0	280	23	303	0	0	0	0	0	381	83	464	1047
04:45 PM	209	0	74	283	0	273	23	296	0	0	0	0	0	396	88	484	1063
05:00 PM	214	0	51	265	0	238	**36**	274	0	0	0	0	0	**428**	**112**	**540**	1079
Total Volume	842	0	276	1118	0	1078	112	1190	0	0	0	0	0	1599	366	1965	4273
% App. Total	75.3	0	24.7		0	90.6	9.4		0	0	0		0	81.4	18.6		
PHF	.975	.000	.896	.964	.000	.939	.778	.938	.000	.000	.000	.000	.000	.934	.817	.910	.985

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: I-15 Southbound Ramps
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MUR15SMHSPM
Site Code : 9311028
Start Date : 12/8/2009
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:30 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:15 PM				04:00 PM				04:00 PM				04:30 PM			
+0 mins.	**216**	0	74	**290**	0	279	28	307	0	0	0	0	0	381	83	464
+15 mins.	203	0	**77**	280	0	**287**	**30**	**317**	0	0	0	0	0	396	88	484
+30 mins.	209	0	74	283	0	280	23	303	0	0	0	0	0	428	**112**	**540**
+45 mins.	214	0	51	265	0	273	23	296	0	0	0	0	0	**448**	59	507
Total Volume	842	0	276	1118	0	1119	104	1223	0	0	0	0	0	1653	342	1995
% App. Total	75.3	0	24.7		0	91.5	8.5		0	0	0		0	82.9	17.1	
PHF	.975	.000	.896	.964	.000	.975	.867	.965	.000	.000	.000	.000	.000	.922	.763	.924

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: I-15 Northbound Ramps
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MUR15NMHSAM
Site Code : 9311043
Start Date : 12/8/2009
Page No : 1

Groups Printed- Total Volume

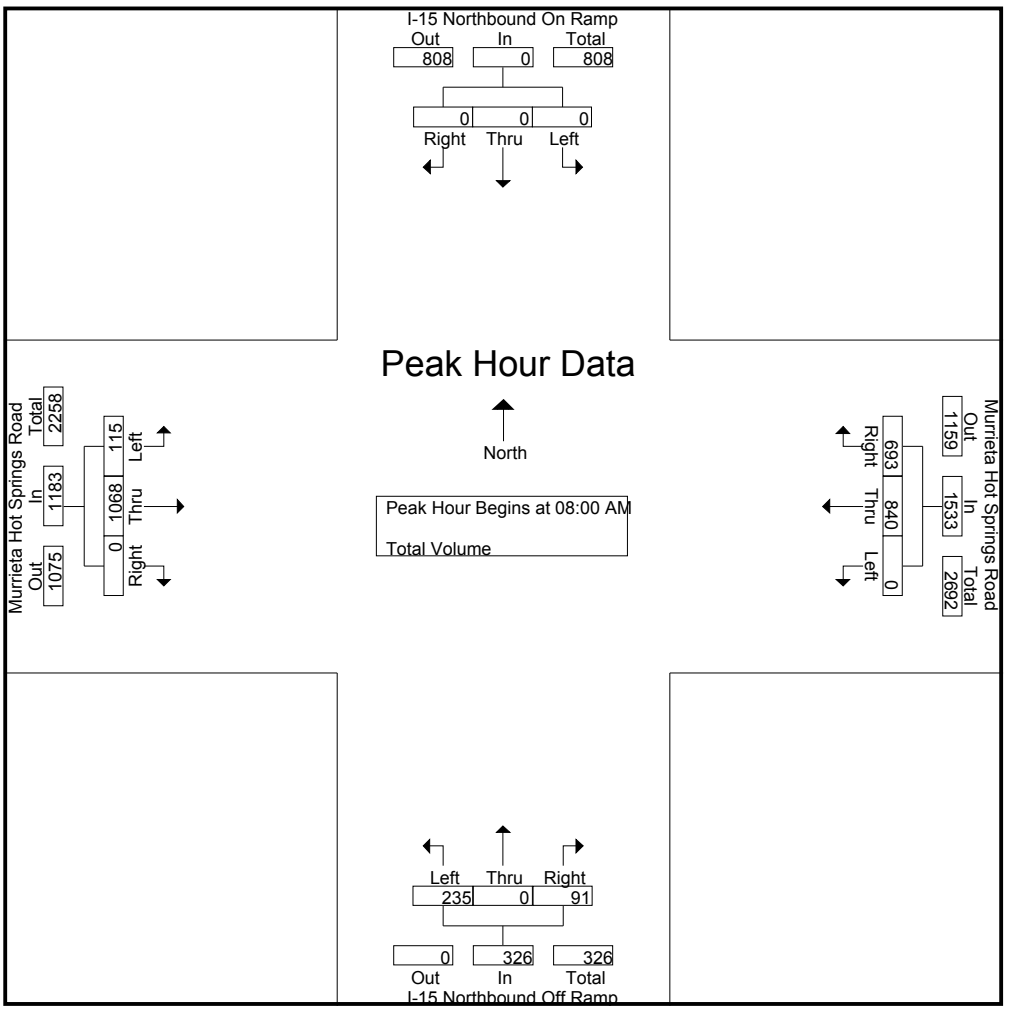
	I-15 Northbound On Ramp Southbound				Murrieta Hot Springs Road Westbound				I-15 Northbound Off Ramp Northbound				Murrieta Hot Springs Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	102	158	260	21	0	9	30	26	153	0	179	469
07:15 AM	0	0	0	0	0	137	227	364	24	2	14	40	21	176	0	197	601
07:30 AM	0	0	0	0	0	146	178	324	29	0	14	43	15	236	0	251	618
07:45 AM	0	0	0	0	0	232	183	415	55	0	19	74	24	317	0	341	830
Total	0	0	0	0	0	617	746	1363	129	2	56	187	86	882	0	968	2518
08:00 AM	0	0	0	0	0	180	151	331	50	0	24	74	13	237	0	250	655
08:15 AM	0	0	0	0	0	182	164	346	56	0	29	85	24	255	0	279	710
08:30 AM	0	0	0	0	0	212	183	395	51	0	19	70	46	285	0	331	796
08:45 AM	0	0	0	0	0	266	195	461	78	0	19	97	32	291	0	323	881
Total	0	0	0	0	0	840	693	1533	235	0	91	326	115	1068	0	1183	3042
Grand Total	0	0	0	0	0	1457	1439	2896	364	2	147	513	201	1950	0	2151	5560
Apprch %	0	0	0		0	50.3	49.7		71	0.4	28.7		9.3	90.7	0		
Total %	0	0	0	0	0	26.2	25.9	52.1	6.5	0	2.6	9.2	3.6	35.1	0	38.7	

	I-15 Northbound On Ramp Southbound				Murrieta Hot Springs Road Westbound				I-15 Northbound Off Ramp Northbound				Murrieta Hot Springs Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	0	0	0	0	180	151	331	50	0	24	74	13	237	0	250	655
08:15 AM	0	0	0	0	0	182	164	346	56	0	**29**	85	24	255	0	279	710
08:30 AM	0	0	0	0	0	212	183	395	51	0	19	70	**46**	285	0	**331**	796
08:45 AM	0	0	0	0	0	**266**	**195**	**461**	**78**	0	19	**97**	32	**291**	0	323	**881**
Total Volume	0	0	0	0	0	840	693	1533	235	0	91	326	115	1068	0	1183	3042
% App. Total	0	0	0		0	54.8	45.2		72.1	0	27.9		9.7	90.3	0		
PHF	.000	.000	.000	.000	.000	.789	.888	.831	.753	.000	.784	.840	.625	.918	.000	.894	.863

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: I-15 Northbound Ramps
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MUR15NMHSAM
Site Code : 9311043
Start Date : 12/8/2009
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				08:00 AM				08:00 AM				07:45 AM			
+0 mins.	0	0	0	0	0	180	151	331	50	0	24	74	24	**317**	0	**341**
+15 mins.	0	0	0	0	0	182	164	346	56	0	**29**	85	13	237	0	250
+30 mins.	0	0	0	0	0	212	183	395	51	0	19	70	24	255	0	279
+45 mins.	0	0	0	0	0	**266**	**195**	**461**	**78**	0	19	**97**	**46**	285	0	331
Total Volume	0	0	0	0	0	840	693	1533	235	0	91	326	107	1094	0	1201
% App. Total	0	0	0		0	54.8	45.2		72.1	0	27.9		8.9	91.1	0	
PHF	.000	.000	.000	.000	.000	.789	.888	.831	.753	.000	.784	.840	.582	.863	.000	.880

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: I-15 Northbound Ramps
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MUR15NMHSPM
Site Code : 9311043
Start Date : 12/8/2009
Page No : 1

Groups Printed- Total Volume

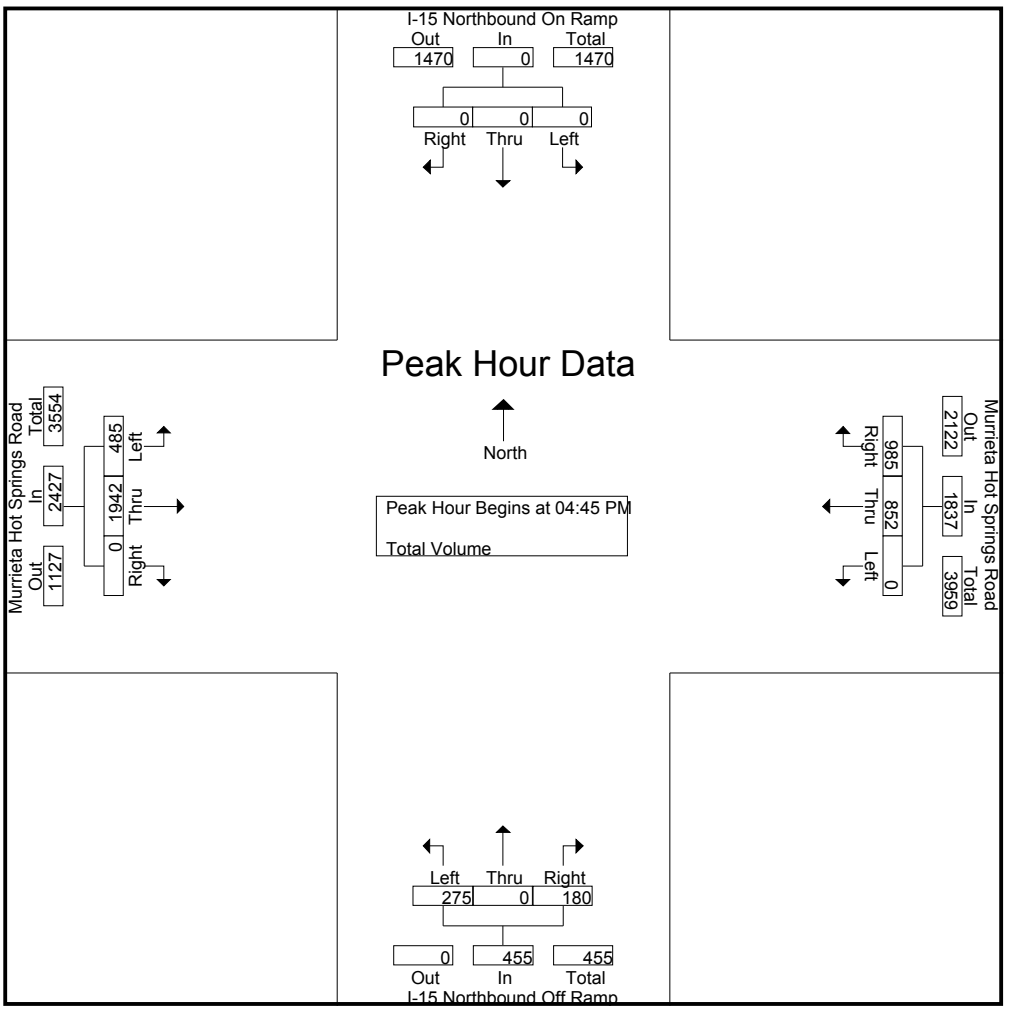
	I-15 Northbound On Ramp Southbound				Murrieta Hot Springs Road Westbound				I-15 Northbound Off Ramp Northbound				Murrieta Hot Springs Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	210	224	434	101	0	46	147	98	445	0	543	1124
04:15 PM	0	0	0	0	0	244	254	498	76	0	44	120	95	487	0	582	1200
04:30 PM	0	0	0	0	0	211	169	380	90	0	36	126	127	474	0	601	1107
04:45 PM	0	0	0	0	0	230	243	473	65	0	33	98	108	476	0	584	1155
Total	0	0	0	0	0	895	890	1785	332	0	159	491	428	1882	0	2310	4586
05:00 PM	0	0	0	0	0	197	243	440	86	0	44	130	130	500	0	630	1200
05:15 PM	0	0	0	0	0	230	258	488	60	0	53	113	125	507	0	632	1233
05:30 PM	0	0	0	0	0	195	241	436	64	0	50	114	122	459	0	581	1131
05:45 PM	0	0	0	0	0	213	186	399	64	0	59	123	76	430	0	506	1028
Total	0	0	0	0	0	835	928	1763	274	0	206	480	453	1896	0	2349	4592
Grand Total	0	0	0	0	0	1730	1818	3548	606	0	365	971	881	3778	0	4659	9178
Apprch %	0	0	0		0	48.8	51.2		62.4	0	37.6		18.9	81.1	0		
Total %	0	0	0	0	0	18.8	19.8	38.7	6.6	0	4	10.6	9.6	41.2	0	50.8	

	I-15 Northbound On Ramp Southbound				Murrieta Hot Springs Road Westbound				I-15 Northbound Off Ramp Northbound				Murrieta Hot Springs Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	0	0	0	**230**	243	473	65	0	33	98	108	476	0	584	1155
05:00 PM	0	0	0	0	0	197	243	440	**86**	0	44	**130**	**130**	500	0	630	1200
05:15 PM	0	0	0	0	0	230	**258**	**488**	60	0	**53**	113	125	**507**	0	**632**	**1233**
05:30 PM	0	0	0	0	0	195	241	436	64	0	50	114	122	459	0	581	1131
Total Volume	0	0	0	0	0	852	985	1837	275	0	180	455	485	1942	0	2427	4719
% App. Total	0	0	0		0	46.4	53.6		60.4	0	39.6		20	80	0		
PHF	.000	.000	.000	.000	.000	.926	.954	.941	.799	.000	.849	.875	.933	.958	.000	.960	.957

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Murrieta
N/S: I-15 Northbound Ramps
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MUR15NMHSPM
Site Code : 9311043
Start Date : 12/8/2009
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:45 PM				04:00 PM				04:30 PM			
+0 mins.	0	0	0	0	0	**230**	243	473	**101**	0	**46**	**147**	127	474	0	601
+15 mins.	0	0	0	0	0	197	243	440	76	0	44	120	108	476	0	584
+30 mins.	0	0	0	0	0	230	**258**	**488**	90	0	36	126	**130**	500	0	630
+45 mins.	0	0	0	0	0	195	241	436	65	0	33	98	125	**507**	0	**632**
Total Volume	0	0	0	0	0	852	985	1837	332	0	159	491	490	1957	0	2447
% App. Total	0	0	0		0	46.4	53.6		67.6	0	32.4		20	80	0	
PHF	.000	.000	.000	.000	.000	.926	.954	.941	.822	.000	.864	.835	.942	.965	.000	.968

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Menifee
N/S: Menifee Road
E/W: Scott Road
Weather: Sunny

File Name : MENMESCAM
Site Code : 9311022
Start Date : 12/9/2009

Groups Printed- Total Volume

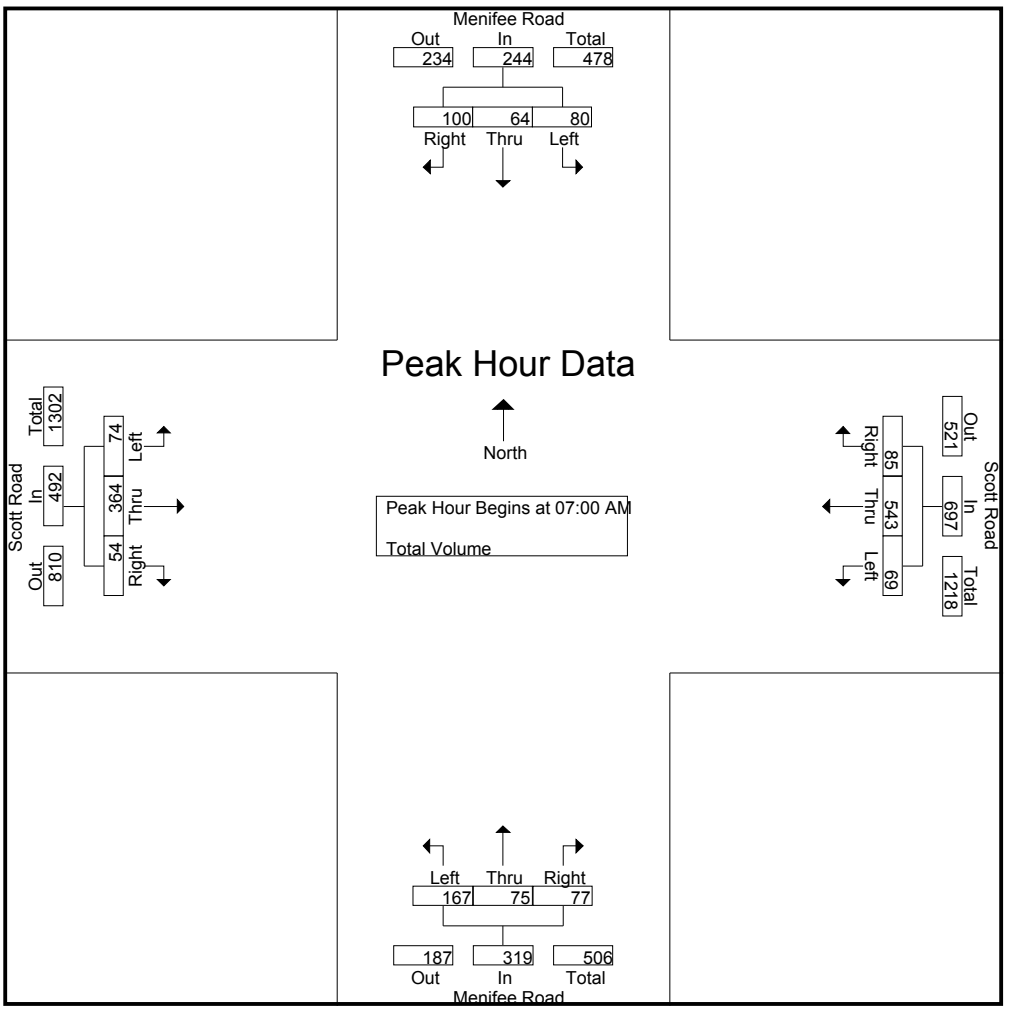
	Menifee Road Southbound				Scott Road Westbound				Menifee Road Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	12	14	23	49	14	137	6	157	51	9	5	65	16	98	9	123	394
07:15 AM	19	18	22	59	21	166	20	207	53	14	14	81	19	112	15	146	493
07:30 AM	23	15	28	66	24	123	25	172	39	29	28	96	18	65	12	95	429
07:45 AM	26	17	27	70	10	117	34	161	24	23	30	77	21	89	18	128	436
Total	80	64	100	244	69	543	85	697	167	75	77	319	74	364	54	492	1752
08:00 AM	21	7	34	62	7	86	20	113	33	19	19	71	21	94	17	132	378
08:15 AM	20	20	19	59	7	85	30	122	34	34	9	77	13	106	12	131	389
08:30 AM	20	29	28	77	9	116	21	146	34	23	11	68	13	59	18	90	381
08:45 AM	22	18	23	63	7	105	13	125	35	6	4	45	18	83	17	118	351
Total	83	74	104	261	30	392	84	506	136	82	43	261	65	342	64	471	1499
Grand Total	163	138	204	505	99	935	169	1203	303	157	120	580	139	706	118	963	3251
Apprch %	32.3	27.3	40.4		8.2	77.7	14		52.2	27.1	20.7		14.4	73.3	12.3		
Total %	5	4.2	6.3	15.5	3	28.8	5.2	37	9.3	4.8	3.7	17.8	4.3	21.7	3.6	29.6	

	Menifee Road Southbound				Scott Road Westbound				Menifee Road Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	12	14	23	49	14	137	6	157	51	9	5	65	16	98	9	123	394
07:15 AM	19	**18**	22	59	21	**166**	20	**207**	**53**	14	14	81	19	**112**	15	**146**	**493**
07:30 AM	23	15	**28**	66	**24**	123	25	172	39	**29**	28	**96**	18	65	12	95	429
07:45 AM	**26**	17	27	**70**	10	117	**34**	161	24	23	**30**	77	**21**	89	**18**	128	436
Total Volume	80	64	100	244	69	543	85	697	167	75	77	319	74	364	54	492	1752
% App. Total	32.8	26.2	41		9.9	77.9	12.2		52.4	23.5	24.1		15	74	11		
PHF	.769	.889	.893	.871	.719	.818	.625	.842	.788	.647	.642	.831	.881	.813	.750	.842	.888

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Menifee
N/S: Menifee Road
E/W: Scott Road
Weather: Sunny

File Name : MENMESCAM
Site Code : 9311022
Start Date : 12/9/2009
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:45 AM				07:00 AM				07:15 AM				07:15 AM			
+0 mins.	**26**	17	27	70	14	137	6	157	**53**	14	14	81	19	**112**	15	**146**
+15 mins.	21	7	**34**	62	21	**166**	20	**207**	39	**29**	28	**96**	18	65	12	95
+30 mins.	20	20	19	59	**24**	123	25	172	24	23	**30**	77	**21**	89	**18**	128
+45 mins.	20	**29**	28	**77**	10	117	**34**	161	33	19	19	71	21	94	17	132
Total Volume	87	73	108	268	69	543	85	697	149	85	91	325	79	360	62	501
% App. Total	32.5	27.2	40.3		9.9	77.9	12.2		45.8	26.2	28		15.8	71.9	12.4	
PHF	.837	.629	.794	.870	.719	.818	.625	.842	.703	.733	.758	.846	.940	.804	.861	.858

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Menifee
N/S: Menifee Road
E/W: Scott Road
Weather: Sunny

File Name : MENMESCPM
Site Code : 9311022
Start Date : 12/9/2009

Groups Printed- Total Volume

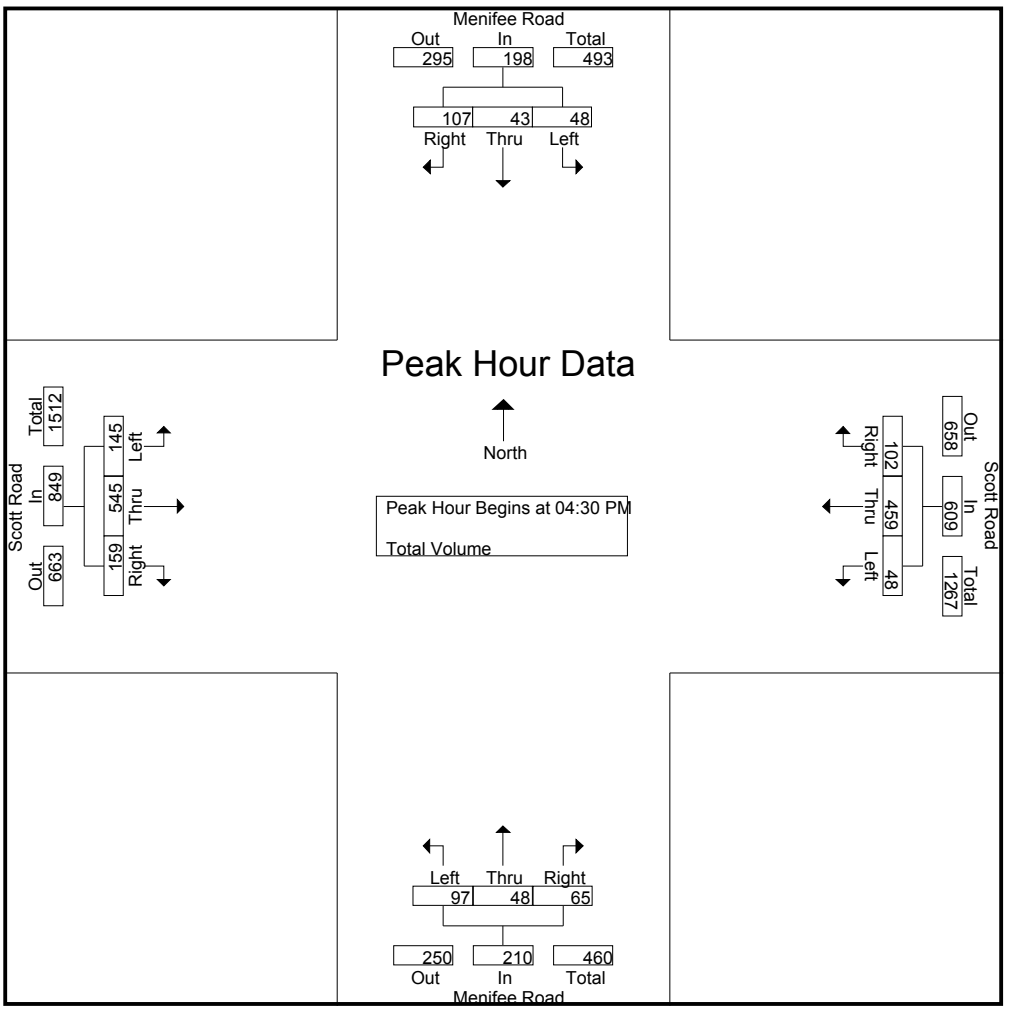
	Menifee Road Southbound				Scott Road Westbound				Menifee Road Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	20	11	20	51	14	111	22	147	26	19	20	65	45	103	31	179	442
04:15 PM	16	14	22	52	6	118	20	144	32	18	11	61	37	113	33	183	440
04:30 PM	10	10	30	50	16	114	25	155	27	8	16	51	29	146	38	213	469
04:45 PM	11	10	22	43	9	120	31	160	29	13	15	57	42	140	35	217	477
Total	57	45	94	196	45	463	98	606	114	58	62	234	153	502	137	792	1828
05:00 PM	16	12	29	57	8	104	15	127	22	13	15	50	39	125	31	195	429
05:15 PM	11	11	26	48	15	121	31	167	19	14	19	52	35	134	55	224	491
05:30 PM	12	16	19	47	11	96	13	120	22	13	9	44	39	135	35	209	420
05:45 PM	7	18	17	42	11	72	26	109	22	21	15	58	39	124	35	198	407
Total	46	57	91	194	45	393	85	523	85	61	58	204	152	518	156	826	1747
Grand Total	103	102	185	390	90	856	183	1129	199	119	120	438	305	1020	293	1618	3575
Apprch %	26.4	26.2	47.4		8	75.8	16.2		45.4	27.2	27.4		18.9	63	18.1		
Total %	2.9	2.9	5.2	10.9	2.5	23.9	5.1	31.6	5.6	3.3	3.4	12.3	8.5	28.5	8.2	45.3	

	Menifee Road Southbound				Scott Road Westbound				Menifee Road Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	10	10	**30**	50	**16**	114	25	155	27	8	16	51	29	**146**	38	213	469
04:45 PM	11	10	22	43	9	120	**31**	160	**29**	13	15	**57**	**42**	140	35	217	477
05:00 PM	**16**	**12**	29	**57**	8	104	15	127	22	13	15	50	39	125	31	195	429
05:15 PM	11	11	26	48	15	**121**	31	**167**	19	**14**	**19**	52	35	134	**55**	**224**	**491**
Total Volume	48	43	107	198	48	459	102	609	97	48	65	210	145	545	159	849	1866
% App. Total	24.2	21.7	54		7.9	75.4	16.7		46.2	22.9	31		17.1	64.2	18.7		
PHF	.750	.896	.892	.868	.750	.948	.823	.912	.836	.857	.855	.921	.863	.933	.723	.948	.950

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Menifee
N/S: Menifee Road
E/W: Scott Road
Weather: Sunny

File Name : MENMESCPM
Site Code : 9311022
Start Date : 12/9/2009
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:15 PM				04:30 PM				04:00 PM				04:30 PM			
+0 mins.	**16**	**14**	22	52	**16**	114	25	155	26	**19**	**20**	**65**	29	**146**	38	213
+15 mins.	10	10	**30**	50	9	120	**31**	160	**32**	18	11	61	**42**	140	35	217
+30 mins.	11	10	22	43	8	104	15	127	27	8	16	51	39	125	31	195
+45 mins.	16	12	29	**57**	15	**121**	31	**167**	29	13	15	57	35	134	**55**	**224**
Total Volume	53	46	103	202	48	459	102	609	114	58	62	234	145	545	159	849
% App. Total	26.2	22.8	51		7.9	75.4	16.7		48.7	24.8	26.5		17.1	64.2	18.7	
PHF	.828	.821	.858	.886	.750	.948	.823	.912	.891	.763	.775	.900	.863	.933	.723	.948

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Winchester Road (SR-79)
E/W: Thompson Rd/Max Gillis Boulevard
Weather: Sunny

File Name : CRVWITHAM
Site Code : 9311028
Start Date : 12/9/2009

Groups Printed- Total Volume

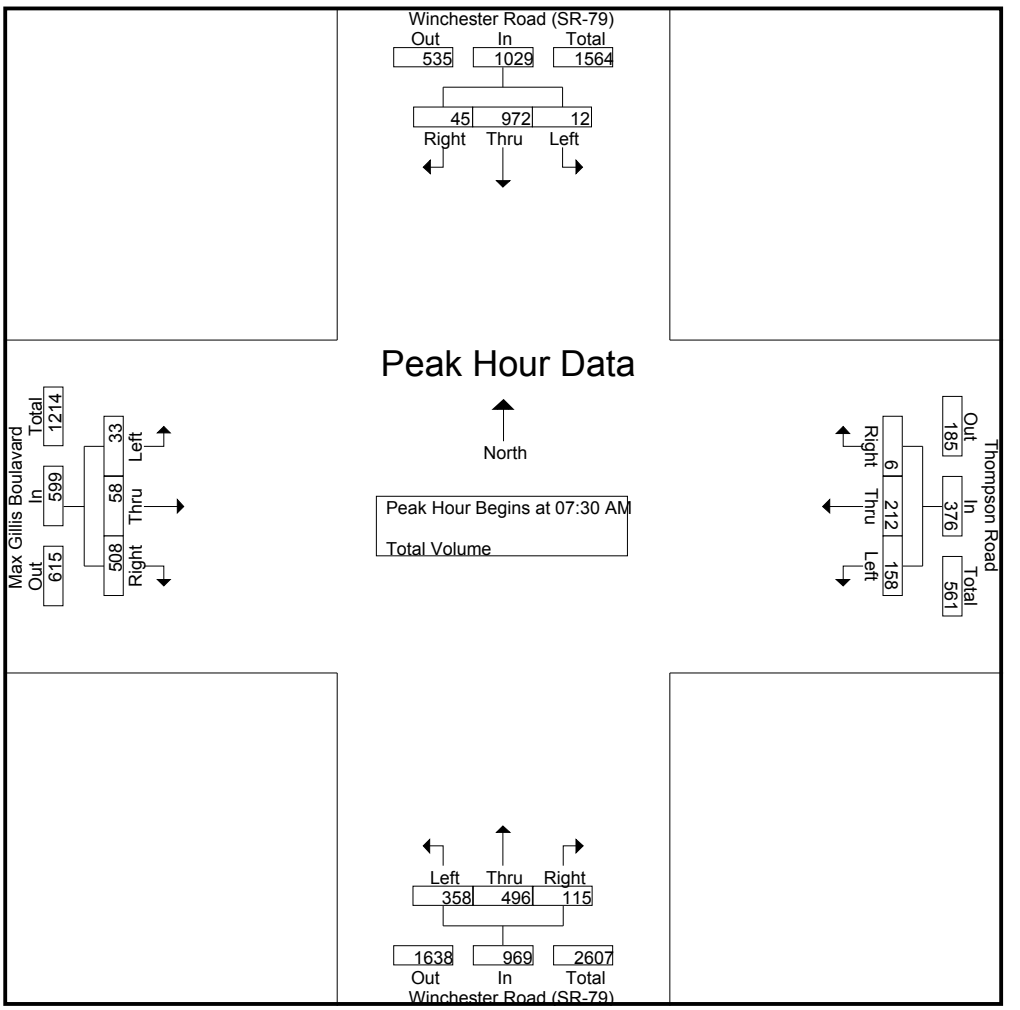
	Winchester Road (SR-79) Southbound				Thompson Road Westbound				Winchester Road (SR-79) Northbound				Max Gillis Boulavard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	5	178	12	195	31	22	3	56	48	107	18	173	12	10	61	83	507
07:15 AM	6	228	11	245	39	23	2	64	46	119	21	186	15	7	70	92	587
07:30 AM	1	263	12	276	46	38	2	86	69	123	21	213	7	12	92	111	686
07:45 AM	2	246	9	257	30	43	0	73	92	122	22	236	7	8	86	101	667
Total	14	915	44	973	146	126	7	279	255	471	82	808	41	37	309	387	2447
08:00 AM	7	232	10	249	42	73	3	118	101	131	45	277	10	16	147	173	817
08:15 AM	2	231	14	247	40	58	1	99	96	120	27	243	9	22	183	214	803
08:30 AM	2	211	16	229	38	12	1	51	52	121	17	190	18	19	150	187	657
08:45 AM	2	170	7	179	65	33	0	98	31	116	19	166	11	14	80	105	548
Total	13	844	47	904	185	176	5	366	280	488	108	876	48	71	560	679	2825
Grand Total	27	1759	91	1877	331	302	12	645	535	959	190	1684	89	108	869	1066	5272
Apprch %	1.4	93.7	4.8		51.3	46.8	1.9		31.8	56.9	11.3		8.3	10.1	81.5		
Total %	0.5	33.4	1.7	35.6	6.3	5.7	0.2	12.2	10.1	18.2	3.6	31.9	1.7	2	16.5	20.2	

	Winchester Road (SR-79) Southbound				Thompson Road Westbound				Winchester Road (SR-79) Northbound				Max Gillis Boulavard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	1	**263**	12	**276**	**46**	38	2	86	69	123	21	213	7	12	92	111	686
07:45 AM	2	246	9	257	30	43	0	73	92	122	22	236	7	8	86	101	667
08:00 AM	**7**	232	10	249	42	**73**	**3**	**118**	**101**	**131**	**45**	**277**	**10**	16	147	173	**817**
08:15 AM	2	231	**14**	247	40	58	1	99	96	120	27	243	9	**22**	**183**	**214**	803
Total Volume	12	972	45	1029	158	212	6	376	358	496	115	969	33	58	508	599	2973
% App. Total	1.2	94.5	4.4		42	56.4	1.6		36.9	51.2	11.9		5.5	9.7	84.8		
PHF	.429	.924	.804	.932	.859	.726	.500	.797	.886	.947	.639	.875	.825	.659	.694	.700	.910

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Winchester Road (SR-79)
E/W: Thompson Rd/Max Gillis Boulevard
Weather: Sunny

File Name : CRVWITHAM
Site Code : 9311028
Start Date : 12/9/2009
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				08:00 AM			
+0 mins.	1	**263**	12	**276**	**46**	38	2	86	69	123	21	213	10	16	147	173
+15 mins.	2	246	9	257	30	43	0	73	92	122	22	236	9	**22**	**183**	**214**
+30 mins.	**7**	232	10	249	42	**73**	**3**	**118**	**101**	**131**	**45**	**277**	**18**	19	150	187
+45 mins.	2	231	**14**	247	40	58	1	99	96	120	27	243	11	14	80	105
Total Volume	12	972	45	1029	158	212	6	376	358	496	115	969	48	71	560	679
% App. Total	1.2	94.5	4.4		42	56.4	1.6		36.9	51.2	11.9		7.1	10.5	82.5	
PHF	.429	.924	.804	.932	.859	.726	.500	.797	.886	.947	.639	.875	.667	.807	.765	.793

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Winchester Road (SR-79)
E/W: Thompson Rd/Max Gillis Boulevard
Weather: Sunny

File Name : CRVWITHPM
Site Code : 9311028
Start Date : 12/9/2009

Groups Printed- Total Volume

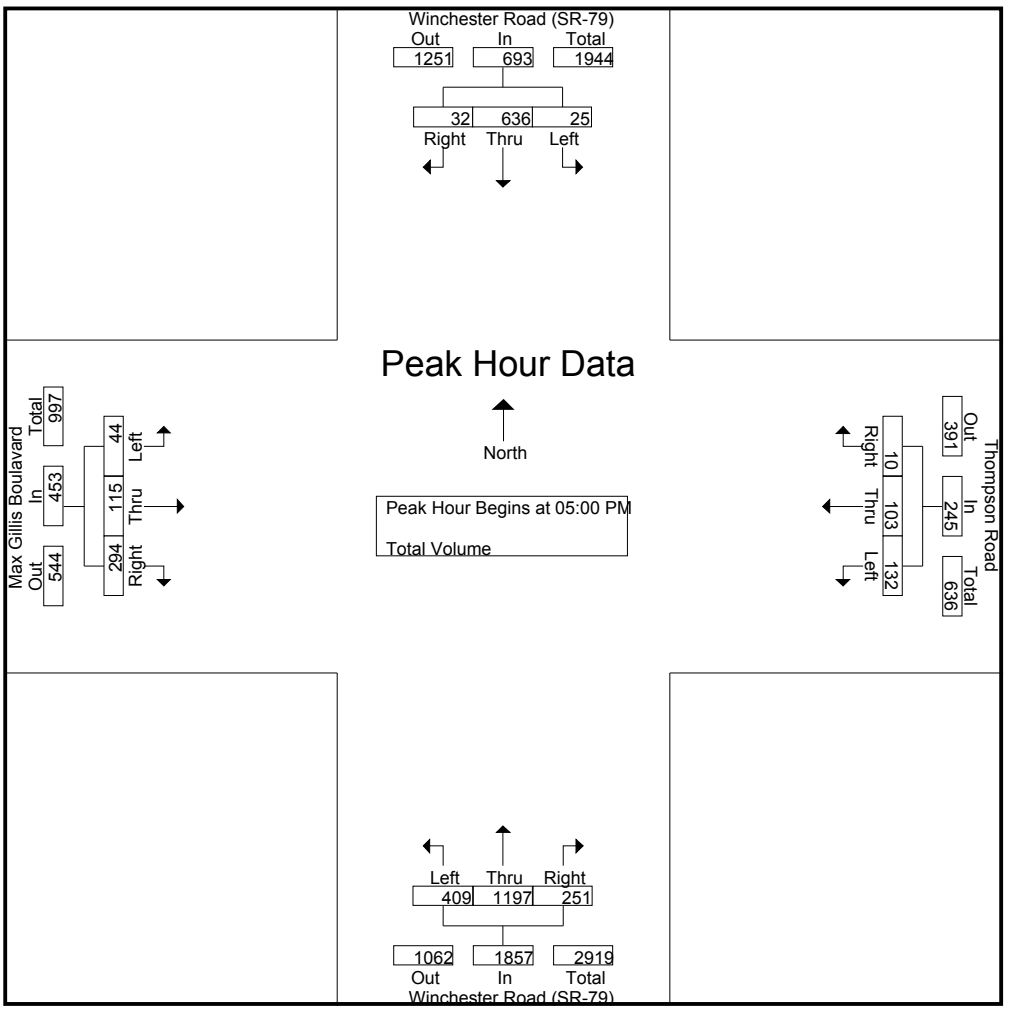
	Winchester Road (SR-79) Southbound				Thompson Road Westbound				Winchester Road (SR-79) Northbound				Max Gillis Boulavard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	3	172	7	182	23	18	3	44	66	299	56	421	8	31	67	106	753
04:15 PM	4	167	6	177	18	14	1	33	98	274	47	419	10	20	53	83	712
04:30 PM	8	184	2	194	35	22	7	64	87	280	40	407	13	28	65	106	771
04:45 PM	5	164	6	175	25	22	4	51	82	291	64	437	12	26	81	119	782
Total	20	687	21	728	101	76	15	192	333	1144	207	1684	43	105	266	414	3018
05:00 PM	7	155	7	169	32	18	2	52	81	280	47	408	15	32	75	122	751
05:15 PM	5	158	9	172	28	22	2	52	107	324	71	502	10	26	80	116	842
05:30 PM	8	181	7	196	31	40	3	74	101	307	80	488	10	26	73	109	867
05:45 PM	5	142	9	156	41	23	3	67	120	286	53	459	9	31	66	106	788
Total	25	636	32	693	132	103	10	245	409	1197	251	1857	44	115	294	453	3248
Grand Total	45	1323	53	1421	233	179	25	437	742	2341	458	3541	87	220	560	867	6266
Apprch %	3.2	93.1	3.7		53.3	41	5.7		21	66.1	12.9		10	25.4	64.6		
Total %	0.7	21.1	0.8	22.7	3.7	2.9	0.4	7	11.8	37.4	7.3	56.5	1.4	3.5	8.9	13.8	

	Winchester Road (SR-79) Southbound				Thompson Road Westbound				Winchester Road (SR-79) Northbound				Max Gillis Boulavard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	7	155	7	169	32	18	2	52	81	280	47	408	**15**	**32**	75	**122**	751
05:15 PM	5	158	**9**	172	28	22	2	52	107	**324**	71	**502**	10	26	**80**	116	842
05:30 PM	**8**	**181**	7	**196**	31	**40**	**3**	**74**	101	307	**80**	488	10	26	73	109	**867**
05:45 PM	5	142	9	156	**41**	23	3	67	**120**	286	53	459	9	31	66	106	788
Total Volume	25	636	32	693	132	103	10	245	409	1197	251	1857	44	115	294	453	3248
% App. Total	3.6	91.8	4.6		53.9	42	4.1		22	64.5	13.5		9.7	25.4	64.9		
PHF	.781	.878	.889	.884	.805	.644	.833	.828	.852	.924	.784	.925	.733	.898	.919	.928	.937

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Winchester Road (SR-79)
E/W: Thompson Rd/Max Gillis Boulevard
Weather: Sunny

File Name : CRVWITHPM
Site Code : 9311028
Start Date : 12/9/2009
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				05:00 PM				05:00 PM				04:45 PM			
+0 mins.	3	172	**7**	182	32	18	2	52	81	280	47	408	12	26	**81**	119
+15 mins.	4	167	6	177	28	22	2	52	107	**324**	71	**502**	**15**	**32**	75	**122**
+30 mins.	**8**	**184**	2	**194**	31	**40**	**3**	**74**	101	307	**80**	488	10	26	80	116
+45 mins.	5	164	6	175	**41**	23	3	67	**120**	286	53	459	10	26	73	109
Total Volume	20	687	21	728	132	103	10	245	409	1197	251	1857	47	110	309	466
% App. Total	2.7	94.4	2.9		53.9	42	4.1		22	64.5	13.5		10.1	23.6	66.3	
PHF	.625	.933	.750	.938	.805	.644	.833	.828	.852	.924	.784	.925	.783	.859	.954	.955

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Winchester Road (SR-79)
E/W: Scott Road-Washington Street
Weather: Sunny

File Name : CRVWISCAM
Site Code : 9311051
Start Date : 12/9/2009

Groups Printed- Total Volume

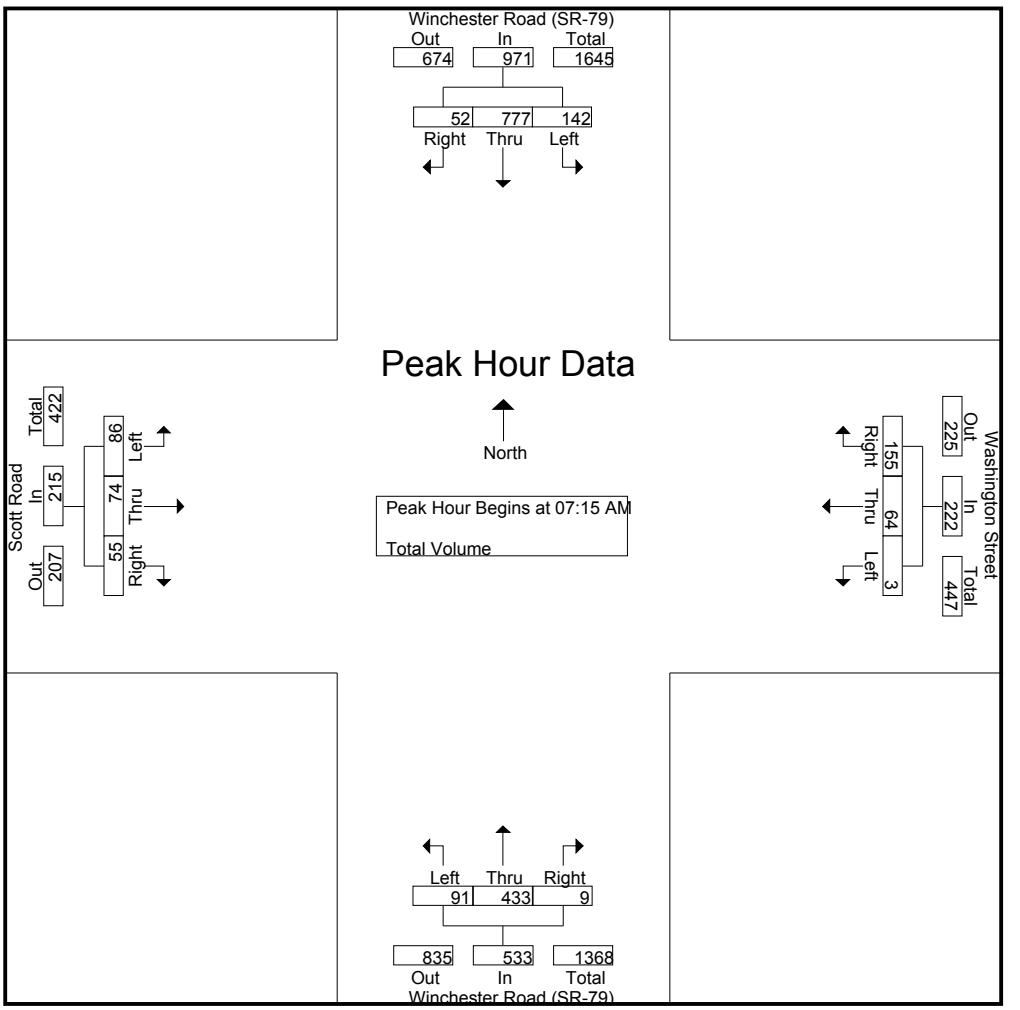
	Winchester Road (SR-79) Southbound				Washington Street Westbound				Winchester Road (SR-79) Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	34	143	14	191	1	17	32	50	26	107	1	134	16	21	17	54	429
07:15 AM	39	200	14	253	0	14	32	46	27	99	3	129	22	23	14	59	487
07:30 AM	41	214	10	265	1	13	52	66	29	102	0	131	26	16	11	53	515
07:45 AM	25	177	22	224	1	18	31	50	17	120	1	138	26	16	13	55	467
Total	139	734	60	933	3	62	147	212	99	428	5	532	90	76	55	221	1898
08:00 AM	37	186	6	229	1	19	40	60	18	112	5	135	12	19	17	48	472
08:15 AM	28	163	18	209	0	14	31	45	13	85	3	101	13	10	18	41	396
08:30 AM	17	152	19	188	1	15	20	36	16	82	1	99	18	6	12	36	359
08:45 AM	20	136	18	174	0	13	23	36	10	108	4	122	20	6	8	34	366
Total	102	637	61	800	2	61	114	177	57	387	13	457	63	41	55	159	1593
Grand Total	241	1371	121	1733	5	123	261	389	156	815	18	989	153	117	110	380	3491
Apprch %	13.9	79.1	7		1.3	31.6	67.1		15.8	82.4	1.8		40.3	30.8	28.9		
Total %	6.9	39.3	3.5	49.6	0.1	3.5	7.5	11.1	4.5	23.3	0.5	28.3	4.4	3.4	3.2	10.9	

	Winchester Road (SR-79) Southbound				Washington Street Westbound				Winchester Road (SR-79) Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	39	200	14	253	0	14	32	46	27	99	3	129	22	**23**	14	**59**	487
07:30 AM	**41**	**214**	10	**265**	**1**	13	**52**	**66**	**29**	102	0	131	**26**	16	11	53	**515**
07:45 AM	25	177	**22**	224	1	18	31	50	17	**120**	1	**138**	26	16	13	55	467
08:00 AM	37	186	6	229	1	**19**	40	60	18	112	**5**	135	12	19	**17**	48	472
Total Volume	142	777	52	971	3	64	155	222	91	433	9	533	86	74	55	215	1941
% App. Total	14.6	80	5.4		1.4	28.8	69.8		17.1	81.2	1.7		40	34.4	25.6		
PHF	.866	.908	.591	.916	.750	.842	.745	.841	.784	.902	.450	.966	.827	.804	.809	.911	.942

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Winchester Road (SR-79)
E/W: Scott Road-Washington Street
Weather: Sunny

File Name : CRVWISCAM
Site Code : 9311051
Start Date : 12/9/2009



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:15 AM				07:15 AM				07:15 AM				07:00 AM			
+0 mins.	39	200	14	253	0	14	32	46	27	99	3	129	16	21	**17**	54
+15 mins.	**41**	**214**	10	**265**	**1**	13	**52**	**66**	**29**	102	0	131	22	**23**	14	**59**
+30 mins.	25	177	**22**	224	1	18	31	50	17	**120**	1	**138**	**26**	16	11	53
+45 mins.	37	186	6	229	1	**19**	40	60	18	112	**5**	135	26	16	13	55
Total Volume	142	777	52	971	3	64	155	222	91	433	9	533	90	76	55	221
% App. Total	14.6	80	5.4		1.4	28.8	69.8		17.1	81.2	1.7		40.7	34.4	24.9	
PHF	.866	.908	.591	.916	.750	.842	.745	.841	.784	.902	.450	.966	.865	.826	.809	.936

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Winchester Road (SR-79)
E/W: Scott Road-Washington Street
Weather: Sunny

File Name : CRVWISCPM
Site Code : 9311051
Start Date : 12/9/2009
Page No : 1

Groups Printed- Total Volume

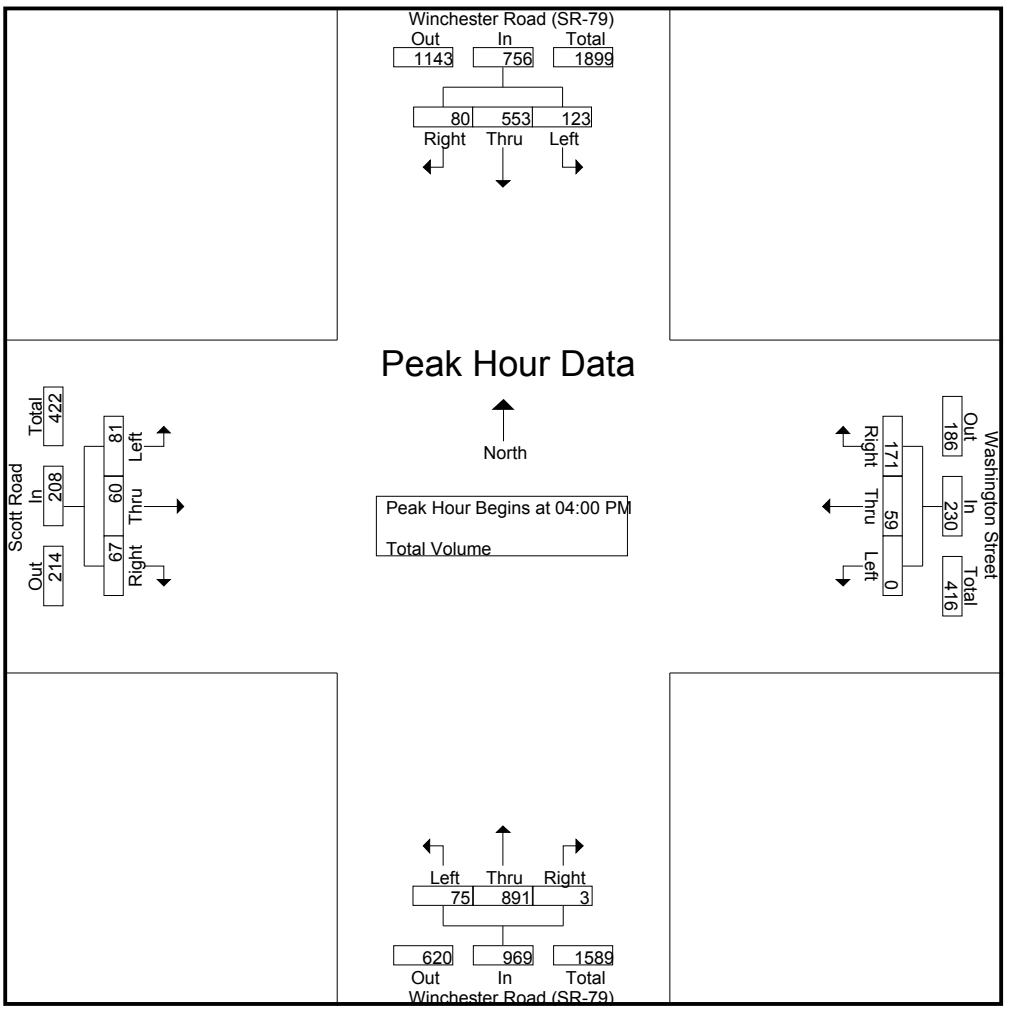
	Winchester Road (SR-79) Southbound				Washington Street Westbound				Winchester Road (SR-79) Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	34	122	20	176	0	11	39	50	18	220	1	239	24	16	16	56	521
04:15 PM	34	129	23	186	0	14	36	50	25	208	1	234	17	15	14	46	516
04:30 PM	32	169	19	220	0	15	41	56	12	208	0	220	25	12	16	53	549
04:45 PM	23	133	18	174	0	19	55	74	20	255	1	276	15	17	21	53	577
Total	123	553	80	756	0	59	171	230	75	891	3	969	81	60	67	208	2163
05:00 PM	23	123	17	163	0	13	35	48	21	198	0	219	22	11	10	43	473
05:15 PM	12	141	23	176	1	20	57	78	20	221	1	242	16	10	15	41	537
05:30 PM	19	161	19	199	0	15	60	75	13	200	3	216	18	15	20	53	543
05:45 PM	22	106	15	143	0	9	40	49	13	200	1	214	16	15	29	60	466
Total	76	531	74	681	1	57	192	250	67	819	5	891	72	51	74	197	2019
Grand Total	199	1084	154	1437	1	116	363	480	142	1710	8	1860	153	111	141	405	4182
Apprch %	13.8	75.4	10.7		0.2	24.2	75.6		7.6	91.9	0.4		37.8	27.4	34.8		
Total %	4.8	25.9	3.7	34.4	0	2.8	8.7	11.5	3.4	40.9	0.2	44.5	3.7	2.7	3.4	9.7	

	Winchester Road (SR-79) Southbound				Washington Street Westbound				Winchester Road (SR-79) Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**34**	122	20	176	0	11	39	50	18	220	**1**	239	24	16	16	**56**	521
04:15 PM	34	129	**23**	186	0	14	36	50	**25**	208	1	234	17	15	14	46	516
04:30 PM	32	**169**	19	**220**	0	15	41	56	12	208	0	220	**25**	12	16	53	549
04:45 PM	23	133	18	174	0	**19**	**55**	**74**	20	**255**	1	**276**	15	**17**	**21**	53	**577**
Total Volume	123	553	80	756	0	59	171	230	75	891	3	969	81	60	67	208	2163
% App. Total	16.3	73.1	10.6		0	25.7	74.3		7.7	92	0.3		38.9	28.8	32.2		
PHF	.904	.818	.870	.859	.000	.776	.777	.777	.750	.874	.750	.878	.810	.882	.798	.929	.937

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Winchester Road (SR-79)
E/W: Scott Road-Washington Street
Weather: Sunny

File Name : CRVWISCPM
Site Code : 9311051
Start Date : 12/9/2009



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:45 PM				04:00 PM				04:00 PM			
+0 mins.	**34**	122	20	176	0	19	55	74	18	220	**1**	239	24	16	16	**56**
+15 mins.	34	129	**23**	186	0	13	35	48	**25**	208	1	234	17	15	14	46
+30 mins.	32	**169**	19	**220**	**1**	**20**	57	**78**	12	208	0	220	**25**	12	16	53
+45 mins.	23	133	18	174	0	15	**60**	75	20	**255**	1	**276**	15	**17**	**21**	53
Total Volume	123	553	80	756	1	67	207	275	75	891	3	969	81	60	67	208
% App. Total	16.3	73.1	10.6		0.4	24.4	75.3		7.7	92	0.3		38.9	28.8	32.2	
PHF	.904	.818	.870	.859	.250	.838	.863	.881	.750	.874	.750	.878	.810	.882	.798	.929

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Winchester Road (SR-79)
E/W: Keller Road
Weather: Sunny

File Name : CRVWIKEAM
Site Code : 9311063
Start Date : 12/9/2009
Page No : 1

Groups Printed- Total Volume

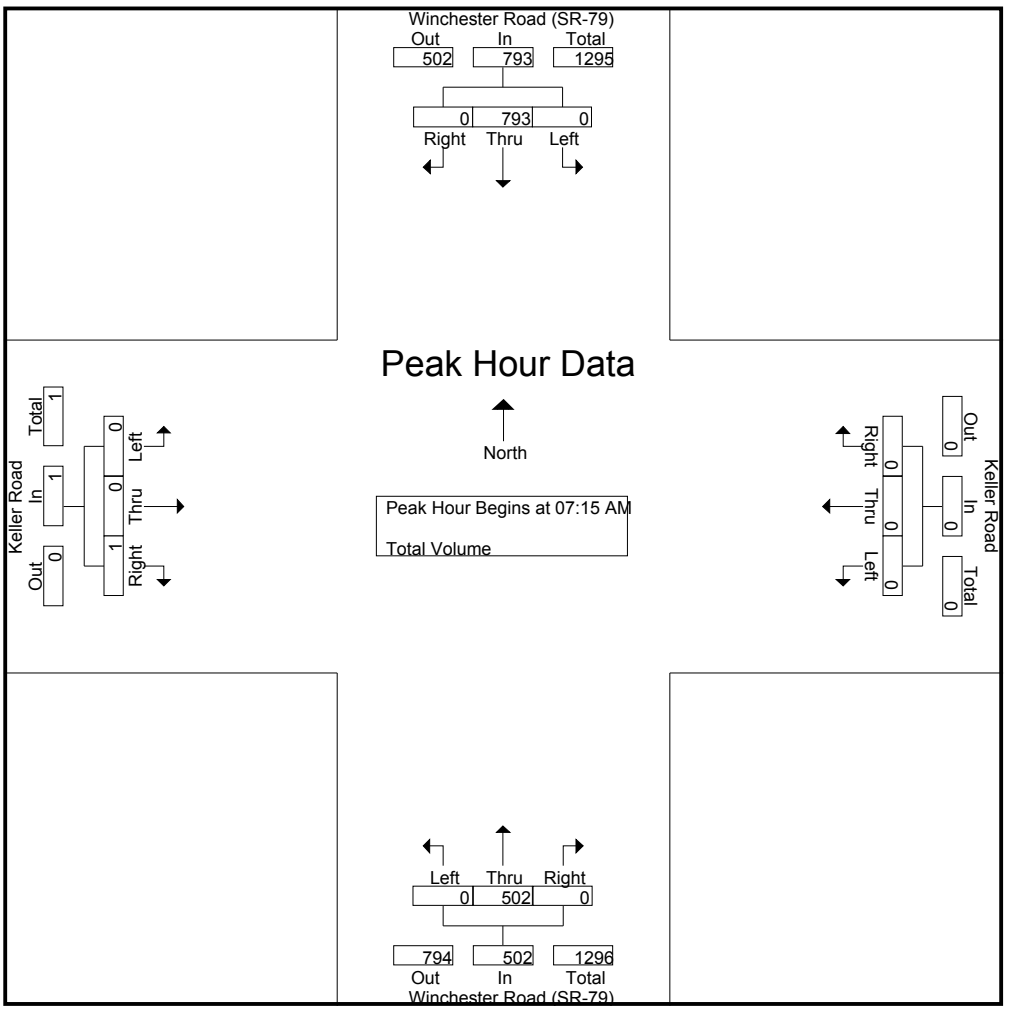
	Winchester Road (SR-79) Southbound				Keller Road Westbound				Winchester Road (SR-79) Northbound				Keller Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	157	0	157	0	0	2	2	0	125	0	125	0	0	0	0	284
07:15 AM	0	191	0	191	0	0	0	0	0	128	0	128	0	0	1	1	320
07:30 AM	0	215	0	215	0	0	0	0	0	129	0	129	0	0	0	0	344
07:45 AM	0	185	0	185	0	0	0	0	0	126	0	126	0	0	0	0	311
Total	0	748	0	748	0	0	2	2	0	508	0	508	0	0	1	1	1259
08:00 AM	0	202	0	202	0	0	0	0	0	119	0	119	0	0	0	0	321
08:15 AM	0	177	0	177	0	0	0	0	0	88	0	88	1	0	0	1	266
08:30 AM	0	163	0	163	0	0	0	0	0	97	1	98	1	0	0	1	262
08:45 AM	0	158	0	158	1	0	0	1	1	114	0	115	0	0	0	0	274
Total	0	700	0	700	1	0	0	1	1	418	1	420	2	0	0	2	1123
Grand Total	0	1448	0	1448	1	0	2	3	1	926	1	928	2	0	1	3	2382
Apprch %	0	100	0		33.3	0	66.7		0.1	99.8	0.1		66.7	0	33.3		
Total %	0	60.8	0	60.8	0	0	0.1	0.1	0	38.9	0	39	0.1	0	0	0.1	

	Winchester Road (SR-79) Southbound				Keller Road Westbound				Winchester Road (SR-79) Northbound				Keller Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	191	0	191	0	0	0	0	0	128	0	128	0	0	**1**	**1**	320
07:30 AM	0	**215**	0	**215**	0	0	0	0	0	**129**	0	**129**	0	0	0	0	**344**
07:45 AM	0	185	0	185	0	0	0	0	0	126	0	126	0	0	0	0	311
08:00 AM	0	202	0	202	0	0	0	0	0	119	0	119	0	0	0	0	321
Total Volume	0	793	0	793	0	0	0	0	0	502	0	502	0	0	1	1	1296
% App. Total	0	100	0		0	0	0		0	100	0		0	0	100		
PHF	.000	.922	.000	.922	.000	.000	.000	.000	.000	.973	.000	.973	.000	.000	.250	.250	.942

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Winchester Road (SR-79)
E/W: Keller Road
Weather: Sunny

File Name : CRVWIKEAM
Site Code : 9311063
Start Date : 12/9/2009



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:15 AM				07:00 AM				07:00 AM				07:45 AM			
+0 mins.	0	191	0	191	0	0	**2**	**2**	0	125	0	125	0	0	0	0
+15 mins.	0	**215**	0	**215**	0	0	0	0	0	128	0	128	0	0	0	0
+30 mins.	0	185	0	185	0	0	0	0	0	**129**	0	**129**	**1**	0	0	**1**
+45 mins.	0	202	0	202	0	0	0	0	0	126	0	126	1	0	0	1
Total Volume	0	793	0	793	0	0	2	2	0	508	0	508	2	0	0	2
% App. Total	0	100	0		0	0	100		0	100	0		100	0	0	
PHF	.000	.922	.000	.922	.000	.000	.250	.250	.000	.984	.000	.984	.500	.000	.000	.500

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Winchester Road (SR-79)
E/W: Keller Road
Weather: Sunny

File Name : CRVWIKEPM
Site Code : 9311063
Start Date : 12/9/2009
Page No : 1

Groups Printed- Total Volume

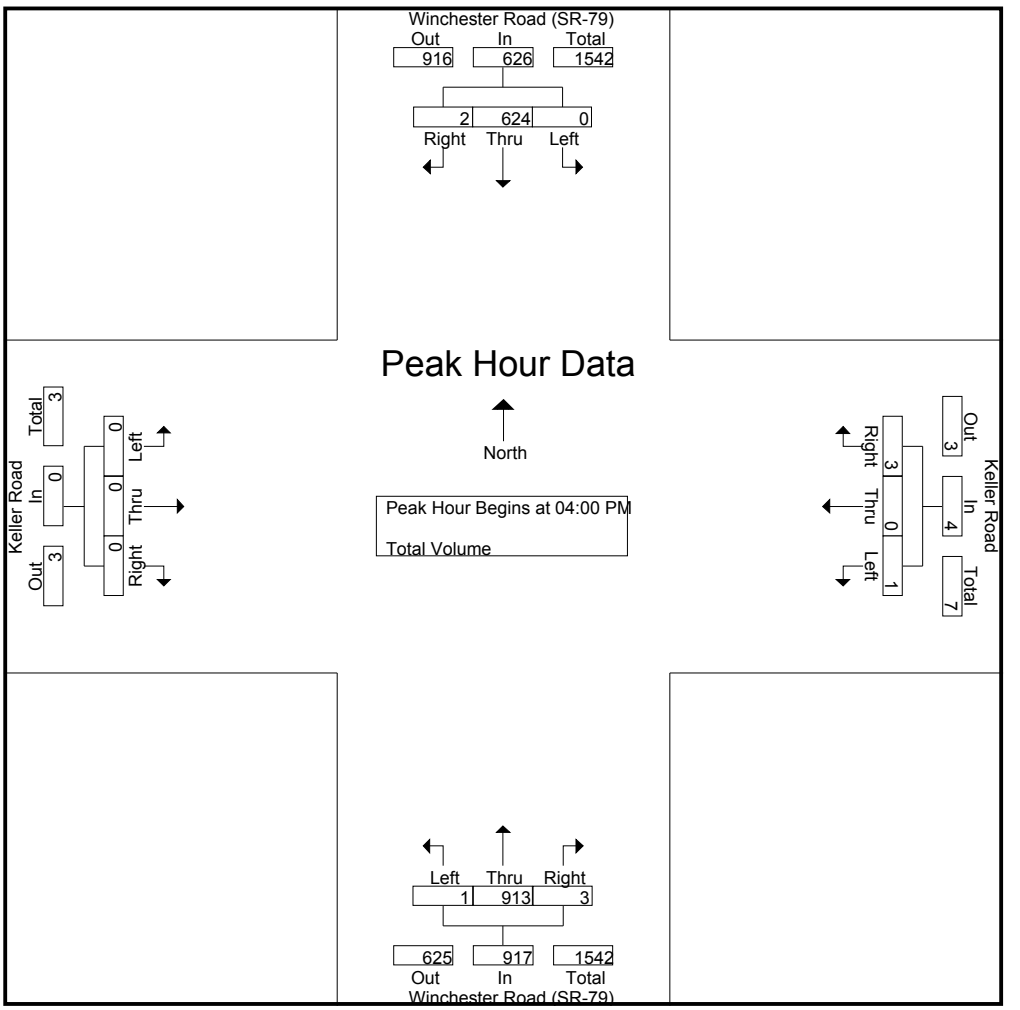
	Winchester Road (SR-79) Southbound				Keller Road Westbound				Winchester Road (SR-79) Northbound				Keller Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	157	2	159	0	0	0	0	1	248	0	249	0	0	0	0	408
04:15 PM	0	145	0	145	0	0	0	0	0	220	3	223	0	0	0	0	368
04:30 PM	0	174	0	174	0	0	0	0	0	207	0	207	0	0	0	0	381
04:45 PM	0	148	0	148	1	0	3	4	0	238	0	238	0	0	0	0	390
Total	0	624	2	626	1	0	3	4	1	913	3	917	0	0	0	0	1547
05:00 PM	0	129	0	129	1	0	0	1	0	238	0	238	0	0	1	1	369
05:15 PM	0	148	0	148	0	0	0	0	0	213	1	214	1	0	0	1	363
05:30 PM	0	172	0	172	1	0	0	1	1	212	1	214	1	0	0	1	388
05:45 PM	0	146	0	146	0	0	0	0	0	190	0	190	0	0	1	1	337
Total	0	595	0	595	2	0	0	2	1	853	2	856	2	0	2	4	1457
Grand Total	0	1219	2	1221	3	0	3	6	2	1766	5	1773	2	0	2	4	3004
Apprch %	0	99.8	0.2		50	0	50		0.1	99.6	0.3		50	0	50		
Total %	0	40.6	0.1	40.6	0.1	0	0.1	0.2	0.1	58.8	0.2	59	0.1	0	0.1	0.1	

	Winchester Road (SR-79) Southbound				Keller Road Westbound				Winchester Road (SR-79) Northbound				Keller Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	157	**2**	159	0	0	0	0	**1**	**248**	0	**249**	0	0	0	0	**408**
04:15 PM	0	145	0	145	0	0	0	0	0	220	**3**	223	0	0	0	0	368
04:30 PM	0	**174**	0	**174**	0	0	0	0	0	207	0	207	0	0	0	0	381
04:45 PM	0	148	0	148	**1**	0	**3**	**4**	0	238	0	238	0	0	0	0	390
Total Volume	0	624	2	626	1	0	3	4	1	913	3	917	0	0	0	0	1547
% App. Total	0	99.7	0.3		25	0	75		0.1	99.6	0.3		0	0	0		
PHF	.000	.897	.250	.899	.250	.000	.250	.250	.250	.920	.250	.921	.000	.000	.000	.000	.948

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Winchester Road (SR-79)
E/W: Keller Road
Weather: Sunny

File Name : CRVWIKEPM
Site Code : 9311063
Start Date : 12/9/2009
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:45 PM				04:00 PM				05:00 PM			
+0 mins.	0	157	**2**	159	**1**	0	**3**	**4**	**1**	**248**	0	**249**	0	0	**1**	**1**
+15 mins.	0	145	0	145	1	0	0	1	0	220	**3**	223	**1**	0	0	1
+30 mins.	0	**174**	0	**174**	0	0	0	0	0	207	0	207	1	0	0	1
+45 mins.	0	148	0	148	1	0	0	1	0	238	0	238	0	0	1	1
Total Volume	0	624	2	626	3	0	3	6	1	913	3	917	2	0	2	4
% App. Total	0	99.7	0.3		50	0	50		0.1	99.6	0.3		50	0	50	
PHF	.000	.897	.250	.899	.750	.000	.250	.375	.250	.920	.250	.921	.500	.000	.500	1.000

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Winchester Road/SR-79
E/W: Jean Nichiolas Rd/Skyview Rd
Weather: Sunny

File Name : CRVWIJNAM
Site Code : 9311035
Start Date : 12/9/2009

Groups Printed- Total Volume

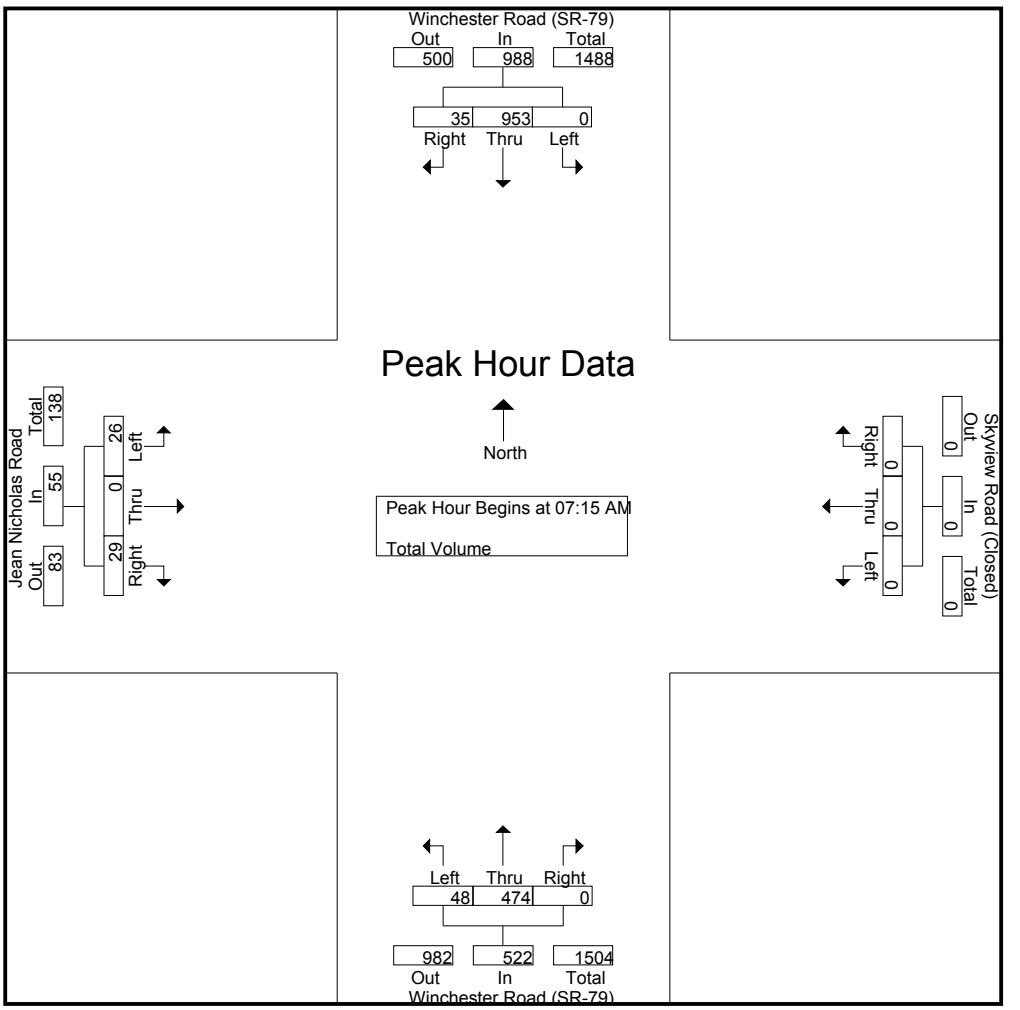
	Winchester Road (SR-79) Southbound				Skyview Road (Closed) Westbound				Winchester Road (SR-79) Northbound				Jean Nicholas Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	199	9	208	0	0	0	0	9	110	0	119	4	0	4	8	335
07:15 AM	0	232	13	245	0	0	0	0	9	126	0	135	11	0	9	20	400
07:30 AM	0	269	5	274	0	0	0	0	7	111	0	118	2	0	3	5	397
07:45 AM	0	217	3	220	0	0	0	0	10	111	0	121	5	0	9	14	355
Total	0	917	30	947	0	0	0	0	35	458	0	493	22	0	25	47	1487
08:00 AM	0	235	14	249	0	0	0	0	22	126	0	148	8	0	8	16	413
08:15 AM	0	236	11	247	0	0	0	0	27	92	0	119	4	0	6	10	376
08:30 AM	0	212	6	218	0	0	0	0	7	112	0	119	7	0	7	14	351
08:45 AM	0	191	1	192	0	0	0	0	11	122	0	133	3	0	1	4	329
Total	0	874	32	906	0	0	0	0	67	452	0	519	22	0	22	44	1469
Grand Total	0	1791	62	1853	0	0	0	0	102	910	0	1012	44	0	47	91	2956
Apprch %	0	96.7	3.3		0	0	0		10.1	89.9	0		48.4	0	51.6		
Total %	0	60.6	2.1	62.7	0	0	0	0	3.5	30.8	0	34.2	1.5	0	1.6	3.1	

	Winchester Road (SR-79) Southbound				Skyview Road (Closed) Westbound				Winchester Road (SR-79) Northbound				Jean Nicholas Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	232	13	245	0	0	0	0	9	**126**	0	135	**11**	0	**9**	**20**	400
07:30 AM	0	**269**	5	**274**	0	0	0	0	7	111	0	118	2	0	3	5	397
07:45 AM	0	217	3	220	0	0	0	0	10	111	0	121	5	0	9	14	355
08:00 AM	0	235	**14**	249	0	0	0	0	**22**	126	0	**148**	8	0	8	16	**413**
Total Volume	0	953	35	988	0	0	0	0	48	474	0	522	26	0	29	55	1565
% App. Total	0	96.5	3.5		0	0	0		9.2	90.8	0		47.3	0	52.7		
PHF	.000	.886	.625	.901	.000	.000	.000	.000	.545	.940	.000	.882	.591	.000	.806	.688	.947

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Winchester Road/SR-79
E/W: Jean Nichiolas Rd/Skyview Rd
Weather: Sunny

File Name : CRVWIJNAM
Site Code : 9311035
Start Date : 12/9/2009
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:30 AM				07:00 AM				07:15 AM				07:15 AM			
+0 mins.	0	**269**	5	**274**	0	0	0	0	9	**126**	0	135	**11**	0	**9**	**20**
+15 mins.	0	217	3	220	0	0	0	0	7	111	0	118	2	0	3	5
+30 mins.	0	235	**14**	249	0	0	0	0	10	111	0	121	5	0	9	14
+45 mins.	0	236	11	247	0	0	0	0	**22**	126	0	**148**	8	0	8	16
Total Volume	0	957	33	990	0	0	0	0	48	474	0	522	26	0	29	55
% App. Total	0	96.7	3.3		0	0	0		9.2	90.8	0		47.3	0	52.7	
PHF	.000	.889	.589	.903	.000	.000	.000	.000	.545	.940	.000	.882	.591	.000	.806	.688

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Winchester Road/SR-79
E/W: Jean Nichiolas Rd/Skyview Rd
Weather: Sunny

File Name : CRVWIJNPM
Site Code : 9311035
Start Date : 12/9/2009

Groups Printed- Total Volume

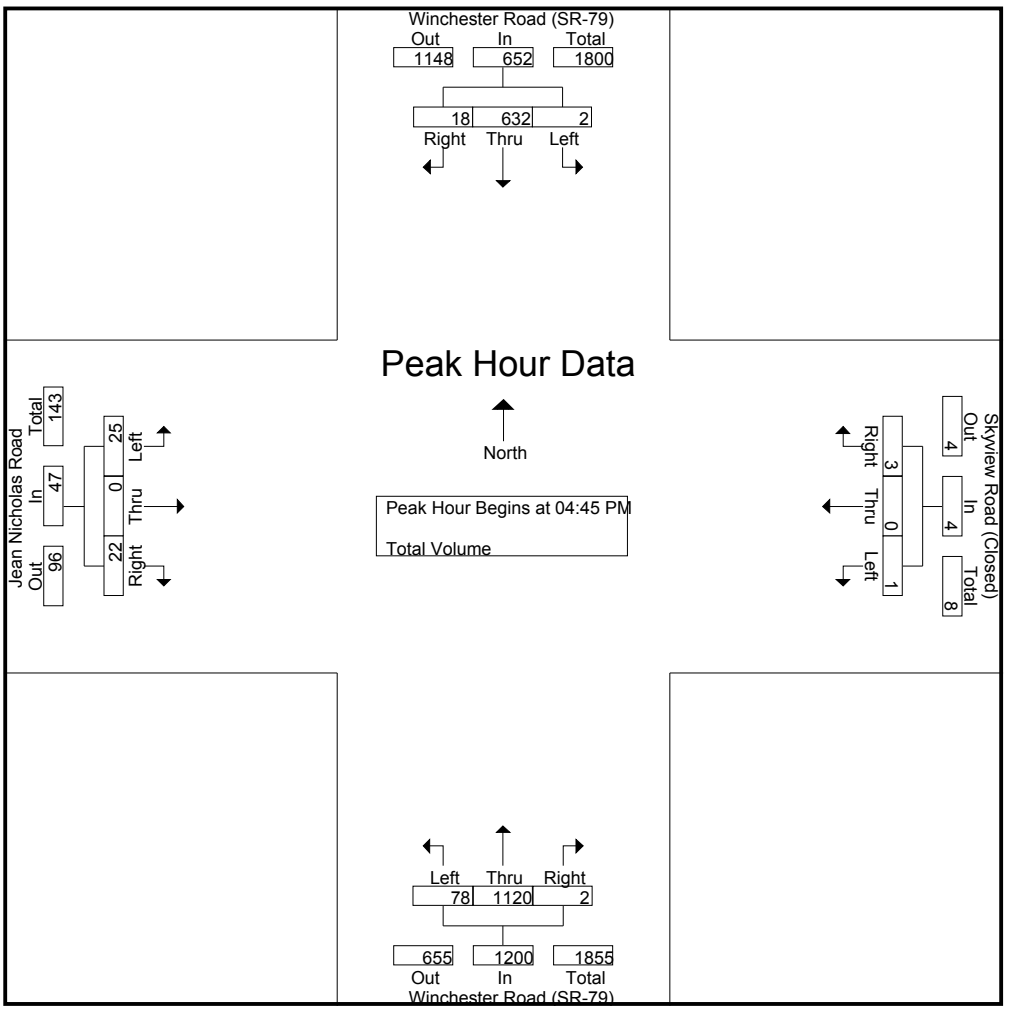
	Winchester Road (SR-79) Southbound				Skyview Road (Closed) Westbound				Winchester Road (SR-79) Northbound				Jean Nicholas Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	159	7	166	0	0	0	0	15	281	0	296	3	0	8	11	473
04:15 PM	0	168	2	170	0	0	0	0	12	248	0	260	7	0	5	12	442
04:30 PM	0	194	7	201	0	0	0	0	16	242	0	258	6	0	11	17	476
04:45 PM	0	148	6	154	1	0	1	2	10	308	2	320	7	0	4	11	487
Total	0	669	22	691	1	0	1	2	53	1079	2	1134	23	0	28	51	1878
05:00 PM	2	144	8	154	0	0	2	2	15	276	0	291	8	0	8	16	463
05:15 PM	0	166	1	167	0	0	0	0	18	271	0	289	5	0	4	9	465
05:30 PM	0	174	3	177	0	0	0	0	35	265	0	300	5	0	6	11	488
05:45 PM	1	160	3	164	1	0	0	1	18	290	0	308	5	0	3	8	481
Total	3	644	15	662	1	0	2	3	86	1102	0	1188	23	0	21	44	1897
Grand Total	3	1313	37	1353	2	0	3	5	139	2181	2	2322	46	0	49	95	3775
Apprch %	0.2	97	2.7		40	0	60		6	93.9	0.1		48.4	0	51.6		
Total %	0.1	34.8	1	35.8	0.1	0	0.1	0.1	3.7	57.8	0.1	61.5	1.2	0	1.3	2.5	

	Winchester Road (SR-79) Southbound				Skyview Road (Closed) Westbound				Winchester Road (SR-79) Northbound				Jean Nicholas Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	148	6	154	**1**	0	1	**2**	10	**308**	**2**	**320**	7	0	4	11	487
05:00 PM	**2**	144	**8**	154	0	0	**2**	2	15	276	0	291	**8**	0	**8**	**16**	463
05:15 PM	0	166	1	167	0	0	0	0	18	271	0	289	5	0	4	9	465
05:30 PM	0	**174**	3	**177**	0	0	0	0	**35**	265	0	300	5	0	6	11	**488**
Total Volume	2	632	18	652	1	0	3	4	78	1120	2	1200	25	0	22	47	1903
% App. Total	0.3	96.9	2.8		25	0	75		6.5	93.3	0.2		53.2	0	46.8		
PHF	.250	.908	.563	.921	.250	.000	.375	.500	.557	.909	.250	.938	.781	.000	.688	.734	.975

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Winchester Road/SR-79
E/W: Jean Nichiolas Rd/Skyview Rd
Weather: Sunny

File Name : CRVWIJNPM
Site Code : 9311035
Start Date : 12/9/2009



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:15 PM				04:45 PM				04:15 PM			
+0 mins.	0	159	**7**	166	0	0	0	0	10	**308**	**2**	**320**	7	0	5	12
+15 mins.	0	168	2	170	0	0	0	0	15	276	0	291	6	0	**11**	**17**
+30 mins.	0	**194**	7	**201**	**1**	0	1	**2**	18	271	0	289	7	0	4	11
+45 mins.	0	148	6	154	0	0	**2**	2	**35**	265	0	300	**8**	0	8	16
Total Volume	0	669	22	691	1	0	3	4	78	1120	2	1200	28	0	28	56
% App. Total	0	96.8	3.2		25	0	75		6.5	93.3	0.2		50	0	50	
PHF	.000	.862	.786	.859	.250	.000	.375	.500	.557	.909	.250	.938	.875	.000	.636	.824

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Winchester Road (SR-79)
E/W: Benton Road
Weather: Sunny

File Name : CRVWIBEAM
Site Code : 9311066
Start Date : 12/9/2009

Groups Printed- Total Volume

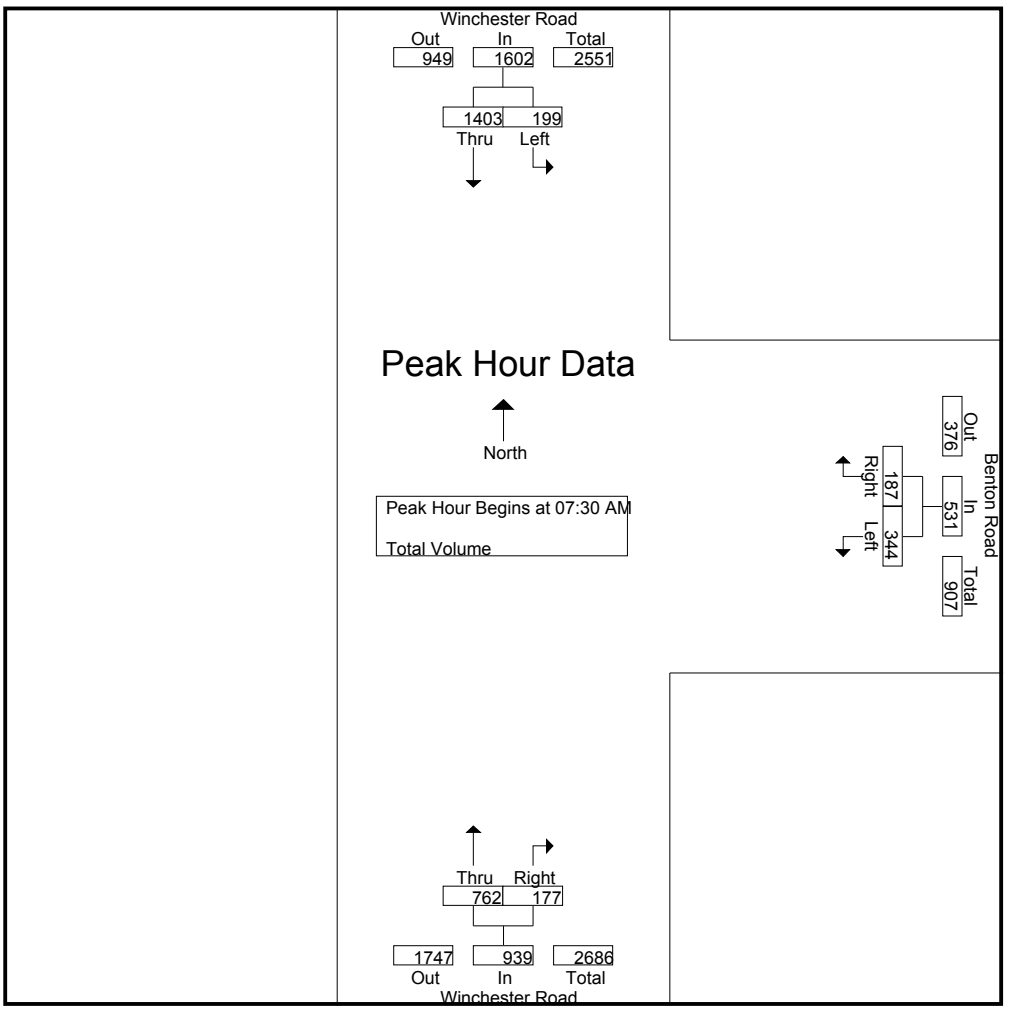
	Winchester Road Southbound			Benton Road Westbound			Winchester Road Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
07:00 AM	42	228	270	87	27	114	148	41	189	573
07:15 AM	50	294	344	96	31	127	165	53	218	689
07:30 AM	40	354	394	96	51	147	167	49	216	757
07:45 AM	55	283	338	87	48	135	191	33	224	697
Total	187	1159	1346	366	157	523	671	176	847	2716
08:00 AM	47	372	419	85	43	128	229	54	283	830
08:15 AM	57	394	451	76	45	121	175	41	216	788
08:30 AM	66	345	411	81	48	129	141	51	192	732
08:45 AM	50	260	310	121	47	168	130	46	176	654
Total	220	1371	1591	363	183	546	675	192	867	3004
Grand Total	407	2530	2937	729	340	1069	1346	368	1714	5720
Apprch %	13.9	86.1		68.2	31.8		78.5	21.5		
Total %	7.1	44.2	51.3	12.7	5.9	18.7	23.5	6.4	30	

	Winchester Road Southbound			Benton Road Westbound			Winchester Road Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	40	354	394	**96**	**51**	**147**	167	49	216	757
07:45 AM	55	283	338	87	48	135	191	33	224	697
08:00 AM	47	372	419	85	43	128	**229**	**54**	**283**	**830**
08:15 AM	**57**	**394**	**451**	76	45	121	175	41	216	788
Total Volume	199	1403	1602	344	187	531	762	177	939	3072
% App. Total	12.4	87.6		64.8	35.2		81.2	18.8		
PHF	.873	.890	.888	.896	.917	.903	.832	.819	.830	.925

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Winchester Road (SR-79)
E/W: Benton Road
Weather: Sunny

File Name : CRVWIBEAM
Site Code : 9311066
Start Date : 12/9/2009
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:45 AM			08:00 AM			07:15 AM		
+0 mins.	55	283	338	85	43	128	165	53	218
+15 mins.	47	372	419	76	45	121	167	49	216
+30 mins.	57	**394**	**451**	81	**48**	129	191	33	224
+45 mins.	**66**	345	411	**121**	47	**168**	**229**	**54**	**283**
Total Volume	225	1394	1619	363	183	546	752	189	941
% App. Total	13.9	86.1		66.5	33.5		79.9	20.1	
PHF	.852	.885	.897	.750	.953	.813	.821	.875	.831

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Winchester Road (SR-79)
E/W: Benton Road
Weather: Sunny

File Name : CRVWIBEPM
Site Code : 9311066
Start Date : 12/9/2009

Groups Printed- Total Volume

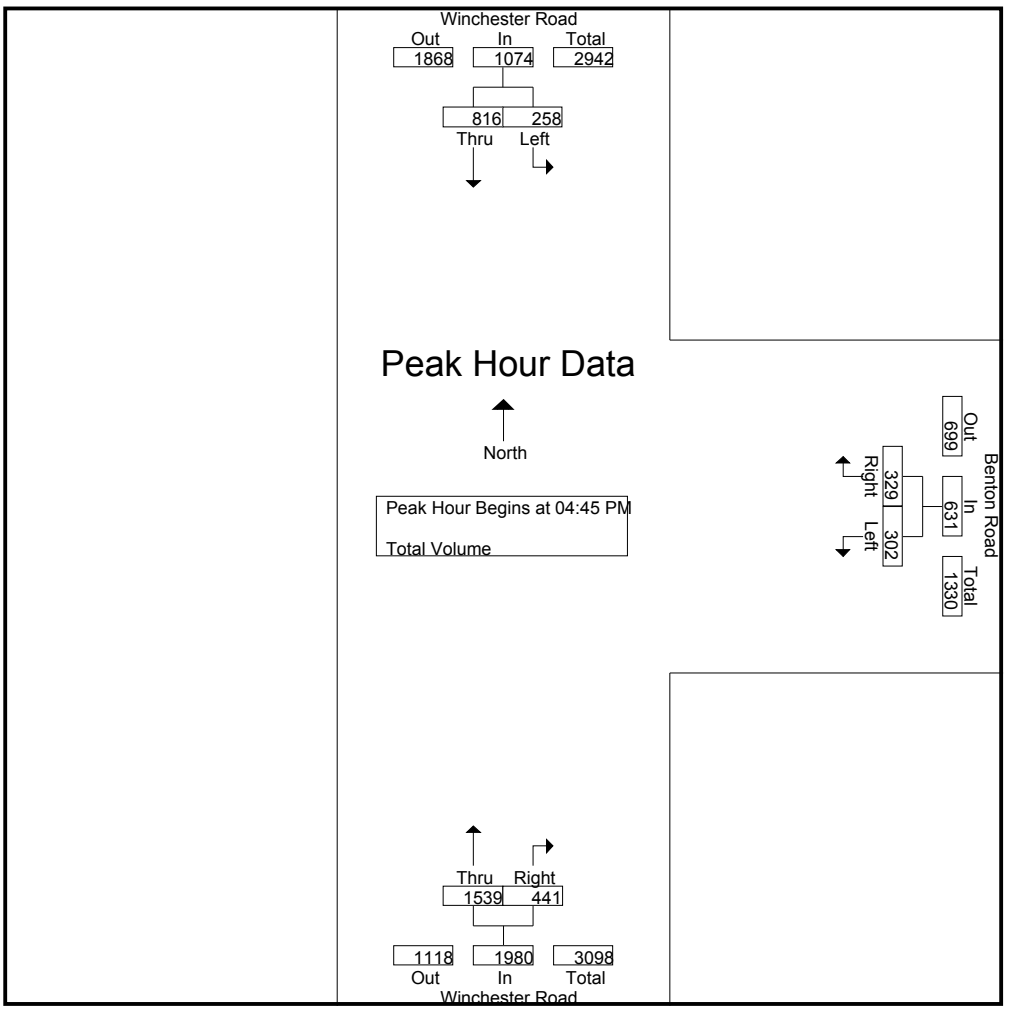
	Winchester Road Southbound			Benton Road Westbound			Winchester Road Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
04:00 PM	61	195	256	62	64	126	329	74	403	785
04:15 PM	37	199	236	73	84	157	327	101	428	821
04:30 PM	50	236	286	51	74	125	347	117	464	875
04:45 PM	70	205	275	79	68	147	371	117	488	910
Total	218	835	1053	265	290	555	1374	409	1783	3391
05:00 PM	59	203	262	92	82	174	365	80	445	881
05:15 PM	65	197	262	70	95	165	381	111	492	919
05:30 PM	64	211	275	61	84	145	422	133	555	975
05:45 PM	48	206	254	67	95	162	353	134	487	903
Total	236	817	1053	290	356	646	1521	458	1979	3678
Grand Total	454	1652	2106	555	646	1201	2895	867	3762	7069
Apprch %	21.6	78.4		46.2	53.8		77	23		
Total %	6.4	23.4	29.8	7.9	9.1	17	41	12.3	53.2	

	Winchester Road Southbound			Benton Road Westbound			Winchester Road Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	**70**	205	**275**	79	68	147	371	117	488	910
05:00 PM	59	203	262	**92**	82	**174**	365	80	445	881
05:15 PM	65	197	262	70	**95**	165	381	111	492	919
05:30 PM	64	**211**	275	61	84	145	**422**	**133**	**555**	**975**
Total Volume	258	816	1074	302	329	631	1539	441	1980	3685
% App. Total	24	76		47.9	52.1		77.7	22.3		
PHF	.921	.967	.976	.821	.866	.907	.912	.829	.892	.945

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Winchester Road (SR-79)
E/W: Benton Road
Weather: Sunny

File Name : CRVWIBEPM
Site Code : 9311066
Start Date : 12/9/2009
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:30 PM			05:00 PM			04:45 PM		
+0 mins.	50	**236**	**286**	**92**	82	**174**	371	117	488
+15 mins.	**70**	205	275	70	**95**	165	365	80	445
+30 mins.	59	203	262	61	84	145	381	111	492
+45 mins.	65	197	262	67	95	162	**422**	**133**	**555**
Total Volume	244	841	1085	290	356	646	1539	441	1980
% App. Total	22.5	77.5		44.9	55.1		77.7	22.3	
PHF	.871	.891	.948	.788	.937	.928	.912	.829	.892

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Leon Road
E/W: Scott Road
Weather: Sunny

File Name : CRVLESCAM
Site Code : 9311044
Start Date : 12/9/2009

Groups Printed- Total Volume

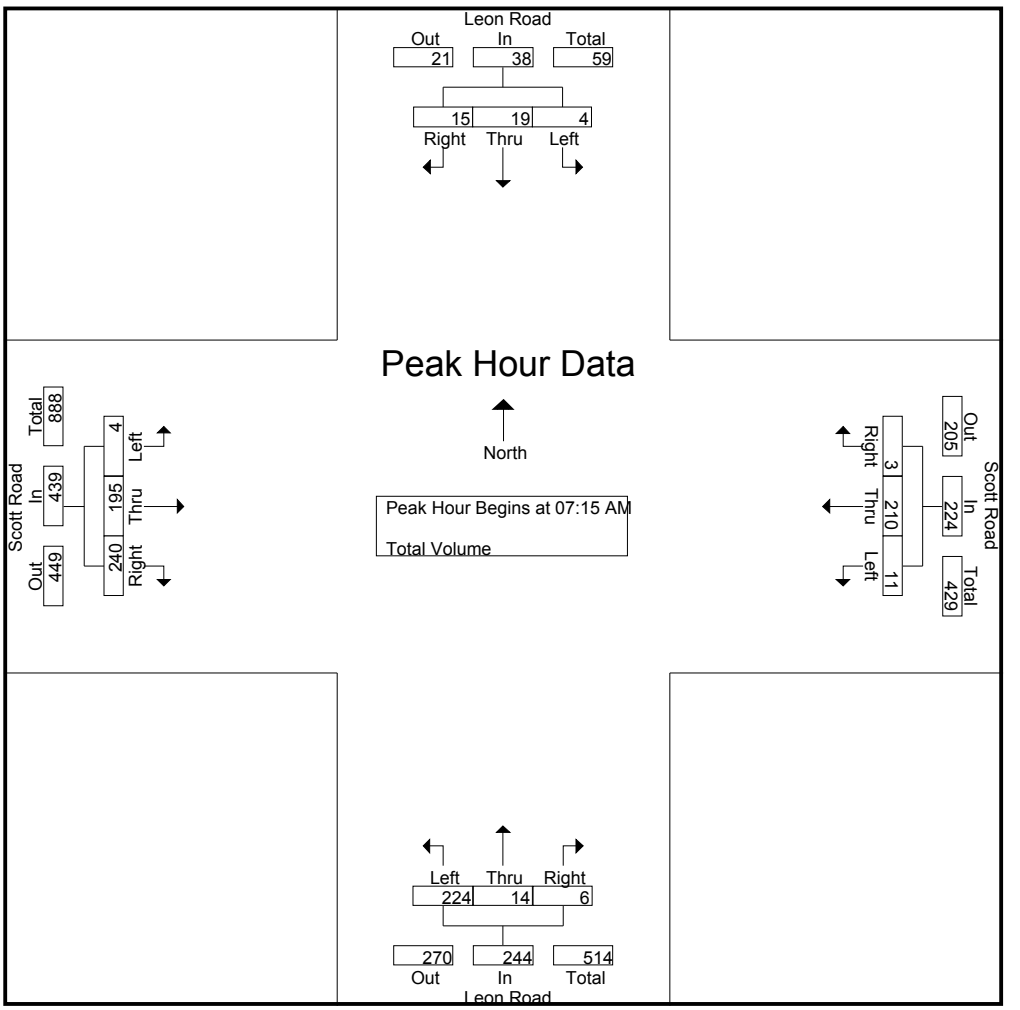
	Leon Road Southbound				Scott Road Westbound				Leon Road Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	1	16	2	19	3	50	0	53	51	4	0	55	0	52	31	83	210
07:15 AM	1	4	4	9	2	60	3	65	46	5	0	51	3	49	61	113	238
07:30 AM	0	2	5	7	1	53	0	54	71	1	2	74	0	54	56	110	245
07:45 AM	3	8	4	15	5	47	0	52	61	6	2	69	1	47	59	107	243
Total	5	30	15	50	11	210	3	224	229	16	4	249	4	202	207	413	936
08:00 AM	0	5	2	7	3	50	0	53	46	2	2	50	0	45	64	109	219
08:15 AM	1	1	0	2	2	50	2	54	47	3	2	52	6	37	45	88	196
08:30 AM	0	3	1	4	2	43	1	46	43	2	1	46	1	39	35	75	171
08:45 AM	0	0	3	3	2	41	0	43	29	1	1	31	0	35	47	82	159
Total	1	9	6	16	9	184	3	196	165	8	6	179	7	156	191	354	745
Grand Total	6	39	21	66	20	394	6	420	394	24	10	428	11	358	398	767	1681
Apprch %	9.1	59.1	31.8		4.8	93.8	1.4		92.1	5.6	2.3		1.4	46.7	51.9		
Total %	0.4	2.3	1.2	3.9	1.2	23.4	0.4	25	23.4	1.4	0.6	25.5	0.7	21.3	23.7	45.6	

	Leon Road Southbound				Scott Road Westbound				Leon Road Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	1	4	4	9	2	**60**	**3**	**65**	46	5	0	51	**3**	49	61	**113**	238
07:30 AM	0	2	**5**	7	1	53	0	54	**71**	1	**2**	**74**	0	**54**	56	110	**245**
07:45 AM	**3**	**8**	4	**15**	**5**	47	0	52	61	**6**	2	69	1	47	59	107	243
08:00 AM	0	5	2	7	3	50	0	53	46	2	2	50	0	45	**64**	109	219
Total Volume	4	19	15	38	11	210	3	224	224	14	6	244	4	195	240	439	945
% App. Total	10.5	50	39.5		4.9	93.8	1.3		91.8	5.7	2.5		0.9	44.4	54.7		
PHF	.333	.594	.750	.633	.550	.875	.250	.862	.789	.583	.750	.824	.333	.903	.938	.971	.964

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Leon Road
E/W: Scott Road
Weather: Sunny

File Name : CRVLESCAM
Site Code : 9311044
Start Date : 12/9/2009
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:15 AM			
+0 mins.	1	**16**	2	**19**	3	50	0	53	51	4	0	55	**3**	49	61	**113**
+15 mins.	1	4	4	9	2	**60**	**3**	**65**	46	5	0	51	0	**54**	56	110
+30 mins.	0	2	**5**	7	1	53	0	54	**71**	1	**2**	**74**	1	47	59	107
+45 mins.	**3**	8	4	15	**5**	47	0	52	61	**6**	2	69	0	45	**64**	109
Total Volume	5	30	15	50	11	210	3	224	229	16	4	249	4	195	240	439
% App. Total	10	60	30		4.9	93.8	1.3		92	6.4	1.6		0.9	44.4	54.7	
PHF	.417	.469	.750	.658	.550	.875	.250	.862	.806	.667	.500	.841	.333	.903	.938	.971

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Leon Road
E/W: Scott Road
Weather: Sunny

File Name : CRVLESCPM
Site Code : 9311044
Start Date : 12/9/2009

Groups Printed- Total Volume

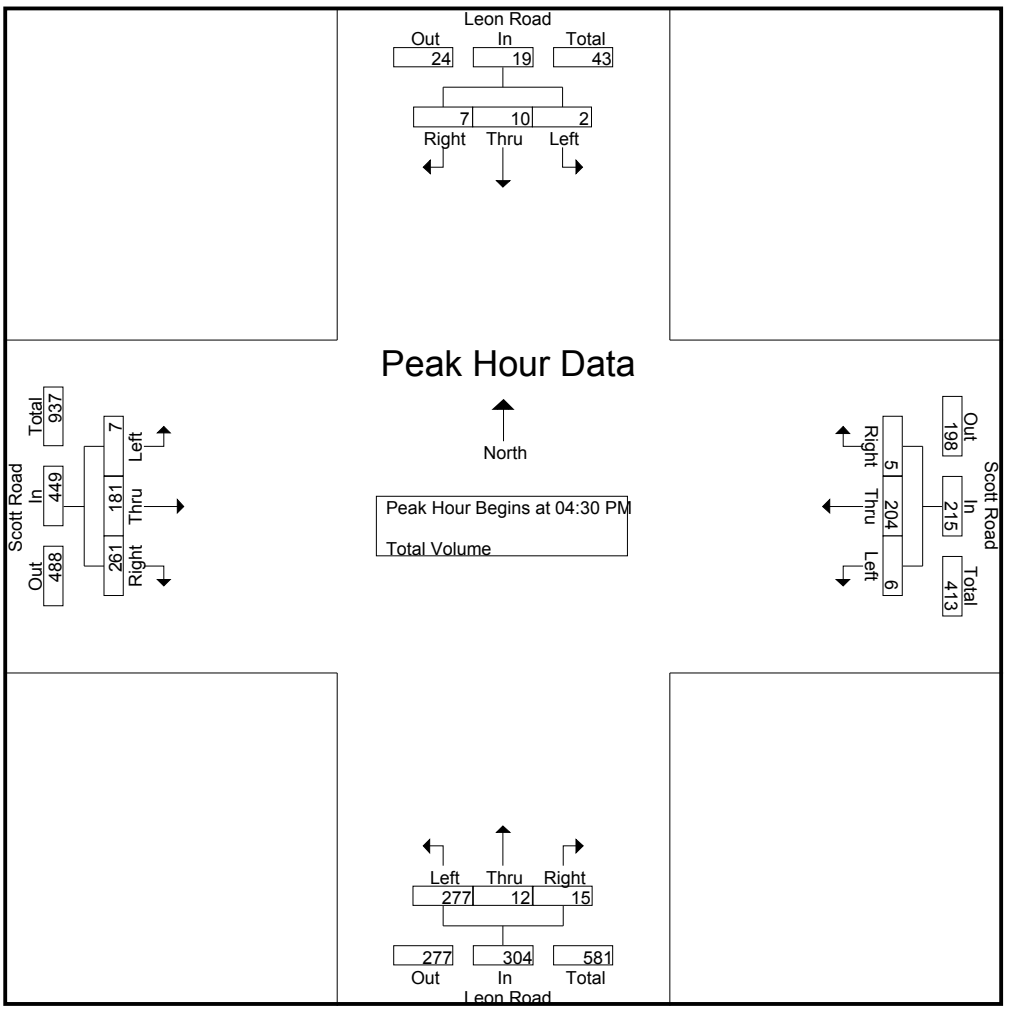
	Leon Road Southbound				Scott Road Westbound				Leon Road Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	4	2	6	0	49	2	51	56	5	3	64	2	45	48	95	216
04:15 PM	0	2	5	7	4	53	1	58	71	2	1	74	6	40	56	102	241
04:30 PM	2	1	0	3	1	53	1	55	66	1	2	69	3	57	56	116	243
04:45 PM	0	5	3	8	2	51	1	54	65	3	2	70	1	45	60	106	238
Total	2	12	10	24	7	206	5	218	258	11	8	277	12	187	220	419	938
05:00 PM	0	4	2	6	0	45	0	45	69	3	2	74	2	37	68	107	232
05:15 PM	0	0	2	2	3	55	3	61	77	5	9	91	1	42	77	120	274
05:30 PM	1	0	3	4	3	53	1	57	52	1	4	57	3	60	49	112	230
05:45 PM	0	1	3	4	1	40	0	41	57	4	7	68	0	47	55	102	215
Total	1	5	10	16	7	193	4	204	255	13	22	290	6	186	249	441	951
Grand Total	3	17	20	40	14	399	9	422	513	24	30	567	18	373	469	860	1889
Apprch %	7.5	42.5	50		3.3	94.5	2.1		90.5	4.2	5.3		2.1	43.4	54.5		
Total %	0.2	0.9	1.1	2.1	0.7	21.1	0.5	22.3	27.2	1.3	1.6	30	1	19.7	24.8	45.5	

	Leon Road Southbound				Scott Road Westbound				Leon Road Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**2**	1	0	3	1	53	1	55	66	1	2	69	**3**	**57**	56	116	243
04:45 PM	0	**5**	**3**	**8**	2	51	1	54	65	3	2	70	1	45	60	106	238
05:00 PM	0	4	2	6	0	45	0	45	69	3	2	74	2	37	68	107	232
05:15 PM	0	0	2	2	**3**	**55**	**3**	**61**	**77**	**5**	**9**	**91**	1	42	**77**	**120**	**274**
Total Volume	2	10	7	19	6	204	5	215	277	12	15	304	7	181	261	449	987
% App. Total	10.5	52.6	36.8		2.8	94.9	2.3		91.1	3.9	4.9		1.6	40.3	58.1		
PHF	.250	.500	.583	.594	.500	.927	.417	.881	.899	.600	.417	.835	.583	.794	.847	.935	.901

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Leon Road
E/W: Scott Road
Weather: Sunny

File Name : CRVLESCPM
Site Code : 9311044
Start Date : 12/9/2009
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:30 PM				04:30 PM			
+0 mins.	0	4	2	6	0	49	**2**	51	66	1	2	69	**3**	**57**	56	116
+15 mins.	0	2	**5**	7	**4**	**53**	1	**58**	65	3	2	70	1	45	60	106
+30 mins.	**2**	1	0	3	1	53	1	55	69	3	2	74	2	37	68	107
+45 mins.	0	**5**	3	**8**	2	51	1	54	**77**	**5**	**9**	**91**	1	42	**77**	**120**
Total Volume	2	12	10	24	7	206	5	218	277	12	15	304	7	181	261	449
% App. Total	8.3	50	41.7		3.2	94.5	2.3		91.1	3.9	4.9		1.6	40.3	58.1	
PHF	.250	.600	.500	.750	.438	.972	.625	.940	.899	.600	.417	.835	.583	.794	.847	.935

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Leon Road
E/W: Max Gillis Boulevard
Weather: Sunny

File Name : CRVLEMGAM
Site Code : 9311017
Start Date : 12/9/2009

Groups Printed- Total Volume

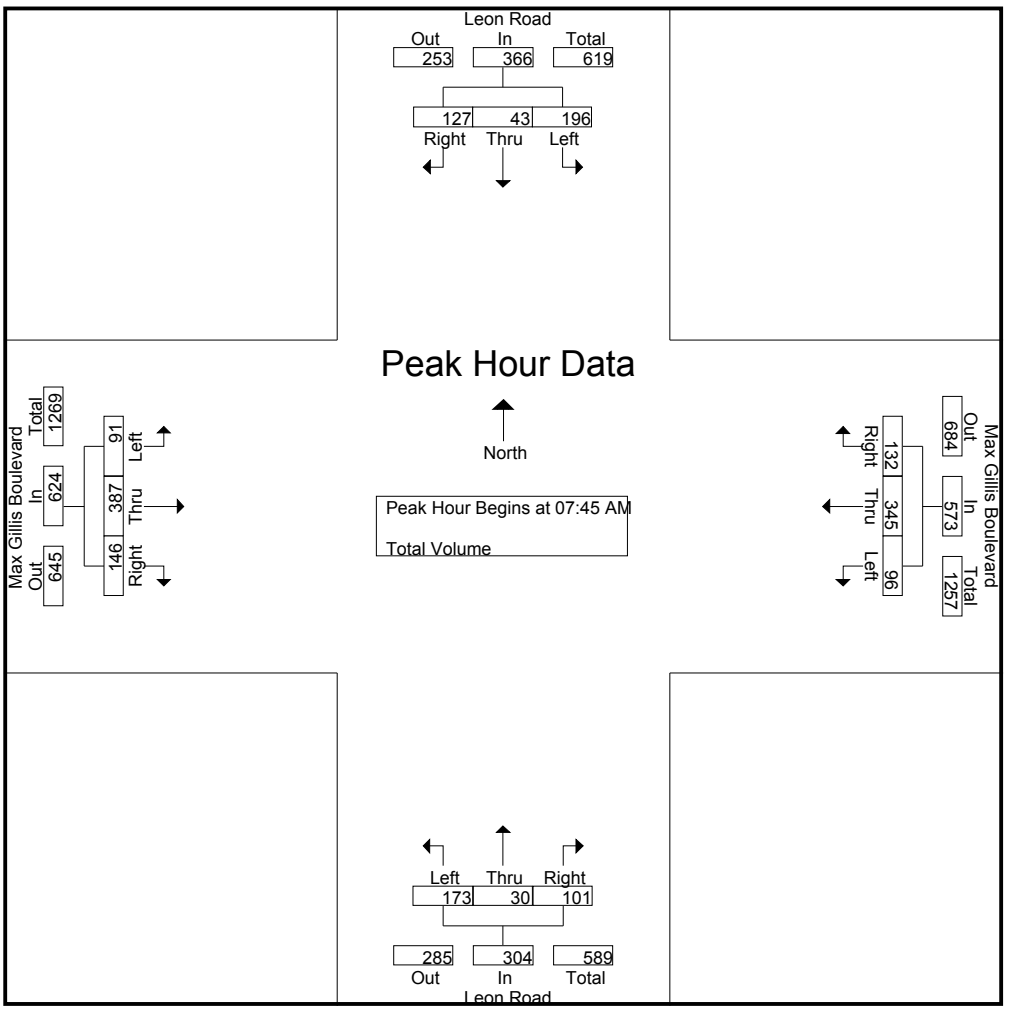
	Leon Road Southbound				Max Gillis Boulevard Westbound				Leon Road Northbound				Max Gillis Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	52	16	4	72	46	4	36	86	4	7	25	36	1	3	0	4	198
07:15 AM	45	22	6	73	36	9	36	81	6	17	41	64	1	2	0	3	221
07:30 AM	63	6	6	75	35	23	59	117	11	12	31	54	2	12	3	17	263
07:45 AM	47	12	16	75	21	60	48	129	26	8	32	66	1	22	6	29	299
Total	207	56	32	295	138	96	179	413	47	44	129	220	5	39	9	53	981
08:00 AM	57	6	50	113	22	144	23	189	83	7	25	115	20	112	42	174	591
08:15 AM	50	15	54	119	25	104	37	166	53	11	27	91	33	125	53	211	587
08:30 AM	42	10	7	59	28	37	24	89	11	4	17	32	37	128	45	210	390
08:45 AM	38	11	3	52	33	15	31	79	4	9	29	42	7	24	12	43	216
Total	187	42	114	343	108	300	115	523	151	31	98	280	97	389	152	638	1784
Grand Total	394	98	146	638	246	396	294	936	198	75	227	500	102	428	161	691	2765
Apprch %	61.8	15.4	22.9		26.3	42.3	31.4		39.6	15	45.4		14.8	61.9	23.3		
Total %	14.2	3.5	5.3	23.1	8.9	14.3	10.6	33.9	7.2	2.7	8.2	18.1	3.7	15.5	5.8	25	

	Leon Road Southbound				Max Gillis Boulevard Westbound				Leon Road Northbound				Max Gillis Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	47	12	16	75	21	60	**48**	129	26	8	**32**	66	1	22	6	29	299
08:00 AM	**57**	6	50	113	22	**144**	23	**189**	**83**	7	25	**115**	20	112	42	174	**591**
08:15 AM	50	**15**	**54**	**119**	25	104	37	166	53	**11**	27	91	33	125	**53**	**211**	587
08:30 AM	42	10	7	59	**28**	37	24	89	11	4	17	32	**37**	**128**	45	210	390
Total Volume	196	43	127	366	96	345	132	573	173	30	101	304	91	387	146	624	1867
% App. Total	53.6	11.7	34.7		16.8	60.2	23		56.9	9.9	33.2		14.6	62	23.4		
PHF	.860	.717	.588	.769	.857	.599	.688	.758	.521	.682	.789	.661	.615	.756	.689	.739	.790

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Leon Road
E/W: Max Gillis Boulevard
Weather: Sunny

File Name : CRVLEMGAM
Site Code : 9311017
Start Date : 12/9/2009



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				08:00 AM			
+0 mins.	**63**	6	6	75	**35**	23	**59**	117	11	**12**	31	54	20	112	42	174
+15 mins.	47	12	16	75	21	60	48	129	26	8	**32**	66	33	125	**53**	**211**
+30 mins.	57	6	50	113	22	**144**	23	**189**	**83**	7	25	**115**	**37**	**128**	45	210
+45 mins.	50	**15**	**54**	**119**	25	104	37	166	53	11	27	91	7	24	12	43
Total Volume	217	39	126	382	103	331	167	601	173	38	115	326	97	389	152	638
% App. Total	56.8	10.2	33		17.1	55.1	27.8		53.1	11.7	35.3		15.2	61	23.8	
PHF	.861	.650	.583	.803	.736	.575	.708	.795	.521	.792	.898	.709	.655	.760	.717	.756

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Leon Road
E/W: Max Gillis Boulevard
Weather: Sunny

File Name : CRVLEMGPM
Site Code : 9311017
Start Date : 12/9/2009

Groups Printed- Total Volume

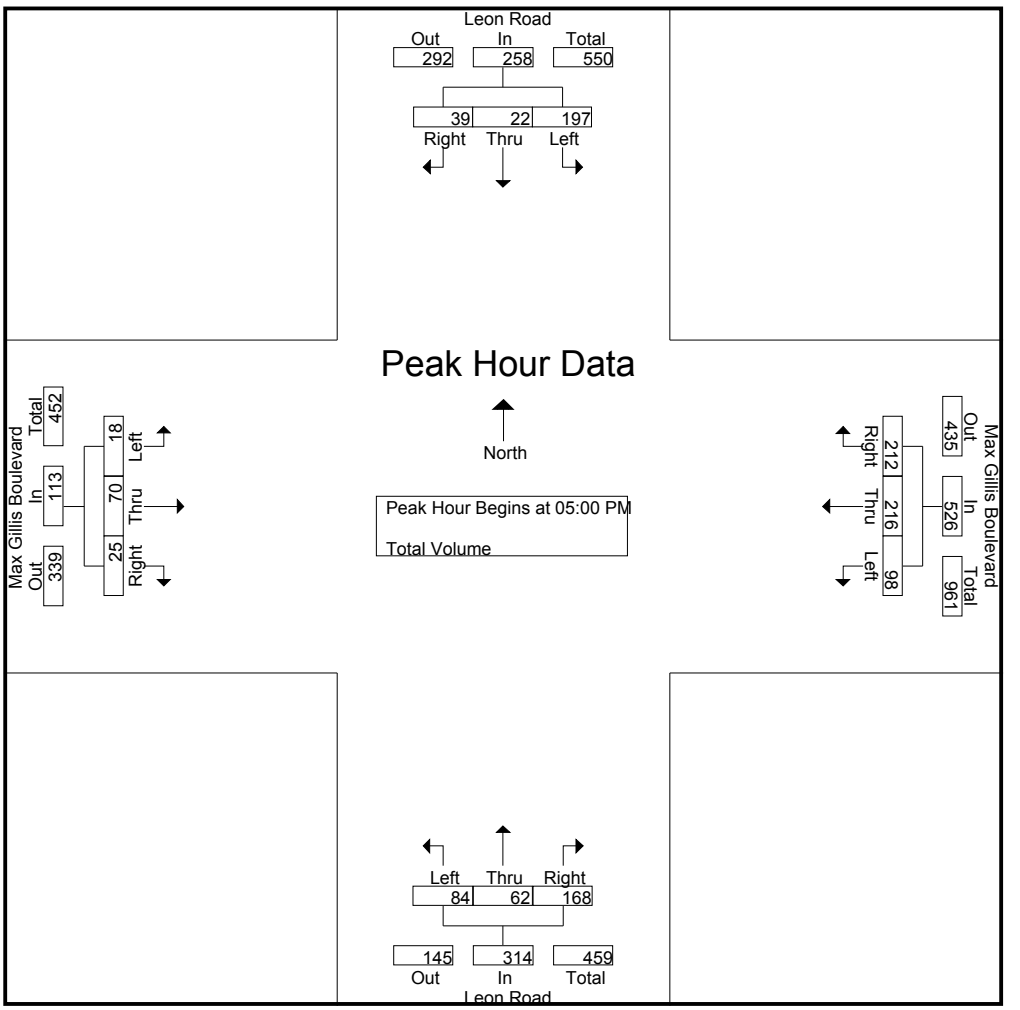
	Leon Road Southbound				Max Gillis Boulevard Westbound				Leon Road Northbound				Max Gillis Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	47	3	0	50	20	14	67	101	2	20	31	53	0	13	6	19	223
04:15 PM	42	9	1	52	30	8	75	113	4	11	34	49	4	9	7	20	234
04:30 PM	46	7	3	56	23	5	70	98	2	12	36	50	2	15	3	20	224
04:45 PM	60	7	4	71	26	17	50	93	12	17	44	73	1	11	3	15	252
Total	195	26	8	229	99	44	262	405	20	60	145	225	7	48	19	74	933
05:00 PM	48	4	9	61	22	31	57	110	7	13	40	60	5	25	14	44	275
05:15 PM	56	4	20	80	19	50	53	122	27	19	49	95	8	13	2	23	320
05:30 PM	46	6	7	59	28	72	48	148	28	15	43	86	4	16	5	25	318
05:45 PM	47	8	3	58	29	63	54	146	22	15	36	73	1	16	4	21	298
Total	197	22	39	258	98	216	212	526	84	62	168	314	18	70	25	113	1211
Grand Total	392	48	47	487	197	260	474	931	104	122	313	539	25	118	44	187	2144
Apprch %	80.5	9.9	9.7		21.2	27.9	50.9		19.3	22.6	58.1		13.4	63.1	23.5		
Total %	18.3	2.2	2.2	22.7	9.2	12.1	22.1	43.4	4.9	5.7	14.6	25.1	1.2	5.5	2.1	8.7	

	Leon Road Southbound				Max Gillis Boulevard Westbound				Leon Road Northbound				Max Gillis Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	48	4	9	61	22	31	**57**	110	7	13	40	60	5	**25**	**14**	**44**	275
05:15 PM	**56**	4	**20**	**80**	19	50	53	122	27	**19**	**49**	**95**	**8**	13	2	23	**320**
05:30 PM	46	6	7	59	28	**72**	48	**148**	**28**	15	43	86	4	16	5	25	318
05:45 PM	47	**8**	3	58	**29**	63	54	146	22	15	36	73	1	16	4	21	298
Total Volume	197	22	39	258	98	216	212	526	84	62	168	314	18	70	25	113	1211
% App. Total	76.4	8.5	15.1		18.6	41.1	40.3		26.8	19.7	53.5		15.9	61.9	22.1		
PHF	.879	.688	.488	.806	.845	.750	.930	.889	.750	.816	.857	.826	.563	.700	.446	.642	.946

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Leon Road
E/W: Max Gillis Boulevard
Weather: Sunny

File Name : CRVLEMGPM
Site Code : 9311017
Start Date : 12/9/2009



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:45 PM				05:00 PM				04:45 PM				05:00 PM			
+0 mins.	**60**	**7**	4	71	22	31	**57**	110	12	17	44	73	5	**25**	**14**	**44**
+15 mins.	48	4	9	61	19	50	53	122	7	13	40	60	**8**	13	2	23
+30 mins.	56	4	**20**	**80**	28	**72**	48	**148**	27	**19**	**49**	**95**	4	16	5	25
+45 mins.	46	6	7	59	**29**	63	54	146	**28**	15	43	86	1	16	4	21
Total Volume	210	21	40	271	98	216	212	526	74	64	176	314	18	70	25	113
% App. Total	77.5	7.7	14.8		18.6	41.1	40.3		23.6	20.4	56.1		15.9	61.9	22.1	
PHF	.875	.750	.500	.847	.845	.750	.930	.889	.661	.842	.898	.826	.563	.700	.446	.642

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Leon Road
E/W: Keller Road
Weather: Sunny

File Name : CRVLEKEAM
Site Code : 9311058
Start Date : 12/9/2009
Page No : 1

Groups Printed- Total Volume

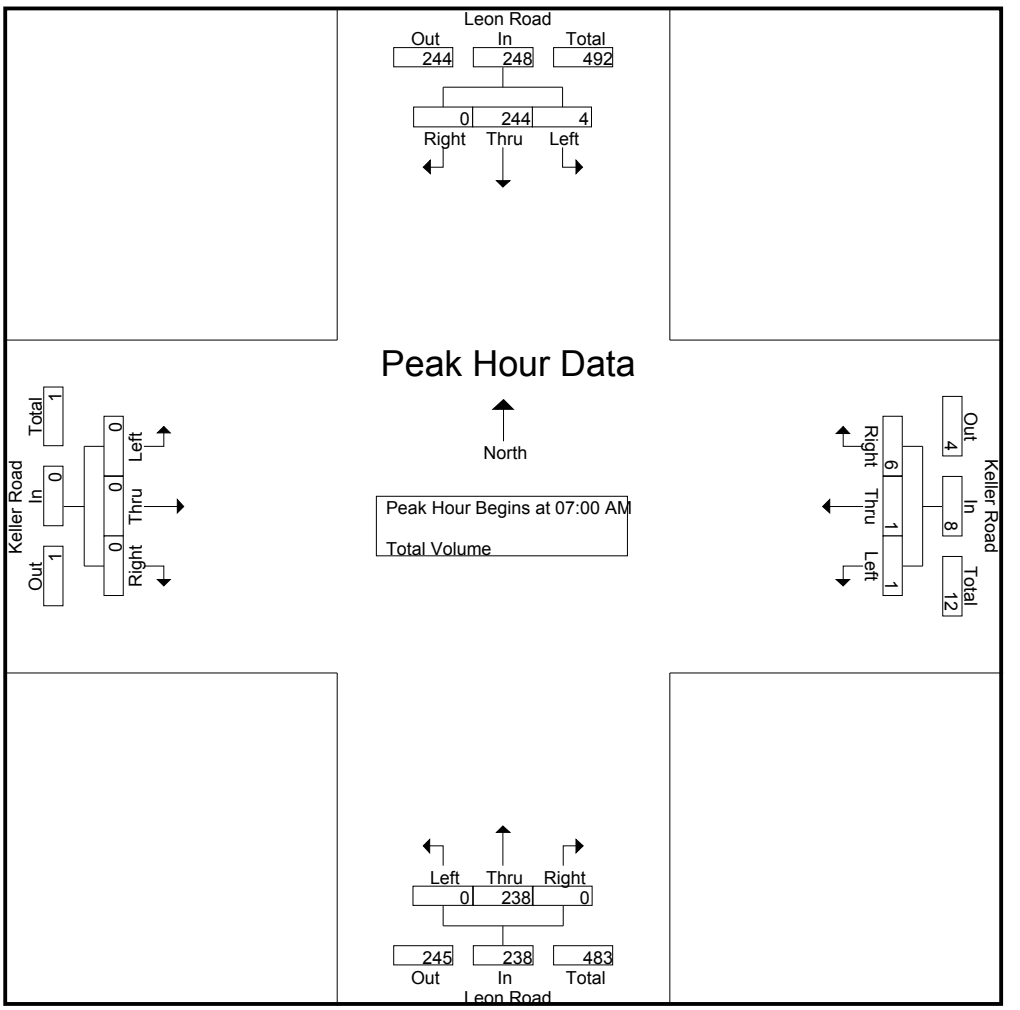
	Leon Road Southbound				Keller Road Westbound				Leon Road Northbound				Keller Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	1	54	0	55	0	0	2	2	0	65	0	65	0	0	0	0	122
07:15 AM	1	62	0	63	0	1	2	3	0	50	0	50	0	0	0	0	116
07:30 AM	0	68	0	68	1	0	1	2	0	78	0	78	0	0	0	0	148
07:45 AM	2	60	0	62	0	0	1	1	0	45	0	45	0	0	0	0	108
Total	4	244	0	248	1	1	6	8	0	238	0	238	0	0	0	0	494
08:00 AM	0	59	0	59	1	0	1	2	0	43	0	43	1	0	0	1	105
08:15 AM	0	51	0	51	0	0	0	0	0	45	0	45	0	0	0	0	96
08:30 AM	0	45	0	45	2	1	1	4	0	39	0	39	0	0	0	0	88
08:45 AM	0	33	0	33	0	0	0	0	0	29	0	29	0	0	0	0	62
Total	0	188	0	188	3	1	2	6	0	156	0	156	1	0	0	1	351
Grand Total	4	432	0	436	4	2	8	14	0	394	0	394	1	0	0	1	845
Apprch %	0.9	99.1	0		28.6	14.3	57.1		0	100	0		100	0	0		
Total %	0.5	51.1	0	51.6	0.5	0.2	0.9	1.7	0	46.6	0	46.6	0.1	0	0	0.1	

	Leon Road Southbound				Keller Road Westbound				Leon Road Northbound				Keller Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	1	54	0	55	0	0	**2**	2	0	65	0	65	0	0	0	0	122
07:15 AM	1	62	0	63	0	**1**	2	**3**	0	50	0	50	0	0	0	0	116
07:30 AM	0	**68**	0	**68**	**1**	0	1	2	0	**78**	0	**78**	0	0	0	0	**148**
07:45 AM	**2**	60	0	62	0	0	1	1	0	45	0	45	0	0	0	0	108
Total Volume	4	244	0	248	1	1	6	8	0	238	0	238	0	0	0	0	494
% App. Total	1.6	98.4	0		12.5	12.5	75		0	100	0		0	0	0		
PHF	.500	.897	.000	.912	.250	.250	.750	.667	.000	.763	.000	.763	.000	.000	.000	.000	.834

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Leon Road
E/W: Keller Road
Weather: Sunny

File Name : CRVLEKEAM
Site Code : 9311058
Start Date : 12/9/2009
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:15 AM				07:00 AM				07:00 AM				07:15 AM			
+0 mins.	1	62	0	63	0	0	**2**	2	0	65	0	65	0	0	0	0
+15 mins.	0	**68**	0	**68**	0	**1**	2	**3**	0	50	0	50	0	0	0	0
+30 mins.	**2**	60	0	62	**1**	0	1	2	0	**78**	0	**78**	0	0	0	0
+45 mins.	0	59	0	59	0	0	1	1	0	45	0	45	**1**	0	0	**1**
Total Volume	3	249	0	252	1	1	6	8	0	238	0	238	1	0	0	1
% App. Total	1.2	98.8	0		12.5	12.5	75		0	100	0		100	0	0	
PHF	.375	.915	.000	.926	.250	.250	.750	.667	.000	.763	.000	.763	.250	.000	.000	.250

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Leon Road
E/W: Keller Road
Weather: Sunny

File Name : CRVLEKEPM
Site Code : 9311058
Start Date : 12/9/2009
Page No : 1

Groups Printed- Total Volume

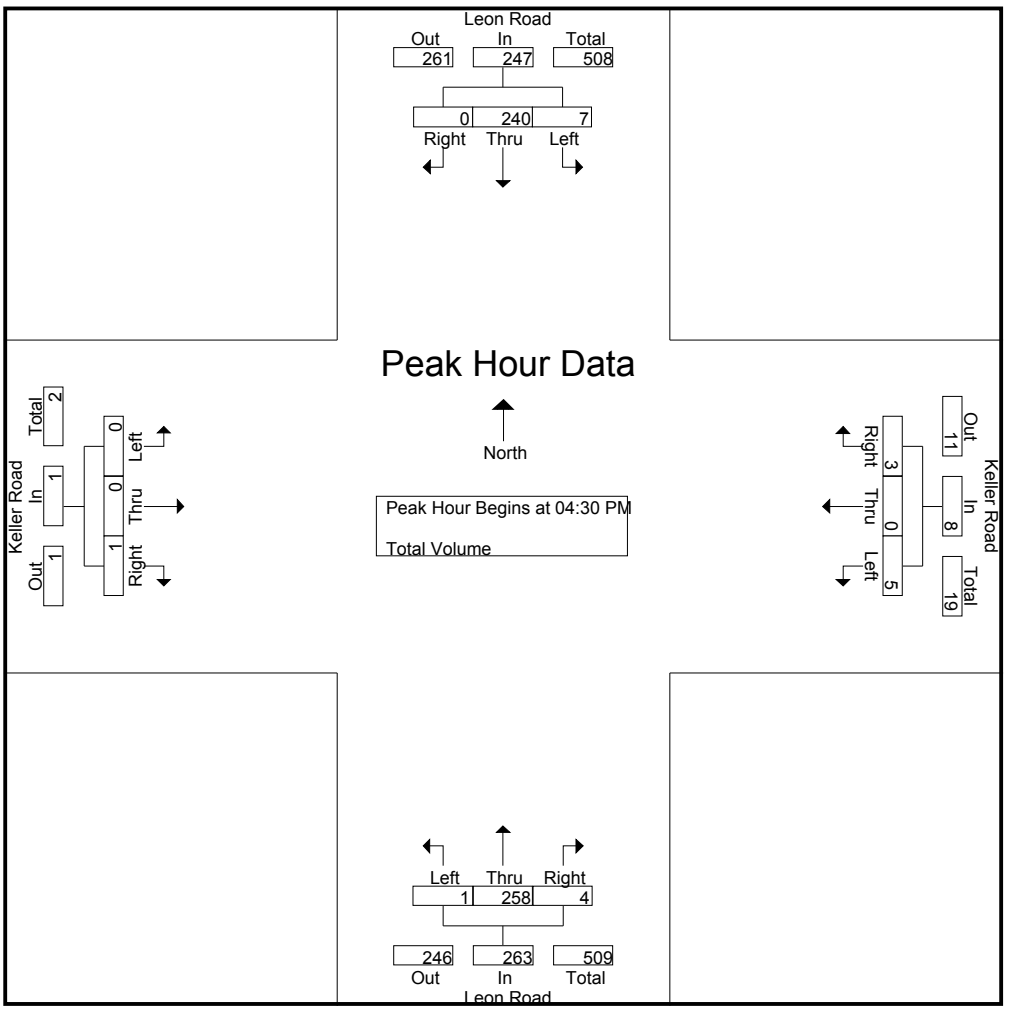
	Leon Road Southbound				Keller Road Westbound				Leon Road Northbound				Keller Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	4	50	0	54	0	0	1	1	6	63	2	71	0	1	0	1	127
04:15 PM	3	54	0	57	2	0	4	6	0	66	0	66	0	0	0	0	129
04:30 PM	2	46	0	48	2	0	0	2	0	69	1	70	0	0	0	0	120
04:45 PM	2	67	0	69	1	0	2	3	0	57	1	58	0	0	0	0	130
Total	11	217	0	228	5	0	7	12	6	255	4	265	0	1	0	1	506
05:00 PM	2	60	0	62	1	0	0	1	0	64	1	65	0	0	1	1	129
05:15 PM	1	67	0	68	1	0	1	2	1	68	1	70	0	0	0	0	140
05:30 PM	5	44	0	49	0	0	0	0	0	52	0	52	0	0	0	0	101
05:45 PM	0	50	0	50	0	0	0	0	1	52	0	53	0	0	0	0	103
Total	8	221	0	229	2	0	1	3	2	236	2	240	0	0	1	1	473
Grand Total	19	438	0	457	7	0	8	15	8	491	6	505	0	1	1	2	979
Apprch %	4.2	95.8	0		46.7	0	53.3		1.6	97.2	1.2		0	50	50		
Total %	1.9	44.7	0	46.7	0.7	0	0.8	1.5	0.8	50.2	0.6	51.6	0	0.1	0.1	0.2	

	Leon Road Southbound				Keller Road Westbound				Leon Road Northbound				Keller Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**2**	46	0	48	**2**	0	0	2	0	**69**	**1**	**70**	0	0	0	0	120
04:45 PM	2	**67**	0	**69**	1	0	**2**	**3**	0	57	1	58	0	0	0	0	130
05:00 PM	2	60	0	62	1	0	0	1	0	64	1	65	0	0	**1**	**1**	129
05:15 PM	1	67	0	68	1	0	1	2	**1**	68	1	70	0	0	0	0	**140**
Total Volume	7	240	0	247	5	0	3	8	1	258	4	263	0	0	1	1	519
% App. Total	2.8	97.2	0		62.5	0	37.5		0.4	98.1	1.5		0	0	100		
PHF	.875	.896	.000	.895	.625	.000	.375	.667	.250	.935	1.000	.939	.000	.000	.250	.250	.927

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Leon Road
E/W: Keller Road
Weather: Sunny

File Name : CRVLEKEPM
Site Code : 9311058
Start Date : 12/9/2009
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:45 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	2	**67**	0	**69**	0	0	1	1	**6**	63	**2**	**71**	0	**1**	0	**1**
+15 mins.	2	60	0	62	**2**	0	**4**	**6**	0	66	0	66	0	0	0	0
+30 mins.	1	67	0	68	2	0	0	2	0	**69**	1	70	0	0	0	0
+45 mins.	**5**	44	0	49	1	0	2	3	0	57	1	58	0	0	0	0
Total Volume	10	238	0	248	5	0	7	12	6	255	4	265	0	1	0	1
% App. Total	4	96	0		41.7	0	58.3		2.3	96.2	1.5		0	100	0	
PHF	.500	.888	.000	.899	.625	.000	.438	.500	.250	.924	.500	.933	.000	.250	.000	.250

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Leon Road
E/W: Jean Nicholas Road
Weather: Sunny

File Name : CRVLEJNAM
Site Code : 9311037
Start Date : 12/9/2009

Groups Printed- Total Volume

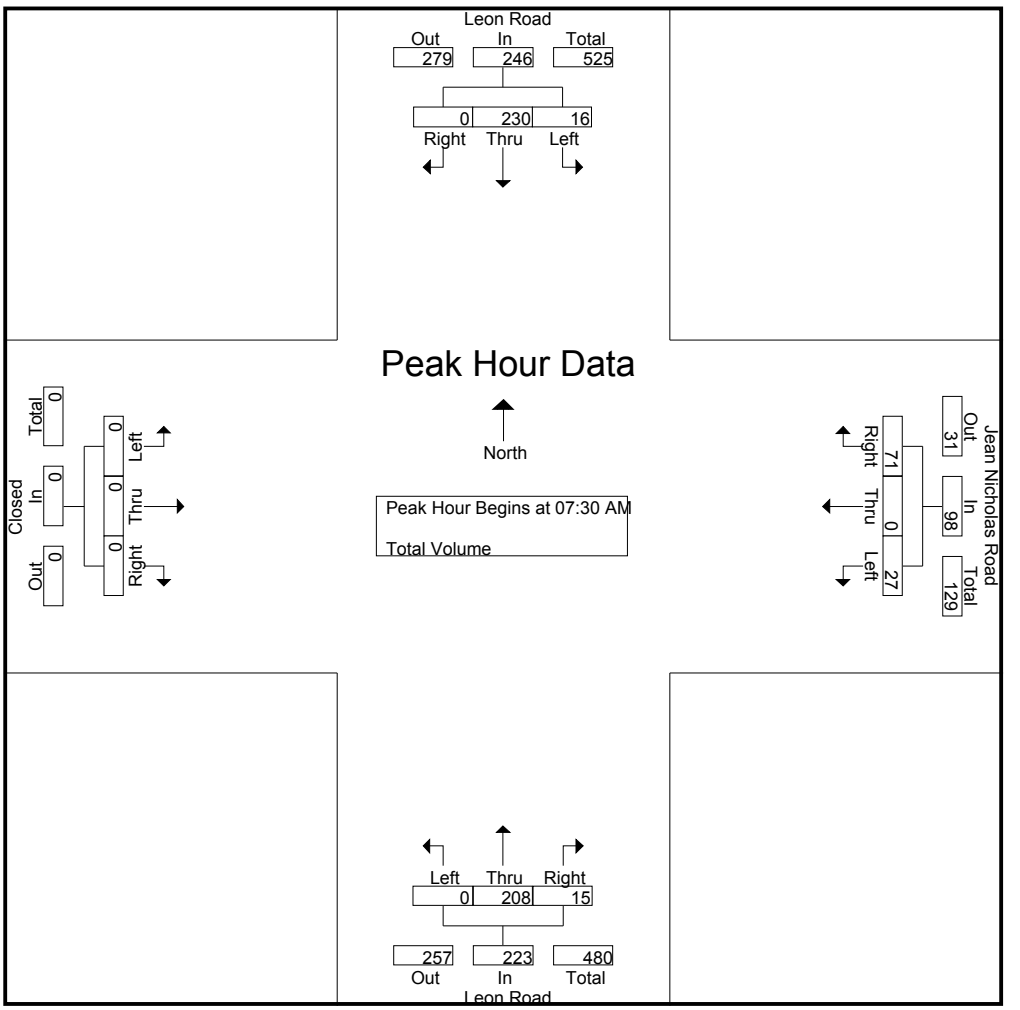
	Leon Road Southbound				Jean Nicholas Road Westbound				Leon Road Northbound				Closed Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	2	53	0	55	2	0	11	13	0	49	4	53	0	0	0	0	121
07:15 AM	2	58	0	60	7	0	9	16	0	42	6	48	0	0	0	0	124
07:30 AM	0	61	0	61	3	0	8	11	0	57	1	58	0	0	0	0	130
07:45 AM	3	60	0	63	4	0	7	11	0	58	3	61	0	0	0	0	135
Total	7	232	0	239	16	0	35	51	0	206	14	220	0	0	0	0	510
08:00 AM	9	54	0	63	8	0	27	35	0	38	7	45	0	0	0	0	143
08:15 AM	4	55	0	59	12	0	29	41	0	55	4	59	0	0	0	0	159
08:30 AM	7	47	0	54	0	0	8	8	0	34	1	35	0	0	0	0	97
08:45 AM	2	45	0	47	2	0	4	6	0	28	2	30	0	0	0	0	83
Total	22	201	0	223	22	0	68	90	0	155	14	169	0	0	0	0	482
Grand Total	29	433	0	462	38	0	103	141	0	361	28	389	0	0	0	0	992
Apprch %	6.3	93.7	0		27	0	73		0	92.8	7.2		0	0	0		
Total %	2.9	43.6	0	46.6	3.8	0	10.4	14.2	0	36.4	2.8	39.2	0	0	0	0	

	Leon Road Southbound				Jean Nicholas Road Westbound				Leon Road Northbound				Closed Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	**61**	0	61	3	0	8	11	0	57	1	58	0	0	0	0	130
07:45 AM	3	60	0	**63**	4	0	7	11	0	**58**	3	**61**	0	0	0	0	135
08:00 AM	**9**	54	0	63	8	0	27	35	0	38	**7**	45	0	0	0	0	143
08:15 AM	4	55	0	59	**12**	0	**29**	**41**	0	55	4	59	0	0	0	0	**159**
Total Volume	16	230	0	246	27	0	71	98	0	208	15	223	0	0	0	0	567
% App. Total	6.5	93.5	0		27.6	0	72.4		0	93.3	6.7		0	0	0		
PHF	.444	.943	.000	.976	.563	.000	.612	.598	.000	.897	.536	.914	.000	.000	.000	.000	.892

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Leon Road
E/W: Jean Nicholas Road
Weather: Sunny

File Name : CRVLEJNAM
Site Code : 9311037
Start Date : 12/9/2009
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:15 AM				07:30 AM				07:30 AM				07:00 AM			
+0 mins.	2	58	0	60	3	0	8	11	0	57	1	58	0	0	0	0
+15 mins.	0	**61**	0	61	4	0	7	11	0	**58**	3	**61**	0	0	0	0
+30 mins.	3	60	0	**63**	8	0	27	35	0	38	**7**	45	0	0	0	0
+45 mins.	**9**	54	0	63	**12**	0	**29**	**41**	0	55	4	59	0	0	0	0
Total Volume	14	233	0	247	27	0	71	98	0	208	15	223	0	0	0	0
% App. Total	5.7	94.3	0		27.6	0	72.4		0	93.3	6.7		0	0	0	
PHF	.389	.955	.000	.980	.563	.000	.612	.598	.000	.897	.536	.914	.000	.000	.000	.000

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Leon Road
E/W: Jean Nicholas Road
Weather: Sunny

File Name : CRVLEJNPM
Site Code : 9311037
Start Date : 12/9/2009
Page No : 1

Groups Printed- Total Volume

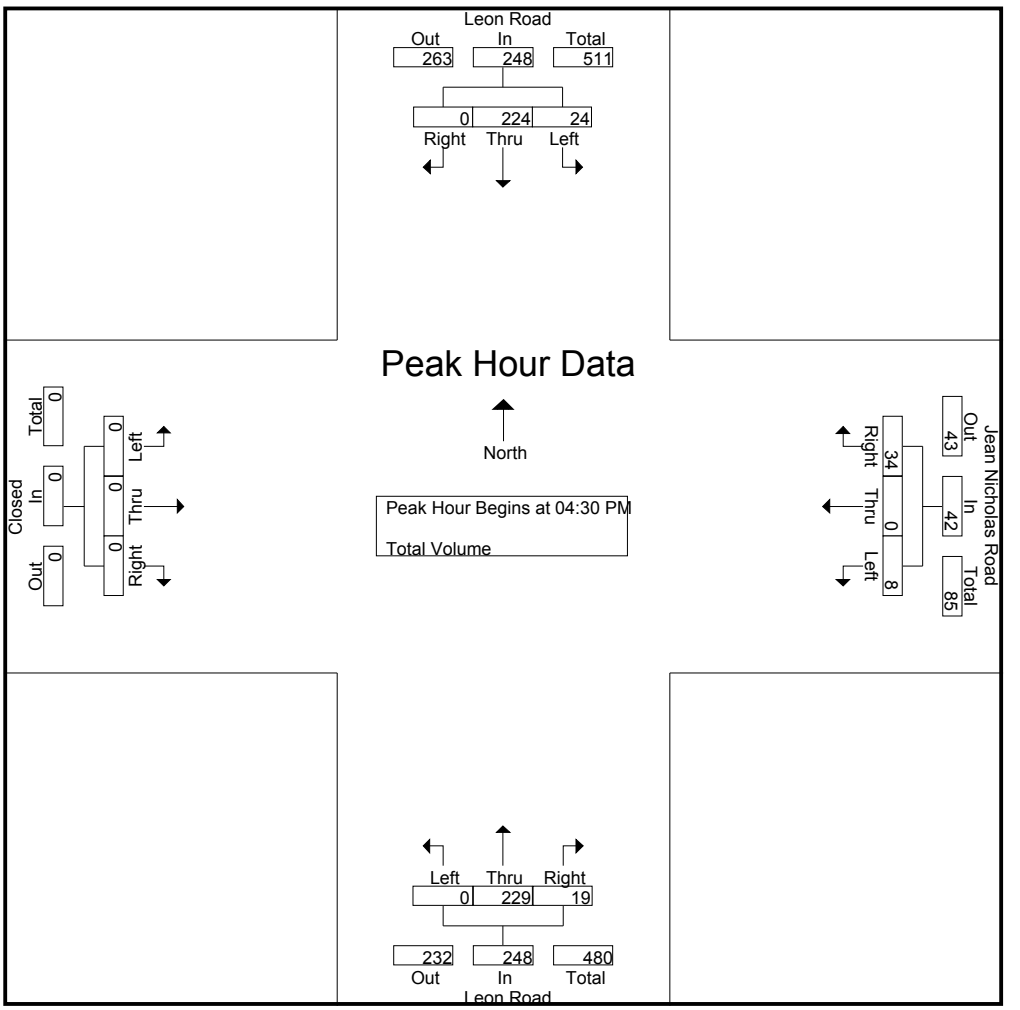
	Leon Road Southbound				Jean Nicholas Road Westbound				Leon Road Northbound				Closed Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	5	45	0	50	2	0	4	6	0	62	4	66	0	0	0	0	122
04:15 PM	9	46	0	55	1	0	8	9	0	61	3	64	0	0	0	0	128
04:30 PM	4	39	0	43	2	0	6	8	0	59	4	63	0	0	0	0	114
04:45 PM	6	65	0	71	2	0	6	8	0	52	7	59	0	0	0	0	138
Total	24	195	0	219	7	0	24	31	0	234	18	252	0	0	0	0	502
05:00 PM	9	57	0	66	4	0	11	15	0	58	7	65	0	0	0	0	146
05:15 PM	5	63	0	68	0	0	11	11	0	60	1	61	0	0	0	0	140
05:30 PM	5	47	0	52	3	0	11	14	0	42	5	47	0	0	0	0	113
05:45 PM	4	48	0	52	2	0	9	11	0	47	3	50	0	0	0	0	113
Total	23	215	0	238	9	0	42	51	0	207	16	223	0	0	0	0	512
Grand Total	47	410	0	457	16	0	66	82	0	441	34	475	0	0	0	0	1014
Apprch %	10.3	89.7	0		19.5	0	80.5		0	92.8	7.2		0	0	0		
Total %	4.6	40.4	0	45.1	1.6	0	6.5	8.1	0	43.5	3.4	46.8	0	0	0	0	

	Leon Road Southbound				Jean Nicholas Road Westbound				Leon Road Northbound				Closed Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	4	39	0	43	2	0	6	8	0	59	4	63	0	0	0	0	114
04:45 PM	6	**65**	0	**71**	2	0	6	8	0	52	**7**	59	0	0	0	0	138
05:00 PM	**9**	57	0	66	**4**	0	**11**	**15**	0	58	7	**65**	0	0	0	0	**146**
05:15 PM	5	63	0	68	0	0	11	11	0	**60**	1	61	0	0	0	0	140
Total Volume	24	224	0	248	8	0	34	42	0	229	19	248	0	0	0	0	538
% App. Total	9.7	90.3	0		19	0	81		0	92.3	7.7		0	0	0		
PHF	.667	.862	.000	.873	.500	.000	.773	.700	.000	.954	.679	.954	.000	.000	.000	.000	.921

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

County of Riverside
N/S: Leon Road
E/W: Jean Nicholas Road
Weather: Sunny

File Name : CRVLEJNPM
Site Code : 9311037
Start Date : 12/9/2009
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:45 PM				05:00 PM				04:00 PM				04:00 PM			
+0 mins.	6	**65**	0	**71**	**4**	0	**11**	**15**	0	**62**	4	**66**	0	0	0	0
+15 mins.	**9**	57	0	66	0	0	11	11	0	61	3	64	0	0	0	0
+30 mins.	5	63	0	68	3	0	11	14	0	59	4	63	0	0	0	0
+45 mins.	5	47	0	52	2	0	9	11	0	52	**7**	59	0	0	0	0
Total Volume	25	232	0	257	9	0	42	51	0	234	18	252	0	0	0	0
% App. Total	9.7	90.3	0		17.6	0	82.4		0	92.9	7.1		0	0	0	
PHF	.694	.892	.000	.905	.563	.000	.955	.850	.000	.944	.643	.955	.000	.000	.000	.000

Counts Unlimited Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Murrieta
N/S: Winchester Road
E/W: Benton Road
Weather: Sunny

File Name : MURWIBEAM
Site Code : 10266044
Start Date : 12/7/2010
Page No : 1

Groups Printed- Class 1

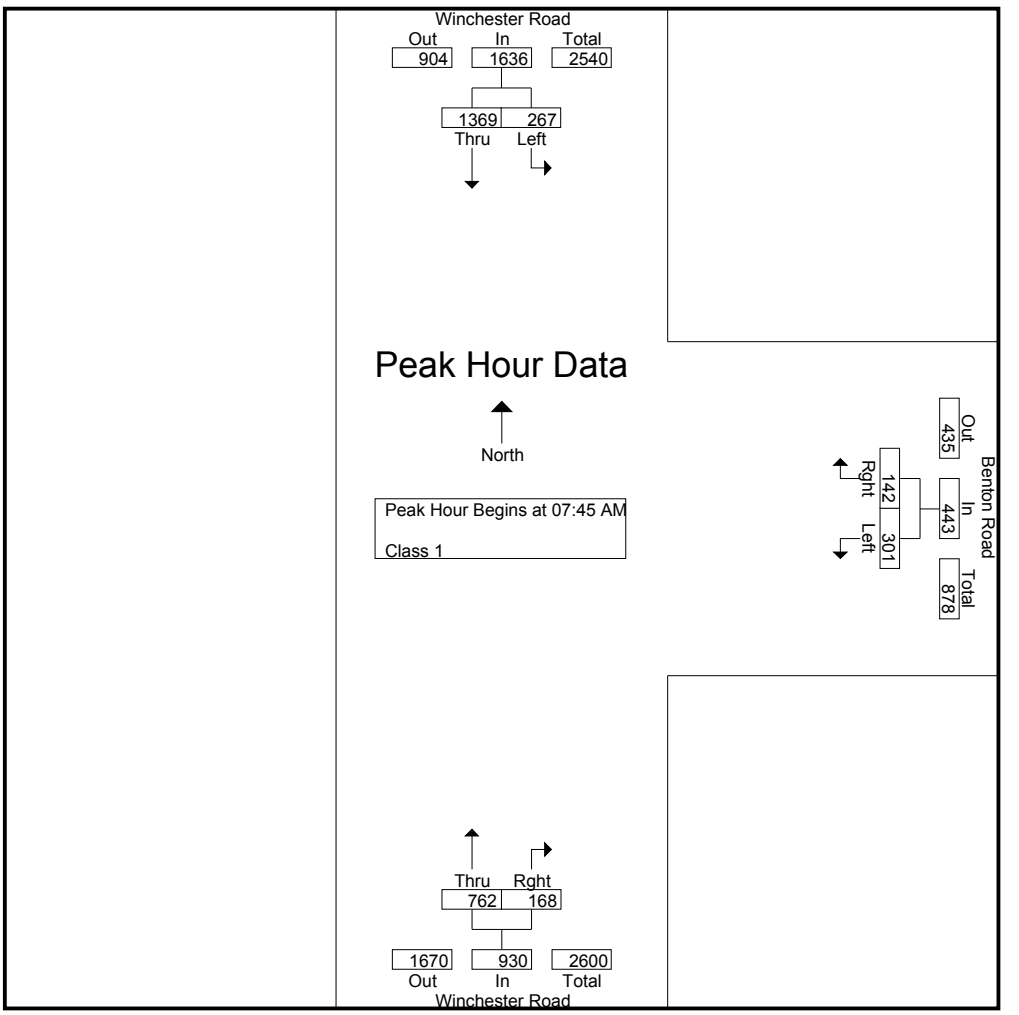
	Winchester Road Southbound			Benton Road Westbound			Winchester Road Northbound			
Start Time	Left	Thru	App. Total	Left	Rght	App. Total	Thru	Rght	App. Total	Int. Total
07:00 AM	35	298	333	93	29	122	118	48	166	621
07:15 AM	45	266	311	64	27	91	171	33	204	606
07:30 AM	46	312	358	90	34	124	165	21	186	668
07:45 AM	56	329	385	67	36	103	245	34	279	767
Total	182	1205	1387	314	126	440	699	136	835	2662
08:00 AM	72	318	390	88	25	113	224	46	270	773
08:15 AM	64	366	430	71	32	103	170	45	215	748
08:30 AM	75	356	431	75	49	124	123	43	166	721
08:45 AM	45	270	315	97	49	146	130	54	184	645
Total	256	1310	1566	331	155	486	647	188	835	2887
Grand Total	438	2515	2953	645	281	926	1346	324	1670	5549
Apprch %	14.8	85.2		69.7	30.3		80.6	19.4		
Total %	7.9	45.3	53.2	11.6	5.1	16.7	24.3	5.8	30.1	

	Winchester Road Southbound			Benton Road Westbound			Winchester Road Northbound			
Start Time	Left	Thru	App. Total	Left	Rght	App. Total	Thru	Rght	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	56	329	385	67	36	103	**245**	34	**279**	767
08:00 AM	72	318	390	**88**	25	113	224	**46**	270	**773**
08:15 AM	64	**366**	430	71	32	103	170	45	215	748
08:30 AM	**75**	356	**431**	75	**49**	**124**	123	43	166	721
Total Volume	267	1369	1636	301	142	443	762	168	930	3009
% App. Total	16.3	83.7		67.9	32.1		81.9	18.1		
PHF	.890	.935	.949	.855	.724	.893	.778	.913	.833	.973

Counts Unlimited Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Murrieta
N/S: Winchester Road
E/W: Benton Road
Weather: Sunny

File Name : MURWIBEAM
Site Code : 10266044
Start Date : 12/7/2010
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM			08:00 AM			07:30 AM		
+0 mins.	56	329	385	88	25	113	165	21	186
+15 mins.	72	318	390	71	32	103	**245**	34	**279**
+30 mins.	64	**366**	430	75	**49**	124	224	**46**	270
+45 mins.	**75**	356	**431**	**97**	49	**146**	170	45	215
Total Volume	267	1369	1636	331	155	486	804	146	950
% App. Total	16.3	83.7		68.1	31.9		84.6	15.4	
PHF	.890	.935	.949	.853	.791	.832	.820	.793	.851

Counts Unlimited Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Murrieta
N/S: Winchester Road
E/W: Benton Road
Weather: Sunny

File Name : MURWIBEPM
Site Code : 10266044
Start Date : 12/7/2010

Groups Printed- Class 1

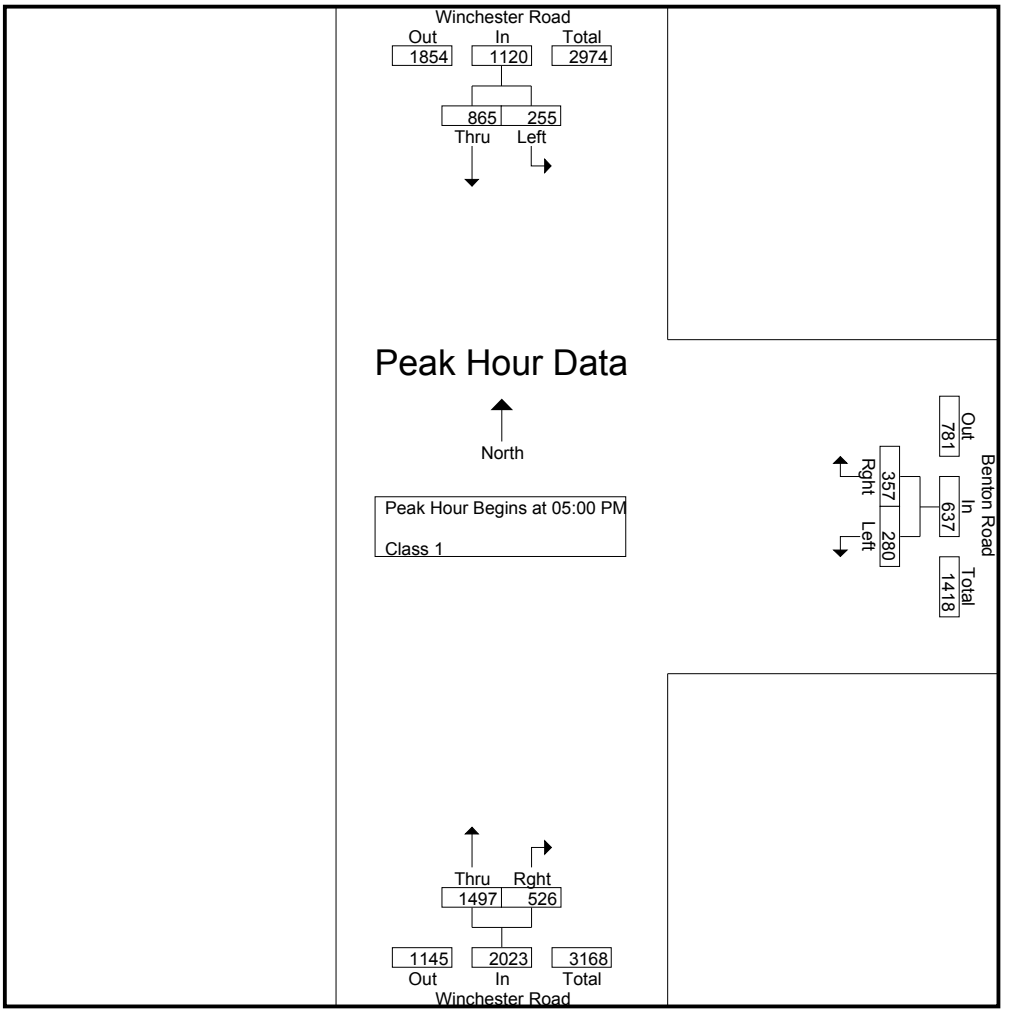
	Winchester Road Southbound			Benton Road Westbound			Winchester Road Northbound			
Start Time	Left	Thru	App. Total	Left	Rght	App. Total	Thru	Rght	App. Total	Int. Total
04:00 PM	46	189	235	44	63	107	265	78	343	685
04:15 PM	39	187	226	66	84	150	312	93	405	781
04:30 PM	59	228	287	56	76	132	349	115	464	883
04:45 PM	47	209	256	65	89	154	350	102	452	862
Total	191	813	1004	231	312	543	1276	388	1664	3211
05:00 PM	49	235	284	60	91	151	369	105	474	909
05:15 PM	67	207	274	76	84	160	382	123	505	939
05:30 PM	60	226	286	72	79	151	393	147	540	977
05:45 PM	79	197	276	72	103	175	353	151	504	955
Total	255	865	1120	280	357	637	1497	526	2023	3780
Grand Total	446	1678	2124	511	669	1180	2773	914	3687	6991
Apprch %	21	79		43.3	56.7		75.2	24.8		
Total %	6.4	24	30.4	7.3	9.6	16.9	39.7	13.1	52.7	

	Winchester Road Southbound			Benton Road Westbound			Winchester Road Northbound			
Start Time	Left	Thru	App. Total	Left	Rght	App. Total	Thru	Rght	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	49	**235**	284	60	91	151	369	105	474	909
05:15 PM	67	207	274	**76**	84	160	382	123	505	939
05:30 PM	60	226	**286**	72	79	151	**393**	147	**540**	**977**
05:45 PM	**79**	197	276	72	**103**	**175**	353	**151**	504	955
Total Volume	255	865	1120	280	357	637	1497	526	2023	3780
% App. Total	22.8	77.2		44	56		74	26		
PHF	.807	.920	.979	.921	.867	.910	.952	.871	.937	.967

Counts Unlimited Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Murrieta
N/S: Winchester Road
E/W: Benton Road
Weather: Sunny

File Name : MURWIBEPM
Site Code : 10266044
Start Date : 12/7/2010
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM			05:00 PM			05:00 PM		
+0 mins.	49	**235**	284	60	91	151	369	105	474
+15 mins.	67	207	274	**76**	84	160	382	123	505
+30 mins.	60	226	**286**	72	79	151	**393**	147	**540**
+45 mins.	**79**	197	276	72	**103**	**175**	353	**151**	504
Total Volume	255	865	1120	280	357	637	1497	526	2023
% App. Total	22.8	77.2		44	56		74	26	
PHF	.807	.920	.979	.921	.867	.910	.952	.871	.937

Counts Unlimited Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

County of Riverside
N/S: Winchester Road (SR-79)
E/W: Auld Road
Weather: Sunny

File Name : CRVWIAUAM
Site Code : 10236064
Start Date : 11/4/2010

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

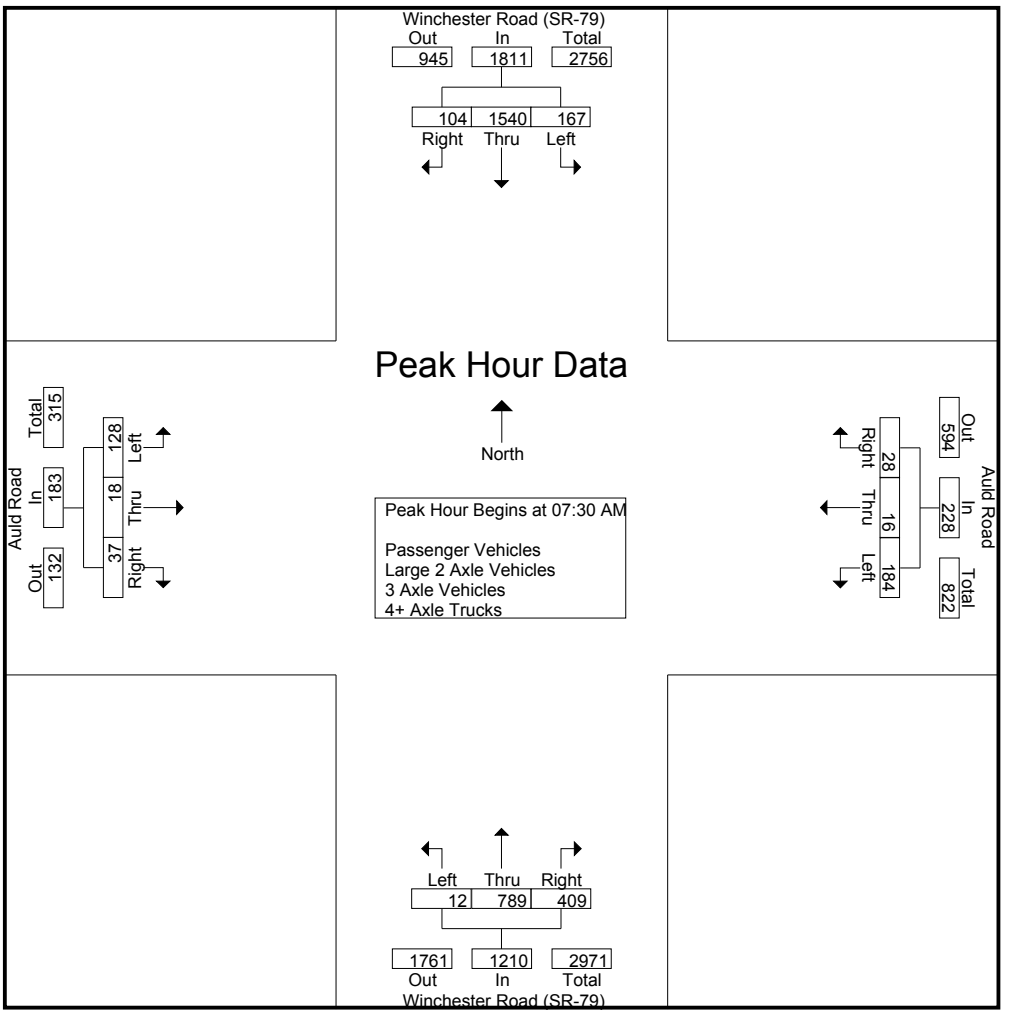
	Winchester Road (SR-79) Southbound				Auld Road Westbound				Winchester Road (SR-79) Northbound				Auld Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	16	350	4	370	53	0	4	57	1	185	67	253	20	3	6	29	709
07:15 AM	33	329	19	381	46	1	4	51	0	187	94	281	8	6	3	17	730
07:30 AM	37	418	11	466	43	2	8	53	1	207	118	326	23	5	4	32	877
07:45 AM	57	370	25	452	49	4	5	58	4	233	116	353	34	5	13	52	915
Total	143	1467	59	1669	191	7	21	219	6	812	395	1213	85	19	26	130	3231
08:00 AM	44	373	46	463	41	6	9	56	3	183	92	278	45	6	12	63	860
08:15 AM	29	379	22	430	51	4	6	61	4	166	83	253	26	2	8	36	780
08:30 AM	37	388	27	452	51	0	9	60	3	160	75	238	22	10	8	40	790
08:45 AM	24	376	15	415	64	4	8	76	1	165	62	228	11	3	8	22	741
Total	134	1516	110	1760	207	14	32	253	11	674	312	997	104	21	36	161	3171
Grand Total	277	2983	169	3429	398	21	53	472	17	1486	707	2210	189	40	62	291	6402
Apprch %	8.1	87	4.9		84.3	4.4	11.2		0.8	67.2	32		64.9	13.7	21.3		
Total %	4.3	46.6	2.6	53.6	6.2	0.3	0.8	7.4	0.3	23.2	11	34.5	3	0.6	1	4.5	
Passenger Vehicles	274	2943	165	3382	395	21	51	467	17	1447	701	2165	186	40	60	286	6300
% Passenger Vehicles	98.9	98.7	97.6	98.6	99.2	100	96.2	98.9	100	97.4	99.2	98	98.4	100	96.8	98.3	98.4
Large 2 Axle Vehicles	3	26	3	32	3	0	1	4	0	30	6	36	3	0	1	4	76
% Large 2 Axle Vehicles	1.1	0.9	1.8	0.9	0.8	0	1.9	0.8	0	2	0.8	1.6	1.6	0	1.6	1.4	1.2
3 Axle Vehicles	0	2	1	3	0	0	1	1	0	4	0	4	0	0	1	1	9
% 3 Axle Vehicles	0	0.1	0.6	0.1	0	0	1.9	0.2	0	0.3	0	0.2	0	0	1.6	0.3	0.1
4+ Axle Trucks	0	12	0	12	0	0	0	0	0	5	0	5	0	0	0	0	17
% 4+ Axle Trucks	0	0.4	0	0.3	0	0	0	0	0	0.3	0	0.2	0	0	0	0	0.3

	Winchester Road (SR-79) Southbound				Auld Road Westbound				Winchester Road (SR-79) Northbound				Auld Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	37	**418**	11	**466**	43	2	8	53	1	207	**118**	326	23	5	4	32	877
07:45 AM	**57**	370	25	452	49	4	5	58	**4**	**233**	116	**353**	34	5	**13**	52	**915**
08:00 AM	44	373	**46**	463	41	**6**	**9**	56	3	183	92	278	**45**	**6**	12	**63**	860
08:15 AM	29	379	22	430	**51**	4	6	**61**	4	166	83	253	26	2	8	36	780
Total Volume	167	1540	104	1811	184	16	28	228	12	789	409	1210	128	18	37	183	3432
% App. Total	9.2	85	5.7		80.7	7	12.3		1	65.2	33.8		69.9	9.8	20.2		
PHF	.732	.921	.565	.972	.902	.667	.778	.934	.750	.847	.867	.857	.711	.750	.712	.726	.938

Counts Unlimited Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

County of Riverside
N/S: Winchester Road (SR-79)
E/W: Auld Road
Weather: Sunny

File Name : CRVWIAUAM
Site Code : 10236064
Start Date : 11/4/2010
Page No : 2



Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	37	**418**	11	**466**	43	2	8	53	1	207	**118**	326	23	5	4	32
+15 mins.	**57**	370	25	452	49	4	5	58	**4**	**233**	116	**353**	34	5	**13**	52
+30 mins.	44	373	**46**	463	41	**6**	**9**	56	3	183	92	278	**45**	**6**	12	**63**
+45 mins.	29	379	22	430	**51**	4	6	**61**	4	166	83	253	26	2	8	36
Total Volume	167	1540	104	1811	184	16	28	228	12	789	409	1210	128	18	37	183
% App. Total	9.2	85	5.7		80.7	7	12.3		1	65.2	33.8		69.9	9.8	20.2	
PHF	.732	.921	.565	.972	.902	.667	.778	.934	.750	.847	.867	.857	.711	.750	.712	.726

Counts Unlimited Inc.
PO Box 1178
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County of Riverside
N/S: Winchester Road (SR-79)
E/W: Auld Road
Weather: Sunny

File Name : CRVWIAUAM
Site Code : 10236064
Start Date : 11/4/2010

Groups Printed- Passenger Vehicles

	Winchester Road (SR-79) Southbound				Auld Road Westbound				Winchester Road (SR-79) Northbound				Auld Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	16	339	4	359	53	0	3	56	1	178	65	244	20	3	6	29	688
07:15 AM	33	323	18	374	46	1	4	51	0	183	92	275	8	6	3	17	717
07:30 AM	36	414	11	461	42	2	8	52	1	203	117	321	23	5	4	32	866
07:45 AM	56	366	25	447	49	4	5	58	4	226	116	346	33	5	13	51	902
Total	141	1442	58	1641	190	7	20	217	6	790	390	1186	84	19	26	129	3173
08:00 AM	44	370	46	460	41	6	8	55	3	178	91	272	43	6	12	61	848
08:15 AM	28	374	22	424	51	4	6	61	4	163	83	250	26	2	8	36	771
08:30 AM	37	384	24	445	49	0	9	58	3	154	75	232	22	10	7	39	774
08:45 AM	24	373	15	412	64	4	8	76	1	162	62	225	11	3	7	21	734
Total	133	1501	107	1741	205	14	31	250	11	657	311	979	102	21	34	157	3127
Grand Total	274	2943	165	3382	395	21	51	467	17	1447	701	2165	186	40	60	286	6300
Apprch %	8.1	87	4.9		84.6	4.5	10.9		0.8	66.8	32.4		65	14	21		
Total %	4.3	46.7	2.6	53.7	6.3	0.3	0.8	7.4	0.3	23	11.1	34.4	3	0.6	1	4.5	

	Winchester Road (SR-79) Southbound				Auld Road Westbound				Winchester Road (SR-79) Northbound				Auld Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	36	**414**	11	**461**	42	2	**8**	52	1	203	**117**	321	23	5	4	32	866
07:45 AM	**56**	366	25	447	49	4	5	58	**4**	**226**	116	**346**	33	5	**13**	51	**902**
08:00 AM	44	370	**46**	460	41	**6**	8	55	3	178	91	272	**43**	**6**	12	**61**	848
08:15 AM	28	374	22	424	**51**	4	6	**61**	4	163	83	250	26	2	8	36	771
Total Volume	164	1524	104	1792	183	16	27	226	12	770	407	1189	125	18	37	180	3387
% App. Total	9.2	85	5.8		81	7.1	11.9		1	64.8	34.2		69.4	10	20.6		
PHF	.732	.920	.565	.972	.897	.667	.844	.926	.750	.852	.870	.859	.727	.750	.712	.738	.939

Counts Unlimited Inc.
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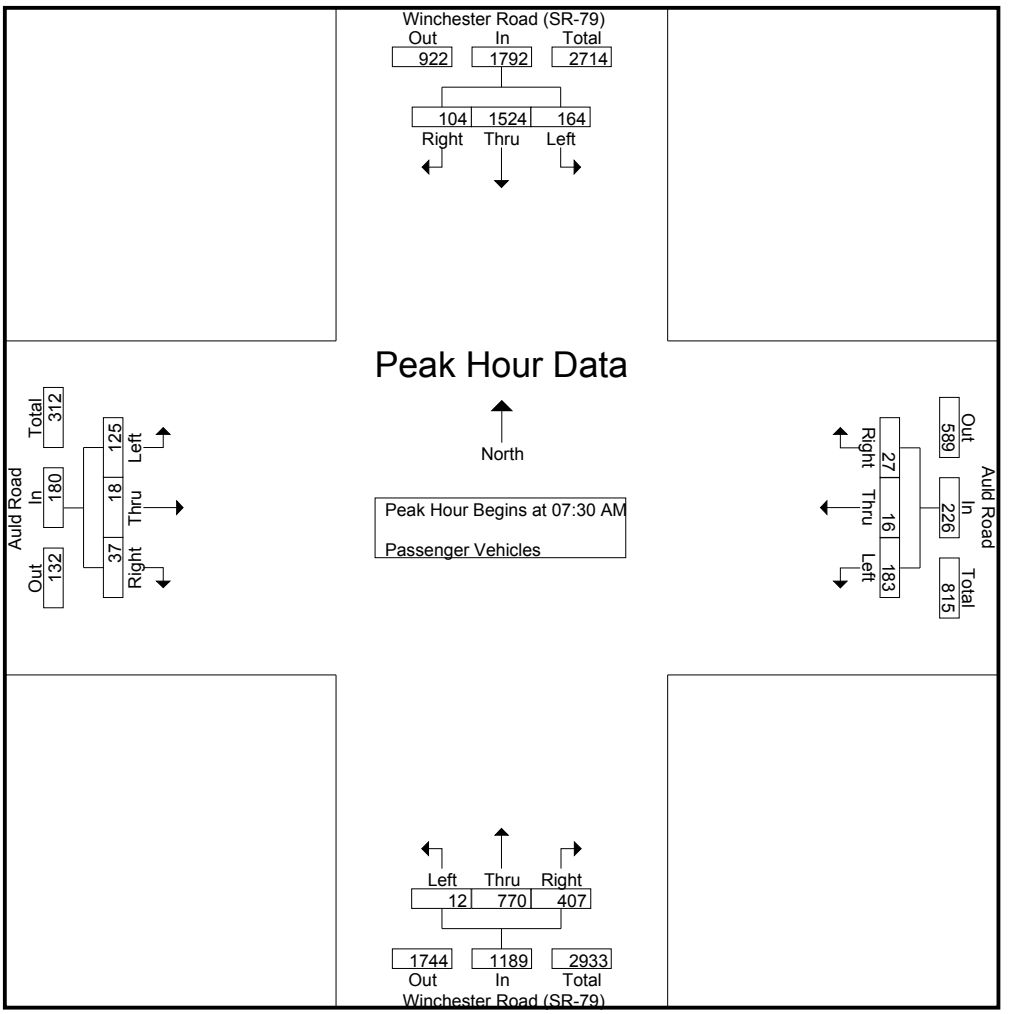
County of Riverside
N/S: Winchester Road (SR-79)
E/W: Auld Road
Weather: Sunny

File Name : CRVWIAUAM
Site Code : 10236064
Start Date : 11/4/2010
Page No : 2



Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	36	**414**	11	**461**	42	2	**8**	52	1	203	**117**	321	23	5	4	32
+15 mins.	**56**	366	25	447	49	4	5	58	**4**	**226**	116	**346**	33	5	**13**	51
+30 mins.	44	370	**46**	460	41	**6**	8	55	3	178	91	272	**43**	**6**	12	**61**
+45 mins.	28	374	22	424	**51**	4	6	**61**	4	163	83	250	26	2	8	36
Total Volume	164	1524	104	1792	183	16	27	226	12	770	407	1189	125	18	37	180
% App. Total	9.2	85	5.8		81	7.1	11.9		1	64.8	34.2		69.4	10	20.6	
PHF	.732	.920	.565	.972	.897	.667	.844	.926	.750	.852	.870	.859	.727	.750	.712	.738

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County of Riverside
N/S: Winchester Road (SR-79)
E/W: Auld Road
Weather: Sunny

File Name : CRVWIAUAM
Site Code : 10236064
Start Date : 11/4/2010

Groups Printed- Large 2 Axle Vehicles

	Winchester Road (SR-79) Southbound				Auld Road Westbound				Winchester Road (SR-79) Northbound				Auld Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	6	0	6	0	0	0	0	0	6	2	8	0	0	0	0	14
07:15 AM	0	2	1	3	0	0	0	0	0	3	2	5	0	0	0	0	8
07:30 AM	1	4	0	5	1	0	0	1	0	2	1	3	0	0	0	0	9
07:45 AM	1	2	0	3	0	0	0	0	0	6	0	6	1	0	0	1	10
Total	2	14	1	17	1	0	0	1	0	17	5	22	1	0	0	1	41
08:00 AM	0	3	0	3	0	0	1	1	0	4	1	5	2	0	0	2	11
08:15 AM	1	4	0	5	0	0	0	0	0	1	0	1	0	0	0	0	6
08:30 AM	0	3	2	5	2	0	0	2	0	6	0	6	0	0	0	0	13
08:45 AM	0	2	0	2	0	0	0	0	0	2	0	2	0	0	1	1	5
Total	1	12	2	15	2	0	1	3	0	13	1	14	2	0	1	3	35
Grand Total	3	26	3	32	3	0	1	4	0	30	6	36	3	0	1	4	76
Apprch %	9.4	81.2	9.4		75	0	25		0	83.3	16.7		75	0	25		
Total %	3.9	34.2	3.9	42.1	3.9	0	1.3	5.3	0	39.5	7.9	47.4	3.9	0	1.3	5.3	

	Winchester Road (SR-79) Southbound				Auld Road Westbound				Winchester Road (SR-79) Northbound				Auld Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	**1**	**4**	0	**5**	**1**	0	0	**1**	0	2	**1**	3	0	0	0	0	9
07:45 AM	1	2	0	3	0	0	0	0	0	**6**	0	**6**	1	0	0	1	10
08:00 AM	0	3	0	3	0	0	**1**	1	0	4	1	5	**2**	0	0	**2**	**11**
08:15 AM	1	4	0	5	0	0	0	0	0	1	0	1	0	0	0	0	6
Total Volume	3	13	0	16	1	0	1	2	0	13	2	15	3	0	0	3	36
% App. Total	18.8	81.2	0		50	0	50		0	86.7	13.3		100	0	0		
PHF	.750	.813	.000	.800	.250	.000	.250	.500	.000	.542	.500	.625	.375	.000	.000	.375	.818

Counts Unlimited Inc.
PO Box 1178
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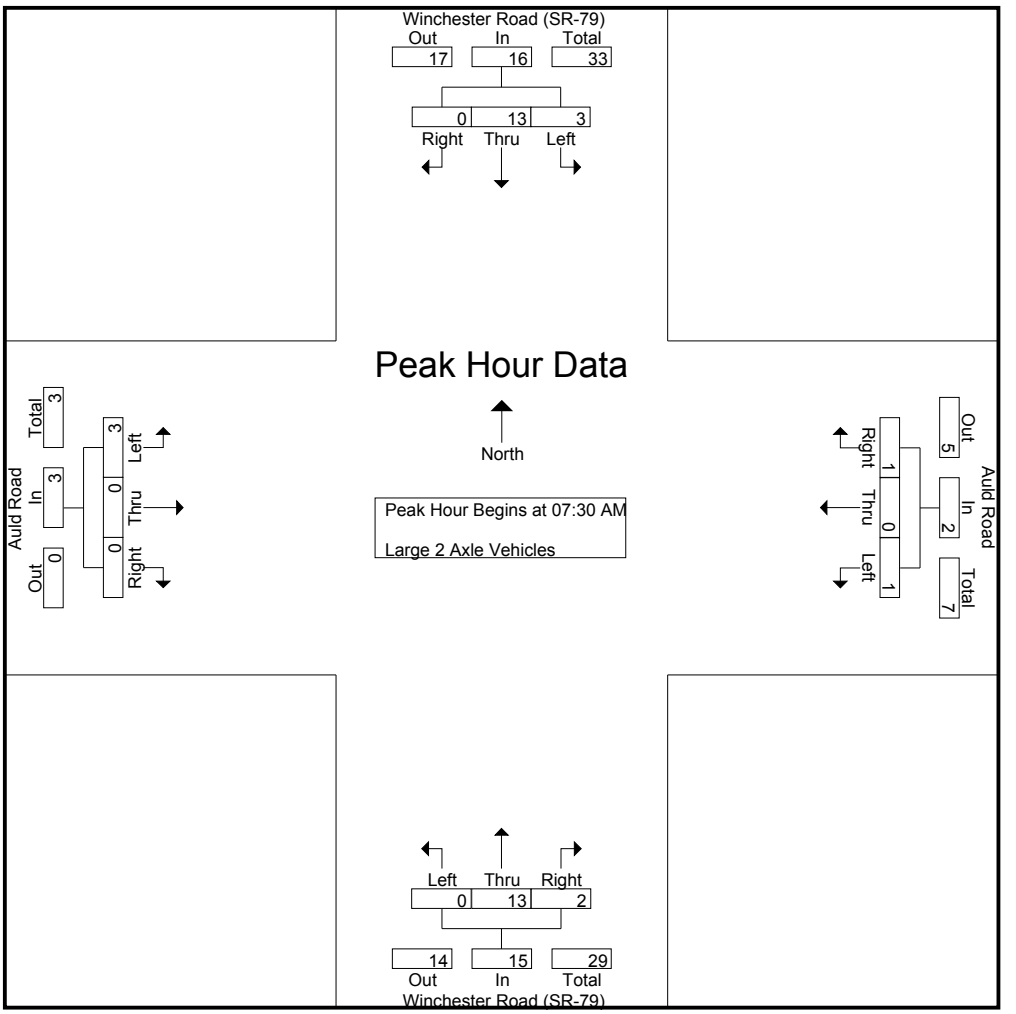
County of Riverside
N/S: Winchester Road (SR-79)
E/W: Auld Road
Weather: Sunny

File Name : CRVWIAUAM
Site Code : 10236064
Start Date : 11/4/2010
Page No : 2



Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	**1**	**4**	0	**5**	**1**	0	0	**1**	0	2	**1**	3	0	0	0	0
+15 mins.	1	2	0	3	0	0	0	0	0	**6**	0	**6**	1	0	0	1
+30 mins.	0	3	0	3	0	0	**1**	1	0	4	1	5	**2**	0	0	**2**
+45 mins.	1	4	0	5	0	0	0	0	0	1	0	1	0	0	0	0
Total Volume	3	13	0	16	1	0	1	2	0	13	2	15	3	0	0	3
% App. Total	18.8	81.2	0		50	0	50		0	86.7	13.3		100	0	0	
PHF	.750	.813	.000	.800	.250	.000	.250	.500	.000	.542	.500	.625	.375	.000	.000	.375

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County of Riverside
N/S: Winchester Road (SR-79)
E/W: Auld Road
Weather: Sunny

File Name : CRVWIAUAM
Site Code : 10236064
Start Date : 11/4/2010

Groups Printed- 3 Axle Vehicles

	Winchester Road (SR-79) Southbound				Auld Road Westbound				Winchester Road (SR-79) Northbound				Auld Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
07:15 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
07:30 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	1	0	2	0	2	0	0	0	0	3
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
08:30 AM	0	1	1	2	0	0	0	0	0	0	0	0	0	0	1	1	3
08:45 AM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
Total	0	2	1	3	0	0	0	0	0	2	0	2	0	0	1	1	6
Grand Total	0	2	1	3	0	0	1	1	0	4	0	4	0	0	1	1	9
Apprch %	0	66.7	33.3		0	0	100		0	100	0		0	0	100		
Total %	0	22.2	11.1	33.3	0	0	11.1	11.1	0	44.4	0	44.4	0	0	11.1	11.1	

	Winchester Road (SR-79) Southbound				Auld Road Westbound				Winchester Road (SR-79) Northbound				Auld Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0	**1**
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
Total Volume	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	2
% App. Total	0	0	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500	.000	.500	.000	.000	.000	.000	.500

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County of Riverside
N/S: Winchester Road (SR-79)
E/W: Auld Road
Weather: Sunny

File Name : CRVWIAUAM
Site Code : 10236064
Start Date : 11/4/2010
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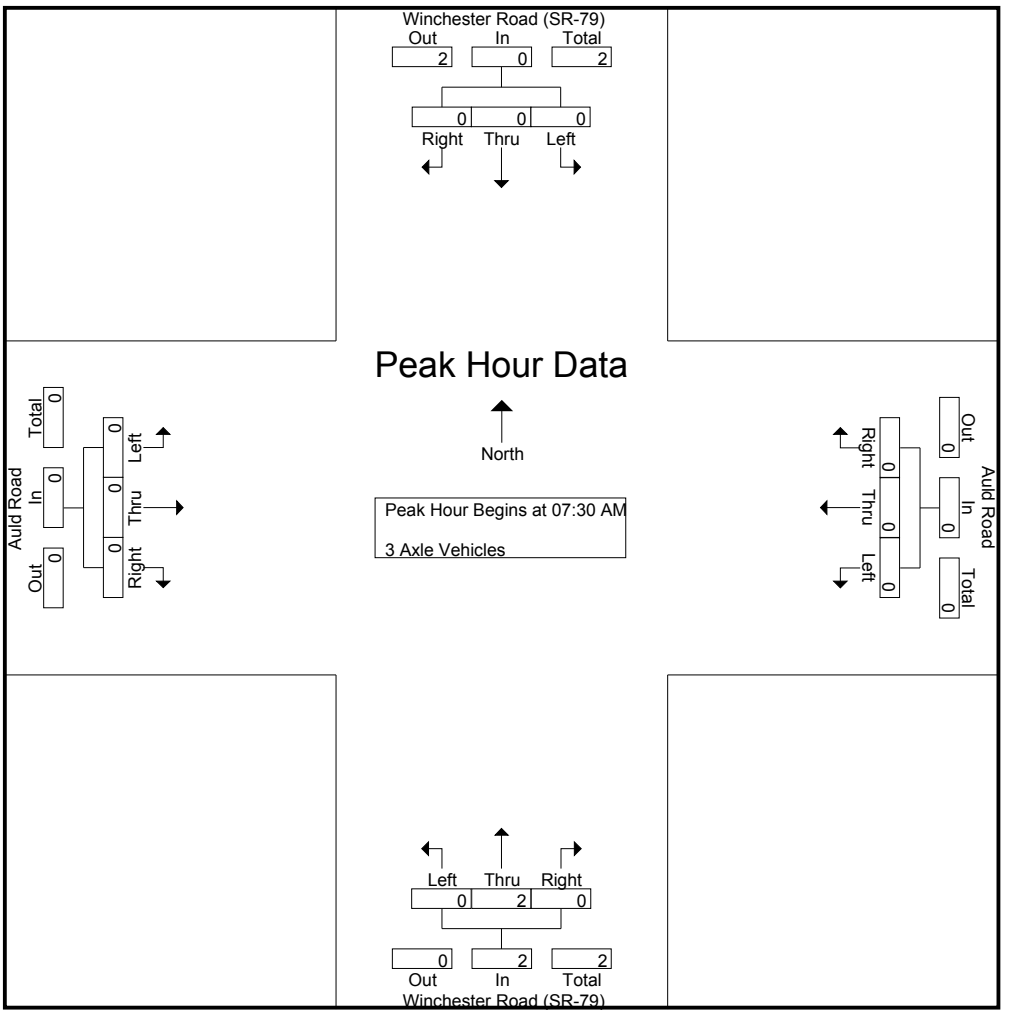

Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0
% App. Total	0	0	0		0	0	0		0	100	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500	.000	.500	.000	.000	.000	.000

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County of Riverside
N/S: Winchester Road (SR-79)
E/W: Auld Road
Weather: Sunny

File Name : CRVWIAUAM
Site Code : 10236064
Start Date : 11/4/2010

Groups Printed- 4+ Axle Trucks

	Winchester Road (SR-79) Southbound				Auld Road Westbound				Winchester Road (SR-79) Northbound				Auld Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	5	0	5	0	0	0	0	0	1	0	1	0	0	0	0	6
07:15 AM	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
07:30 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
07:45 AM	0	2	0	2	0	0	0	0	0	1	0	1	0	0	0	0	3
Total	0	11	0	11	0	0	0	0	0	3	0	3	0	0	0	0	14
08:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
08:15 AM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	1	0	0	0	0	0	2	0	2	0	0	0	0	3
Grand Total	0	12	0	12	0	0	0	0	0	5	0	5	0	0	0	0	17
Apprch %	0	100	0		0	0	0		0	100	0		0	0	0		
Total %	0	70.6	0	70.6	0	0	0	0	0	29.4	0	29.4	0	0	0	0	

	Winchester Road (SR-79) Southbound				Auld Road Westbound				Winchester Road (SR-79) Northbound				Auld Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0	1
07:45 AM	0	**2**	0	**2**	0	0	0	0	0	1	0	1	0	0	0	0	**3**
08:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
08:15 AM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
Total Volume	0	3	0	3	0	0	0	0	0	4	0	4	0	0	0	0	7
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.375	.000	.375	.000	.000	.000	.000	.000	1.000	.000	1.000	.000	.000	.000	.000	.583

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County of Riverside
N/S: Winchester Road (SR-79)
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File Name : CRVWIAUAM
Site Code : 10236064
Start Date : 11/4/2010
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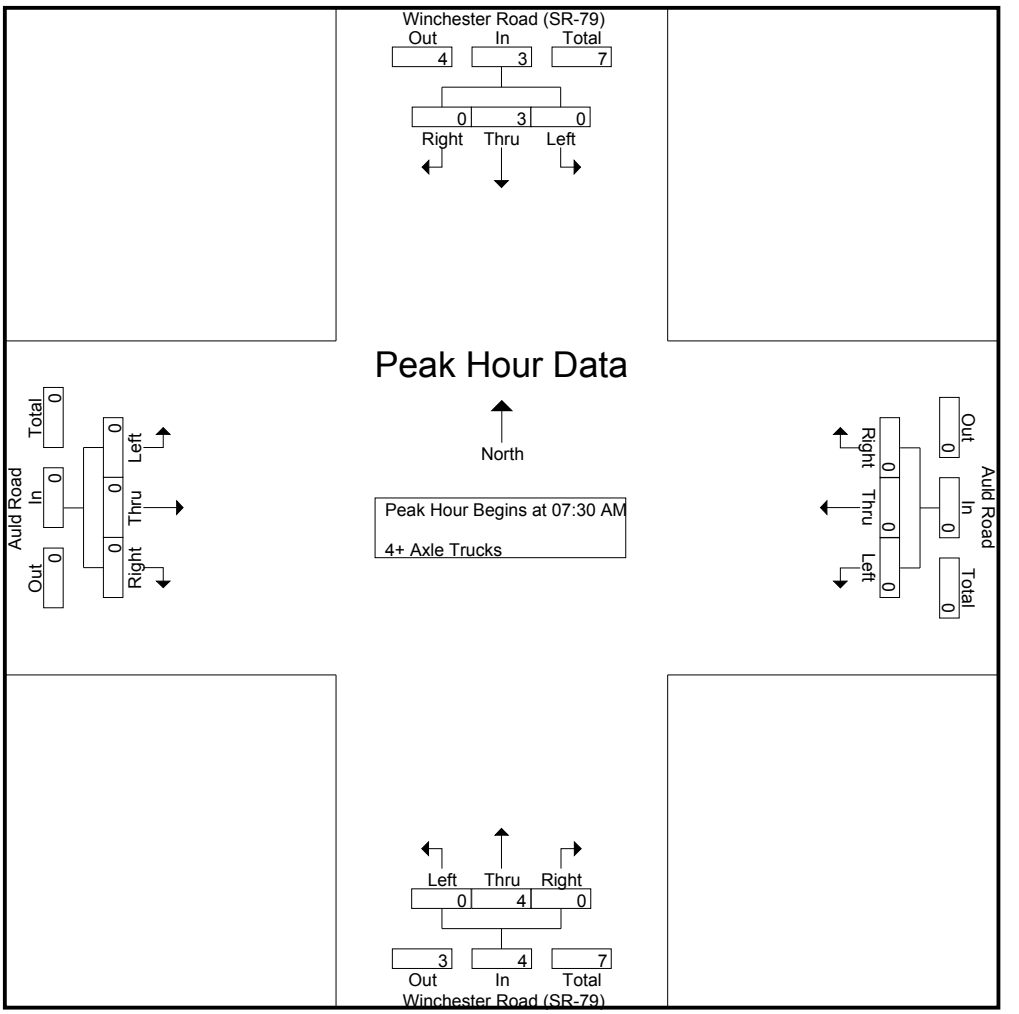

Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0
+15 mins.	0	**2**	0	**2**	0	0	0	0	0	1	0	1	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
+45 mins.	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0
Total Volume	0	3	0	3	0	0	0	0	0	4	0	4	0	0	0	0
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0	
PHF	.000	.375	.000	.375	.000	.000	.000	.000	.000	1.000	.000	1.000	.000	.000	.000	.000

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County of Riverside
N/S: Winchester Road (SR-79)
E/W: Auld Road
Weather: Sunny

File Name : CRVWIAUPM
Site Code : 10236064
Start Date : 11/4/2010

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

	Winchester Road (SR-79) Southbound				Auld Road Westbound				Winchester Road (SR-79) Northbound				Auld Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 AM	7	260	17	284	66	4	26	96	13	367	40	420	7	0	4	11	811
04:15 AM	11	258	13	282	57	6	18	81	8	487	45	540	12	0	11	23	926
04:30 AM	22	252	16	290	90	1	24	115	6	459	51	516	12	3	4	19	940
04:45 AM	3	273	16	292	67	4	10	81	3	480	60	543	19	5	8	32	948
Total	43	1043	62	1148	280	15	78	373	30	1793	196	2019	50	8	27	85	3625
05:00 AM	6	286	10	302	90	5	34	129	7	467	48	522	15	3	4	22	975
05:15 AM	9	261	13	283	47	3	10	60	5	440	38	483	17	1	4	22	848
05:30 AM	18	269	15	302	46	2	18	66	8	501	47	556	12	3	7	22	946
05:45 AM	18	252	16	286	52	0	13	65	4	389	53	446	18	0	12	30	827
Total	51	1068	54	1173	235	10	75	320	24	1797	186	2007	62	7	27	96	3596
Grand Total	94	2111	116	2321	515	25	153	693	54	3590	382	4026	112	15	54	181	7221
Apprch %	4	91	5		74.3	3.6	22.1		1.3	89.2	9.5		61.9	8.3	29.8		
Total %	1.3	29.2	1.6	32.1	7.1	0.3	2.1	9.6	0.7	49.7	5.3	55.8	1.6	0.2	0.7	2.5	
Passenger Vehicles	93	2085	114	2292	509	25	150	684	52	3567	377	3996	111	15	54	180	7152
% Passenger Vehicles	98.9	98.8	98.3	98.8	98.8	100	98	98.7	96.3	99.4	98.7	99.3	99.1	100	100	99.4	99
Large 2 Axle Vehicles	1	23	1	25	6	0	3	9	2	19	5	26	1	0	0	1	61
% Large 2 Axle Vehicles	1.1	1.1	0.9	1.1	1.2	0	2	1.3	3.7	0.5	1.3	0.6	0.9	0	0	0.6	0.8
3 Axle Vehicles	0	2	1	3	0	0	0	0	0	2	0	2	0	0	0	0	5
% 3 Axle Vehicles	0	0.1	0.9	0.1	0	0	0	0	0	0.1	0	0	0	0	0	0	0.1
4+ Axle Trucks	0	1	0	1	0	0	0	0	0	2	0	2	0	0	0	0	3
% 4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0

	Winchester Road (SR-79) Southbound				Auld Road Westbound				Winchester Road (SR-79) Northbound				Auld Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 AM to 05:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 AM																	
04:15 AM	11	258	13	282	57	**6**	18	81	**8**	**487**	45	540	12	0	**11**	23	926
04:30 AM	**22**	252	**16**	290	**90**	1	24	115	6	459	51	516	12	3	4	19	940
04:45 AM	3	273	16	292	67	4	10	81	3	480	**60**	**543**	**19**	**5**	8	**32**	948
05:00 AM	6	**286**	10	**302**	90	5	**34**	**129**	7	467	48	522	15	3	4	22	**975**
Total Volume	42	1069	55	1166	304	16	86	406	24	1893	204	2121	58	11	27	96	3789
% App. Total	3.6	91.7	4.7		74.9	3.9	21.2		1.1	89.3	9.6		60.4	11.5	28.1		
PHF	.477	.934	.859	.965	.844	.667	.632	.787	.750	.972	.850	.977	.763	.550	.614	.750	.972

Counts Unlimited Inc.
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County of Riverside
N/S: Winchester Road (SR-79)
E/W: Auld Road
Weather: Sunny

File Name : CRVWIAUPM
Site Code : 10236064
Start Date : 11/4/2010
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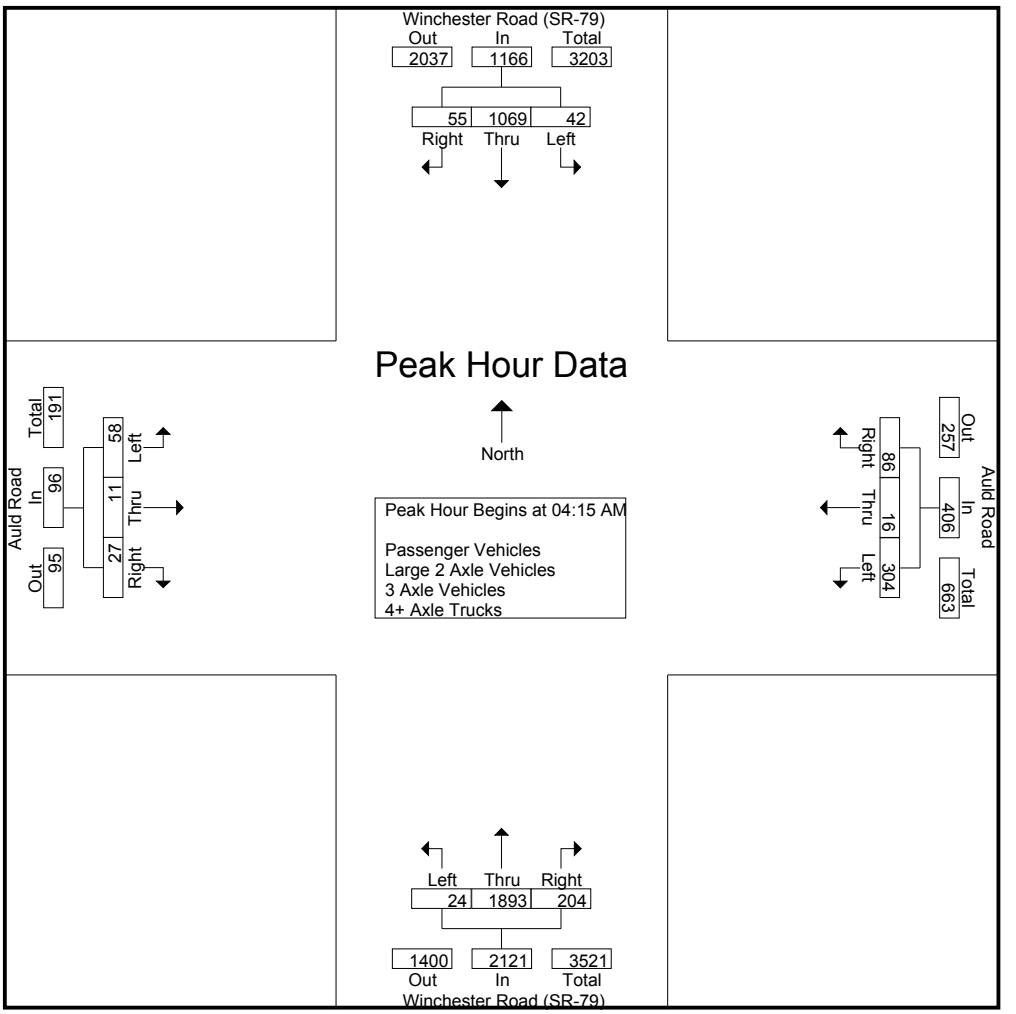

Peak Hour Analysis From 04:00 AM to 05:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:45 AM				04:15 AM				04:15 AM				04:45 AM			
+0 mins.	3	273	**16**	292	57	**6**	18	81	**8**	**487**	45	540	**19**	**5**	**8**	**32**
+15 mins.	6	**286**	10	**302**	**90**	1	24	115	6	459	51	516	15	3	4	22
+30 mins.	9	261	13	283	67	4	10	81	3	480	**60**	**543**	17	1	4	22
+45 mins.	**18**	269	15	302	90	5	**34**	**129**	7	467	48	522	12	3	7	22
Total Volume	36	1089	54	1179	304	16	86	406	24	1893	204	2121	63	12	23	98
% App. Total	3.1	92.4	4.6		74.9	3.9	21.2		1.1	89.3	9.6		64.3	12.2	23.5	
PHF	.500	.952	.844	.976	.844	.667	.632	.787	.750	.972	.850	.977	.829	.600	.719	.766

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County of Riverside
N/S: Winchester Road (SR-79)
E/W: Auld Road
Weather: Sunny

File Name : CRVWIAUPM
Site Code : 10236064
Start Date : 11/4/2010
Page No : 1

Groups Printed- Passenger Vehicles

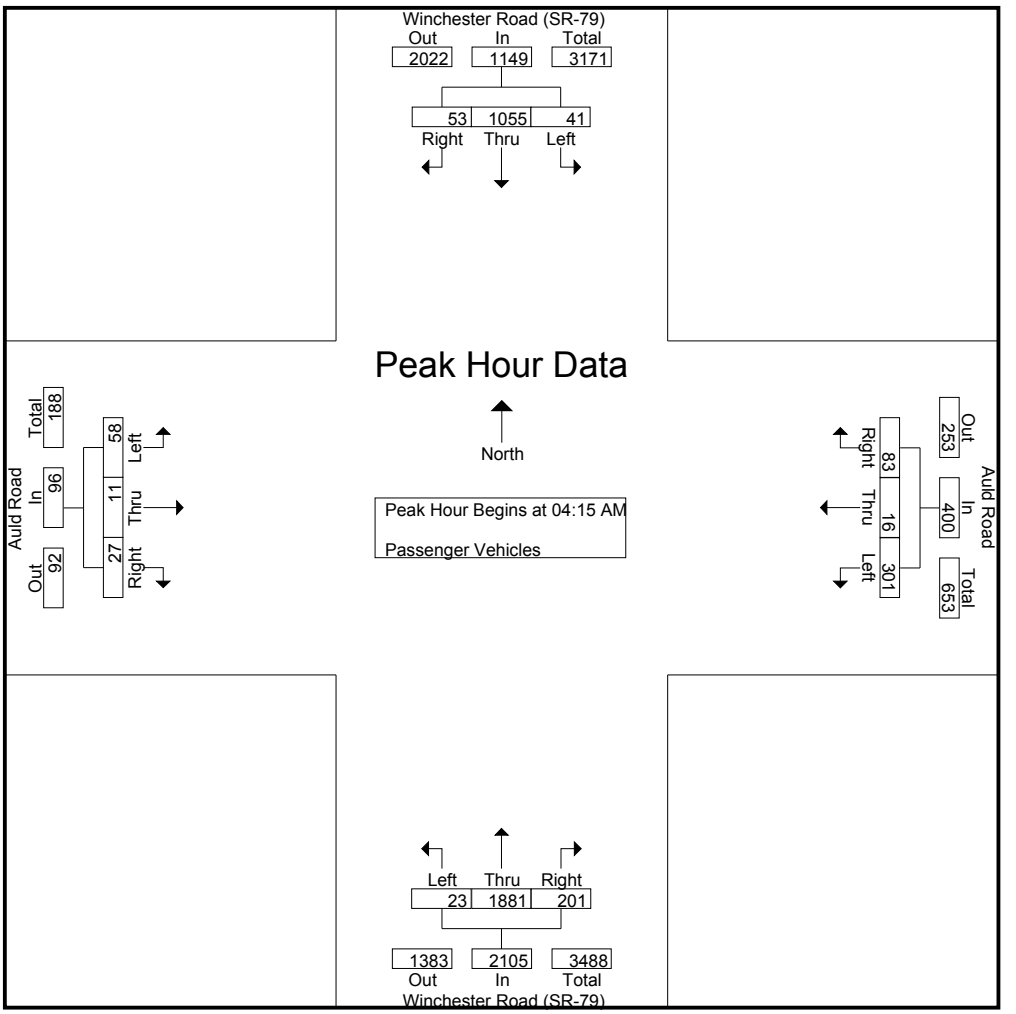
	Winchester Road (SR-79) Southbound				Auld Road Westbound				Winchester Road (SR-79) Northbound				Auld Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 AM	7	252	17	276	64	4	26	94	13	362	39	414	7	0	4	11	795
04:15 AM	10	254	12	276	56	6	16	78	7	483	44	534	12	0	11	23	911
04:30 AM	22	246	16	284	88	1	24	113	6	458	51	515	12	3	4	19	931
04:45 AM	3	271	16	290	67	4	9	80	3	475	59	537	19	5	8	32	939
Total	42	1023	61	1126	275	15	75	365	29	1778	193	2000	50	8	27	85	3576
05:00 AM	6	284	9	299	90	5	34	129	7	465	47	519	15	3	4	22	969
05:15 AM	9	261	13	283	47	3	10	60	4	437	38	479	16	1	4	21	843
05:30 AM	18	265	15	298	46	2	18	66	8	499	46	553	12	3	7	22	939
05:45 AM	18	252	16	286	51	0	13	64	4	388	53	445	18	0	12	30	825
Total	51	1062	53	1166	234	10	75	319	23	1789	184	1996	61	7	27	95	3576
Grand Total	93	2085	114	2292	509	25	150	684	52	3567	377	3996	111	15	54	180	7152
Apprch %	4.1	91	5		74.4	3.7	21.9		1.3	89.3	9.4		61.7	8.3	30		
Total %	1.3	29.2	1.6	32	7.1	0.3	2.1	9.6	0.7	49.9	5.3	55.9	1.6	0.2	0.8	2.5	

	Winchester Road (SR-79) Southbound				Auld Road Westbound				Winchester Road (SR-79) Northbound				Auld Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:15 AM to 05:00 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 AM																	
04:15 AM	10	254	12	276	56	**6**	16	78	**7**	**483**	44	534	12	0	**11**	23	911
04:30 AM	**22**	246	**16**	284	88	1	24	113	6	458	51	515	12	3	4	19	931
04:45 AM	3	271	16	290	67	4	9	80	3	475	**59**	**537**	**19**	**5**	8	**32**	939
05:00 AM	6	**284**	9	**299**	**90**	5	**34**	**129**	7	465	47	519	15	3	4	22	**969**
Total Volume	41	1055	53	1149	301	16	83	400	23	1881	201	2105	58	11	27	96	3750
% App. Total	3.6	91.8	4.6		75.2	4	20.8		1.1	89.4	9.5		60.4	11.5	28.1		
PHF	.466	.929	.828	.961	.836	.667	.610	.775	.821	.974	.852	.980	.763	.550	.614	.750	.967

Counts Unlimited Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

County of Riverside
N/S: Winchester Road (SR-79)
E/W: Auld Road
Weather: Sunny

File Name : CRVWIAUPM
Site Code : 10236064
Start Date : 11/4/2010
Page No : 2



Peak Hour Analysis From 04:15 AM to 05:00 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:15 AM				04:15 AM				04:15 AM				04:15 AM			
+0 mins.	10	254	12	276	56	**6**	16	78	**7**	**483**	44	534	12	0	**11**	23
+15 mins.	**22**	246	**16**	284	88	1	24	113	6	458	51	515	12	3	4	19
+30 mins.	3	271	16	290	67	4	9	80	3	475	**59**	**537**	**19**	**5**	8	**32**
+45 mins.	6	**284**	9	**299**	**90**	5	**34**	**129**	7	465	47	519	15	3	4	22
Total Volume	41	1055	53	1149	301	16	83	400	23	1881	201	2105	58	11	27	96
% App. Total	3.6	91.8	4.6		75.2	4	20.8		1.1	89.4	9.5		60.4	11.5	28.1	
PHF	.466	.929	.828	.961	.836	.667	.610	.775	.821	.974	.852	.980	.763	.550	.614	.750

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County of Riverside
N/S: Winchester Road (SR-79)
E/W: Auld Road
Weather: Sunny

File Name : CRVWIAUPM
Site Code : 10236064
Start Date : 11/4/2010

Groups Printed- Large 2 Axle Vehicles

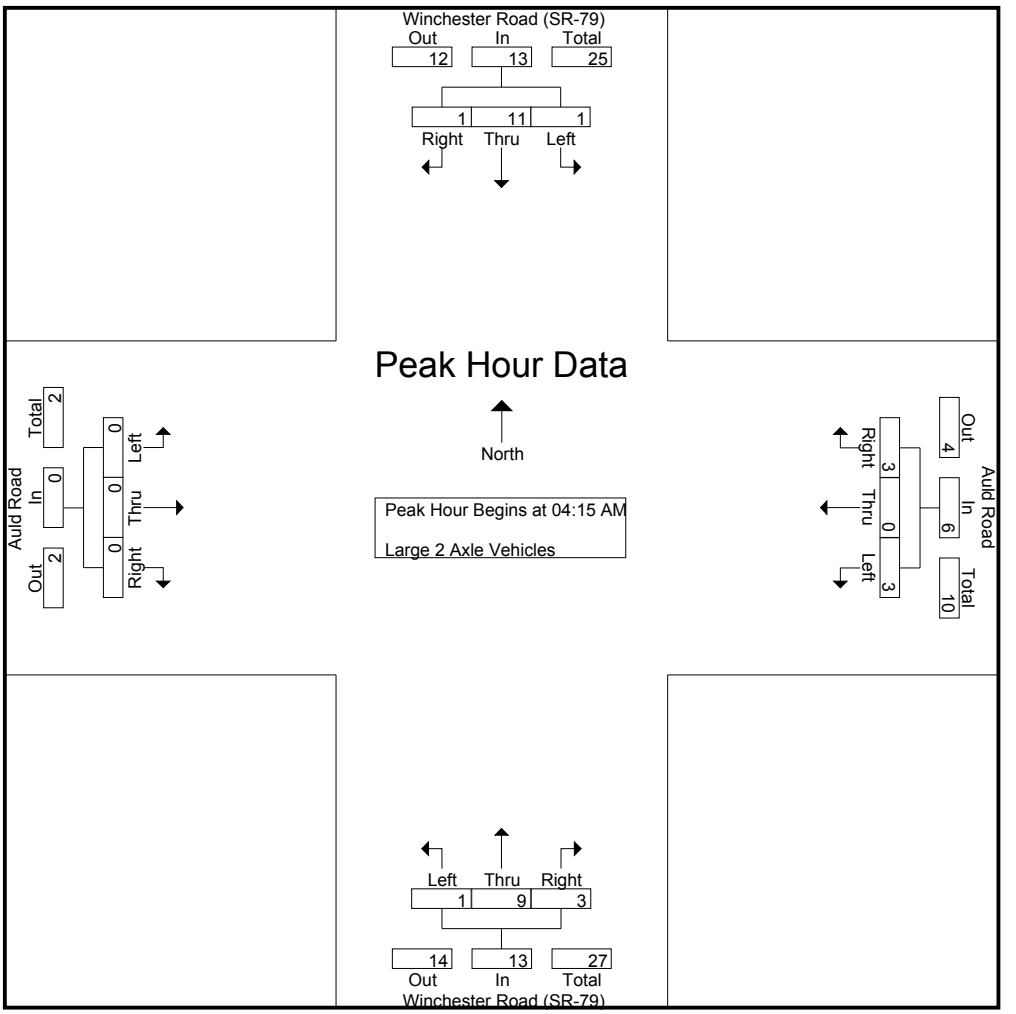
	Winchester Road (SR-79) Southbound				Auld Road Westbound				Winchester Road (SR-79) Northbound				Auld Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 AM	0	8	0	8	2	0	0	2	0	5	1	6	0	0	0	0	16
04:15 AM	1	2	0	3	1	0	2	3	1	2	1	4	0	0	0	0	10
04:30 AM	0	5	0	5	2	0	0	2	0	1	0	1	0	0	0	0	8
04:45 AM	0	2	0	2	0	0	1	1	0	4	1	5	0	0	0	0	8
Total	1	17	0	18	5	0	3	8	1	12	3	16	0	0	0	0	42
05:00 AM	0	2	1	3	0	0	0	0	0	2	1	3	0	0	0	0	6
05:15 AM	0	0	0	0	0	0	0	0	1	2	0	3	1	0	0	1	4
05:30 AM	0	4	0	4	0	0	0	0	0	2	1	3	0	0	0	0	7
05:45 AM	0	0	0	0	1	0	0	1	0	1	0	1	0	0	0	0	2
Total	0	6	1	7	1	0	0	1	1	7	2	10	1	0	0	1	19
Grand Total	1	23	1	25	6	0	3	9	2	19	5	26	1	0	0	1	61
Apprch %	4	92	4		66.7	0	33.3		7.7	73.1	19.2		100	0	0		
Total %	1.6	37.7	1.6	41	9.8	0	4.9	14.8	3.3	31.1	8.2	42.6	1.6	0	0	1.6	

	Winchester Road (SR-79) Southbound				Auld Road Westbound				Winchester Road (SR-79) Northbound				Auld Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:15 AM to 05:00 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 AM																	
04:15 AM	**1**	2	0	3	1	0	**2**	**3**	**1**	2	**1**	4	0	0	0	0	**10**
04:30 AM	0	**5**	0	**5**	**2**	0	0	2	0	1	0	1	0	0	0	0	8
04:45 AM	0	2	0	2	0	0	1	1	0	**4**	1	**5**	0	0	0	0	8
05:00 AM	0	2	**1**	3	0	0	0	0	0	2	1	3	0	0	0	0	6
Total Volume	1	11	1	13	3	0	3	6	1	9	3	13	0	0	0	0	32
% App. Total	7.7	84.6	7.7		50	0	50		7.7	69.2	23.1		0	0	0		
PHF	.250	.550	.250	.650	.375	.000	.375	.500	.250	.563	.750	.650	.000	.000	.000	.000	.800

Counts Unlimited Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

County of Riverside
N/S: Winchester Road (SR-79)
E/W: Auld Road
Weather: Sunny

File Name : CRVWIAUPM
Site Code : 10236064
Start Date : 11/4/2010
Page No : 2



Peak Hour Analysis From 04:15 AM to 05:00 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:15 AM				04:15 AM				04:15 AM				04:15 AM			
+0 mins.	**1**	2	0	3	1	0	**2**	**3**	**1**	2	**1**	4	0	0	0	0
+15 mins.	0	**5**	0	**5**	**2**	0	0	2	0	1	0	1	0	0	0	0
+30 mins.	0	2	0	2	0	0	1	1	0	**4**	1	**5**	0	0	0	0
+45 mins.	0	2	**1**	3	0	0	0	0	0	2	1	3	0	0	0	0
Total Volume	1	11	1	13	3	0	3	6	1	9	3	13	0	0	0	0
% App. Total	7.7	84.6	7.7		50	0	50		7.7	69.2	23.1		0	0	0	
PHF	.250	.550	.250	.650	.375	.000	.375	.500	.250	.563	.750	.650	.000	.000	.000	.000

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County of Riverside
N/S: Winchester Road (SR-79)
E/W: Auld Road
Weather: Sunny

File Name : CRVWIAUPM
Site Code : 10236064
Start Date : 11/4/2010

Groups Printed- 3 Axle Vehicles

	Winchester Road (SR-79) Southbound				Auld Road Westbound				Winchester Road (SR-79) Northbound				Auld Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 AM	0	2	1	3	0	0	0	0	0	1	0	1	0	0	0	0	4
04:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	2	1	3	0	0	0	0	0	1	0	1	0	0	0	0	4
05:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
05:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
Grand Total	0	2	1	3	0	0	0	0	0	2	0	2	0	0	0	0	5
Apprch %	0	66.7	33.3		0	0	0		0	100	0		0	0	0		
Total %	0	40	20	60	0	0	0	0	0	40	0	40	0	0	0	0	

	Winchester Road (SR-79) Southbound				Auld Road Westbound				Winchester Road (SR-79) Northbound				Auld Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:15 AM to 05:00 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 AM																	
04:15 AM	0	**2**	**1**	**3**	0	0	0	0	0	**1**	0	**1**	0	0	0	0	**4**
04:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	2	1	3	0	0	0	0	0	1	0	1	0	0	0	0	4
% App. Total	0	66.7	33.3		0	0	0		0	100	0		0	0	0		
PHF	.000	.250	.250	.250	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.250

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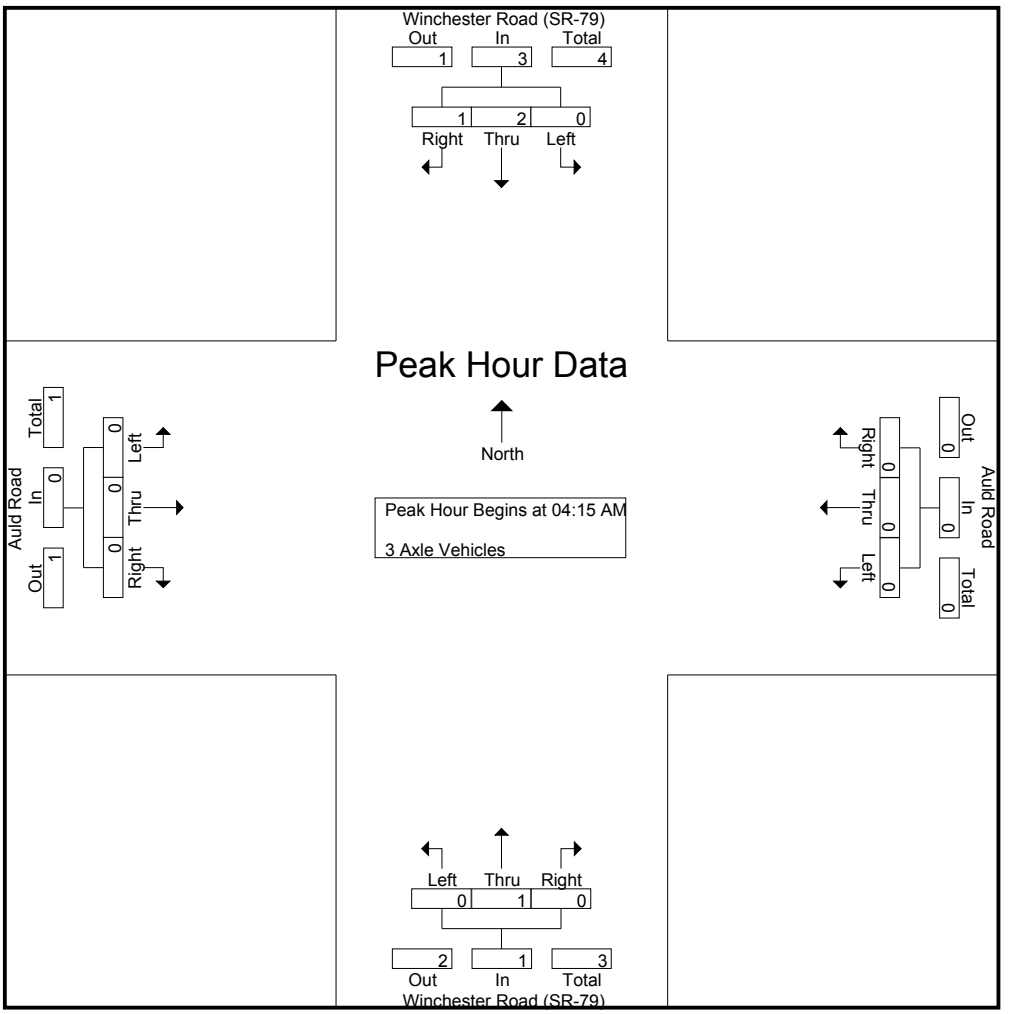
County of Riverside
N/S: Winchester Road (SR-79)
E/W: Auld Road
Weather: Sunny

File Name : CRVWIAUPM
Site Code : 10236064
Start Date : 11/4/2010
Page No : 2



Peak Hour Analysis From 04:15 AM to 05:00 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:15 AM				04:15 AM				04:15 AM				04:15 AM			
+0 mins.	0	**2**	**1**	**3**	0	0	0	0	0	**1**	0	**1**	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	2	1	3	0	0	0	0	0	1	0	1	0	0	0	0
% App. Total	0	66.7	33.3		0	0	0		0	100	0		0	0	0	
PHF	.000	.250	.250	.250	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000

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County of Riverside
N/S: Winchester Road (SR-79)
E/W: Auld Road
Weather: Sunny

File Name : CRVWIAUPM
Site Code : 10236064
Start Date : 11/4/2010

Groups Printed- 4+ Axle Trucks

	Winchester Road (SR-79) Southbound				Auld Road Westbound				Winchester Road (SR-79) Northbound				Auld Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
04:30 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:45 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
Total	0	1	0	1	0	0	0	0	0	2	0	2	0	0	0	0	3
05:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	1	0	1	0	0	0	0	0	2	0	2	0	0	0	0	3
Apprch %	0	100	0		0	0	0		0	100	0		0	0	0		
Total %	0	33.3	0	33.3	0	0	0	0	0	66.7	0	66.7	0	0	0	0	

	Winchester Road (SR-79) Southbound				Auld Road Westbound				Winchester Road (SR-79) Northbound				Auld Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:15 AM to 05:00 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 AM																	
04:15 AM	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0	**1**
04:30 AM	0	**1**	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	1
04:45 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
05:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	0	1	0	0	0	0	0	2	0	2	0	0	0	0	3
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.250	.000	.250	.000	.000	.000	.000	.000	.500	.000	.500	.000	.000	.000	.000	.750

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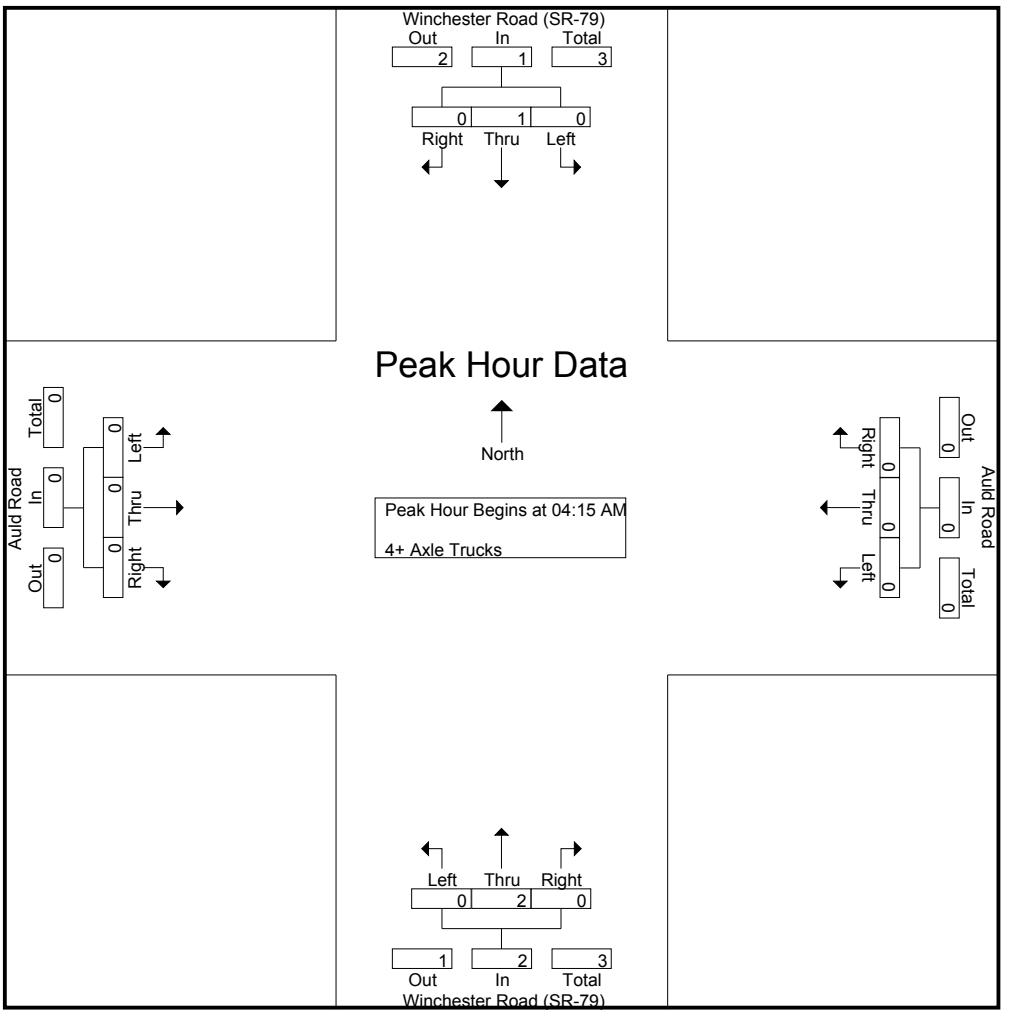
County of Riverside
N/S: Winchester Road (SR-79)
E/W: Auld Road
Weather: Sunny

File Name : CRVWIAUPM
Site Code : 10236064
Start Date : 11/4/2010
Page No : 2



Peak Hour Analysis From 04:15 AM to 05:00 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:15 AM				04:15 AM				04:15 AM				04:15 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0
+15 mins.	0	**1**	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	0	1	0	0	0	0	0	2	0	2	0	0	0	0
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0	
PHF	.000	.250	.000	.250	.000	.000	.000	.000	.000	.500	.000	.500	.000	.000	.000	.000

Counts Unlimited Inc.
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Corona, CA 92878
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City of Murrieta
N/S: Clinton Keith Road
E/W: Calle Del Oso Oro/Bear Creek Drive
Weather: Sunny

File Name : MURCKCDOAM
Site Code : 10266139
Start Date : 12/1/2010

Groups Printed- Total Volume

	Clinton Keith Road Southbound				Calle Del Oso Oro Westbound				Clinton Keith Road Northbound				Bear Creek Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	1	35	17	53	6	0	15	21	1	52	3	56	10	1	0	11	141
07:15 AM	2	31	13	46	5	0	23	28	0	68	18	86	10	1	0	11	171
07:30 AM	4	30	13	47	3	4	21	28	0	71	12	83	17	2	0	19	177
07:45 AM	14	42	26	82	1	4	21	26	1	64	17	82	8	4	1	13	203
Total	21	138	69	228	15	8	80	103	2	255	50	307	45	8	1	54	692
08:00 AM	5	38	22	65	12	3	13	28	1	68	31	100	13	5	0	18	211
08:15 AM	10	35	14	59	19	5	15	39	0	62	65	127	12	13	0	25	250
08:30 AM	9	39	18	66	17	11	22	50	0	67	31	98	20	15	1	36	250
08:45 AM	7	45	21	73	16	7	14	37	1	65	28	94	24	4	1	29	233
Total	31	157	75	263	64	26	64	154	2	262	155	419	69	37	2	108	944
Grand Total	52	295	144	491	79	34	144	257	4	517	205	726	114	45	3	162	1636
Apprch %	10.6	60.1	29.3		30.7	13.2	56		0.6	71.2	28.2		70.4	27.8	1.9		
Total %	3.2	18	8.8	30	4.8	2.1	8.8	15.7	0.2	31.6	12.5	44.4	7	2.8	0.2	9.9	

	Clinton Keith Road Southbound				Calle Del Oso Oro Westbound				Clinton Keith Road Northbound				Bear Creek Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	5	38	**22**	65	12	3	13	28	**1**	**68**	31	100	13	5	0	18	211
08:15 AM	**10**	35	14	59	**19**	5	15	39	0	62	**65**	**127**	12	13	0	25	**250**
08:30 AM	9	39	18	66	17	**11**	**22**	**50**	0	67	31	98	20	**15**	**1**	**36**	250
08:45 AM	7	**45**	21	**73**	16	7	14	37	1	65	28	94	**24**	4	1	29	233
Total Volume	31	157	75	263	64	26	64	154	2	262	155	419	69	37	2	108	944
% App. Total	11.8	59.7	28.5		41.6	16.9	41.6		0.5	62.5	37		63.9	34.3	1.9		
PHF	.775	.872	.852	.901	.842	.591	.727	.770	.500	.963	.596	.825	.719	.617	.500	.750	.944

Counts Unlimited Inc.
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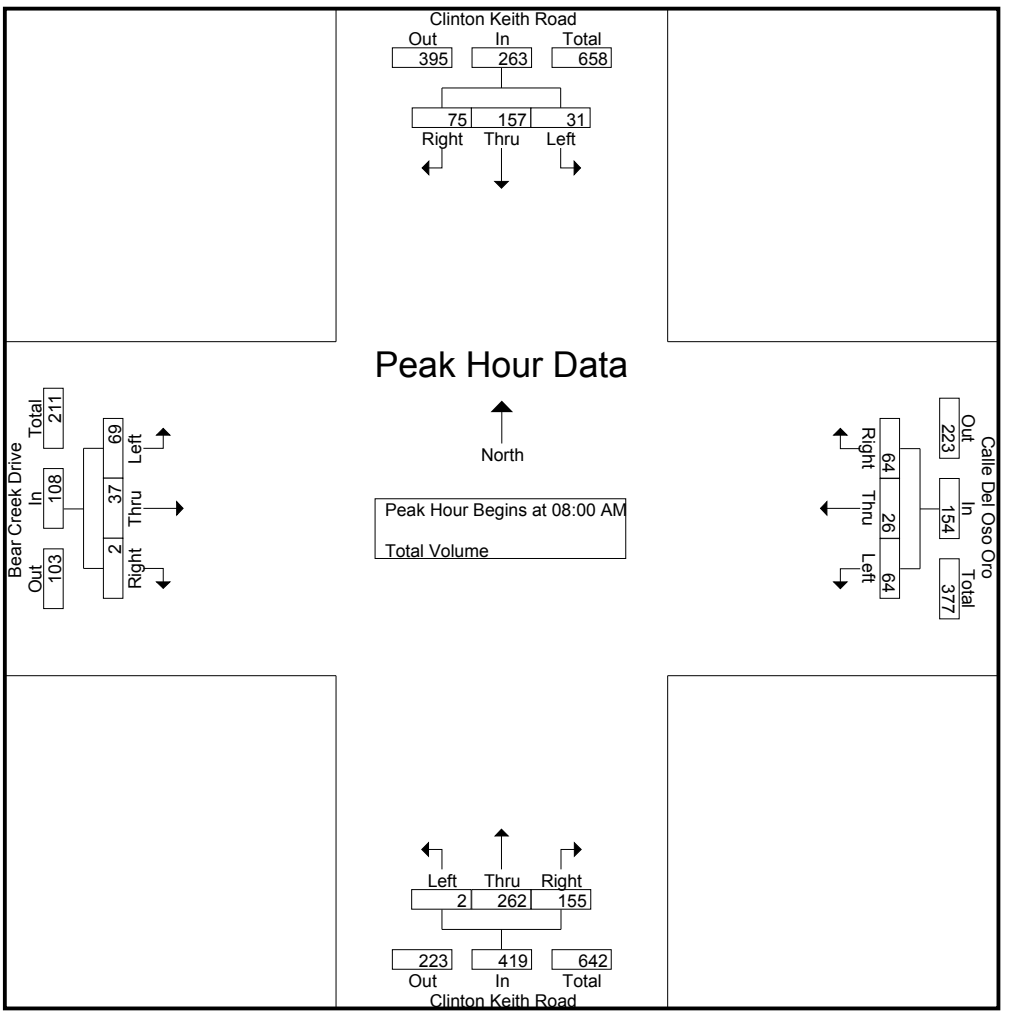
Corona, CA 92878
(951) 268-6268

City of Murrieta
N/S: Clinton Keith Road
E/W: Calle Del Oso Oro/Bear Creek Drive
Weather: Sunny

File Name : MURCKCDOAM
Site Code : 10266139
Start Date : 12/1/2010
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM				08:00 AM				08:00 AM				08:00 AM			
+0 mins.	**14**	**42**	**26**	**82**	12	3	13	28	**1**	**68**	31	100	13	5	0	18
+15 mins.	5	38	22	65	**19**	5	15	39	0	62	**65**	**127**	12	13	0	25
+30 mins.	10	35	14	59	17	**11**	**22**	**50**	0	67	31	98	20	**15**	**1**	**36**
+45 mins.	9	39	18	66	16	7	14	37	1	65	28	94	**24**	4	1	29
Total Volume	38	154	80	272	64	26	64	154	2	262	155	419	69	37	2	108
% App. Total	14	56.6	29.4		41.6	16.9	41.6		0.5	62.5	37		63.9	34.3	1.9	
PHF	.679	.917	.769	.829	.842	.591	.727	.770	.500	.963	.596	.825	.719	.617	.500	.750

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City of Murrieta
N/S: Clinton Keith Road
E/W: Calle Del Oso Oro/Bear Creek Drive
Weather: Sunny

File Name : MURCKCDOPM
Site Code : 10266139
Start Date : 12/1/2010

Groups Printed- Total Volume

	Clinton Keith Road Southbound				Calle Del Oso Oro Westbound				Clinton Keith Road Northbound				Bear Creek Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	18	57	24	99	24	6	11	41	1	70	11	82	13	2	0	15	237
04:15 PM	18	61	17	96	15	14	10	39	0	60	10	70	19	4	1	24	229
04:30 PM	17	58	30	105	20	8	8	36	0	73	8	81	19	3	2	24	246
04:45 PM	10	51	30	91	14	10	17	41	0	57	7	64	16	5	0	21	217
Total	63	227	101	391	73	38	46	157	1	260	36	297	67	14	3	84	929
05:00 PM	38	63	28	129	26	5	18	49	1	65	10	76	13	10	0	23	277
05:15 PM	17	49	27	93	23	7	15	45	0	52	8	60	12	9	1	22	220
05:30 PM	18	62	25	105	20	7	7	34	3	41	10	54	9	1	1	11	204
05:45 PM	10	67	34	111	15	7	9	31	10	42	14	66	7	3	0	10	218
Total	83	241	114	438	84	26	49	159	14	200	42	256	41	23	2	66	919
Grand Total	146	468	215	829	157	64	95	316	15	460	78	553	108	37	5	150	1848
Apprch %	17.6	56.5	25.9		49.7	20.3	30.1		2.7	83.2	14.1		72	24.7	3.3		
Total %	7.9	25.3	11.6	44.9	8.5	3.5	5.1	17.1	0.8	24.9	4.2	29.9	5.8	2	0.3	8.1	

	Clinton Keith Road Southbound				Calle Del Oso Oro Westbound				Clinton Keith Road Northbound				Bear Creek Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	18	61	17	96	15	**14**	10	39	0	60	**10**	70	**19**	4	1	**24**	229
04:30 PM	17	58	**30**	105	20	8	8	36	0	**73**	8	**81**	19	3	**2**	24	246
04:45 PM	10	51	30	91	14	10	17	41	0	57	7	64	16	5	0	21	217
05:00 PM	**38**	**63**	28	**129**	**26**	5	**18**	**49**	**1**	65	10	76	13	**10**	0	23	**277**
Total Volume	83	233	105	421	75	37	53	165	1	255	35	291	67	22	3	92	969
% App. Total	19.7	55.3	24.9		45.5	22.4	32.1		0.3	87.6	12		72.8	23.9	3.3		
PHF	.546	.925	.875	.816	.721	.661	.736	.842	.250	.873	.875	.898	.882	.550	.375	.958	.875

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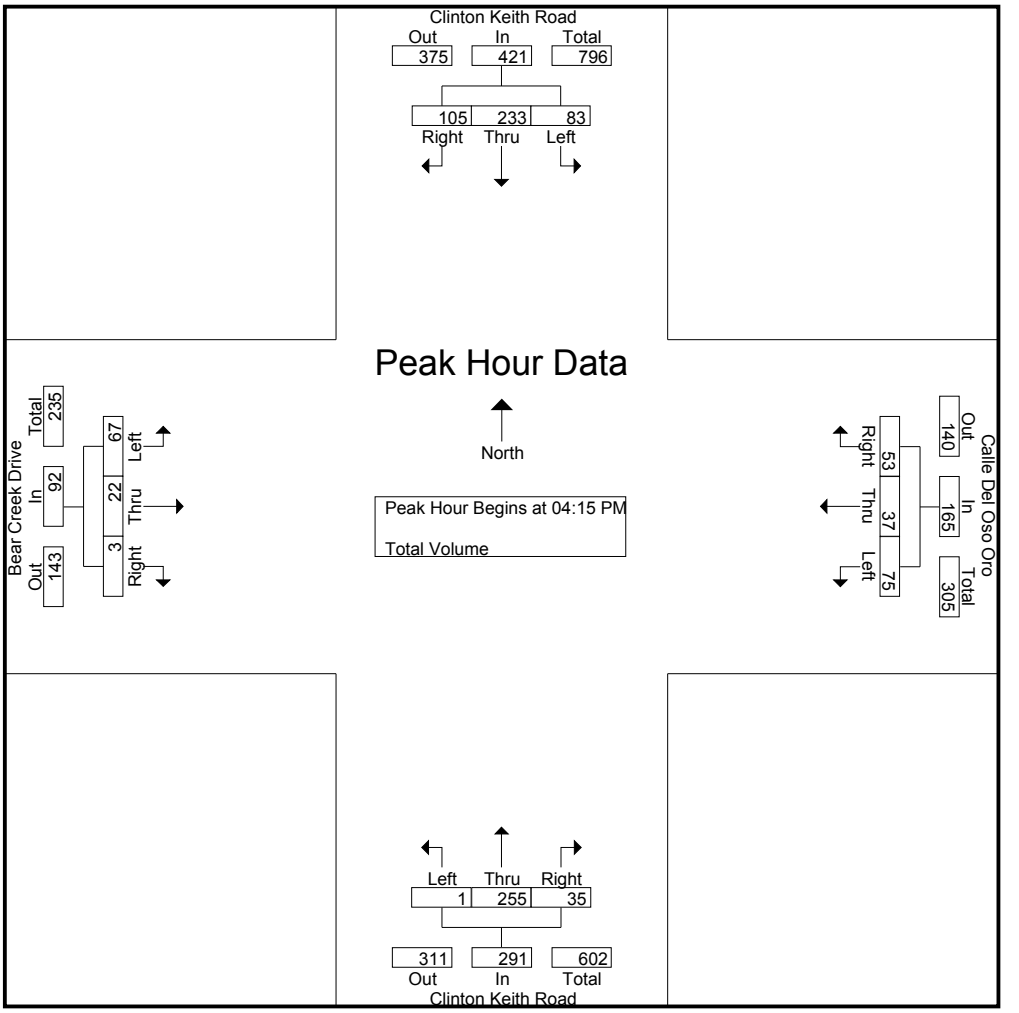
City of Murrieta
N/S: Clinton Keith Road
E/W: Calle Del Oso Oro/Bear Creek Drive
Weather: Sunny

File Name : MURCKCDOPM
Site Code : 10266139
Start Date : 12/1/2010
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				04:30 PM				04:00 PM				04:15 PM			
+0 mins.	**38**	63	28	**129**	20	8	8	36	**1**	70	**11**	**82**	**19**	4	1	**24**
+15 mins.	17	49	27	93	14	**10**	17	41	0	60	10	70	19	3	**2**	24
+30 mins.	18	62	25	105	**26**	5	**18**	**49**	0	**73**	8	81	16	5	0	21
+45 mins.	10	**67**	**34**	111	23	7	15	45	0	57	7	64	13	**10**	0	23
Total Volume	83	241	114	438	83	30	58	171	1	260	36	297	67	22	3	92
% App. Total	18.9	55	26		48.5	17.5	33.9		0.3	87.5	12.1		72.8	23.9	3.3	
PHF	.546	.899	.838	.849	.798	.750	.806	.872	.250	.890	.818	.905	.882	.550	.375	.958

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City of Murrieta
N/S: Jefferson Avenue
E/W: Nutmeg Street
Weather: Sunny

File Name : MURJENUAM
Site Code : 10266111
Start Date : 11/30/2010
Page No : 1

Groups Printed- Total Volume

	Jefferson Avenue Southbound				Nutmeg Street Westbound				Jefferson Avenue Northbound				Nutmeg Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	2	16	4	22	93	89	7	189	10	8	33	51	15	39	27	81	343
07:15 AM	7	19	1	27	81	56	1	138	15	9	66	90	1	39	43	83	338
07:30 AM	5	16	1	22	32	27	1	60	21	9	63	93	2	60	27	89	264
07:45 AM	5	20	1	26	46	29	1	76	14	8	16	38	0	47	33	80	220
Total	19	71	7	97	252	201	10	463	60	34	178	272	18	185	130	333	1165
08:00 AM	3	23	0	26	66	46	4	116	24	8	23	55	1	41	30	72	269
08:15 AM	4	30	4	38	60	60	11	131	22	9	27	58	5	50	42	97	324
08:30 AM	2	26	1	29	82	75	4	161	18	7	45	70	5	47	59	111	371
08:45 AM	2	14	2	18	53	69	3	125	16	8	41	65	4	43	47	94	302
Total	11	93	7	111	261	250	22	533	80	32	136	248	15	181	178	374	1266
Grand Total	30	164	14	208	513	451	32	996	140	66	314	520	33	366	308	707	2431
Apprch %	14.4	78.8	6.7		51.5	45.3	3.2		26.9	12.7	60.4		4.7	51.8	43.6		
Total %	1.2	6.7	0.6	8.6	21.1	18.6	1.3	41	5.8	2.7	12.9	21.4	1.4	15.1	12.7	29.1	

	Jefferson Avenue Southbound				Nutmeg Street Westbound				Jefferson Avenue Northbound				Nutmeg Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	3	23	0	26	66	46	4	116	**24**	8	23	55	1	41	30	72	269
08:15 AM	**4**	**30**	**4**	**38**	60	60	**11**	131	22	**9**	27	58	**5**	**50**	42	97	324
08:30 AM	2	26	1	29	**82**	**75**	4	**161**	18	7	**45**	**70**	5	47	**59**	**111**	**371**
08:45 AM	2	14	2	18	53	69	3	125	16	8	41	65	4	43	47	94	302
Total Volume	11	93	7	111	261	250	22	533	80	32	136	248	15	181	178	374	1266
% App. Total	9.9	83.8	6.3		49	46.9	4.1		32.3	12.9	54.8		4	48.4	47.6		
PHF	.688	.775	.438	.730	.796	.833	.500	.828	.833	.889	.756	.886	.750	.905	.754	.842	.853

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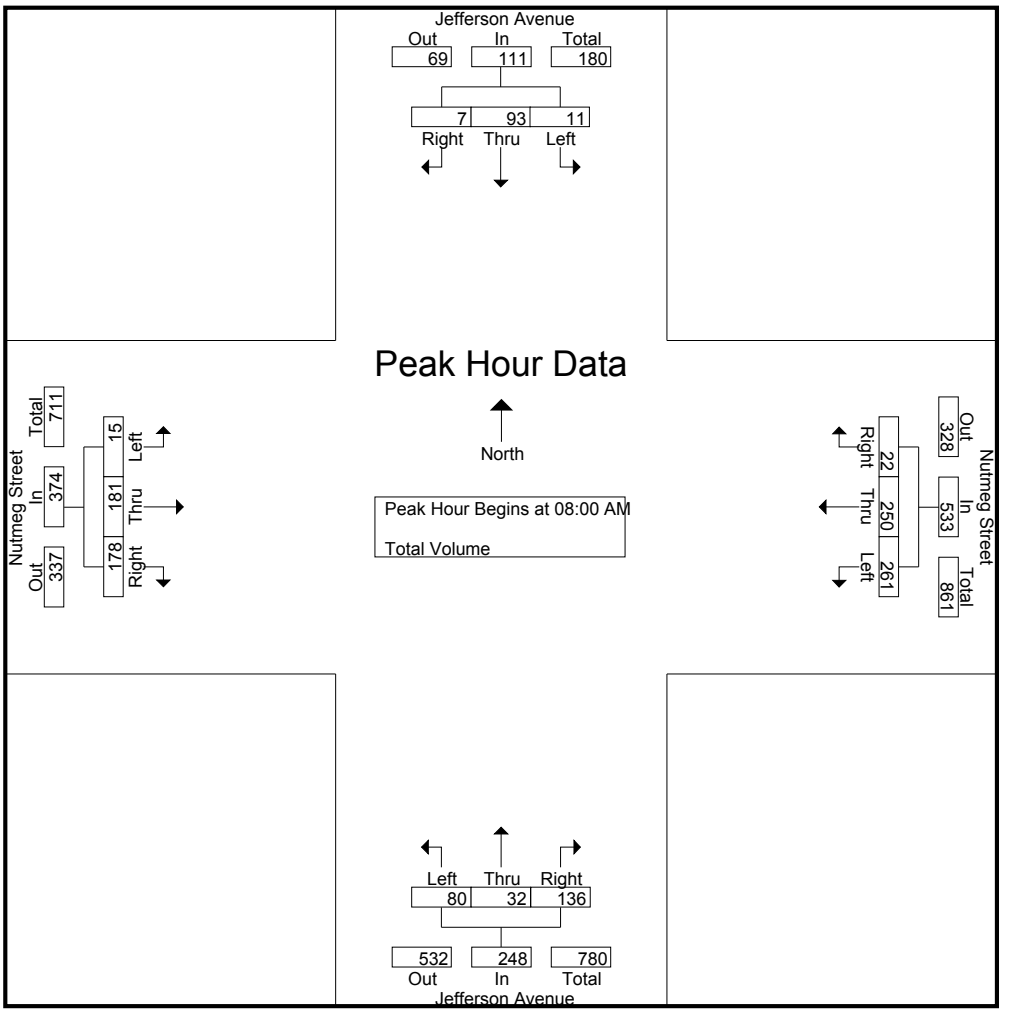
City of Murrieta
N/S: Jefferson Avenue
E/W: Nutmeg Street
Weather: Sunny

File Name : MURJENUAM
Site Code : 10266111
Start Date : 11/30/2010
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:45 AM				08:00 AM				07:15 AM				08:00 AM			
+0 mins.	**5**	20	1	26	66	46	4	116	15	**9**	**66**	90	1	41	30	72
+15 mins.	3	23	0	26	60	60	**11**	131	21	9	63	**93**	**5**	**50**	42	97
+30 mins.	4	**30**	**4**	**38**	**82**	**75**	4	**161**	14	8	16	38	5	47	**59**	**111**
+45 mins.	2	26	1	29	53	69	3	125	**24**	8	23	55	4	43	47	94
Total Volume	14	99	6	119	261	250	22	533	74	34	168	276	15	181	178	374
% App. Total	11.8	83.2	5		49	46.9	4.1		26.8	12.3	60.9		4	48.4	47.6	
PHF	.700	.825	.375	.783	.796	.833	.500	.828	.771	.944	.636	.742	.750	.905	.754	.842

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City of Murrieta
N/S: Jefferson Avenue
E/W: Nutmeg Street
Weather: Sunny

File Name : MURJENUPM
Site Code : 10266111
Start Date : 11/30/2010
Page No : 1

Groups Printed- Total Volume

	Jefferson Avenue Southbound				Nutmeg Street Westbound				Jefferson Avenue Northbound				Nutmeg Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	3	8	2	13	34	46	5	85	53	13	46	112	1	51	29	81	291
04:15 PM	2	11	2	15	38	51	4	93	48	27	48	123	4	45	27	76	307
04:30 PM	4	14	4	22	40	58	9	107	49	21	43	113	2	45	23	70	312
04:45 PM	5	9	0	14	31	54	4	89	54	22	54	130	3	40	24	67	300
Total	14	42	8	64	143	209	22	374	204	83	191	478	10	181	103	294	1210
05:00 PM	2	10	3	15	23	56	8	87	56	23	45	124	3	51	26	80	306
05:15 PM	3	11	2	16	31	59	8	98	62	18	53	133	3	43	21	67	314
05:30 PM	7	15	2	24	32	42	7	81	52	24	29	105	1	60	10	71	281
05:45 PM	8	9	1	18	27	56	7	90	57	28	38	123	0	46	32	78	309
Total	20	45	8	73	113	213	30	356	227	93	165	485	7	200	89	296	1210
Grand Total	34	87	16	137	256	422	52	730	431	176	356	963	17	381	192	590	2420
Apprch %	24.8	63.5	11.7		35.1	57.8	7.1		44.8	18.3	37		2.9	64.6	32.5		
Total %	1.4	3.6	0.7	5.7	10.6	17.4	2.1	30.2	17.8	7.3	14.7	39.8	0.7	15.7	7.9	24.4	

	Jefferson Avenue Southbound				Nutmeg Street Westbound				Jefferson Avenue Northbound				Nutmeg Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	4	**14**	**4**	**22**	**40**	58	**9**	**107**	49	21	43	113	2	45	23	70	312
04:45 PM	**5**	9	0	14	31	54	4	89	54	22	**54**	130	**3**	40	24	67	300
05:00 PM	2	10	3	15	23	56	8	87	56	**23**	45	124	3	**51**	**26**	**80**	306
05:15 PM	3	11	2	16	31	**59**	8	98	**62**	18	53	**133**	3	43	21	67	**314**
Total Volume	14	44	9	67	125	227	29	381	221	84	195	500	11	179	94	284	1232
% App. Total	20.9	65.7	13.4		32.8	59.6	7.6		44.2	16.8	39		3.9	63	33.1		
PHF	.700	.786	.563	.761	.781	.962	.806	.890	.891	.913	.903	.940	.917	.877	.904	.888	.981

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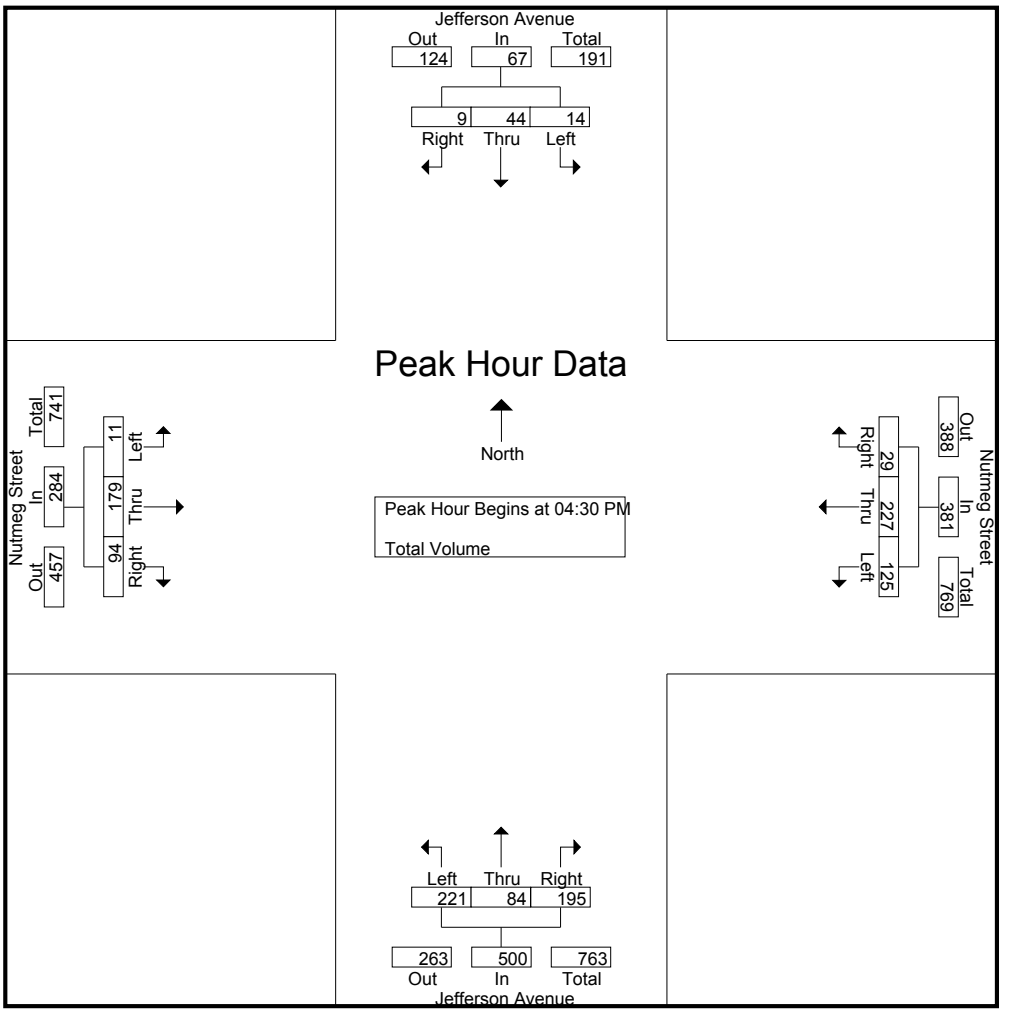
City of Murrieta
N/S: Jefferson Avenue
E/W: Nutmeg Street
Weather: Sunny

File Name : MURJENUPM
Site Code : 10266111
Start Date : 11/30/2010
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM				04:30 PM				04:30 PM				05:00 PM			
+0 mins.	2	10	**3**	15	**40**	58	**9**	**107**	49	21	43	113	**3**	51	26	**80**
+15 mins.	3	11	2	16	31	54	4	89	54	22	**54**	130	3	43	21	67
+30 mins.	7	**15**	2	**24**	23	56	8	87	56	**23**	45	124	1	**60**	10	71
+45 mins.	**8**	9	1	18	31	**59**	8	98	**62**	18	53	**133**	0	46	**32**	78
Total Volume	20	45	8	73	125	227	29	381	221	84	195	500	7	200	89	296
% App. Total	27.4	61.6	11		32.8	59.6	7.6		44.2	16.8	39		2.4	67.6	30.1	
PHF	.625	.750	.667	.760	.781	.962	.806	.890	.891	.913	.903	.940	.583	.833	.695	.925

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City of Murrieta
N/S: Jefferson Avenue
E/W: Magnolia Street
Weather: Sunny

File Name : MURJEMAAM
Site Code : 10266131
Start Date : 11/30/2010
Page No : 1

Groups Printed- Total Volume

	Jefferson Avenue Southbound				Magnolia Street Westbound				Jefferson Avenue Northbound				Magnolia Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	2	83	101	186	2	2	1	5	20	27	0	47	41	3	22	66	304
07:15 AM	0	103	54	157	2	1	1	4	10	39	0	49	63	3	29	95	305
07:30 AM	0	85	9	94	1	0	2	3	11	48	0	59	33	1	20	54	210
07:45 AM	2	107	8	117	2	0	2	4	10	36	0	46	10	1	10	21	188
Total	4	378	172	554	7	3	6	16	51	150	0	201	147	8	81	236	1007
08:00 AM	1	107	27	135	8	1	0	9	15	38	4	57	15	0	11	26	227
08:15 AM	2	119	37	158	1	2	1	4	15	42	1	58	28	1	24	53	273
08:30 AM	1	118	52	171	4	1	0	5	14	41	0	55	45	2	18	65	296
08:45 AM	1	84	27	112	4	2	0	6	12	43	1	56	36	0	42	78	252
Total	5	428	143	576	17	6	1	24	56	164	6	226	124	3	95	222	1048
Grand Total	9	806	315	1130	24	9	7	40	107	314	6	427	271	11	176	458	2055
Apprch %	0.8	71.3	27.9		60	22.5	17.5		25.1	73.5	1.4		59.2	2.4	38.4		
Total %	0.4	39.2	15.3	55	1.2	0.4	0.3	1.9	5.2	15.3	0.3	20.8	13.2	0.5	8.6	22.3	

	Jefferson Avenue Southbound				Magnolia Street Westbound				Jefferson Avenue Northbound				Magnolia Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	1	107	27	135	**8**	1	0	**9**	**15**	38	**4**	57	15	0	11	26	227
08:15 AM	**2**	**119**	37	158	1	**2**	**1**	4	15	42	1	**58**	28	1	24	53	273
08:30 AM	1	118	**52**	**171**	4	1	0	5	14	41	0	55	**45**	**2**	18	65	**296**
08:45 AM	1	84	27	112	4	2	0	6	12	**43**	1	56	36	0	**42**	**78**	252
Total Volume	5	428	143	576	17	6	1	24	56	164	6	226	124	3	95	222	1048
% App. Total	0.9	74.3	24.8		70.8	25	4.2		24.8	72.6	2.7		55.9	1.4	42.8		
PHF	.625	.899	.688	.842	.531	.750	.250	.667	.933	.953	.375	.974	.689	.375	.565	.712	.885

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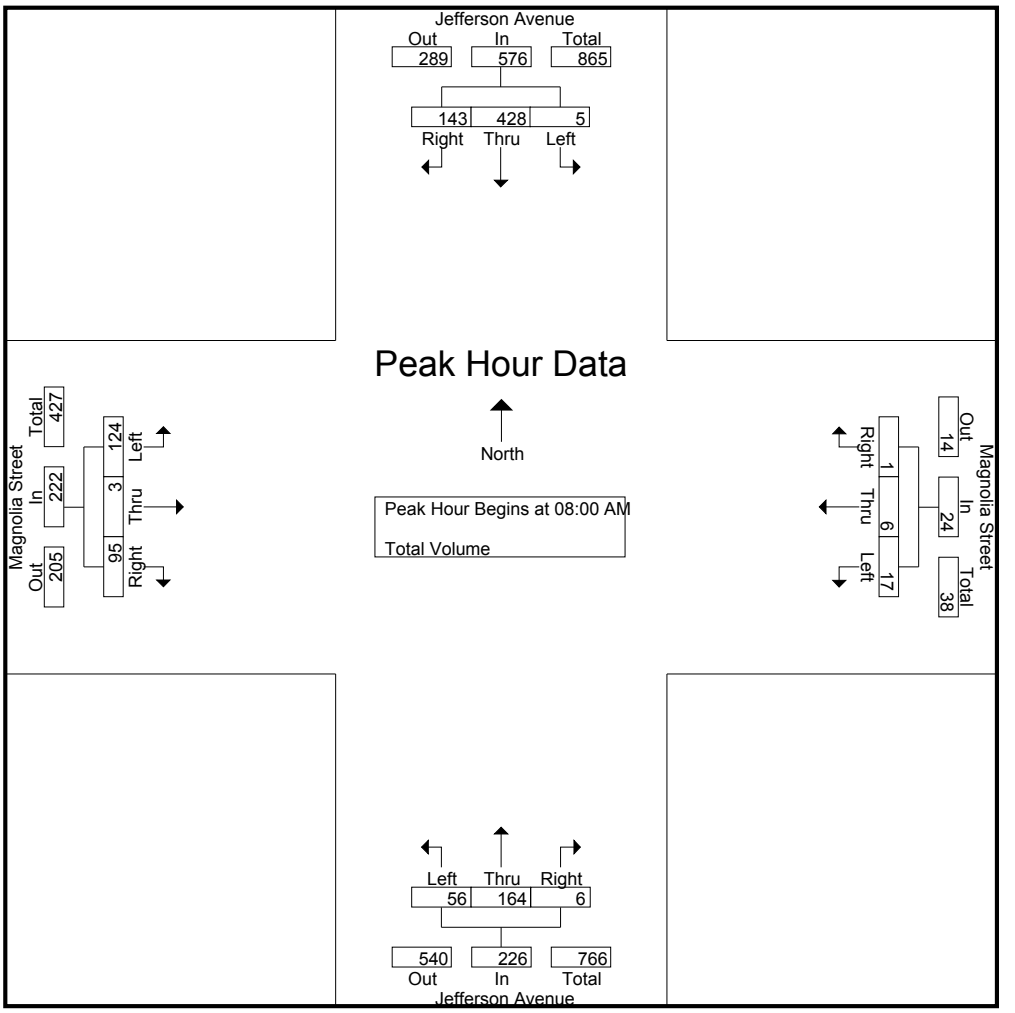
City of Murrieta
N/S: Jefferson Avenue
E/W: Magnolia Street
Weather: Sunny

File Name : MURJEMAAM
Site Code : 10266131
Start Date : 11/30/2010
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:45 AM				08:00 AM				08:00 AM				07:00 AM			
+0 mins.	**2**	107	8	117	**8**	1	0	**9**	**15**	38	**4**	57	41	**3**	22	66
+15 mins.	1	107	27	135	1	**2**	**1**	4	15	42	1	**58**	**63**	3	**29**	**95**
+30 mins.	2	**119**	37	158	4	1	0	5	14	41	0	55	33	1	20	54
+45 mins.	1	118	**52**	**171**	4	2	0	6	12	**43**	1	56	10	1	10	21
Total Volume	6	451	124	581	17	6	1	24	56	164	6	226	147	8	81	236
% App. Total	1	77.6	21.3		70.8	25	4.2		24.8	72.6	2.7		62.3	3.4	34.3	
PHF	.750	.947	.596	.849	.531	.750	.250	.667	.933	.953	.375	.974	.583	.667	.698	.621

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City of Murrieta
N/S: Jefferson Avenue
E/W: Magnolia Street
Weather: Sunny

File Name : MURJEMAPM
Site Code : 10266131
Start Date : 11/30/2010
Page No : 1

Groups Printed- Total Volume

	Jefferson Avenue Southbound				Magnolia Street Westbound				Jefferson Avenue Northbound				Magnolia Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	1	73	4	78	1	2	1	4	16	107	1	124	21	1	16	38	244
04:15 PM	1	63	14	78	1	0	2	3	18	110	0	128	18	2	14	34	243
04:30 PM	0	78	13	91	1	1	2	4	22	119	1	142	17	0	9	26	263
04:45 PM	2	62	9	73	1	0	0	1	28	124	0	152	14	0	7	21	247
Total	4	276	40	320	4	3	5	12	84	460	2	546	70	3	46	119	997
05:00 PM	2	63	10	75	3	3	3	9	18	117	4	139	23	2	9	34	257
05:15 PM	0	61	6	67	0	3	2	5	28	120	4	152	13	5	8	26	250
05:30 PM	1	55	7	63	1	3	0	4	20	109	2	131	7	2	9	18	216
05:45 PM	4	61	9	74	2	1	3	6	20	124	5	149	9	2	10	21	250
Total	7	240	32	279	6	10	8	24	86	470	15	571	52	11	36	99	973
Grand Total	11	516	72	599	10	13	13	36	170	930	17	1117	122	14	82	218	1970
Apprch %	1.8	86.1	12		27.8	36.1	36.1		15.2	83.3	1.5		56	6.4	37.6		
Total %	0.6	26.2	3.7	30.4	0.5	0.7	0.7	1.8	8.6	47.2	0.9	56.7	6.2	0.7	4.2	11.1	

	Jefferson Avenue Southbound				Magnolia Street Westbound				Jefferson Avenue Northbound				Magnolia Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	**78**	**13**	**91**	1	1	2	4	22	119	1	142	17	0	**9**	26	**263**
04:45 PM	**2**	62	9	73	1	0	0	1	**28**	**124**	0	**152**	14	0	7	21	247
05:00 PM	2	63	10	75	**3**	**3**	**3**	**9**	18	117	**4**	139	**23**	2	9	**34**	257
05:15 PM	0	61	6	67	0	3	2	5	28	120	4	152	13	**5**	8	26	250
Total Volume	4	264	38	306	5	7	7	19	96	480	9	585	67	7	33	107	1017
% App. Total	1.3	86.3	12.4		26.3	36.8	36.8		16.4	82.1	1.5		62.6	6.5	30.8		
PHF	.500	.846	.731	.841	.417	.583	.583	.528	.857	.968	.563	.962	.728	.350	.917	.787	.967

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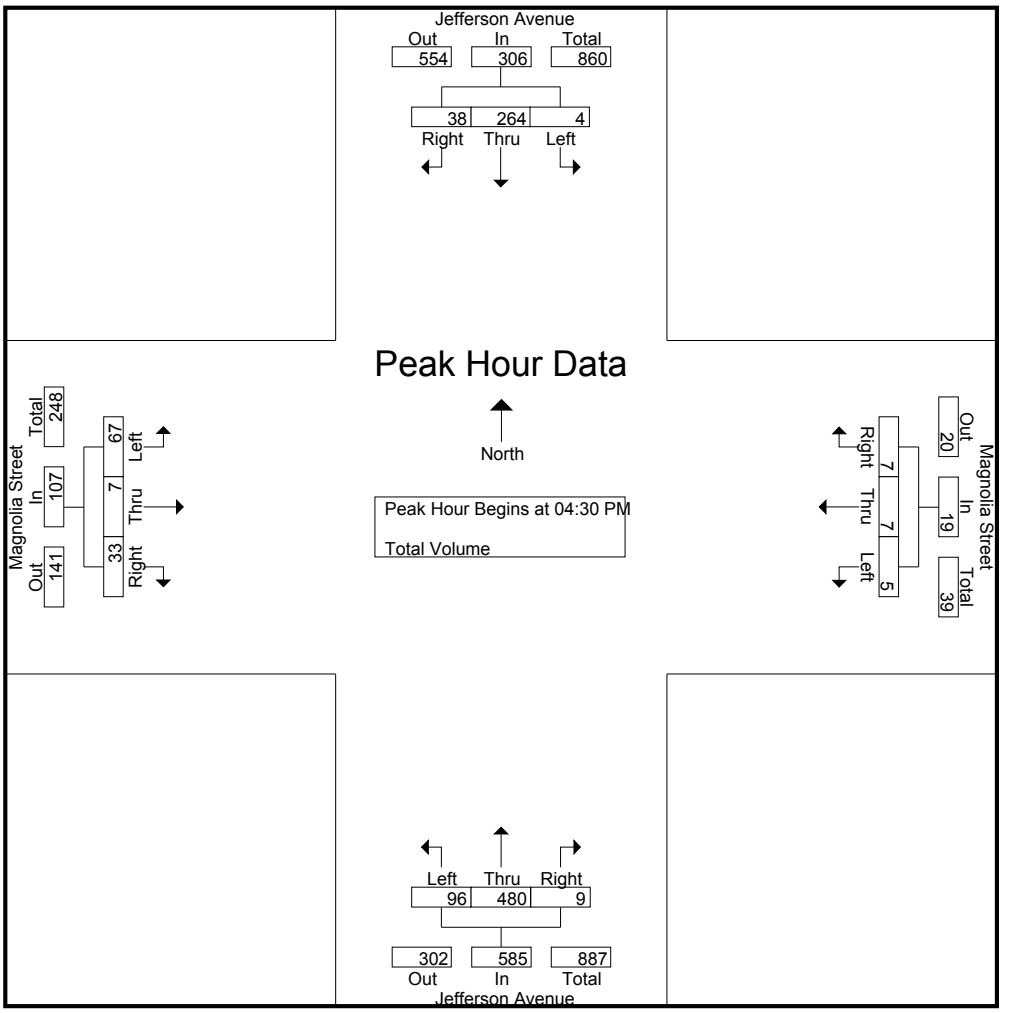
City of Murrieta
N/S: Jefferson Avenue
E/W: Magnolia Street
Weather: Sunny

File Name : MURJEMAPM
Site Code : 10266131
Start Date : 11/30/2010
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				05:00 PM				04:30 PM				04:00 PM			
+0 mins.	1	73	4	78	**3**	**3**	**3**	**9**	22	119	1	142	**21**	1	**16**	**38**
+15 mins.	1	63	**14**	78	0	3	2	5	**28**	**124**	0	**152**	18	**2**	14	34
+30 mins.	0	**78**	13	**91**	1	3	0	4	18	117	**4**	139	17	0	9	26
+45 mins.	**2**	62	9	73	2	1	3	6	28	120	4	152	14	0	7	21
Total Volume	4	276	40	320	6	10	8	24	96	480	9	585	70	3	46	119
% App. Total	1.2	86.2	12.5		25	41.7	33.3		16.4	82.1	1.5		58.8	2.5	38.7	
PHF	.500	.885	.714	.879	.500	.833	.667	.667	.857	.968	.563	.962	.833	.375	.719	.783

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City of Murrieta
N/S: Jefferson Avenue
E/W: Lemon Street
Weather: Sunny

File Name : MURJELEAM
Site Code : 10268661
Start Date : 11/30/2010
Page No : 1

Groups Printed- Total Volume

	Jefferson Avenue Southbound				Lemon Street Westbound				Jefferson Avenue Northbound				Lemon Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	80	18	98	0	0	0	0	37	56	0	93	1	0	2	3	194
07:15 AM	0	124	29	153	0	0	0	0	42	36	0	78	24	0	22	46	277
07:30 AM	0	106	6	112	2	0	1	3	15	55	0	70	16	0	31	47	232
07:45 AM	0	124	4	128	0	1	2	3	3	55	0	58	2	0	5	7	196
Total	0	434	57	491	2	1	3	6	97	202	0	299	43	0	60	103	899
08:00 AM	0	121	19	140	0	1	0	1	15	80	0	95	4	0	7	11	247
08:15 AM	0	116	28	144	0	0	1	1	15	62	0	77	5	1	23	29	251
08:30 AM	0	150	6	156	0	1	1	2	25	50	0	75	6	0	32	38	271
08:45 AM	1	114	8	123	1	1	0	2	21	65	0	86	6	0	20	26	237
Total	1	501	61	563	1	3	2	6	76	257	0	333	21	1	82	104	1006
Grand Total	1	935	118	1054	3	4	5	12	173	459	0	632	64	1	142	207	1905
Apprch %	0.1	88.7	11.2		25	33.3	41.7		27.4	72.6	0		30.9	0.5	68.6		
Total %	0.1	49.1	6.2	55.3	0.2	0.2	0.3	0.6	9.1	24.1	0	33.2	3.4	0.1	7.5	10.9	

	Jefferson Avenue Southbound				Lemon Street Westbound				Jefferson Avenue Northbound				Lemon Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	121	19	140	0	**1**	0	1	15	**80**	0	**95**	4	0	7	11	247
08:15 AM	0	116	**28**	144	0	0	**1**	1	15	62	0	77	5	**1**	23	29	251
08:30 AM	0	**150**	6	**156**	0	1	1	**2**	**25**	50	0	75	**6**	0	**32**	**38**	**271**
08:45 AM	**1**	114	8	123	**1**	1	0	2	21	65	0	86	6	0	20	26	237
Total Volume	1	501	61	563	1	3	2	6	76	257	0	333	21	1	82	104	1006
% App. Total	0.2	89	10.8		16.7	50	33.3		22.8	77.2	0		20.2	1	78.8		
PHF	.250	.835	.545	.902	.250	.750	.500	.750	.760	.803	.000	.876	.875	.250	.641	.684	.928

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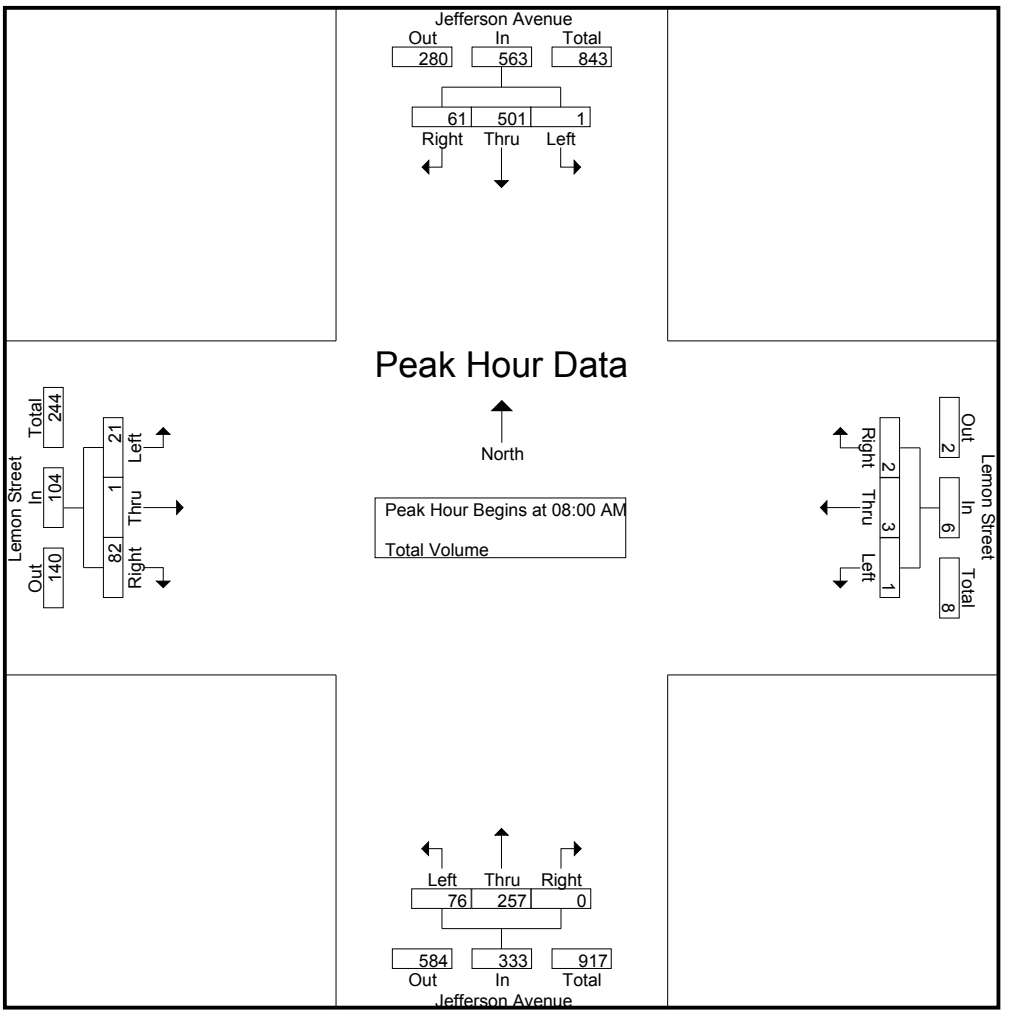
City of Murrieta
N/S: Jefferson Avenue
E/W: Lemon Street
Weather: Sunny

File Name : MURJELEAM
Site Code : 10268661
Start Date : 11/30/2010
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:45 AM				07:30 AM				08:00 AM				07:15 AM			
+0 mins.	0	124	4	128	**2**	0	1	**3**	15	**80**	0	**95**	**24**	0	22	46
+15 mins.	0	121	19	140	0	**1**	**2**	3	15	62	0	77	16	0	**31**	**47**
+30 mins.	0	116	**28**	144	0	1	0	1	**25**	50	0	75	2	0	5	7
+45 mins.	0	**150**	6	**156**	0	0	1	1	21	65	0	86	4	0	7	11
Total Volume	0	511	57	568	2	2	4	8	76	257	0	333	46	0	65	111
% App. Total	0	90	10		25	25	50		22.8	77.2	0		41.4	0	58.6	
PHF	.000	.852	.509	.910	.250	.500	.500	.667	.760	.803	.000	.876	.479	.000	.524	.590

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City of Murrieta
N/S: Jefferson Avenue
E/W: Lemon Street
Weather: Sunny

File Name : MURJELEPM
Site Code : 10268661
Start Date : 11/30/2010
Page No : 1

Groups Printed- Total Volume

	Jefferson Avenue Southbound				Lemon Street Westbound				Jefferson Avenue Northbound				Lemon Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	85	8	93	0	0	0	0	16	138	0	154	2	0	10	12	259
04:15 PM	1	85	3	89	1	0	2	3	26	129	0	155	2	0	14	16	263
04:30 PM	1	88	3	92	1	1	3	5	16	146	0	162	1	0	10	11	270
04:45 PM	0	77	1	78	1	2	0	3	24	161	0	185	4	0	9	13	279
Total	2	335	15	352	3	3	5	11	82	574	0	656	9	0	43	52	1071
05:00 PM	0	79	0	79	1	1	1	3	21	151	1	173	1	0	9	10	265
05:15 PM	1	80	2	83	1	0	0	1	17	158	0	175	1	0	9	10	269
05:30 PM	0	72	3	75	0	0	0	0	9	145	0	154	2	0	4	6	235
05:45 PM	0	82	0	82	1	0	0	1	17	155	0	172	0	0	8	8	263
Total	1	313	5	319	3	1	1	5	64	609	1	674	4	0	30	34	1032
Grand Total	3	648	20	671	6	4	6	16	146	1183	1	1330	13	0	73	86	2103
Apprch %	0.4	96.6	3		37.5	25	37.5		11	88.9	0.1		15.1	0	84.9		
Total %	0.1	30.8	1	31.9	0.3	0.2	0.3	0.8	6.9	56.3	0	63.2	0.6	0	3.5	4.1	

	Jefferson Avenue Southbound				Lemon Street Westbound				Jefferson Avenue Northbound				Lemon Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**1**	**88**	**3**	**92**	**1**	1	**3**	**5**	16	146	0	162	1	0	**10**	11	270
04:45 PM	0	77	1	78	1	**2**	0	3	**24**	**161**	0	**185**	**4**	0	9	**13**	**279**
05:00 PM	0	79	0	79	1	1	1	3	21	151	**1**	173	1	0	9	10	265
05:15 PM	1	80	2	83	1	0	0	1	17	158	0	175	1	0	9	10	269
Total Volume	2	324	6	332	4	4	4	12	78	616	1	695	7	0	37	44	1083
% App. Total	0.6	97.6	1.8		33.3	33.3	33.3		11.2	88.6	0.1		15.9	0	84.1		
PHF	.500	.920	.500	.902	1.000	.500	.333	.600	.813	.957	.250	.939	.438	.000	.925	.846	.970

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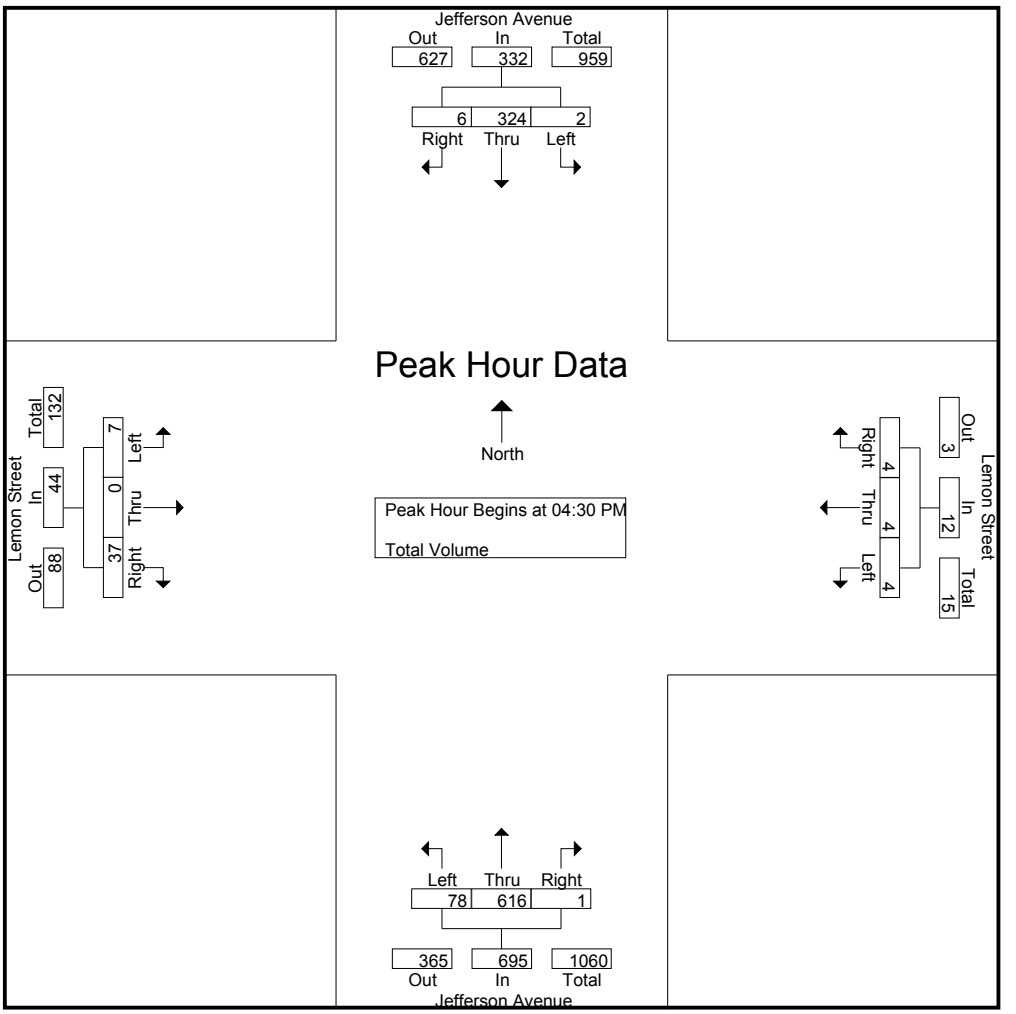
City of Murrieta
N/S: Jefferson Avenue
E/W: Lemon Street
Weather: Sunny

File Name : MURJELEPM
Site Code : 10268661
Start Date : 11/30/2010
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:15 PM				04:30 PM				04:00 PM			
+0 mins.	0	85	**8**	**93**	**1**	0	2	3	16	146	0	162	2	0	10	12
+15 mins.	**1**	85	3	89	1	1	**3**	**5**	**24**	**161**	0	**185**	2	0	**14**	**16**
+30 mins.	1	**88**	3	92	1	**2**	0	3	21	151	**1**	173	1	0	10	11
+45 mins.	0	77	1	78	1	1	1	3	17	158	0	175	**4**	0	9	13
Total Volume	2	335	15	352	4	4	6	14	78	616	1	695	9	0	43	52
% App. Total	0.6	95.2	4.3		28.6	28.6	42.9		11.2	88.6	0.1		17.3	0	82.7	
PHF	.500	.952	.469	.946	1.000	.500	.500	.700	.813	.957	.250	.939	.563	.000	.768	.813

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City of Murrieta
N/S: Jefferson Avenue
E/W: Kalmia Street
Weather: Sunny

File Name : MURJEKAAM
Site Code : 10266035
Start Date : 11/30/2010
Page No : 1

Groups Printed- Total Volume

	Jefferson Avenue Southbound				Kalmia Street Westbound				Jefferson Avenue Northbound				Kalmia Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	49	29	1	79	15	116	70	201	39	24	16	79	1	83	22	106	465
07:15 AM	78	61	2	141	24	105	45	174	40	28	18	86	0	138	47	185	586
07:30 AM	79	72	1	152	31	60	43	134	14	27	21	62	2	155	40	197	545
07:45 AM	48	71	3	122	52	76	39	167	13	27	5	45	1	94	29	124	458
Total	254	233	7	494	122	357	197	676	106	106	60	272	4	470	138	612	2054
08:00 AM	57	55	17	129	24	73	52	149	12	36	26	74	5	88	36	129	481
08:15 AM	59	58	19	136	34	140	62	236	26	24	30	80	8	135	40	183	635
08:30 AM	77	81	7	165	38	87	42	167	43	27	22	92	4	154	68	226	650
08:45 AM	72	79	9	160	42	128	44	214	34	39	19	92	2	141	63	206	672
Total	265	273	52	590	138	428	200	766	115	126	97	338	19	518	207	744	2438
Grand Total	519	506	59	1084	260	785	397	1442	221	232	157	610	23	988	345	1356	4492
Apprch %	47.9	46.7	5.4		18	54.4	27.5		36.2	38	25.7		1.7	72.9	25.4		
Total %	11.6	11.3	1.3	24.1	5.8	17.5	8.8	32.1	4.9	5.2	3.5	13.6	0.5	22	7.7	30.2	

	Jefferson Avenue Southbound				Kalmia Street Westbound				Jefferson Avenue Northbound				Kalmia Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	57	55	17	129	24	73	52	149	12	36	26	74	5	88	36	129	481
08:15 AM	59	58	**19**	136	34	**140**	**62**	**236**	26	24	**30**	80	**8**	135	40	183	635
08:30 AM	**77**	**81**	7	**165**	38	87	42	167	**43**	27	22	**92**	4	**154**	**68**	**226**	650
08:45 AM	72	79	9	160	**42**	128	44	214	34	**39**	19	92	2	141	63	206	**672**
Total Volume	265	273	52	590	138	428	200	766	115	126	97	338	19	518	207	744	2438
% App. Total	44.9	46.3	8.8		18	55.9	26.1		34	37.3	28.7		2.6	69.6	27.8		
PHF	.860	.843	.684	.894	.821	.764	.806	.811	.669	.808	.808	.918	.594	.841	.761	.823	.907

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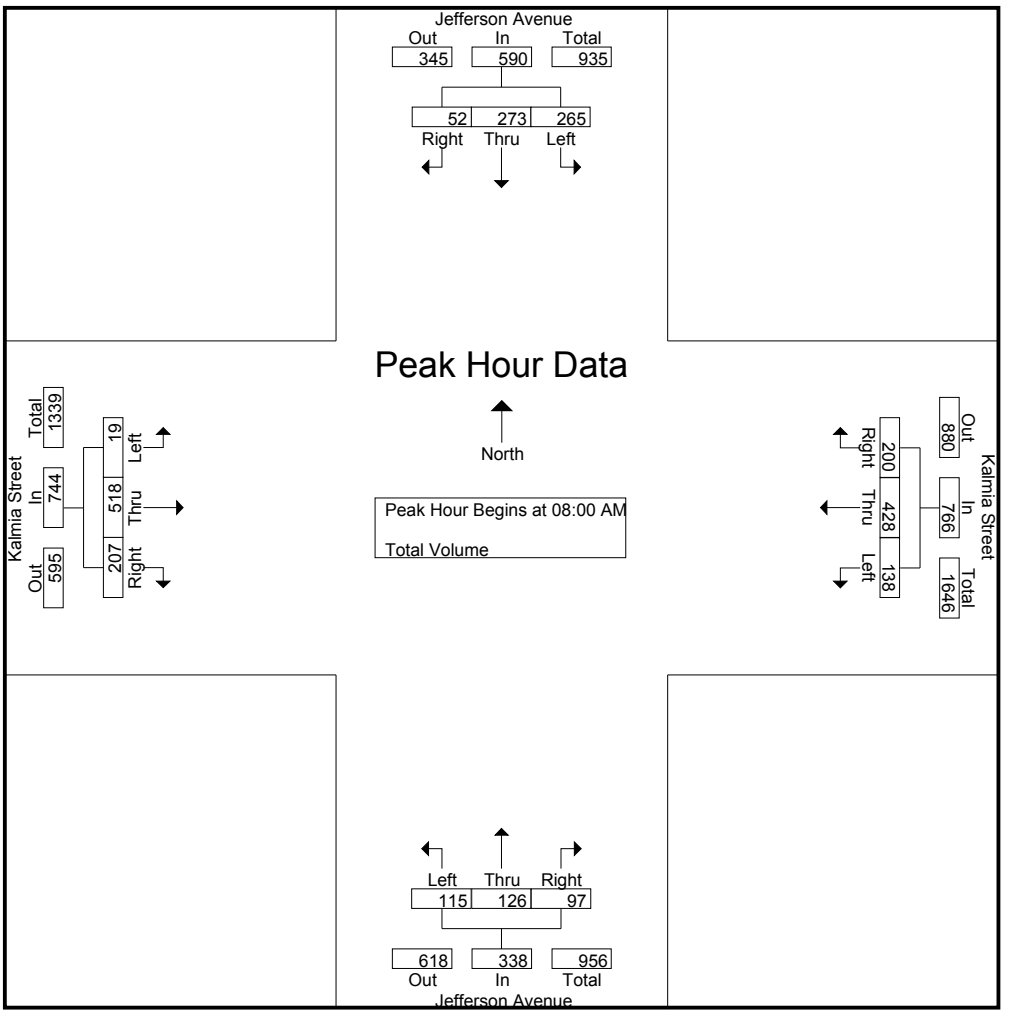
City of Murrieta
N/S: Jefferson Avenue
E/W: Kalmia Street
Weather: Sunny

File Name : MURJEKAAM
Site Code : 10266035
Start Date : 11/30/2010
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00 AM				08:00 AM				08:00 AM				08:00 AM			
+0 mins.	57	55	17	129	24	73	52	149	12	36	26	74	5	88	36	129
+15 mins.	59	58	**19**	136	34	**140**	**62**	**236**	26	24	**30**	80	**8**	135	40	183
+30 mins.	**77**	**81**	7	**165**	38	87	42	167	**43**	27	22	**92**	4	**154**	**68**	**226**
+45 mins.	72	79	9	160	**42**	128	44	214	34	**39**	19	92	2	141	63	206
Total Volume	265	273	52	590	138	428	200	766	115	126	97	338	19	518	207	744
% App. Total	44.9	46.3	8.8		18	55.9	26.1		34	37.3	28.7		2.6	69.6	27.8	
PHF	.860	.843	.684	.894	.821	.764	.806	.811	.669	.808	.808	.918	.594	.841	.761	.823

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City of Murrieta
N/S: Jefferson Avenue
E/W: Kalmia Street
Weather: Sunny

File Name : MURJEKAPM
Site Code : 10266035
Start Date : 11/30/2010
Page No : 1

Groups Printed- Total Volume

	Jefferson Avenue Southbound				Kalmia Street Westbound				Jefferson Avenue Northbound				Kalmia Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	43	44	5	92	34	130	86	250	37	73	41	151	0	135	42	177	670
04:15 PM	45	56	3	104	32	95	54	181	49	82	54	185	6	128	53	187	657
04:30 PM	46	37	2	85	28	101	74	203	38	74	65	177	2	123	46	171	636
04:45 PM	43	51	4	98	35	133	92	260	56	78	49	183	9	109	50	168	709
Total	177	188	14	379	129	459	306	894	180	307	209	696	17	495	191	703	2672
05:00 PM	34	42	2	78	33	129	78	240	48	92	65	205	3	155	49	207	730
05:15 PM	35	41	2	78	28	113	91	232	48	77	55	180	4	122	38	164	654
05:30 PM	39	43	3	85	23	110	71	204	62	75	59	196	3	100	47	150	635
05:45 PM	36	46	4	86	30	131	72	233	65	106	38	209	3	111	34	148	676
Total	144	172	11	327	114	483	312	909	223	350	217	790	13	488	168	669	2695
Grand Total	321	360	25	706	243	942	618	1803	403	657	426	1486	30	983	359	1372	5367
Apprch %	45.5	51	3.5		13.5	52.2	34.3		27.1	44.2	28.7		2.2	71.6	26.2		
Total %	6	6.7	0.5	13.2	4.5	17.6	11.5	33.6	7.5	12.2	7.9	27.7	0.6	18.3	6.7	25.6	

	Jefferson Avenue Southbound				Kalmia Street Westbound				Jefferson Avenue Northbound				Kalmia Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	45	**56**	3	**104**	32	95	54	181	49	82	54	185	6	128	**53**	187	657
04:30 PM	**46**	37	2	85	28	101	74	203	38	74	**65**	177	2	123	46	171	636
04:45 PM	43	51	**4**	98	**35**	**133**	**92**	**260**	**56**	78	49	183	**9**	109	50	168	709
05:00 PM	34	42	2	78	33	129	78	240	48	**92**	65	**205**	3	**155**	49	**207**	**730**
Total Volume	168	186	11	365	128	458	298	884	191	326	233	750	20	515	198	733	2732
% App. Total	46	51	3		14.5	51.8	33.7		25.5	43.5	31.1		2.7	70.3	27		
PHF	.913	.830	.688	.877	.914	.861	.810	.850	.853	.886	.896	.915	.556	.831	.934	.885	.936

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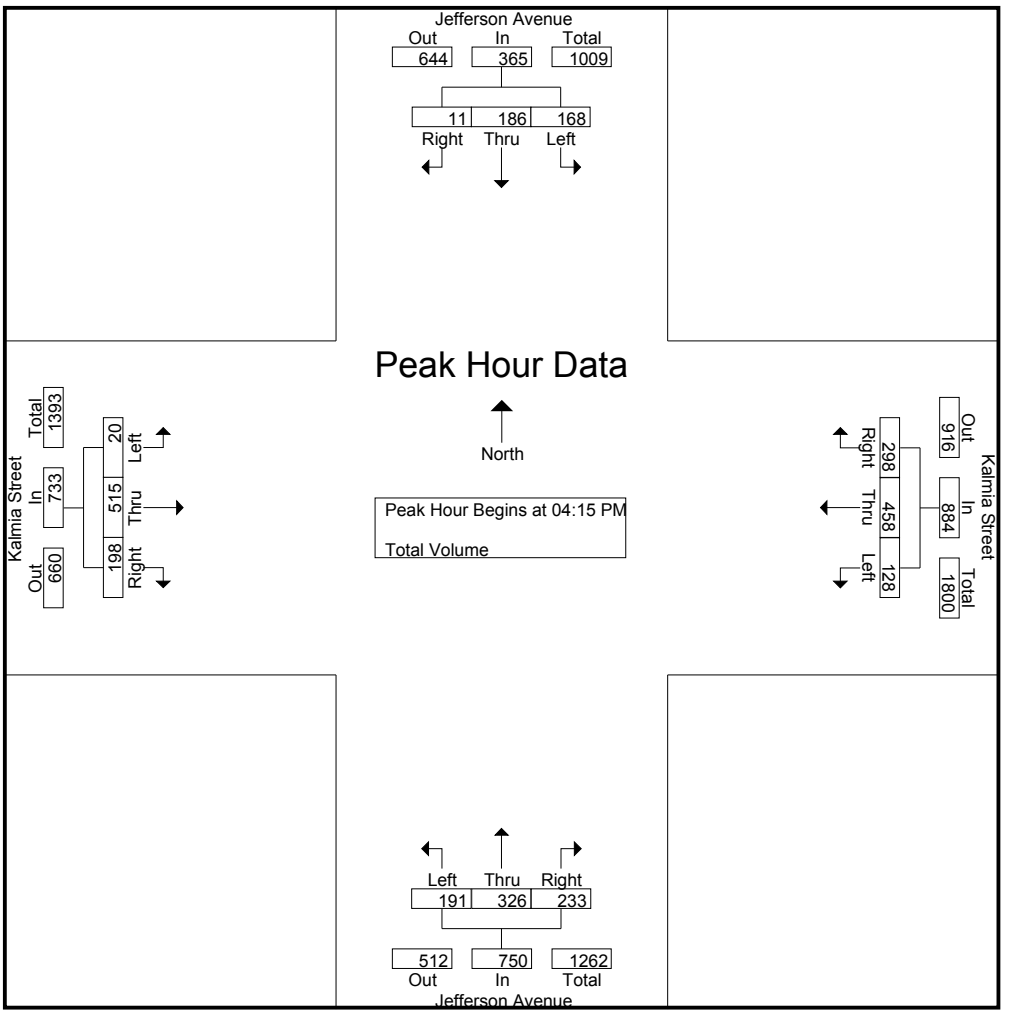
City of Murrieta
N/S: Jefferson Avenue
E/W: Kalmia Street
Weather: Sunny

File Name : MURJEKAPM
Site Code : 10266035
Start Date : 11/30/2010
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:45 PM				05:00 PM				04:15 PM			
+0 mins.	43	44	**5**	92	**35**	**133**	**92**	**260**	48	92	**65**	205	6	128	**53**	187
+15 mins.	45	**56**	3	**104**	33	129	78	240	48	77	55	180	2	123	46	171
+30 mins.	**46**	37	2	85	28	113	91	232	62	75	59	196	**9**	109	50	168
+45 mins.	43	51	4	98	23	110	71	204	**65**	**106**	38	**209**	3	**155**	49	**207**
Total Volume	177	188	14	379	119	485	332	936	223	350	217	790	20	515	198	733
% App. Total	46.7	49.6	3.7		12.7	51.8	35.5		28.2	44.3	27.5		2.7	70.3	27	
PHF	.962	.839	.700	.911	.850	.912	.902	.900	.858	.825	.835	.945	.556	.831	.934	.885

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City of Murrieta
N/S: Jefferson Avenue
E/W: Juniper Street
Weather: Sunny

File Name : MURJEJUAM
Site Code : 10266155
Start Date : 11/30/2010
Page No : 1

Groups Printed- Total Volume

	Jefferson Avenue Southbound				Juniper Street Westbound				Jefferson Avenue Northbound				Juniper Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	5	59	3	67	3	5	11	19	5	71	1	77	12	8	9	29	192
07:15 AM	10	111	4	125	6	7	9	22	9	60	2	71	6	11	9	26	244
07:30 AM	9	138	7	154	4	12	4	20	13	46	1	60	8	7	9	24	258
07:45 AM	2	146	13	161	7	11	3	21	11	52	4	67	6	8	11	25	274
Total	26	454	27	507	20	35	27	82	38	229	8	275	32	34	38	104	968
08:00 AM	8	102	8	118	1	17	3	21	23	59	0	82	10	12	15	37	258
08:15 AM	4	124	9	137	1	35	9	45	26	59	6	91	16	26	41	83	356
08:30 AM	15	142	3	160	0	15	7	22	10	68	3	81	17	31	14	62	325
08:45 AM	10	158	11	179	6	11	4	21	10	72	6	88	11	15	9	35	323
Total	37	526	31	594	8	78	23	109	69	258	15	342	54	84	79	217	1262
Grand Total	63	980	58	1101	28	113	50	191	107	487	23	617	86	118	117	321	2230
Apprch %	5.7	89	5.3		14.7	59.2	26.2		17.3	78.9	3.7		26.8	36.8	36.4		
Total %	2.8	43.9	2.6	49.4	1.3	5.1	2.2	8.6	4.8	21.8	1	27.7	3.9	5.3	5.2	14.4	

	Jefferson Avenue Southbound				Juniper Street Westbound				Jefferson Avenue Northbound				Juniper Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	8	102	8	118	1	17	3	21	23	59	0	82	10	12	15	37	258
08:15 AM	4	124	9	137	1	**35**	**9**	**45**	**26**	59	**6**	**91**	16	26	**41**	**83**	**356**
08:30 AM	**15**	142	3	160	0	15	7	22	10	68	3	81	**17**	**31**	14	62	325
08:45 AM	10	**158**	**11**	**179**	**6**	11	4	21	10	**72**	6	88	11	15	9	35	323
Total Volume	37	526	31	594	8	78	23	109	69	258	15	342	54	84	79	217	1262
% App. Total	6.2	88.6	5.2		7.3	71.6	21.1		20.2	75.4	4.4		24.9	38.7	36.4		
PHF	.617	.832	.705	.830	.333	.557	.639	.606	.663	.896	.625	.940	.794	.677	.482	.654	.886

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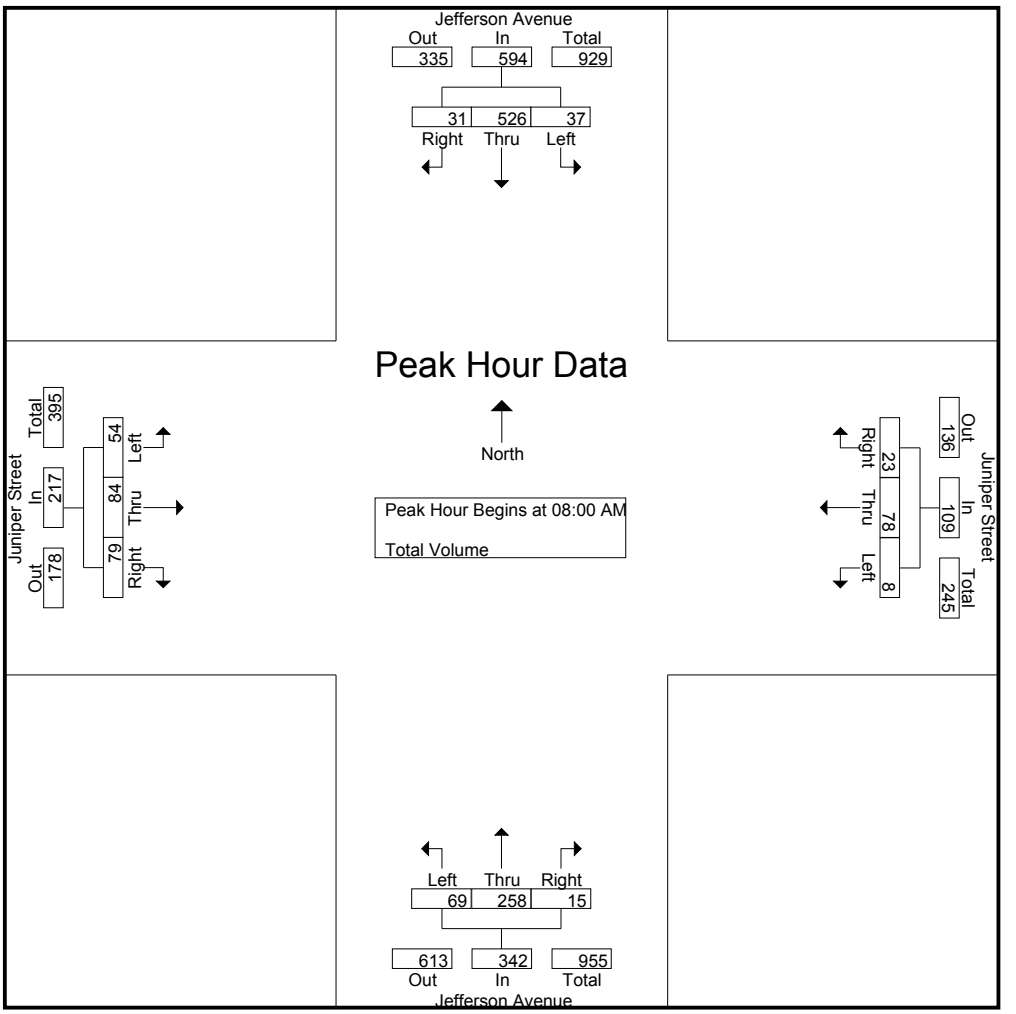
City of Murrieta
N/S: Jefferson Avenue
E/W: Juniper Street
Weather: Sunny

File Name : MURJEJUAM
Site Code : 10266155
Start Date : 11/30/2010
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00 AM				07:45 AM				08:00 AM				08:00 AM			
+0 mins.	8	102	8	118	**7**	11	3	21	23	59	0	82	10	12	15	37
+15 mins.	4	124	9	137	1	17	3	21	**26**	59	**6**	**91**	16	26	**41**	**83**
+30 mins.	**15**	142	3	160	1	**35**	**9**	**45**	10	68	3	81	**17**	**31**	14	62
+45 mins.	10	**158**	**11**	**179**	0	15	7	22	10	**72**	6	88	11	15	9	35
Total Volume	37	526	31	594	9	78	22	109	69	258	15	342	54	84	79	217
% App. Total	6.2	88.6	5.2		8.3	71.6	20.2		20.2	75.4	4.4		24.9	38.7	36.4	
PHF	.617	.832	.705	.830	.321	.557	.611	.606	.663	.896	.625	.940	.794	.677	.482	.654

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City of Murrieta
N/S: Jefferson Avenue
E/W: Juniper Street
Weather: Sunny

File Name : MURJEJUPM
Site Code : 10266155
Start Date : 11/30/2010
Page No : 1

Groups Printed- Total Volume

	Jefferson Avenue Southbound				Juniper Street Westbound				Jefferson Avenue Northbound				Juniper Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	7	84	10	101	6	11	16	33	11	137	7	155	7	7	21	35	324
04:15 PM	16	111	4	131	3	11	9	23	13	159	7	179	8	11	6	25	358
04:30 PM	10	88	5	103	4	14	10	28	15	156	14	185	15	14	12	41	357
04:45 PM	5	109	9	123	4	10	19	33	12	189	20	221	12	11	13	36	413
Total	38	392	28	458	17	46	54	117	51	641	48	740	42	43	52	137	1452
05:00 PM	21	105	7	133	3	16	6	25	21	185	24	230	13	18	16	47	435
05:15 PM	8	84	6	98	3	11	7	21	16	169	18	203	11	14	9	34	356
05:30 PM	13	94	6	113	0	10	13	23	12	195	12	219	12	10	17	39	394
05:45 PM	2	62	5	69	2	6	14	22	11	175	5	191	10	3	10	23	305
Total	44	345	24	413	8	43	40	91	60	724	59	843	46	45	52	143	1490
Grand Total	82	737	52	871	25	89	94	208	111	1365	107	1583	88	88	104	280	2942
Apprch %	9.4	84.6	6		12	42.8	45.2		7	86.2	6.8		31.4	31.4	37.1		
Total %	2.8	25.1	1.8	29.6	0.8	3	3.2	7.1	3.8	46.4	3.6	53.8	3	3	3.5	9.5	

	Jefferson Avenue Southbound				Juniper Street Westbound				Jefferson Avenue Northbound				Juniper Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	5	**109**	**9**	123	**4**	10	**19**	**33**	12	189	20	221	12	11	13	36	413
05:00 PM	**21**	105	7	**133**	3	**16**	6	25	**21**	185	**24**	**230**	**13**	**18**	16	**47**	**435**
05:15 PM	8	84	6	98	3	11	7	21	16	169	18	203	11	14	9	34	356
05:30 PM	13	94	6	113	0	10	13	23	12	**195**	12	219	12	10	**17**	39	394
Total Volume	47	392	28	467	10	47	45	102	61	738	74	873	48	53	55	156	1598
% App. Total	10.1	83.9	6		9.8	46.1	44.1		7	84.5	8.5		30.8	34	35.3		
PHF	.560	.899	.778	.878	.625	.734	.592	.773	.726	.946	.771	.949	.923	.736	.809	.830	.918

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City of Murrieta
N/S: Jefferson Avenue
E/W: Juniper Street
Weather: Sunny

File Name : MURJEJUPM
Site Code : 10266155
Start Date : 11/30/2010
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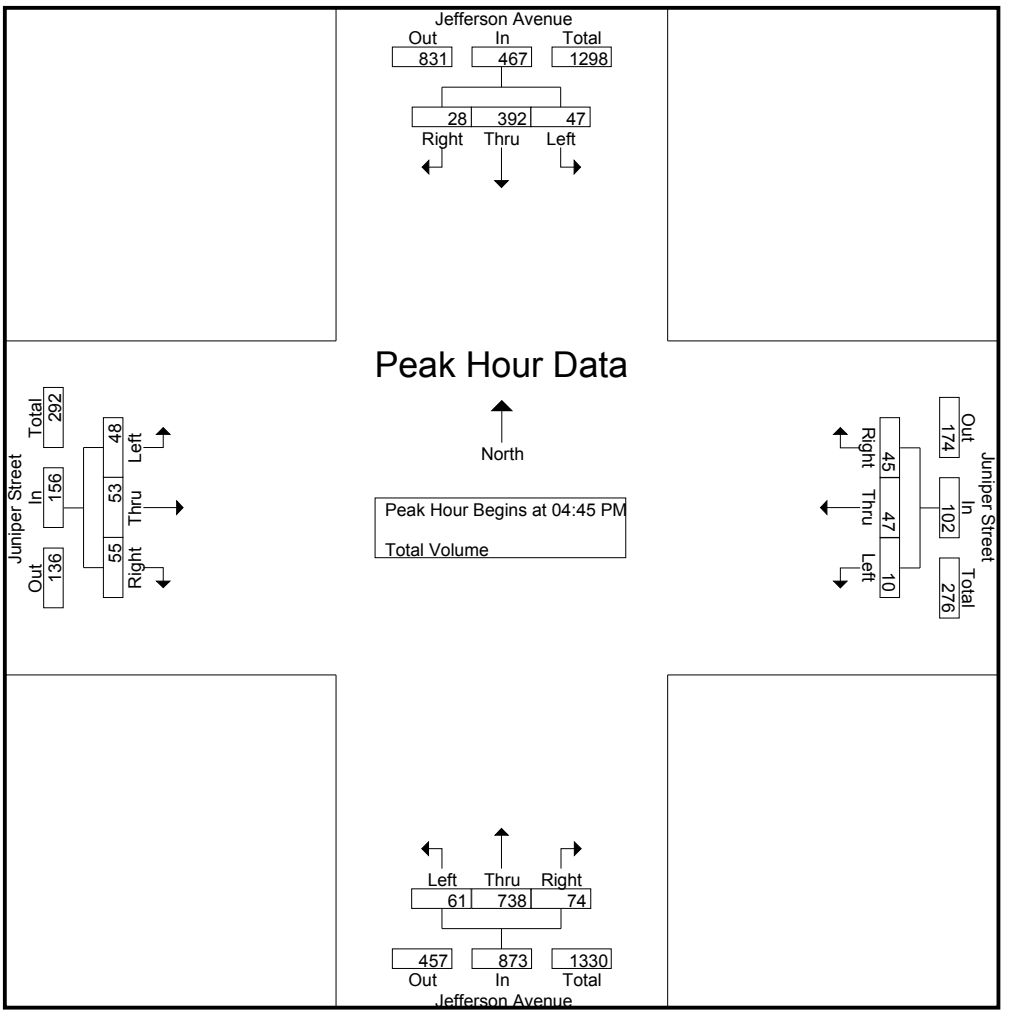

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:15 PM				04:00 PM				04:45 PM				04:30 PM			
+0 mins.	16	**111**	4	131	**6**	11	16	**33**	12	189	20	221	**15**	14	12	41
+15 mins.	10	88	5	103	3	11	9	23	**21**	185	**24**	**230**	12	11	13	36
+30 mins.	5	109	**9**	123	4	**14**	10	28	16	169	18	203	13	**18**	**16**	**47**
+45 mins.	**21**	105	7	**133**	4	10	**19**	33	12	**195**	12	219	11	14	9	34
Total Volume	52	413	25	490	17	46	54	117	61	738	74	873	51	57	50	158
% App. Total	10.6	84.3	5.1		14.5	39.3	46.2		7	84.5	8.5		32.3	36.1	31.6	
PHF	.619	.930	.694	.921	.708	.821	.711	.886	.726	.946	.771	.949	.850	.792	.781	.840

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City of Murrieta
N/S: Jefferson Street
E/W: Ivy Street-Los Alamos Road
Weather: Sunny

File Name : MURJELAAM
Site Code : 10266156
Start Date : 11/30/2010
Page No : 1

Groups Printed- Total Volume

	Jefferson Avenue Southbound				Los Alamos Road Westbound				Jefferson Avenue Northbound				Ivy Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	30	40	1	71	26	25	47	98	7	25	4	36	5	39	20	64	269
07:15 AM	41	66	6	113	32	25	39	96	5	22	3	30	9	38	14	61	300
07:30 AM	49	106	9	164	47	40	30	117	7	24	2	33	2	34	23	59	373
07:45 AM	22	118	10	150	64	49	31	144	13	26	9	48	2	33	28	63	405
Total	142	330	26	498	169	139	147	455	32	97	18	147	18	144	85	247	1347
08:00 AM	24	85	4	113	42	27	32	101	22	46	9	77	7	35	23	65	356
08:15 AM	38	113	5	156	43	28	34	105	24	38	11	73	10	33	29	72	406
08:30 AM	54	118	9	181	39	20	27	86	23	47	13	83	6	43	30	79	429
08:45 AM	36	125	19	180	47	45	39	131	31	40	6	77	4	34	20	58	446
Total	152	441	37	630	171	120	132	423	100	171	39	310	27	145	102	274	1637
Grand Total	294	771	63	1128	340	259	279	878	132	268	57	457	45	289	187	521	2984
Apprch %	26.1	68.4	5.6		38.7	29.5	31.8		28.9	58.6	12.5		8.6	55.5	35.9		
Total %	9.9	25.8	2.1	37.8	11.4	8.7	9.3	29.4	4.4	9	1.9	15.3	1.5	9.7	6.3	17.5	

	Jefferson Avenue Southbound				Los Alamos Road Westbound				Jefferson Avenue Northbound				Ivy Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	24	85	4	113	42	27	32	101	22	46	9	77	7	35	23	65	356
08:15 AM	38	113	5	156	43	28	34	105	24	38	11	73	**10**	33	29	72	406
08:30 AM	**54**	118	9	**181**	39	20	27	86	23	**47**	**13**	**83**	6	**43**	**30**	**79**	429
08:45 AM	36	**125**	**19**	180	**47**	**45**	**39**	**131**	**31**	40	6	77	4	34	20	58	**446**
Total Volume	152	441	37	630	171	120	132	423	100	171	39	310	27	145	102	274	1637
% App. Total	24.1	70	5.9		40.4	28.4	31.2		32.3	55.2	12.6		9.9	52.9	37.2		
PHF	.704	.882	.487	.870	.910	.667	.846	.807	.806	.910	.750	.934	.675	.843	.850	.867	.918

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City of Murrieta
N/S: Jefferson Street
E/W: Ivy Street-Los Alamos Road
Weather: Sunny

File Name : MURJELAAM
Site Code : 10266156
Start Date : 11/30/2010
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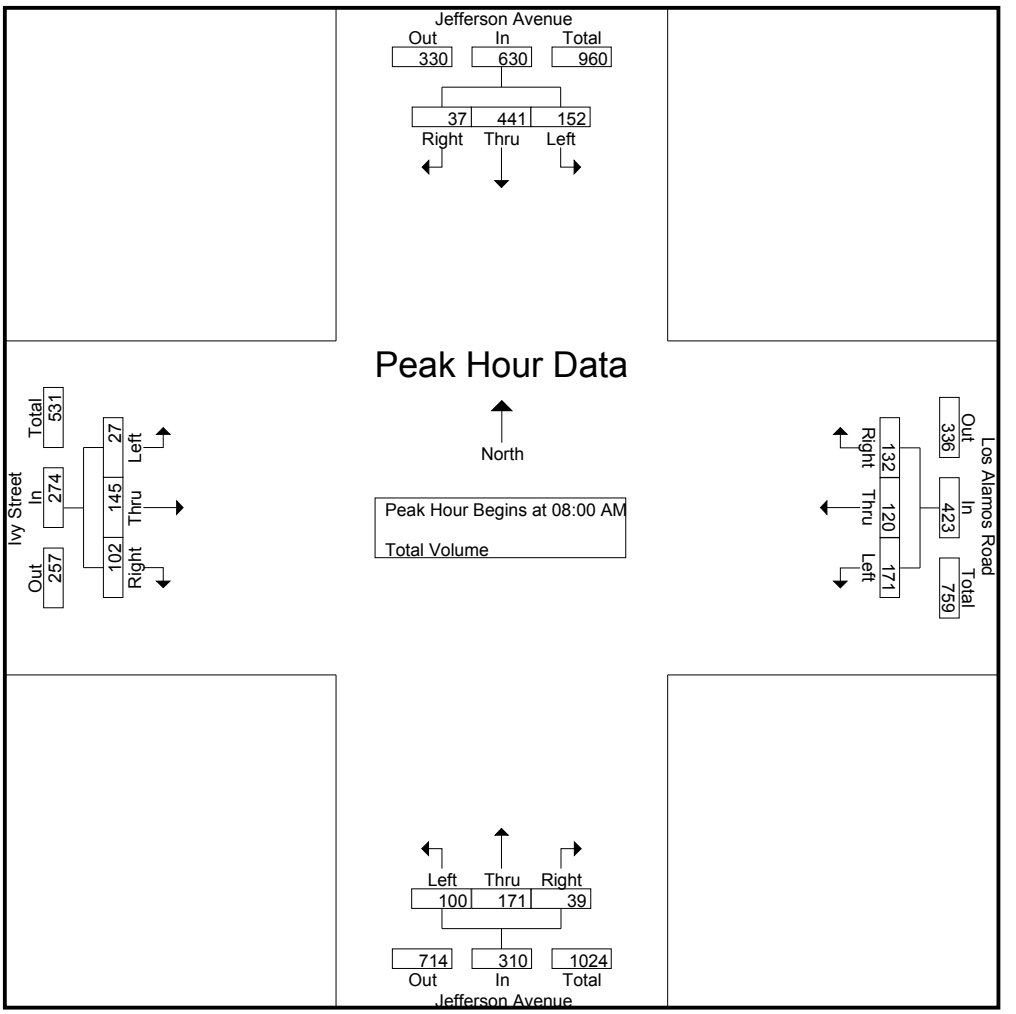

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00 AM				07:30 AM				08:00 AM				07:45 AM			
+0 mins.	24	85	4	113	47	40	30	117	22	46	9	77	2	33	28	63
+15 mins.	38	113	5	156	**64**	**49**	31	**144**	24	38	11	73	7	35	23	65
+30 mins.	**54**	118	9	**181**	42	27	32	101	23	**47**	**13**	**83**	**10**	33	29	72
+45 mins.	36	**125**	**19**	180	43	28	**34**	105	**31**	40	6	77	6	**43**	**30**	**79**
Total Volume	152	441	37	630	196	144	127	467	100	171	39	310	25	144	110	279
% App. Total	24.1	70	5.9		42	30.8	27.2		32.3	55.2	12.6		9	51.6	39.4	
PHF	.704	.882	.487	.870	.766	.735	.934	.811	.806	.910	.750	.934	.625	.837	.917	.883

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City of Murrieta
N/S: Jefferson Street
E/W: Ivy Street-Los Alamos Road
Weather: Sunny

File Name : MURJELAPM
Site Code : 10266156
Start Date : 11/30/2010
Page No : 1

Groups Printed- Total Volume

	Jefferson Avenue Southbound				Los Alamos Road Westbound				Jefferson Avenue Northbound				Ivy Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	39	83	12	134	27	41	35	103	28	118	77	223	12	51	32	95	555
04:15 PM	33	81	9	123	31	48	26	105	37	135	60	232	13	49	31	93	553
04:30 PM	35	77	6	118	33	40	30	103	46	145	87	278	10	78	39	127	626
04:45 PM	43	78	12	133	27	52	34	113	46	158	86	290	10	54	31	95	631
Total	150	319	39	508	118	181	125	424	157	556	310	1023	45	232	133	410	2365
05:00 PM	35	76	9	120	24	39	48	111	44	155	126	325	16	57	38	111	667
05:15 PM	35	66	9	110	14	30	20	64	44	169	103	316	8	56	21	85	575
05:30 PM	30	77	6	113	17	27	37	81	29	155	95	279	7	39	17	63	536
05:45 PM	25	63	7	95	26	49	46	121	38	129	62	229	9	40	21	70	515
Total	125	282	31	438	81	145	151	377	155	608	386	1149	40	192	97	329	2293
Grand Total	275	601	70	946	199	326	276	801	312	1164	696	2172	85	424	230	739	4658
Apprch %	29.1	63.5	7.4		24.8	40.7	34.5		14.4	53.6	32		11.5	57.4	31.1		
Total %	5.9	12.9	1.5	20.3	4.3	7	5.9	17.2	6.7	25	14.9	46.6	1.8	9.1	4.9	15.9	

	Jefferson Avenue Southbound				Los Alamos Road Westbound				Jefferson Avenue Northbound				Ivy Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	35	77	6	118	**33**	40	30	103	**46**	145	87	278	10	**78**	**39**	**127**	626
04:45 PM	**43**	**78**	**12**	**133**	27	**52**	34	**113**	46	158	86	290	10	54	31	95	631
05:00 PM	35	76	9	120	24	39	**48**	111	44	155	**126**	**325**	**16**	57	38	111	**667**
05:15 PM	35	66	9	110	14	30	20	64	44	**169**	103	316	8	56	21	85	575
Total Volume	148	297	36	481	98	161	132	391	180	627	402	1209	44	245	129	418	2499
% App. Total	30.8	61.7	7.5		25.1	41.2	33.8		14.9	51.9	33.3		10.5	58.6	30.9		
PHF	.860	.952	.750	.904	.742	.774	.688	.865	.978	.928	.798	.930	.688	.785	.827	.823	.937

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City of Murrieta
N/S: Jefferson Street
E/W: Ivy Street-Los Alamos Road
Weather: Sunny

File Name : MURJELAPM
Site Code : 10266156
Start Date : 11/30/2010
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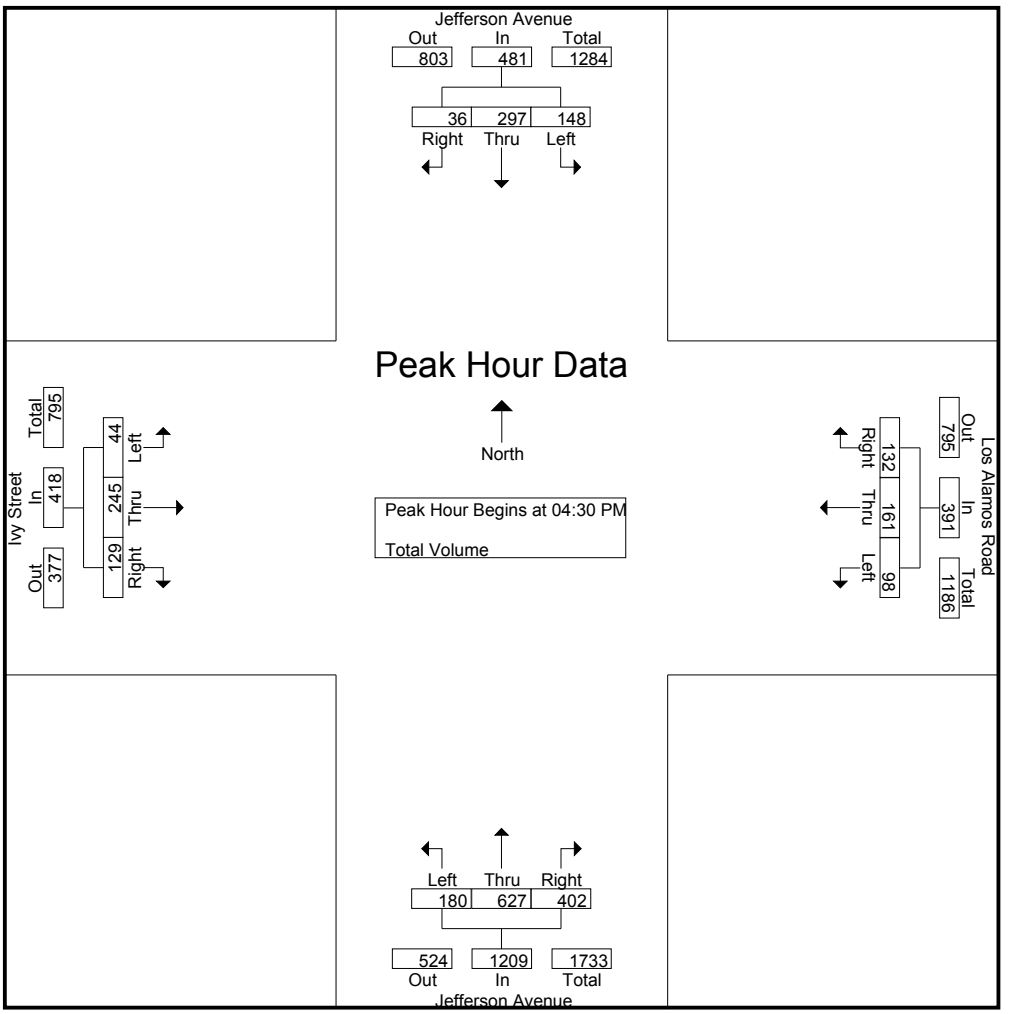

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:15 PM				04:45 PM				04:15 PM			
+0 mins.	39	**83**	**12**	**134**	31	48	26	105	**46**	158	86	290	13	49	31	93
+15 mins.	33	81	9	123	**33**	40	30	103	44	155	**126**	**325**	10	**78**	**39**	**127**
+30 mins.	35	77	6	118	27	**52**	34	**113**	44	**169**	103	316	10	54	31	95
+45 mins.	**43**	78	12	133	24	39	**48**	111	29	155	95	279	**16**	57	38	111
Total Volume	150	319	39	508	115	179	138	432	163	637	410	1210	49	238	139	426
% App. Total	29.5	62.8	7.7		26.6	41.4	31.9		13.5	52.6	33.9		11.5	55.9	32.6	
PHF	.872	.961	.813	.948	.871	.861	.719	.956	.886	.942	.813	.931	.766	.763	.891	.839

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City of Murrieta
N/S: Madison Avenue
E/W: Kalmia Street
Weather: Sunny

File Name : MURMAKAAM
Site Code : 10266051
Start Date : 11/30/2010
Page No : 1

Groups Printed- Total Volume

	Kalmia Street Westbound			Madison Avenue Northbound			Kalmia Street Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
07:00 AM	36	189	225	16	40	56	131	15	146	427
07:15 AM	50	165	215	9	41	50	183	27	210	475
07:30 AM	74	148	222	13	41	54	225	32	257	533
07:45 AM	79	166	245	14	47	61	172	13	185	491
Total	239	668	907	52	169	221	711	87	798	1926
08:00 AM	67	166	233	18	47	65	149	18	167	465
08:15 AM	61	217	278	27	47	74	207	19	226	578
08:30 AM	82	175	257	32	63	95	210	30	240	592
08:45 AM	100	214	314	31	80	111	199	40	239	664
Total	310	772	1082	108	237	345	765	107	872	2299
Grand Total	549	1440	1989	160	406	566	1476	194	1670	4225
Apprch %	27.6	72.4		28.3	71.7		88.4	11.6		
Total %	13	34.1	47.1	3.8	9.6	13.4	34.9	4.6	39.5	

	Kalmia Street Westbound			Madison Avenue Northbound			Kalmia Street Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	67	166	233	18	47	65	149	18	167	465
08:15 AM	61	**217**	278	27	47	74	207	19	226	578
08:30 AM	82	175	257	**32**	63	95	**210**	30	**240**	592
08:45 AM	**100**	214	**314**	31	**80**	**111**	199	**40**	239	**664**
Total Volume	310	772	1082	108	237	345	765	107	872	2299
% App. Total	28.7	71.3		31.3	68.7		87.7	12.3		
PHF	.775	.889	.861	.844	.741	.777	.911	.669	.908	.866

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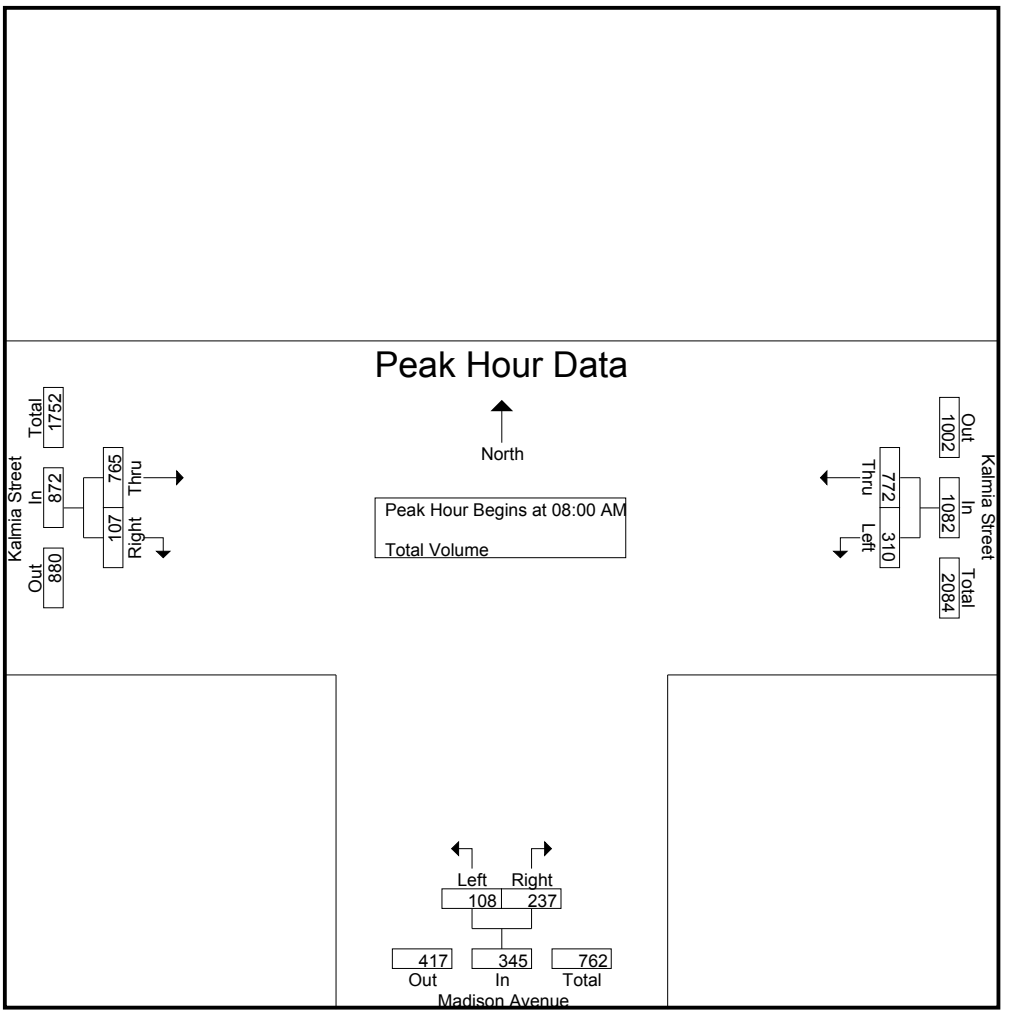
City of Murrieta
N/S: Madison Avenue
E/W: Kalmia Street
Weather: Sunny

File Name : MURMAKAAM
Site Code : 10266051
Start Date : 11/30/2010
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00 AM			08:00 AM			08:00 AM		
+0 mins.	67	166	233	18	47	65	149	18	167
+15 mins.	61	**217**	278	27	47	74	207	19	226
+30 mins.	82	175	257	**32**	63	95	**210**	30	**240**
+45 mins.	**100**	214	**314**	31	**80**	**111**	199	**40**	239
Total Volume	310	772	1082	108	237	345	765	107	872
% App. Total	28.7	71.3		31.3	68.7		87.7	12.3	
PHF	.775	.889	.861	.844	.741	.777	.911	.669	.908

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City of Murrieta
N/S: Madison Avenue
E/W: Kalmia Street
Weather: Sunny

File Name : MURMAKAPM
Site Code : 10266051
Start Date : 11/30/2010
Page No : 1

Groups Printed- Total Volume

	Kalmia Street Westbound			Madison Avenue Northbound			Kalmia Street Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
04:00 PM	114	256	370	45	129	174	241	44	285	829
04:15 PM	111	205	316	54	111	165	259	48	307	788
04:30 PM	92	225	317	44	145	189	259	51	310	816
04:45 PM	89	228	317	62	148	210	244	36	280	807
Total	406	914	1320	205	533	738	1003	179	1182	3240
05:00 PM	96	232	328	41	126	167	265	50	315	810
05:15 PM	106	267	373	43	118	161	252	35	287	821
05:30 PM	109	231	340	42	109	151	242	37	279	770
05:45 PM	86	224	310	56	125	181	230	41	271	762
Total	397	954	1351	182	478	660	989	163	1152	3163
Grand Total	803	1868	2671	387	1011	1398	1992	342	2334	6403
Apprch %	30.1	69.9		27.7	72.3		85.3	14.7		
Total %	12.5	29.2	41.7	6	15.8	21.8	31.1	5.3	36.5	

	Kalmia Street Westbound			Madison Avenue Northbound			Kalmia Street Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	92	225	317	44	145	189	259	**51**	310	816
04:45 PM	89	228	317	**62**	**148**	**210**	244	36	280	807
05:00 PM	96	232	328	41	126	167	**265**	50	**315**	810
05:15 PM	**106**	**267**	**373**	43	118	161	252	35	287	**821**
Total Volume	383	952	1335	190	537	727	1020	172	1192	3254
% App. Total	28.7	71.3		26.1	73.9		85.6	14.4		
PHF	.903	.891	.895	.766	.907	.865	.962	.843	.946	.991

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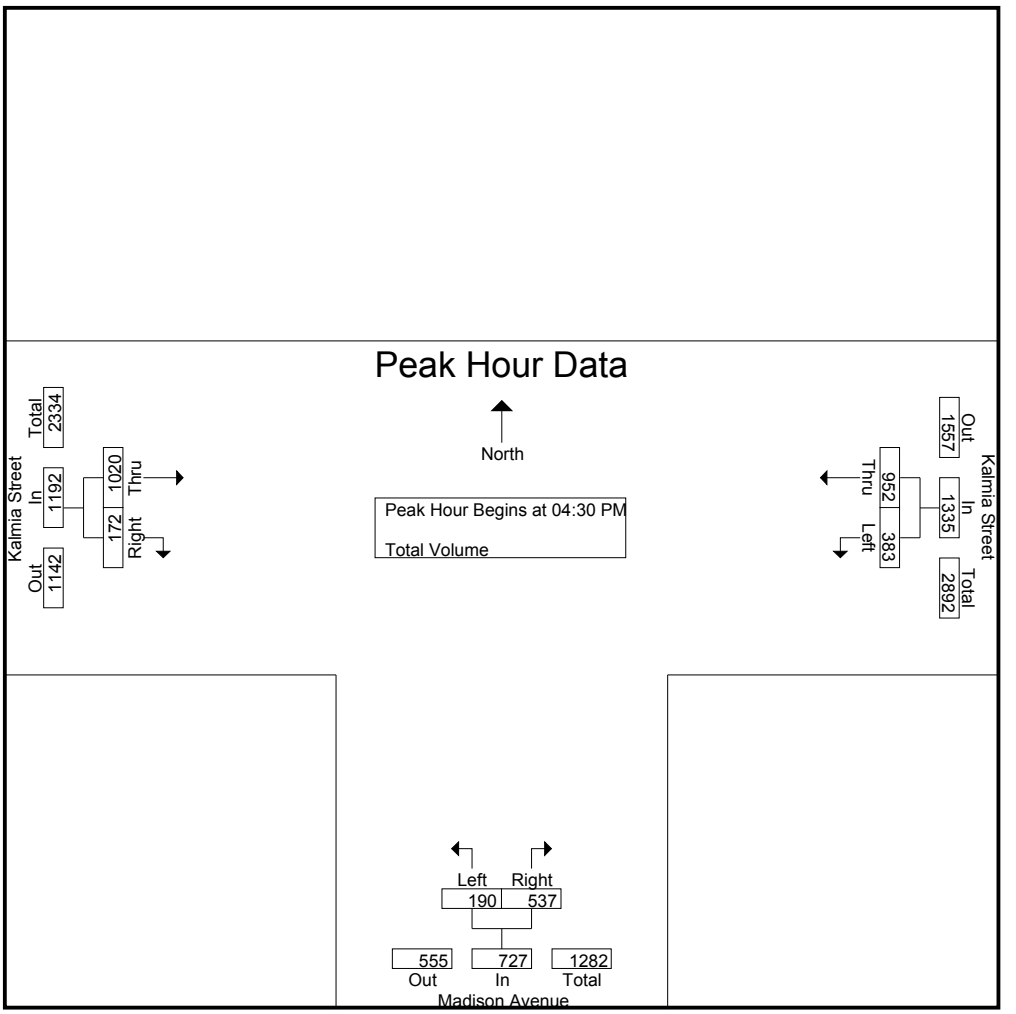
City of Murrieta
N/S: Madison Avenue
E/W: Kalmia Street
Weather: Sunny

File Name : MURMAKAPM
Site Code : 10266051
Start Date : 11/30/2010
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:45 PM			04:00 PM			04:15 PM		
+0 mins.	89	228	317	45	129	174	259	48	307
+15 mins.	96	232	328	54	111	165	259	**51**	310
+30 mins.	106	**267**	**373**	44	145	189	244	36	280
+45 mins.	**109**	231	340	**62**	**148**	**210**	**265**	50	**315**
Total Volume	400	958	1358	205	533	738	1027	185	1212
% App. Total	29.5	70.5		27.8	72.2		84.7	15.3	
PHF	.917	.897	.910	.827	.900	.879	.969	.907	.962

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City of Murrieta
N/S: I-15 Southbound Ramps
E/W: Kalmia Street
Weather: Sunny

File Name : MUR15SKAAM
Site Code : 10266063
Start Date : 11/30/2010
Page No : 1

Groups Printed- Total Volume

	I-15 Southbound Off Ramp Southbound				Kalmia Street Westbound				I-15 Southbound On Ramp Northbound				Kalmia Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	47	0	51	98	81	183	0	264	0	0	0	0	0	51	88	139	501
07:15 AM	84	0	54	138	104	143	0	247	0	0	0	0	0	120	80	200	585
07:30 AM	81	0	54	135	149	150	0	299	0	0	0	0	0	130	82	212	646
07:45 AM	68	0	82	150	119	160	0	279	0	0	0	0	0	93	80	173	602
Total	280	0	241	521	453	636	0	1089	0	0	0	0	0	394	330	724	2334
08:00 AM	57	0	62	119	108	168	0	276	0	0	0	0	0	88	61	149	544
08:15 AM	76	0	70	146	95	209	0	304	0	0	0	0	0	117	83	200	650
08:30 AM	84	2	71	157	96	183	0	279	0	0	0	0	0	126	109	235	671
08:45 AM	88	0	75	163	113	213	0	326	0	0	0	0	0	152	120	272	761
Total	305	2	278	585	412	773	0	1185	0	0	0	0	0	483	373	856	2626
Grand Total	585	2	519	1106	865	1409	0	2274	0	0	0	0	0	877	703	1580	4960
Apprch %	52.9	0.2	46.9		38	62	0		0	0	0		0	55.5	44.5		
Total %	11.8	0	10.5	22.3	17.4	28.4	0	45.8	0	0	0	0	0	17.7	14.2	31.9	

	I-15 Southbound Off Ramp Southbound				Kalmia Street Westbound				I-15 Southbound On Ramp Northbound				Kalmia Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	57	0	62	119	108	168	0	276	0	0	0	0	0	88	61	149	544
08:15 AM	76	0	70	146	95	209	0	304	0	0	0	0	0	117	83	200	650
08:30 AM	84	**2**	71	157	96	183	0	279	0	0	0	0	0	126	109	235	671
08:45 AM	**88**	0	**75**	**163**	**113**	**213**	0	**326**	0	0	0	0	0	**152**	**120**	**272**	**761**
Total Volume	305	2	278	585	412	773	0	1185	0	0	0	0	0	483	373	856	2626
% App. Total	52.1	0.3	47.5		34.8	65.2	0		0	0	0		0	56.4	43.6		
PHF	.866	.250	.927	.897	.912	.907	.000	.909	.000	.000	.000	.000	.000	.794	.777	.787	.863

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City of Murrieta
N/S: I-15 Southbound Ramps
E/W: Kalmia Street
Weather: Sunny

File Name : MUR15SKAAM
Site Code : 10266063
Start Date : 11/30/2010
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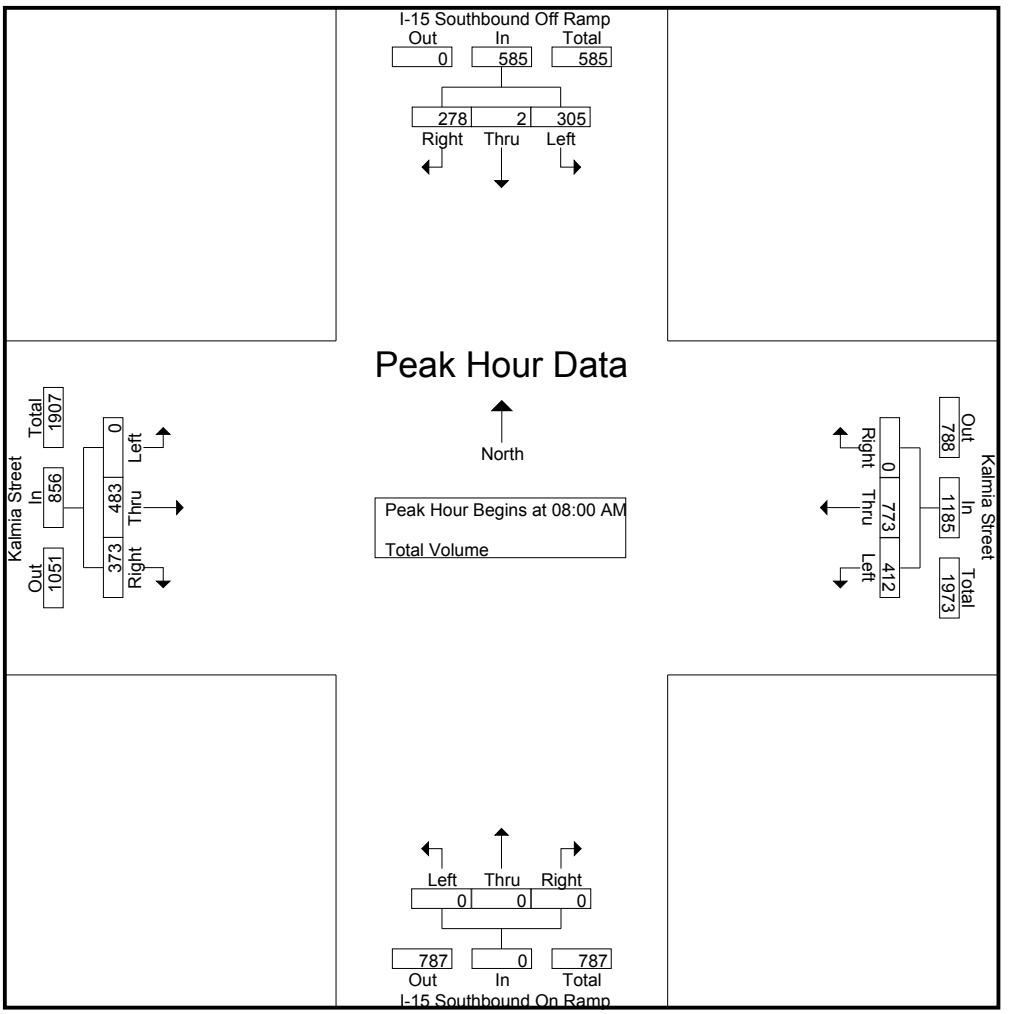

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00 AM				08:00 AM				07:00 AM				08:00 AM			
+0 mins.	57	0	62	119	108	168	0	276	0	0	0	0	0	88	61	149
+15 mins.	76	0	70	146	95	209	0	304	0	0	0	0	0	117	83	200
+30 mins.	84	**2**	71	157	96	183	0	279	0	0	0	0	0	126	109	235
+45 mins.	**88**	0	**75**	**163**	**113**	**213**	0	**326**	0	0	0	0	0	**152**	**120**	**272**
Total Volume	305	2	278	585	412	773	0	1185	0	0	0	0	0	483	373	856
% App. Total	52.1	0.3	47.5		34.8	65.2	0		0	0	0		0	56.4	43.6	
PHF	.866	.250	.927	.897	.912	.907	.000	.909	.000	.000	.000	.000	.000	.794	.777	.787

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City of Murrieta
N/S: I-15 Southbound Ramps
E/W: Kalmia Street
Weather: Sunny

File Name : MUR15SKAPM
Site Code : 10266063
Start Date : 11/30/2010
Page No : 1

Groups Printed- Total Volume

	I-15 Southbound Off Ramp Southbound				Kalmia Street Westbound				I-15 Southbound On Ramp Northbound				Kalmia Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	85	1	95	181	87	250	0	337	0	0	0	0	0	256	101	357	875
04:15 PM	93	1	89	183	85	228	0	313	0	0	0	0	0	259	103	362	858
04:30 PM	105	0	77	182	85	243	0	328	0	0	0	0	0	283	104	387	897
04:45 PM	96	1	110	207	94	247	0	341	0	0	0	0	0	291	90	381	929
Total	379	3	371	753	351	968	0	1319	0	0	0	0	0	1089	398	1487	3559
05:00 PM	73	1	86	160	104	238	0	342	0	0	0	0	0	289	106	395	897
05:15 PM	85	0	88	173	102	259	0	361	0	0	0	0	0	246	108	354	888
05:30 PM	96	0	91	187	80	227	0	307	0	0	0	0	0	256	84	340	834
05:45 PM	98	0	86	184	67	231	0	298	0	0	0	0	0	262	94	356	838
Total	352	1	351	704	353	955	0	1308	0	0	0	0	0	1053	392	1445	3457
Grand Total	731	4	722	1457	704	1923	0	2627	0	0	0	0	0	2142	790	2932	7016
Apprch %	50.2	0.3	49.6		26.8	73.2	0		0	0	0		0	73.1	26.9		
Total %	10.4	0.1	10.3	20.8	10	27.4	0	37.4	0	0	0	0	0	30.5	11.3	41.8	

	I-15 Southbound Off Ramp Southbound				Kalmia Street Westbound				I-15 Southbound On Ramp Northbound				Kalmia Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**105**	0	77	182	85	243	0	328	0	0	0	0	0	283	104	387	897
04:45 PM	96	**1**	**110**	**207**	94	247	0	341	0	0	0	0	0	**291**	90	381	**929**
05:00 PM	73	1	86	160	**104**	238	0	342	0	0	0	0	0	289	106	**395**	897
05:15 PM	85	0	88	173	102	**259**	0	**361**	0	0	0	0	0	246	**108**	354	888
Total Volume	359	2	361	722	385	987	0	1372	0	0	0	0	0	1109	408	1517	3611
% App. Total	49.7	0.3	50		28.1	71.9	0		0	0	0		0	73.1	26.9		
PHF	.855	.500	.820	.872	.925	.953	.000	.950	.000	.000	.000	.000	.000	.953	.944	.960	.972

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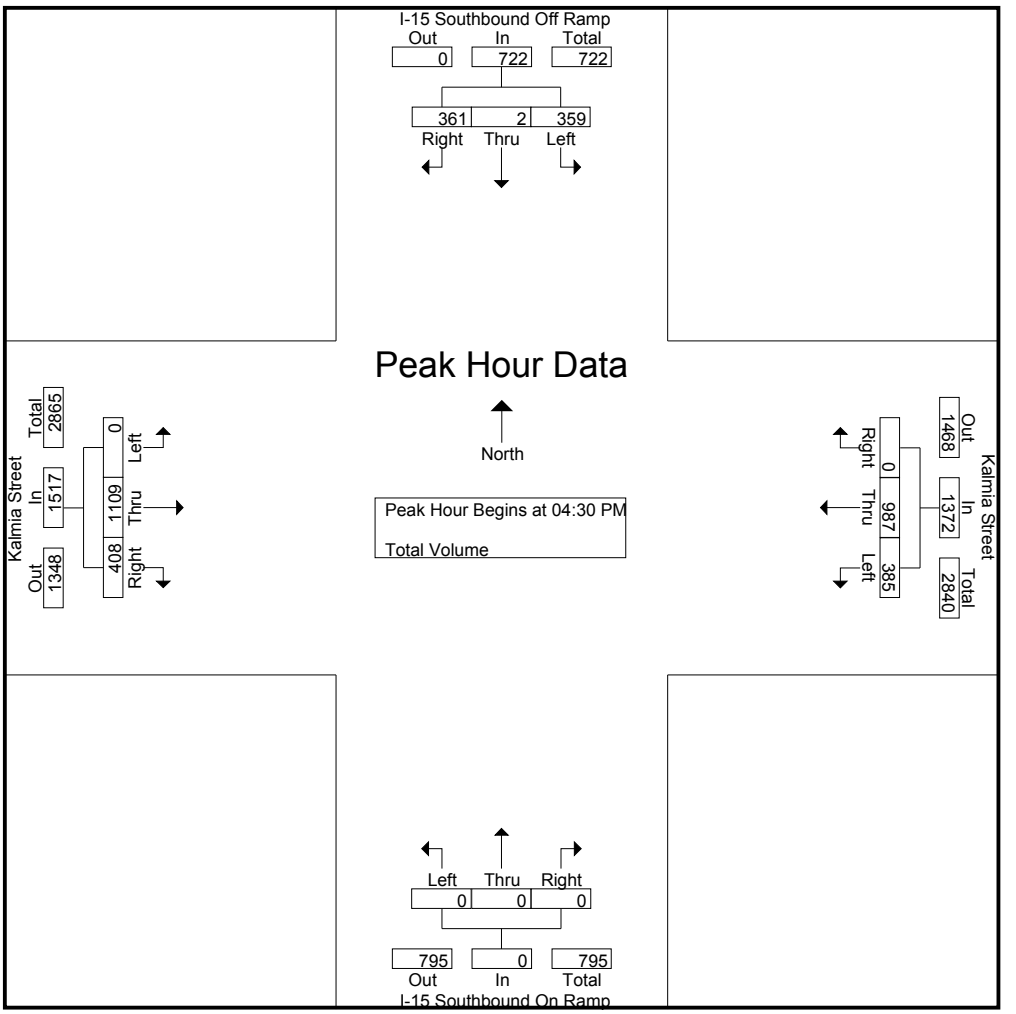
City of Murrieta
N/S: I-15 Southbound Ramps
E/W: Kalmia Street
Weather: Sunny

File Name : MUR15SKAPM
Site Code : 10266063
Start Date : 11/30/2010
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:30 PM				04:00 PM				04:15 PM			
+0 mins.	85	**1**	95	181	85	243	0	328	0	0	0	0	0	259	103	362
+15 mins.	93	1	89	183	94	247	0	341	0	0	0	0	0	283	104	387
+30 mins.	**105**	0	77	182	**104**	238	0	342	0	0	0	0	0	**291**	90	381
+45 mins.	96	1	**110**	**207**	102	**259**	0	**361**	0	0	0	0	0	289	**106**	**395**
Total Volume	379	3	371	753	385	987	0	1372	0	0	0	0	0	1122	403	1525
% App. Total	50.3	0.4	49.3		28.1	71.9	0		0	0	0		0	73.6	26.4	
PHF	.902	.750	.843	.909	.925	.953	.000	.950	.000	.000	.000	.000	.000	.964	.950	.965

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City of Murrieta
N/S: Monroe Avenue
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURMOMHSAM
Site Code : 10266066
Start Date : 11/30/2010
Page No : 1

Groups Printed- Total Volume

	Monroe Avenue Southbound			Murrieta Hot Springs Road Westbound			Murrieta Hot Springs Road Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
07:00 AM	0	12	12	283	1	284	14	141	155	451
07:15 AM	0	9	9	349	1	350	22	195	217	576
07:30 AM	0	16	16	366	2	368	33	259	292	676
07:45 AM	0	22	22	398	2	400	37	273	310	732
Total	0	59	59	1396	6	1402	106	868	974	2435
08:00 AM	0	15	15	326	5	331	26	252	278	624
08:15 AM	0	12	12	347	8	355	42	275	317	684
08:30 AM	0	24	24	385	3	388	27	271	298	710
08:45 AM	0	20	20	405	9	414	30	299	329	763
Total	0	71	71	1463	25	1488	125	1097	1222	2781
Grand Total	0	130	130	2859	31	2890	231	1965	2196	5216
Apprch %	0	100		98.9	1.1		10.5	89.5		
Total %	0	2.5	2.5	54.8	0.6	55.4	4.4	37.7	42.1	

	Monroe Avenue Southbound			Murrieta Hot Springs Road Westbound			Murrieta Hot Springs Road Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	0	15	15	326	5	331	26	252	278	624
08:15 AM	0	12	12	347	8	355	**42**	275	317	684
08:30 AM	0	**24**	**24**	385	3	388	27	271	298	710
08:45 AM	0	20	20	**405**	**9**	**414**	30	**299**	**329**	**763**
Total Volume	0	71	71	1463	25	1488	125	1097	1222	2781
% App. Total	0	100		98.3	1.7		10.2	89.8		
PHF	.000	.740	.740	.903	.694	.899	.744	.917	.929	.911

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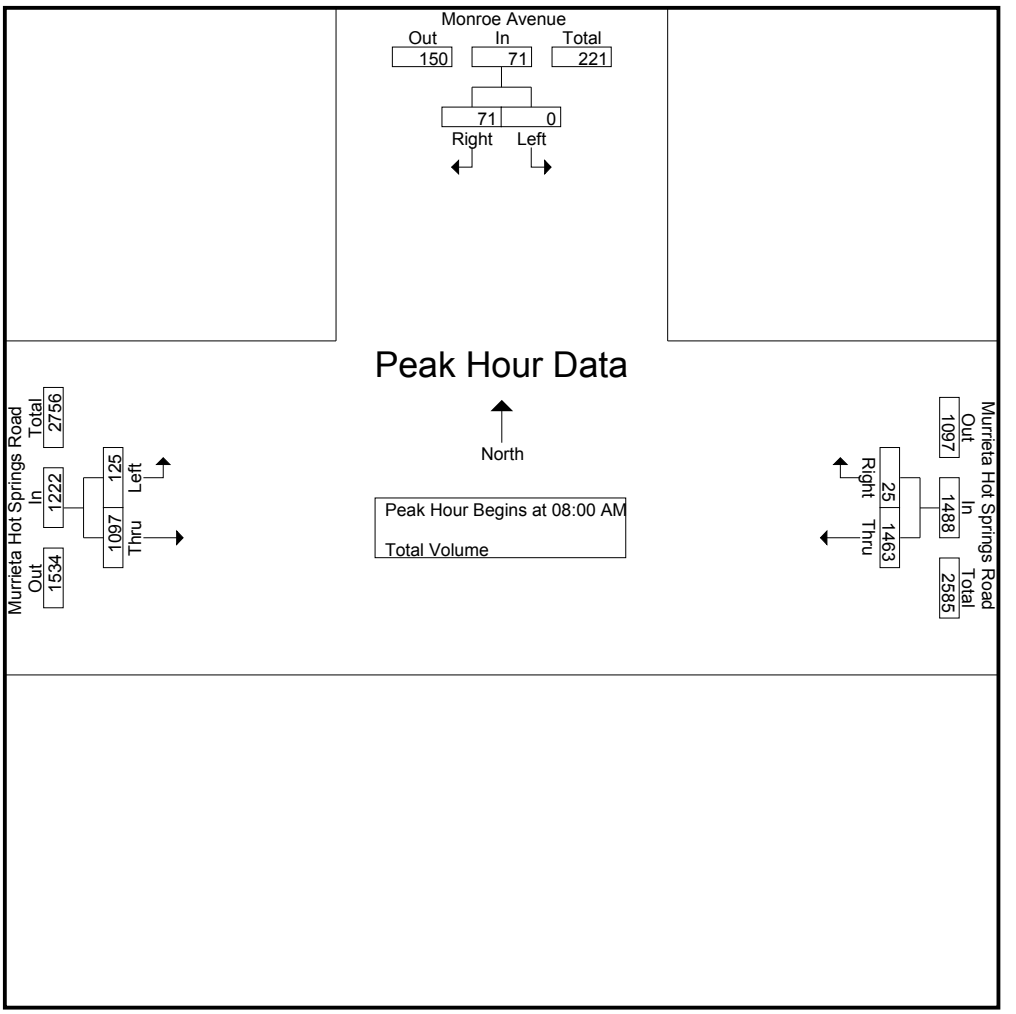
City of Murrieta
N/S: Monroe Avenue
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURMOMHSAM
Site Code : 10266066
Start Date : 11/30/2010
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:45 AM			08:00 AM			08:00 AM		
+0 mins.	0	22	22	326	5	331	26	252	278
+15 mins.	0	15	15	347	8	355	**42**	275	317
+30 mins.	0	12	12	385	3	388	27	271	298
+45 mins.	0	**24**	**24**	**405**	**9**	**414**	30	**299**	**329**
Total Volume	0	73	73	1463	25	1488	125	1097	1222
% App. Total	0	100		98.3	1.7		10.2	89.8	
PHF	.000	.760	.760	.903	.694	.899	.744	.917	.929

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City of Murrieta
N/S: Monroe Avenue
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURMOMHSPM
Site Code : 10266066
Start Date : 11/30/2010

Groups Printed- Total Volume

	Monroe Avenue Southbound			Murrieta Hot Springs Road Westbound			Murrieta Hot Springs Road Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
04:00 PM	0	27	27	491	3	494	29	435	464	985
04:15 PM	0	33	33	390	5	395	35	508	543	971
04:30 PM	0	40	40	441	5	446	26	462	488	974
04:45 PM	0	37	37	368	5	373	43	570	613	1023
Total	0	137	137	1690	18	1708	133	1975	2108	3953
05:00 PM	0	33	33	427	7	434	36	512	548	1015
05:15 PM	0	34	34	385	12	397	65	555	620	1051
05:30 PM	0	26	26	394	6	400	83	474	557	983
05:45 PM	0	20	20	338	7	345	85	489	574	939
Total	0	113	113	1544	32	1576	269	2030	2299	3988
Grand Total	0	250	250	3234	50	3284	402	4005	4407	7941
Apprch %	0	100		98.5	1.5		9.1	90.9		
Total %	0	3.1	3.1	40.7	0.6	41.4	5.1	50.4	55.5	

	Monroe Avenue Southbound			Murrieta Hot Springs Road Westbound			Murrieta Hot Springs Road Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	0	**37**	**37**	368	5	373	43	**570**	613	1023
05:00 PM	0	33	33	**427**	7	**434**	36	512	548	1015
05:15 PM	0	34	34	385	**12**	397	65	555	**620**	**1051**
05:30 PM	0	26	26	394	6	400	**83**	474	557	983
Total Volume	0	130	130	1574	30	1604	227	2111	2338	4072
% App. Total	0	100		98.1	1.9		9.7	90.3		
PHF	.000	.878	.878	.922	.625	.924	.684	.926	.943	.969

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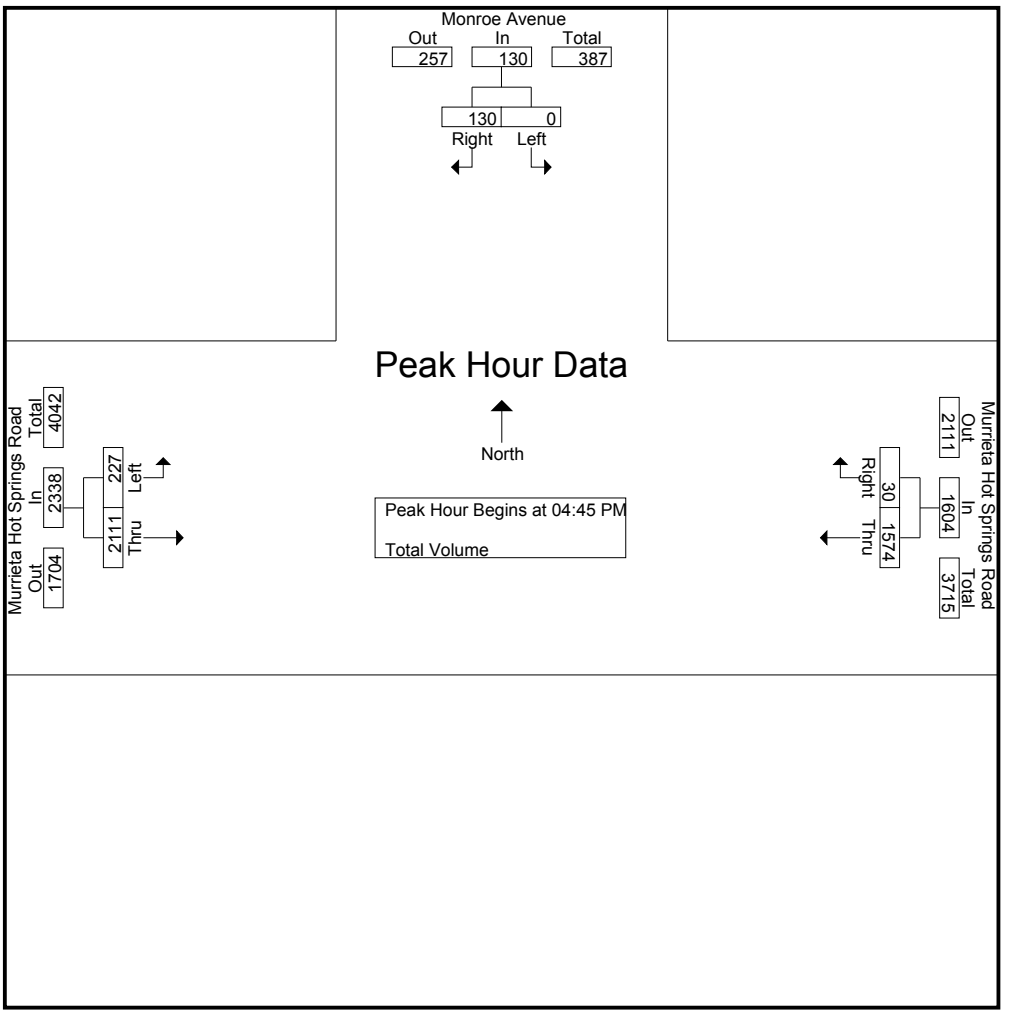
City of Murrieta
N/S: Monroe Avenue
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURMOMHSPM
Site Code : 10266066
Start Date : 11/30/2010
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:30 PM			04:00 PM			04:45 PM		
+0 mins.	0	**40**	**40**	**491**	3	**494**	43	**570**	613
+15 mins.	0	37	37	390	**5**	395	36	512	548
+30 mins.	0	33	33	441	5	446	65	555	**620**
+45 mins.	0	34	34	368	5	373	**83**	474	557
Total Volume	0	144	144	1690	18	1708	227	2111	2338
% App. Total	0	100		98.9	1.1		9.7	90.3	
PHF	.000	.900	.900	.860	.900	.864	.684	.926	.943

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City of Murrieta
N/S: Hancock Avenue
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURHAMHSAM
Site Code : 10266048
Start Date : 11/30/2010

Groups Printed- Total Volume

	Hancock Avenue Southbound			Murrieta Hot Springs Road Westbound			Murrieta Hot Springs Road Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
07:00 AM	28	22	50	281	42	323	21	124	145	518
07:15 AM	41	30	71	303	72	375	33	171	204	650
07:30 AM	78	37	115	344	75	419	42	220	262	796
07:45 AM	82	43	125	370	115	485	42	226	268	878
Total	229	132	361	1298	304	1602	138	741	879	2842
08:00 AM	53	28	81	296	113	409	41	210	251	741
08:15 AM	59	38	97	339	122	461	60	220	280	838
08:30 AM	74	39	113	346	106	452	54	224	278	843
08:45 AM	78	42	120	365	123	488	72	230	302	910
Total	264	147	411	1346	464	1810	227	884	1111	3332
Grand Total	493	279	772	2644	768	3412	365	1625	1990	6174
Apprch %	63.9	36.1		77.5	22.5		18.3	81.7		
Total %	8	4.5	12.5	42.8	12.4	55.3	5.9	26.3	32.2	

	Hancock Avenue Southbound			Murrieta Hot Springs Road Westbound			Murrieta Hot Springs Road Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	53	28	81	296	113	409	41	210	251	741
08:15 AM	59	38	97	339	122	461	60	220	280	838
08:30 AM	74	39	113	346	106	452	54	224	278	843
08:45 AM	**78**	**42**	**120**	**365**	**123**	**488**	**72**	**230**	**302**	**910**
Total Volume	264	147	411	1346	464	1810	227	884	1111	3332
% App. Total	64.2	35.8		74.4	25.6		20.4	79.6		
PHF	.846	.875	.856	.922	.943	.927	.788	.961	.920	.915

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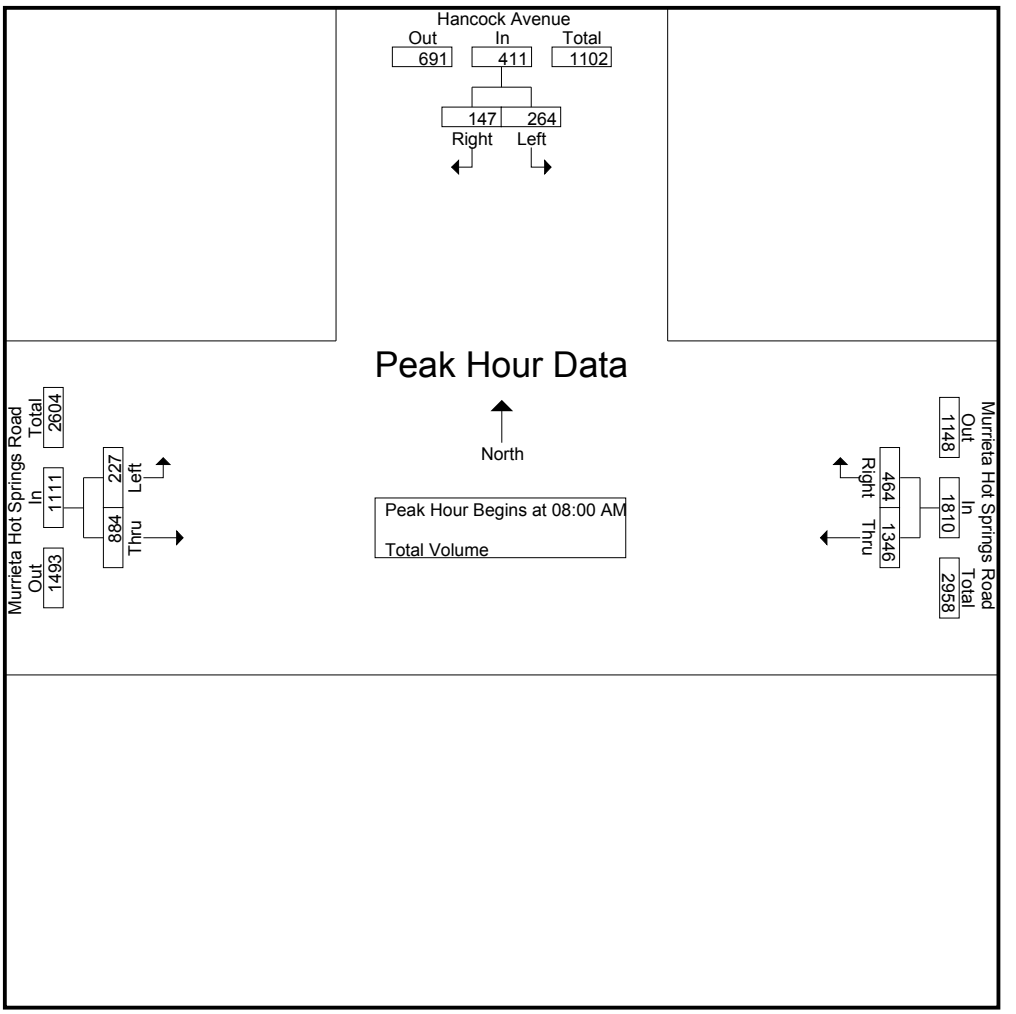
City of Murrieta
N/S: Hancock Avenue
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURHAMHSAM
Site Code : 10266048
Start Date : 11/30/2010
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:30 AM			08:00 AM			08:00 AM		
+0 mins.	78	37	115	296	113	409	41	210	251
+15 mins.	**82**	**43**	**125**	339	122	461	60	220	280
+30 mins.	53	28	81	346	106	452	54	224	278
+45 mins.	59	38	97	**365**	**123**	**488**	**72**	**230**	**302**
Total Volume	272	146	418	1346	464	1810	227	884	1111
% App. Total	65.1	34.9		74.4	25.6		20.4	79.6	
PHF	.829	.849	.836	.922	.943	.927	.788	.961	.920

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City of Murrieta
N/S: Hancock Avenue
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURHAMHSPM
Site Code : 10266048
Start Date : 11/30/2010

Groups Printed- Total Volume

	Hancock Avenue Southbound			Murrieta Hot Springs Road Westbound			Murrieta Hot Springs Road Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
04:00 PM	115	57	172	386	114	500	53	407	460	1132
04:15 PM	115	51	166	381	120	501	65	421	486	1153
04:30 PM	131	47	178	356	106	462	51	440	491	1131
04:45 PM	120	49	169	379	101	480	57	478	535	1184
Total	481	204	685	1502	441	1943	226	1746	1972	4600
05:00 PM	185	49	234	339	106	445	65	461	526	1205
05:15 PM	133	38	171	391	108	499	64	545	609	1279
05:30 PM	160	52	212	299	84	383	71	389	460	1055
05:45 PM	108	33	141	323	89	412	46	467	513	1066
Total	586	172	758	1352	387	1739	246	1862	2108	4605
Grand Total	1067	376	1443	2854	828	3682	472	3608	4080	9205
Apprch %	73.9	26.1		77.5	22.5		11.6	88.4		
Total %	11.6	4.1	15.7	31	9	40	5.1	39.2	44.3	

	Hancock Avenue Southbound			Murrieta Hot Springs Road Westbound			Murrieta Hot Springs Road Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	131	47	178	356	106	462	51	440	491	1131
04:45 PM	120	**49**	169	379	101	480	57	478	535	1184
05:00 PM	**185**	49	**234**	339	106	445	**65**	461	526	1205
05:15 PM	133	38	171	**391**	**108**	**499**	64	**545**	**609**	**1279**
Total Volume	569	183	752	1465	421	1886	237	1924	2161	4799
% App. Total	75.7	24.3		77.7	22.3		11	89		
PHF	.769	.934	.803	.937	.975	.945	.912	.883	.887	.938

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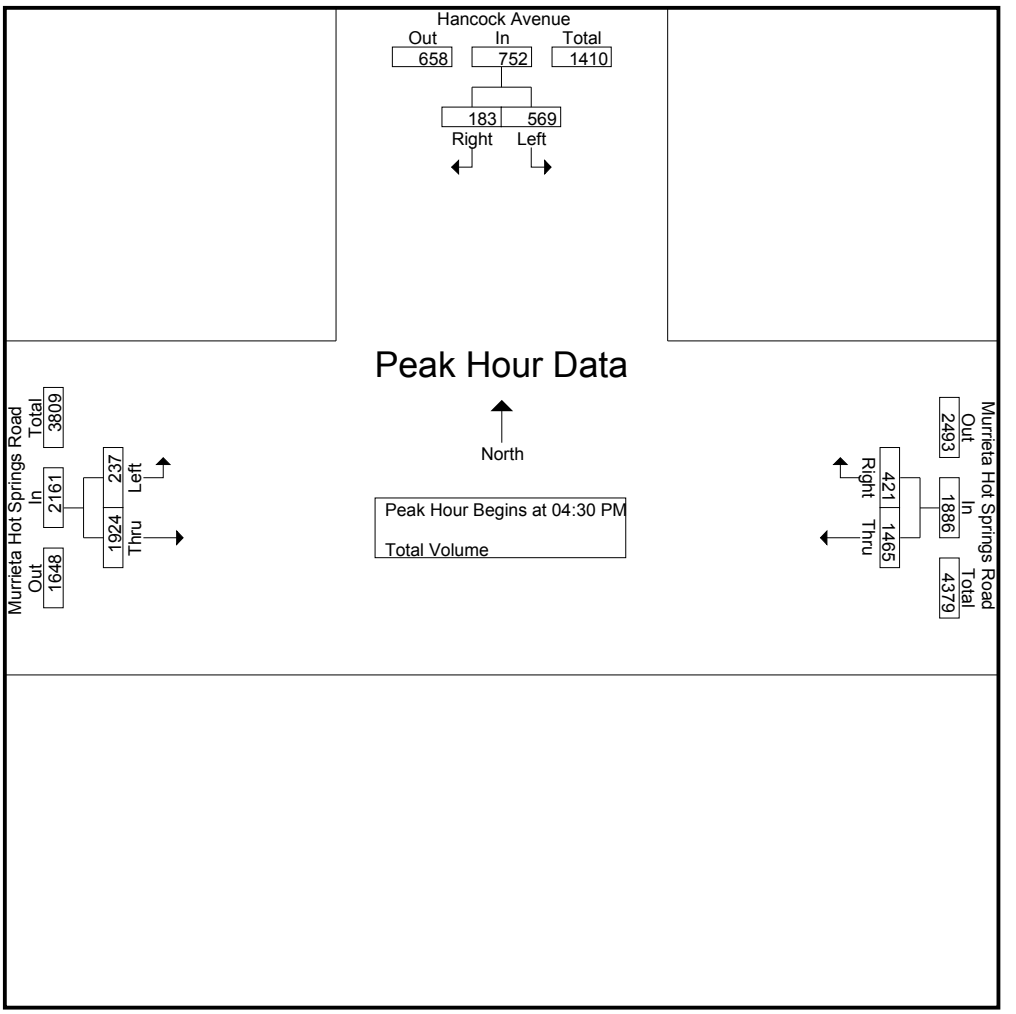
City of Murrieta
N/S: Hancock Avenue
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURHAMHSPM
Site Code : 10266048
Start Date : 11/30/2010
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:45 PM			04:00 PM			04:30 PM		
+0 mins.	120	49	169	**386**	114	500	51	440	491
+15 mins.	**185**	49	**234**	381	**120**	**501**	57	478	535
+30 mins.	133	38	171	356	106	462	**65**	461	526
+45 mins.	160	**52**	212	379	101	480	64	**545**	**609**
Total Volume	598	188	786	1502	441	1943	237	1924	2161
% App. Total	76.1	23.9		77.3	22.7		11	89	
PHF	.808	.904	.840	.973	.919	.970	.912	.883	.887

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City of Murrieta
N/S: Alta Murrieta Drive
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURAMMHSAM
Site Code : 10266044
Start Date : 11/30/2010

Groups Printed- Total Volume

	Alta Murrieta Drive Southbound				Murrieta Hot Springs Road Westbound				Alta Murrieta Drive Northbound				Murrieta Hot Springs Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	3	8	102	113	10	402	11	423	54	7	1	62	23	166	33	222	820
07:15 AM	3	10	75	88	15	403	2	420	52	8	5	65	30	208	36	274	847
07:30 AM	8	12	58	78	7	380	8	395	51	6	3	60	22	285	35	342	875
07:45 AM	21	9	72	102	11	334	13	358	43	3	4	50	46	326	45	417	927
Total	35	39	307	381	43	1519	34	1596	200	24	13	237	121	985	149	1255	3469
08:00 AM	9	14	58	81	9	349	25	383	41	10	6	57	50	264	55	369	890
08:15 AM	13	27	77	117	18	329	23	370	46	14	1	61	64	232	51	347	895
08:30 AM	23	32	88	143	21	311	35	367	50	18	2	70	64	222	61	347	927
08:45 AM	16	21	74	111	24	361	24	409	38	15	5	58	71	277	68	416	994
Total	61	94	297	452	72	1350	107	1529	175	57	14	246	249	995	235	1479	3706
Grand Total	96	133	604	833	115	2869	141	3125	375	81	27	483	370	1980	384	2734	7175
Apprch %	11.5	16	72.5		3.7	91.8	4.5		77.6	16.8	5.6		13.5	72.4	14		
Total %	1.3	1.9	8.4	11.6	1.6	40	2	43.6	5.2	1.1	0.4	6.7	5.2	27.6	5.4	38.1	

	Alta Murrieta Drive Southbound				Murrieta Hot Springs Road Westbound				Alta Murrieta Drive Northbound				Murrieta Hot Springs Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	9	14	58	81	9	349	25	383	41	10	**6**	57	50	264	55	369	890
08:15 AM	13	27	77	117	18	329	23	370	46	14	1	61	64	232	51	347	895
08:30 AM	**23**	**32**	**88**	**143**	21	311	**35**	367	**50**	**18**	2	**70**	64	222	61	347	927
08:45 AM	16	21	74	111	**24**	**361**	24	**409**	38	15	5	58	**71**	**277**	**68**	**416**	**994**
Total Volume	61	94	297	452	72	1350	107	1529	175	57	14	246	249	995	235	1479	3706
% App. Total	13.5	20.8	65.7		4.7	88.3	7		71.1	23.2	5.7		16.8	67.3	15.9		
PHF	.663	.734	.844	.790	.750	.935	.764	.935	.875	.792	.583	.879	.877	.898	.864	.889	.932

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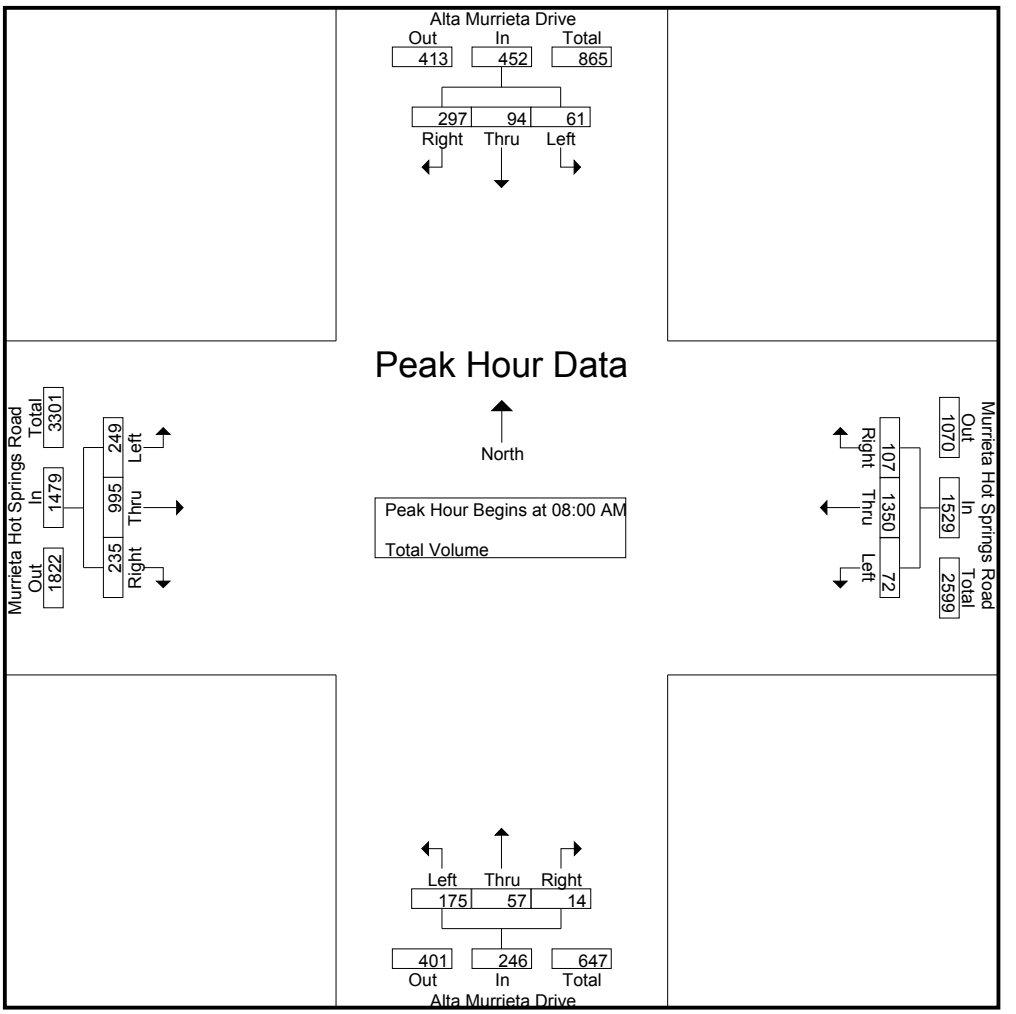
City of Murrieta
N/S: Alta Murrieta Drive
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURAMMHSAM
Site Code : 10266044
Start Date : 11/30/2010
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00 AM				07:00 AM				08:00 AM				07:45 AM			
+0 mins.	9	14	58	81	10	402	11	**423**	41	10	**6**	57	46	**326**	45	**417**
+15 mins.	13	27	77	117	**15**	**403**	2	420	46	14	1	61	50	264	55	369
+30 mins.	**23**	**32**	**88**	**143**	7	380	8	395	**50**	**18**	2	**70**	**64**	232	51	347
+45 mins.	16	21	74	111	11	334	**13**	358	38	15	5	58	64	222	**61**	347
Total Volume	61	94	297	452	43	1519	34	1596	175	57	14	246	224	1044	212	1480
% App. Total	13.5	20.8	65.7		2.7	95.2	2.1		71.1	23.2	5.7		15.1	70.5	14.3	
PHF	.663	.734	.844	.790	.717	.942	.654	.943	.875	.792	.583	.879	.875	.801	.869	.887

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City of Murrieta
N/S: Alta Murrieta Drive
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURAMMHSPM
Site Code : 10266044
Start Date : 11/30/2010

Groups Printed- Total Volume

	Alta Murrieta Drive Southbound				Murrieta Hot Springs Road Westbound				Alta Murrieta Drive Northbound				Murrieta Hot Springs Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	50	24	96	170	41	360	46	447	99	28	6	133	151	421	133	705	1455
04:15 PM	58	22	104	184	29	294	35	358	96	59	13	168	137	381	121	639	1349
04:30 PM	40	29	107	176	27	375	40	442	101	43	9	153	178	422	108	708	1479
04:45 PM	57	35	99	191	42	271	36	349	100	42	13	155	177	397	130	704	1399
Total	205	110	406	721	139	1300	157	1596	396	172	41	609	643	1621	492	2756	5682
05:00 PM	50	29	98	177	30	356	17	403	89	52	10	151	180	451	131	762	1493
05:15 PM	61	39	108	208	20	291	19	330	104	58	13	175	182	427	130	739	1452
05:30 PM	58	30	91	179	23	289	22	334	95	42	13	150	145	377	91	613	1276
05:45 PM	38	31	51	120	31	232	27	290	108	42	12	162	141	325	111	577	1149
Total	207	129	348	684	104	1168	85	1357	396	194	48	638	648	1580	463	2691	5370
Grand Total	412	239	754	1405	243	2468	242	2953	792	366	89	1247	1291	3201	955	5447	11052
Apprch %	29.3	17	53.7		8.2	83.6	8.2		63.5	29.4	7.1		23.7	58.8	17.5		
Total %	3.7	2.2	6.8	12.7	2.2	22.3	2.2	26.7	7.2	3.3	0.8	11.3	11.7	29	8.6	49.3	

	Alta Murrieta Drive Southbound				Murrieta Hot Springs Road Westbound				Alta Murrieta Drive Northbound				Murrieta Hot Springs Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	40	29	107	176	27	**375**	**40**	**442**	101	43	9	153	178	422	108	708	1479
04:45 PM	57	35	99	191	**42**	271	36	349	100	42	**13**	155	177	397	130	704	1399
05:00 PM	50	29	98	177	30	356	17	403	89	52	10	151	180	**451**	**131**	**762**	**1493**
05:15 PM	**61**	**39**	**108**	**208**	20	291	19	330	**104**	**58**	13	**175**	**182**	427	130	739	1452
Total Volume	208	132	412	752	119	1293	112	1524	394	195	45	634	717	1697	499	2913	5823
% App. Total	27.7	17.6	54.8		7.8	84.8	7.3		62.1	30.8	7.1		24.6	58.3	17.1		
PHF	.852	.846	.954	.904	.708	.862	.700	.862	.947	.841	.865	.906	.985	.941	.952	.956	.975

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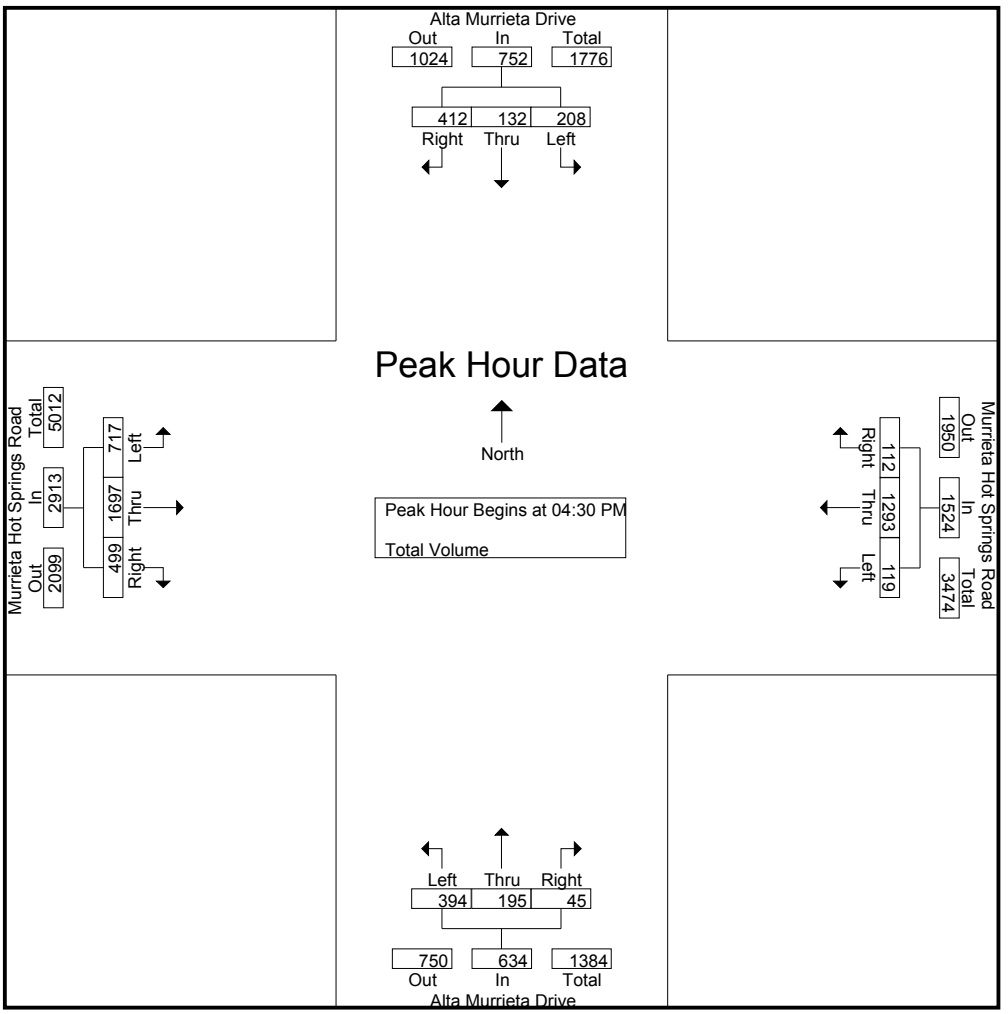
City of Murrieta
N/S: Alta Murrieta Drive
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURAMMHSPM
Site Code : 10266044
Start Date : 11/30/2010
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:45 PM				04:00 PM				05:00 PM				04:30 PM			
+0 mins.	57	35	99	191	41	360	**46**	**447**	89	52	10	151	178	422	108	708
+15 mins.	50	29	98	177	29	294	35	358	104	**58**	**13**	**175**	177	397	130	704
+30 mins.	**61**	**39**	**108**	**208**	27	**375**	40	442	95	42	13	150	180	**451**	**131**	**762**
+45 mins.	58	30	91	179	**42**	271	36	349	**108**	42	12	162	**182**	427	130	739
Total Volume	226	133	396	755	139	1300	157	1596	396	194	48	638	717	1697	499	2913
% App. Total	29.9	17.6	52.5		8.7	81.5	9.8		62.1	30.4	7.5		24.6	58.3	17.1	
PHF	.926	.853	.917	.907	.827	.867	.853	.893	.917	.836	.923	.911	.985	.941	.952	.956

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City of Murrieta
N/S: Winchester Road (SR-79)
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURWIMHSAM
Site Code : 10266661
Start Date : 12/1/2010
Page No : 1

Groups Printed- Total Volume

	Winchester Road (SR-79) Southbound				Murrieta Hot Springs Road Westbound				Winchester Road (SR-79) Northbound				Murrieta Hot Springs Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	18	349	89	456	84	89	3	176	37	184	38	259	86	39	34	159	1050
07:15 AM	7	353	127	487	65	86	7	158	51	219	41	311	106	48	23	177	1133
07:30 AM	21	359	131	511	53	75	9	137	43	211	28	282	114	64	18	196	1126
07:45 AM	25	380	138	543	53	75	9	137	22	178	33	233	154	90	31	275	1188
Total	71	1441	485	1997	255	325	28	608	153	792	140	1085	460	241	106	807	4497
08:00 AM	26	331	113	470	75	96	13	184	28	184	38	250	125	66	22	213	1117
08:15 AM	37	357	144	538	73	93	6	172	30	207	31	268	120	62	32	214	1192
08:30 AM	40	340	141	521	67	76	9	152	38	160	33	231	113	100	52	265	1169
08:45 AM	26	305	131	462	92	119	14	225	43	162	23	228	102	89	23	214	1129
Total	129	1333	529	1991	307	384	42	733	139	713	125	977	460	317	129	906	4607
Grand Total	200	2774	1014	3988	562	709	70	1341	292	1505	265	2062	920	558	235	1713	9104
Apprch %	5	69.6	25.4		41.9	52.9	5.2		14.2	73	12.9		53.7	32.6	13.7		
Total %	2.2	30.5	11.1	43.8	6.2	7.8	0.8	14.7	3.2	16.5	2.9	22.6	10.1	6.1	2.6	18.8	

	Winchester Road (SR-79) Southbound				Murrieta Hot Springs Road Westbound				Winchester Road (SR-79) Northbound				Murrieta Hot Springs Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	25	**380**	138	**543**	53	75	9	137	22	178	33	233	**154**	90	31	**275**	1188
08:00 AM	26	331	113	470	**75**	**96**	**13**	**184**	28	184	**38**	250	125	66	22	213	1117
08:15 AM	37	357	**144**	538	73	93	6	172	30	**207**	31	**268**	120	62	32	214	**1192**
08:30 AM	**40**	340	141	521	67	76	9	152	**38**	160	33	231	113	**100**	**52**	265	1169
Total Volume	128	1408	536	2072	268	340	37	645	118	729	135	982	512	318	137	967	4666
% App. Total	6.2	68	25.9		41.6	52.7	5.7		12	74.2	13.7		52.9	32.9	14.2		
PHF	.800	.926	.931	.954	.893	.885	.712	.876	.776	.880	.888	.916	.831	.795	.659	.879	.979

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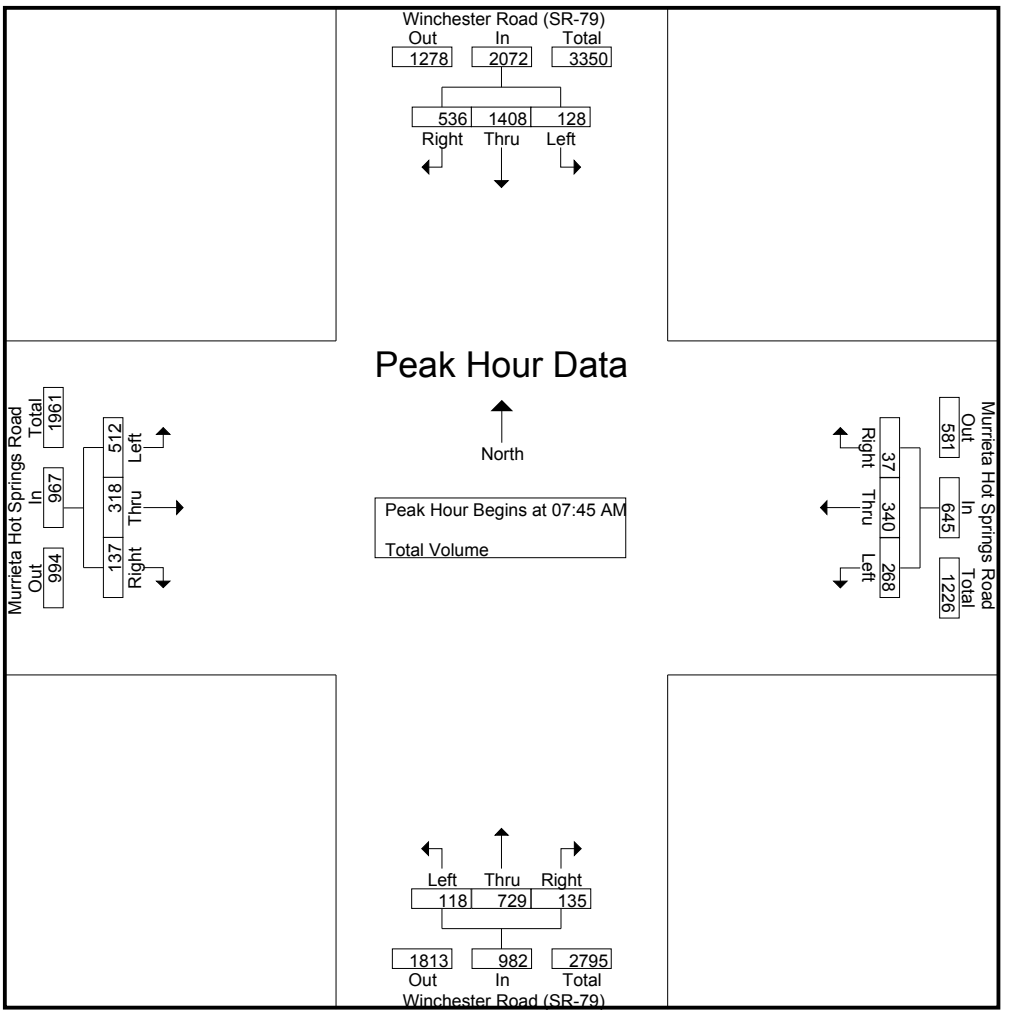
City of Murrieta
N/S: Winchester Road (SR-79)
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURWIMHSAM
Site Code : 10266661
Start Date : 12/1/2010
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:45 AM				08:00 AM				07:00 AM				07:45 AM			
+0 mins.	25	**380**	138	**543**	75	96	13	184	37	184	38	259	**154**	90	31	**275**
+15 mins.	26	331	113	470	73	93	6	172	**51**	**219**	**41**	**311**	125	66	22	213
+30 mins.	37	357	**144**	538	67	76	9	152	43	211	28	282	120	62	32	214
+45 mins.	**40**	340	141	521	**92**	**119**	**14**	**225**	22	178	33	233	113	**100**	**52**	265
Total Volume	128	1408	536	2072	307	384	42	733	153	792	140	1085	512	318	137	967
% App. Total	6.2	68	25.9		41.9	52.4	5.7		14.1	73	12.9		52.9	32.9	14.2	
PHF	.800	.926	.931	.954	.834	.807	.750	.814	.750	.904	.854	.872	.831	.795	.659	.879

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City of Murrieta
N/S: Winchester Road (SR-79)
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURWIMHSPM
Site Code : 10266661
Start Date : 12/1/2010
Page No : 1

Groups Printed- Total Volume

	Winchester Road (SR-79) Southbound				Murrieta Hot Springs Road Westbound				Winchester Road (SR-79) Northbound				Murrieta Hot Springs Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	33	228	112	373	60	95	17	172	58	419	45	522	141	107	30	278	1345
04:15 PM	30	237	106	373	70	87	11	168	70	381	43	494	166	142	45	353	1388
04:30 PM	26	283	151	460	63	113	17	193	56	469	54	579	153	117	57	327	1559
04:45 PM	34	257	99	390	67	108	24	199	64	417	54	535	139	147	51	337	1461
Total	123	1005	468	1596	260	403	69	732	248	1686	196	2130	599	513	183	1295	5753
05:00 PM	32	287	142	461	73	104	10	187	60	422	53	535	153	116	54	323	1506
05:15 PM	52	239	108	399	69	95	14	178	62	259	49	370	185	148	46	379	1326
05:30 PM	38	265	111	414	60	107	14	181	55	257	39	351	205	175	63	443	1389
05:45 PM	30	226	87	343	83	71	17	171	46	377	60	483	221	163	42	426	1423
Total	152	1017	448	1617	285	377	55	717	223	1315	201	1739	764	602	205	1571	5644
Grand Total	275	2022	916	3213	545	780	124	1449	471	3001	397	3869	1363	1115	388	2866	11397
Apprch %	8.6	62.9	28.5		37.6	53.8	8.6		12.2	77.6	10.3		47.6	38.9	13.5		
Total %	2.4	17.7	8	28.2	4.8	6.8	1.1	12.7	4.1	26.3	3.5	33.9	12	9.8	3.4	25.1	

	Winchester Road (SR-79) Southbound				Murrieta Hot Springs Road Westbound				Winchester Road (SR-79) Northbound				Murrieta Hot Springs Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	30	237	106	373	70	87	11	168	**70**	381	43	494	**166**	142	45	**353**	1388
04:30 PM	26	283	**151**	460	63	**113**	17	193	56	**469**	**54**	**579**	153	117	**57**	327	**1559**
04:45 PM	**34**	257	99	390	67	108	**24**	**199**	64	417	54	535	139	**147**	51	337	1461
05:00 PM	32	**287**	142	**461**	**73**	104	10	187	60	422	53	535	153	116	54	323	1506
Total Volume	122	1064	498	1684	273	412	62	747	250	1689	204	2143	611	522	207	1340	5914
% App. Total	7.2	63.2	29.6		36.5	55.2	8.3		11.7	78.8	9.5		45.6	39	15.4		
PHF	.897	.927	.825	.913	.935	.912	.646	.938	.893	.900	.944	.925	.920	.888	.908	.949	.948

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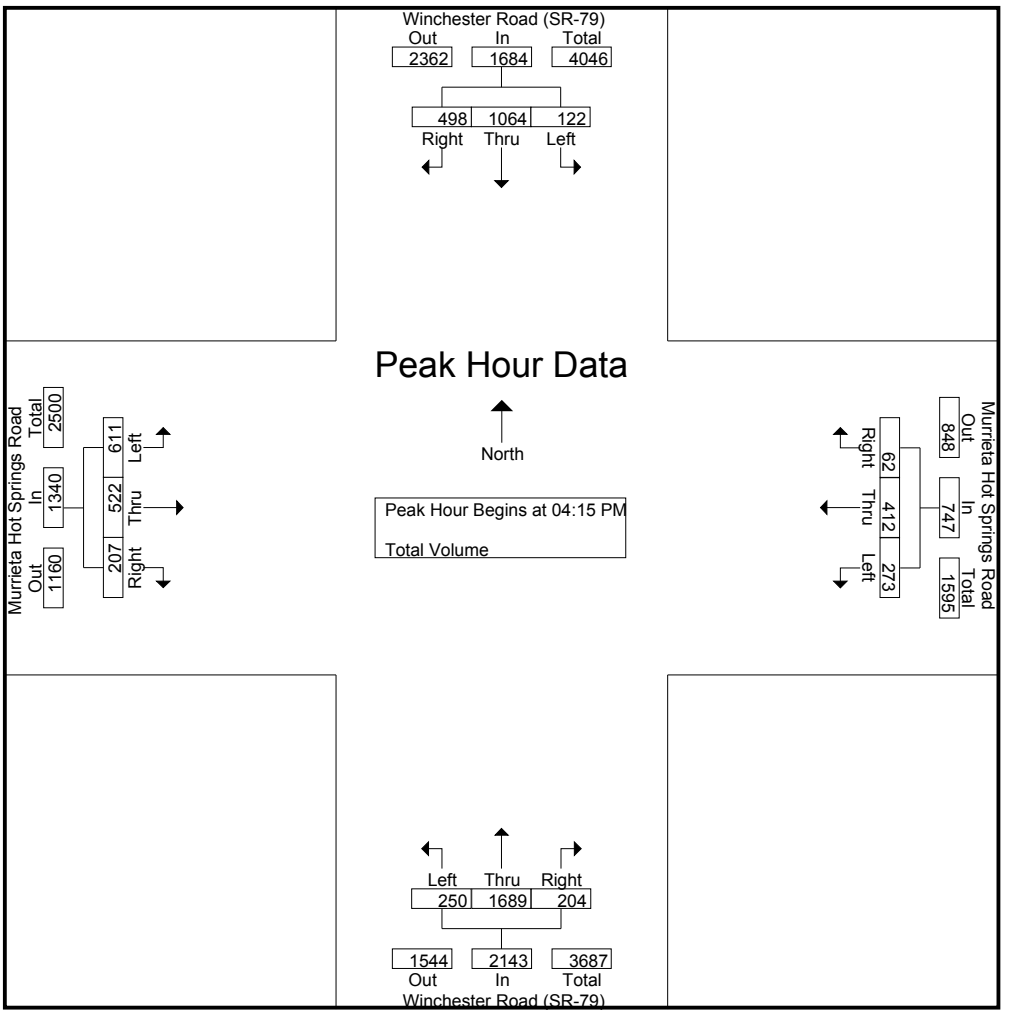
City of Murrieta
N/S: Winchester Road (SR-79)
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURWIMHSPM
Site Code : 10266661
Start Date : 12/1/2010
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:30 PM				04:30 PM				04:15 PM				05:00 PM			
+0 mins.	26	283	**151**	460	63	**113**	17	193	**70**	381	43	494	153	116	54	323
+15 mins.	34	257	99	390	67	108	**24**	**199**	56	**469**	**54**	**579**	185	148	46	379
+30 mins.	32	**287**	142	**461**	**73**	104	10	187	64	417	54	535	205	**175**	**63**	**443**
+45 mins.	**52**	239	108	399	69	95	14	178	60	422	53	535	**221**	163	42	426
Total Volume	144	1066	500	1710	272	420	65	757	250	1689	204	2143	764	602	205	1571
% App. Total	8.4	62.3	29.2		35.9	55.5	8.6		11.7	78.8	9.5		48.6	38.3	13	
PHF	.692	.929	.828	.927	.932	.929	.677	.951	.893	.900	.944	.925	.864	.860	.813	.887

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City of Murrieta
N/S: Hancock Avenue
E/W: Los Alamos Road
Weather: Sunny

File Name : MURHALAAM
Site Code : 10266022
Start Date : 12/1/2010
Page No : 1

Groups Printed- Total Volume

	Hancock Avenue Southbound				Los Alamos Road Westbound				Hancock Avenue Northbound				Los Alamos Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	122	24	16	162	32	84	23	139	3	12	7	22	7	97	7	111	434
07:15 AM	132	31	22	185	30	94	41	165	5	16	11	32	16	116	11	143	525
07:30 AM	120	46	25	191	49	102	32	183	1	18	13	32	12	96	10	118	524
07:45 AM	118	53	26	197	58	158	53	269	11	24	21	56	17	117	9	143	665
Total	492	154	89	735	169	438	149	756	20	70	52	142	52	426	37	515	2148
08:00 AM	129	53	29	211	52	127	66	245	8	28	16	52	32	121	19	172	680
08:15 AM	111	61	45	217	57	160	82	299	21	46	33	100	43	127	14	184	800
08:30 AM	152	74	45	271	55	259	87	401	11	35	21	67	25	177	20	222	961
08:45 AM	134	58	37	229	62	165	58	285	11	34	23	68	25	176	13	214	796
Total	526	246	156	928	226	711	293	1230	51	143	93	287	125	601	66	792	3237
Grand Total	1018	400	245	1663	395	1149	442	1986	71	213	145	429	177	1027	103	1307	5385
Apprch %	61.2	24.1	14.7		19.9	57.9	22.3		16.6	49.7	33.8		13.5	78.6	7.9		
Total %	18.9	7.4	4.5	30.9	7.3	21.3	8.2	36.9	1.3	4	2.7	8	3.3	19.1	1.9	24.3	

	Hancock Avenue Southbound				Los Alamos Road Westbound				Hancock Avenue Northbound				Los Alamos Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	129	53	29	211	52	127	66	245	8	28	16	52	32	121	19	172	680
08:15 AM	111	61	**45**	217	57	160	82	299	**21**	**46**	**33**	**100**	**43**	127	14	184	800
08:30 AM	**152**	**74**	45	**271**	55	**259**	**87**	**401**	11	35	21	67	25	**177**	**20**	**222**	**961**
08:45 AM	134	58	37	229	**62**	165	58	285	11	34	23	68	25	176	13	214	796
Total Volume	526	246	156	928	226	711	293	1230	51	143	93	287	125	601	66	792	3237
% App. Total	56.7	26.5	16.8		18.4	57.8	23.8		17.8	49.8	32.4		15.8	75.9	8.3		
PHF	.865	.831	.867	.856	.911	.686	.842	.767	.607	.777	.705	.718	.727	.849	.825	.892	.842

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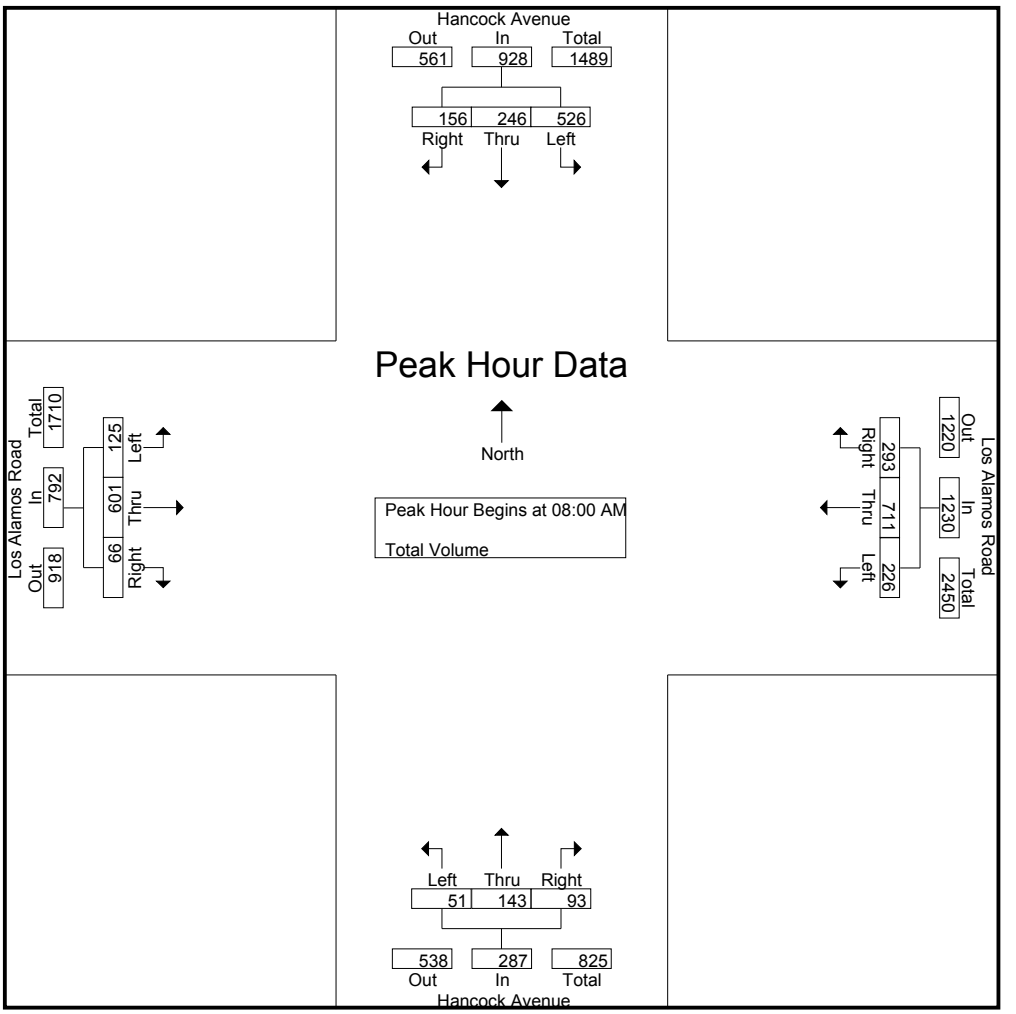
City of Murrieta
N/S: Hancock Avenue
E/W: Los Alamos Road
Weather: Sunny

File Name : MURHALAAM
Site Code : 10266022
Start Date : 12/1/2010
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00 AM				08:00 AM				08:00 AM				08:00 AM			
+0 mins.	129	53	29	211	52	127	66	245	8	28	16	52	32	121	19	172
+15 mins.	111	61	**45**	217	57	160	82	299	**21**	**46**	**33**	**100**	**43**	127	14	184
+30 mins.	**152**	**74**	45	**271**	55	**259**	**87**	**401**	11	35	21	67	25	**177**	**20**	**222**
+45 mins.	134	58	37	229	**62**	165	58	285	11	34	23	68	25	176	13	214
Total Volume	526	246	156	928	226	711	293	1230	51	143	93	287	125	601	66	792
% App. Total	56.7	26.5	16.8		18.4	57.8	23.8		17.8	49.8	32.4		15.8	75.9	8.3	
PHF	.865	.831	.867	.856	.911	.686	.842	.767	.607	.777	.705	.718	.727	.849	.825	.892

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City of Murrieta
N/S: Hancock Avenue
E/W: Los Alamos Road
Weather: Sunny

File Name : MURHALAPM
Site Code : 10266022
Start Date : 12/1/2010
Page No : 1

Groups Printed- Total Volume

	Hancock Avenue Southbound				Los Alamos Road Westbound				Hancock Avenue Northbound				Los Alamos Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	88	42	23	153	37	113	62	212	36	92	41	169	39	197	21	257	791
04:15 PM	108	44	26	178	30	130	66	226	39	109	61	209	50	226	24	300	913
04:30 PM	101	41	35	177	35	120	78	233	34	128	69	231	48	209	17	274	915
04:45 PM	122	54	18	194	38	149	80	267	40	124	50	214	42	258	25	325	1000
Total	419	181	102	702	140	512	286	938	149	453	221	823	179	890	87	1156	3619
05:00 PM	117	58	22	197	38	133	68	239	29	122	71	222	47	242	8	297	955
05:15 PM	107	54	15	176	38	127	72	237	42	153	87	282	54	237	16	307	1002
05:30 PM	113	56	10	179	49	128	75	252	38	160	82	280	55	228	13	296	1007
05:45 PM	84	32	15	131	42	129	67	238	43	118	57	218	46	186	16	248	835
Total	421	200	62	683	167	517	282	966	152	553	297	1002	202	893	53	1148	3799
Grand Total	840	381	164	1385	307	1029	568	1904	301	1006	518	1825	381	1783	140	2304	7418
Apprch %	60.6	27.5	11.8		16.1	54	29.8		16.5	55.1	28.4		16.5	77.4	6.1		
Total %	11.3	5.1	2.2	18.7	4.1	13.9	7.7	25.7	4.1	13.6	7	24.6	5.1	24	1.9	31.1	

	Hancock Avenue Southbound				Los Alamos Road Westbound				Hancock Avenue Northbound				Los Alamos Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	**122**	54	18	194	38	**149**	**80**	**267**	40	124	50	214	42	**258**	**25**	**325**	1000
05:00 PM	117	**58**	**22**	**197**	38	133	68	239	29	122	71	222	47	242	8	297	955
05:15 PM	107	54	15	176	38	127	72	237	**42**	153	**87**	**282**	54	237	16	307	1002
05:30 PM	113	56	10	179	**49**	128	75	252	38	**160**	82	280	**55**	228	13	296	**1007**
Total Volume	459	222	65	746	163	537	295	995	149	559	290	998	198	965	62	1225	3964
% App. Total	61.5	29.8	8.7		16.4	54	29.6		14.9	56	29.1		16.2	78.8	5.1		
PHF	.941	.957	.739	.947	.832	.901	.922	.932	.887	.873	.833	.885	.900	.935	.620	.942	.984

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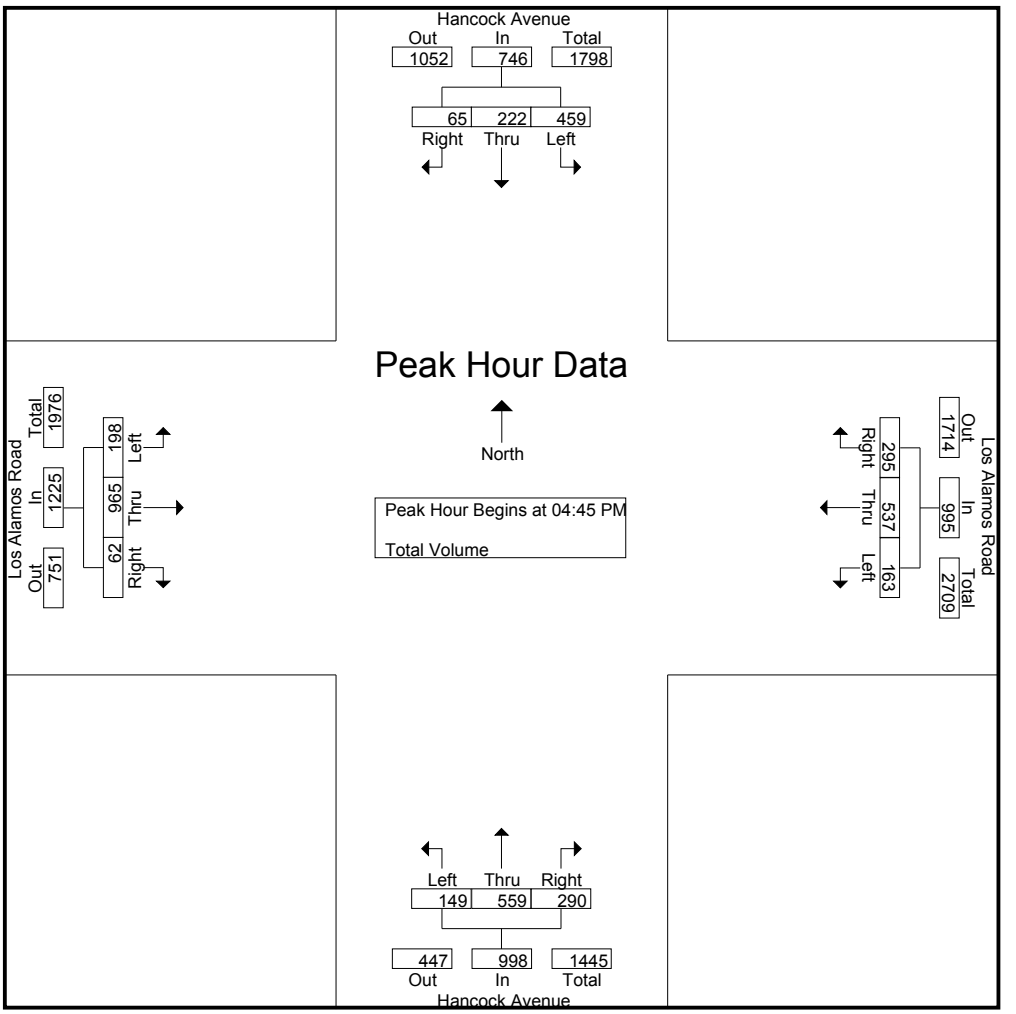
City of Murrieta
N/S: Hancock Avenue
E/W: Los Alamos Road
Weather: Sunny

File Name : MURHALAPM
Site Code : 10266022
Start Date : 12/1/2010
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:15 PM				04:45 PM				05:00 PM				04:45 PM			
+0 mins.	108	44	26	178	38	**149**	**80**	**267**	29	122	71	222	42	**258**	**25**	**325**
+15 mins.	101	41	**35**	177	38	133	68	239	42	153	**87**	**282**	47	242	8	297
+30 mins.	**122**	54	18	194	38	127	72	237	38	**160**	82	280	54	237	16	307
+45 mins.	117	**58**	22	**197**	**49**	128	75	252	**43**	118	57	218	**55**	228	13	296
Total Volume	448	197	101	746	163	537	295	995	152	553	297	1002	198	965	62	1225
% App. Total	60.1	26.4	13.5		16.4	54	29.6		15.2	55.2	29.6		16.2	78.8	5.1	
PHF	.918	.849	.721	.947	.832	.901	.922	.932	.884	.864	.853	.888	.900	.935	.620	.942

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City of Murrieta
N/S: I-215 Southbound Ramps
E/W: Los Alamos Road
Weather: Sunny

File Name : MUR215SLAAM
Site Code : 10266021
Start Date : 12/1/2010

Groups Printed- Total Volume

	I-215 Southbound Off Ramp Southbound				Los Alamos Road Westbound				I-215 Southbound On Ramp Northbound				Los Alamos Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	27	0	52	79	58	98	0	156	0	0	0	0	0	165	90	255	490
07:15 AM	21	0	90	111	43	121	0	164	0	0	0	0	0	163	114	277	552
07:30 AM	23	1	110	134	52	127	0	179	0	0	0	0	0	144	100	244	557
07:45 AM	20	0	129	149	45	158	0	203	0	0	0	0	0	181	101	282	634
Total	91	1	381	473	198	504	0	702	0	0	0	0	0	653	405	1058	2233
08:00 AM	28	0	124	152	63	184	0	247	0	0	0	0	0	188	78	266	665
08:15 AM	31	0	134	165	62	254	0	316	0	0	0	0	0	204	108	312	793
08:30 AM	20	0	123	143	66	258	0	324	0	0	0	0	0	198	132	330	797
08:45 AM	40	1	116	157	59	203	0	262	0	0	0	0	0	211	108	319	738
Total	119	1	497	617	250	899	0	1149	0	0	0	0	0	801	426	1227	2993
Grand Total	210	2	878	1090	448	1403	0	1851	0	0	0	0	0	1454	831	2285	5226
Apprch %	19.3	0.2	80.6		24.2	75.8	0		0	0	0		0	63.6	36.4		
Total %	4	0	16.8	20.9	8.6	26.8	0	35.4	0	0	0	0	0	27.8	15.9	43.7	

	I-215 Southbound Off Ramp Southbound				Los Alamos Road Westbound				I-215 Southbound On Ramp Northbound				Los Alamos Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	28	0	124	152	63	184	0	247	0	0	0	0	0	188	78	266	665
08:15 AM	31	0	**134**	**165**	62	254	0	316	0	0	0	0	0	204	108	312	793
08:30 AM	20	0	123	143	**66**	**258**	0	**324**	0	0	0	0	0	198	**132**	**330**	**797**
08:45 AM	**40**	**1**	116	157	59	203	0	262	0	0	0	0	0	**211**	108	319	738
Total Volume	119	1	497	617	250	899	0	1149	0	0	0	0	0	801	426	1227	2993
% App. Total	19.3	0.2	80.6		21.8	78.2	0		0	0	0		0	65.3	34.7		
PHF	.744	.250	.927	.935	.947	.871	.000	.887	.000	.000	.000	.000	.000	.949	.807	.930	.939

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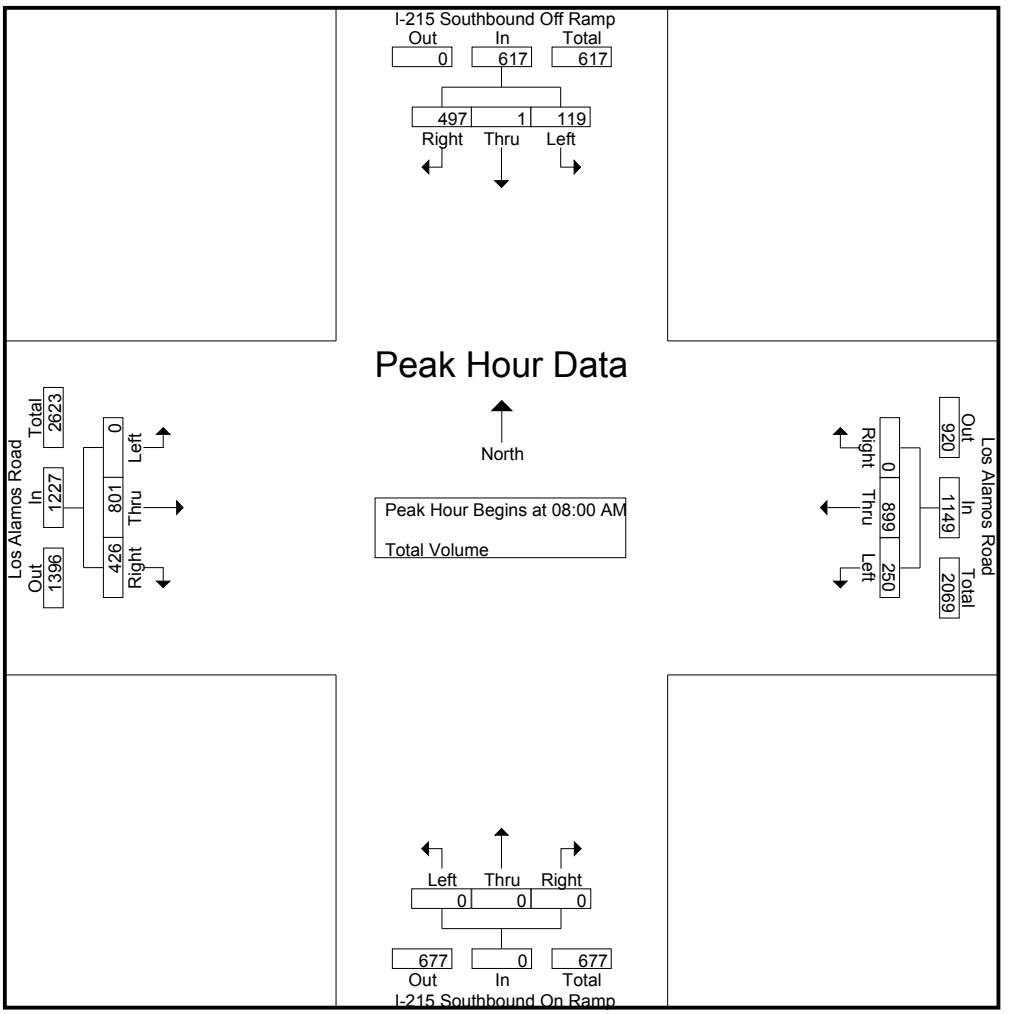
City of Murrieta
N/S: I-215 Southbound Ramps
E/W: Los Alamos Road
Weather: Sunny

File Name : MUR215SLAAM
Site Code : 10266021
Start Date : 12/1/2010
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00 AM				08:00 AM				07:00 AM				08:00 AM			
+0 mins.	28	0	124	152	63	184	0	247	0	0	0	0	0	188	78	266
+15 mins.	31	0	**134**	**165**	62	254	0	316	0	0	0	0	0	204	108	312
+30 mins.	20	0	123	143	**66**	**258**	0	**324**	0	0	0	0	0	198	**132**	**330**
+45 mins.	**40**	**1**	116	157	59	203	0	262	0	0	0	0	0	**211**	108	319
Total Volume	119	1	497	617	250	899	0	1149	0	0	0	0	0	801	426	1227
% App. Total	19.3	0.2	80.6		21.8	78.2	0		0	0	0		0	65.3	34.7	
PHF	.744	.250	.927	.935	.947	.871	.000	.887	.000	.000	.000	.000	.000	.949	.807	.930

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City of Murrieta
N/S: I-215 Southbound Ramps
E/W: Los Alamos Road
Weather: Sunny

File Name : MUR215SLAPM
Site Code : 10266021
Start Date : 12/1/2010
Page No : 1

Groups Printed- Total Volume

	I-215 Southbound Off Ramp Southbound				Los Alamos Road Westbound				I-215 Southbound On Ramp Northbound				Los Alamos Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	38	1	91	130	52	184	0	236	0	0	0	0	0	301	67	368	734
04:15 PM	45	1	93	139	49	184	0	233	0	0	0	0	0	333	68	401	773
04:30 PM	48	0	95	143	53	180	0	233	0	0	0	0	0	335	72	407	783
04:45 PM	60	1	116	177	39	188	0	227	0	0	0	0	0	336	80	416	820
Total	191	3	395	589	193	736	0	929	0	0	0	0	0	1305	287	1592	3110
05:00 PM	40	1	82	123	35	199	0	234	0	0	0	0	0	357	86	443	800
05:15 PM	50	1	96	147	41	169	0	210	0	0	0	0	0	380	48	428	785
05:30 PM	42	0	114	156	45	182	0	227	0	0	0	0	0	368	73	441	824
05:45 PM	47	1	99	147	42	157	0	199	0	0	0	0	0	317	61	378	724
Total	179	3	391	573	163	707	0	870	0	0	0	0	0	1422	268	1690	3133
Grand Total	370	6	786	1162	356	1443	0	1799	0	0	0	0	0	2727	555	3282	6243
Apprch %	31.8	0.5	67.6		19.8	80.2	0		0	0	0		0	83.1	16.9		
Total %	5.9	0.1	12.6	18.6	5.7	23.1	0	28.8	0	0	0	0	0	43.7	8.9	52.6	

	I-215 Southbound Off Ramp Southbound				Los Alamos Road Westbound				I-215 Southbound On Ramp Northbound				Los Alamos Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	**60**	**1**	**116**	**177**	39	188	0	227	0	0	0	0	0	336	80	416	820
05:00 PM	40	1	82	123	35	**199**	0	**234**	0	0	0	0	0	357	**86**	**443**	800
05:15 PM	50	1	96	147	41	169	0	210	0	0	0	0	0	**380**	48	428	785
05:30 PM	42	0	114	156	**45**	182	0	227	0	0	0	0	0	368	73	441	**824**
Total Volume	192	3	408	603	160	738	0	898	0	0	0	0	0	1441	287	1728	3229
% App. Total	31.8	0.5	67.7		17.8	82.2	0		0	0	0		0	83.4	16.6		
PHF	.800	.750	.879	.852	.889	.927	.000	.959	.000	.000	.000	.000	.000	.948	.834	.975	.980

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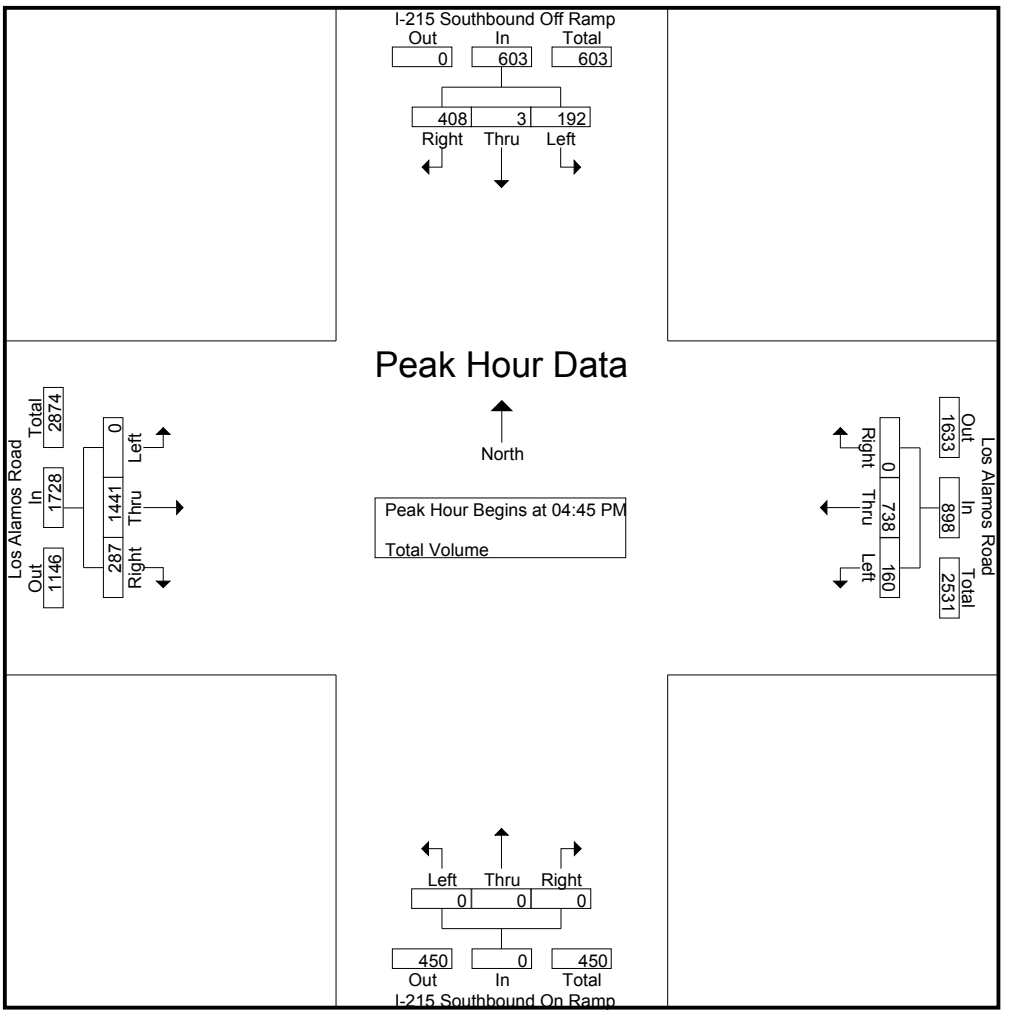
City of Murrieta
N/S: I-215 Southbound Ramps
E/W: Los Alamos Road
Weather: Sunny

File Name : MUR215SLAPM
Site Code : 10266021
Start Date : 12/1/2010
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:45 PM				04:00 PM				04:00 PM				04:45 PM			
+0 mins.	**60**	**1**	**116**	**177**	52	184	0	**236**	0	0	0	0	0	336	80	416
+15 mins.	40	1	82	123	49	184	0	233	0	0	0	0	0	357	**86**	**443**
+30 mins.	50	1	96	147	**53**	180	0	233	0	0	0	0	0	**380**	48	428
+45 mins.	42	0	114	156	39	**188**	0	227	0	0	0	0	0	368	73	441
Total Volume	192	3	408	603	193	736	0	929	0	0	0	0	0	1441	287	1728
% App. Total	31.8	0.5	67.7		20.8	79.2	0		0	0	0		0	83.4	16.6	
PHF	.800	.750	.879	.852	.910	.979	.000	.984	.000	.000	.000	.000	.000	.948	.834	.975

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City of Murrieta
N/S: I-215 Northbound Ramps
E/W: Los Alamos Road
Weather: Sunny

File Name : MUR215NLAAM
Site Code : 10266044
Start Date : 12/1/2010

Groups Printed- Total Volume

	I-215 Northbound On Ramp Southbound				Los Alamos Road Westbound				I-215 Northbound Off Ramp Northbound				Los Alamos Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	84	27	111	23	1	13	37	71	68	0	139	287
07:15 AM	0	0	0	0	0	151	28	179	26	3	18	47	77	114	0	191	417
07:30 AM	0	0	0	0	0	138	23	161	36	1	9	46	69	101	0	170	377
07:45 AM	0	0	0	0	0	166	21	187	41	0	25	66	87	118	0	205	458
Total	0	0	0	0	0	539	99	638	126	5	65	196	304	401	0	705	1539
08:00 AM	0	0	0	0	0	182	19	201	57	0	15	72	51	149	0	200	473
08:15 AM	0	0	0	0	0	272	23	295	52	1	30	83	63	198	0	261	639
08:30 AM	0	0	0	0	0	289	12	301	54	0	24	78	58	153	0	211	590
08:45 AM	0	0	0	0	0	208	18	226	46	0	38	84	70	170	0	240	550
Total	0	0	0	0	0	951	72	1023	209	1	107	317	242	670	0	912	2252
Grand Total	0	0	0	0	0	1490	171	1661	335	6	172	513	546	1071	0	1617	3791
Apprch %	0	0	0		0	89.7	10.3		65.3	1.2	33.5		33.8	66.2	0		
Total %	0	0	0	0	0	39.3	4.5	43.8	8.8	0.2	4.5	13.5	14.4	28.3	0	42.7	

	I-215 Northbound On Ramp Southbound				Los Alamos Road Westbound				I-215 Northbound Off Ramp Northbound				Los Alamos Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	0	0	0	0	182	19	201	**57**	0	15	72	51	149	0	200	473
08:15 AM	0	0	0	0	0	272	**23**	295	52	**1**	30	83	63	**198**	0	**261**	**639**
08:30 AM	0	0	0	0	0	**289**	12	**301**	54	0	24	78	58	153	0	211	590
08:45 AM	0	0	0	0	0	208	18	226	46	0	**38**	**84**	**70**	170	0	240	550
Total Volume	0	0	0	0	0	951	72	1023	209	1	107	317	242	670	0	912	2252
% App. Total	0	0	0		0	93	7		65.9	0.3	33.8		26.5	73.5	0		
PHF	.000	.000	.000	.000	.000	.823	.783	.850	.917	.250	.704	.943	.864	.846	.000	.874	.881

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City of Murrieta
N/S: I-215 Northbound Ramps
E/W: Los Alamos Road
Weather: Sunny

File Name : MUR215NLAAM
Site Code : 10266044
Start Date : 12/1/2010
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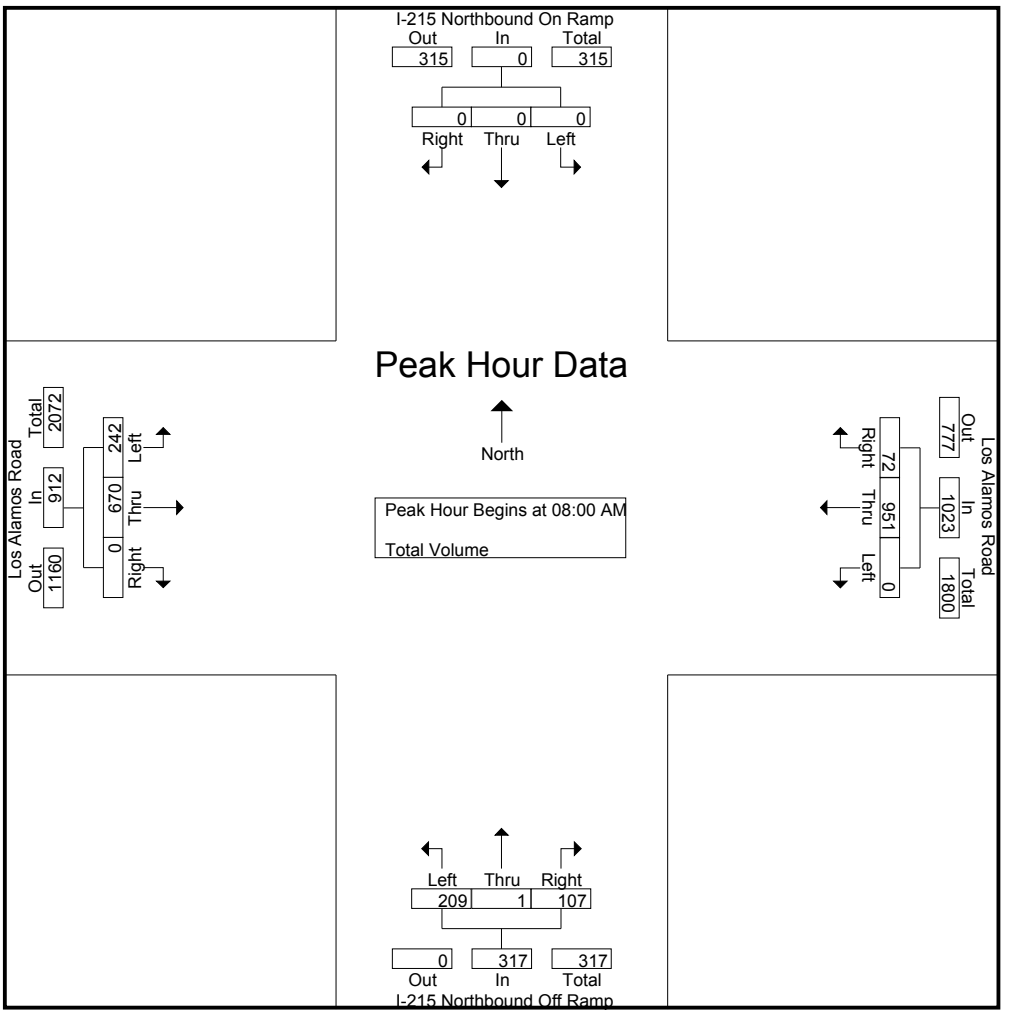

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				08:00 AM				08:00 AM				08:00 AM			
+0 mins.	0	0	0	0	0	182	19	201	**57**	0	15	72	51	149	0	200
+15 mins.	0	0	0	0	0	272	**23**	295	52	**1**	30	83	63	**198**	0	**261**
+30 mins.	0	0	0	0	0	**289**	12	**301**	54	0	24	78	58	153	0	211
+45 mins.	0	0	0	0	0	208	18	226	46	0	**38**	**84**	**70**	170	0	240
Total Volume	0	0	0	0	0	951	72	1023	209	1	107	317	242	670	0	912
% App. Total	0	0	0		0	93	7		65.9	0.3	33.8		26.5	73.5	0	
PHF	.000	.000	.000	.000	.000	.823	.783	.850	.917	.250	.704	.943	.864	.846	.000	.874

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City of Murrieta
N/S: I-215 Northbound Ramps
E/W: Los Alamos Road
Weather: Sunny

File Name : MUR215NLAPM
Site Code : 10266044
Start Date : 12/1/2010

Groups Printed- Total Volume

	I-215 Northbound On Ramp Southbound				Los Alamos Road Westbound				I-215 Northbound Off Ramp Northbound				Los Alamos Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	164	29	193	45	2	42	89	75	259	0	334	616
04:15 PM	0	0	0	0	0	207	25	232	39	0	26	65	112	273	0	385	682
04:30 PM	0	0	0	0	0	200	65	265	23	1	52	76	99	303	0	402	743
04:45 PM	0	0	0	0	0	186	42	228	30	3	55	88	76	314	0	390	706
Total	0	0	0	0	0	757	161	918	137	6	175	318	362	1149	0	1511	2747
05:00 PM	0	0	0	0	0	181	33	214	37	0	42	79	107	291	0	398	691
05:15 PM	0	0	0	0	0	180	24	204	22	0	37	59	97	305	0	402	665
05:30 PM	0	0	0	0	0	196	15	211	21	2	47	70	87	315	0	402	683
05:45 PM	0	0	0	0	0	146	22	168	42	1	60	103	62	259	0	321	592
Total	0	0	0	0	0	703	94	797	122	3	186	311	353	1170	0	1523	2631
Grand Total	0	0	0	0	0	1460	255	1715	259	9	361	629	715	2319	0	3034	5378
Apprch %	0	0	0		0	85.1	14.9		41.2	1.4	57.4		23.6	76.4	0		
Total %	0	0	0	0	0	27.1	4.7	31.9	4.8	0.2	6.7	11.7	13.3	43.1	0	56.4	

	I-215 Northbound On Ramp Southbound				Los Alamos Road Westbound				I-215 Northbound Off Ramp Northbound				Los Alamos Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	0	0	0	0	**207**	25	232	**39**	0	26	65	**112**	273	0	385	682
04:30 PM	0	0	0	0	0	200	**65**	**265**	23	1	52	76	99	303	0	**402**	**743**
04:45 PM	0	0	0	0	0	186	42	228	30	**3**	**55**	**88**	76	**314**	0	390	706
05:00 PM	0	0	0	0	0	181	33	214	37	0	42	79	107	291	0	398	691
Total Volume	0	0	0	0	0	774	165	939	129	4	175	308	394	1181	0	1575	2822
% App. Total	0	0	0		0	82.4	17.6		41.9	1.3	56.8		25	75	0		
PHF	.000	.000	.000	.000	.000	.935	.635	.886	.827	.333	.795	.875	.879	.940	.000	.979	.950

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City of Murrieta
N/S: I-215 Northbound Ramps
E/W: Los Alamos Road
Weather: Sunny

File Name : MUR215NLAPM
Site Code : 10266044
Start Date : 12/1/2010
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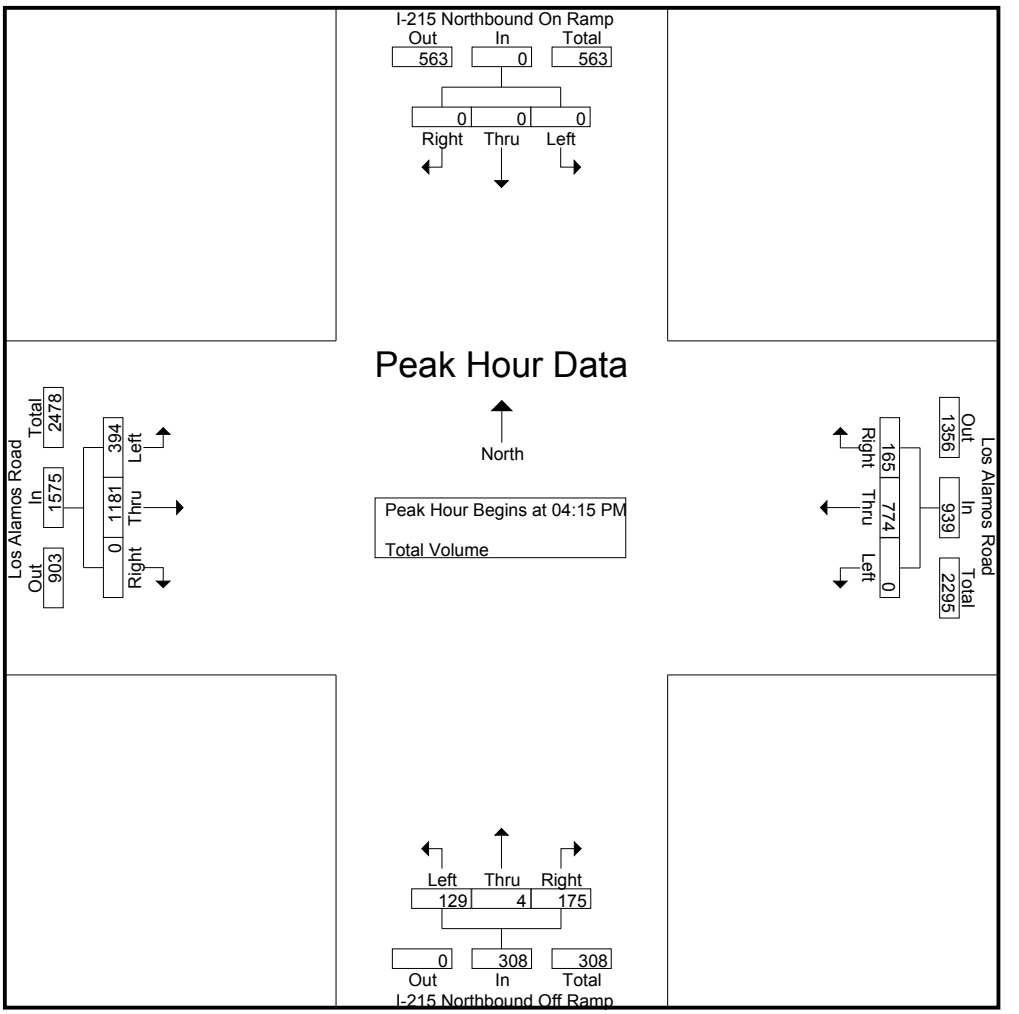

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:15 PM				04:00 PM				04:30 PM			
+0 mins.	0	0	0	0	0	**207**	25	232	**45**	2	42	**89**	99	303	0	**402**
+15 mins.	0	0	0	0	0	200	**65**	**265**	39	0	26	65	76	**314**	0	390
+30 mins.	0	0	0	0	0	186	42	228	23	1	52	76	**107**	291	0	398
+45 mins.	0	0	0	0	0	181	33	214	30	**3**	**55**	88	97	305	0	402
Total Volume	0	0	0	0	0	774	165	939	137	6	175	318	379	1213	0	1592
% App. Total	0	0	0		0	82.4	17.6		43.1	1.9	55		23.8	76.2	0	
PHF	.000	.000	.000	.000	.000	.935	.635	.886	.761	.500	.795	.893	.886	.966	.000	.990

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City of Murrieta
N/S: Whitewood Road
E/W: Los Alamos Road
Weather: Sunny

File Name : MURWHLAAM
Site Code : 10266027
Start Date : 12/1/2010
Page No : 1

Groups Printed- Total Volume

	Whitewood Road Southbound				Los Alamos Road Westbound				Whitewood Road Northbound				Los Alamos Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	2	3	29	34	15	37	4	56	29	11	3	43	16	35	13	64	197
07:15 AM	1	16	55	72	4	59	0	63	36	20	10	66	45	38	7	90	291
07:30 AM	3	21	45	69	7	75	2	84	28	24	8	60	20	33	18	71	284
07:45 AM	5	28	63	96	5	45	1	51	35	23	19	77	34	57	21	112	336
Total	11	68	192	271	31	216	7	254	128	78	40	246	115	163	59	337	1108
08:00 AM	2	45	91	138	17	91	3	111	27	23	22	72	25	98	18	141	462
08:15 AM	4	31	101	136	36	152	4	192	47	37	16	100	26	143	16	185	613
08:30 AM	1	44	74	119	41	140	3	184	55	32	15	102	38	45	32	115	520
08:45 AM	2	43	50	95	13	86	0	99	61	45	8	114	53	45	42	140	448
Total	9	163	316	488	107	469	10	586	190	137	61	388	142	331	108	581	2043
Grand Total	20	231	508	759	138	685	17	840	318	215	101	634	257	494	167	918	3151
Apprch %	2.6	30.4	66.9		16.4	81.5	2		50.2	33.9	15.9		28	53.8	18.2		
Total %	0.6	7.3	16.1	24.1	4.4	21.7	0.5	26.7	10.1	6.8	3.2	20.1	8.2	15.7	5.3	29.1	

	Whitewood Road Southbound				Los Alamos Road Westbound				Whitewood Road Northbound				Los Alamos Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:00 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	1	16	55	72	4	59	0	63	**36**	20	10	66	**45**	38	7	90	291
07:30 AM	3	21	45	69	7	75	2	84	28	**24**	8	60	20	33	18	71	284
07:45 AM	**5**	28	63	96	5	45	1	51	35	23	19	**77**	34	57	**21**	112	336
08:00 AM	2	**45**	**91**	**138**	**17**	**91**	**3**	**111**	27	23	**22**	72	25	**98**	18	**141**	**462**
Total Volume	11	110	254	375	33	270	6	309	126	90	59	275	124	226	64	414	1373
% App. Total	2.9	29.3	67.7		10.7	87.4	1.9		45.8	32.7	21.5		30	54.6	15.5		
PHF	.550	.611	.698	.679	.485	.742	.500	.696	.875	.938	.670	.893	.689	.577	.762	.734	.743

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City of Murrieta
N/S: Whitewood Road
E/W: Los Alamos Road
Weather: Sunny

File Name : MURWHLAAM
Site Code : 10266027
Start Date : 12/1/2010
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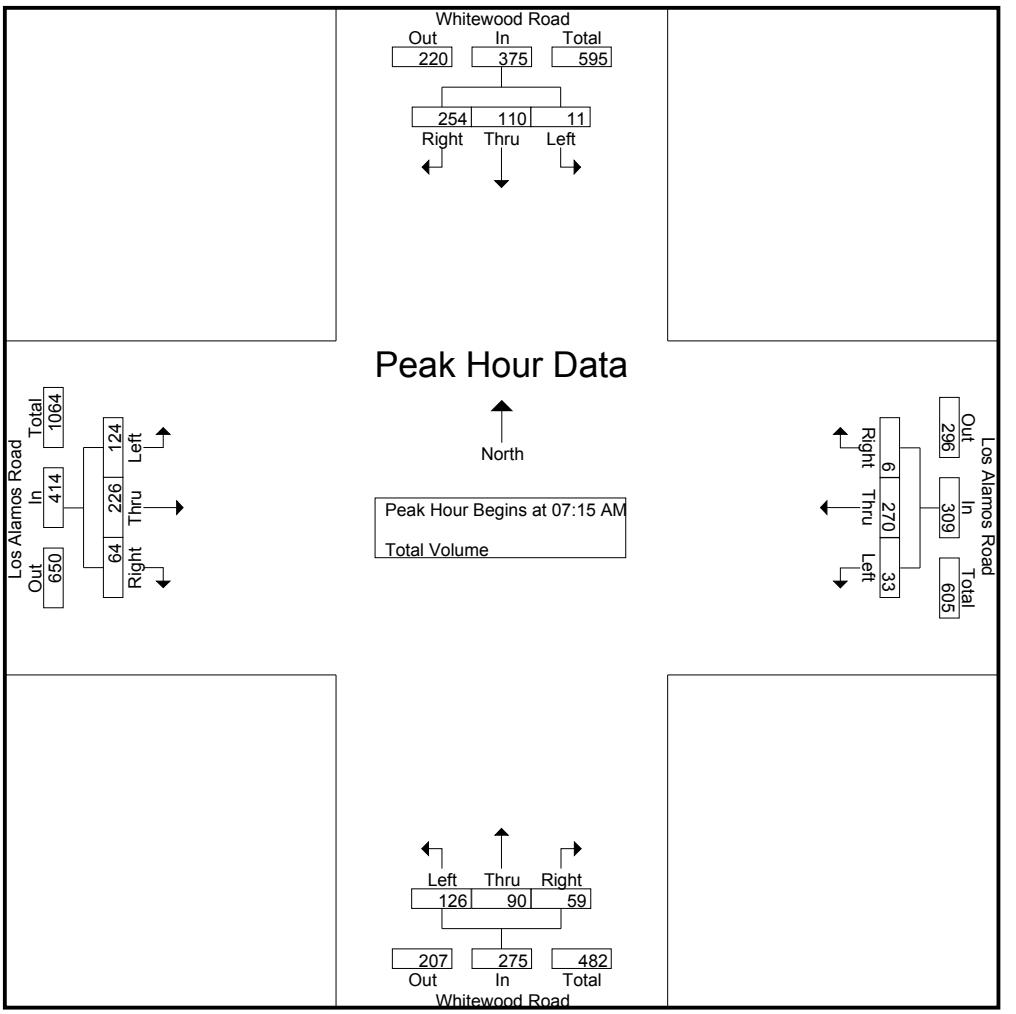

Peak Hour Analysis From 07:00 AM to 08:00 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:15 AM				07:15 AM				07:15 AM				07:15 AM			
+0 mins.	1	16	55	72	4	59	0	63	**36**	20	10	66	**45**	38	7	90
+15 mins.	3	21	45	69	7	75	2	84	28	**24**	8	60	20	33	18	71
+30 mins.	**5**	28	63	96	5	45	1	51	35	23	19	**77**	34	57	**21**	112
+45 mins.	2	**45**	**91**	**138**	**17**	**91**	**3**	**111**	27	23	**22**	72	25	**98**	18	**141**
Total Volume	11	110	254	375	33	270	6	309	126	90	59	275	124	226	64	414
% App. Total	2.9	29.3	67.7		10.7	87.4	1.9		45.8	32.7	21.5		30	54.6	15.5	
PHF	.550	.611	.698	.679	.485	.742	.500	.696	.875	.938	.670	.893	.689	.577	.762	.734

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City of Murrieta
N/S: Whitewood Road
E/W: Los Alamos Road
Weather: Sunny

File Name : MURWHLAPM
Site Code : 10266027
Start Date : 12/1/2010
Page No : 1

Groups Printed- Total Volume

	Whitewood Road Southbound				Los Alamos Road Westbound				Whitewood Road Northbound				Los Alamos Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	5	44	32	81	11	49	1	61	40	72	5	117	57	67	55	179	438
04:15 PM	4	57	33	94	17	53	5	75	44	63	6	113	62	86	62	210	492
04:30 PM	2	48	50	100	12	52	3	67	50	75	14	139	71	80	59	210	516
04:45 PM	5	54	40	99	17	55	5	77	48	102	20	170	73	97	73	243	589
Total	16	203	155	374	57	209	14	280	182	312	45	539	263	330	249	842	2035
05:00 PM	2	37	39	78	24	47	5	76	55	103	24	182	63	90	71	224	560
05:15 PM	2	45	48	95	21	58	4	83	52	94	23	169	81	95	68	244	591
05:30 PM	1	52	49	102	19	60	3	82	42	91	21	154	101	109	41	251	589
05:45 PM	5	40	26	71	18	50	4	72	48	93	17	158	97	97	50	244	545
Total	10	174	162	346	82	215	16	313	197	381	85	663	342	391	230	963	2285
Grand Total	26	377	317	720	139	424	30	593	379	693	130	1202	605	721	479	1805	4320
Apprch %	3.6	52.4	44		23.4	71.5	5.1		31.5	57.7	10.8		33.5	39.9	26.5		
Total %	0.6	8.7	7.3	16.7	3.2	9.8	0.7	13.7	8.8	16	3	27.8	14	16.7	11.1	41.8	

	Whitewood Road Southbound				Los Alamos Road Westbound				Whitewood Road Northbound				Los Alamos Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:00 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	4	**57**	33	94	17	53	**5**	75	44	63	6	113	62	86	62	210	492
04:30 PM	2	48	**50**	**100**	12	52	3	67	50	75	14	139	71	80	59	210	516
04:45 PM	**5**	54	40	99	17	**55**	5	**77**	48	102	20	170	**73**	**97**	**73**	**243**	**589**
05:00 PM	2	37	39	78	**24**	47	5	76	**55**	**103**	**24**	**182**	63	90	71	224	560
Total Volume	13	196	162	371	70	207	18	295	197	343	64	604	269	353	265	887	2157
% App. Total	3.5	52.8	43.7		23.7	70.2	6.1		32.6	56.8	10.6		30.3	39.8	29.9		
PHF	.650	.860	.810	.928	.729	.941	.900	.958	.895	.833	.667	.830	.921	.910	.908	.913	.916

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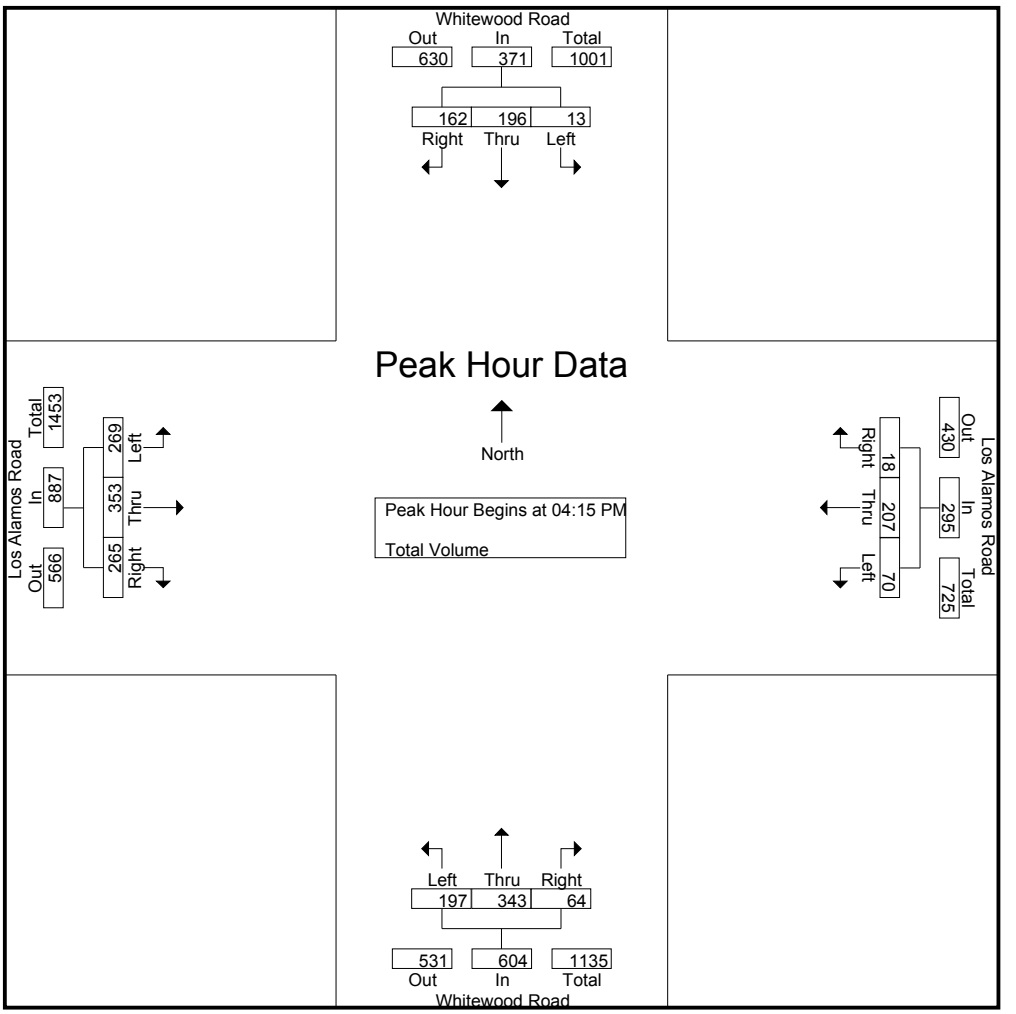
City of Murrieta
N/S: Whitewood Road
E/W: Los Alamos Road
Weather: Sunny

File Name : MURWHLAPM
Site Code : 10266027
Start Date : 12/1/2010
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:00 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:15 PM				04:15 PM				04:15 PM			
+0 mins.	**5**	44	32	81	17	53	**5**	75	44	63	6	113	62	86	62	210
+15 mins.	4	**57**	33	94	12	52	3	67	50	75	14	139	71	80	59	210
+30 mins.	2	48	**50**	**100**	17	**55**	5	**77**	48	102	20	170	**73**	**97**	**73**	**243**
+45 mins.	5	54	40	99	**24**	47	5	76	**55**	**103**	**24**	**182**	63	90	71	224
Total Volume	16	203	155	374	70	207	18	295	197	343	64	604	269	353	265	887
% App. Total	4.3	54.3	41.4		23.7	70.2	6.1		32.6	56.8	10.6		30.3	39.8	29.9	
PHF	.800	.890	.775	.935	.729	.941	.900	.958	.895	.833	.667	.830	.921	.910	.908	.913

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City of Murrieta
N/S: Whitewood Road
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURWHMHSAM
Site Code : 10266156
Start Date : 12/1/2010

Groups Printed- Total Volume

	Whitewood Road Southbound				Murrieta Hot Springs Westbound				Whitewood Road Northbound				Murrieta Hot Springs Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	34	2	6	42	0	332	28	360	4	1	5	10	4	165	2	171	583
07:15 AM	35	1	17	53	1	369	34	404	3	0	2	5	8	194	1	203	665
07:30 AM	46	1	24	71	2	381	32	415	1	1	4	6	5	215	2	222	714
07:45 AM	58	0	35	93	2	333	37	372	0	3	6	9	19	282	0	301	775
Total	173	4	82	259	5	1415	131	1551	8	5	17	30	36	856	5	897	2737
08:00 AM	76	1	12	89	4	358	27	389	2	12	10	24	5	275	0	280	782
08:15 AM	97	10	20	127	2	362	58	422	0	11	14	25	8	270	2	280	854
08:30 AM	94	5	15	114	10	399	80	489	1	15	10	26	7	270	2	279	908
08:45 AM	86	4	16	106	7	437	76	520	1	0	9	10	11	291	0	302	938
Total	353	20	63	436	23	1556	241	1820	4	38	43	85	31	1106	4	1141	3482
Grand Total	526	24	145	695	28	2971	372	3371	12	43	60	115	67	1962	9	2038	6219
Apprch %	75.7	3.5	20.9		0.8	88.1	11		10.4	37.4	52.2		3.3	96.3	0.4		
Total %	8.5	0.4	2.3	11.2	0.5	47.8	6	54.2	0.2	0.7	1	1.8	1.1	31.5	0.1	32.8	

	Whitewood Road Southbound				Murrieta Hot Springs Westbound				Whitewood Road Northbound				Murrieta Hot Springs Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	76	1	12	89	4	358	27	389	**2**	12	10	24	5	275	0	280	782
08:15 AM	**97**	**10**	**20**	**127**	2	362	58	422	0	11	**14**	25	8	270	**2**	280	854
08:30 AM	94	5	15	114	**10**	399	**80**	489	1	**15**	10	**26**	7	270	2	279	908
08:45 AM	86	4	16	106	7	**437**	76	**520**	1	0	9	10	**11**	**291**	0	**302**	**938**
Total Volume	353	20	63	436	23	1556	241	1820	4	38	43	85	31	1106	4	1141	3482
% App. Total	81	4.6	14.4		1.3	85.5	13.2		4.7	44.7	50.6		2.7	96.9	0.4		
PHF	.910	.500	.788	.858	.575	.890	.753	.875	.500	.633	.768	.817	.705	.950	.500	.945	.928

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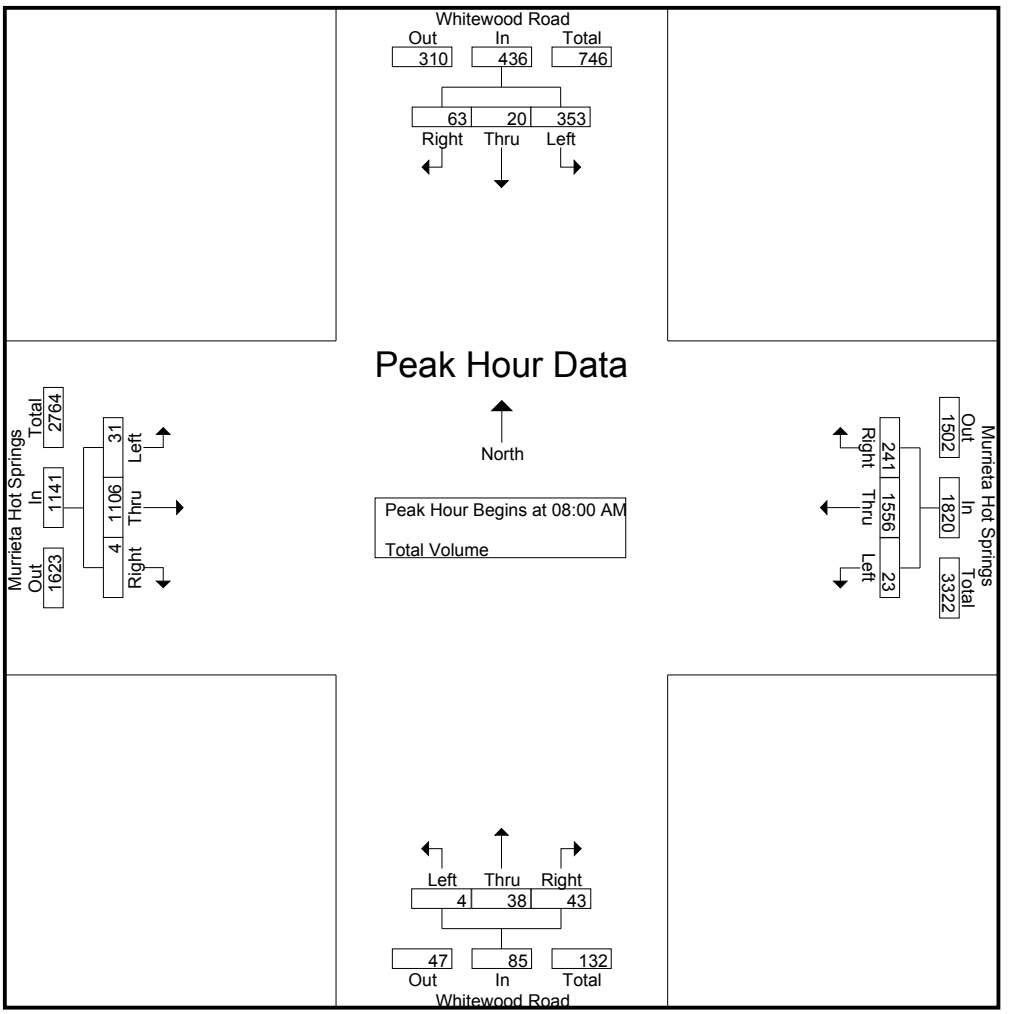
City of Murrieta
N/S: Whitewood Road
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURWHMHSAM
Site Code : 10266156
Start Date : 12/1/2010
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00 AM				08:00 AM				08:00 AM				08:00 AM			
+0 mins.	76	1	12	89	4	358	27	389	**2**	12	10	24	5	275	0	280
+15 mins.	**97**	**10**	**20**	**127**	2	362	58	422	0	11	**14**	25	8	270	**2**	280
+30 mins.	94	5	15	114	**10**	399	**80**	489	1	**15**	10	**26**	7	270	2	279
+45 mins.	86	4	16	106	7	**437**	76	**520**	1	0	9	10	**11**	**291**	0	**302**
Total Volume	353	20	63	436	23	1556	241	1820	4	38	43	85	31	1106	4	1141
% App. Total	81	4.6	14.4		1.3	85.5	13.2		4.7	44.7	50.6		2.7	96.9	0.4	
PHF	.910	.500	.788	.858	.575	.890	.753	.875	.500	.633	.768	.817	.705	.950	.500	.945

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City of Murrieta
N/S: Whitewood Road
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURWHMHSPM
Site Code : 10266156
Start Date : 12/1/2010

Groups Printed- Total Volume

	Whitewood Road Southbound				Murrieta Hot Springs Westbound				Whitewood Road Northbound				Murrieta Hot Springs Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	73	1	18	92	11	418	90	519	1	1	9	11	22	348	2	372	994
04:15 PM	90	2	20	112	5	418	85	508	1	2	5	8	22	441	2	465	1093
04:30 PM	65	4	20	89	5	443	88	536	1	1	2	4	19	492	2	513	1142
04:45 PM	92	1	29	122	5	471	94	570	2	1	3	6	27	481	1	509	1207
Total	320	8	87	415	26	1750	357	2133	5	5	19	29	90	1762	7	1859	4436
05:00 PM	79	1	17	97	8	440	116	564	0	3	4	7	27	441	2	470	1138
05:15 PM	80	1	27	108	3	422	119	544	3	0	7	10	28	489	1	518	1180
05:30 PM	78	3	16	97	6	405	92	503	4	2	1	7	29	477	4	510	1117
05:45 PM	68	2	25	95	6	387	95	488	1	0	4	5	27	469	1	497	1085
Total	305	7	85	397	23	1654	422	2099	8	5	16	29	111	1876	8	1995	4520
Grand Total	625	15	172	812	49	3404	779	4232	13	10	35	58	201	3638	15	3854	8956
Apprch %	77	1.8	21.2		1.2	80.4	18.4		22.4	17.2	60.3		5.2	94.4	0.4		
Total %	7	0.2	1.9	9.1	0.5	38	8.7	47.3	0.1	0.1	0.4	0.6	2.2	40.6	0.2	43	

	Whitewood Road Southbound				Murrieta Hot Springs Westbound				Whitewood Road Northbound				Murrieta Hot Springs Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	65	**4**	20	89	5	443	88	536	1	1	2	4	19	**492**	**2**	513	1142
04:45 PM	**92**	1	**29**	**122**	5	**471**	94	**570**	2	1	3	6	27	481	1	509	**1207**
05:00 PM	79	1	17	97	**8**	440	116	564	0	**3**	4	7	27	441	2	470	1138
05:15 PM	80	1	27	108	3	422	**119**	544	**3**	0	**7**	**10**	**28**	489	1	**518**	1180
Total Volume	316	7	93	416	21	1776	417	2214	6	5	16	27	101	1903	6	2010	4667
% App. Total	76	1.7	22.4		0.9	80.2	18.8		22.2	18.5	59.3		5	94.7	0.3		
PHF	.859	.438	.802	.852	.656	.943	.876	.971	.500	.417	.571	.675	.902	.967	.750	.970	.967

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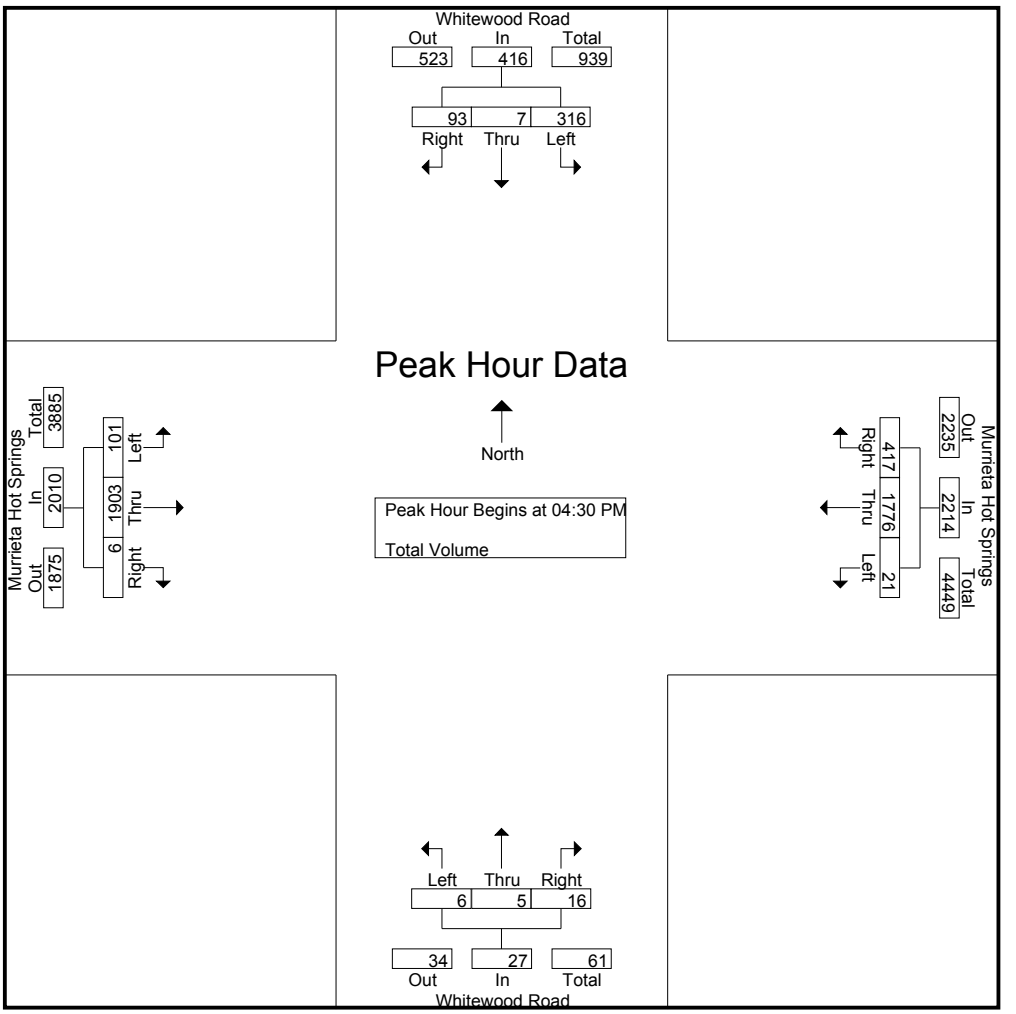
City of Murrieta
N/S: Whitewood Road
E/W: Murrieta Hot Springs Road
Weather: Sunny

File Name : MURWHMHSPM
Site Code : 10266156
Start Date : 12/1/2010
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:45 PM				04:30 PM				04:45 PM				04:30 PM			
+0 mins.	**92**	1	**29**	**122**	5	443	88	536	2	1	3	6	19	**492**	**2**	513
+15 mins.	79	1	17	97	5	**471**	94	**570**	0	**3**	4	7	27	481	1	509
+30 mins.	80	1	27	108	**8**	440	116	564	3	0	**7**	**10**	27	441	2	470
+45 mins.	78	**3**	16	97	3	422	**119**	544	**4**	2	1	7	**28**	489	1	**518**
Total Volume	329	6	89	424	21	1776	417	2214	9	6	15	30	101	1903	6	2010
% App. Total	77.6	1.4	21		0.9	80.2	18.8		30	20	50		5	94.7	0.3	
PHF	.894	.500	.767	.869	.656	.943	.876	.971	.563	.500	.536	.750	.902	.967	.750	.970

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City of Murrieta
N/S: Adams Avenue
E/W: Guava Street
Weather: Sunny

File Name : MURADGUAM
Site Code : 10266050
Start Date : 11/30/2010
Page No : 1

Groups Printed- Total Volume

	Adams Avenue Southbound			Guava Street Westbound			Adams Avenue Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
07:00 AM	9	3	12	0	2	2	2	0	2	16
07:15 AM	15	9	24	0	10	10	2	0	2	36
07:30 AM	20	15	35	0	8	8	1	0	1	44
07:45 AM	22	25	47	0	19	19	2	1	3	69
Total	66	52	118	0	39	39	7	1	8	165
08:00 AM	17	8	25	1	9	10	3	1	4	39
08:15 AM	28	15	43	1	11	12	5	0	5	60
08:30 AM	27	19	46	1	5	6	3	0	3	55
08:45 AM	13	10	23	2	11	13	8	1	9	45
Total	85	52	137	5	36	41	19	2	21	199
Grand Total	151	104	255	5	75	80	26	3	29	364
Apprch %	59.2	40.8		6.2	93.8		89.7	10.3		
Total %	41.5	28.6	70.1	1.4	20.6	22	7.1	0.8	8	

	Adams Avenue Southbound			Guava Street Westbound			Adams Avenue Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	22	**25**	**47**	0	**19**	**19**	2	**1**	3	**69**
08:00 AM	17	8	25	**1**	9	10	3	1	4	39
08:15 AM	**28**	15	43	1	11	12	**5**	0	**5**	60
08:30 AM	27	19	46	1	5	6	3	0	3	55
Total Volume	94	67	161	3	44	47	13	2	15	223
% App. Total	58.4	41.6		6.4	93.6		86.7	13.3		
PHF	.839	.670	.856	.750	.579	.618	.650	.500	.750	.808

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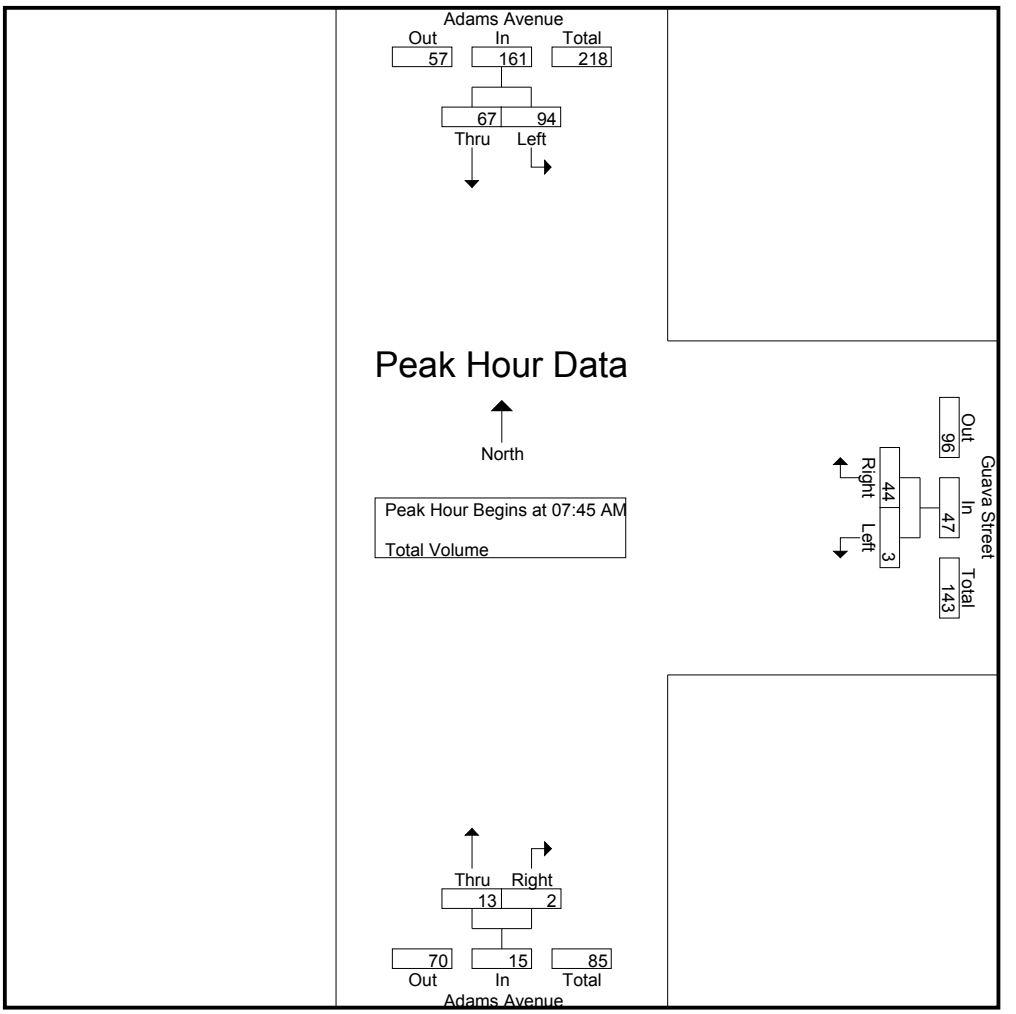
City of Murrieta
N/S: Adams Avenue
E/W: Guava Street
Weather: Sunny

File Name : MURADGUAM
Site Code : 10266050
Start Date : 11/30/2010
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:45 AM			07:30 AM			08:00 AM		
+0 mins.	22	**25**	**47**	0	8	8	3	**1**	4
+15 mins.	17	8	25	0	**19**	**19**	5	0	5
+30 mins.	**28**	15	43	**1**	9	10	3	0	3
+45 mins.	27	19	46	1	11	12	**8**	1	**9**
Total Volume	94	67	161	2	47	49	19	2	21
% App. Total	58.4	41.6		4.1	95.9		90.5	9.5	
PHF	.839	.670	.856	.500	.618	.645	.594	.500	.583

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City of Murrieta
N/S: Adams Avenue
E/W: Guava Street
Weather: Sunny

File Name : MURADGUPM
Site Code : 10266050
Start Date : 11/30/2010
Page No : 1

Groups Printed- Total Volume

	Adams Avenue Southbound			Guava Street Westbound			Adams Avenue Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
04:00 PM	15	15	30	5	13	18	20	9	29	77
04:15 PM	16	7	23	3	22	25	19	7	26	74
04:30 PM	24	5	29	0	25	25	29	6	35	89
04:45 PM	17	6	23	3	17	20	15	7	22	65
Total	72	33	105	11	77	88	83	29	112	305
05:00 PM	20	4	24	1	26	27	23	6	29	80
05:15 PM	12	4	16	4	21	25	21	2	23	64
05:30 PM	9	12	21	6	21	27	19	7	26	74
05:45 PM	12	6	18	6	16	22	16	12	28	68
Total	53	26	79	17	84	101	79	27	106	286
Grand Total	125	59	184	28	161	189	162	56	218	591
Apprch %	67.9	32.1		14.8	85.2		74.3	25.7		
Total %	21.2	10	31.1	4.7	27.2	32	27.4	9.5	36.9	

	Adams Avenue Southbound			Guava Street Westbound			Adams Avenue Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	16	**7**	23	**3**	22	25	19	**7**	26	74
04:30 PM	**24**	5	**29**	0	25	25	**29**	6	**35**	**89**
04:45 PM	17	6	23	3	17	20	15	7	22	65
05:00 PM	20	4	24	1	**26**	**27**	23	6	29	80
Total Volume	77	22	99	7	90	97	86	26	112	308
% App. Total	77.8	22.2		7.2	92.8		76.8	23.2		
PHF	.802	.786	.853	.583	.865	.898	.741	.929	.800	.865

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City of Murrieta
N/S: Adams Avenue
E/W: Guava Street
Weather: Sunny

File Name : MURADGUPM
Site Code : 10266050
Start Date : 11/30/2010
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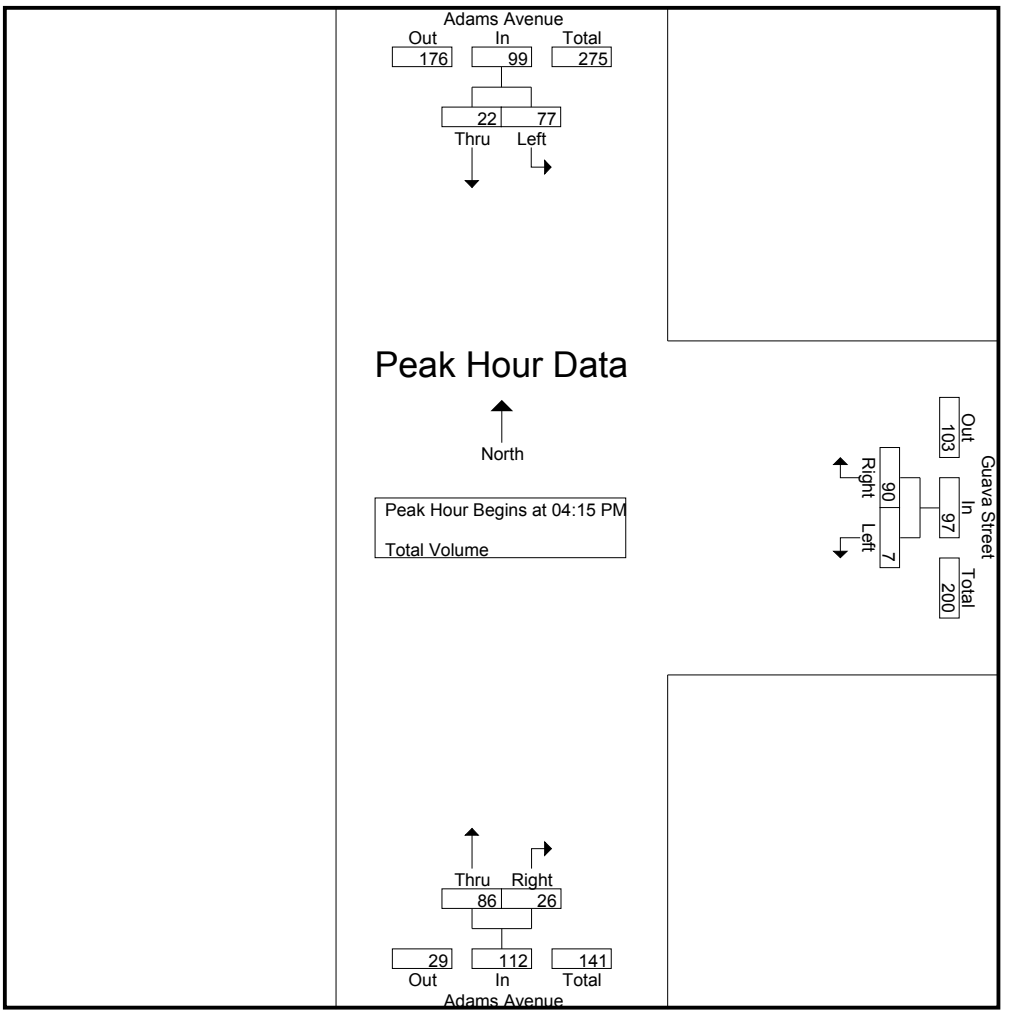

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM			05:00 PM			04:00 PM		
+0 mins.	15	**15**	**30**	1	**26**	**27**	20	**9**	29
+15 mins.	16	7	23	4	21	25	19	7	26
+30 mins.	**24**	5	29	**6**	21	27	**29**	6	**35**
+45 mins.	17	6	23	6	16	22	15	7	22
Total Volume	72	33	105	17	84	101	83	29	112
% App. Total	68.6	31.4		16.8	83.2		74.1	25.9	
PHF	.750	.550	.875	.708	.808	.935	.716	.806	.800

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City of Murrieta
N/S: Nutmeg Street
E/W: Clinton Keith Road
Weather: Sunny

File Name : MURNUCKAM
Site Code : 10266027
Start Date : 12/2/2010
Page No : 1

Groups Printed- Total Volume

	Nutmeg Street Southbound				Clinton Keith Road Westbound				Nutmeg Street Northbound				Clinton Keith Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	19	21	10	50	35	86	8	129	6	2	30	38	2	57	7	66	283
07:15 AM	23	14	6	43	49	89	13	151	10	9	48	67	3	84	8	95	356
07:30 AM	11	16	7	34	59	111	8	178	16	8	43	67	7	84	16	107	386
07:45 AM	32	9	13	54	38	87	8	133	16	7	53	76	3	92	32	127	390
Total	85	60	36	181	181	373	37	591	48	26	174	248	15	317	63	395	1415
08:00 AM	35	16	13	64	60	117	10	187	27	10	57	94	4	97	23	124	469
08:15 AM	26	12	3	41	42	96	17	155	16	3	49	68	5	72	8	85	349
08:30 AM	23	8	4	35	28	88	15	131	9	6	45	60	2	97	7	106	332
08:45 AM	15	6	6	27	25	74	12	111	10	3	38	51	6	99	7	112	301
Total	99	42	26	167	155	375	54	584	62	22	189	273	17	365	45	427	1451
Grand Total	184	102	62	348	336	748	91	1175	110	48	363	521	32	682	108	822	2866
Apprch %	52.9	29.3	17.8		28.6	63.7	7.7		21.1	9.2	69.7		3.9	83	13.1		
Total %	6.4	3.6	2.2	12.1	11.7	26.1	3.2	41	3.8	1.7	12.7	18.2	1.1	23.8	3.8	28.7	

	Nutmeg Street Southbound				Clinton Keith Road Westbound				Nutmeg Street Northbound				Clinton Keith Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	23	14	6	43	49	89	**13**	151	10	9	48	67	3	84	8	95	356
07:30 AM	11	**16**	7	34	59	111	8	178	16	8	43	67	**7**	84	16	107	386
07:45 AM	32	9	**13**	54	38	87	8	133	16	7	53	76	3	92	**32**	**127**	390
08:00 AM	**35**	16	13	**64**	**60**	**117**	10	**187**	**27**	**10**	**57**	**94**	4	**97**	23	124	**469**
Total Volume	101	55	39	195	206	404	39	649	69	34	201	304	17	357	79	453	1601
% App. Total	51.8	28.2	20		31.7	62.2	6		22.7	11.2	66.1		3.8	78.8	17.4		
PHF	.721	.859	.750	.762	.858	.863	.750	.868	.639	.850	.882	.809	.607	.920	.617	.892	.853

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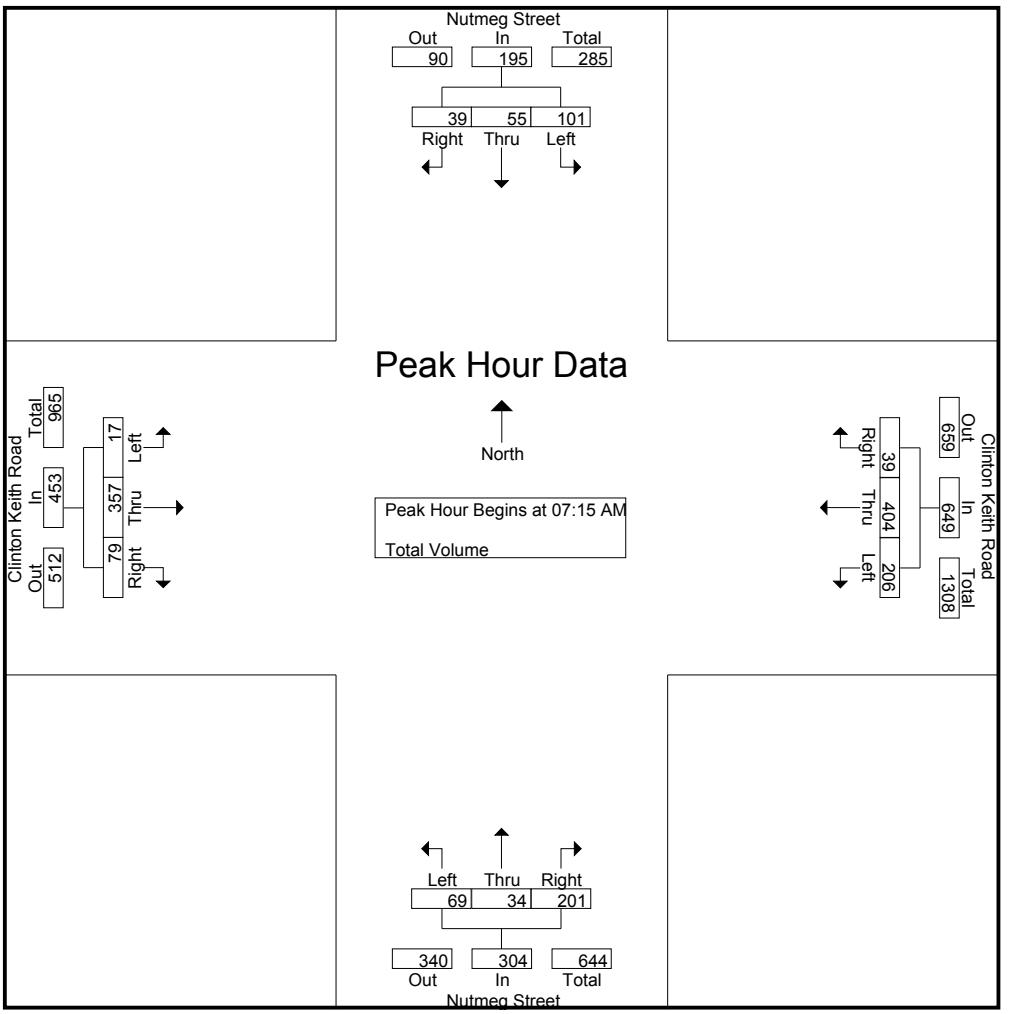
City of Murrieta
N/S: Nutmeg Street
E/W: Clinton Keith Road
Weather: Sunny

File Name : MURNUCKAM
Site Code : 10266027
Start Date : 12/2/2010
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:15 AM				07:30 AM				07:30 AM				07:15 AM			
+0 mins.	23	14	6	43	59	111	8	178	16	8	43	67	3	84	8	95
+15 mins.	11	**16**	7	34	38	87	8	133	16	7	53	76	**7**	84	16	107
+30 mins.	32	9	**13**	54	**60**	**117**	10	**187**	**27**	**10**	**57**	**94**	3	92	**32**	**127**
+45 mins.	**35**	16	13	**64**	42	96	**17**	155	16	3	49	68	4	**97**	23	124
Total Volume	101	55	39	195	199	411	43	653	75	28	202	305	17	357	79	453
% App. Total	51.8	28.2	20		30.5	62.9	6.6		24.6	9.2	66.2		3.8	78.8	17.4	
PHF	.721	.859	.750	.762	.829	.878	.632	.873	.694	.700	.886	.811	.607	.920	.617	.892

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City of Murrieta
N/S: Nutmeg Street
E/W: Clinton Keith Road
Weather: Sunny

File Name : MURNUCKPM
Site Code : 10266027
Start Date : 12/2/2010

Groups Printed- Total Volume

	Nutmeg Street Southbound				Clinton Keith Road Westbound				Nutmeg Street Northbound				Clinton Keith Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	10	9	7	26	56	94	14	164	12	14	26	52	6	110	9	125	367
04:15 PM	17	3	6	26	60	97	11	168	19	11	44	74	9	107	10	126	394
04:30 PM	12	3	10	25	53	104	14	171	12	10	51	73	10	104	14	128	397
04:45 PM	18	5	5	28	48	98	18	164	10	10	37	57	8	129	18	155	404
Total	57	20	28	105	217	393	57	667	53	45	158	256	33	450	51	534	1562
05:00 PM	13	9	4	26	48	96	16	160	16	16	50	82	10	152	12	174	442
05:15 PM	19	6	3	28	53	101	15	169	12	19	57	88	19	129	17	165	450
05:30 PM	11	3	9	23	61	102	24	187	10	16	48	74	15	123	22	160	444
05:45 PM	11	5	6	22	47	93	15	155	10	11	39	60	10	102	17	129	366
Total	54	23	22	99	209	392	70	671	48	62	194	304	54	506	68	628	1702
Grand Total	111	43	50	204	426	785	127	1338	101	107	352	560	87	956	119	1162	3264
Apprch %	54.4	21.1	24.5		31.8	58.7	9.5		18	19.1	62.9		7.5	82.3	10.2		
Total %	3.4	1.3	1.5	6.2	13.1	24.1	3.9	41	3.1	3.3	10.8	17.2	2.7	29.3	3.6	35.6	

	Nutmeg Street Southbound				Clinton Keith Road Westbound				Nutmeg Street Northbound				Clinton Keith Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	18	5	5	**28**	48	98	18	164	10	10	37	57	8	129	18	155	404
05:00 PM	13	**9**	4	26	48	96	16	160	**16**	16	50	82	10	**152**	12	**174**	442
05:15 PM	**19**	6	3	28	53	101	15	169	12	**19**	**57**	**88**	**19**	129	17	165	**450**
05:30 PM	11	3	**9**	23	**61**	**102**	**24**	**187**	10	16	48	74	15	123	**22**	160	444
Total Volume	61	23	21	105	210	397	73	680	48	61	192	301	52	533	69	654	1740
% App. Total	58.1	21.9	20		30.9	58.4	10.7		15.9	20.3	63.8		8	81.5	10.6		
PHF	.803	.639	.583	.938	.861	.973	.760	.909	.750	.803	.842	.855	.684	.877	.784	.940	.967

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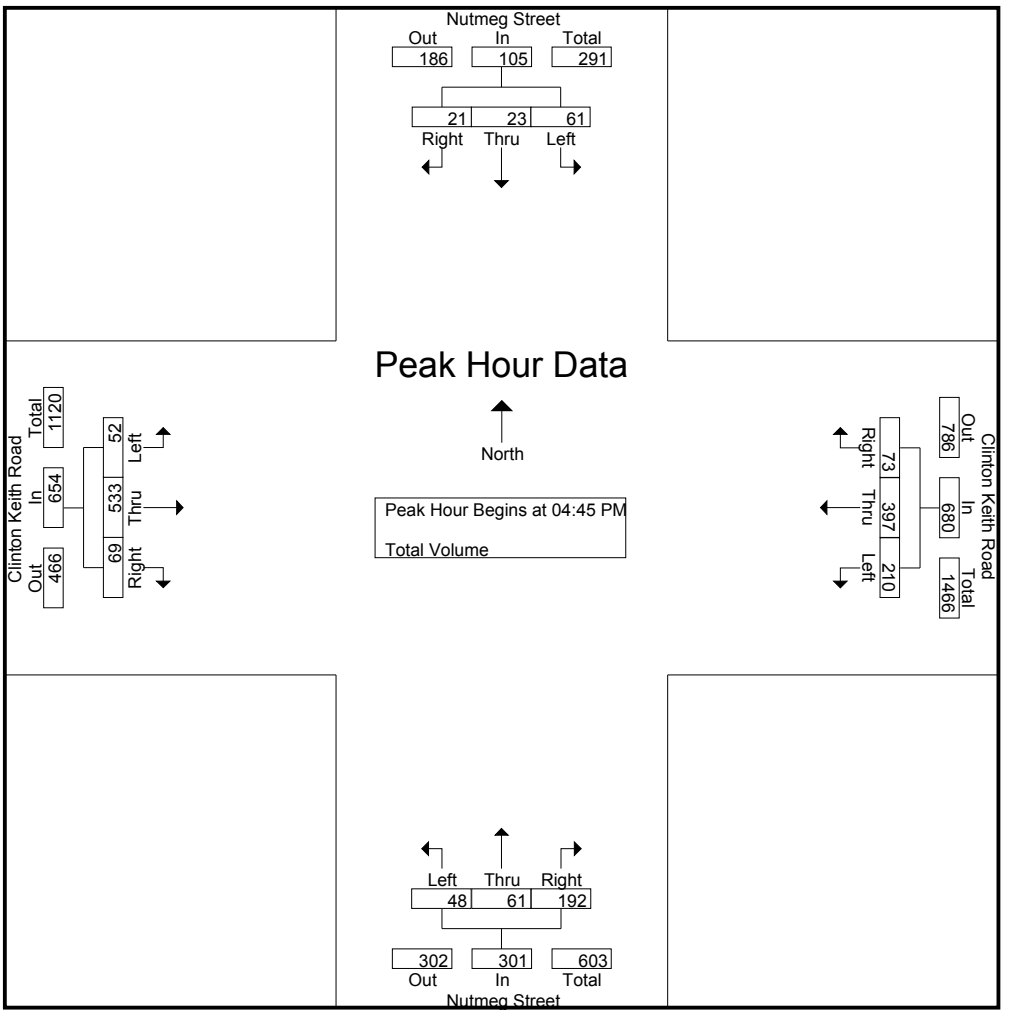
City of Murrieta
N/S: Nutmeg Street
E/W: Clinton Keith Road
Weather: Sunny

File Name : MURNUCKPM
Site Code : 10266027
Start Date : 12/2/2010
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:30 PM				04:45 PM				05:00 PM				04:45 PM			
+0 mins.	12	3	**10**	25	48	98	18	164	**16**	16	50	82	8	129	18	155
+15 mins.	18	5	5	**28**	48	96	16	160	12	**19**	**57**	**88**	10	**152**	12	**174**
+30 mins.	13	**9**	4	26	53	101	15	169	10	16	48	74	**19**	129	17	165
+45 mins.	**19**	6	3	28	**61**	**102**	**24**	**187**	10	11	39	60	15	123	**22**	160
Total Volume	62	23	22	107	210	397	73	680	48	62	194	304	52	533	69	654
% App. Total	57.9	21.5	20.6		30.9	58.4	10.7		15.8	20.4	63.8		8	81.5	10.6	
PHF	.816	.639	.550	.955	.861	.973	.760	.909	.750	.816	.851	.864	.684	.877	.784	.940

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City of Murrieta
N/S: Murrieta Oaks Avenue
E/W: Clinton Keith Road
Weather: Sunny

File Name : MURMOCKAM
Site Code : 10266044
Start Date : 12/2/2010
Page No : 1

Groups Printed- Total Volume

	Clinton Keith Road Westbound			Murrieta Oaks Avenue Northbound			Clinton Keith Road Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
07:00 AM	21	168	189	15	0	15	209	21	230	434
07:15 AM	14	199	213	13	71	84	211	14	225	522
07:30 AM	14	217	231	11	42	53	222	16	238	522
07:45 AM	26	179	205	7	33	40	178	62	240	485
Total	75	763	838	46	146	192	820	113	933	1963
08:00 AM	65	180	245	47	63	110	212	148	360	715
08:15 AM	53	176	229	57	74	131	250	28	278	638
08:30 AM	11	172	183	6	25	31	227	15	242	456
08:45 AM	9	135	144	8	18	26	219	8	227	397
Total	138	663	801	118	180	298	908	199	1107	2206
Grand Total	213	1426	1639	164	326	490	1728	312	2040	4169
Apprch %	13	87		33.5	66.5		84.7	15.3		
Total %	5.1	34.2	39.3	3.9	7.8	11.8	41.4	7.5	48.9	

	Clinton Keith Road Westbound			Murrieta Oaks Avenue Northbound			Clinton Keith Road Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	14	**217**	231	11	42	53	222	16	238	522
07:45 AM	26	179	205	7	33	40	178	62	240	485
08:00 AM	**65**	180	**245**	47	63	110	212	**148**	**360**	**715**
08:15 AM	53	176	229	**57**	**74**	**131**	**250**	28	278	638
Total Volume	158	752	910	122	212	334	862	254	1116	2360
% App. Total	17.4	82.6		36.5	63.5		77.2	22.8		
PHF	.608	.866	.929	.535	.716	.637	.862	.429	.775	.825

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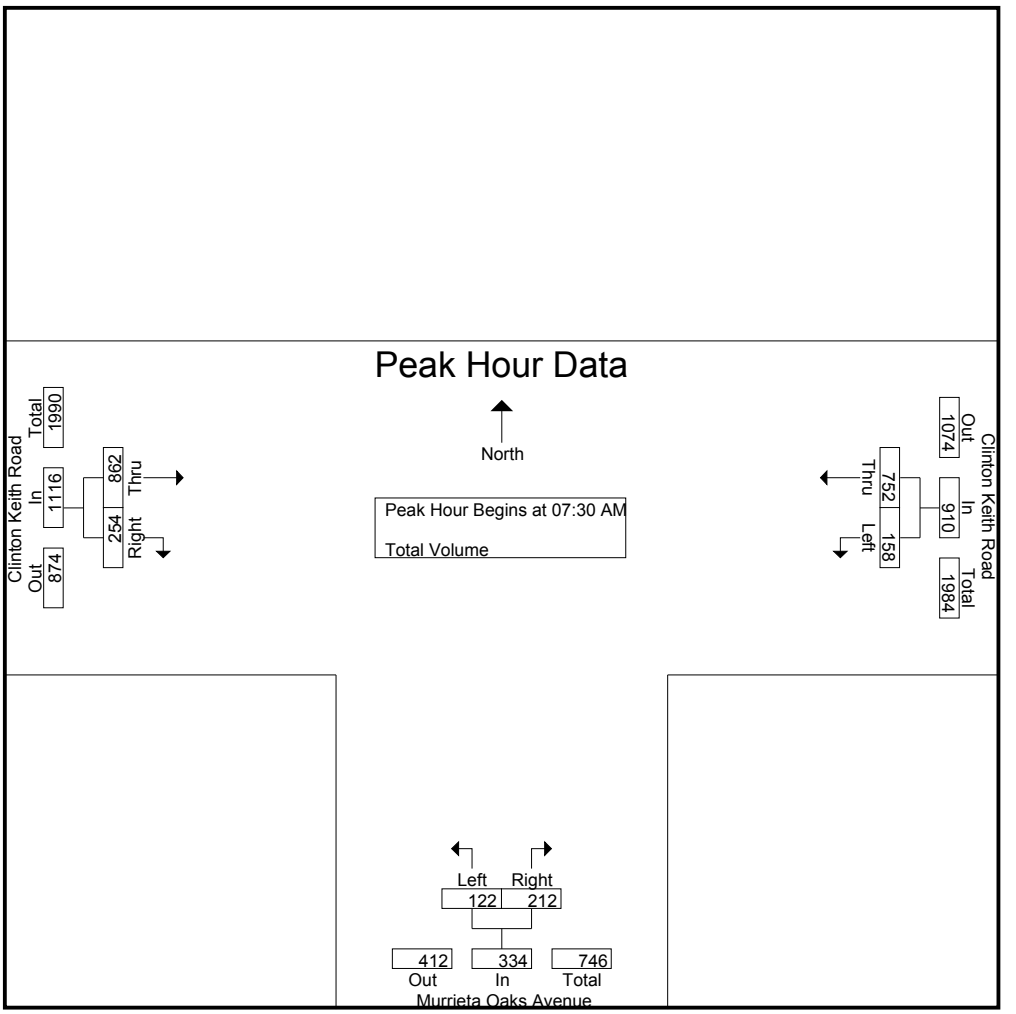
City of Murrieta
N/S: Murrieta Oaks Avenue
E/W: Clinton Keith Road
Weather: Sunny

File Name : MURMOCKAM
Site Code : 10266044
Start Date : 12/2/2010
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:30 AM			07:30 AM			07:45 AM		
+0 mins.	14	**217**	231	11	42	53	178	62	240
+15 mins.	26	179	205	7	33	40	212	**148**	**360**
+30 mins.	**65**	180	**245**	47	63	110	**250**	28	278
+45 mins.	53	176	229	**57**	**74**	**131**	227	15	242
Total Volume	158	752	910	122	212	334	867	253	1120
% App. Total	17.4	82.6		36.5	63.5		77.4	22.6	
PHF	.608	.866	.929	.535	.716	.637	.867	.427	.778

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City of Murrieta
N/S: Murrieta Oaks Avenue
E/W: Clinton Keith Road
Weather: Sunny

File Name : MURMOCKPM
Site Code : 10266044
Start Date : 12/2/2010
Page No : 1

Groups Printed- Total Volume

	Clinton Keith Road Westbound			Murrieta Oaks Avenue Northbound			Clinton Keith Road Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
04:00 PM	13	177	190	4	28	32	181	6	187	409
04:15 PM	24	237	261	8	23	31	250	8	258	550
04:30 PM	14	238	252	6	15	21	225	10	235	508
04:45 PM	25	207	232	7	18	25	284	10	294	551
Total	76	859	935	25	84	109	940	34	974	2018
05:00 PM	25	239	264	9	21	30	237	8	245	539
05:15 PM	26	235	261	6	12	18	304	12	316	595
05:30 PM	17	265	282	10	16	26	275	7	282	590
05:45 PM	23	197	220	5	6	11	232	3	235	466
Total	91	936	1027	30	55	85	1048	30	1078	2190
Grand Total	167	1795	1962	55	139	194	1988	64	2052	4208
Apprch %	8.5	91.5		28.4	71.6		96.9	3.1		
Total %	4	42.7	46.6	1.3	3.3	4.6	47.2	1.5	48.8	

	Clinton Keith Road Westbound			Murrieta Oaks Avenue Northbound			Clinton Keith Road Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	25	207	232	7	18	25	284	10	294	551
05:00 PM	25	239	264	9	**21**	**30**	237	8	245	539
05:15 PM	**26**	235	261	6	12	18	**304**	**12**	**316**	**595**
05:30 PM	17	**265**	**282**	**10**	16	26	275	7	282	590
Total Volume	93	946	1039	32	67	99	1100	37	1137	2275
% App. Total	9	91		32.3	67.7		96.7	3.3		
PHF	.894	.892	.921	.800	.798	.825	.905	.771	.900	.956

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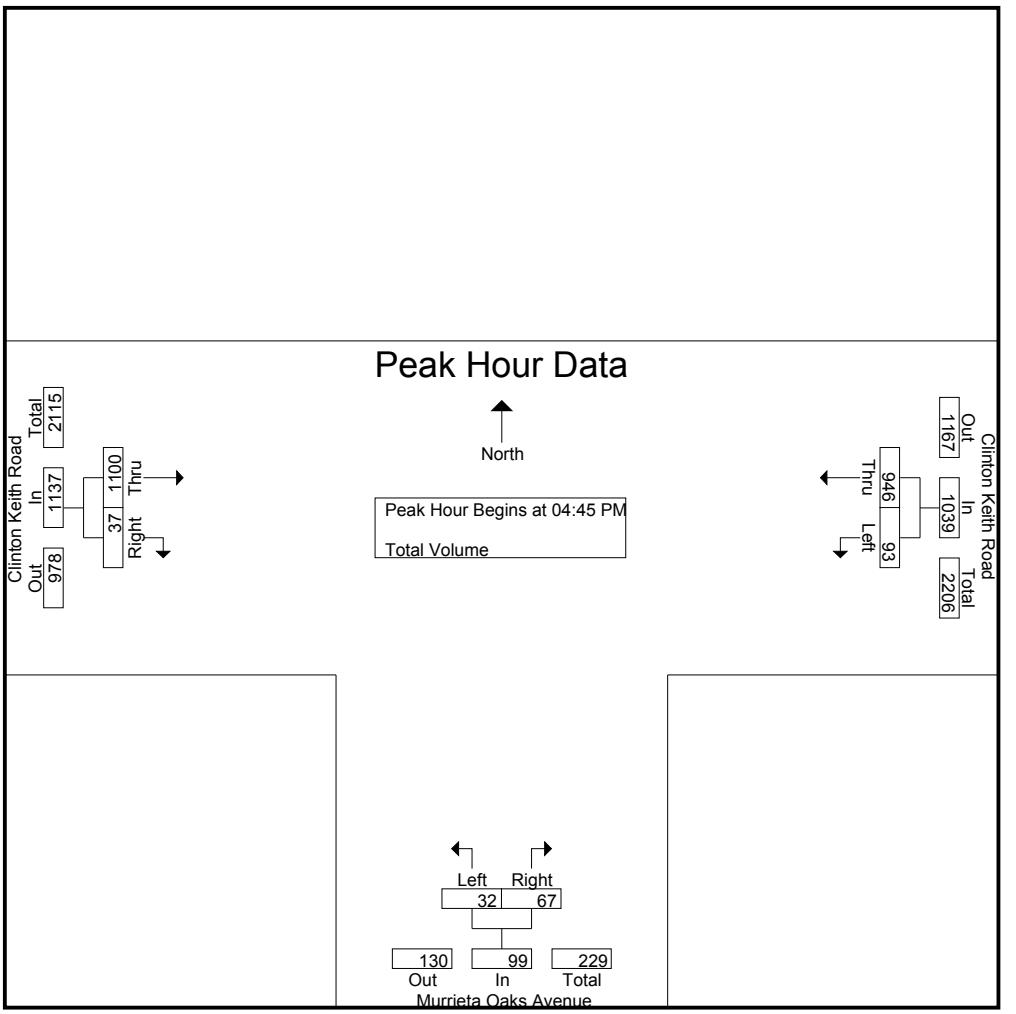
City of Murrieta
N/S: Murrieta Oaks Avenue
E/W: Clinton Keith Road
Weather: Sunny

File Name : MURMOCKPM
Site Code : 10266044
Start Date : 12/2/2010
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:45 PM			04:00 PM			04:45 PM		
+0 mins.	25	207	232	4	**28**	**32**	284	10	294
+15 mins.	25	239	264	**8**	23	31	237	8	245
+30 mins.	**26**	235	261	6	15	21	**304**	**12**	**316**
+45 mins.	17	**265**	**282**	7	18	25	275	7	282
Total Volume	93	946	1039	25	84	109	1100	37	1137
% App. Total	9	91		22.9	77.1		96.7	3.3	
PHF	.894	.892	.921	.781	.750	.852	.905	.771	.900

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City of Menifee
N/S: I-215 Southbound Ramps
E/W: Scott Road
Weather: Sunny

File Name : MEN215SSCAM
Site Code : 10209066
Start Date : 10/13/2010
Page No : 1

Groups Printed- Total Volume

	I-215 Southbound Off Ramp Southbound				Scott Road Westbound				I-215 Southbound On Ramp Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
06:00 AM	52	0	29	81	112	74	0	186	0	0	0	0	0	55	35	90	357
06:15 AM	67	0	26	93	107	102	0	209	0	0	0	0	0	65	38	103	405
06:30 AM	53	0	26	79	110	93	0	203	0	0	0	0	0	79	54	133	415
06:45 AM	71	0	27	98	117	86	0	203	0	0	0	0	0	96	46	142	443
Total	243	0	108	351	446	355	0	801	0	0	0	0	0	295	173	468	1620
07:00 AM	68	2	27	97	111	120	0	231	0	0	0	0	0	76	59	135	463
07:15 AM	64	1	23	88	99	151	0	250	0	0	0	0	0	126	82	208	546
07:30 AM	65	0	21	86	112	160	0	272	0	0	0	0	0	148	68	216	574
07:45 AM	62	2	24	88	123	104	0	227	0	0	0	0	0	128	57	185	500
Total	259	5	95	359	445	535	0	980	0	0	0	0	0	478	266	744	2083
08:00 AM	67	1	20	88	113	86	0	199	0	0	0	0	0	133	113	246	533
08:15 AM	68	0	26	94	118	94	0	212	0	0	0	0	0	89	97	186	492
08:30 AM	70	0	30	100	127	85	0	212	0	0	0	0	0	83	77	160	472
08:45 AM	65	0	20	85	143	66	0	209	0	0	0	0	0	95	46	141	435
Total	270	1	96	367	501	331	0	832	0	0	0	0	0	400	333	733	1932
Grand Total	772	6	299	1077	1392	1221	0	2613	0	0	0	0	0	1173	772	1945	5635
Apprch %	71.7	0.6	27.8		53.3	46.7	0		0	0	0		0	60.3	39.7		
Total %	13.7	0.1	5.3	19.1	24.7	21.7	0	46.4	0	0	0	0	0	20.8	13.7	34.5	

	I-215 Southbound Off Ramp Southbound				Scott Road Westbound				I-215 Southbound On Ramp Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	64	1	23	**88**	99	151	0	250	0	0	0	0	0	126	82	208	546
07:30 AM	65	0	21	86	112	**160**	0	**272**	0	0	0	0	0	**148**	68	216	**574**
07:45 AM	62	**2**	**24**	88	**123**	104	0	227	0	0	0	0	0	128	57	185	500
08:00 AM	**67**	1	20	88	113	86	0	199	0	0	0	0	0	133	**113**	**246**	533
Total Volume	258	4	88	350	447	501	0	948	0	0	0	0	0	535	320	855	2153
% App. Total	73.7	1.1	25.1		47.2	52.8	0		0	0	0		0	62.6	37.4		
PHF	.963	.500	.917	.994	.909	.783	.000	.871	.000	.000	.000	.000	.000	.904	.708	.869	.938

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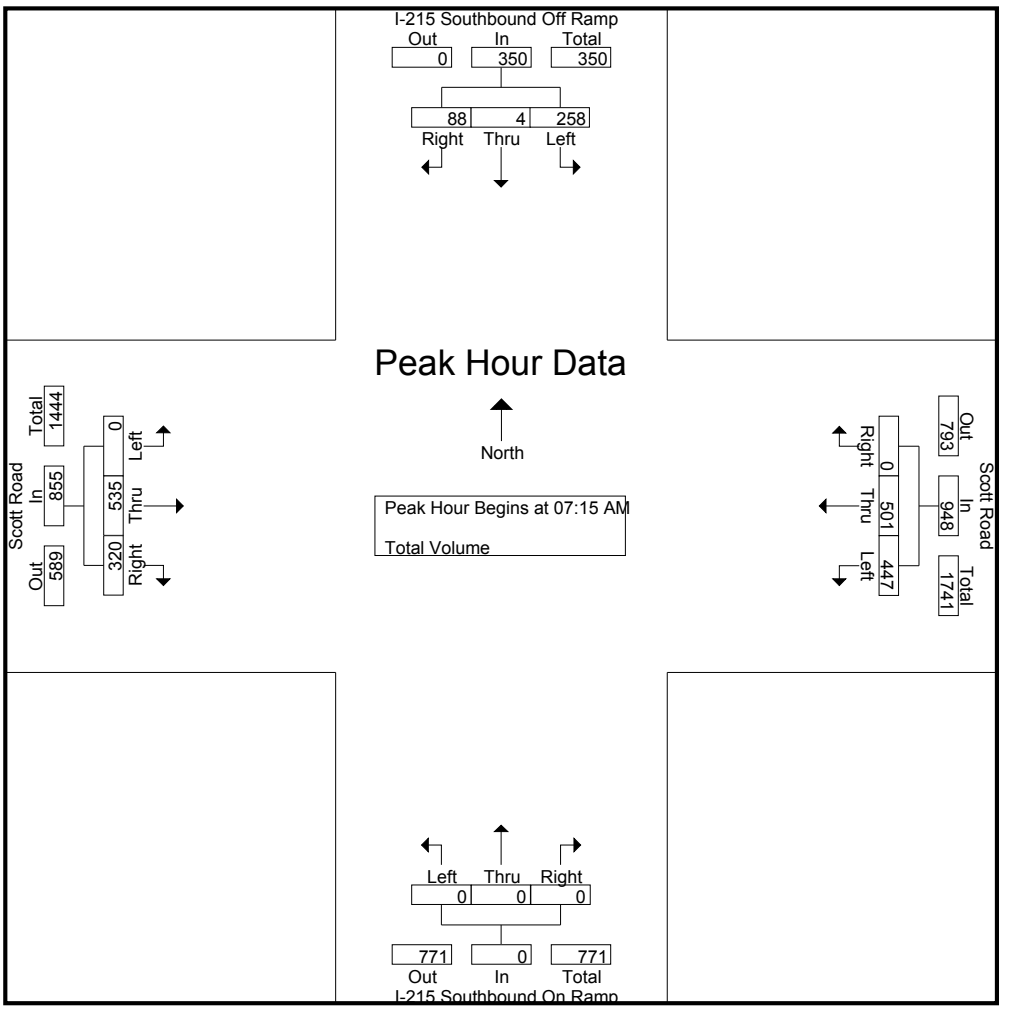
City of Menifee
N/S: I-215 Southbound Ramps
E/W: Scott Road
Weather: Sunny

File Name : MEN215SSCAM
Site Code : 10209066
Start Date : 10/13/2010
Page No : 2



Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM				07:00 AM				06:00 AM				07:15 AM			
+0 mins.	62	**2**	24	88	111	120	0	231	0	0	0	0	0	126	82	208
+15 mins.	67	1	20	88	99	151	0	250	0	0	0	0	0	**148**	68	216
+30 mins.	68	0	26	94	112	**160**	0	**272**	0	0	0	0	0	128	57	185
+45 mins.	**70**	0	**30**	**100**	**123**	104	0	227	0	0	0	0	0	133	**113**	**246**
Total Volume	267	3	100	370	445	535	0	980	0	0	0	0	0	535	320	855
% App. Total	72.2	0.8	27		45.4	54.6	0		0	0	0		0	62.6	37.4	
PHF	.954	.375	.833	.925	.904	.836	.000	.901	.000	.000	.000	.000	.000	.904	.708	.869

Counts Unlimited Inc.
PO Box 1178
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City of Menifee
N/S: I-215 Southbound Ramps
E/W: Scot Road
Weather: Sunny

File Name : MEN215SSCPM
Site Code : 10209066
Start Date : 10/13/2010

Groups Printed- Total Volume

	I-215 Southbound Off Ramp Southbound				Westbound				I-215 Southbound On Ramp Northbound				Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	85	0	26	111	122	157	0	279	0	0	0	0	0	138	63	201	591
04:15 PM	87	0	35	122	98	163	0	261	0	0	0	0	0	133	54	187	570
04:30 PM	88	0	21	109	115	147	0	262	0	0	0	0	0	122	52	174	545
04:45 PM	88	2	25	115	125	143	0	268	0	0	0	0	0	134	18	152	535
Total	348	2	107	457	460	610	0	1070	0	0	0	0	0	527	187	714	2241
05:00 PM	86	1	26	113	133	158	0	291	0	0	0	0	0	143	56	199	603
05:15 PM	83	0	27	110	101	157	0	258	0	0	0	0	0	156	55	211	579
05:30 PM	77	1	36	114	106	145	0	251	0	0	0	0	0	147	36	183	548
05:45 PM	81	0	38	119	88	143	0	231	0	0	0	0	0	158	27	185	535
Total	327	2	127	456	428	603	0	1031	0	0	0	0	0	604	174	778	2265
06:00 PM	98	0	28	126	112	141	0	253	0	0	0	0	0	136	29	165	544
06:15 PM	96	0	33	129	103	120	0	223	0	0	0	0	0	141	31	172	524
06:30 PM	99	0	39	138	98	119	0	217	0	0	0	0	0	145	21	166	521
06:45 PM	90	0	25	115	91	119	0	210	0	0	0	0	0	149	32	181	506
Total	383	0	125	508	404	499	0	903	0	0	0	0	0	571	113	684	2095
Grand Total	1058	4	359	1421	1292	1712	0	3004	0	0	0	0	0	1702	474	2176	6601
Apprch %	74.5	0.3	25.3		43	57	0		0	0	0		0	78.2	21.8		
Total %	16	0.1	5.4	21.5	19.6	25.9	0	45.5	0	0	0	0	0	25.8	7.2	33	

	I-215 Southbound Off Ramp Southbound				Westbound				I-215 Southbound On Ramp Northbound				Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 06:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	**88**	**2**	25	**115**	125	143	0	268	0	0	0	0	0	134	18	152	535
05:00 PM	86	1	26	113	**133**	**158**	0	**291**	0	0	0	0	0	143	**56**	199	**603**
05:15 PM	83	0	27	110	101	157	0	258	0	0	0	0	0	**156**	55	**211**	579
05:30 PM	77	1	**36**	114	106	145	0	251	0	0	0	0	0	147	36	183	548
Total Volume	334	4	114	452	465	603	0	1068	0	0	0	0	0	580	165	745	2265
% App. Total	73.9	0.9	25.2		43.5	56.5	0		0	0	0		0	77.9	22.1		
PHF	.949	.500	.792	.983	.874	.954	.000	.918	.000	.000	.000	.000	.000	.929	.737	.883	.939

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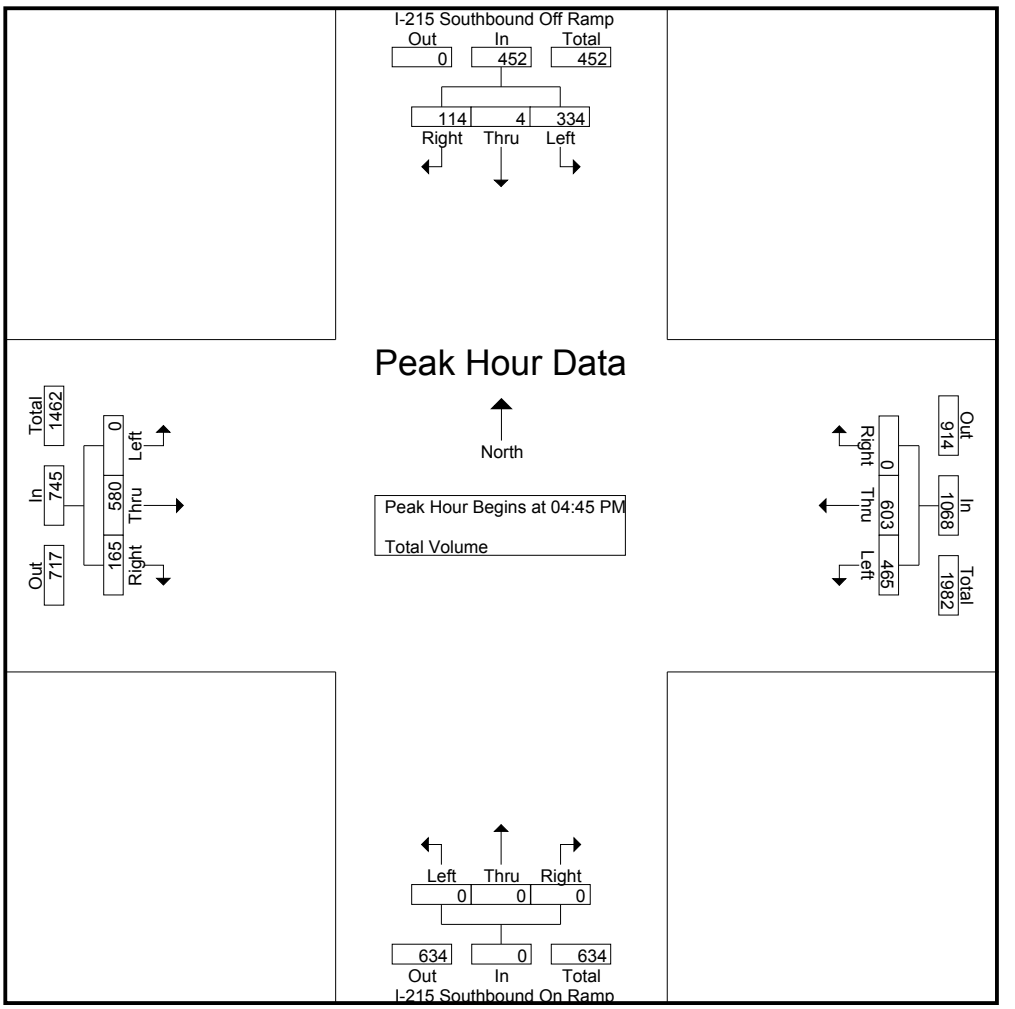
City of Menifee
N/S: I-215 Southbound Ramps
E/W: Scot Road
Weather: Sunny

File Name : MEN215SSCPM
Site Code : 10209066
Start Date : 10/13/2010
Page No : 2



Peak Hour Analysis From 04:00 PM to 06:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:45 PM				04:15 PM				04:00 PM				05:00 PM			
+0 mins.	81	0	38	119	98	**163**	0	261	0	0	0	0	0	143	**56**	199
+15 mins.	98	0	28	126	115	147	0	262	0	0	0	0	0	156	55	**211**
+30 mins.	96	0	33	129	125	143	0	268	0	0	0	0	0	147	36	183
+45 mins.	**99**	0	**39**	**138**	**133**	158	0	**291**	0	0	0	0	0	**158**	27	185
Total Volume	374	0	138	512	471	611	0	1082	0	0	0	0	0	604	174	778
% App. Total	73	0	27		43.5	56.5	0		0	0	0		0	77.6	22.4	
PHF	.944	.000	.885	.928	.885	.937	.000	.930	.000	.000	.000	.000	.000	.956	.777	.922

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City of Menifee
N/S: I-215 Northbound Ramps
E/W: Scott Road
Weather: Sunny

File Name : MEN215NSCAM
Site Code : 10209063
Start Date : 10/13/2010

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

	I-215 Northbound On Ramp Southbound				Scott Road Westbound				I-215 Northbound Off Ramp Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
06:00 AM	0	0	0	0	0	171	94	265	14	0	23	37	25	75	0	100	402
06:15 AM	0	0	0	0	0	170	94	264	32	0	23	55	26	103	0	129	448
06:30 AM	0	0	0	0	0	184	99	283	19	0	34	53	31	99	0	130	466
06:45 AM	0	0	0	0	0	177	99	276	25	1	58	84	51	119	0	170	530
Total	0	0	0	0	0	702	386	1088	90	1	138	229	133	396	0	529	1846
07:00 AM	0	0	0	0	0	179	109	288	30	9	70	109	27	100	0	127	524
07:15 AM	0	0	0	0	0	193	105	298	50	2	84	136	26	167	0	193	627
07:30 AM	0	0	0	0	0	226	75	301	36	0	90	126	31	176	0	207	634
07:45 AM	0	0	0	0	0	194	91	285	29	1	105	135	24	160	0	184	604
Total	0	0	0	0	0	792	380	1172	145	12	349	506	108	603	0	711	2389
08:00 AM	0	0	0	0	0	171	58	229	17	0	79	96	26	162	0	188	513
08:15 AM	0	0	0	0	0	192	79	271	23	0	70	93	22	141	0	163	527
08:30 AM	0	0	0	0	0	189	68	257	25	0	83	108	24	118	0	142	507
08:45 AM	0	0	0	0	0	178	61	239	21	0	95	116	24	137	0	161	516
Total	0	0	0	0	0	730	266	996	86	0	327	413	96	558	0	654	2063
Grand Total	0	0	0	0	0	2224	1032	3256	321	13	814	1148	337	1557	0	1894	6298
Apprch %	0	0	0		0	68.3	31.7		28	1.1	70.9		17.8	82.2	0		
Total %	0	0	0	0	0	35.3	16.4	51.7	5.1	0.2	12.9	18.2	5.4	24.7	0	30.1	
Passenger Vehicles	0	0	0	0	0	2161	1004	3165	305	13	793	1111	316	1478	0	1794	6070
% Passenger Vehicles	0	0	0	0	0	97.2	97.3	97.2	95	100	97.4	96.8	93.8	94.9	0	94.7	96.4
Large 2 Axle Vehicles	0	0	0	0	0	47	23	70	14	0	12	26	14	57	0	71	167
% Large 2 Axle Vehicles	0	0	0	0	0	2.1	2.2	2.1	4.4	0	1.5	2.3	4.2	3.7	0	3.7	2.7
3 Axle Vehicles	0	0	0	0	0	5	0	5	1	0	3	4	2	7	0	9	18
% 3 Axle Vehicles	0	0	0	0	0	0.2	0	0.2	0.3	0	0.4	0.3	0.6	0.4	0	0.5	0.3
4+ Axle Trucks	0	0	0	0	0	11	5	16	1	0	6	7	5	15	0	20	43
% 4+ Axle Trucks	0	0	0	0	0	0.5	0.5	0.5	0.3	0	0.7	0.6	1.5	1	0	1.1	0.7

	I-215 Northbound On Ramp Southbound				Scott Road Westbound				I-215 Northbound Off Ramp Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	179	**109**	288	30	**9**	70	109	27	100	0	127	524
07:15 AM	0	0	0	0	0	193	105	298	**50**	2	84	**136**	26	167	0	193	627
07:30 AM	0	0	0	0	0	**226**	75	**301**	36	0	90	126	**31**	**176**	0	**207**	**634**
07:45 AM	0	0	0	0	0	194	91	285	29	1	**105**	135	24	160	0	184	604
Total Volume	0	0	0	0	0	792	380	1172	145	12	349	506	108	603	0	711	2389
% App. Total	0	0	0		0	67.6	32.4		28.7	2.4	69		15.2	84.8	0		
PHF	.000	.000	.000	.000	.000	.876	.872	.973	.725	.333	.831	.930	.871	.857	.000	.859	.942

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City of Menifee
N/S: I-215 Northbound Ramps
E/W: Scott Road
Weather: Sunny

File Name : MEN215NSCAM
Site Code : 10209063
Start Date : 10/13/2010
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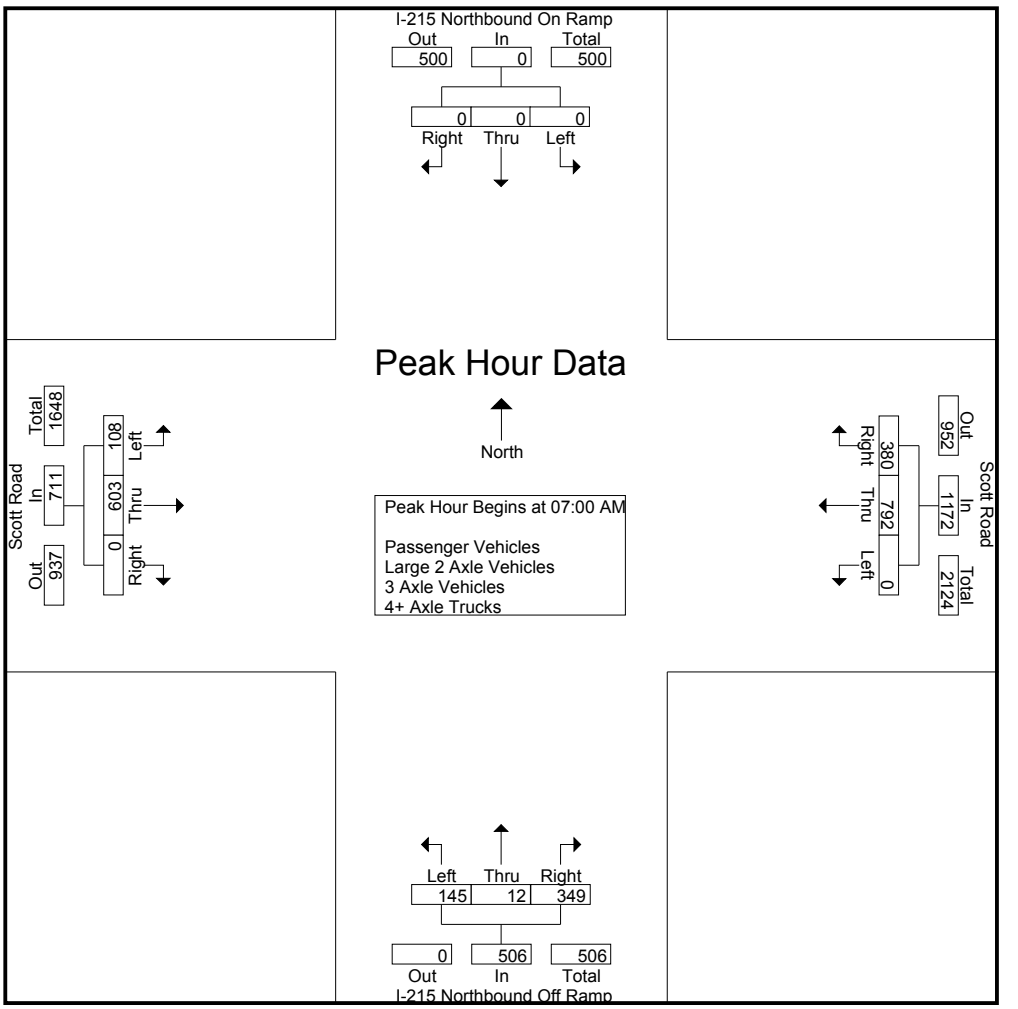

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	06:00 AM				07:00 AM				07:00 AM				07:15 AM			
+0 mins.	0	0	0	0	0	179	**109**	288	30	**9**	70	109	26	167	0	193
+15 mins.	0	0	0	0	0	193	105	298	**50**	2	84	**136**	**31**	**176**	0	**207**
+30 mins.	0	0	0	0	0	**226**	75	**301**	36	0	90	126	24	160	0	184
+45 mins.	0	0	0	0	0	194	91	285	29	1	**105**	135	26	162	0	188
Total Volume	0	0	0	0	0	792	380	1172	145	12	349	506	107	665	0	772
% App. Total	0	0	0		0	67.6	32.4		28.7	2.4	69		13.9	86.1	0	
PHF	.000	.000	.000	.000	.000	.876	.872	.973	.725	.333	.831	.930	.863	.945	.000	.932

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City of Menifee
N/S: I-215 Northbound Ramps
E/W: Scott Road
Weather: Sunny

File Name : MEN215NSCAM
Site Code : 10209063
Start Date : 10/13/2010

Groups Printed- Passenger Vehicles

	I-215 Northbound On Ramp Southbound				Scott Road Westbound				I-215 Northbound Off Ramp Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
06:00 AM	0	0	0	0	0	167	92	259	13	0	22	35	21	72	0	93	387
06:15 AM	0	0	0	0	0	168	91	259	32	0	21	53	24	92	0	116	428
06:30 AM	0	0	0	0	0	181	98	279	18	0	30	48	29	92	0	121	448
06:45 AM	0	0	0	0	0	174	97	271	25	1	55	81	48	112	0	160	512
Total	0	0	0	0	0	690	378	1068	88	1	128	217	122	368	0	490	1775
07:00 AM	0	0	0	0	0	175	104	279	29	9	67	105	26	96	0	122	506
07:15 AM	0	0	0	0	0	191	103	294	48	2	80	130	24	154	0	178	602
07:30 AM	0	0	0	0	0	225	73	298	33	0	89	122	28	167	0	195	615
07:45 AM	0	0	0	0	0	187	90	277	29	1	105	135	24	158	0	182	594
Total	0	0	0	0	0	778	370	1148	139	12	341	492	102	575	0	677	2317
08:00 AM	0	0	0	0	0	166	56	222	16	0	79	95	25	152	0	177	494
08:15 AM	0	0	0	0	0	184	77	261	19	0	68	87	22	137	0	159	507
08:30 AM	0	0	0	0	0	179	63	242	24	0	83	107	21	111	0	132	481
08:45 AM	0	0	0	0	0	164	60	224	19	0	94	113	24	135	0	159	496
Total	0	0	0	0	0	693	256	949	78	0	324	402	92	535	0	627	1978
Grand Total	0	0	0	0	0	2161	1004	3165	305	13	793	1111	316	1478	0	1794	6070
Apprch %	0	0	0		0	68.3	31.7		27.5	1.2	71.4		17.6	82.4	0		
Total %	0	0	0	0	0	35.6	16.5	52.1	5	0.2	13.1	18.3	5.2	24.3	0	29.6	

	I-215 Northbound On Ramp Southbound				Scott Road Westbound				I-215 Northbound Off Ramp Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	175	**104**	279	29	**9**	67	105	26	96	0	122	506
07:15 AM	0	0	0	0	0	191	103	294	**48**	2	80	130	24	154	0	178	602
07:30 AM	0	0	0	0	0	**225**	73	**298**	33	0	89	122	**28**	**167**	0	**195**	**615**
07:45 AM	0	0	0	0	0	187	90	277	29	1	**105**	**135**	24	158	0	182	594
Total Volume	0	0	0	0	0	778	370	1148	139	12	341	492	102	575	0	677	2317
% App. Total	0	0	0		0	67.8	32.2		28.3	2.4	69.3		15.1	84.9	0		
PHF	.000	.000	.000	.000	.000	.864	.889	.963	.724	.333	.812	.911	.911	.861	.000	.868	.942

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City of Menifee
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File Name : MEN215NSCAM
Site Code : 10209063
Start Date : 10/13/2010
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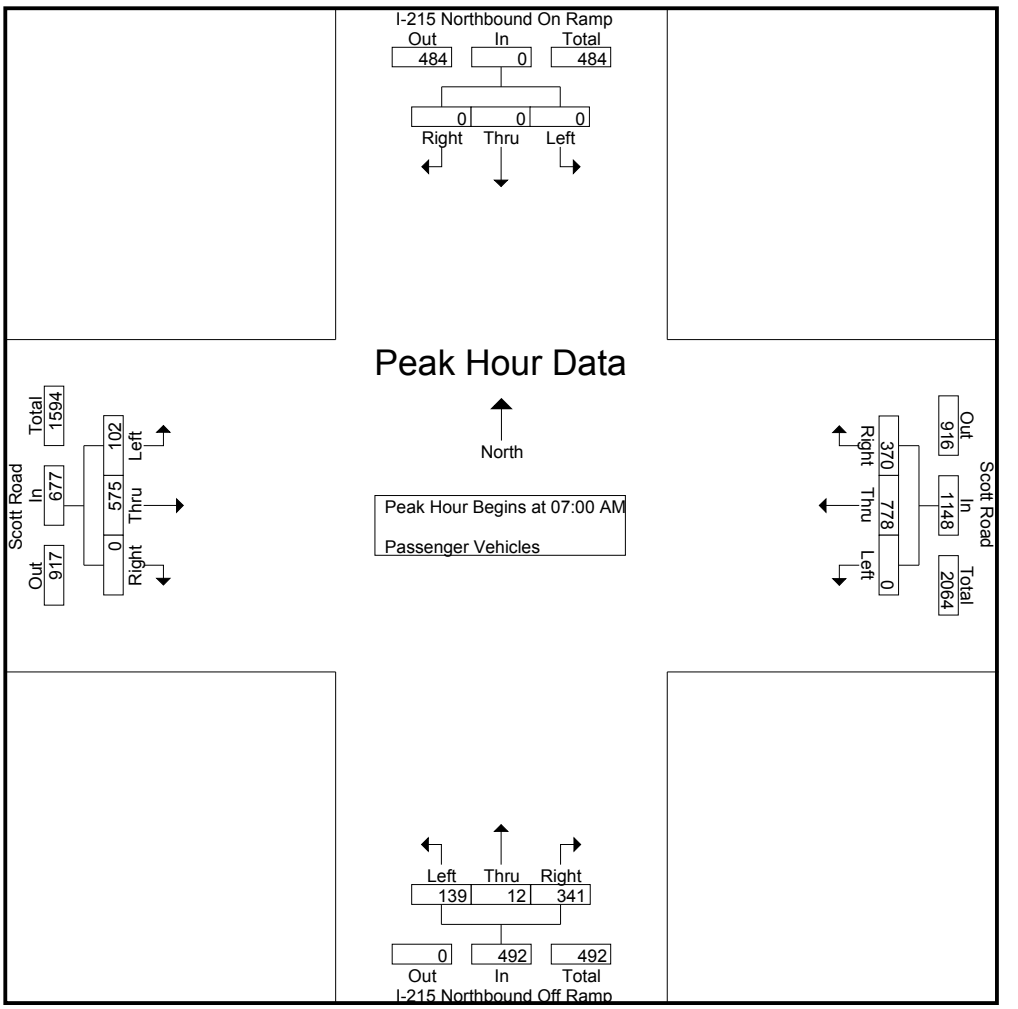

Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	175	**104**	279	29	**9**	67	105	26	96	0	122
+15 mins.	0	0	0	0	0	191	103	294	**48**	2	80	130	24	154	0	178
+30 mins.	0	0	0	0	0	**225**	73	**298**	33	0	89	122	**28**	**167**	0	**195**
+45 mins.	0	0	0	0	0	187	90	277	29	1	**105**	**135**	24	158	0	182
Total Volume	0	0	0	0	0	778	370	1148	139	12	341	492	102	575	0	677
% App. Total	0	0	0		0	67.8	32.2		28.3	2.4	69.3		15.1	84.9	0	
PHF	.000	.000	.000	.000	.000	.864	.889	.963	.724	.333	.812	.911	.911	.861	.000	.868

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City of Menifee
N/S: I-215 Northbound Ramps
E/W: Scott Road
Weather: Sunny

File Name : MEN215NSCAM
Site Code : 10209063
Start Date : 10/13/2010

Groups Printed- Large 2 Axle Vehicles

	I-215 Northbound On Ramp Southbound				Scott Road Westbound				I-215 Northbound Off Ramp Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
06:00 AM	0	0	0	0	0	3	1	4	1	0	1	2	3	1	0	4	10
06:15 AM	0	0	0	0	0	1	3	4	0	0	1	1	1	6	0	7	12
06:30 AM	0	0	0	0	0	3	1	4	1	0	3	4	0	7	0	7	15
06:45 AM	0	0	0	0	0	2	2	4	0	0	2	2	2	6	0	8	14
Total	0	0	0	0	0	9	7	16	2	0	7	9	6	20	0	26	51
07:00 AM	0	0	0	0	0	4	4	8	0	0	2	2	1	2	0	3	13
07:15 AM	0	0	0	0	0	2	2	4	2	0	0	2	2	8	0	10	16
07:30 AM	0	0	0	0	0	1	1	2	2	0	0	2	3	9	0	12	16
07:45 AM	0	0	0	0	0	5	1	6	0	0	0	0	0	0	0	0	6
Total	0	0	0	0	0	12	8	20	4	0	2	6	6	19	0	25	51
08:00 AM	0	0	0	0	0	3	2	5	1	0	0	1	1	8	0	9	15
08:15 AM	0	0	0	0	0	4	2	6	4	0	2	6	0	3	0	3	15
08:30 AM	0	0	0	0	0	6	3	9	1	0	0	1	1	6	0	7	17
08:45 AM	0	0	0	0	0	13	1	14	2	0	1	3	0	1	0	1	18
Total	0	0	0	0	0	26	8	34	8	0	3	11	2	18	0	20	65
Grand Total	0	0	0	0	0	47	23	70	14	0	12	26	14	57	0	71	167
Apprch %	0	0	0		0	67.1	32.9		53.8	0	46.2		19.7	80.3	0		
Total %	0	0	0	0	0	28.1	13.8	41.9	8.4	0	7.2	15.6	8.4	34.1	0	42.5	

	I-215 Northbound On Ramp Southbound				Scott Road Westbound				I-215 Northbound Off Ramp Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	4	**4**	**8**	0	0	**2**	**2**	1	2	0	3	13
07:15 AM	0	0	0	0	0	2	2	4	**2**	0	0	2	2	8	0	10	**16**
07:30 AM	0	0	0	0	0	1	1	2	2	0	0	2	**3**	**9**	0	**12**	16
07:45 AM	0	0	0	0	0	**5**	1	6	0	0	0	0	0	0	0	0	6
Total Volume	0	0	0	0	0	12	8	20	4	0	2	6	6	19	0	25	51
% App. Total	0	0	0		0	60	40		66.7	0	33.3		24	76	0		
PHF	.000	.000	.000	.000	.000	.600	.500	.625	.500	.000	.250	.750	.500	.528	.000	.521	.797

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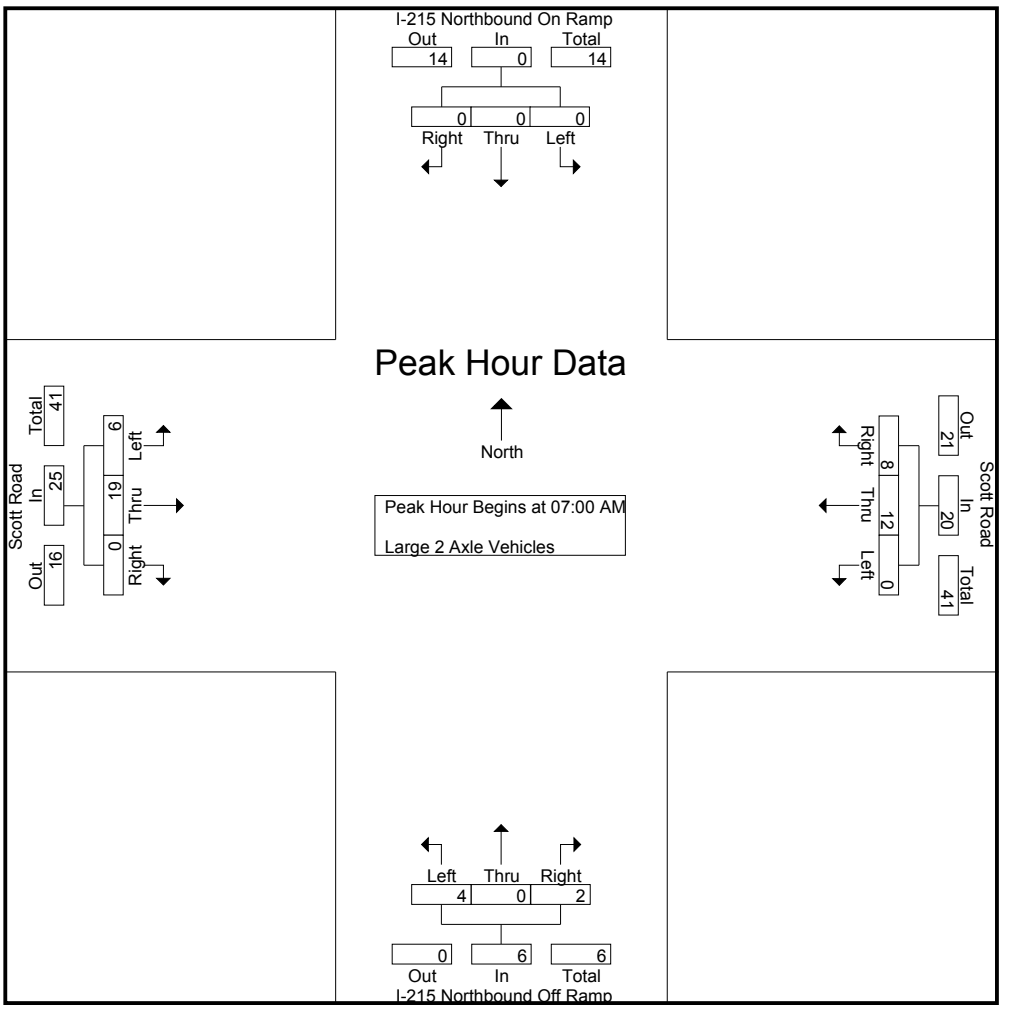
(951) 268-6268

City of Menifee
N/S: I-215 Northbound Ramps
E/W: Scott Road
Weather: Sunny

File Name : MEN215NSCAM
Site Code : 10209063
Start Date : 10/13/2010
Page No : 2



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	4	**4**	**8**	0	0	**2**	**2**	1	2	0	3
+15 mins.	0	0	0	0	0	2	2	4	**2**	0	0	2	2	8	0	10
+30 mins.	0	0	0	0	0	1	1	2	2	0	0	2	**3**	**9**	0	**12**
+45 mins.	0	0	0	0	0	**5**	1	6	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	12	8	20	4	0	2	6	6	19	0	25
% App. Total	0	0	0		0	60	40		66.7	0	33.3		24	76	0	
PHF	.000	.000	.000	.000	.000	.600	.500	.625	.500	.000	.250	.750	.500	.528	.000	.521

Counts Unlimited Inc.
PO Box 1178
Corona, CA 92878
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City of Menifee
N/S: I-215 Northbound Ramps
E/W: Scott Road
Weather: Sunny

File Name : MEN215NSCAM
Site Code : 10209063
Start Date : 10/13/2010

Groups Printed- 3 Axle Vehicles

	I-215 Northbound On Ramp Southbound				Scott Road Westbound				I-215 Northbound Off Ramp Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
06:00 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	2	0	2	3
06:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
06:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
06:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	1	0	0	0	0	2	4	0	6	7
07:00 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	1	2
07:15 AM	0	0	0	0	0	0	0	0	0	0	2	2	0	1	0	1	3
07:30 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	1	0	3	4	0	2	0	2	6
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	3	0	3	0	0	0	0	0	1	0	1	4
08:30 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	4	0	4	0	0	0	0	0	1	0	1	5
Grand Total	0	0	0	0	0	5	0	5	1	0	3	4	2	7	0	9	18
Apprch %	0	0	0		0	100	0		25	0	75		22.2	77.8	0		
Total %	0	0	0	0	0	27.8	0	27.8	5.6	0	16.7	22.2	11.1	38.9	0	50	

	I-215 Northbound On Ramp Southbound				Scott Road Westbound				I-215 Northbound Off Ramp Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	**1**	0	**1**	2
07:15 AM	0	0	0	0	0	0	0	0	0	0	**2**	**2**	0	1	0	1	**3**
07:30 AM	0	0	0	0	0	0	0	0	**1**	0	0	1	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	1	0	3	4	0	2	0	2	6
% App. Total	0	0	0		0	0	0		25	0	75		0	100	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.375	.500	.000	.500	.000	.500	.500

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PO Box 1178
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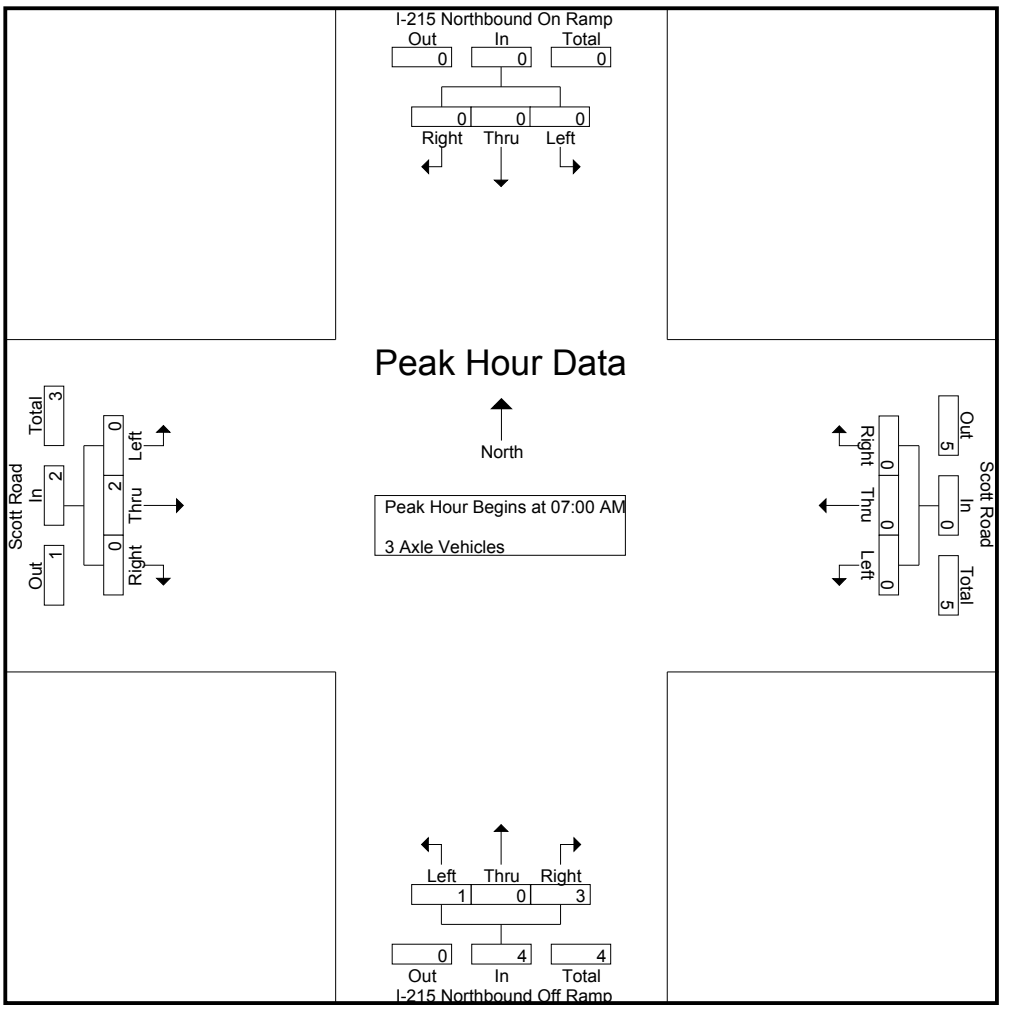
City of Menifee
N/S: I-215 Northbound Ramps
E/W: Scott Road
Weather: Sunny

File Name : MEN215NSCAM
Site Code : 10209063
Start Date : 10/13/2010
Page No : 2



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	1	1	0	**1**	0	**1**
+15 mins.	0	0	0	0	0	0	0	0	0	0	**2**	**2**	0	1	0	1
+30 mins.	0	0	0	0	0	0	0	0	**1**	0	0	1	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	1	0	3	4	0	2	0	2
% App. Total	0	0	0		0	0	0		25	0	75		0	100	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.375	.500	.000	.500	.000	.500

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City of Menifee
N/S: I-215 Northbound Ramps
E/W: Scott Road
Weather: Sunny

File Name : MEN215NSCAM
Site Code : 10209063
Start Date : 10/13/2010
Page No : 1

Groups Printed- 4+ Axle Trucks

	I-215 Northbound On Ramp Southbound				Scott Road Westbound				I-215 Northbound Off Ramp Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
06:00 AM	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	1	2
06:15 AM	0	0	0	0	0	1	0	1	0	0	1	1	1	3	0	4	6
06:30 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
06:45 AM	0	0	0	0	0	1	0	1	0	0	1	1	1	1	0	2	4
Total	0	0	0	0	0	2	1	3	0	0	3	3	3	4	0	7	13
07:00 AM	0	0	0	0	0	0	1	1	1	0	0	1	0	1	0	1	3
07:15 AM	0	0	0	0	0	0	0	0	0	0	2	2	0	4	0	4	6
07:30 AM	0	0	0	0	0	0	1	1	0	0	1	1	0	0	0	0	2
07:45 AM	0	0	0	0	0	2	0	2	0	0	0	0	0	2	0	2	4
Total	0	0	0	0	0	2	2	4	1	0	3	4	0	7	0	7	15
08:00 AM	0	0	0	0	0	2	0	2	0	0	0	0	0	2	0	2	4
08:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
08:30 AM	0	0	0	0	0	3	2	5	0	0	0	0	2	1	0	3	8
08:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
Total	0	0	0	0	0	7	2	9	0	0	0	0	2	4	0	6	15
Grand Total	0	0	0	0	0	11	5	16	1	0	6	7	5	15	0	20	43
Apprch %	0	0	0		0	68.8	31.2		14.3	0	85.7		25	75	0		
Total %	0	0	0	0	0	25.6	11.6	37.2	2.3	0	14	16.3	11.6	34.9	0	46.5	

	I-215 Northbound On Ramp Southbound				Scott Road Westbound				I-215 Northbound Off Ramp Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	0	**1**	1	**1**	0	0	1	0	1	0	1	3
07:15 AM	0	0	0	0	0	0	0	0	0	0	**2**	**2**	0	**4**	0	**4**	**6**
07:30 AM	0	0	0	0	0	0	1	1	0	0	1	1	0	0	0	0	2
07:45 AM	0	0	0	0	0	**2**	0	**2**	0	0	0	0	0	2	0	2	4
Total Volume	0	0	0	0	0	2	2	4	1	0	3	4	0	7	0	7	15
% App. Total	0	0	0		0	50	50		25	0	75		0	100	0		
PHF	.000	.000	.000	.000	.000	.250	.500	.500	.250	.000	.375	.500	.000	.438	.000	.438	.625

Counts Unlimited Inc.
PO Box 1178
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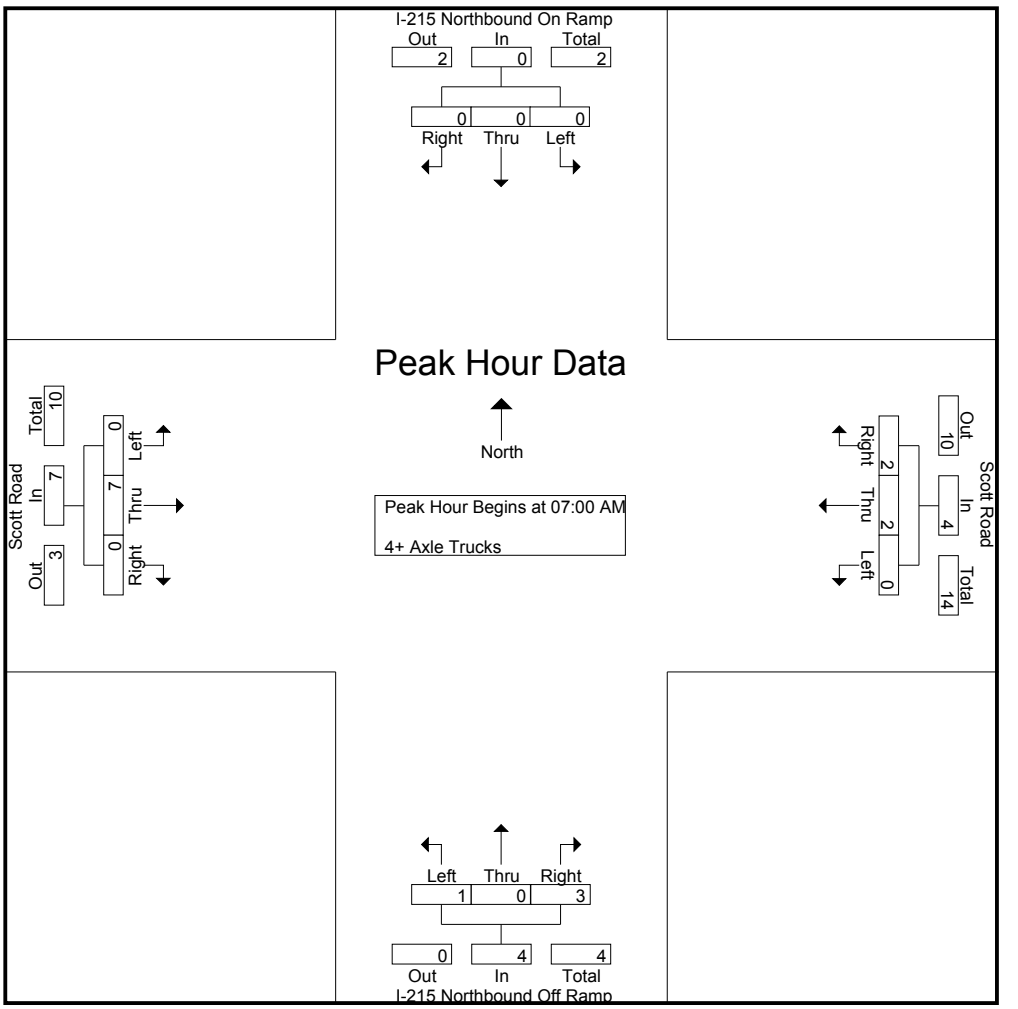
City of Menifee
N/S: I-215 Northbound Ramps
E/W: Scott Road
Weather: Sunny

File Name : MEN215NSCAM
Site Code : 10209063
Start Date : 10/13/2010
Page No : 2



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	0	**1**	1	**1**	0	0	1	0	1	0	1
+15 mins.	0	0	0	0	0	0	0	0	0	0	**2**	**2**	0	**4**	0	**4**
+30 mins.	0	0	0	0	0	0	1	1	0	0	1	1	0	0	0	0
+45 mins.	0	0	0	0	0	**2**	0	**2**	0	0	0	0	0	2	0	2
Total Volume	0	0	0	0	0	2	2	4	1	0	3	4	0	7	0	7
% App. Total	0	0	0		0	50	50		25	0	75		0	100	0	
PHF	.000	.000	.000	.000	.000	.250	.500	.500	.250	.000	.375	.500	.000	.438	.000	.438

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City of Menifee
N/S: I-215 Northbound Ramps
E/W: Scott Road
Weather: Sunny

File Name : MEN215NSCPM
Site Code : 10209063
Start Date : 10/13/2010

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

	I-215 Northbound On Ramp Southbound				Scott Road Westbound				I-215 Northbound Off Ramp Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	215	79	294	55	0	107	162	20	179	0	199	655
04:15 PM	0	0	0	0	0	188	68	256	63	1	105	169	27	194	0	221	646
04:30 PM	0	0	0	0	0	198	88	286	67	0	94	161	28	173	0	201	648
04:45 PM	0	0	0	0	0	240	91	331	45	3	123	171	20	193	0	213	715
Total	0	0	0	0	0	841	326	1167	230	4	429	663	95	739	0	834	2664
05:00 PM	0	0	0	0	0	242	94	336	39	0	87	126	40	192	0	232	694
05:15 PM	0	0	0	0	0	210	88	298	47	0	132	179	26	210	0	236	713
05:30 PM	0	0	0	0	0	221	91	312	51	3	126	180	26	185	0	211	703
05:45 PM	0	0	0	0	0	205	75	280	43	1	120	164	24	208	0	232	676
Total	0	0	0	0	0	878	348	1226	180	4	465	649	116	795	0	911	2786
06:00 PM	0	0	0	0	0	199	73	272	57	1	133	191	20	205	0	225	688
06:15 PM	0	0	0	0	0	182	63	245	45	2	135	182	13	207	0	220	647
06:30 PM	0	0	0	0	0	184	75	259	36	0	138	174	21	218	0	239	672
06:45 PM	0	0	0	0	0	160	63	223	33	3	119	155	14	196	0	210	588
Total	0	0	0	0	0	725	274	999	171	6	525	702	68	826	0	894	2595
Grand Total	0	0	0	0	0	2444	948	3392	581	14	1419	2014	279	2360	0	2639	8045
Apprch %	0	0	0		0	72.1	27.9		28.8	0.7	70.5		10.6	89.4	0		
Total %	0	0	0	0	0	30.4	11.8	42.2	7.2	0.2	17.6	25	3.5	29.3	0	32.8	
Passenger Vehicles	0	0	0	0	0	2409	925	3334	563	13	1403	1979	268	2334	0	2602	7915
% Passenger Vehicles	0	0	0	0	0	98.6	97.6	98.3	96.9	92.9	98.9	98.3	96.1	98.9	0	98.6	98.4
Large 2 Axle Vehicles	0	0	0	0	0	29	16	45	15	1	12	28	7	19	0	26	99
% Large 2 Axle Vehicles	0	0	0	0	0	1.2	1.7	1.3	2.6	7.1	0.8	1.4	2.5	0.8	0	1	1.2
3 Axle Vehicles	0	0	0	0	0	3	2	5	0	0	0	0	2	0	0	2	7
% 3 Axle Vehicles	0	0	0	0	0	0.1	0.2	0.1	0	0	0	0	0.7	0	0	0.1	0.1
4+ Axle Trucks	0	0	0	0	0	3	5	8	3	0	4	7	2	7	0	9	24
% 4+ Axle Trucks	0	0	0	0	0	0.1	0.5	0.2	0.5	0	0.3	0.3	0.7	0.3	0	0.3	0.3

	I-215 Northbound On Ramp Southbound				Scott Road Westbound				I-215 Northbound Off Ramp Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 06:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	0	0	0	240	91	331	45	**3**	123	171	20	193	0	213	**715**
05:00 PM	0	0	0	0	0	**242**	**94**	**336**	39	0	87	126	**40**	192	0	232	694
05:15 PM	0	0	0	0	0	210	88	298	47	0	**132**	179	26	**210**	0	**236**	713
05:30 PM	0	0	0	0	0	221	91	312	**51**	3	126	**180**	26	185	0	211	703
Total Volume	0	0	0	0	0	913	364	1277	182	6	468	656	112	780	0	892	2825
% App. Total	0	0	0		0	71.5	28.5		27.7	0.9	71.3		12.6	87.4	0		
PHF	.000	.000	.000	.000	.000	.943	.968	.950	.892	.500	.886	.911	.700	.929	.000	.945	.988

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City of Menifee
N/S: I-215 Northbound Ramps
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File Name : MEN215NSCPM
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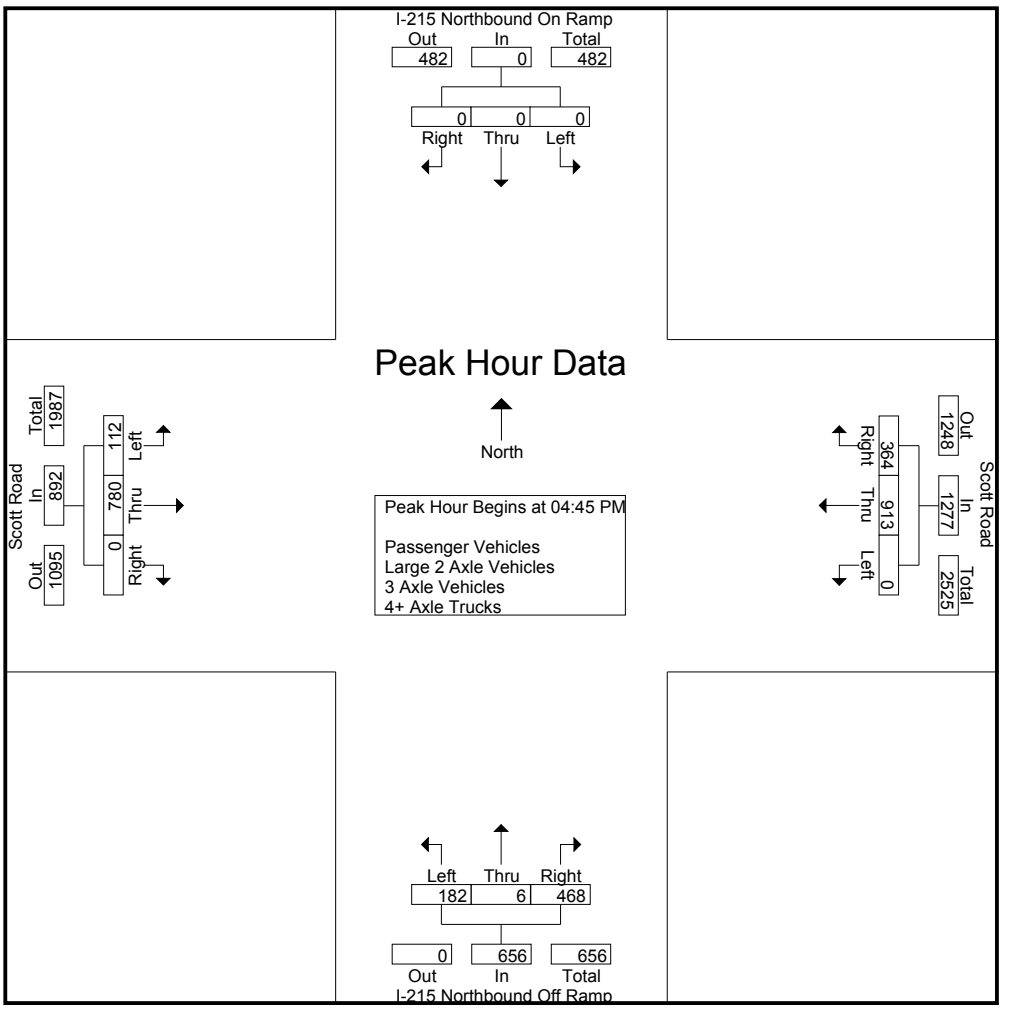

Peak Hour Analysis From 04:00 PM to 06:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:45 PM				05:30 PM				05:45 PM			
+0 mins.	0	0	0	0	0	240	91	331	51	**3**	126	180	**24**	208	0	232
+15 mins.	0	0	0	0	0	**242**	**94**	**336**	43	1	120	164	20	205	0	225
+30 mins.	0	0	0	0	0	210	88	298	**57**	1	133	**191**	13	207	0	220
+45 mins.	0	0	0	0	0	221	91	312	45	2	**135**	182	21	**218**	0	**239**
Total Volume	0	0	0	0	0	913	364	1277	196	7	514	717	78	838	0	916
% App. Total	0	0	0		0	71.5	28.5		27.3	1	71.7		8.5	91.5	0	
PHF	.000	.000	.000	.000	.000	.943	.968	.950	.860	.583	.952	.938	.813	.961	.000	.958

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City of Menifee
N/S: I-215 Northbound Ramps
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File Name : MEN215NSCPM
Site Code : 10209063
Start Date : 10/13/2010
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Groups Printed- Passenger Vehicles

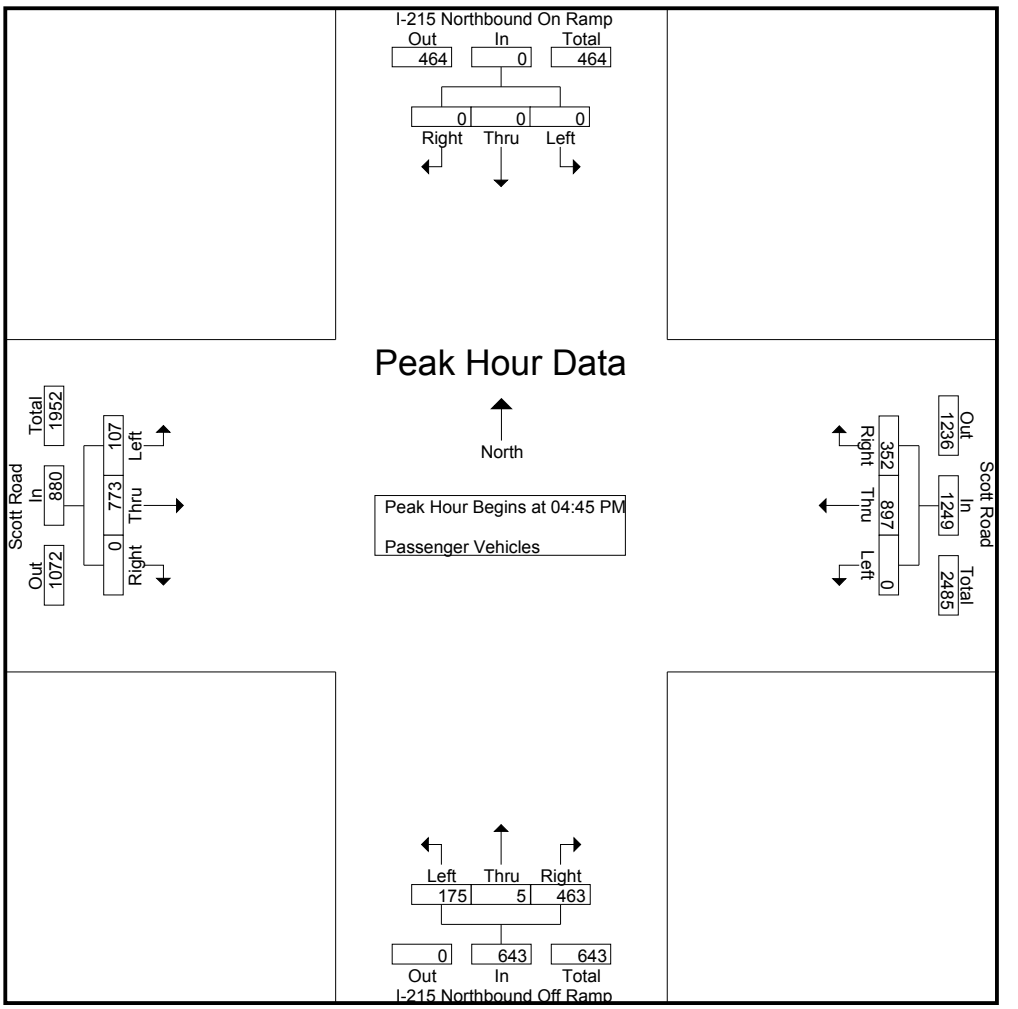
	I-215 Northbound On Ramp Southbound				Scott Road Westbound				I-215 Northbound Off Ramp Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	210	79	289	52	0	106	158	19	178	0	197	644
04:15 PM	0	0	0	0	0	183	66	249	60	1	104	165	25	191	0	216	630
04:30 PM	0	0	0	0	0	198	87	285	62	0	93	155	27	173	0	200	640
04:45 PM	0	0	0	0	0	236	89	325	44	3	121	168	20	191	0	211	704
Total	0	0	0	0	0	827	321	1148	218	4	424	646	91	733	0	824	2618
05:00 PM	0	0	0	0	0	241	91	332	37	0	87	124	39	191	0	230	686
05:15 PM	0	0	0	0	0	207	84	291	45	0	130	175	24	207	0	231	697
05:30 PM	0	0	0	0	0	213	88	301	49	2	125	176	24	184	0	208	685
05:45 PM	0	0	0	0	0	203	74	277	43	1	117	161	23	205	0	228	666
Total	0	0	0	0	0	864	337	1201	174	3	459	636	110	787	0	897	2734
06:00 PM	0	0	0	0	0	195	71	266	57	1	131	189	19	203	0	222	677
06:15 PM	0	0	0	0	0	181	62	243	45	2	135	182	13	206	0	219	644
06:30 PM	0	0	0	0	0	182	71	253	36	0	136	172	21	215	0	236	661
06:45 PM	0	0	0	0	0	160	63	223	33	3	118	154	14	190	0	204	581
Total	0	0	0	0	0	718	267	985	171	6	520	697	67	814	0	881	2563
Grand Total	0	0	0	0	0	2409	925	3334	563	13	1403	1979	268	2334	0	2602	7915
Apprch %	0	0	0		0	72.3	27.7		28.4	0.7	70.9		10.3	89.7	0		
Total %	0	0	0	0	0	30.4	11.7	42.1	7.1	0.2	17.7	25	3.4	29.5	0	32.9	

	I-215 Northbound On Ramp Southbound				Scott Road Westbound				I-215 Northbound Off Ramp Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	0	0	0	236	89	325	44	**3**	121	168	20	191	0	211	**704**
05:00 PM	0	0	0	0	0	**241**	**91**	**332**	37	0	87	124	**39**	191	0	230	686
05:15 PM	0	0	0	0	0	207	84	291	45	0	**130**	175	24	**207**	0	**231**	697
05:30 PM	0	0	0	0	0	213	88	301	**49**	2	125	**176**	24	184	0	208	685
Total Volume	0	0	0	0	0	897	352	1249	175	5	463	643	107	773	0	880	2772
% App. Total	0	0	0		0	71.8	28.2		27.2	0.8	72		12.2	87.8	0		
PHF	.000	.000	.000	.000	.000	.930	.967	.941	.893	.417	.890	.913	.686	.934	.000	.952	.984

Counts Unlimited Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Menifee
N/S: I-215 Northbound Ramps
E/W: Scott Road
Weather: Sunny

File Name : MEN215NSCPM
Site Code : 10209063
Start Date : 10/13/2010
Page No : 2



Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				04:45 PM				04:45 PM			
+0 mins.	0	0	0	0	0	236	89	325	44	**3**	121	168	20	191	0	211
+15 mins.	0	0	0	0	0	**241**	**91**	**332**	37	0	87	124	**39**	191	0	230
+30 mins.	0	0	0	0	0	207	84	291	45	0	**130**	175	24	**207**	0	**231**
+45 mins.	0	0	0	0	0	213	88	301	**49**	2	125	**176**	24	184	0	208
Total Volume	0	0	0	0	0	897	352	1249	175	5	463	643	107	773	0	880
% App. Total	0	0	0		0	71.8	28.2		27.2	0.8	72		12.2	87.8	0	
PHF	.000	.000	.000	.000	.000	.930	.967	.941	.893	.417	.890	.913	.686	.934	.000	.952

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City of Menifee
N/S: I-215 Northbound Ramps
E/W: Scott Road
Weather: Sunny

File Name : MEN215NSCPM
Site Code : 10209063
Start Date : 10/13/2010

Groups Printed- Large 2 Axle Vehicles

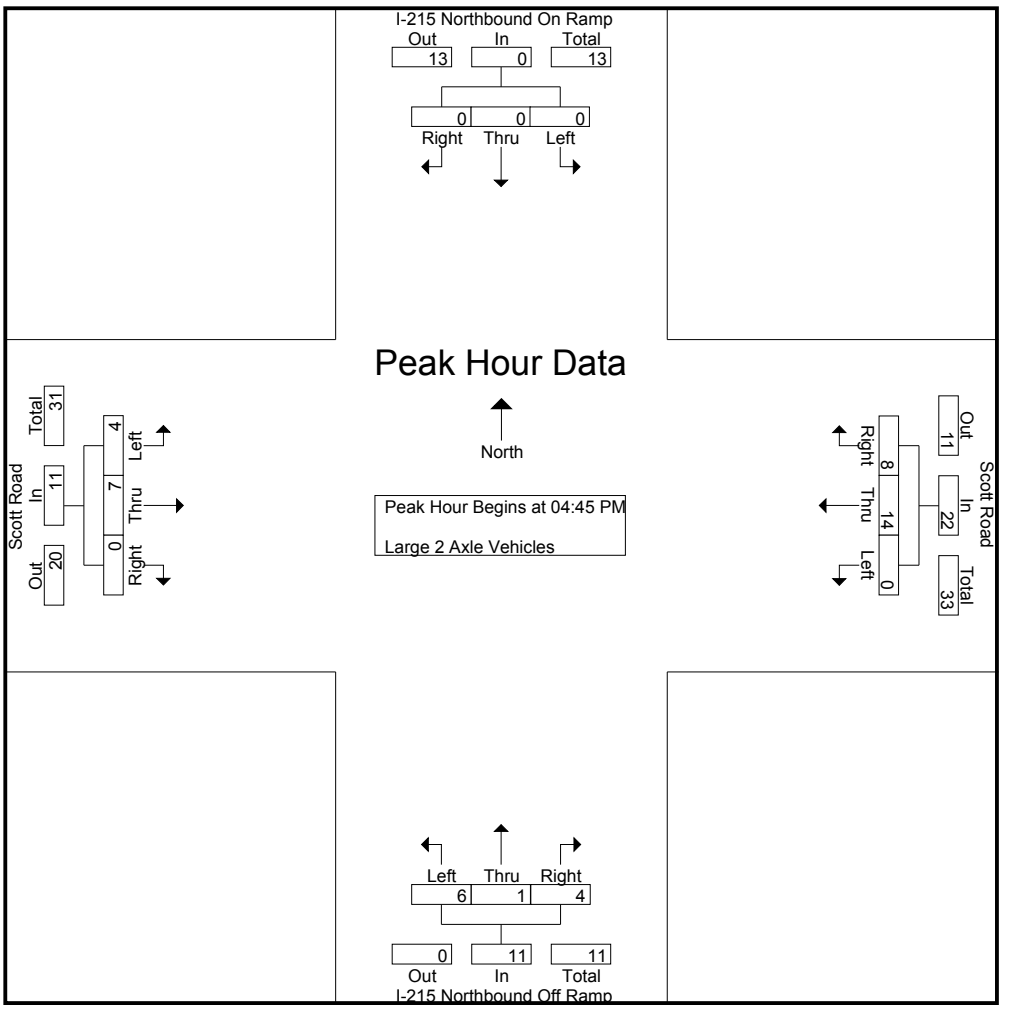
	I-215 Northbound On Ramp Southbound				Scott Road Westbound				I-215 Northbound Off Ramp Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	5	0	5	2	0	1	3	0	0	0	0	8
04:15 PM	0	0	0	0	0	5	2	7	2	0	1	3	1	3	0	4	14
04:30 PM	0	0	0	0	0	0	0	0	5	0	1	6	1	0	0	1	7
04:45 PM	0	0	0	0	0	4	1	5	1	0	2	3	0	2	0	2	10
Total	0	0	0	0	0	14	3	17	10	0	5	15	2	5	0	7	39
05:00 PM	0	0	0	0	0	1	3	4	2	0	0	2	1	1	0	2	8
05:15 PM	0	0	0	0	0	3	2	5	1	0	1	2	2	3	0	5	12
05:30 PM	0	0	0	0	0	6	2	8	2	1	1	4	1	1	0	2	14
05:45 PM	0	0	0	0	0	1	0	1	0	0	2	2	0	1	0	1	4
Total	0	0	0	0	0	11	7	18	5	1	4	10	4	6	0	10	38
06:00 PM	0	0	0	0	0	3	2	5	0	0	1	1	1	2	0	3	9
06:15 PM	0	0	0	0	0	1	1	2	0	0	0	0	0	1	0	1	3
06:30 PM	0	0	0	0	0	0	3	3	0	0	2	2	0	2	0	2	7
06:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	3
Total	0	0	0	0	0	4	6	10	0	0	3	3	1	8	0	9	22
Grand Total	0	0	0	0	0	29	16	45	15	1	12	28	7	19	0	26	99
Apprch %	0	0	0		0	64.4	35.6		53.6	3.6	42.9		26.9	73.1	0		
Total %	0	0	0	0	0	29.3	16.2	45.5	15.2	1	12.1	28.3	7.1	19.2	0	26.3	

	I-215 Northbound On Ramp Southbound				Scott Road Westbound				I-215 Northbound Off Ramp Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	0	0	0	4	1	5	1	0	**2**	3	0	2	0	2	10
05:00 PM	0	0	0	0	0	1	**3**	4	**2**	0	0	2	1	1	0	2	8
05:15 PM	0	0	0	0	0	3	2	5	1	0	1	2	**2**	**3**	0	**5**	12
05:30 PM	0	0	0	0	0	**6**	2	**8**	2	**1**	1	**4**	1	1	0	2	**14**
Total Volume	0	0	0	0	0	14	8	22	6	1	4	11	4	7	0	11	44
% App. Total	0	0	0		0	63.6	36.4		54.5	9.1	36.4		36.4	63.6	0		
PHF	.000	.000	.000	.000	.000	.583	.667	.688	.750	.250	.500	.688	.500	.583	.000	.550	.786

Counts Unlimited Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Menifee
N/S: I-215 Northbound Ramps
E/W: Scott Road
Weather: Sunny

File Name : MEN215NSCPM
Site Code : 10209063
Start Date : 10/13/2010
Page No : 2



Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				04:45 PM				04:45 PM			
+0 mins.	0	0	0	0	0	4	1	5	1	0	**2**	3	0	2	0	2
+15 mins.	0	0	0	0	0	1	**3**	4	**2**	0	0	2	1	1	0	2
+30 mins.	0	0	0	0	0	3	2	5	1	0	1	2	**2**	**3**	0	**5**
+45 mins.	0	0	0	0	0	**6**	2	**8**	2	**1**	1	**4**	1	1	0	2
Total Volume	0	0	0	0	0	14	8	22	6	1	4	11	4	7	0	11
% App. Total	0	0	0		0	63.6	36.4		54.5	9.1	36.4		36.4	63.6	0	
PHF	.000	.000	.000	.000	.000	.583	.667	.688	.750	.250	.500	.688	.500	.583	.000	.550

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City of Menifee
N/S: I-215 Northbound Ramps
E/W: Scott Road
Weather: Sunny

File Name : MEN215NSCPM
Site Code : 10209063
Start Date : 10/13/2010

Groups Printed- 3 Axle Vehicles

	I-215 Northbound On Ramp Southbound				Scott Road Westbound				I-215 Northbound Off Ramp Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	2
05:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0	1	2
05:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	2	2	4	0	0	0	0	1	0	0	1	5
06:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
06:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
Grand Total	0	0	0	0	0	3	2	5	0	0	0	0	2	0	0	2	7
Apprch %	0	0	0		0	60	40		0	0	0		100	0	0		
Total %	0	0	0	0	0	42.9	28.6	71.4	0	0	0	0	28.6	0	0	28.6	

	I-215 Northbound On Ramp Southbound				Scott Road Westbound				I-215 Northbound Off Ramp Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	**2**	**2**	0	0	0	0	0	0	0	0	**2**
05:30 PM	0	0	0	0	0	**1**	0	1	0	0	0	0	**1**	0	0	**1**	2
Total Volume	0	0	0	0	0	1	2	3	0	0	0	0	1	0	0	1	4
% App. Total	0	0	0		0	33.3	66.7		0	0	0		100	0	0		
PHF	.000	.000	.000	.000	.000	.250	.250	.375	.000	.000	.000	.000	.250	.000	.000	.250	.500

Counts Unlimited Inc.
PO Box 1178
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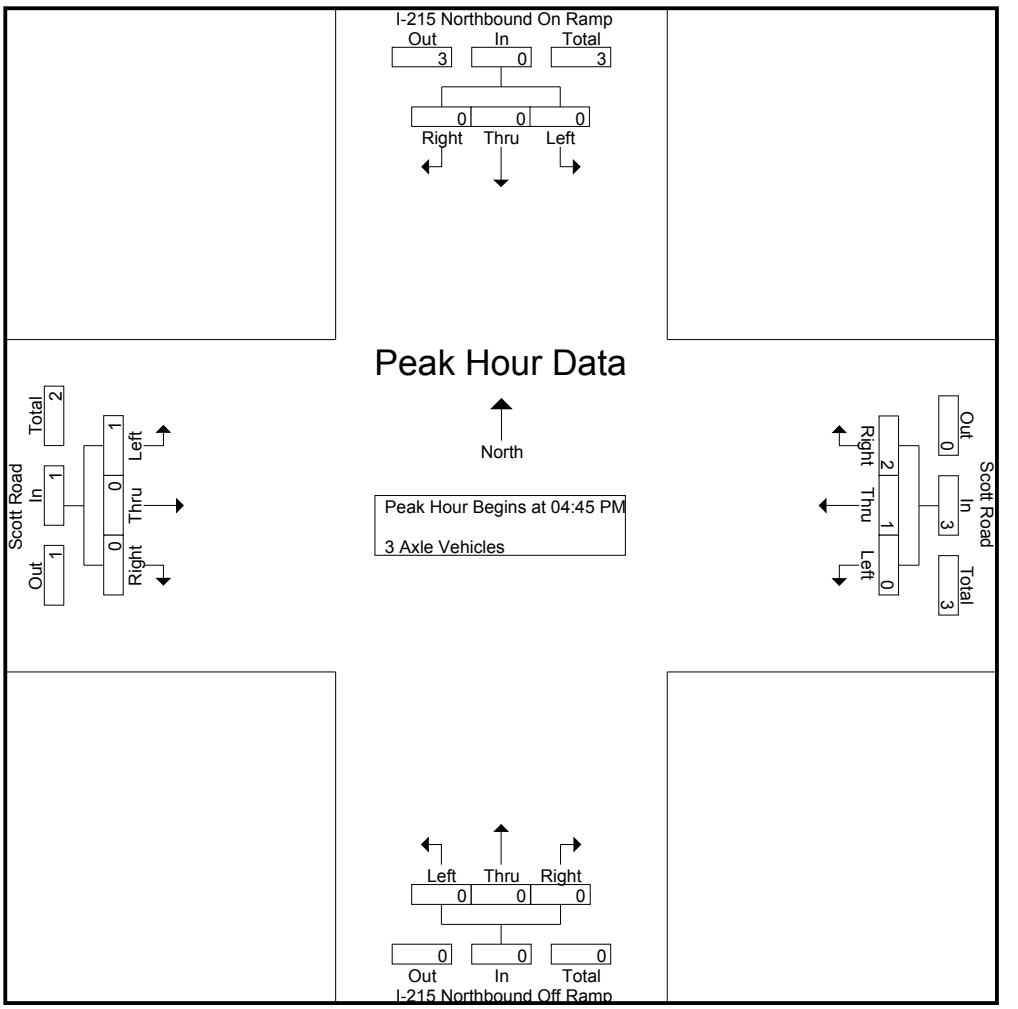
(951) 268-6268

City of Menifee
N/S: I-215 Northbound Ramps
E/W: Scott Road
Weather: Sunny

File Name : MEN215NSCPM
Site Code : 10209063
Start Date : 10/13/2010
Page No : 2



Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				04:45 PM				04:45 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	**2**	**2**	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	**1**	0	1	0	0	0	0	**1**	0	0	**1**
Total Volume	0	0	0	0	0	1	2	3	0	0	0	0	1	0	0	1
% App. Total	0	0	0		0	33.3	66.7		0	0	0		100	0	0	
PHF	.000	.000	.000	.000	.000	.250	.250	.375	.000	.000	.000	.000	.250	.000	.000	.250

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City of Menifee
N/S: I-215 Northbound Ramps
E/W: Scott Road
Weather: Sunny

File Name : MEN215NSCPM
Site Code : 10209063
Start Date : 10/13/2010

Groups Printed- 4+ Axle Trucks

	I-215 Northbound On Ramp Southbound				Scott Road Westbound				I-215 Northbound Off Ramp Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	1	2
04:15 PM	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	1	2
04:30 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	2	2	2	0	0	2	1	1	0	2	6
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	1	0	1	2	0	0	0	0	2
05:30 PM	0	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	2
05:45 PM	0	0	0	0	0	0	1	1	0	0	1	1	1	2	0	3	5
Total	0	0	0	0	0	1	2	3	1	0	2	3	1	2	0	3	9
06:00 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
06:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:30 PM	0	0	0	0	0	2	1	3	0	0	0	0	0	1	0	1	4
06:45 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	3	0	3	4
Total	0	0	0	0	0	2	1	3	0	0	2	2	0	4	0	4	9
Grand Total	0	0	0	0	0	3	5	8	3	0	4	7	2	7	0	9	24
Apprch %	0	0	0		0	37.5	62.5		42.9	0	57.1		22.2	77.8	0		
Total %	0	0	0	0	0	12.5	20.8	33.3	12.5	0	16.7	29.2	8.3	29.2	0	37.5	

	I-215 Northbound On Ramp Southbound				Scott Road Westbound				I-215 Northbound Off Ramp Northbound				Scott Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	0	0	0	0	**1**	1	0	0	0	0	0	0	0	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	**1**	0	**1**	**2**	0	0	0	0	**2**
05:30 PM	0	0	0	0	0	**1**	1	**2**	0	0	0	0	0	0	0	0	2
Total Volume	0	0	0	0	0	1	2	3	1	0	1	2	0	0	0	0	5
% App. Total	0	0	0		0	33.3	66.7		50	0	50		0	0	0		
PHF	.000	.000	.000	.000	.000	.250	.500	.375	.250	.000	.250	.250	.000	.000	.000	.000	.625

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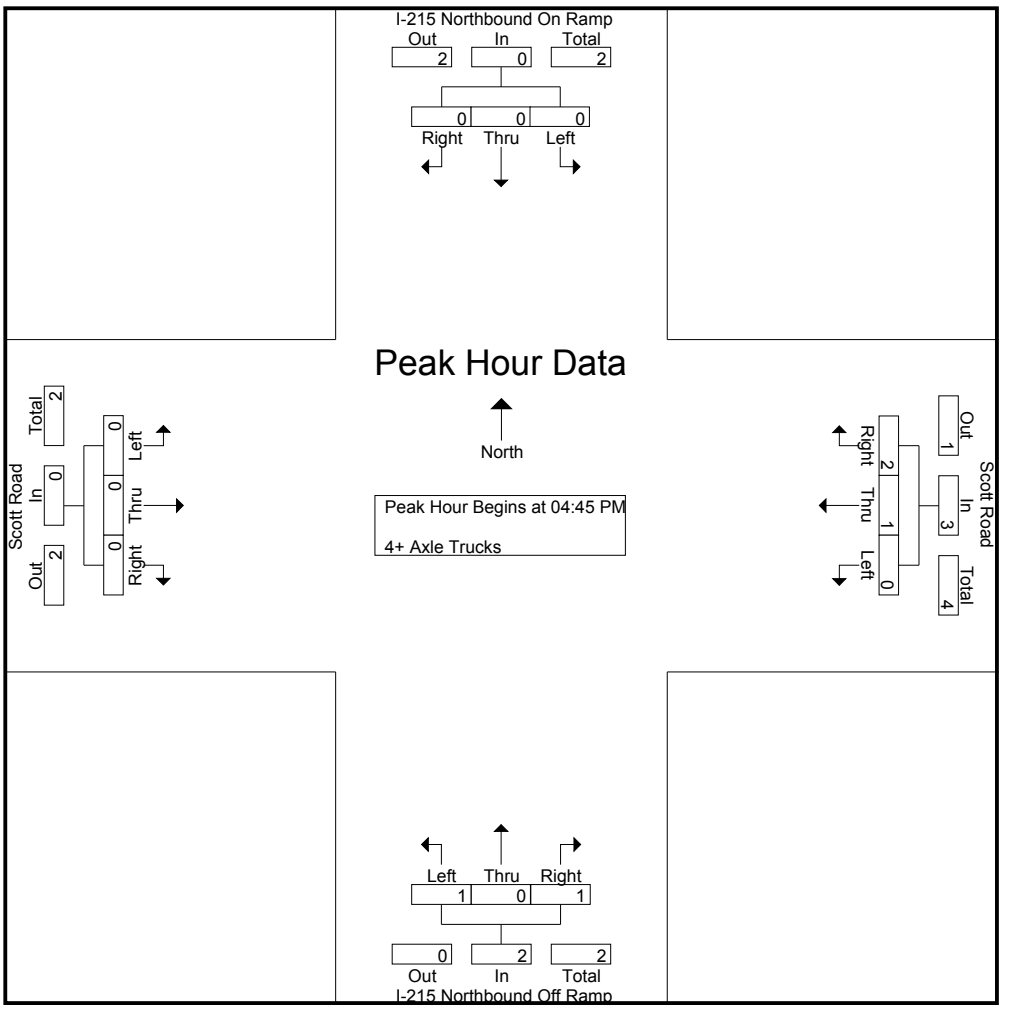
City of Menifee
N/S: I-215 Northbound Ramps
E/W: Scott Road
Weather: Sunny

File Name : MEN215NSCPM
Site Code : 10209063
Start Date : 10/13/2010
Page No : 2



Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				04:45 PM				04:45 PM			
+0 mins.	0	0	0	0	0	0	**1**	1	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	**1**	0	**1**	**2**	0	0	0	0
+45 mins.	0	0	0	0	0	**1**	1	**2**	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	1	2	3	1	0	1	2	0	0	0	0
% App. Total	0	0	0		0	33.3	66.7		50	0	50		0	0	0	
PHF	.000	.000	.000	.000	.000	.250	.500	.375	.250	.000	.250	.250	.000	.000	.000	.000

APPENDIX B:
LEVEL OF SERVICE CALCULATIONS

EXISTING CONDITIONS

City of Murrieta General Plan
Existing
AM Peak Hour

Scenario Report

Scenario:	Existing AM
Command:	Existing AM
Volume:	Existing AM
Geometry:	Existing
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	Default Trip Distribution
Paths:	Default Path
Routes:	Default Route
Configuration:	Existing AM

City of Murrieta General Plan
Existing
AM Peak Hour

Turning Movement Report

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#1 Menifee Road & Scott Road													
Base	167	75	77	80	64	100	74	364	54	69	543	85	1752
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	167	75	77	80	64	100	74	364	54	69	543	85	1752
#2 Leon Road & Scott Road													
Base	224	14	6	4	19	15	4	195	240	11	210	3	945
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	224	14	6	4	19	15	4	195	240	11	210	3	945
#3 Winchester Road/SR-79 & Scott Road													
Base	91	433	9	142	777	52	86	74	55	3	64	155	1941
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	91	433	9	142	777	52	86	74	55	3	64	155	1941
#4 Antelope Road & Keller Road													
Base	6	112	110	18	115	9	8	2	8	270	17	29	704
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	6	112	110	18	115	9	8	2	8	270	17	29	704
#5 Menifee Road - Meadowlark Road & Keller Road													
Base	0	0	0	11	0	121	105	19	0	0	31	10	297
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	11	0	121	105	19	0	0	31	10	297
#6 Briggs Road & Keller Road													
Base	1	2	3	4	5	6	7	8	9	10	11	12	78
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	2	3	4	5	6	7	8	9	10	11	12	78
#7 Leon Road & Keller Road													
Base	0	238	0	4	244	0	0	0	0	1	1	6	494
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	238	0	4	244	0	0	0	0	1	1	6	494
#8 Winchester Road - SR-79 & Keller Road													
Base	0	502	0	0	793	0	0	0	1	0	0	0	1296
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	502	0	0	793	0	0	0	1	0	0	0	1296
#9 Antelope Road & Golden City Drive - Baxter Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0

City of Murrieta General Plan
Existing
AM Peak Hour

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#10 Whitewood Roa - /Meadowlark Road & Golden City Drive - Baxter Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#11 Briggs Road & Baxter Road - Jean Nicholas													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0F
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#12 Leon Road & Jean Nicholas													
Base	0	208	15	16	230	0	0	0	0	27	0	71	567
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	208	15	16	230	0	0	0	0	27	0	71	567
#13 Winchester Road - SR-79 & Nicholas - Skyview													
Base	48	474	0	0	953	35	26	0	29	0	0	0	1565
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	48	474	0	0	953	35	26	0	29	0	0	0	1565
#14 Antelope Road & Linnel Lane Extension													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#15 Whitewood Road - Meadowlark Road & Linnel Lane Extension													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#16 Leon Road & Max Gillis Road													
Base	173	30	101	196	43	127	91	387	146	96	345	132	1867
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	173	30	101	196	43	127	91	387	146	96	345	132	1867
#17 Winchester Road - SR-79 & Max Gillis - Thompson													
Base	358	496	115	12	972	45	33	58	508	158	212	6	2973
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	358	496	115	12	972	45	33	58	508	158	212	6	2973
#18 California Oaks Road & Clinton Keith Road													
Base	111	0	339	0	0	0	0	493	113	437	508	0	2001
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	111	0	339	0	0	0	0	493	113	437	508	0	2001

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#19 I-215 SB Off-Ramp & Clinton Keith Road													
Base	0	0	0	88	2	388	0	786	514	207	368	0	2353
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	88	2	388	0	786	514	207	368	0	2353
#20 I-215 NB Off Ramp & Clinton Keith Road													
Base	128	0	432	0	0	0	467	486	0	0	489	100	2102
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	128	0	432	0	0	0	467	486	0	0	489	100	2102
#21 Antelope Road & Clinton Keith Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#22 Meadowlark Lane - Whitewood Road & Clinton Keith Road													
Base	154	76	30	0	161	141	136	4	173	34	7	1	917
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	154	76	30	0	161	141	136	4	173	34	7	1	917
#23 Liberty Road & Clinton Keith Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#24 Leon Road & Clinton Keith Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#25 Winchester Road - SR-79 & Benton Road													
Base	0	762	168	267	1369	0	0	0	0	301	0	142	3009
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	762	168	267	1369	0	0	0	0	301	0	142	3009
#26 Winchester Road - SR-79 & Via Mira Mosa													
Base	12	789	409	167	1540	104	128	18	37	184	16	28	3432
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	12	789	409	167	1540	104	128	18	37	184	16	28	3432
#27 Monroe Ave & Los Alamos													
Base	0	0	0	288	0	142	70	315	0	0	507	302	1624
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	288	0	142	70	315	0	0	507	302	1624

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Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#28 Jefferson Avenue & Murrieta Hot Springs Road													
Base	0	203	185	226	555	0	0	0	0	652	0	190	2011
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	203	185	226	555	0	0	0	0	652	0	190	2011
#29 Madison Avenue & Murrieta Hot Springs Road													
Base	28	63	147	210	120	87	68	318	43	354	710	127	2275
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	28	63	147	210	120	87	68	318	43	354	710	127	2275
#30 I-15 SB Off-Ramp & Murrieta Hot Springs Road													
Base	0	0	0	773	0	397	0	446	194	0	956	47	2813
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	773	0	397	0	446	194	0	956	47	2813
#31 I-15 NB Off-Ramp & Murrieta Hot Springs Road													
Base	235	0	91	0	0	0	115	1068	0	0	840	693	3042
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	235	0	91	0	0	0	115	1068	0	0	840	693	3042
#32 I-215 SB Off-Ramp & Murrieta Hot Springs Road													
Base	0	0	0	526	0	420	0	1105	53	0	1343	378	3825
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	526	0	420	0	1105	53	0	1343	378	3825
#33 I-215 NB Off-Ramp & Murrieta Hot Springs Road													
Base	151	0	163	0	0	0	0	1444	115	0	1591	466	3930
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	151	0	163	0	0	0	0	1444	115	0	1591	466	3930
#34 Jackson Avenue & Murrieta Hot Springs Road													
Base	66	0	52	0	0	0	0	1217	24	69	1439	0	2867
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	66	0	52	0	0	0	0	1217	24	69	1439	0	2867
#35 Margarita Road & Murrieta Hot Springs Road													
Base	674	8	131	6	3	1	22	782	581	197	999	5	3409
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	674	8	131	6	3	1	22	782	581	197	999	5	3409
#36 French Valley Parkway & Murrieta Hot Springs Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0

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Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#37 Jefferson Avenue & Guava Street													
Base	0	319	11	10	1198	0	0	0	0	30	0	16	1584
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	319	11	10	1198	0	0	0	0	30	0	16	1584
#38 Jefferson Avenue & Cherry Street													
Base	105	553	0	0	742	28	10	0	50	0	0	0	1488
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	105	553	0	0	742	28	10	0	50	0	0	0	1488
#39 Washington Ave & Calle Del Oso Oro/Nutmeg													
Base	226	199	101	53	264	57	36	223	551	162	109	31	2012
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	226	199	101	53	264	57	36	223	551	162	109	31	2012
#40 Clinton Keith Rd & Calle de Oso Oro/Bear Creek Dr													
Base	2	262	155	31	157	75	69	37	2	64	26	64	944
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	262	155	31	157	75	69	37	2	64	26	64	944
#41 Jefferson Ave & Nutmeg St													
Base	80	32	136	11	93	7	15	181	178	261	250	22	1266
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	80	32	136	11	93	7	15	181	178	261	250	22	1266
#42 Jefferson Ave & Magnolia St													
Base	56	164	6	5	428	143	124	3	95	17	6	1	1048
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	56	164	6	5	428	143	124	3	95	17	6	1	1048
#43 Jefferson Ave & Lemon St													
Base	76	257	0	1	501	61	21	1	82	1	3	2	1006
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	76	257	0	1	501	61	21	1	82	1	3	2	1006
#44 Jefferson Ave & Kalmia St													
Base	115	126	97	265	273	52	19	518	207	138	428	200	2438
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	115	126	97	265	273	52	19	518	207	138	428	200	2438
#45 Jefferson Ave & Juniper St													
Base	69	258	15	37	526	31	54	84	79	8	78	23	1262
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	69	258	15	37	526	31	54	84	79	8	78	23	1262

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#46 Jefferson Ave & Ivy St/Los Alamos Rd													
Base	100	171	39	152	441	37	27	145	102	171	120	132	1637
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	100	171	39	152	441	37	27	145	102	171	120	132	1637
#47 Madison Ave & Kalmia St													
Base	108	0	237	0	0	0	0	765	107	310	772	0	2299
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	108	0	237	0	0	0	0	765	107	310	772	0	2299
#48 Madison Ave/I-15 SB Ramps & Kalmia St													
Base	0	0	0	305	2	278	0	483	373	412	773	0	2626
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	305	2	278	0	483	373	412	773	0	2626
#49 Monroe Ave & Murrieta Hot Springs Rd													
Base	0	0	0	0	0	71	125	1097	0	0	1463	25	2781
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	71	125	1097	0	0	1463	25	2781
#50 Hancock Ave & Murrieta Hot Springs Rd													
Base	0	0	0	264	0	147	227	884	0	0	1346	464	3332
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	264	0	147	227	884	0	0	1346	464	3332
#51 Alta Murrieta Dr & Murrieta Hot Springs Rd													
Base	175	57	14	61	94	297	249	995	235	72	1350	107	3706
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	175	57	14	61	94	297	249	995	235	72	1350	107	3706
#52 Winchester Road - SR-79 & Murrieta Hot Springs Rd													
Base	118	729	135	128	1408	536	512	318	137	268	340	37	4666
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	118	729	135	128	1408	536	512	318	137	268	340	37	4666
#53 Hancock Ave & Los Alamos Rd													
Base	51	143	93	526	246	156	125	601	66	226	711	293	3237
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	51	143	93	526	246	156	125	601	66	226	711	293	3237
#54 I-215 SB Ramps & Los Alamos Rd													
Base	0	0	0	119	1	497	0	801	426	250	899	0	2993
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	119	1	497	0	801	426	250	899	0	2993

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#55 I-215 NB Ramps & Los Alamos Rd													
Base	209	1	107	0	0	0	242	670	0	0	951	72	2252
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	209	1	107	0	0	0	242	670	0	0	951	72	2252
#56 Whitewood Rd & Los Alamos Rd													
Base	126	90	59	11	110	254	124	226	64	33	270	6	1373
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	126	90	59	11	110	254	124	226	64	33	270	6	1373
#57 Whitewood Rd & Murrieta Hot Springs Rd													
Base	4	38	43	353	20	63	31	1106	4	23	1556	241	3482
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	4	38	43	353	20	63	31	1106	4	23	1556	241	3482
#58 Adams Ave & Guava St													
Base	0	13	2	94	67	0	0	0	0	3	0	44	223
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	13	2	94	67	0	0	0	0	3	0	44	223
#59 Nutmeg St & Clinton Keith Rd													
Base	69	34	201	101	55	39	17	357	79	206	404	39	1601
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	69	34	201	101	55	39	17	357	79	206	404	39	1601
#60 Mitchell Rd & Clinton Keith Rd													
Base	122	0	212	0	0	0	0	862	254	158	752	0	2360
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	122	0	212	0	0	0	0	862	254	158	752	0	2360
#61 I-215 SB Ramps & Scott Rd													
Base	0	0	0	258	4	88	0	535	320	447	501	0	2153
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	258	4	88	0	535	320	447	501	0	2153
#62 I-215 NB Ramps & Scott Rd													
Base	145	12	349	0	0	0	108	603	0	0	792	380	2389
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	145	12	349	0	0	0	108	603	0	0	792	380	2389
#104 Antelope Road & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#105 Menifee Road - Meadowlark Road & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#122 Meadowlark Lane - Whitewood Road & Clinton Keith Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#138 Jefferson Avenue & Cherry Street													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#141 Jefferson Ave & Nutmeg St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#142 Jefferson Ave & Magnolia St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#149 Monroe Ave & Murrieta Hot Springs Rd													
Base	0	0	0	0	0	71	125	1097	0	0	1463	25	2781
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	71	125	1097	0	0	1463	25	2781

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Impact Analysis Report
Level Of Service

Intersection	Base LOS	Del/ Veh	V/ C	Future LOS	Del/ Veh	V/ C	Change in
# 1 Menifee Road & Scott Road	B	19.8	0.376	B	19.8	0.376	+ 0.000 D/V
# 2 Leon Road & Scott Road	B	12.4	0.589	B	12.4	0.589	+ 0.000 V/C
# 3 Winchester Road/SR-79 & Scott	C	20.7	0.432	C	20.7	0.432	+ 0.000 D/V
# 4 Antelope Road & Keller Road	B	10.4	0.449	B	10.4	0.449	+ 0.000 V/C
# 5 Menifee Road - Meadowlark Road	A	8.1	0.158	A	8.1	0.158	+ 0.000 V/C
# 7 Leon Road & Keller Road	B	10.2	0.000	B	10.2	0.000	+ 0.000 D/V
# 8 Winchester Road - SR-79 & Kell	B	14.2	0.000	B	14.2	0.000	+ 0.000 D/V
# 12 Leon Road & Jean Nicholas	B	10.7	0.000	B	10.7	0.000	+ 0.000 D/V
# 13 Winchester Road - SR-79 & Nich	A	4.0	0.321	A	4.0	0.321	+ 0.000 D/V
# 16 Leon Road & Max Gillis Road	C	24.6	0.310	C	24.6	0.310	+ 0.000 D/V
# 17 Winchester Road - SR-79 & Max	D	37.1	0.870	D	37.1	0.870	+ 0.000 D/V
# 18 California Oaks Road & Clinton	C	21.7	0.545	C	21.7	0.545	+ 0.000 D/V
# 19 I-215 SB Off-Ramp & Clinton Ke	C	23.9	0.770	C	23.9	0.770	+ 0.000 D/V
# 20 I-215 NB Off Ramp & Clinton Ke	C	26.2	0.745	C	26.2	0.745	+ 0.000 D/V
# 22 Meadowlark Lane - Whitewood Ro	B	10.5	0.287	B	10.5	0.287	+ 0.000 V/C
# 25 Winchester Road - SR-79 & Bent	B	14.4	0.465	B	14.4	0.465	+ 0.000 D/V
# 26 Winchester Road - SR-79 & Via	B	14.2	0.600	B	14.2	0.600	+ 0.000 D/V
# 27 Monroe Ave & Los Alamos	B	15.0	0.314	B	15.0	0.314	+ 0.000 D/V
# 28 Jefferson Avenue & Murrieta Ho	C	21.2	0.472	C	21.2	0.472	+ 0.000 D/V
# 29 Madison Avenue & Murrieta Hot	C	25.3	0.307	C	25.3	0.307	+ 0.000 D/V
# 30 I-15 SB Off-Ramp & Murrieta Ho	B	17.7	0.521	B	17.7	0.521	+ 0.000 D/V
# 31 I-15 NB Off-Ramp & Murrieta Ho	B	11.8	0.291	B	11.8	0.291	+ 0.000 D/V
# 32 I-215 SB Off-Ramp & Murrieta H	B	16.0	0.501	B	16.0	0.501	+ 0.000 D/V

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Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
# 33 I-215 NB Off-Ramp & Murrieta H	A	5.4	0.369	A	5.4	0.369	+ 0.000 D/V
# 34 Jackson Avenue & Murrieta Hot	A	4.3	0.303	A	4.3	0.303	+ 0.000 D/V
# 35 Margarita Road & Murrieta Hot	B	19.2	0.666	B	19.2	0.666	+ 0.000 D/V
# 37 Jefferson Avenue & Guava Stree	A	2.0	0.352	A	2.0	0.352	+ 0.000 D/V
# 38 Jefferson Avenue & Cherry Stre	C	15.2	0.000	C	15.2	0.000	+ 0.000 D/V
# 39 Washington Ave & Calle Del Oso	C	29.2	0.648	C	29.2	0.648	+ 0.000 D/V
# 40 Clinton Keith Rd & Calle de Os	B	13.6	0.195	B	13.6	0.195	+ 0.000 D/V
# 41 Jefferson Ave & Nutmeg St	B	13.2	0.535	B	13.2	0.535	+ 0.000 V/C
# 42 Jefferson Ave & Magnolia St	C	18.2	0.796	C	18.2	0.796	+ 0.000 V/C
# 43 Jefferson Ave & Lemon St	B	10.9	0.370	B	10.9	0.370	+ 0.000 D/V
# 44 Jefferson Ave & Kalmia St	C	26.2	0.449	C	26.2	0.449	+ 0.000 D/V
# 45 Jefferson Ave & Juniper St	B	18.6	0.243	B	18.6	0.243	+ 0.000 D/V
# 46 Jefferson Ave & Ivy St/Los Ala	C	27.9	0.345	C	27.9	0.345	+ 0.000 D/V
# 47 Madison Ave & Kalmia St	B	16.2	0.320	B	16.2	0.320	+ 0.000 D/V
# 48 Madison Ave/I-15 SB Ramps & Ka	C	20.4	0.537	C	20.4	0.537	+ 0.000 D/V
# 49 Monroe Ave & Murrieta Hot Spri	C	15.8	0.000	C	15.8	0.000	+ 0.000 D/V
# 50 Hancock Ave & Murrieta Hot Spr	B	11.7	0.428	B	11.7	0.428	+ 0.000 D/V
# 51 Alta Murrieta Dr & Murrieta Ho	C	21.3	0.432	C	21.3	0.432	+ 0.000 D/V
# 52 Winchester Road - SR-79 & Murr	C	24.0	0.606	C	24.0	0.606	+ 0.000 D/V
# 53 Hancock Ave & Los Alamos Rd	C	28.4	0.613	C	28.4	0.613	+ 0.000 D/V
# 54 I-215 SB Ramps & Los Alamos Rd	B	18.0	0.522	B	18.0	0.522	+ 0.000 D/V
# 55 I-215 NB Ramps & Los Alamos Rd	B	15.4	0.462	B	15.4	0.462	+ 0.000 D/V
# 56 Whitewood Rd & Los Alamos Rd	C	26.7	0.372	C	26.7	0.372	+ 0.000 D/V
# 57 Whitewood Rd & Murrieta Hot Sp	B	12.6	0.518	B	12.6	0.518	+ 0.000 D/V
# 58 Adams Ave & Guava St	A	8.6	0.000	A	8.6	0.000	+ 0.000 D/V

Traffix 7.9.0215 (c) 2008 Dowling Assoc. Licensed to MMA, LONG BEACH, CA

City of Murrieta General Plan
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Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
# 59 Nutmeg St & Clinton Keith Rd	C	20.6	0.366	C	20.6	0.366	+ 0.000 D/V
# 61 I-215 SB Ramps & Scott Rd	C	23.2	0.684	C	23.2	0.684	+ 0.000 D/V
# 62 I-215 NB Ramps & Scott Rd	B	18.0	0.693	B	18.0	0.693	+ 0.000 D/V

Traffix 7.9.0215 (c) 2008 Dowling Assoc. Licensed to MMA, LONG BEACH, CA

City of Murrieta General Plan
Existing
AM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #1 Menifee Road & Scott Road

Cycle (sec):	100	Critical Vol./Cap.(X):	0.376
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	19.8
Optimal Cycle:	30	Level Of Service:	B

Street Name:	Menifee Rd						Scott Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	0 1	1	0 0	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	167	75	77	80	64	100	74	364	54	69	543	85
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	167	75	77	80	64	100	74	364	54	69	543	85
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	167	75	77	80	64	100	74	364	54	69	543	85
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	167	75	77	80	64	100	74	364	54	69	543	85
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	167	75	77	80	64	100	74	364	54	69	543	85
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.56	1.00	0.85	0.67	0.91	0.91	0.95	0.93	0.93	0.95	0.93	0.93
Lanes:	1.00	1.00	1.00	1.00	0.39	0.61	1.00	1.74	0.26	1.00	1.73	0.27
Final Sat.:	1058	1900	1615	1264	674	1053	1805	3084	458	1805	3059	479
Capacity Analysis Module:												
Vol/Sat:	0.16	0.04	0.05	0.06	0.09	0.09	0.04	0.12	0.12	0.04	0.18	0.18
Crit Moves:	****						****				****	
Green/Cycle:	0.42	0.42	0.42	0.42	0.42	0.42	0.11	0.44	0.44	0.14	0.47	0.47
Volume/Cap:	0.38	0.09	0.11	0.15	0.23	0.23	0.38	0.27	0.27	0.27	0.38	0.38
Delay/Veh:	20.6	17.6	17.8	18.1	18.8	18.8	42.6	18.0	18.0	38.8	17.1	17.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	20.6	17.6	17.8	18.1	18.8	18.8	42.6	18.0	18.0	38.8	17.1	17.1
LOS by Move:	C	B	B	B	B	B	D	B	B	D	B	B
HCM2kAvgQ:	4	1	1	2	3	3	2	4	4	2	6	6

Note: Queue reported is the number of cars per lane.

City of Murrieta General Plan
Existing
AM Peak Hour

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #2 Leon Road & Scott Road

Cycle (sec):	100	Critical Vol./Cap.(X):	0.589
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	12.4
Optimal Cycle:	0	Level Of Service:	B

Street Name:	Leon Rd						Scott Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0 1!	0	0	0 1!	0	0	0 1!	0	0	0 1!	0
Volume Module:												
Base Vol:	224	14	6	4	19	15	4	195	240	11	210	3
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	224	14	6	4	19	15	4	195	240	11	210	3
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	224	14	6	4	19	15	4	195	240	11	210	3
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	224	14	6	4	19	15	4	195	240	11	210	3
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	224	14	6	4	19	15	4	195	240	11	210	3
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.92	0.06	0.02	0.11	0.50	0.39	0.01	0.44	0.55	0.05	0.94	0.01
Final Sat.:	545	34	15	57	272	214	7	331	407	32	610	9
Capacity Analysis Module:												
Vol/Sat:	0.41	0.41	0.41	0.07	0.07	0.07	0.59	0.59	0.59	0.34	0.34	0.34
Crit Moves:		****			****			****			****	
Delay/Veh:	12.1	12.1	12.1	9.0	9.0	9.0	13.7	13.7	13.7	10.8	10.8	10.8
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	12.1	12.1	12.1	9.0	9.0	9.0	13.7	13.7	13.7	10.8	10.8	10.8
LOS by Move:	B	B	B	A	A	A	B	B	B	B	B	B
ApproachDel:		12.1			9.0			13.7			10.8	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		12.1			9.0			13.7			10.8	
LOS by Appr:		B			A			B			B	
AllWayAvgQ:	0.6	0.6	0.6	0.1	0.1	0.1	1.3	1.3	1.3	0.5	0.5	0.5

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #3 Winchester Road/SR-79 & Scott Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.432
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 20.7
Optimal Cycle: 33 Level Of Service: C

Street Name:	Winchester Road/SR-79									Scott Road								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Permitted					Permitted				
Rights:	Include					Include					Include					Include				
Min. Green:	0	0	0			0	0	0			0	0	0			0	0	0		
Lanes:	1	0	1	1	0	1	0	1	1	0	0	0	1!	0	0	0	0	1!	0	0
Volume Module:																				
Base Vol:	91	433		9		142	777		52		86		74		55	3		64		155
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00	1.00		1.00		1.00
Initial Bse:	91	433		9		142	777		52		86		74		55	3		64		155
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00	1.00		1.00		1.00
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00	1.00		1.00		1.00
PHF Volume:	91	433		9		142	777		52		86		74		55	3		64		155
Reduct Vol:	0	0		0		0	0		0		0		0		0	0		0		0
Reduced Vol:	91	433		9		142	777		52		86		74		55	3		64		155
PCE Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00	1.00		1.00		1.00
MLF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00	1.00		1.00		1.00
FinalVolume:	91	433		9		142	777		52		86		74		55	3		64		155
Saturation Flow Module:																				
Sat/Lane:	1900	1900		1900		1900	1900		1900		1900		1900		1900	1900		1900		1900
Adjustment:	0.95	0.95		0.95		0.95	0.94		0.94		0.76		0.76		0.76	0.90		0.90		0.90
Lanes:	1.00	1.96		0.04		1.00	1.87		0.13		0.40		0.34		0.26	0.01		0.29		0.70
Final Sat.:	1805	3526		73		1805	3353		224		576		495		368	23		495		1198
Capacity Analysis Module:																				
Vol/Sat:	0.05	0.12		0.12		0.08	0.23		0.23		0.15		0.15		0.15	0.13		0.13		0.13
Crit Moves:	****						****						****							
Green/Cycle:	0.12	0.40		0.40		0.26	0.54		0.54		0.35		0.35		0.35	0.35		0.35		0.35
Volume/Cap:	0.43	0.31		0.31		0.31	0.43		0.43		0.43		0.43		0.43	0.37		0.37		0.37
Delay/Veh:	42.5	20.7		20.7		30.5	14.1		14.1		25.7		25.7		25.7	24.9		24.9		24.9
User DelAdj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00	1.00		1.00		1.00
AdjDel/Veh:	42.5	20.7		20.7		30.5	14.1		14.1		25.7		25.7		25.7	24.9		24.9		24.9
LOS by Move:	D		C		C	C		B		B	C		C		C	C		C		C
HCM2kAvgQ:	3		5		5	4		8		8	5		5		5	5		5		5

Note: Queue reported is the number of cars per lane.

City of Murrieta General Plan
Existing
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Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #4 Antelope Road & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.449
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 10.4
Optimal Cycle: 0 Level Of Service: B

Street Name:	Antelope Road									Keller Road								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Stop Sign					Stop Sign					Stop Sign					Stop Sign				
Rights:	Include					Include					Include					Include				
Min. Green:	0	0	0			0	0	0			0	0	0			0	0	0		
Lanes:	0	0	1!	0	0	0	0	1!	0	0	0	0	1!	0	0	0	0	1!	0	0
Volume Module:																				
Base Vol:	6	112		110		18	115		9		8		2		8	270		17		29
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00	1.00		1.00		1.00
Initial Bse:	6	112		110		18	115		9		8		2		8	270		17		29
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00	1.00		1.00		1.00
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00	1.00		1.00		1.00
PHF Volume:	6	112		110		18	115		9		8		2		8	270		17		29
Reduct Vol:	0	0		0		0	0		0		0		0		0	0		0		0
Reduced Vol:	6	112		110		18	115		9		8		2		8	270		17		29
PCE Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00	1.00		1.00		1.00
MLF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00	1.00		1.00		1.00
FinalVolume:	6	112		110		18	115		9		8		2		8	270		17		29
Saturation Flow Module:																				
Adjustment:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00	1.00		1.00		1.00
Lanes:	0.03	0.49		0.48		0.13	0.81		0.06		0.45		0.11		0.44	0.86		0.05		0.09
Final Sat.:	19	361		355		86	549		43		289		72		289	602		38		65
Capacity Analysis Module:																				
Vol/Sat:	0.31	0.31		0.31		0.21	0.21		0.21		0.03		0.03		0.03	0.45		0.45		0.45
Crit Moves:		****				****						****					****			
Delay/Veh:	9.6	9.6		9.6		9.2	9.2		9.2		8.1		8.1		8.1	11.6		11.6		11.6
Delay Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00	1.00		1.00		1.00
AdjDel/Veh:	9.6	9.6		9.6		9.2	9.2		9.2		8.1		8.1		8.1	11.6		11.6		11.6
LOS by Move:	A		A		A	A		A		A	A		A		A	B		B		B
ApproachDel:	9.6					9.2					8.1					11.6				
Delay Adj:	1.00					1.00					1.00					1.00				
ApprAdjDel:	9.6					9.2					8.1					11.6				
LOS by Appr:	A					A					A					B				
AllWayAvgQ:	0.4	0.4		0.4		0.2	0.2		0.2		0.0		0.0		0.0	0.7		0.7		0.7

Note: Queue reported is the number of cars per lane.

City of Murrieta General Plan
Existing
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Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #5 Menifee Road - Meadowlark Road & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.158
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 8.1
Optimal Cycle: 0 Level Of Service: A

Street Name:	Menifee Road - Meadowlark Road						Keller Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	- T	- R	L	- T	- R	L	- T	- R	L	- T	- R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	0	0 0	1	0 0	0 1	1	0 1	0 0	1	0 1	0 1
Volume Module:												
Base Vol:	0	0	0	11	0	121	105	19	0	0	31	10
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	11	0	121	105	19	0	0	31	10
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	11	0	121	105	19	0	0	31	10
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	11	0	121	105	19	0	0	31	10
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	11	0	121	105	19	0	0	31	10
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Final Sat.:	0	0	0	649	0	829	663	730	0	627	688	793
Capacity Analysis Module:												
Vol/Sat:	xxxx	xxxx	xxxx	0.02	xxxx	0.15	0.16	0.03	xxxx	0.00	0.05	0.01
Crit Moves:						****	****				****	
Delay/Veh:	0.0	0.0	0.0	8.2	0.0	7.6	9.0	7.6	0.0	0.0	8.0	7.1
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	8.2	0.0	7.6	9.0	7.6	0.0	0.0	8.0	7.1
LOS by Move:	*	*	*	A	*	A	A	A	*	*	A	A
ApproachDel:	xxxxxx			7.7			8.8			7.8		
Delay Adj:	xxxxx			1.00			1.00			1.00		
ApprAdjDel:	xxxxxx			7.7			8.8			7.8		
LOS by Appr:	*			A			A			A		
AllWayAvgQ:	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0

Note: Queue reported is the number of cars per lane.

City of Murrieta General Plan
Existing
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Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #7 Leon Road & Keller Road

Average Delay (sec/veh): 0.2 Worst Case Level Of Service: B[10.2]

Street Name:	Leon Road						Keller Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	- T	- R	L	- T	- R	L	- T	- R	L	- T	- R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0 0	1	0 0	0	1	0 0 0	0	0 1!	0 0	0	0 1!	0 0
Volume Module:												
Base Vol:	0	238	0	4	244	0	0	0	0	1	1	6
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	238	0	4	244	0	0	0	0	1	1	6
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	238	0	4	244	0	0	0	0	1	1	6
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	238	0	4	244	0	0	0	0	1	1	6
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx	7.1	6.5	6.2	6.4	6.5	6.2
FollowUpTim:	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx	3.5	4.0	3.3	3.5	4.0	3.3
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	238	xxxx	xxxxx	494	490	244	490	490	238
Potent Cap.:	xxxx	xxxx	xxxxx	1341	xxxx	xxxxx	489	482	800	541	482	806
Move Cap.:	xxxx	xxxx	xxxxx	1341	xxxx	xxxxx	484	480	800	540	480	806
Volume/Cap:	xxxx	xxxx	xxxx	0.00	xxxx	xxxx	0.00	0.00	0.00	0.00	0.00	0.01
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	7.7	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	A	*	*	*	*	*	*	*	*
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	0	xxxxx	xxxx	703	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.0	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	7.7	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	10.2	xxxxx
Shared LOS:	*	*	*	A	*	*	*	*	*	*	B	*
ApproachDel:	xxxxxx			xxxxxx			xxxxxx			10.2		
ApproachLOS:	*			*			*			B		

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #8 Winchester Road - SR-79 & Keller Road

Average Delay (sec/veh): 0.0 Worst Case Level Of Service: B[14.2]

Street Name:	Winchester Road - SR-79								Keller Road							
Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Rights:	Include					Include					Include					Include				
Lanes:	0	0	1	0	0	0	0	1	0	0	0	0	0	1		0	0	1!	0	0
Volume Module:																				
Base Vol:	0	502		0		0	793		0		0	0		1		0	0		0	
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
Initial Bse:	0	502		0		0	793		0		0	0		1		0	0		0	
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Volume:	0	502		0		0	793		0		0	0		1		0	0		0	
Reduct Vol:	0	0		0		0	0		0		0	0		0		0	0		0	
FinalVolume:	0	502		0		0	793		0		0	0		1		0	0		0	
Critical Gap Module:																				
Critical Gp:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx		6.2		7.1		6.5		6.2				
FollowUpTim:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx		3.3		3.5		4.0		3.3				
Capacity Module:																				
Cnflict Vol:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx		793		1296		1295		502				
Potent Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx		392		141		164		573				
Move Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx		392		140		164		573				
Volume/Cap:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx		0.00		0.00		0.00		0.00				
Level Of Service Module:																				
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx		0.0		xxxx		xxxx		xxxxx				
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx		14.2		xxxxx		xxxx		xxxxx				
LOS by Move:	*	*	*	*	*	*	*	*		B		*		*		*				
Movement:	LT	-	LTR	-	RT	LT	-	LTR	-	RT	LT	-	LTR	-	RT	LT	-	LTR	-	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx		0	xxxxx							
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx								
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx								
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*								
ApproachDel:	xxxxxx			xxxxxx			14.2			xxxxxx										
ApproachLOS:	*			*			B			*										

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #12 Leon Road & Jean Nicholas

Average Delay (sec/veh): 2.1 Worst Case Level Of Service: B[10.7]

Street Name:	Leon Road								Jean Nicholas							
Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Uncontrolled					Uncontrolled					Stop Sign					Stop Sign				
Rights:	Include					Include					Include					Include				
Lanes:	0	0	1	0	1	1	0	1	0	0	0	0	0	0	0	0	0	1!	0	0
Volume Module:																				
Base Vol:	0	208		15		16	230		0		0	0		0		27	0		71	
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
Initial Bse:	0	208		15		16	230		0		0	0		0		27	0		71	
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Volume:	0	208		15		16	230		0		0	0		0		27	0		71	
Reduct Vol:	0	0		0		0	0		0		0	0		0		0	0		0	
FinalVolume:	0	208		15		16	230		0		0	0		0		27	0		71	
Critical Gap Module:																				
Critical Gp:	xxxxx	xxxx	xxxxx		4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx		6.4		6.5		6.2				
FollowUpTim:	xxxxx	xxxx	xxxxx		2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx		3.5		4.0		3.3				
Capacity Module:																				
Cnflict Vol:	xxxx	xxxx	xxxxx		223	xxxx	xxxxx		xxxx	xxxx	xxxxx		470		470		208			
Potent Cap.:	xxxx	xxxx	xxxxx		1358	xxxx	xxxxx		xxxx	xxxx	xxxxx		556		495		837			
Move Cap.:	xxxx	xxxx	xxxxx		1358	xxxx	xxxxx		xxxx	xxxx	xxxxx		551		489		837			
Volume/Cap:	xxxx	xxxx	xxxx		0.01	xxxx	xxxx		xxxx	xxxx	xxxx		0.05		0.00		0.08			
Level Of Service Module:																				
2Way95thQ:	xxxx	xxxx	xxxxx		0.0	xxxx	xxxxx		xxxx	xxxx	xxxxx		xxxx		xxxx		xxxxx			
Control Del:	xxxxx	xxxx	xxxxx		7.7	xxxx	xxxxx		xxxxx	xxxx	xxxxx		xxxxx		xxxx		xxxxx			
LOS by Move:	*	*	*		A	*	*		*	*	*		*		*		*			
Movement:	LT	-	LTR	-	RT	LT	-	LTR	-	RT	LT	-	LTR	-	RT	LT	-	LTR	-	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx		732	xxxxx							
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx		0.5	xxxxx							
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx		10.7	xxxxx							
Shared LOS:	*	*	*	*	*	*	*	*	*	*		B	*							
ApproachDel:	xxxxxx			xxxxxx			xxxxxx			10.7										
ApproachLOS:	*			*			*			B										

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #13 Winchester Road - SR-79 & Nicholas - Skyview

Cycle (sec): 100 Critical Vol./Cap.(X): 0.321
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 4.0
Optimal Cycle: 34 Level Of Service: A

Street Name:	Winchester Road - SR-79						Nicholas - Skyview					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	0 1	1	0 1	1 0	1	0 1	1 0	1	0 1	0 1
Volume Module:												
Base Vol:	48	474	0	0	953	35	26	0	29	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	48	474	0	0	953	35	26	0	29	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	48	474	0	0	953	35	26	0	29	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	48	474	0	0	953	35	26	0	29	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	48	474	0	0	953	35	26	0	29	0	0	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	1.00	1.00	0.95	0.95	0.95	0.95	0.81	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	1.93	0.07	1.00	1.00	1.00	1.00	1.00	1.00
Final Sat.:	1805	3610	1900	1900	3465	127	1805	1805	1534	1900	1900	1900
Capacity Analysis Module:												
Vol/Sat:	0.03	0.13	0.00	0.00	0.28	0.28	0.01	0.00	0.02	0.00	0.00	0.00
Crit Moves:	****				****				****			
Green/Cycle:	0.08	0.94	0.00	0.00	0.86	0.86	0.06	0.00	0.06	0.00	0.00	0.00
Volume/Cap:	0.32	0.14	0.00	0.00	0.32	0.32	0.24	0.00	0.32	0.00	0.00	0.00
Delay/Veh:	44.4	0.2	0.0	0.0	1.4	1.4	46.1	0.0	47.2	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	44.4	0.2	0.0	0.0	1.4	1.4	46.1	0.0	47.2	0.0	0.0	0.0
LOS by Move:	D	A	A	A	A	A	D	A	D	A	A	A
HCM2kAvgQ:	2	1	0	0	3	3	1	0	1	0	0	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #16 Leon Road & Max Gillis Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.310
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 24.6
Optimal Cycle: 33 Level Of Service: C

Street Name:	Leon Road						Max Gillis Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 2	0 1	2	0 1	1 0	2	0 1	1 0	2	0 1	1 0
Volume Module:												
Base Vol:	173	30	101	196	43	127	91	387	146	96	345	132
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	173	30	101	196	43	127	91	387	146	96	345	132
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	173	30	101	196	43	127	91	387	146	96	345	132
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	173	30	101	196	43	127	91	387	146	96	345	132
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	173	30	101	196	43	127	91	387	146	96	345	132
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.95	0.85	0.92	0.84	0.84	0.92	0.91	0.91	0.92	0.91	0.91
Lanes:	2.00	2.00	1.00	2.00	1.00	1.00	2.00	1.45	0.55	2.00	1.45	0.55
Final Sat.:	3502	3610	1615	3502	1603	1603	3502	2514	948	3502	2501	957
Capacity Analysis Module:												
Vol/Sat:	0.05	0.01	0.06	0.06	0.03	0.08	0.03	0.15	0.15	0.03	0.14	0.14
Crit Moves:	****					****		****		****		
Green/Cycle:	0.16	0.22	0.22	0.20	0.26	0.26	0.09	0.50	0.50	0.09	0.49	0.49
Volume/Cap:	0.31	0.04	0.29	0.29	0.10	0.31	0.28	0.31	0.31	0.31	0.28	0.28
Delay/Veh:	37.5	30.8	33.0	34.5	28.5	30.4	42.7	15.1	15.1	43.3	15.0	15.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	37.5	30.8	33.0	34.5	28.5	30.4	42.7	15.1	15.1	43.3	15.0	15.0
LOS by Move:	D	C	C	C	C	C	D	B	B	D	B	B
HCM2kAvgQ:	3	0	3	3	1	3	2	5	5	2	4	4

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #17 Winchester Road - SR-79 & Max Gillis - Thompson

Cycle (sec):	100	Critical Vol./Cap.(X):	0.870
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	37.1
Optimal Cycle:	175	Level Of Service:	D

Street Name:	Winchester Road - SR-79						Max Gillis - Thompson					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 2	0 1	1	0 1	0 1	1	0 1	0 1
Volume Module:												
Base Vol:	358	496	115	12	972	45	33	58	508	158	212	6
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	358	496	115	12	972	45	33	58	508	158	212	6
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	358	496	115	12	972	45	33	58	508	158	212	6
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	358	496	115	12	972	45	33	58	508	158	212	6
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	358	496	115	12	972	45	33	58	508	158	212	6
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.92	0.92	0.95	0.95	0.85	0.95	1.00	0.85	0.95	1.00	0.85
Lanes:	1.00	1.62	0.38	1.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Sat.:	1805	2848	660	1805	3610	1615	1805	1900	1615	1805	1900	1615
Capacity Analysis Module:												
Vol/Sat:	0.20	0.17	0.17	0.01	0.27	0.03	0.02	0.03	0.31	0.09	0.11	0.00
Crit Moves:	****				****				****	****		
Green/Cycle:	0.23	0.52	0.52	0.02	0.31	0.31	0.07	0.36	0.36	0.10	0.40	0.40
Volume/Cap:	0.87	0.34	0.34	0.34	0.87	0.09	0.28	0.08	0.87	0.87	0.28	0.01
Delay/Veh:	54.9	14.2	14.2	53.9	40.2	24.6	45.8	21.1	43.0	77.7	20.7	18.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	54.9	14.2	14.2	53.9	40.2	24.6	45.8	21.1	43.0	77.7	20.7	18.2
LOS by Move:	D	B	B	D	D	C	D	C	D	E	C	B
HCM2kAvgQ:	14	6	6	1	18	1	1	1	18	8	4	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #18 California Oaks Road & Clinton Keith Road

Cycle (sec):	100	Critical Vol./Cap.(X):	0.545
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	21.7
Optimal Cycle:	41	Level Of Service:	C

Street Name:	California Oaks Road						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1!	0 1	0	0 0	0 0	0	0 1	1 0	1	0 2	0 0
Volume Module:												
Base Vol:	111	0	339	0	0	0	0	493	113	437	508	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	111	0	339	0	0	0	0	493	113	437	508	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	111	0	339	0	0	0	0	493	113	437	508	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	111	0	339	0	0	0	0	493	113	437	508	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	111	0	339	0	0	0	0	493	113	437	508	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.78	1.00	0.78	1.00	1.00	1.00	1.00	0.92	0.92	0.95	0.95	1.00
Lanes:	1.25	0.00	1.75	0.00	0.00	0.00	0.00	1.63	0.37	1.00	2.00	0.00
Final Sat.:	1849	0	2600	0	0	0	0	2855	654	1805	3610	0
Capacity Analysis Module:												
Vol/Sat:	0.06	0.00	0.13	0.00	0.00	0.00	0.00	0.17	0.17	0.24	0.14	0.00
Crit Moves:			****					****		****		
Green/Cycle:	0.24	0.00	0.24	0.00	0.00	0.00	0.00	0.32	0.32	0.44	0.76	0.00
Volume/Cap:	0.25	0.00	0.55	0.00	0.00	0.00	0.00	0.55	0.55	0.55	0.18	0.00
Delay/Veh:	30.9	0.0	34.0	0.0	0.0	0.0	0.0	28.8	28.8	21.2	3.4	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	30.9	0.0	34.0	0.0	0.0	0.0	0.0	28.8	28.8	21.2	3.4	0.0
LOS by Move:	C	A	C	A	A	A	A	C	C	C	A	A
HCM2kAvgQ:	2	0	6	0	0	0	0	8	8	10	2	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #19 I-215 SB Off-Ramp & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.770
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 23.9
Optimal Cycle: 81 Level Of Service: C

Street Name:	I-215 SB Off-Ramp						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	1	0	0	1	0	1	1	0	1
Volume Module:												
Base Vol:	0	0	0	88	2	388	0	786	514	207	368	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	88	2	388	0	786	514	207	368	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	88	2	388	0	786	514	207	368	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	88	2	388	0	786	514	207	368	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	88	2	388	0	786	514	207	368	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.85	0.85	0.85	1.00	1.00	0.85	0.95	1.00	1.00
Lanes:	0.00	0.00	0.00	1.00	0.01	0.99	0.00	1.00	1.00	1.00	1.00	0.00
Final Sat.:	0	0	0	1615	8	1609	0	1900	1615	1805	1900	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.05	0.24	0.24	0.00	0.41	0.32	0.11	0.19	0.00
Crit Moves:					****			****		****		
Green/Cycle:	0.00	0.00	0.00	0.31	0.31	0.31	0.00	0.54	0.54	0.15	0.69	0.00
Volume/Cap:	0.00	0.00	0.00	0.17	0.77	0.77	0.00	0.77	0.59	0.77	0.28	0.00
Delay/Veh:	0.0	0.0	0.0	25.1	38.1	38.1	0.0	21.9	16.8	53.6	6.2	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	25.1	38.1	38.1	0.0	21.9	16.8	53.6	6.2	0.0
LOS by Move:	A	A	A	C	D	D	A	C	B	D	A	A
HCM2kAvgQ:	0	0	0	2	13	13	0	20	11	8	4	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #20 I-215 NB Off Ramp & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.745
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 26.2
Optimal Cycle: 73 Level Of Service: C

Street Name:	I-215 NB Off Ramp						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	1!	0	1	0	0	0	0	1	0	1
Volume Module:												
Base Vol:	128	0	432	0	0	0	467	486	0	0	489	100
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	128	0	432	0	0	0	467	486	0	0	489	100
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	128	0	432	0	0	0	467	486	0	0	489	100
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	128	0	432	0	0	0	467	486	0	0	489	100
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	128	0	432	0	0	0	467	486	0	0	489	100
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.82	1.00	0.78	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.85
Lanes:	0.36	0.00	1.64	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Final Sat.:	560	0	2425	0	0	0	1805	1900	0	0	1900	1615
Capacity Analysis Module:												
Vol/Sat:	0.23	0.00	0.18	0.00	0.00	0.00	0.26	0.26	0.00	0.00	0.26	0.06
Crit Moves:	****						****				****	
Green/Cycle:	0.31	0.00	0.31	0.00	0.00	0.00	0.35	0.69	0.00	0.00	0.35	0.35
Volume/Cap:	0.74	0.00	0.58	0.00	0.00	0.00	0.74	0.37	0.00	0.00	0.74	0.18
Delay/Veh:	35.2	0.0	30.1	0.0	0.0	0.0	33.6	6.5	0.0	0.0	33.5	23.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	35.2	0.0	30.1	0.0	0.0	0.0	33.6	6.5	0.0	0.0	33.5	23.0
LOS by Move:	D	A	C	A	A	A	C	A	A	A	C	C
HCM2kAvgQ:	11	0	7	0	0	0	14	6	0	0	15	2

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #22 Meadowlark Lane - Whitewood Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.287
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 10.5
Optimal Cycle: 0 Level Of Service: B

Street Name:	Meadowlark Lane - Whitewood Road						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	0 1	0	1	0 1	0	1	0 0 1	0	0	1! 0 0
Volume Module:												
Base Vol:	154	76	30	0	161	141	136	4	173	34	7	1
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	154	76	30	0	161	141	136	4	173	34	7	1
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	154	76	30	0	161	141	136	4	173	34	7	1
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	154	76	30	0	161	141	136	4	173	34	7	1
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	154	76	30	0	161	141	136	4	173	34	7	1
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	0.72	0.28	1.00	1.00	1.00	0.97	0.03	1.00	0.81	0.17	0.02
Final Sat.:	544	435	172	517	561	628	515	15	643	410	85	12
Capacity Analysis Module:												
Vol/Sat:	0.28	0.17	0.17	0.00	0.29	0.22	0.26	0.26	0.27	0.08	0.08	0.08
Crit Moves:	****				****				****		****	
Delay/Veh:	11.4	9.5	9.5	0.0	11.2	9.7	11.4	11.4	9.8	10.1	10.1	10.1
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	11.4	9.5	9.5	0.0	11.2	9.7	11.4	11.4	9.8	10.1	10.1	10.1
LOS by Move:	B	A	A	*	B	A	B	B	A	B	B	B
ApproachDel:	10.6			10.5			10.5			10.1		
Delay Adj:	1.00			1.00			1.00			1.00		
ApprAdjDel:	10.6			10.5			10.5			10.1		
LOS by Appr:	B			B			B			B		
AllWayAvgQ:	0.4	0.2	0.2	0.0	0.4	0.3	0.3	0.3	0.3	0.1	0.1	0.1

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #25 Winchester Road - SR-79 & Benton Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.465
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 14.4
Optimal Cycle: 43 Level Of Service: B

Street Name:	Winchester Road - SR-79						Benton Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	2 0 1	1	0	2 0 0	0	0	0 0 0	2	0	0 0 1
Volume Module:												
Base Vol:	0	762	168	267	1369	0	0	0	0	301	0	142
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	762	168	267	1369	0	0	0	0	301	0	142
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	762	168	267	1369	0	0	0	0	301	0	142
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	762	168	267	1369	0	0	0	0	301	0	142
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	762	168	267	1369	0	0	0	0	301	0	142
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.95	0.85	0.95	0.95	1.00	1.00	1.00	1.00	0.92	1.00	0.85
Lanes:	0.00	2.00	1.00	1.00	2.00	0.00	0.00	0.00	0.00	2.00	0.00	1.00
Final Sat.:	0	3610	1615	1805	3610	0	0	0	0	3502	0	1615
Capacity Analysis Module:												
Vol/Sat:	0.00	0.21	0.10	0.15	0.38	0.00	0.00	0.00	0.00	0.09	0.00	0.09
Crit Moves:	****				****					****		
Green/Cycle:	0.00	0.48	0.48	0.34	0.82	0.00	0.00	0.00	0.00	0.18	0.00	0.18
Volume/Cap:	0.00	0.44	0.22	0.44	0.47	0.00	0.00	0.00	0.00	0.47	0.00	0.48
Delay/Veh:	0.0	17.4	15.3	26.4	2.9	0.0	0.0	0.0	0.0	36.9	0.0	37.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	17.4	15.3	26.4	2.9	0.0	0.0	0.0	0.0	36.9	0.0	37.6
LOS by Move:	A	B	B	C	A	A	A	A	A	D	A	D
HCM2kAvgQ:	0	8	3	7	7	0	0	0	0	5	0	4

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #26 Winchester Road - SR-79 & Via Mira Mosa

Cycle (sec): 100 Critical Vol./Cap.(X): 0.600
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 14.2
Optimal Cycle: 57 Level Of Service: B

Street Name:	Winchester Road - SR-79						Via Mira Mosa					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	0 1	1	0 1	1 0	1	0 0	1 0	1	0 0	1 0
Volume Module:												
Base Vol:	12	789	409	167	1540	104	128	18	37	184	16	28
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	12	789	409	167	1540	104	128	18	37	184	16	28
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	12	789	409	167	1540	104	128	18	37	184	16	28
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	12	789	409	167	1540	104	128	18	37	184	16	28
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	12	789	409	167	1540	104	128	18	37	184	16	28
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.85	0.95	0.94	0.94	0.95	0.90	0.90	0.95	0.91	0.91
Lanes:	1.00	2.00	1.00	1.00	1.87	0.13	1.00	0.33	0.67	1.00	0.36	0.64
Final Sat.:	1805	3610	1615	1805	3351	226	1805	559	1149	1805	625	1094
Capacity Analysis Module:												
Vol/Sat:	0.01	0.22	0.25	0.09	0.46	0.46	0.07	0.03	0.03	0.10	0.03	0.03
Crit Moves:	****				****			****		****		
Green/Cycle:	0.01	0.57	0.57	0.21	0.77	0.77	0.16	0.05	0.05	0.17	0.06	0.06
Volume/Cap:	0.60	0.38	0.45	0.45	0.60	0.60	0.43	0.60	0.60	0.60	0.43	0.43
Delay/Veh:	91.0	12.0	12.8	35.4	5.5	5.5	38.6	56.9	56.9	41.7	48.3	48.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	91.0	12.0	12.8	35.4	5.5	5.5	38.6	56.9	56.9	41.7	48.3	48.3
LOS by Move:	F	B	B	D	A	A	D	E	E	D	D	D
HCM2kAvgQ:	1	7	7	5	12	12	4	3	3	6	2	2

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #27 Monroe Ave & Los Alamos

Cycle (sec): 100 Critical Vol./Cap.(X): 0.314
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 15.0
Optimal Cycle: 33 Level Of Service: B

Street Name:	Monroe Ave						Los Alamos					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0 0	0 0	2	0 0	0 1	1	0 2	0 0	0	0 2	0 1
Volume Module:												
Base Vol:	0	0	0	288	0	142	70	315	0	0	507	302
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	288	0	142	70	315	0	0	507	302
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	288	0	142	70	315	0	0	507	302
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	288	0	142	70	315	0	0	507	302
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	288	0	142	70	315	0	0	507	302
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.92	1.00	0.85	0.95	0.95	1.00	1.00	0.95	0.85
Lanes:	0.00	0.00	0.00	2.00	0.00	1.00	1.00	2.00	0.00	0.00	2.00	1.00
Final Sat.:	0	0	0	3502	0	1615	1805	3610	0	0	3610	1615
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.08	0.00	0.09	0.04	0.09	0.00	0.00	0.14	0.19
Crit Moves:						****	****					****
Green/Cycle:	0.00	0.00	0.00	0.28	0.00	0.28	0.12	0.72	0.00	0.00	0.60	0.60
Volume/Cap:	0.00	0.00	0.00	0.29	0.00	0.31	0.31	0.12	0.00	0.00	0.24	0.31
Delay/Veh:	0.0	0.0	0.0	28.4	0.0	28.8	40.8	4.3	0.0	0.0	9.5	10.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	28.4	0.0	28.8	40.8	4.3	0.0	0.0	9.5	10.2
LOS by Move:	A	A	A	C	A	C	D	A	A	A	A	B
HCM2kAvgQ:	0	0	0	4	0	4	2	2	0	0	4	5

Note: Queue reported is the number of cars per lane.

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2000 HCM Operations Method (Base Volume Alternative)

Intersection #28 Jefferson Avenue & Murrieta Hot Springs Road

Cycle (sec):	100	Critical Vol./Cap.(X):	0.472
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	21.2
Optimal Cycle:	35	Level Of Service:	C

Street Name:	Jefferson Avenue						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	2	0 1	2	0 2	0 0	0 0	0	0 0	2	0 0	0 1
Volume Module:												
Base Vol:	0	203	185	226	555	0	0	0	0	652	0	190
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	203	185	226	555	0	0	0	0	652	0	190
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	203	185	226	555	0	0	0	0	652	0	190
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	203	185	226	555	0	0	0	0	652	0	190
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	203	185	226	555	0	0	0	0	652	0	190
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.95	0.85	0.92	0.95	1.00	1.00	1.00	1.00	0.59	1.00	0.85
Lanes:	0.00	2.00	1.00	2.00	2.00	0.00	0.00	0.00	0.00	2.00	0.00	1.00
Final Sat.:	0	3610	1615	3502	3610	0	0	0	0	2226	0	1615
Capacity Analysis Module:												
Vol/Sat:	0.00	0.06	0.11	0.06	0.15	0.00	0.00	0.00	0.00	0.29	0.00	0.12
Crit Moves:			****	****						****		
Green/Cycle:	0.00	0.24	0.24	0.14	0.38	0.00	0.00	0.00	0.00	0.62	0.00	0.62
Volume/Cap:	0.00	0.23	0.47	0.47	0.41	0.00	0.00	0.00	0.00	0.47	0.00	0.19
Delay/Veh:	0.0	30.5	33.3	40.6	22.9	0.0	0.0	0.0	0.0	10.4	0.0	8.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	30.5	33.3	40.6	22.9	0.0	0.0	0.0	0.0	10.4	0.0	8.3
LOS by Move:	A	C	C	D	C	A	A	A	A	B	A	A
HCM2kAvgQ:	0	3	5	4	7	0	0	0	0	6	0	3

Note: Queue reported is the number of cars per lane.

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2000 HCM Operations Method (Base Volume Alternative)

Intersection #29 Madison Avenue & Murrieta Hot Springs Road

Cycle (sec):	100	Critical Vol./Cap.(X):	0.307
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	25.3
Optimal Cycle:	33	Level Of Service:	C

Street Name:	Madison Avenue						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2 0	2	0 1	2	0 1	1 0	2	0 3	1 0	2	0 3	0 1
Volume Module:												
Base Vol:	28	63	147	210	120	87	68	318	43	354	710	127
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	28	63	147	210	120	87	68	318	43	354	710	127
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	28	63	147	210	120	87	68	318	43	354	710	127
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	28	63	147	210	120	87	68	318	43	354	710	127
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	28	63	147	210	120	87	68	318	43	354	710	127
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.95	0.85	0.92	0.89	0.89	0.92	0.89	0.89	0.92	0.91	0.85
Lanes:	2.00	2.00	1.00	2.00	1.16	0.84	2.00	3.52	0.48	2.00	3.00	1.00
Final Sat.:	3502	3610	1615	3502	1961	1422	3502	5983	809	3502	5187	1615
Capacity Analysis Module:												
Vol/Sat:	0.01	0.02	0.09	0.06	0.06	0.06	0.02	0.05	0.05	0.10	0.14	0.08
Crit Moves:			****	****			****				****	
Green/Cycle:	0.06	0.30	0.30	0.20	0.43	0.43	0.06	0.18	0.18	0.33	0.45	0.45
Volume/Cap:	0.14	0.06	0.31	0.31	0.14	0.14	0.31	0.30	0.30	0.30	0.31	0.18
Delay/Veh:	45.2	25.2	27.6	34.7	17.1	17.1	45.5	36.1	36.1	24.9	17.9	16.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	45.2	25.2	27.6	34.7	17.1	17.1	45.5	36.1	36.1	24.9	17.9	16.8
LOS by Move:	D	C	C	C	B	B	D	D	D	C	B	B
HCM2kAvgQ:	1	1	4	3	2	2	1	3	3	4	5	2

Note: Queue reported is the number of cars per lane.

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2000 HCM Operations Method (Base Volume Alternative)

Intersection #30 I-15 SB Off-Ramp & Murrieta Hot Springs Road

Cycle (sec):	100	Critical Vol./Cap.(X):	0.521
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	17.7
Optimal Cycle:	39	Level Of Service:	B

Street Name:	I-15 SB Off-Ramp						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	1	0	1! 0	0	0	3	0	1	
Volume Module:												
Base Vol:	0	0	0	773	0	397	0	446	194	0	956	47
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	773	0	397	0	446	194	0	956	47
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	0	0	0	773	0	397	0	446	0	0	956	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	773	0	397	0	446	0	0	956	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	0	0	0	773	0	397	0	446	0	0	956	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.73	1.00	0.73	1.00	0.91	1.00	1.00	0.91	1.00
Lanes:	0.00	0.00	0.00	1.66	0.00	1.34	0.00	3.00	1.00	0.00	3.00	1.00
Final Sat.:	0	0	0	2297	0	1852	0	5187	1900	0	5187	1900
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.34	0.00	0.21	0.00	0.09	0.00	0.00	0.18	0.00
Crit Moves:				****			****				****	
Green/Cycle:	0.00	0.00	0.00	0.65	0.00	0.65	0.00	0.35	0.00	0.00	0.35	0.00
Volume/Cap:	0.00	0.00	0.00	0.52	0.00	0.33	0.00	0.24	0.00	0.00	0.52	0.00
Delay/Veh:	0.0	0.0	0.0	9.7	0.0	8.0	0.0	22.9	0.0	0.0	25.9	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	9.7	0.0	8.0	0.0	22.9	0.0	0.0	25.9	0.0
LOS by Move:	A	A	A	A	A	A	A	C	A	A	C	A
HCM2kAvgQ:	0	0	0	8	0	4	0	4	0	0	9	0

Note: Queue reported is the number of cars per lane.

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2000 HCM Operations Method (Base Volume Alternative)

Intersection #31 I-15 NB Off-Ramp & Murrieta Hot Springs Road

Cycle (sec):	100	Critical Vol./Cap.(X):	0.291
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	11.8
Optimal Cycle:	32	Level Of Service:	B

Street Name:	I-15 NB Off-Ramp						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	1	0	0	1	0	0	0	0	0	1	0
Volume Module:												
Base Vol:	235	0	91	0	0	0	115	1068	0	0	840	693
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	235	0	91	0	0	0	115	1068	0	0	840	693
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
PHF Volume:	235	0	91	0	0	0	115	1068	0	0	840	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	235	0	91	0	0	0	115	1068	0	0	840	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
FinalVolume:	235	0	91	0	0	0	115	1068	0	0	840	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	1.00	1.00	1.00	0.95	0.91	1.00	1.00	0.91	1.00
Lanes:	2.00	0.00	1.00	0.00	0.00	0.00	1.00	3.00	0.00	0.00	3.00	1.00
Final Sat.:	3618	0	1615	0	0	0	1805	5187	0	0	5187	1900
Capacity Analysis Module:												
Vol/Sat:	0.06	0.00	0.06	0.00	0.00	0.00	0.06	0.21	0.00	0.00	0.16	0.00
Crit Moves:	****						****				****	
Green/Cycle:	0.22	0.00	0.22	0.00	0.00	0.00	0.22	0.78	0.00	0.00	0.56	0.00
Volume/Cap:	0.29	0.00	0.25	0.00	0.00	0.00	0.29	0.27	0.00	0.00	0.29	0.00
Delay/Veh:	32.4	0.0	32.3	0.0	0.0	0.0	33.0	3.2	0.0	0.0	11.8	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	32.4	0.0	32.3	0.0	0.0	0.0	33.0	3.2	0.0	0.0	11.8	0.0
LOS by Move:	C	A	C	A	A	A	C	A	A	A	B	A
HCM2kAvgQ:	3	0	2	0	0	0	3	3	0	0	5	0

Note: Queue reported is the number of cars per lane.

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2000 HCM Operations Method (Base Volume Alternative)

Intersection #32 I-215 SB Off-Ramp & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.501
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 16.0
Optimal Cycle: 29 Level Of Service: B

Street Name:	I-215 SB Off-Ramp						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	1	0	1! 0	0	0	3	0	1	
Volume Module:												
Base Vol:	0	0	0	526	0	420	0	1105	53	0	1343	378
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	526	0	420	0	1105	53	0	1343	378
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	0	0	0	526	0	420	0	1105	0	0	1343	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	526	0	420	0	1105	0	0	1343	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	0	0	0	526	0	420	0	1105	0	0	1343	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.74	1.00	0.74	1.00	0.91	1.00	1.00	0.91	1.00
Lanes:	0.00	0.00	0.00	1.56	0.00	1.44	0.00	3.00	1.00	0.00	3.00	1.00
Final Sat.:	0	0	0	2176	0	2020	0	5187	1900	0	5187	1900
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.24	0.00	0.21	0.00	0.21	0.00	0.00	0.26	0.00
Crit Moves:				****							****	
Green/Cycle:	0.00	0.00	0.00	0.48	0.00	0.48	0.00	0.52	0.00	0.00	0.52	0.00
Volume/Cap:	0.00	0.00	0.00	0.50	0.00	0.43	0.00	0.41	0.00	0.00	0.50	0.00
Delay/Veh:	0.0	0.0	0.0	17.8	0.0	17.0	0.0	14.9	0.0	0.0	15.9	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	17.8	0.0	17.0	0.0	14.9	0.0	0.0	15.9	0.0
LOS by Move:	A	A	A	B	A	B	A	B	A	A	B	A
HCM2kAvgQ:	0	0	0	7	0	6	0	8	0	0	10	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #33 I-215 NB Off-Ramp & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.369
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 5.4
Optimal Cycle: 23 Level Of Service: A

Street Name:	I-215 NB Off-Ramp						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	0	0	2	0	0	0	0	0	0	3	0	1	0	0	3	0	1
Volume Module:												
Base Vol:	151	0	163	0	0	0	0	1444	115	0	1591	466
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	151	0	163	0	0	0	0	1444	115	0	1591	466
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	151	0	163	0	0	0	0	1444	0	0	1591	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	151	0	163	0	0	0	0	1444	0	0	1591	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	151	0	163	0	0	0	0	1444	0	0	1591	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.63	1.00	0.75	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Lanes:	2.00	0.00	2.00	0.00	0.00	0.00	0.00	3.00	1.00	0.00	3.00	1.00
Final Sat.:	2407	0	2842	0	0	0	0	5187	1900	0	5187	1900
Capacity Analysis Module:												
Vol/Sat:	0.06	0.00	0.06	0.00	0.00	0.00	0.00	0.28	0.00	0.00	0.31	0.00
Crit Moves:	****										****	
Green/Cycle:	0.17	0.00	0.17	0.00	0.00	0.00	0.00	0.83	0.00	0.00	0.83	0.00
Volume/Cap:	0.37	0.00	0.34	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.37	0.00
Delay/Veh:	37.3	0.0	37.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.1	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	37.3	0.0	37.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.1	0.0
LOS by Move:	D	A	D	A	A	A	A	A	A	A	A	A
HCM2kAvgQ:	2	0	3	0	0	0	0	4	0	0	5	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #34 Jackson Avenue & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.303
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 4.3
Optimal Cycle: 27 Level Of Service: A

Street Name:	Jackson Avenue						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	0	0	2	0	0	0	0	0	0	3	0	1	1	0	3	0	0
Volume Module:																			
Base Vol:	66	0	52	0	0	0	0	1217	24	69	1439	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	66	0	52	0	0	0	0	1217	24	69	1439	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	66	0	52	0	0	0	0	1217	24	69	1439	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	66	0	52	0	0	0	0	1217	24	69	1439	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	66	0	52	0	0	0	0	1217	24	69	1439	0
Saturation Flow Module:																			
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.68	1.00	0.75	1.00	1.00	1.00	1.00	0.91	0.85	0.95	0.91	1.00
Lanes:	2.00	0.00	2.00	0.00	0.00	0.00	0.00	3.00	1.00	1.00	3.00	0.00
Final Sat.:	2580	0	2842	0	0	0	0	5187	1615	1805	5187	0
Capacity Analysis Module:																			
Vol/Sat:	0.03	0.00	0.02	0.00	0.00	0.00	0.00	0.23	0.01	0.04	0.28	0.00
Crit Moves:	****						****				****	
Green/Cycle:	0.08	0.00	0.08	0.00	0.00	0.00	0.00	0.79	0.79	0.13	0.92	0.00
Volume/Cap:	0.30	0.00	0.22	0.00	0.00	0.00	0.00	0.30	0.02	0.30	0.30	0.00
Delay/Veh:	43.8	0.0	43.2	0.0	0.0	0.0	0.0	3.0	2.3	40.2	0.5	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	43.8	0.0	43.2	0.0	0.0	0.0	0.0	3.0	2.3	40.2	0.5	0.0
LOS by Move:	D	A	D	A	A	A	A	A	A	D	A	A
HCM2kAvgQ:	1	0	1	0	0	0	0	4	0	2	2	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #35 Margarita Road & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.666
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 19.2
Optimal Cycle: 68 Level Of Service: B

Street Name:	Margarita Road						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	1	0	1	0	1	0	0	1	1	0	2	0	1	1	0	2	1	0
Volume Module:																			
Base Vol:	674	8	131	6	3	1	22	782	581	197	999	5
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	674	8	131	6	3	1	22	782	581	197	999	5
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	674	8	131	6	3	1	22	782	581	197	999	5
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	674	8	131	6	3	1	22	782	581	197	999	5
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	674	8	131	6	3	1	22	782	581	197	999	5
Saturation Flow Module:																			
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.85	0.97	0.97	0.85	0.95	0.95	0.85	0.95	0.91	0.91
Lanes:	2.00	1.00	1.00	0.67	0.33	1.00	1.00	2.00	1.00	1.00	2.99	0.01
Final Sat.:	3502	1900	1615	1226	613	1615	1805	3610	1615	1805	5156	26
Capacity Analysis Module:																			
Vol/Sat:	0.19	0.00	0.08	0.00	0.00	0.00	0.01	0.22	0.36	0.11	0.19	0.19
Crit Moves:	****				****				****	****		
Green/Cycle:	0.29	0.28	0.28	0.02	0.01	0.01	0.04	0.54	0.54	0.16	0.66	0.66
Volume/Cap:	0.67	0.02	0.29	0.29	0.67	0.08	0.29	0.40	0.67	0.67	0.29	0.29
Delay/Veh:	33.0	26.1	28.6	53.7	133	52.3	48.7	13.6	18.5	44.9	7.1	7.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	33.0	26.1	28.6	53.7	133	52.3	48.7	13.6	18.5	44.9	7.1	7.1
LOS by Move:	C	C	C	D	F	D	D	B	B	D	A	A
HCM2kAvgQ:	10	0	3	1	1	0	1	7	13	7	5	5

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #37 Jefferson Avenue & Guava Street

Cycle (sec): 100 Critical Vol./Cap.(X): 0.352
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 2.0
Optimal Cycle: 29 Level Of Service: A

Street Name:	Jefferson Avenue						Guava Street					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	0 1	1	0 1	1 0	1	0 0	1 0	1	0 1	0 1
Volume Module:												
Base Vol:	0	319	11	10	1198	0	0	0	0	30	0	16
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	319	11	10	1198	0	0	0	0	30	0	16
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	319	11	10	1198	0	0	0	0	30	0	16
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	319	11	10	1198	0	0	0	0	30	0	16
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	319	11	10	1198	0	0	0	0	30	0	16
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.95	0.85	0.95	0.95	0.95	1.00	1.00	1.00	0.77	1.00	0.85
Lanes:	1.00	2.00	1.00	1.00	2.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
Final Sat.:	1900	3610	1615	1805	3610	0	1900	1900	0	1461	1900	1615
Capacity Analysis Module:												
Vol/Sat:	0.00	0.09	0.01	0.01	0.33	0.00	0.00	0.00	0.00	0.02	0.00	0.01
Crit Moves:	****				****					****		
Green/Cycle:	0.00	0.89	0.89	0.06	0.94	0.00	0.00	0.00	0.00	0.06	0.00	0.06
Volume/Cap:	0.00	0.10	0.01	0.10	0.35	0.00	0.00	0.00	0.00	0.35	0.00	0.17
Delay/Veh:	0.0	0.7	0.7	45.3	0.3	0.0	0.0	0.0	0.0	47.8	0.0	45.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.7	0.7	45.3	0.3	0.0	0.0	0.0	0.0	47.8	0.0	45.6
LOS by Move:	A	A	A	D	A	A	A	A	A	D	A	D
HCM2kAvgQ:	0	1	0	0	2	0	0	0	0	1	0	1

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #38 Jefferson Avenue & Cherry Street

Average Delay (sec/veh): 1.3 Worst Case Level Of Service: C[15.2]

Street Name:	Jefferson Avenue						Cherry Street					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	1	0 2	0 0	0	0 1	1 0	0	0 1!	0 0	0	0 0	0 0
Volume Module:												
Base Vol:	105	553	0	0	742	28	10	0	50	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	105	553	0	0	742	28	10	0	50	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	105	553	0	0	742	28	10	0	50	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	105	553	0	0	742	28	10	0	50	0	0	0
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.8	6.5	6.9	xxxxx	xxxx	xxxxx
FollowUpTim:	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.5	4.0	3.3	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	770	xxxx	xxxxx	xxxx	xxxx	xxxxx	1243	1519	385	xxxx	xxxx	xxxxx
Potent Cap.:	854	xxxx	xxxxx	xxxx	xxxx	xxxxx	170	120	619	xxxx	xxxx	xxxxx
Move Cap.:	854	xxxx	xxxxx	xxxx	xxxx	xxxxx	154	105	619	xxxx	xxxx	xxxxx
Volume/Cap:	0.12	xxxx	xxxx	xxxx	xxxx	xxxx	0.07	0.00	0.08	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	0.4	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	9.8	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT - LTR - RT			LT - LTR - RT			LT - LTR - RT			LT - LTR - RT		
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	411	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.5	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	15.2	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	C	*	*	*	*
ApproachDel:	xxxxxx			xxxxxx			15.2			xxxxxx		
ApproachLOS:	*			*			C			*		

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #39 Washington Ave & Calle Del Oso Oro/Nutmeg

Cycle (sec): 100 Critical Vol./Cap.(X): 0.648
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 29.2
Optimal Cycle: 65 Level Of Service: C

Street Name:	Washington Ave						Calle Del Oso Oro/Nutmeg					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	0 1	1	0 1	1 0	1	0 1	0 1	1	0 1	0 1
Volume Module:												
Base Vol:	226	199	101	53	264	57	36	223	551	162	109	31
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	226	199	101	53	264	57	36	223	551	162	109	31
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	226	199	101	53	264	57	36	223	551	162	109	31
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	226	199	101	53	264	57	36	223	551	162	109	31
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	226	199	101	53	264	57	36	223	551	162	109	31
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	0.95	0.92	0.92	0.95	1.00	0.85	0.95	1.00	0.85
Lanes:	1.00	1.00	1.00	1.00	1.64	0.36	1.00	1.00	1.00	1.00	1.00	1.00
Final Sat.:	1805	1900	1615	1805	2889	624	1805	1900	1615	1805	1900	1615
Capacity Analysis Module:												
Vol/Sat:	0.13	0.10	0.06	0.03	0.09	0.09	0.02	0.12	0.34	0.09	0.06	0.02
Crit Moves:	****				****				****	****		
Green/Cycle:	0.19	0.26	0.26	0.07	0.14	0.14	0.17	0.53	0.53	0.14	0.49	0.49
Volume/Cap:	0.65	0.40	0.24	0.40	0.65	0.65	0.12	0.22	0.65	0.65	0.12	0.04
Delay/Veh:	41.4	31.0	29.4	46.2	43.6	43.6	35.2	12.8	18.7	46.6	13.6	13.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	41.4	31.0	29.4	46.2	43.6	43.6	35.2	12.8	18.7	46.6	13.6	13.1
LOS by Move:	D	C	C	D	D	D	D	B	B	D	B	B
HCM2kAvgQ:	7	5	3	2	6	6	1	4	13	6	2	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #40 Clinton Keith Rd & Calle de Oso Oro/Bear Creek Dr

Cycle (sec): 100 Critical Vol./Cap.(X): 0.195
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 13.6
Optimal Cycle: 23 Level Of Service: B

Street Name:	Clinton Keith Rd						Calle de Oso Oro/Bear Creek Dr					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 0	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	2	262	155	31	157	75	69	37	2	64	26	64
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	2	262	155	31	157	75	69	37	2	64	26	64
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	2	262	155	31	157	75	69	37	2	64	26	64
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	2	262	155	31	157	75	69	37	2	64	26	64
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	2	262	155	31	157	75	69	37	2	64	26	64
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.90	0.90	0.95	0.90	0.90	0.65	0.99	0.99	0.69	0.85	0.85
Lanes:	1.00	1.26	0.74	1.00	1.35	0.65	1.00	0.95	0.05	1.00	1.00	1.00
Final Sat.:	1805	2141	1267	1805	2326	1111	1239	1788	97	1313	1612	1612
Capacity Analysis Module:												
Vol/Sat:	0.00	0.12	0.12	0.02	0.07	0.07	0.06	0.02	0.02	0.05	0.02	0.04
Crit Moves:		****		****			****					
Green/Cycle:	0.01	0.63	0.63	0.09	0.70	0.70	0.29	0.29	0.29	0.29	0.29	0.29
Volume/Cap:	0.10	0.20	0.20	0.20	0.10	0.10	0.20	0.07	0.07	0.17	0.06	0.14
Delay/Veh:	50.9	8.0	8.0	42.9	4.7	4.7	27.3	26.1	26.1	27.1	26.0	26.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	50.9	8.0	8.0	42.9	4.7	4.7	27.3	26.1	26.1	27.1	26.0	26.7
LOS by Move:	D	A	A	D	A	A	C	C	C	C	C	C
HCM2kAvgQ:	0	3	3	1	1	1	2	1	1	2	1	2

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #41 Jefferson Ave & Nutmeg St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.535
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 13.2
Optimal Cycle: 0 Level Of Service: B

Street Name:	Jefferson Ave				Nutmeg St			
Approach:	North Bound		South Bound		East Bound		West Bound	
Movement:	L - T - R		L - T - R		L - T - R		L - T - R	
Control:	Stop Sign		Stop Sign		Stop Sign		Stop Sign	
Rights:	Include		Include		Include		Include	
Min. Green:	0 0 0		0 0 0		0 0 0		0 0 0	
Lanes:	1 0 0 1 0		1 0 0 1 0		1 0 1 1 0		1 0 1 1 0	
Volume Module:								
Base Vol:	80 32 136		11 93 7		15 181 178		261 250 22	
Growth Adj:	1.00 1.00 1.00		1.00 1.00 1.00		1.00 1.00 1.00		1.00 1.00 1.00	
Initial Bse:	80 32 136		11 93 7		15 181 178		261 250 22	
User Adj:	1.00 1.00 1.00		1.00 1.00 1.00		1.00 1.00 1.00		1.00 1.00 1.00	
PHF Adj:	1.00 1.00 1.00		1.00 1.00 1.00		1.00 1.00 1.00		1.00 1.00 1.00	
PHF Volume:	80 32 136		11 93 7		15 181 178		261 250 22	
Reduct Vol:	0 0 0		0 0 0		0 0 0		0 0 0	
Reduced Vol:	80 32 136		11 93 7		15 181 178		261 250 22	
PCE Adj:	1.00 1.00 1.00		1.00 1.00 1.00		1.00 1.00 1.00		1.00 1.00 1.00	
MLF Adj:	1.00 1.00 1.00		1.00 1.00 1.00		1.00 1.00 1.00		1.00 1.00 1.00	
FinalVolume:	80 32 136		11 93 7		15 181 178		261 250 22	
Saturation Flow Module:								
Adjustment:	1.00 1.00 1.00		1.00 1.00 1.00		1.00 1.00 1.00		1.00 1.00 1.00	
Lanes:	1.00 0.19 0.81		1.00 0.93 0.07		1.00 1.01 0.99		1.00 1.84 0.16	
Final Sat.:	453 100 425		429 430 32		454 496 537		488 961 85	
Capacity Analysis Module:								
Vol/Sat:	0.18 0.32 0.32		0.03 0.22 0.22		0.03 0.37 0.33		0.53 0.26 0.26	
Crit Moves:	****		****		****		****	
Delay/Veh:	11.8 12.0 12.0		10.7 11.8 11.8		10.5 13.5 12.0		17.5 11.6 11.5	
Delay Adj:	1.00 1.00 1.00		1.00 1.00 1.00		1.00 1.00 1.00		1.00 1.00 1.00	
AdjDel/Veh:	11.8 12.0 12.0		10.7 11.8 11.8		10.5 13.5 12.0		17.5 11.6 11.5	
LOS by Move:	B B B		B B B		B B B		C B B	
ApproachDel:	11.9		11.7		12.7		14.5	
Delay Adj:	1.00		1.00		1.00		1.00	
ApprAdjDel:	11.9		11.7		12.7		14.5	
LOS by Appr:	B		B		B		B	
AllWayAvgQ:	0.2 0.4 0.4		0.0 0.2 0.2		0.0 0.5 0.4		1.0 0.3 0.3	

Note: Queue reported is the number of cars per lane.

City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #42 Jefferson Ave & Magnolia St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.796
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 18.2
Optimal Cycle: 0 Level Of Service: C

Street Name:	Jefferson Ave				Magnolia St			
Approach:	North Bound		South Bound		East Bound		West Bound	
Movement:	L - T - R		L - T - R		L - T - R		L - T - R	
Control:	Stop Sign		Stop Sign		Stop Sign		Stop Sign	
Rights:	Include		Include		Include		Include	
Min. Green:	0 0 0		0 0 0		0 0 0		0 0 0	
Lanes:	0 1 0 0 1		0 0 1! 0 0		0 0 1! 0 0		0 0 1! 0 0	
Volume Module:								
Base Vol:	56 164 6		5 428 143		124 3 95		17 6 1	
Growth Adj:	1.00 1.00 1.00		1.00 1.00 1.00		1.00 1.00 1.00		1.00 1.00 1.00	
Initial Bse:	56 164 6		5 428 143		124 3 95		17 6 1	
User Adj:	1.00 1.00 1.00		1.00 1.00 1.00		1.00 1.00 1.00		1.00 1.00 1.00	
PHF Adj:	1.00 1.00 1.00		1.00 1.00 1.00		1.00 1.00 1.00		1.00 1.00 1.00	
PHF Volume:	56 164 6		5 428 143		124 3 95		17 6 1	
Reduct Vol:	0 0 0		0 0 0		0 0 0		0 0 0	
Reduced Vol:	56 164 6		5 428 143		124 3 95		17 6 1	
PCE Adj:	1.00 1.00 1.00		1.00 1.00 1.00		1.00 1.00 1.00		1.00 1.00 1.00	
MLF Adj:	1.00 1.00 1.00		1.00 1.00 1.00		1.00 1.00 1.00		1.00 1.00 1.00	
FinalVolume:	56 164 6		5 428 143		124 3 95		17 6 1	
Saturation Flow Module:								
Adjustment:	1.00 1.00 1.00		1.00 1.00 1.00		1.00 1.00 1.00		1.00 1.00 1.00	
Lanes:	0.25 0.75 1.00		0.01 0.74 0.25		0.56 0.01 0.43		0.71 0.25 0.04	
Final Sat.:	148 435 673		6 538 180		323 8 248		351 124 21	
Capacity Analysis Module:								
Vol/Sat:	0.38 0.38 0.01		0.80 0.80 0.80		0.38 0.38 0.38		0.05 0.05 0.05	
Crit Moves:	****		****		****		****	
Delay/Veh:	12.0 12.0 7.8		23.5 23.5 23.5		11.8 11.8 11.8		9.7 9.7 9.7	
Delay Adj:	1.00 1.00 1.00		1.00 1.00 1.00		1.00 1.00 1.00		1.00 1.00 1.00	
AdjDel/Veh:	12.0 12.0 7.8		23.5 23.5 23.5		11.8 11.8 11.8		9.7 9.7 9.7	
LOS by Move:	B B A		C C C		B B B		A A A	
ApproachDel:	11.8		23.5		11.8		9.7	
Delay Adj:	1.00		1.00		1.00		1.00	
ApprAdjDel:	11.8		23.5		11.8		9.7	
LOS by Appr:	B		C		B		A	
AllWayAvgQ:	0.5 0.5 0.0		3.1 3.1 3.1		0.5 0.5 0.5		0.0 0.0 0.0	

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #43 Jefferson Ave & Lemon St

Cycle (sec):	100	Critical Vol./Cap.(X):	0.370
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	10.9
Optimal Cycle:	30	Level Of Service:	B

Street Name:	Jefferson Ave						Lemon St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	0 1	1	0 1	0 1	0	0 1!	0 0	0	0 1!	0 0
Volume Module:												
Base Vol:	76	257	0	1	501	61	21	1	82	1	3	2
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	76	257	0	1	501	61	21	1	82	1	3	2
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	76	257	0	1	501	61	21	1	82	1	3	2
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	76	257	0	1	501	61	21	1	82	1	3	2
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	76	257	0	1	501	61	21	1	82	1	3	2
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	1.00	0.95	1.00	0.85	0.85	0.85	0.85	0.93	0.93	0.93
Lanes:	1.00	1.00	1.00	1.00	1.00	1.00	0.20	0.01	0.79	0.17	0.50	0.33
Final Sat.:	1805	1900	1900	1805	1900	1615	328	16	1279	295	885	590
Capacity Analysis Module:												
Vol/Sat:	0.04	0.14	0.00	0.00	0.26	0.04	0.06	0.06	0.06	0.00	0.00	0.00
Crit Moves:	****				****			****				
Green/Cycle:	0.11	0.82	0.00	0.00	0.71	0.71	0.17	0.17	0.17	0.17	0.17	0.17
Volume/Cap:	0.37	0.16	0.00	0.16	0.37	0.05	0.37	0.37	0.37	0.02	0.02	0.02
Delay/Veh:	42.1	1.9	0.0	62.1	5.8	4.3	37.3	37.3	37.3	34.3	34.3	34.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	42.1	1.9	0.0	62.1	5.8	4.3	37.3	37.3	37.3	34.3	34.3	34.3
LOS by Move:	D	A	A	E	A	A	D	D	D	C	C	C
HCM2kAvgQ:	3	2	0	0	6	1	3	3	3	0	0	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #44 Jefferson Ave & Kalmia St

Cycle (sec):	100	Critical Vol./Cap.(X):	0.449
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	26.2
Optimal Cycle:	41	Level Of Service:	C

Street Name:	Jefferson Ave						Kalmia St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	0 1	1	0 1	1 0	1	0 2	0 1	1	0 1	0 1
Volume Module:												
Base Vol:	115	126	97	265	273	52	19	518	207	138	428	200
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	115	126	97	265	273	52	19	518	207	138	428	200
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	115	126	97	265	273	52	19	518	207	138	428	200
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	115	126	97	265	273	52	19	518	207	138	428	200
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	115	126	97	265	273	52	19	518	207	138	428	200
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	0.95	0.93	0.93	0.95	0.95	0.85	0.95	1.00	0.85
Lanes:	1.00	1.00	1.00	1.00	1.68	0.32	1.00	2.00	1.00	1.00	1.00	1.00
Final Sat.:	1805	1900	1615	1805	2960	564	1805	3610	1615	1805	1900	1615
Capacity Analysis Module:												
Vol/Sat:	0.06	0.07	0.06	0.15	0.09	0.09	0.01	0.14	0.13	0.08	0.23	0.12
Crit Moves:		****		****			****				****	
Green/Cycle:	0.19	0.15	0.15	0.33	0.28	0.28	0.02	0.34	0.34	0.18	0.50	0.50
Volume/Cap:	0.33	0.45	0.41	0.45	0.33	0.33	0.45	0.42	0.37	0.42	0.45	0.25
Delay/Veh:	35.2	40.0	39.8	27.1	28.7	28.7	55.6	25.5	25.2	37.0	16.4	14.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	35.2	40.0	39.8	27.1	28.7	28.7	55.6	25.5	25.2	37.0	16.4	14.3
LOS by Move:	D	D	D	C	C	C	E	C	C	D	B	B
HCM2kAvgQ:	3	4	3	7	4	4	1	7	5	4	8	3

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #45 Jefferson Ave & Juniper St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.243
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 18.6
Optimal Cycle: 30 Level Of Service: B

Street Name:	Jefferson Ave						Juniper St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	0 1	1	0 2	0 1	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	69	258	15	37	526	31	54	84	79	8	78	23
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	69	258	15	37	526	31	54	84	79	8	78	23
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	69	258	15	37	526	31	54	84	79	8	78	23
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	69	258	15	37	526	31	54	84	79	8	78	23
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	69	258	15	37	526	31	54	84	79	8	78	23
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.85	0.95	0.95	0.85	0.95	0.88	0.88	0.95	0.92	0.92
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	1.03	0.97	1.00	1.54	0.46
Final Sat.:	1805	3610	1615	1805	3610	1615	1805	1725	1622	1805	2693	794
Capacity Analysis Module:												
Vol/Sat:	0.04	0.07	0.01	0.02	0.15	0.02	0.03	0.05	0.05	0.00	0.03	0.03
Crit Moves:	****				****		****				****	
Green/Cycle:	0.16	0.59	0.59	0.17	0.60	0.60	0.12	0.22	0.22	0.02	0.12	0.12
Volume/Cap:	0.24	0.12	0.02	0.12	0.24	0.03	0.24	0.22	0.22	0.22	0.24	0.24
Delay/Veh:	37.4	9.1	8.5	35.4	9.4	8.2	40.2	31.9	31.9	51.2	40.2	40.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	37.4	9.1	8.5	35.4	9.4	8.2	40.2	31.9	31.9	51.2	40.2	40.2
LOS by Move:	D	A	A	D	A	A	D	C	C	D	D	D
HCM2kAvgQ:	2	2	0	1	4	0	2	2	2	0	2	2

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #46 Jefferson Ave & Ivy St/Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.345
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 27.9
Optimal Cycle: 35 Level Of Service: C

Street Name:	Jefferson Ave						Ivy St/Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	0 1	1	0 2	0 1	1	0 1	1 0	1	0 1	0 1
Volume Module:												
Base Vol:	100	171	39	152	441	37	27	145	102	171	120	132
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	100	171	39	152	441	37	27	145	102	171	120	132
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	100	171	39	152	441	37	27	145	102	171	120	132
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	100	171	39	152	441	37	27	145	102	171	120	132
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	100	171	39	152	441	37	27	145	102	171	120	132
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.85	0.95	0.95	0.85	0.95	0.89	0.89	0.95	1.00	0.85
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	1.17	0.83	1.00	1.00	1.00
Final Sat.:	1805	3610	1615	1805	3610	1615	1805	1988	1398	1805	1900	1615
Capacity Analysis Module:												
Vol/Sat:	0.06	0.05	0.02	0.08	0.12	0.02	0.01	0.07	0.07	0.09	0.06	0.08
Crit Moves:	****				****			****		****		
Green/Cycle:	0.16	0.19	0.19	0.33	0.35	0.35	0.08	0.21	0.21	0.27	0.41	0.41
Volume/Cap:	0.35	0.26	0.13	0.26	0.35	0.06	0.20	0.35	0.35	0.35	0.15	0.20
Delay/Veh:	38.0	35.1	34.2	24.8	23.9	21.4	44.1	33.8	33.8	29.5	18.6	19.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	38.0	35.1	34.2	24.8	23.9	21.4	44.1	33.8	33.8	29.5	18.6	19.1
LOS by Move:	D	D	C	C	C	C	D	C	C	C	B	B
HCM2kAvgQ:	3	2	1	3	5	1	1	4	4	4	2	3

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #47 Madison Ave & Kalmia St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.320
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 16.2
Optimal Cycle: 34 Level Of Service: B

Street Name:	Madison Ave						Kalmia St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	1! 0	1	0	0	0	0	0	3	0	1	2	0	2	0	0
Volume Module:												
Base Vol:	108	0	237	0	0	0	0	765	107	310	772	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	108	0	237	0	0	0	0	765	107	310	772	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	108	0	237	0	0	0	0	765	107	310	772	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	108	0	237	0	0	0	0	765	107	310	772	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	108	0	237	0	0	0	0	765	107	310	772	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.88	1.00	0.88	1.00	1.00	1.00	1.00	0.91	0.85	0.92	0.95	1.00
Lanes:	1.31	0.00	1.69	0.00	0.00	0.00	0.00	3.00	1.00	2.00	2.00	0.00
Final Sat.:	2204	0	2832	0	0	0	0	5187	1615	3502	3610	0
Capacity Analysis Module:												
Vol/Sat:	0.05	0.00	0.08	0.00	0.00	0.00	0.00	0.15	0.07	0.09	0.21	0.00
Crit Moves:			****					****		****		
Green/Cycle:	0.26	0.00	0.26	0.00	0.00	0.00	0.00	0.46	0.46	0.28	0.74	0.00
Volume/Cap:	0.19	0.00	0.32	0.00	0.00	0.00	0.00	0.32	0.14	0.32	0.29	0.00
Delay/Veh:	28.7	0.0	29.9	0.0	0.0	0.0	0.0	17.1	15.6	28.9	4.4	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	28.7	0.0	29.9	0.0	0.0	0.0	0.0	17.1	15.6	28.9	4.4	0.0
LOS by Move:	C	A	C	A	A	A	A	B	B	C	A	A
HCM2kAvgQ:	2	0	4	0	0	0	0	5	2	4	4	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #48 Madison Ave/I-15 SB Ramps & Kalmia St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.537
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 20.4
Optimal Cycle: 49 Level Of Service: C

Street Name:	Madison Ave/I-15 SB Ramps						Kalmia St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	1	0	0	1	0	0	2	0	1	2	0	2	0	0
Volume Module:												
Base Vol:	0	0	0	305	2	278	0	483	373	412	773	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	305	2	278	0	483	373	412	773	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	305	2	278	0	483	373	412	773	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	305	2	278	0	483	373	412	773	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	305	2	278	0	483	373	412	773	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.85	0.85	0.85	1.00	0.95	0.85	0.92	0.95	1.00
Lanes:	0.00	0.00	0.00	1.00	0.01	0.99	0.00	2.00	1.00	2.00	2.00	0.00
Final Sat.:	0	0	0	1615	12	1605	0	3610	1615	3502	3610	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.19	0.17	0.17	0.00	0.13	0.23	0.12	0.21	0.00
Crit Moves:				****					****	****		
Green/Cycle:	0.00	0.00	0.00	0.35	0.35	0.35	0.00	0.43	0.43	0.22	0.65	0.00
Volume/Cap:	0.00	0.00	0.00	0.54	0.49	0.49	0.00	0.31	0.54	0.54	0.33	0.00
Delay/Veh:	0.0	0.0	0.0	27.0	26.1	26.1	0.0	18.9	22.0	35.3	7.9	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	27.0	26.1	26.1	0.0	18.9	22.0	35.3	7.9	0.0
LOS by Move:	A	A	A	C	C	C	A	B	C	D	A	A
HCM2kAvgQ:	0	0	0	8	7	7	0	5	9	6	6	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #49 Monroe Ave & Murrieta Hot Springs Rd

Average Delay (sec/veh): 1.0 Worst Case Level Of Service: C[15.8]

Street Name:	Monroe Ave									Murrieta Hot Springs Rd								
Approach:	North Bound					South Bound				East Bound				West Bound				
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Stop Sign					Stop Sign					Uncontrolled					Uncontrolled				
Rights:	Include					Include					Include					Include				
Lanes:	0	0	0	0	0	0	0	0	0	1	1	0	4	0	0	0	0	3	0	1
Volume Module:																				
Base Vol:	0	0	0	0	0	71	125	1097	0	0	1463	25								
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00								
Initial Bse:	0	0	0	0	0	71	125	1097	0	0	1463	25								
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00								
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00								
PHF Volume:	0	0	0	0	0	71	125	1097	0	0	1463	25								
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0								
FinalVolume:	0	0	0	0	0	71	125	1097	0	0	1463	25								
Critical Gap Module:																				
Critical Gp:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	6.9	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx								
FollowUpTim:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx								
Capacity Module:																				
Cnflict Vol:	xxxx	xxxx	xxxxx	xxxx	xxxx	488	1488	xxxx	xxxxx	xxxx	xxxx	xxxxx								
Potent Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	531	458	xxxx	xxxxx	xxxx	xxxx	xxxxx								
Move Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	531	458	xxxx	xxxxx	xxxx	xxxx	xxxxx								
Volume/Cap:	xxxx	xxxx	xxxx	xxxx	xxxx	0.13	0.27	xxxx	xxxx	xxxx	xxxx	xxxx								
Level Of Service Module:																				
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	0.5	1.1	xxxx	xxxxx	xxxx	xxxx	xxxxx								
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	12.8	15.8	xxxx	xxxxx	xxxxx	xxxx	xxxxx								
LOS by Move:	*	*	*	*	*	B	C	*	*	*	*	*								
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT								
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx								
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx								
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx								
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*								
ApproachDel:	xxxxxx			12.8			xxxxxx			xxxxxx										
ApproachLOS:	*			B			*			*										

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #50 Hancock Ave & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.428
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 11.7
Optimal Cycle: 40 Level Of Service: B

Street Name:	Hancock Ave									Murrieta Hot Springs Rd								
Approach:	North Bound					South Bound				East Bound				West Bound				
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected					Protected				
Rights:	Include					Include					Include					Include				
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	2	0	0	0	2	2	0	4	0	0	0	0	3	0	1
Volume Module:																				
Base Vol:	0	0	0	264	0	147	227	884	0	0	1346	464								
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00								
Initial Bse:	0	0	0	264	0	147	227	884	0	0	1346	464								
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00								
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00								
PHF Volume:	0	0	0	264	0	147	227	884	0	0	1346	464								
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0								
Reduced Vol:	0	0	0	264	0	147	227	884	0	0	1346	464								
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00								
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00								
FinalVolume:	0	0	0	264	0	147	227	884	0	0	1346	464								
Saturation Flow Module:																				
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900								
Adjustment:	1.00	1.00	1.00	0.92	1.00	0.75	0.92	0.91	1.00	1.00	0.91	0.85								
Lanes:	0.00	0.00	0.00	2.00	0.00	2.00	2.00	4.00	0.00	0.00	3.00	1.00								
Final Sat.:	0	0	0	3502	0	2842	3502	6916	0	0	5187	1615								
Capacity Analysis Module:																				
Vol/Sat:	0.00	0.00	0.00	0.08	0.00	0.05	0.06	0.13	0.00	0.00	0.26	0.29								
Crit Moves:				****			****					****								
Green/Cycle:	0.00	0.00	0.00	0.18	0.00	0.18	0.15	0.82	0.00	0.00	0.67	0.67								
Volume/Cap:	0.00	0.00	0.00	0.43	0.00	0.29	0.43	0.16	0.00	0.00	0.39	0.43								
Delay/Veh:	0.0	0.0	0.0	37.2	0.0	36.1	39.0	1.8	0.0	0.0	7.3	7.8								
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00								
AdjDel/Veh:	0.0	0.0	0.0	37.2	0.0	36.1	39.0	1.8	0.0	0.0	7.3	7.8								
LOS by Move:	A	A	A	D	A	D	D	A	A	A	A	A								
HCM2kAvgQ:	0	0	0	4	0	2	4	2	0	0	7	7								

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #51 Alta Murrieta Dr & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.432
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 21.3
Optimal Cycle: 40 Level Of Service: C

Street Name:	Alta Murrieta Dr						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 1	0 1	2	0	0 1 1	2	0 2	1 0	2	0 4	0 1
Volume Module:												
Base Vol:	175	57	14	61	94	297	249	995	235	72	1350	107
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	175	57	14	61	94	297	249	995	235	72	1350	107
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	175	57	14	61	94	297	249	995	235	72	1350	107
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	175	57	14	61	94	297	249	995	235	72	1350	107
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	175	57	14	61	94	297	249	995	235	72	1350	107
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.85	0.92	0.89	0.89	0.92	0.88	0.88	0.92	0.91	0.85
Lanes:	2.00	1.00	1.00	2.00	0.48	1.52	2.00	2.43	0.57	2.00	4.00	1.00
Final Sat.:	3502	1900	1615	3502	809	2557	3502	4074	962	3502	6916	1615
Capacity Analysis Module:												
Vol/Sat:	0.05	0.03	0.01	0.02	0.12	0.12	0.07	0.24	0.24	0.02	0.20	0.07
Crit Moves:	****				****			****			****	
Green/Cycle:	0.12	0.24	0.24	0.14	0.27	0.27	0.16	0.57	0.57	0.05	0.45	0.45
Volume/Cap:	0.43	0.12	0.04	0.12	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.15
Delay/Veh:	41.9	29.7	28.9	37.7	30.6	30.6	38.1	12.4	12.4	48.1	18.8	16.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	41.9	29.7	28.9	37.7	30.6	30.6	38.1	12.4	12.4	48.1	18.8	16.2
LOS by Move:	D	C	C	D	C	C	D	B	B	D	B	B
HCM2kAvgQ:	3	1	0	1	5	5	4	8	8	2	8	2

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #52 Winchester Road - SR-79 & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.606
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 24.0
Optimal Cycle: 58 Level Of Service: C

Street Name:	Winchester Road - SR-79						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 3	0 1	2	0	3 0 1	2	0 3	0 1	2	0 2	0 1
Volume Module:												
Base Vol:	118	729	135	128	1408	536	512	318	137	268	340	37
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	118	729	135	128	1408	536	512	318	137	268	340	37
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	118	729	135	128	1408	536	512	318	137	268	340	37
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	118	729	135	128	1408	536	512	318	137	268	340	37
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	118	729	135	128	1408	536	512	318	137	268	340	37
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.91	0.85	0.92	0.91	0.85	0.92	0.91	0.85	0.92	0.95	0.85
Lanes:	2.00	3.00	1.00	2.00	3.00	1.00	2.00	3.00	1.00	2.00	2.00	1.00
Final Sat.:	3502	5187	1615	3502	5187	1615	3502	5187	1615	3502	3610	1615
Capacity Analysis Module:												
Vol/Sat:	0.03	0.14	0.08	0.04	0.27	0.33	0.15	0.06	0.08	0.08	0.09	0.02
Crit Moves:	****					****	****				****	
Green/Cycle:	0.06	0.48	0.48	0.12	0.55	0.55	0.24	0.21	0.21	0.19	0.16	0.16
Volume/Cap:	0.61	0.29	0.17	0.29	0.50	0.61	0.61	0.29	0.41	0.41	0.61	0.15
Delay/Veh:	51.5	15.9	14.9	40.2	14.2	16.5	35.0	33.5	35.0	36.1	41.3	36.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	51.5	15.9	14.9	40.2	14.2	16.5	35.0	33.5	35.0	36.1	41.3	36.8
LOS by Move:	D	B	B	D	B	B	C	C	D	D	D	D
HCM2kAvgQ:	3	5	2	2	10	12	8	3	4	4	6	1

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #53 Hancock Ave & Los Alamos Rd

Cycle (sec):	100	Critical Vol./Cap.(X):	0.613
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	28.4
Optimal Cycle:	59	Level Of Service:	C

Street Name:	Hancock Ave						Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	1	1	0	2	0	0	1	0	1	0	1	1	0	1	0	1	1	0
Volume Module:												
Base Vol:	51	143	93	526	246	156	125	601	66	226	711	293
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	51	143	93	526	246	156	125	601	66	226	711	293
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	51	143	93	526	246	156	125	601	66	226	711	293
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	51	143	93	526	246	156	125	601	66	226	711	293
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	51	143	93	526	246	156	125	601	66	226	711	293
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.89	0.89	0.92	0.94	0.94	0.95	0.94	0.94	0.95	0.91	0.91
Lanes:	1.00	1.21	0.79	2.00	0.61	0.39	1.00	1.80	0.20	1.00	1.42	0.58
Final Sat.:	1805	2058	1339	3502	1095	695	1805	3204	352	1805	2444	1007
Capacity Analysis Module:												
Vol/Sat:	0.03	0.07	0.07	0.15	0.22	0.22	0.07	0.19	0.19	0.13	0.29	0.29
Crit Moves:	****				****		****				****	
Green/Cycle:	0.05	0.13	0.13	0.28	0.37	0.37	0.11	0.35	0.35	0.24	0.47	0.47
Volume/Cap:	0.61	0.53	0.53	0.53	0.61	0.61	0.61	0.53	0.53	0.53	0.61	0.61
Delay/Veh:	59.6	41.9	41.9	30.9	27.6	27.6	47.7	26.3	26.3	34.7	20.2	20.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	59.6	41.9	41.9	30.9	27.6	27.6	47.7	26.3	26.3	34.7	20.2	20.2
LOS by Move:	E	D	D	C	C	C	D	C	C	C	C	C
HCM2kAvgQ:	3	4	4	7	11	11	5	9	9	7	12	12

Note: Queue reported is the number of cars per lane.

City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #54 I-215 SB Ramps & Los Alamos Rd

Cycle (sec):	100	Critical Vol./Cap.(X):	0.522
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	18.0
Optimal Cycle:	48	Level Of Service:	B

Street Name:	I-215 SB Ramps						Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	1	0	1!	0	1	0	0	2	1	0	2	0	2	0	0
Volume Module:												
Base Vol:	0	0	0	119	1	497	0	801	426	250	899	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	119	1	497	0	801	426	250	899	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	119	1	497	0	801	426	250	899	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	119	1	497	0	801	426	250	899	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	119	1	497	0	801	426	250	899	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.85	0.85	0.85	1.00	0.86	0.86	0.92	0.95	1.00
Lanes:	0.00	0.00	0.00	1.19	0.01	1.80	0.00	2.00	1.00	2.00	2.00	0.00
Final Sat.:	0	0	0	1934	5	2926	0	3278	1639	3502	3610	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.06	0.19	0.17	0.00	0.24	0.26	0.07	0.25	0.00
Crit Moves:					****				****	****		
Green/Cycle:	0.00	0.00	0.00	0.37	0.37	0.37	0.00	0.50	0.50	0.14	0.63	0.00
Volume/Cap:	0.00	0.00	0.00	0.17	0.52	0.47	0.00	0.49	0.52	0.52	0.39	0.00
Delay/Veh:	0.0	0.0	0.0	21.5	25.3	24.5	0.0	16.8	17.2	41.2	9.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	21.5	25.3	24.5	0.0	16.8	17.2	41.2	9.0	0.0
LOS by Move:	A	A	A	C	C	C	A	B	B	D	A	A
HCM2kAvgQ:	0	0	0	2	8	7	0	9	10	4	7	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #55 I-215 NB Ramps & Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.462
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 15.4
Optimal Cycle: 42 Level Of Service: B

Street Name:	I-215 NB Ramps						Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	0 1	0	0	0 0	2	0	3 0	0	0	0 1
Volume Module:												
Base Vol:	209	1	107	0	0	0	242	670	0	0	951	72
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	209	1	107	0	0	0	242	670	0	0	951	72
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	209	1	107	0	0	0	242	670	0	0	951	72
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	209	1	107	0	0	0	242	670	0	0	951	72
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	209	1	107	0	0	0	242	670	0	0	951	72
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.85	0.85	0.85	1.00	1.00	1.00	0.92	0.91	1.00	1.00	0.95	0.85
Lanes:	1.00	0.01	0.99	0.00	0.00	0.00	2.00	3.00	0.00	0.00	2.00	1.00
Final Sat.:	1615	15	1602	0	0	0	3502	5187	0	0	3610	1615
Capacity Analysis Module:												
Vol/Sat:	0.13	0.07	0.07	0.00	0.00	0.00	0.07	0.13	0.00	0.00	0.26	0.04
Crit Moves:	****						****				****	
Green/Cycle:	0.28	0.28	0.28	0.00	0.00	0.00	0.15	0.72	0.00	0.00	0.57	0.57
Volume/Cap:	0.46	0.24	0.24	0.00	0.00	0.00	0.46	0.18	0.00	0.00	0.46	0.08
Delay/Veh:	30.5	28.0	28.0	0.0	0.0	0.0	39.5	4.5	0.0	0.0	12.7	9.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	30.5	28.0	28.0	0.0	0.0	0.0	39.5	4.5	0.0	0.0	12.7	9.7
LOS by Move:	C		C	A	A	A	D	A	A	A	B	A
HCM2kAvgQ:	6		3	0		0	4		2	0	0	9	1

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #56 Whitewood Rd & Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.372
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 26.7
Optimal Cycle: 36 Level Of Service: C

Street Name:	Whitewood Rd						Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	1 1	0	1	0 2	0	1	1 0	2	0	1 1 0
Volume Module:												
Base Vol:	126	90	59	11	110	254	124	226	64	33	270	6
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	126	90	59	11	110	254	124	226	64	33	270	6
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	126	90	59	11	110	254	124	226	64	33	270	6
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	126	90	59	11	110	254	124	226	64	33	270	6
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	126	90	59	11	110	254	124	226	64	33	270	6
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.89	0.89	0.95	0.95	0.85	0.95	0.95	0.85	0.95	0.95	0.95
Lanes:	1.00	1.21	0.79	1.00	2.00	1.00	1.00	2.00	1.00	1.00	1.96	0.04
Final Sat.:	1805	2052	1345	1805	3610	1615	1805	3610	1615	1805	3521	78
Capacity Analysis Module:												
Vol/Sat:	0.07	0.04	0.04	0.01	0.03	0.16	0.07	0.06	0.04	0.02	0.08	0.08
Crit Moves:	****					****	****				****	
Green/Cycle:	0.19	0.54	0.54	0.07	0.42	0.42	0.18	0.30	0.30	0.09	0.21	0.21
Volume/Cap:	0.37	0.08	0.08	0.08	0.07	0.37	0.37	0.21	0.13	0.21	0.37	0.37
Delay/Veh:	36.2	11.3	11.3	43.4	17.2	20.1	36.4	26.1	25.5	43.0	34.5	34.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	36.2	11.3	11.3	43.4	17.2	20.1	36.4	26.1	25.5	43.0	34.5	34.5
LOS by Move:	D	B	B	D	B	C	D	C	C	D	C	C
HCM2kAvgQ:	4	1	1	0	1	5	4	3	1	1	4	4

Note: Queue reported is the number of cars per lane.

City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #57 Whitewood Rd & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.518
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 12.6
Optimal Cycle: 47 Level Of Service: B

Street Name:	Whitewood Rd						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	0 1	0	2	0 1	0 1	0	2 1	0	1	0 2
Volume Module:												
Base Vol:	4	38	43	353	20	63	31	1106	4	23	1556	241
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	4	38	43	353	20	63	31	1106	4	23	1556	241
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	4	38	43	353	20	63	31	1106	4	23	1556	241
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	4	38	43	353	20	63	31	1106	4	23	1556	241
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	4	38	43	353	20	63	31	1106	4	23	1556	241
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.92	0.92	0.92	1.00	0.85	0.95	0.91	0.91	0.95	0.89	0.89
Lanes:	1.00	0.47	0.53	2.00	1.00	1.00	1.00	2.99	0.01	1.00	2.60	0.40
Final Sat.:	1805	820	928	3502	1900	1615	1805	5163	19	1805	4402	682
Capacity Analysis Module:												
Vol/Sat:	0.00	0.05	0.05	0.10	0.01	0.04	0.02	0.21	0.21	0.01	0.35	0.35
Crit Moves:		****		****			****				****	
Green/Cycle:	0.02	0.09	0.09	0.19	0.27	0.27	0.03	0.68	0.68	0.04	0.68	0.68
Volume/Cap:	0.15	0.52	0.52	0.52	0.04	0.15	0.52	0.32	0.32	0.32	0.52	0.52
Delay/Veh:	51.0	46.5	46.5	36.8	27.0	28.0	55.3	6.7	6.7	49.2	7.9	7.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	51.0	46.5	46.5	36.8	27.0	28.0	55.3	6.7	6.7	49.2	7.9	7.9
LOS by Move:	D		D	D		C	E	A	A	D	A	A
HCM2kAvgQ:	0	3	3	6	0	2	2	5	5	1	10	10

Note: Queue reported is the number of cars per lane.

City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #58 Adams Ave & Guava St

Average Delay (sec/veh): 4.9 Worst Case Level Of Service: A[8.6]

Street Name:	Adams Ave						Guava St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0	0	0 1 0	0	1	0 0 0	0	0	0 0 0	0	0	1! 0 0
Volume Module:												
Base Vol:	0	13	2	94	67	0	0	0	0	3	0	44
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	13	2	94	67	0	0	0	0	3	0	44
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	13	2	94	67	0	0	0	0	3	0	44
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	13	2	94	67	0	0	0	0	3	0	44
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.4	6.5	6.2
FollowUpTim:	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.5	4.0	3.3
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	15	xxxx	xxxxx	xxxx	xxxx	xxxxx	269	269	14
Potent Cap.:	xxxx	xxxx	xxxxx	1616	xxxx	xxxxx	xxxx	xxxx	xxxxx	725	641	1072
Move Cap.:	xxxx	xxxx	xxxxx	1616	xxxx	xxxxx	xxxx	xxxx	xxxxx	691	601	1072
Volume/Cap:	xxxx	xxxx	xxxx	0.06	xxxx	xxxx	xxxx	xxxx	xxxx	0.00	0.00	0.04
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	0.2	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	7.4	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	A	*	*	*	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	1035	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	0.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.1	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	7.4	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	8.6	xxxxx
Shared LOS:	*	*	*	A	*	*	*	*	*	*	A	*
ApproachDel:	xxxxxx			xxxxxx			xxxxxx			8.6		
ApproachLOS:	*			*			*			A		

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #59 Nutmeg St & Clinton Keith Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.366
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 20.6
Optimal Cycle: 29 Level Of Service: C

Street Name:	Nutmeg St									Clinton Keith Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	69	34	201	101	55	39	17	357	79	206	404	39
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	69	34	201	101	55	39	17	357	79	206	404	39
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	69	34	201	101	55	39	17	357	79	206	404	39
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	69	34	201	101	55	39	17	357	79	206	404	39
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	69	34	201	101	55	39	17	357	79	206	404	39
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.65	0.83	0.83	0.52	0.89	0.89	0.95	0.92	0.92	0.95	0.94	0.94
Lanes:	1.00	1.00	1.00	1.00	1.17	0.83	1.00	1.64	0.36	1.00	1.82	0.18
Final Sat.:	1243	1574	1574	980	1981	1405	1805	2876	636	1805	3249	314
Capacity Analysis Module:												
Vol/Sat:	0.06	0.02	0.13	0.10	0.03	0.03	0.01	0.12	0.12	0.11	0.12	0.12
Crit Moves:			****					****			****	
Green/Cycle:	0.35	0.35	0.35	0.35	0.35	0.35	0.05	0.34	0.34	0.31	0.61	0.61
Volume/Cap:	0.16	0.06	0.37	0.30	0.08	0.08	0.21	0.37	0.37	0.37	0.21	0.21
Delay/Veh:	22.6	21.7	24.7	24.1	21.8	21.8	47.2	25.1	25.1	27.1	8.9	8.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	22.6	21.7	24.7	24.1	21.8	21.8	47.2	25.1	25.1	27.1	8.9	8.9
LOS by Move:	C	C	C	C	C	C	D	C	C	C	A	A
HCM2kAvgQ:	2	1	5	2	1	1	1	5	5	5	3	3

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #61 I-215 SB Ramps & Scott Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.684
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 23.2
Optimal Cycle: 72 Level Of Service: C

Street Name:	I-215 SB Ramps									Scott Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0 0	0 0	0	1 0	0 1	0	0 1	1 0	1	0 1	0 0
Volume Module:												
Base Vol:	0	0	0	258	4	88	0	535	320	447	501	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	258	4	88	0	535	320	447	501	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	258	4	88	0	535	320	447	501	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	258	4	88	0	535	320	447	501	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	258	4	88	0	535	320	447	501	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.89	0.89	0.85	1.00	1.00	0.85	0.95	1.00	1.00
Lanes:	0.00	0.00	0.00	0.98	0.02	1.00	0.00	1.00	1.00	1.00	1.00	0.00
Final Sat.:	0	0	0	1663	26	1615	0	1900	1615	1805	1900	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.16	0.16	0.05	0.00	0.28	0.20	0.25	0.26	0.00
Crit Moves:				****						****		
Green/Cycle:	0.00	0.00	0.00	0.23	0.23	0.23	0.00	0.41	0.41	0.36	0.77	0.00
Volume/Cap:	0.00	0.00	0.00	0.68	0.68	0.24	0.00	0.68	0.48	0.68	0.34	0.00
Delay/Veh:	0.0	0.0	0.0	40.5	40.5	32.0	0.0	26.6	22.2	30.1	3.6	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	40.5	40.5	32.0	0.0	26.6	22.2	30.1	3.6	0.0
LOS by Move:	A	A	A	D	D	C	A	C	C	C	A	A
HCM2kAvgQ:	0	0	0	9	9	2	0	14	7	13	5	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #62 I-215 NB Ramps & Scott Rd

Cycle (sec):	100	Critical Vol./Cap.(X):	0.693
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	18.0
Optimal Cycle:	74	Level Of Service:	B

Street Name:	I-215 NB Ramps						Scott Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 1	0	0 1	0	0 0	0 0	1	0 1	0 0	0	0 1	0 1
Volume Module:												
Base Vol:	145	12	349	0	0	0	108	603	0	0	792	380
Growth Adj:	1.00 1.00	1.00	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00	1.00
Initial Bse:	145	12	349	0	0	0	108	603	0	0	792	380
User Adj:	1.00 1.00	1.00	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00	1.00
PHF Adj:	1.00 1.00	1.00	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00	1.00
PHF Volume:	145	12	349	0	0	0	108	603	0	0	792	380
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	145	12	349	0	0	0	108	603	0	0	792	380
PCE Adj:	1.00 1.00	1.00	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00	1.00
MLF Adj:	1.00 1.00	1.00	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00	1.00
FinalVolume:	145	12	349	0	0	0	108	603	0	0	792	380
Saturation Flow Module:												
Sat/Lane:	1900 1900	1900	1900 1900	1900	1900	1900 1900	1900	1900	1900 1900	1900	1900	1900
Adjustment:	0.96 0.96	0.85	1.00 1.00	1.00	1.00	0.95 1.00	1.00	1.00	1.00 1.00	1.00	1.00	0.85
Lanes:	0.92 0.08	1.00	0.00 0.00	0.00	1.00	1.00 1.00	0.00	0.00	1.00 1.00	1.00	1.00	1.00
Final Sat.:	1679 139	1615	0 0	0	1805	1900	0	0	1900	1615		
Capacity Analysis Module:												
Vol/Sat:	0.09 0.09	0.22	0.00 0.00	0.00	0.06	0.32	0.00	0.00	0.42	0.24		
Crit Moves:		****			****				****			
Green/Cycle:	0.31 0.31	0.31	0.00 0.00	0.00	0.09	0.69	0.00	0.00	0.60	0.60		
Volume/Cap:	0.28 0.28	0.69	0.00 0.00	0.00	0.69	0.46	0.00	0.00	0.69	0.39		
Delay/Veh:	26.2 26.2	34.3	0.0 0.0	0.0	57.0	7.4	0.0	0.0	15.5	10.6		
User DelAdj:	1.00 1.00	1.00	1.00 1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
AdjDel/Veh:	26.2 26.2	34.3	0.0 0.0	0.0	57.0	7.4	0.0	0.0	15.5	10.6		
LOS by Move:	C	C	C	A	A	A	E	A	A	A	B	B
HCM2kAvgQ:	4	4	11	0	0	0	5	9	0	0	17	6

Note: Queue reported is the number of cars per lane.

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Scenario Report

Scenario:	Existing PM
Command:	Existing PM
Volume:	Existing PM
Geometry:	Existing
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	Default Trip Distribution
Paths:	Default Path
Routes:	Default Route
Configuration:	Existing PM

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Turning Movement Report

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#1 Menifee Road & Scott Road													
Base	97	48	65	48	43	107	145	545	159	48	459	102	1866
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	97	48	65	48	43	107	145	545	159	48	459	102	1866
#2 Leon Road & Scott Road													
Base	277	12	15	2	10	7	7	181	261	6	204	5	987
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	277	12	15	2	10	7	7	181	261	6	204	5	987
#3 Winchester Road/SR-79 & Scott Road													
Base	75	891	3	123	553	80	81	60	67	0	59	171	2163
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	75	891	3	123	553	80	81	60	67	0	59	171	2163
#4 Antelope Road & Keller Road													
Base	14	315	271	19	93	7	10	5	7	72	2	19	834
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	14	315	271	19	93	7	10	5	7	72	2	19	834
#5 Menifee Road - Meadowlark Road & Keller Road													
Base	0	0	0	12	0	48	119	32	0	0	20	10	241
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	12	0	48	119	32	0	0	20	10	241
#6 Briggs Road & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#7 Leon Road & Keller Road													
Base	1	258	4	7	240	0	0	0	1	5	0	3	519
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	258	4	7	240	0	0	0	1	5	0	3	519
#8 Winchester Road - SR-79 & Keller Road													
Base	1	913	3	0	624	2	0	0	1	1	0	3	1548
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	913	3	0	624	2	0	0	1	1	0	3	1548
#9 Antelope Road & Golden City Drive - Baxter Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#10 Whitewood Roa - /Meadowlark Road & Golden City Drive - Baxter Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#11 Briggs Road & Baxter Road - Jean Nicholas													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#12 Leon Road & Jean Nicholas													
Base	0	229	19	24	224	0	0	0	0	8	0	34	538
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	229	19	24	224	0	0	0	0	8	0	34	538
#13 Winchester Road - SR-79 & Nicholas - Skyview													
Base	78	1120	2	2	632	18	25	0	22	1	0	3	1903
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	78	1120	2	2	632	18	25	0	22	1	0	3	1903
#14 Antelope Road & Linnel Lane Extension													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#15 Whitewood Road - Meadowlark Road & Linnel Lane Extension													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#16 Leon Road & Max Gillis Road													
Base	84	62	168	197	22	39	18	70	25	98	216	212	1211
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	84	62	168	197	22	39	18	70	25	98	216	212	1211
#17 Winchester Road - SR-79 & Max Gillis - Thompson													
Base	409	1197	251	25	636	32	44	115	294	132	103	10	3248
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	409	1197	251	25	636	32	44	115	294	132	103	10	3248
#18 California Oaks Road & Clinton Keith Road													
Base	162	0	554	0	0	0	0	602	89	312	608	0	2327
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	162	0	554	0	0	0	0	602	89	312	608	0	2327

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#19 I-215 SB Off-Ramp & Clinton Keith Road													
Base	0	0	0	46	2	629	0	710	403	77	405	0	2272
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	46	2	629	0	710	403	77	405	0	2272
#20 I-215 NB Off Ramp & Clinton Keith Road													
Base	241	1	88	0	0	0	455	274	0	0	261	81	1401
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	241	1	88	0	0	0	455	274	0	0	261	81	1401
#21 Antelope Road & Clinton Keith Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#22 Meadowlark Lane - Whitewood Road & Clinton Keith Road													
Base	248	380	3	0	78	62	161	3	152	0	1	0	1088
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	248	380	3	0	78	62	161	3	152	0	1	0	1088
#23 Liberty Road & Clinton Keith Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#24 Leon Road & Clinton Keith Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#25 Winchester Road - SR-79 & Benton Road													
Base	0	1497	526	255	865	0	0	0	0	280	0	357	3780
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1497	526	255	865	0	0	0	0	280	0	357	3780
#26 Winchester Road - SR-79 & Via Mira Mosa													
Base	24	1893	204	42	1069	55	58	11	27	304	16	86	3789
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	24	1893	204	42	1069	55	58	11	27	304	16	86	3789
#27 Monroe Ave & Los Alamos													
Base	0	0	0	179	0	83	167	946	0	0	447	134	1956
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	179	0	83	167	946	0	0	447	134	1956

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#28 Jefferson Avenue & Murrieta Hot Springs Road													
Base	0	965	976	275	329	0	0	0	0	289	0	246	3080
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	965	976	275	329	0	0	0	0	289	0	246	3080
#29 Madison Avenue & Murrieta Hot Springs Road													
Base	63	286	562	459	212	67	206	868	103	419	424	162	3831
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	63	286	562	459	212	67	206	868	103	419	424	162	3831
#30 I-15 SB Off-Ramp & Murrieta Hot Springs Road													
Base	0	0	0	842	0	276	0	1599	366	0	1078	112	4273
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	842	0	276	0	1599	366	0	1078	112	4273
#31 I-15 NB Off-Ramp & Murrieta Hot Springs Road													
Base	275	0	180	0	0	0	485	1942	0	0	852	985	4719
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	275	0	180	0	0	0	485	1942	0	0	852	985	4719
#32 I-215 SB Off-Ramp & Murrieta Hot Springs Road													
Base	0	0	0	603	0	236	0	2103	139	0	1535	238	4854
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	603	0	236	0	2103	139	0	1535	238	4854
#33 I-215 NB Off-Ramp & Murrieta Hot Springs Road													
Base	77	0	496	0	0	0	0	2300	104	0	1748	571	5296
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	77	0	496	0	0	0	0	2300	104	0	1748	571	5296
#34 Jackson Avenue & Murrieta Hot Springs Road													
Base	90	0	111	0	0	0	0	1968	43	136	1577	0	3925
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	90	0	111	0	0	0	0	1968	43	136	1577	0	3925
#35 Margarita Road & Murrieta Hot Springs Road													
Base	879	20	225	20	15	26	18	1241	687	186	973	7	4297
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	879	20	225	20	15	26	18	1241	687	186	973	7	4297
#36 French Valley Parkway & Murrieta Hot Springs Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0

City of Murrieta General Plan
Existing
PM Peak Hour

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#37 Jefferson Avenue & Guava Street													
Base	0	1995	75	16	560	0	0	0	0	9	0	19	2674
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1995	75	16	560	0	0	0	0	9	0	19	2674
#38 Jefferson Avenue & Cherry Street													
Base	55	1372	0	0	880	9	4	0	76	0	0	0	2396
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	55	1372	0	0	880	9	4	0	76	0	0	0	2396
#39 Washington Ave & Calle Del Oso Oro/Nutmeg													
Base	327	319	113	64	278	35	20	121	275	124	258	89	2023
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	327	319	113	64	278	35	20	121	275	124	258	89	2023
#40 Clinton Keith Rd & Calle de Oso Oro/Bear Creek Dr													
Base	1	255	35	83	233	105	67	22	3	75	37	53	969
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	255	35	83	233	105	67	22	3	75	37	53	969
#41 Jefferson Ave & Nutmeg St													
Base	221	84	195	14	44	9	11	179	94	125	227	29	1232
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	221	84	195	14	44	9	11	179	94	125	227	29	1232
#42 Jefferson Ave & Magnolia St													
Base	96	480	9	4	264	38	67	7	33	5	7	7	1017
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	96	480	9	4	264	38	67	7	33	5	7	7	1017
#43 Jefferson Ave & Lemon St													
Base	78	616	1	2	324	6	7	0	37	4	4	4	1083
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	78	616	1	2	324	6	7	0	37	4	4	4	1083
#44 Jefferson Ave & Kalmia St													
Base	191	326	233	168	186	11	20	515	198	128	458	298	2732
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	191	326	233	168	186	11	20	515	198	128	458	298	2732
#45 Jefferson Ave & Juniper St													
Base	61	738	74	47	392	28	48	53	55	10	47	45	1598
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	61	738	74	47	392	28	48	53	55	10	47	45	1598

City of Murrieta General Plan
Existing
PM Peak Hour

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#46 Jefferson Ave & Ivy St/Los Alamos Rd													
Base	180	627	402	148	297	36	44	245	129	98	161	132	2499
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	180	627	402	148	297	36	44	245	129	98	161	132	2499
#47 Madison Ave & Kalmia St													
Base	190	0	537	0	0	0	0	1020	172	383	952	0	3254
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	190	0	537	0	0	0	0	1020	172	383	952	0	3254
#48 Madison Ave/I-15 SB Ramps & Kalmia St													
Base	0	0	0	359	2	361	0	1109	408	385	987	0	3611
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	359	2	361	0	1109	408	385	987	0	3611
#49 Monroe Ave & Murrieta Hot Springs Rd													
Base	0	0	0	0	0	130	227	2111	0	0	1574	30	4072
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	130	227	2111	0	0	1574	30	4072
#50 Hancock Ave & Murrieta Hot Springs Rd													
Base	0	0	0	569	0	183	237	1924	0	0	1465	421	4799
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	569	0	183	237	1924	0	0	1465	421	4799
#51 Alta Murrieta Dr & Murrieta Hot Springs Rd													
Base	394	195	45	208	132	412	717	1697	499	119	1293	112	5823
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	394	195	45	208	132	412	717	1697	499	119	1293	112	5823
#52 Winchester Road - SR-79 & Murrieta Hot Springs Rd													
Base	250	1689	204	122	1064	498	611	522	207	273	412	62	5914
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	250	1689	204	122	1064	498	611	522	207	273	412	62	5914
#53 Hancock Ave & Los Alamos Rd													
Base	149	559	290	459	222	65	198	965	62	163	537	295	3964
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	149	559	290	459	222	65	198	965	62	163	537	295	3964
#54 I-215 SB Ramps & Los Alamos Rd													
Base	0	0	0	192	3	408	0	1441	287	160	738	0	3229
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	192	3	408	0	1441	287	160	738	0	3229

City of Murrieta General Plan
Existing
PM Peak Hour

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#55 I-215 NB Ramps & Los Alamos Rd													
Base	129	4	175	0	0	0	394	1181	0	0	774	165	2822
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	129	4	175	0	0	0	394	1181	0	0	774	165	2822
#56 Whitewood Rd & Los Alamos Rd													
Base	197	343	64	13	196	162	269	353	265	70	207	18	2157
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	197	343	64	13	196	162	269	353	265	70	207	18	2157
#57 Whitewood Rd & Murrieta Hot Springs Rd													
Base	6	5	16	316	7	93	101	1903	6	21	1776	417	4667
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	6	5	16	316	7	93	101	1903	6	21	1776	417	4667
#58 Adams Ave & Guava St													
Base	0	86	26	77	22	0	0	0	0	7	0	90	308
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	86	26	77	22	0	0	0	0	7	0	90	308
#59 Nutmeg St & Clinton Keith Rd													
Base	48	61	192	61	23	21	52	533	69	210	397	73	1740
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	48	61	192	61	23	21	52	533	69	210	397	73	1740
#60 Mitchell Rd & Clinton Keith Rd													
Base	32	0	67	0	0	0	0	1100	37	93	946	0	2275
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	32	0	67	0	0	0	0	1100	37	93	946	0	2275
#61 I-215 SB Ramps & Scott Rd													
Base	0	0	0	334	4	114	0	580	165	465	603	0	2265
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	334	4	114	0	580	165	465	603	0	2265
#62 I-215 NB Ramps & Scott Rd													
Base	182	6	468	0	0	0	112	780	0	0	913	364	2825
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	182	6	468	0	0	0	112	780	0	0	913	364	2825
#104 Antelope Road & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0

City of Murrieta General Plan
Existing
PM Peak Hour

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#105 Menifee Road - Meadowlark Road & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#122 Meadowlark Lane - Whitewood Road & Clinton Keith Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#138 Jefferson Avenue & Cherry Street													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#141 Jefferson Ave & Nutmeg St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#142 Jefferson Ave & Magnolia St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#149 Monroe Ave & Murrieta Hot Springs Rd													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#158 Adams Ave & Guava St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0

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City of Murrieta General Plan
Existing
PM Peak Hour

Impact Analysis Report
Level Of Service

Intersection	Base LOS	Del/ Veh	V/ C	Future LOS	Del/ Veh	V/ C	Change in
# 1 Menifee Road & Scott Road	B	18.0	0.340	B	18.0	0.340	+ 0.000 D/V
# 2 Leon Road & Scott Road	B	13.4	0.617	B	13.4	0.617	+ 0.000 V/C
# 3 Winchester Road/SR-79 & Scott	B	18.5	0.450	B	18.5	0.450	+ 0.000 D/V
# 4 Antelope Road & Keller Road	B	13.5	0.688	B	13.5	0.688	+ 0.000 V/C
# 5 Menifee Road - Meadowlark Road	A	8.2	0.172	A	8.2	0.172	+ 0.000 V/C
# 7 Leon Road & Keller Road	B	11.6	0.000	B	11.6	0.000	+ 0.000 D/V
# 8 Winchester Road - SR-79 & Kell	C	23.0	0.000	C	23.0	0.000	+ 0.000 D/V
# 12 Leon Road & Jean Nicholas	B	10.2	0.000	B	10.2	0.000	+ 0.000 D/V
# 13 Winchester Road - SR-79 & Nich	A	5.1	0.325	A	5.1	0.325	+ 0.000 D/V
# 16 Leon Road & Max Gillis Road	C	25.4	0.293	C	25.4	0.293	+ 0.000 D/V
# 17 Winchester Road - SR-79 & Max	C	25.6	0.681	C	25.6	0.681	+ 0.000 D/V
# 18 California Oaks Road & Clinton	C	22.4	0.580	C	22.4	0.580	+ 0.000 D/V
# 19 I-215 SB Off-Ramp & Clinton Ke	C	26.1	0.807	C	26.1	0.807	+ 0.000 D/V
# 20 I-215 NB Off Ramp & Clinton Ke	C	23.1	0.565	C	23.1	0.565	+ 0.000 D/V
# 22 Meadowlark Lane - Whitewood Ro	B	13.4	0.608	B	13.4	0.608	+ 0.000 V/C
# 25 Winchester Road - SR-79 & Bent	C	21.2	0.777	C	21.2	0.777	+ 0.000 D/V
# 26 Winchester Road - SR-79 & Via	B	14.4	0.738	B	14.4	0.738	+ 0.000 D/V
# 27 Monroe Ave & Los Alamos	B	12.4	0.313	B	12.4	0.313	+ 0.000 D/V
# 28 Jefferson Avenue & Murrieta Ho	C	20.7	0.835	C	20.7	0.835	+ 0.000 D/V
# 29 Madison Avenue & Murrieta Hot	C	34.2	0.741	C	34.2	0.741	+ 0.000 D/V
# 30 I-15 SB Off-Ramp & Murrieta Ho	B	18.9	0.657	B	18.9	0.657	+ 0.000 D/V
# 31 I-15 NB Off-Ramp & Murrieta Ho	B	15.3	0.544	B	15.3	0.544	+ 0.000 D/V
# 32 I-215 SB Off-Ramp & Murrieta H	B	14.5	0.659	B	14.5	0.659	+ 0.000 D/V

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City of Murrieta General Plan
Existing
PM Peak Hour

Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
# 33 I-215 NB Off-Ramp & Murrieta H	A	10.0	0.618	A	10.0	0.618	+ 0.000 D/V
# 34 Jackson Avenue & Murrieta Hot	A	6.2	0.494	A	6.2	0.494	+ 0.000 D/V
# 35 Margarita Road & Murrieta Hot	C	23.7	0.798	C	23.7	0.798	+ 0.000 D/V
# 37 Jefferson Avenue & Guava Stree	A	1.4	0.573	A	1.4	0.573	+ 0.000 D/V
# 38 Jefferson Avenue & Cherry Stre	C	15.0	0.000	C	15.0	0.000	+ 0.000 D/V
# 39 Washington Ave & Calle Del Oso	C	26.8	0.508	C	26.8	0.508	+ 0.000 D/V
# 40 Clinton Keith Rd & Calle de Os	B	16.2	0.183	B	16.2	0.183	+ 0.000 D/V
# 41 Jefferson Ave & Nutmeg St	B	12.9	0.480	B	12.9	0.480	+ 0.000 V/C
# 42 Jefferson Ave & Magnolia St	C	21.2	0.841	C	21.2	0.841	+ 0.000 V/C
# 43 Jefferson Ave & Lemon St	A	6.6	0.353	A	6.6	0.353	+ 0.000 D/V
# 44 Jefferson Ave & Kalmia St	C	26.7	0.517	C	26.7	0.517	+ 0.000 D/V
# 45 Jefferson Ave & Juniper St	B	13.8	0.285	B	13.8	0.285	+ 0.000 D/V
# 46 Jefferson Ave & Ivy St/Los Ala	C	25.2	0.494	C	25.2	0.494	+ 0.000 D/V
# 47 Madison Ave & Kalmia St	C	20.3	0.491	C	20.3	0.491	+ 0.000 D/V
# 48 Madison Ave/I-15 SB Ramps & Ka	C	21.0	0.639	C	21.0	0.639	+ 0.000 D/V
# 49 Monroe Ave & Murrieta Hot Spri	C	23.8	0.000	C	23.8	0.000	+ 0.000 D/V
# 50 Hancock Ave & Murrieta Hot Spr	B	14.7	0.513	B	14.7	0.513	+ 0.000 D/V
# 51 Alta Murrieta Dr & Murrieta Ho	C	28.1	0.746	C	28.1	0.746	+ 0.000 D/V
# 52 Winchester Road - SR-79 & Murr	C	26.4	0.668	C	26.4	0.668	+ 0.000 D/V
# 53 Hancock Ave & Los Alamos Rd	C	34.5	0.756	C	34.5	0.756	+ 0.000 D/V
# 54 I-215 SB Ramps & Los Alamos Rd	B	15.6	0.574	B	15.6	0.574	+ 0.000 D/V
# 55 I-215 NB Ramps & Los Alamos Rd	B	15.0	0.437	B	15.0	0.437	+ 0.000 D/V
# 56 Whitewood Rd & Los Alamos Rd	C	26.0	0.422	C	26.0	0.422	+ 0.000 D/V
# 57 Whitewood Rd & Murrieta Hot Sp	A	9.7	0.594	A	9.7	0.594	+ 0.000 D/V
# 58 Adams Ave & Guava St	A	9.3	0.000	A	9.3	0.000	+ 0.000 D/V

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City of Murrieta General Plan
Existing
PM Peak Hour

Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
# 59 Nutmeg St & Clinton Keith Rd	C	21.0	0.406	C	21.0	0.406	+ 0.000 D/V
# 61 I-215 SB Ramps & Scott Rd	C	25.6	0.763	C	25.6	0.763	+ 0.000 D/V
# 62 I-215 NB Ramps & Scott Rd	C	23.4	0.832	C	23.4	0.832	+ 0.000 D/V

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City of Murrieta General Plan
Existing
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #1 Menifee Road & Scott Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.340
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 18.0
Optimal Cycle: 28 Level Of Service: B

Street Name:	Menifee Rd						Scott Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	0 1	1	0 0	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	97	48	65	48	43	107	145	545	159	48	459	102
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	97	48	65	48	43	107	145	545	159	48	459	102
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	97	48	65	48	43	107	145	545	159	48	459	102
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	97	48	65	48	43	107	145	545	159	48	459	102
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	97	48	65	48	43	107	145	545	159	48	459	102
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.51	1.00	0.85	0.68	0.89	0.89	0.95	0.92	0.92	0.95	0.92	0.92
Lanes:	1.00	1.00	1.00	1.00	0.29	0.71	1.00	1.55	0.45	1.00	1.64	0.36
Final Sat.:	973	1900	1615	1294	486	1210	1805	2700	788	1805	2874	639
Capacity Analysis Module:												
Vol/Sat:	0.10	0.03	0.04	0.04	0.09	0.09	0.08	0.20	0.20	0.03	0.16	0.16
Crit Moves:	****						****				****	
Green/Cycle:	0.29	0.29	0.29	0.29	0.29	0.29	0.24	0.62	0.62	0.08	0.47	0.47
Volume/Cap:	0.34	0.09	0.14	0.13	0.30	0.30	0.34	0.32	0.32	0.32	0.34	0.34
Delay/Veh:	28.4	25.7	26.1	26.1	27.7	27.7	32.2	8.9	8.9	44.5	16.8	16.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	28.4	25.7	26.1	26.1	27.7	27.7	32.2	8.9	8.9	44.5	16.8	16.8
LOS by Move:	C	C	C	C	C	C	C	A	A	D	B	B
HCM2kAvgQ:	3	1	1	1	4	4	4	5	5	2	6	6

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #2 Leon Road & Scott Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.617
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 13.4
Optimal Cycle: 0 Level Of Service: B

Street Name:	Leon Rd						Scott Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0 1! 0	0	0	0 1! 0	0	0	0 1! 0	0	0	0 1! 0	0
Volume Module:												
Base Vol:	277	12	15	2	10	7	7	181	261	6	204	5
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	277	12	15	2	10	7	7	181	261	6	204	5
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	277	12	15	2	10	7	7	181	261	6	204	5
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	277	12	15	2	10	7	7	181	261	6	204	5
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	277	12	15	2	10	7	7	181	261	6	204	5
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.91	0.04	0.05	0.10	0.53	0.37	0.02	0.40	0.58	0.03	0.95	0.02
Final Sat.:	549	24	30	55	273	191	11	293	423	18	598	15
Capacity Analysis Module:												
Vol/Sat:	0.50	0.50	0.50	0.04	0.04	0.04	0.62	0.62	0.62	0.34	0.34	0.34
Crit Moves:			****	****				****				****
Delay/Veh:	13.7	13.7	13.7	9.0	9.0	9.0	14.7	14.7	14.7	10.9	10.9	10.9
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	13.7	13.7	13.7	9.0	9.0	9.0	14.7	14.7	14.7	10.9	10.9	10.9
LOS by Move:	B	B	B	A	A	A	B	B	B	B	B	B
ApproachDel:	13.7			9.0			14.7			10.9		
Delay Adj:	1.00			1.00			1.00			1.00		
ApprAdjDel:	13.7			9.0			14.7			10.9		
LOS by Appr:	B			A			B			B		
AllWayAvgQ:	0.8	0.8	0.8	0.0	0.0	0.0	1.4	1.4	1.4	0.4	0.4	0.4

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #3 Winchester Road/SR-79 & Scott Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.450
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 18.5
Optimal Cycle: 34 Level Of Service: B

Street Name:	Winchester Road/SR-79						Scott Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	0	0 1!	0 0	0	0 0	1 0
Volume Module:												
Base Vol:	75	891	3	123	553	80	81	60	67	0	59	171
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	75	891	3	123	553	80	81	60	67	0	59	171
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	75	891	3	123	553	80	81	60	67	0	59	171
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	75	891	3	123	553	80	81	60	67	0	59	171
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	75	891	3	123	553	80	81	60	67	0	59	171
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.95	0.95	0.93	0.93	0.84	0.84	0.84	1.00	0.90	0.90
Lanes:	1.00	1.99	0.01	1.00	1.75	0.25	0.39	0.29	0.32	0.00	0.26	0.74
Final Sat.:	1805	3598	12	1805	3094	448	622	461	514	0	439	1271
Capacity Analysis Module:												
Vol/Sat:	0.04	0.25	0.25	0.07	0.18	0.18	0.13	0.13	0.13	0.00	0.13	0.13
Crit Moves:		****		****							****	
Green/Cycle:	0.13	0.55	0.55	0.15	0.57	0.57	0.30	0.30	0.30	0.00	0.30	0.30
Volume/Cap:	0.31	0.45	0.45	0.45	0.31	0.31	0.44	0.44	0.44	0.00	0.45	0.45
Delay/Veh:	40.0	13.6	13.6	39.8	11.4	11.4	28.9	28.9	28.9	0.0	29.0	29.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	40.0	13.6	13.6	39.8	11.4	11.4	28.9	28.9	28.9	0.0	29.0	29.0
LOS by Move:	D	B	B	D	B	B	C	C	C	A	C	C
HCM2kAvgQ:	2	9	9	4	5	5	5	5	5	0	6	6

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #4 Antelope Road & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.688
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 13.5
Optimal Cycle: 0 Level Of Service: B

Street Name:	Antelope Road						Keller Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0 1!	0 0	0	0 1!	0 0	0	0 1!	0 0	0	0 1!	0 0
Volume Module:												
Base Vol:	14	315	271	19	93	7	10	5	7	72	2	19
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	14	315	271	19	93	7	10	5	7	72	2	19
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	14	315	271	19	93	7	10	5	7	72	2	19
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	14	315	271	19	93	7	10	5	7	72	2	19
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	14	315	271	19	93	7	10	5	7	72	2	19
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.02	0.53	0.45	0.16	0.78	0.06	0.45	0.23	0.32	0.78	0.02	0.20
Final Sat.:	20	458	394	115	563	42	265	132	185	462	13	122
Capacity Analysis Module:												
Vol/Sat:	0.69	0.69	0.69	0.17	0.17	0.17	0.04	0.04	0.04	0.16	0.16	0.16
Crit Moves:		****			****			****			****	
Delay/Veh:	15.3	15.3	15.3	8.7	8.7	8.7	8.6	8.6	8.6	9.3	9.3	9.3
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	15.3	15.3	15.3	8.7	8.7	8.7	8.6	8.6	8.6	9.3	9.3	9.3
LOS by Move:	C	C	C	A	A	A	A	A	A	A	A	A
ApproachDel:		15.3			8.7			8.6			9.3	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		15.3			8.7			8.6			9.3	
LOS by Appr:		C			A			A			A	
AllWayAvgQ:	2.0	2.0	2.0	0.2	0.2	0.2	0.0	0.0	0.0	0.1	0.1	0.1

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #5 Menifee Road - Meadowlark Road & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.172
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 8.2
Optimal Cycle: 0 Level Of Service: A

Street Name:	Menifee Road - Meadowlark Road						Keller Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	- T	- R	L	- T	- R	L	- T	- R	L	- T	- R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0 0	0 0	1	0 0	0 1	1	0 1	0 0	1	0 1	0 1
Volume Module:												
Base Vol:	0	0	0	12	0	48	119	32	0	0	20	10
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	12	0	48	119	32	0	0	20	10
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	12	0	48	119	32	0	0	20	10
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	12	0	48	119	32	0	0	20	10
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	12	0	48	119	32	0	0	20	10
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Final Sat.:	0	0	0	645	0	820	691	764	0	649	714	827
Capacity Analysis Module:												
Vol/Sat:	xxxx	xxxx	xxxx	0.02	xxxx	0.06	0.17	0.04	xxxx	0.00	0.03	0.01
Crit Moves:						****	****				****	
Delay/Veh:	0.0	0.0	0.0	8.2	0.0	7.2	8.9	7.6	0.0	0.0	7.8	7.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	8.2	0.0	7.2	8.9	7.6	0.0	0.0	7.8	7.0
LOS by Move:	*	*	*	A	*	A	A	A	*	*	A	A
ApproachDel:	xxxxxx			7.4			8.6			7.5		
Delay Adj:	xxxxx			1.00			1.00			1.00		
ApprAdjDel:	xxxxxx			7.4			8.6			7.5		
LOS by Appr:	*			A			A			A		
AllWayAvgQ:	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #7 Leon Road & Keller Road

Average Delay (sec/veh): 0.3 Worst Case Level Of Service: B[11.6]

Street Name:	Leon Road						Keller Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	- T	- R	L	- T	- R	L	- T	- R	L	- T	- R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0	0 1! 0	0	0	1 0	0 0	0	0 0	0 1	0	0 1! 0	0
Volume Module:												
Base Vol:	1	258	4	7	240	0	0	0	1	5	0	3
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	1	258	4	7	240	0	0	0	1	5	0	3
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	1	258	4	7	240	0	0	0	1	5	0	3
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	1	258	4	7	240	0	0	0	1	5	0	3
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx	xxxxx	xxxx	6.2	7.1	6.5	6.2
FollowUpTim:	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx	xxxxx	xxxx	3.3	3.5	4.0	3.3
Capacity Module:												
Cnflict Vol:	240	xxxx	xxxxx	262	xxxx	xxxxx	xxxx	xxxx	240	517	516	260
Potent Cap.:	1339	xxxx	xxxxx	1314	xxxx	xxxxx	xxxx	xxxx	804	472	466	784
Move Cap.:	1339	xxxx	xxxxx	1314	xxxx	xxxxx	xxxx	xxxx	804	470	463	784
Volume/Cap:	0.00	xxxx	xxxx	0.01	xxxx	xxxx	xxxx	xxxx	0.00	0.01	0.00	0.00
Level Of Service Module:												
2Way95thQ:	0.0	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxx	xxxx	0.0	xxxx	xxxx	xxxxx
Control Del:	7.7	xxxx	xxxxx	7.8	xxxx	xxxxx	xxxxx	xxxx	9.5	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	A	*	*	*	*	A	*	*	*
Movement:	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT	LT -	LTR -	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	553	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.0	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	7.8	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	11.6	xxxxx
Shared LOS:	*	*	*	A	*	*	*	*	*	*	B	*
ApproachDel:	xxxxxx			xxxxxx			9.5			11.6		
ApproachLOS:	*			*			A			B		

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #8 Winchester Road - SR-79 & Keller Road

Average Delay (sec/veh): 0.1 Worst Case Level Of Service: C[23.0]

Street Name:	Winchester Road - SR-79						Keller Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 1! 0	0		0 0 0 1	0		0 0 0 0	1		0 0 1! 0	0	
Volume Module:												
Base Vol:	1	913	3	0	624	2	0	0	1	1	0	3
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	1	913	3	0	624	2	0	0	1	1	0	3
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	1	913	3	0	624	2	0	0	1	1	0	3
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	1	913	3	0	624	2	0	0	1	1	0	3
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	6.2	7.1	6.5	6.2
FollowUpTim:	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	3.3	3.5	4.0	3.3
Capacity Module:												
Cnflict Vol:	626	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	625	1542	1543	915
Potent Cap.:	965	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	488	95	116	334
Move Cap.:	965	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	488	95	116	334
Volume/Cap:	0.00	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.00	0.01	0.00	0.01
Level Of Service Module:												
2Way95thQ:	0.0	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	0.0	xxxx	xxxx	xxxxx
Control Del:	8.7	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	12.4	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	*	*	*	*	*	B	*	*	*
Movement:	LT - LTR - RT			LT - LTR - RT			LT - LTR - RT			LT - LTR - RT		
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	204	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.1	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	23.0	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	C	*
ApproachDel:	xxxxxx			xxxxxx			12.4			23.0		
ApproachLOS:	*			*			B			C		

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #12 Leon Road & Jean Nicholas

Average Delay (sec/veh): 1.1 Worst Case Level Of Service: B[10.2]

Street Name:	Leon Road						Jean Nicholas					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 1 0	1		1 0 1 0	0		0 0 0 0	0		0 0 1! 0	0	
Volume Module:												
Base Vol:	0	229	19	24	224	0	0	0	0	8	0	34
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	229	19	24	224	0	0	0	0	8	0	34
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	229	19	24	224	0	0	0	0	8	0	34
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	229	19	24	224	0	0	0	0	8	0	34
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.4	6.5	6.2
FollowUpTim:	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.5	4.0	3.3
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	248	xxxx	xxxxx	xxxx	xxxx	xxxxx	501	501	229
Potent Cap.:	xxxx	xxxx	xxxxx	1330	xxxx	xxxxx	xxxx	xxxx	xxxxx	533	475	815
Move Cap.:	xxxx	xxxx	xxxxx	1330	xxxx	xxxxx	xxxx	xxxx	xxxxx	526	466	815
Volume/Cap:	xxxx	xxxx	xxxx	0.02	xxxx	xxxx	xxxx	xxxx	xxxx	0.02	0.00	0.04
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	0.1	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	7.8	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	A	*	*	*	*	*	*	*	*
Movement:	LT - LTR - RT			LT - LTR - RT			LT - LTR - RT			LT - LTR - RT		
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	738	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.2	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	10.2	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	B	*
ApproachDel:	xxxxxx			xxxxxx			xxxxxx			10.2		
ApproachLOS:	*			*			*			B		

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #13 Winchester Road - SR-79 & Nicholas - Skyview

Cycle (sec): 100 Critical Vol./Cap.(X): 0.325
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 5.1
Optimal Cycle: 34 Level Of Service: A

Street Name:	Winchester Road - SR-79						Nicholas - Skyview					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	0 1	1	0 1	1 1	0	1 0	1 1	0	1 0	1 0 1
Volume Module:												
Base Vol:	78	1120	2	2	632	18	25	0	22	1	0	3
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	78	1120	2	2	632	18	25	0	22	1	0	3
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	78	1120	2	2	632	18	25	0	22	1	0	3
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	78	1120	2	2	632	18	25	0	22	1	0	3
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	78	1120	2	2	632	18	25	0	22	1	0	3
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.85	0.95	0.95	0.95	0.95	0.95	0.81	0.95	1.00	0.85
Lanes:	1.00	2.00	1.00	1.00	1.94	0.06	1.00	1.00	1.00	1.00	1.00	1.00
Final Sat.:	1805	3610	1615	1805	3496	100	1805	1805	1534	1805	1900	1615
Capacity Analysis Module:												
Vol/Sat:	0.04	0.31	0.00	0.00	0.18	0.18	0.01	0.00	0.01	0.00	0.00	0.00
Crit Moves:		****		****			****				****	
Green/Cycle:	0.18	0.95	0.95	0.00	0.77	0.77	0.04	0.00	0.04	0.00	0.00	0.00
Volume/Cap:	0.23	0.33	0.00	0.33	0.23	0.23	0.33	0.00	0.35	0.35	0.00	1.17
Delay/Veh:	35.1	0.2	0.1	78.1	3.2	3.2	48.9	0.0	50.0	111.4	0.0	699.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	35.1	0.2	0.1	78.1	3.2	3.2	48.9	0.0	50.0	111.4	0.0	699.2
LOS by Move:	D	A	A	E	A	A	D	A	D	F	A	F
HCM2kAvgQ:	2	2	0	0	3	3	1	0	1	0	0	1

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #16 Leon Road & Max Gillis Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.293
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 25.4
Optimal Cycle: 32 Level Of Service: C

Street Name:	Leon Road									Max Gillis Road					
Approach:	North Bound			South Bound			East Bound			West Bound					
Movement:	L - T - R			L - T - R			L - T - R			L - T - R					
Control:	Protected			Protected			Protected			Protected					
Rights:	Include			Include			Include			Include					
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0			
Lanes:	2	0 2	0 1	2	0 1	1 1	0	2 0	1 1	0	2 0	1 1	0		
Volume Module:															
Base Vol:	84	62	168	197	22	39	18	70	25	98	216	212			
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Initial Bse:	84	62	168	197	22	39	18	70	25	98	216	212			
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
PHF Volume:	84	62	168	197	22	39	18	70	25	98	216	212			
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0			
Reduced Vol:	84	62	168	197	22	39	18	70	25	98	216	212			
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
FinalVolume:	84	62	168	197	22	39	18	70	25	98	216	212			
Saturation Flow Module:															
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900			
Adjustment:	0.92	0.95	0.85	0.92	0.86	0.86	0.92	0.91	0.91	0.92	0.88	0.88			
Lanes:	2.00	2.00	1.00	2.00	1.00	1.00	2.00	1.47	0.53	2.00	1.01	0.99			
Final Sat.:	3502	3610	1615	3502	1632	1632	3502	2556	913	3502	1687	1656			
Capacity Analysis Module:															
Vol/Sat:	0.02	0.02	0.10	0.06	0.01	0.02	0.01	0.03	0.03	0.03	0.13	0.13			
Crit Moves:			****	****			****				****				
Green/Cycle:	0.27	0.35	0.35	0.19	0.27	0.27	0.02	0.22	0.22	0.23	0.44	0.44			
Volume/Cap:	0.09	0.05	0.29	0.29	0.05	0.09	0.29	0.12	0.12	0.12	0.29	0.29			
Delay/Veh:	27.1	21.2	23.5	34.9	26.8	27.2	51.2	31.0	31.0	30.6	18.3	18.3			
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
AdjDel/Veh:	27.1	21.2	23.5	34.9	26.8	27.2	51.2	31.0	31.0	30.6	18.3	18.3			
LOS by Move:	C	C	C	C	C	C	D	C	C	C	B	B			
HCM2kAvgQ:	1	1	4	3	1	1	1	1	1	1	4	4			

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #17 Winchester Road - SR-79 & Max Gillis - Thompson

Cycle (sec): 100 Critical Vol./Cap.(X): 0.681
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 25.6
Optimal Cycle: 71 Level Of Service: C

Street Name:	Winchester Road - SR-79						Max Gillis - Thompson					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 2	0 1	1	0 1	0 1	1	0 1	0 1
Volume Module:												
Base Vol:	409	1197	251	25	636	32	44	115	294	132	103	10
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	409	1197	251	25	636	32	44	115	294	132	103	10
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	409	1197	251	25	636	32	44	115	294	132	103	10
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	409	1197	251	25	636	32	44	115	294	132	103	10
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	409	1197	251	25	636	32	44	115	294	132	103	10
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.93	0.93	0.95	0.95	0.85	0.95	1.00	0.85	0.95	1.00	0.85
Lanes:	1.00	1.65	0.35	1.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Sat.:	1805	2907	609	1805	3610	1615	1805	1900	1615	1805	1900	1615
Capacity Analysis Module:												
Vol/Sat:	0.23	0.41	0.41	0.01	0.18	0.02	0.02	0.06	0.18	0.07	0.05	0.01
Crit Moves:		****		****					****	****		
Green/Cycle:	0.35	0.60	0.60	0.02	0.27	0.27	0.12	0.27	0.27	0.11	0.26	0.26
Volume/Cap:	0.64	0.68	0.68	0.68	0.64	0.07	0.21	0.23	0.68	0.68	0.21	0.02
Delay/Veh:	29.5	14.2	14.2	90.0	33.5	27.0	40.5	28.8	37.2	52.4	29.3	27.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	29.5	14.2	14.2	90.0	33.5	27.0	40.5	28.8	37.2	52.4	29.3	27.7
LOS by Move:	C	B	B	F	C	C	D	C	D	D	C	C
HCM2kAvgQ:	11	16	16	2	10	1	1	3	9	5	3	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #18 California Oaks Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.580
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 22.4
Optimal Cycle: 44 Level Of Service: C

Street Name:	California Oaks Road						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1!	0 1	0	0 0	0 0	0	0 1	1 0	1	0 2	0 0
Volume Module:												
Base Vol:	162	0	554	0	0	0	0	602	89	312	608	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	162	0	554	0	0	0	0	602	89	312	608	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	162	0	554	0	0	0	0	602	89	312	608	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	162	0	554	0	0	0	0	602	89	312	608	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	162	0	554	0	0	0	0	602	89	312	608	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.78	1.00	0.78	1.00	1.00	1.00	1.00	0.93	0.93	0.95	0.95	1.00
Lanes:	1.23	0.00	1.77	0.00	0.00	0.00	0.00	1.74	0.26	1.00	2.00	0.00
Final Sat.:	1810	0	2619	0	0	0	0	3085	456	1805	3610	0
Capacity Analysis Module:												
Vol/Sat:	0.09	0.00	0.21	0.00	0.00	0.00	0.00	0.20	0.20	0.17	0.17	0.00
Crit Moves:			****							****		
Green/Cycle:	0.37	0.00	0.37	0.00	0.00	0.00	0.00	0.34	0.34	0.30	0.63	0.00
Volume/Cap:	0.25	0.00	0.58	0.00	0.00	0.00	0.00	0.58	0.58	0.58	0.27	0.00
Delay/Veh:	22.2	0.0	26.3	0.0	0.0	0.0	0.0	28.1	28.1	31.4	8.1	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	22.2	0.0	26.3	0.0	0.0	0.0	0.0	28.1	28.1	31.4	8.1	0.0
LOS by Move:	C	A	C	A	A	A	A	C	C	C	A	A
HCM2kAvgQ:	3	0	8	0	0	0	0	10	10	9	4	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #19 I-215 SB Off-Ramp & Clinton Keith Road

Cycle (sec):	100	Critical Vol./Cap.(X):	0.807
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	26.1
Optimal Cycle:	96	Level Of Service:	C

Street Name:	I-215 SB Off-Ramp						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	1	0	0	1	0	1	1	0	1
Volume Module:												
Base Vol:	0	0	0	46	2	629	0	710	403	77	405	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	46	2	629	0	710	403	77	405	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	46	2	629	0	710	403	77	405	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	46	2	629	0	710	403	77	405	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	46	2	629	0	710	403	77	405	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.85	0.85	0.85	1.00	1.00	0.85	0.95	1.00	1.00
Lanes:	0.00	0.00	0.00	1.00	0.01	0.99	0.00	1.00	1.00	1.00	1.00	0.00
Final Sat.:	0	0	0	1615	5	1610	0	1900	1615	1805	1900	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.03	0.39	0.39	0.00	0.37	0.25	0.04	0.21	0.00
Crit Moves:					****			****		****		
Green/Cycle:	0.00	0.00	0.00	0.48	0.48	0.48	0.00	0.46	0.46	0.05	0.52	0.00
Volume/Cap:	0.00	0.00	0.00	0.06	0.81	0.81	0.00	0.81	0.54	0.81	0.41	0.00
Delay/Veh:	0.0	0.0	0.0	13.7	28.1	28.1	0.0	28.6	20.0	84.8	15.2	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	13.7	28.1	28.1	0.0	28.6	20.0	84.8	15.2	0.0
LOS by Move:	A	A	A	B	C	C	A	C	C	F	B	A
HCM2kAvgQ:	0	0	0	1	18	18	0	20	9	4	8	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #20 I-215 NB Off Ramp & Clinton Keith Road

Cycle (sec):	100	Critical Vol./Cap.(X):	0.565
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	23.1
Optimal Cycle:	43	Level Of Service:	C

Street Name:	I-215 NB Off Ramp						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	1!	0	1	0	0	0	0	1	0	1
Volume Module:												
Base Vol:	241	1	88	0	0	0	455	274	0	0	261	81
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	241	1	88	0	0	0	455	274	0	0	261	81
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	241	1	88	0	0	0	455	274	0	0	261	81
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	241	1	88	0	0	0	455	274	0	0	261	81
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	241	1	88	0	0	0	455	274	0	0	261	81
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.86	0.86	0.86	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.85
Lanes:	0.84	0.01	1.15	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Final Sat.:	1369	6	1875	0	0	0	1805	1900	0	0	1900	1615
Capacity Analysis Module:												
Vol/Sat:	0.18	0.18	0.05	0.00	0.00	0.00	0.25	0.14	0.00	0.00	0.14	0.05
Crit Moves:		****					****				****	
Green/Cycle:	0.31	0.31	0.31	0.00	0.00	0.00	0.45	0.69	0.00	0.00	0.24	0.24
Volume/Cap:	0.57	0.57	0.15	0.00	0.00	0.00	0.57	0.21	0.00	0.00	0.57	0.21
Delay/Veh:	30.1	30.1	24.9	0.0	0.0	0.0	21.5	5.7	0.0	0.0	34.9	30.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	30.1	30.1	24.9	0.0	0.0	0.0	21.5	5.7	0.0	0.0	34.9	30.4
LOS by Move:	C	C	C	A	A	A	C	A	A	A	C	C
HCM2kAvgQ:	8	8	2	0	0	0	11	3	0	0	8	2

Note: Queue reported is the number of cars per lane.

City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #22 Meadowlark Lane - Whitewood Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.608
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 13.4
Optimal Cycle: 0 Level Of Service: B

Street Name:	Meadowlark Lane - Whitewood Road						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	0 1	0	1	0 1	0	1	0 0 1	0	0	1 0 0
Volume Module:												
Base Vol:	248	380	3	0	78	62	161	3	152	0	1	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	248	380	3	0	78	62	161	3	152	0	1	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	248	380	3	0	78	62	161	3	152	0	1	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	248	380	3	0	78	62	161	3	152	0	1	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	248	380	3	0	78	62	161	3	152	0	1	0
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	0.99	0.01	1.00	1.00	1.00	0.98	0.02	1.00	0.00	1.00	0.00
Final Sat.:	577	625	5	472	507	562	493	9	602	0	490	0
Capacity Analysis Module:												
Vol/Sat:	0.43	0.61	0.61	0.00	0.15	0.11	0.33	0.33	0.25	xxxx	0.00	xxxx
Crit Moves:		****			****		****				****	
Delay/Veh:	13.2	16.4	16.4	0.0	10.7	9.5	12.7	12.7	10.2	0.0	9.8	0.0
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	13.2	16.4	16.4	0.0	10.7	9.5	12.7	12.7	10.2	0.0	9.8	0.0
LOS by Move:	B	C	C	*	B	A	B	B	B	*	A	*
ApproachDel:		15.1			10.2			11.5			9.8	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		15.1			10.2			11.5			9.8	
LOS by Appr:		C			B			B			A	
AllWayAvgQ:	0.7	1.4	1.4	0.0	0.2	0.1	0.4	0.4	0.3	0.0	0.0	0.0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #25 Winchester Road - SR-79 & Benton Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.777
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 21.2
Optimal Cycle: 102 Level Of Service: C

Street Name:	Winchester Road - SR-79						Benton Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	2 0 1	1	0	2 0 0	0	0	0 0 0	2	0	0 0 1
Volume Module:												
Base Vol:	0	1497	526	255	865	0	0	0	0	280	0	357
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1497	526	255	865	0	0	0	0	280	0	357
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	1497	526	255	865	0	0	0	0	280	0	357
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1497	526	255	865	0	0	0	0	280	0	357
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	1497	526	255	865	0	0	0	0	280	0	357
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.95	0.85	0.95	0.95	1.00	1.00	1.00	1.00	0.92	1.00	0.85
Lanes:	0.00	2.00	1.00	1.00	2.00	0.00	0.00	0.00	0.00	2.00	0.00	1.00
Final Sat.:	0	3610	1615	1805	3610	0	0	0	0	3502	0	1615
Capacity Analysis Module:												
Vol/Sat:	0.00	0.41	0.33	0.14	0.24	0.00	0.00	0.00	0.00	0.08	0.00	0.22
Crit Moves:		****		****								****
Green/Cycle:	0.00	0.53	0.53	0.18	0.72	0.00	0.00	0.00	0.00	0.28	0.00	0.28
Volume/Cap:	0.00	0.78	0.61	0.78	0.33	0.00	0.00	0.00	0.00	0.28	0.00	0.78
Delay/Veh:	0.0	20.6	17.4	50.1	5.4	0.0	0.0	0.0	0.0	28.0	0.0	41.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	20.6	17.4	50.1	5.4	0.0	0.0	0.0	0.0	28.0	0.0	41.0
LOS by Move:	A	C	B	D	A	A	A	A	A	C	A	D
HCM2kAvgQ:	0	21	12	9	5	0	0	0	0	4	0	12

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #26 Winchester Road - SR-79 & Via Mira Mosa

Cycle (sec):	100	Critical Vol./Cap.(X):	0.738
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	14.4
Optimal Cycle:	87	Level Of Service:	B

Street Name:	Winchester Road - SR-79						Via Mira Mosa					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	0 1	1	0 1	1 0	1	0 0	1 0	1	0 0	1 0
Volume Module:												
Base Vol:	24	1893	204	42	1069	55	58	11	27	304	16	86
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	24	1893	204	42	1069	55	58	11	27	304	16	86
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	24	1893	204	42	1069	55	58	11	27	304	16	86
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	24	1893	204	42	1069	55	58	11	27	304	16	86
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	24	1893	204	42	1069	55	58	11	27	304	16	86
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.85	0.95	0.94	0.94	0.95	0.89	0.89	0.95	0.87	0.87
Lanes:	1.00	2.00	1.00	1.00	1.90	0.10	1.00	0.29	0.71	1.00	0.16	0.84
Final Sat.:	1805	3610	1615	1805	3409	175	1805	491	1206	1805	260	1400
Capacity Analysis Module:												
Vol/Sat:	0.01	0.52	0.13	0.02	0.31	0.31	0.03	0.02	0.02	0.17	0.06	0.06
Crit Moves:		****		****				****		****		
Green/Cycle:	0.03	0.71	0.71	0.03	0.71	0.71	0.09	0.03	0.03	0.23	0.17	0.17
Volume/Cap:	0.44	0.74	0.18	0.74	0.44	0.44	0.36	0.74	0.74	0.74	0.36	0.36
Delay/Veh:	53.3	10.0	4.9	87.7	6.2	6.2	44.3	91.1	91.1	42.8	37.5	37.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	53.3	10.0	4.9	87.7	6.2	6.2	44.3	91.1	91.1	42.8	37.5	37.5
LOS by Move:	D	B	A	F	A	A	D	F	F	D	D	D
HCM2kAvgQ:	1	20	2	3	8	8	2	3	3	10	3	3

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #27 Monroe Ave & Los Alamos

Cycle (sec):	100	Critical Vol./Cap.(X):	0.313
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	12.4
Optimal Cycle:	33	Level Of Service:	B

Street Name:	Monroe Ave						Los Alamos					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0 0	0 0	2	0 0	0 1	1	0 2	0 0	0	0 2	0 1
Volume Module:												
Base Vol:	0	0	0	179	0	83	167	946	0	0	447	134
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	179	0	83	167	946	0	0	447	134
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	179	0	83	167	946	0	0	447	134
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	179	0	83	167	946	0	0	447	134
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	179	0	83	167	946	0	0	447	134
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.92	1.00	0.85	0.95	0.95	1.00	1.00	0.95	0.85
Lanes:	0.00	0.00	0.00	2.00	0.00	1.00	1.00	2.00	0.00	0.00	2.00	1.00
Final Sat.:	0	0	0	3502	0	1615	1805	3610	0	0	3610	1615
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.05	0.00	0.05	0.09	0.26	0.00	0.00	0.12	0.08
Crit Moves:				****				****		****		
Green/Cycle:	0.00	0.00	0.00	0.16	0.00	0.16	0.36	0.84	0.00	0.00	0.48	0.48
Volume/Cap:	0.00	0.00	0.00	0.31	0.00	0.31	0.26	0.31	0.00	0.00	0.26	0.17
Delay/Veh:	0.0	0.0	0.0	37.2	0.0	37.6	22.9	1.9	0.0	0.0	15.6	14.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	37.2	0.0	37.6	22.9	1.9	0.0	0.0	15.6	14.9
LOS by Move:	A	A	A	D	A	D	C	A	A	A	B	B
HCM2kAvgQ:	0	0	0	3	0	2	4	4	0	0	4	2

Note: Queue reported is the number of cars per lane.

City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #28 Jefferson Avenue & Murrieta Hot Springs Road

Cycle (sec):	100	Critical Vol./Cap.(X):	0.835
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	20.7
Optimal Cycle:	113	Level Of Service:	C

Street Name:	Jefferson Avenue						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	2	0 1	2	0 2	0 0	0 0	0	0 0	2	0 0	0 1
Volume Module:												
Base Vol:	0	965	976	275	329	0	0	0	0	289	0	246
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	965	976	275	329	0	0	0	0	289	0	246
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	965	976	275	329	0	0	0	0	289	0	246
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	965	976	275	329	0	0	0	0	289	0	246
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	965	976	275	329	0	0	0	0	289	0	246
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.95	0.85	0.92	0.95	1.00	1.00	1.00	1.00	0.61	1.00	0.85
Lanes:	0.00	2.00	1.00	2.00	2.00	0.00	0.00	0.00	0.00	2.00	0.00	1.00
Final Sat.:	0	3610	1615	3502	3610	0	0	0	0	2330	0	1615
Capacity Analysis Module:												
Vol/Sat:	0.00	0.27	0.60	0.08	0.09	0.00	0.00	0.00	0.00	0.12	0.00	0.15
Crit Moves:			****	****								****
Green/Cycle:	0.00	0.72	0.72	0.09	0.82	0.00	0.00	0.00	0.00	0.18	0.00	0.18
Volume/Cap:	0.00	0.37	0.84	0.84	0.11	0.00	0.00	0.00	0.00	0.68	0.00	0.84
Delay/Veh:	0.0	5.3	15.0	61.2	1.8	0.0	0.0	0.0	0.0	42.6	0.0	57.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	5.3	15.0	61.2	1.8	0.0	0.0	0.0	0.0	42.6	0.0	57.7
LOS by Move:	A	A	B	E	A	A	A	A	A	D	A	E
HCM2kAvgQ:	0	6	23	7	1	0	0	0	0	6	0	10

Note: Queue reported is the number of cars per lane.

City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #29 Madison Avenue & Murrieta Hot Springs Road

Cycle (sec):	100	Critical Vol./Cap.(X):	0.741
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	34.2
Optimal Cycle:	88	Level Of Service:	C

Street Name:	Madison Avenue						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2 0	2	0 1	2	0 1	1 0	2	0	3 1	0 2	0	3 0 1
Volume Module:												
Base Vol:	63	286	562	459	212	67	206	868	103	419	424	162
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	63	286	562	459	212	67	206	868	103	419	424	162
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	63	286	562	459	212	67	206	868	103	419	424	162
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	63	286	562	459	212	67	206	868	103	419	424	162
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	63	286	562	459	212	67	206	868	103	419	424	162
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.95	0.85	0.92	0.92	0.92	0.92	0.90	0.90	0.92	0.91	0.85
Lanes:	2.00	2.00	1.00	2.00	1.52	0.48	2.00	3.58	0.42	2.00	3.00	1.00
Final Sat.:	3502	3610	1615	3502	2644	836	3502	6083	722	3502	5187	1615
Capacity Analysis Module:												
Vol/Sat:	0.02	0.08	0.35	0.13	0.08	0.08	0.06	0.14	0.14	0.12	0.08	0.10
Crit Moves:			****	****				****		****		
Green/Cycle:	0.12	0.47	0.47	0.18	0.53	0.53	0.13	0.19	0.19	0.16	0.22	0.22
Volume/Cap:	0.15	0.17	0.74	0.74	0.15	0.15	0.45	0.74	0.74	0.74	0.37	0.45
Delay/Veh:	39.7	15.3	25.5	43.8	12.2	12.2	40.8	40.3	40.3	45.2	33.1	34.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	39.7	15.3	25.5	43.8	12.2	12.2	40.8	40.3	40.3	45.2	33.1	34.4
LOS by Move:	D	B	C	D	B	B	D	D	D	D	C	C
HCM2kAvgQ:	1	3	15	9	2	2	4	9	9	8	4	5

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #30 I-15 SB Off-Ramp & Murrieta Hot Springs Road

Cycle (sec):	100	Critical Vol./Cap.(X):	0.657
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	18.9
Optimal Cycle:	54	Level Of Service:	B

Street Name:	I-15 SB Off-Ramp						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	1	0	1! 0	0	0	3	0	1	
Volume Module:												
Base Vol:	0	0	0	842	0	276	0	1599	366	0	1078	112
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	842	0	276	0	1599	366	0	1078	112
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	0	0	0	842	0	276	0	1599	0	0	1078	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	842	0	276	0	1599	0	0	1078	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	0	0	0	842	0	276	0	1599	0	0	1078	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.73	1.00	0.73	1.00	0.91	1.00	1.00	0.91	1.00
Lanes:	0.00	0.00	0.00	1.75	0.00	1.25	0.00	3.00	1.00	0.00	3.00	1.00
Final Sat.:	0	0	0	2415	0	1718	0	5187	1900	0	5187	1900
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.35	0.00	0.16	0.00	0.31	0.00	0.00	0.21	0.00
Crit Moves:				****				****		****		
Green/Cycle:	0.00	0.00	0.00	0.53	0.00	0.53	0.00	0.47	0.00	0.00	0.47	0.00
Volume/Cap:	0.00	0.00	0.00	0.66	0.00	0.30	0.00	0.66	0.00	0.00	0.44	0.00
Delay/Veh:	0.0	0.0	0.0	17.9	0.0	13.2	0.0	21.0	0.0	0.0	17.9	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	17.9	0.0	13.2	0.0	21.0	0.0	0.0	17.9	0.0
LOS by Move:	A	A	A	B	A	B	A	C	A	A	B	A
HCM2kAvgQ:	0	0	0	11	0	4	0	14	0	0	8	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #31 I-15 NB Off-Ramp & Murrieta Hot Springs Road

Cycle (sec):	100	Critical Vol./Cap.(X):	0.544
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	15.3
Optimal Cycle:	50	Level Of Service:	B

Street Name:	I-15 NB Off-Ramp						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	1	0	0	1	0	0	0	0	0	1	0
Volume Module:												
Base Vol:	275	0	180	0	0	0	485	1942	0	0	852	985
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	275	0	180	0	0	0	485	1942	0	0	852	985
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
PHF Volume:	275	0	180	0	0	0	485	1942	0	0	852	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	275	0	180	0	0	0	485	1942	0	0	852	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
FinalVolume:	275	0	180	0	0	0	485	1942	0	0	852	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	1.00	1.00	1.00	0.95	0.91	1.00	1.00	0.91	1.00
Lanes:	2.00	0.00	1.00	0.00	0.00	0.00	1.00	3.00	0.00	0.00	3.00	1.00
Final Sat.:	3618	0	1615	0	0	0	1805	5187	0	0	5187	1900
Capacity Analysis Module:												
Vol/Sat:	0.08	0.00	0.11	0.00	0.00	0.00	0.27	0.37	0.00	0.00	0.16	0.00
Crit Moves:			****				****				****	
Green/Cycle:	0.20	0.00	0.20	0.00	0.00	0.00	0.49	0.80	0.00	0.00	0.30	0.00
Volume/Cap:	0.37	0.00	0.54	0.00	0.00	0.00	0.54	0.47	0.00	0.00	0.54	0.00
Delay/Veh:	34.5	0.0	37.5	0.0	0.0	0.0	18.2	3.4	0.0	0.0	29.6	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	34.5	0.0	37.5	0.0	0.0	0.0	18.2	3.4	0.0	0.0	29.6	0.0
LOS by Move:	C	A	D	A	A	A	B	A	A	A	C	A
HCM2kAvgQ:	4	0	6	0	0	0	10	7	0	0	8	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #32 I-215 SB Off-Ramp & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.659
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 14.5
Optimal Cycle: 42 Level Of Service: B

Street Name:	I-215 SB Off-Ramp						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	1	0	1! 0	0	0	3	0	1	
Volume Module:												
Base Vol:	0	0	0	603	0	236	0	2103	139	0	1535	238
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	603	0	236	0	2103	139	0	1535	238
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	0	0	0	603	0	236	0	2103	0	0	1535	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	603	0	236	0	2103	0	0	1535	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	0	0	0	603	0	236	0	2103	0	0	1535	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.73	1.00	0.73	1.00	0.91	1.00	1.00	0.91	1.00
Lanes:	0.00	0.00	0.00	1.72	0.00	1.28	0.00	3.00	1.00	0.00	3.00	1.00
Final Sat.:	0	0	0	2381	0	1775	0	5187	1900	0	5187	1900
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.25	0.00	0.13	0.00	0.41	0.00	0.00	0.30	0.00
Crit Moves:				****				****				
Green/Cycle:	0.00	0.00	0.00	0.38	0.00	0.38	0.00	0.62	0.00	0.00	0.62	0.00
Volume/Cap:	0.00	0.00	0.00	0.66	0.00	0.35	0.00	0.66	0.00	0.00	0.48	0.00
Delay/Veh:	0.0	0.0	0.0	26.6	0.0	21.9	0.0	12.9	0.0	0.0	10.6	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	26.6	0.0	21.9	0.0	12.9	0.0	0.0	10.6	0.0
LOS by Move:	A	A	A	C	A	C	A	B	A	A	B	A
HCM2kAvgQ:	0	0	0	10	0	4	0	16	0	0	9	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #33 I-215 NB Off-Ramp & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.618
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 10.0
Optimal Cycle: 38 Level Of Service: A

Street Name:	I-215 NB Off-Ramp						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	0	0	2	0	0	0	0	0	0	3	0	1	0	0	3	0	1
Volume Module:												
Base Vol:	77	0	496	0	0	0	0	2300	104	0	1748	571
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	77	0	496	0	0	0	0	2300	104	0	1748	571
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	77	0	496	0	0	0	0	2300	0	0	1748	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	77	0	496	0	0	0	0	2300	0	0	1748	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	77	0	496	0	0	0	0	2300	0	0	1748	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.67	1.00	0.75	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Lanes:	2.00	0.00	2.00	0.00	0.00	0.00	0.00	3.00	1.00	0.00	3.00	1.00
Final Sat.:	2547	0	2842	0	0	0	0	5187	1900	0	5187	1900
Capacity Analysis Module:												
Vol/Sat:	0.03	0.00	0.17	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.34	0.00
Crit Moves:			****					****				
Green/Cycle:	0.28	0.00	0.28	0.00	0.00	0.00	0.00	0.72	0.00	0.00	0.72	0.00
Volume/Cap:	0.11	0.00	0.62	0.00	0.00	0.00	0.00	0.62	0.00	0.00	0.47	0.00
Delay/Veh:	26.6	0.0	32.7	0.0	0.0	0.0	0.0	7.5	0.0	0.0	6.1	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	26.6	0.0	32.7	0.0	0.0	0.0	0.0	7.5	0.0	0.0	6.1	0.0
LOS by Move:	C	A	C	A	A	A	A	A	A	A	A	A
HCM2kAvgQ:	1	0	8	0	0	0	0	13	0	0	8	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #34 Jackson Avenue & Murrieta Hot Springs Road

Cycle (sec):	100	Critical Vol./Cap.(X):	0.494
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	6.2
Optimal Cycle:	37	Level Of Service:	A

Street Name:	Jackson Avenue						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	0	0	2	0	0	0	0	0	1	0	0	3	0	1	1	0	3	0	0
Volume Module:												
Base Vol:	90	0	111	0	0	0	0	1968	43	136	1577	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	90	0	111	0	0	0	0	1968	43	136	1577	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	90	0	111	0	0	0	0	1968	43	136	1577	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	90	0	111	0	0	0	0	1968	43	136	1577	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	90	0	111	0	0	0	0	1968	43	136	1577	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.74	1.00	0.75	1.00	1.00	1.00	1.00	0.91	0.85	0.95	0.91	1.00
Lanes:	2.00	0.00	2.00	0.00	0.00	0.00	0.00	3.00	1.00	1.00	3.00	0.00
Final Sat.:	2809	0	2842	0	0	0	0	5187	1615	1805	5187	0
Capacity Analysis Module:												
Vol/Sat:	0.03	0.00	0.04	0.00	0.00	0.00	0.00	0.38	0.03	0.08	0.30	0.00
Crit Moves:			****					****		****		
Green/Cycle:	0.08	0.00	0.08	0.00	0.00	0.00	0.00	0.77	0.77	0.15	0.92	0.00
Volume/Cap:	0.41	0.00	0.49	0.00	0.00	0.00	0.00	0.49	0.03	0.49	0.33	0.00
Delay/Veh:	45.0	0.0	45.8	0.0	0.0	0.0	0.0	4.4	2.8	40.2	0.5	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	45.0	0.0	45.8	0.0	0.0	0.0	0.0	4.4	2.8	40.2	0.5	0.0
LOS by Move:	D		A	D		A	A		A	A		A
HCM2kAvgQ:	2		0	3		0	0		8	0		4	2	0

Note: Queue reported is the number of cars per lane.

City of Murrieta General Plan
Existing
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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #35 Margarita Road & Murrieta Hot Springs Road

Cycle (sec):	100	Critical Vol./Cap.(X):	0.798
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	23.7
Optimal Cycle:	113	Level Of Service:	C

Street Name:	Margarita Road						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	1	0	1	0	1	0	0	1	1	0	2	0	1	1	0	2	1	0
Volume Module:												
Base Vol:	879	20	225	20	15	26	18	1241	687	186	973	7
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	879	20	225	20	15	26	18	1241	687	186	973	7
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	879	20	225	20	15	26	18	1241	687	186	973	7
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	879	20	225	20	15	26	18	1241	687	186	973	7
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	879	20	225	20	15	26	18	1241	687	186	973	7
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.85	0.97	0.97	0.85	0.95	0.95	0.85	0.95	0.91	0.91
Lanes:	2.00	1.00	1.00	0.57	0.43	1.00	1.00	2.00	1.00	1.00	2.98	0.02
Final Sat.:	3502	1900	1615	1055	791	1615	1805	3610	1615	1805	5145	37
Capacity Analysis Module:												
Vol/Sat:	0.25	0.01	0.14	0.02	0.02	0.02	0.01	0.34	0.43	0.10	0.19	0.19
Crit Moves:	****				****				****	****		
Green/Cycle:	0.31	0.30	0.30	0.04	0.02	0.02	0.03	0.53	0.53	0.13	0.63	0.63
Volume/Cap:	0.80	0.04	0.47	0.47	0.80	0.68	0.30	0.65	0.80	0.80	0.30	0.30
Delay/Veh:	35.6	25.0	29.4	51.5	113	87.8	50.0	17.4	24.3	59.7	8.6	8.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	35.6	25.0	29.4	51.5	113	87.8	50.0	17.4	24.3	59.7	8.6	8.6
LOS by Move:	D		C	C		D	F		F	D	B	C	E	A	A
HCM2kAvgQ:	15		0	6		2	3		2	1	15	19	8	5	5

Note: Queue reported is the number of cars per lane.

City of Murrieta General Plan
Existing
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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #37 Jefferson Avenue & Guava Street

Cycle (sec): 100 Critical Vol./Cap.(X): 0.573
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 1.4
Optimal Cycle: 44 Level Of Service: A

Street Name:	Jefferson Avenue						Guava Street					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	0 1	1	0 1	1 0	1	0 0	1 0	1	0 1	0 1
Volume Module:												
Base Vol:	0	1995	75	16	560	0	0	0	0	9	0	19
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1995	75	16	560	0	0	0	0	9	0	19
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	1995	75	16	560	0	0	0	0	9	0	19
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1995	75	16	560	0	0	0	0	9	0	19
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	1995	75	16	560	0	0	0	0	9	0	19
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.95	0.85	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.85
Lanes:	1.00	2.00	1.00	1.00	2.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
Final Sat.:	1900	3610	1615	1805	3610	0	1900	1900	0	1900	1900	1615
Capacity Analysis Module:												
Vol/Sat:	0.00	0.55	0.05	0.01	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Crit Moves:		****		****								****
Green/Cycle:	0.00	0.96	0.96	0.02	0.98	0.00	0.00	0.00	0.00	0.02	0.00	0.02
Volume/Cap:	0.00	0.57	0.05	0.57	0.16	0.00	0.00	0.00	0.00	0.13	0.00	0.57
Delay/Veh:	0.0	0.4	0.1	74.7	0.0	0.0	0.0	0.0	0.0	48.9	0.0	70.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.4	0.1	74.7	0.0	0.0	0.0	0.0	0.0	48.9	0.0	70.6
LOS by Move:	A	A	A	E	A	A	A	A	A	D	A	E
HCM2kAvgQ:	0	4	0	1	0	0	0	0	0	0	0	1

Note: Queue reported is the number of cars per lane.

City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #38 Jefferson Avenue & Cherry Street

Average Delay (sec/veh): 0.7 Worst Case Level Of Service: C[15.0]

Street Name:	Jefferson Avenue						Cherry Street					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	1	0 2	0 0	0	0 1	1 0	0	0 1!	0 0	0	0 0	0 0
Volume Module:												
Base Vol:	55	1372	0	0	880	9	4	0	76	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	55	1372	0	0	880	9	4	0	76	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	55	1372	0	0	880	9	4	0	76	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	55	1372	0	0	880	9	4	0	76	0	0	0
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.8	6.5	6.9	xxxxx	xxxx	xxxxx
FollowUpTim:	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.5	4.0	3.3	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	889	xxxx	xxxxx	xxxx	xxxx	xxxxx	1681	2367	445	xxxx	xxxx	xxxxx
Potent Cap.:	771	xxxx	xxxxx	xxxx	xxxx	xxxxx	87	36	567	xxxx	xxxx	xxxxx
Move Cap.:	771	xxxx	xxxxx	xxxx	xxxx	xxxxx	83	33	567	xxxx	xxxx	xxxxx
Volume/Cap:	0.07	xxxx	xxxx	xxxx	xxxx	xxxx	0.05	0.00	0.13	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	0.2	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	10.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	B	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	438	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.7	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	15.0	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	C	*	*	*	*
ApproachDel:	xxxxxx			xxxxxx			15.0			xxxxxx		
ApproachLOS:	*			*			C			*		

Note: Queue reported is the number of cars per lane.

City of Murrieta General Plan
Existing
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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #39 Washington Ave & Calle Del Oso Oro/Nutmeg

Cycle (sec): 100 Critical Vol./Cap.(X): 0.508
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 26.8
Optimal Cycle: 46 Level Of Service: C

Street Name:	Washington Ave						Calle Del Oso Oro/Nutmeg					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	0 1	1	0 1	1 0	1	0 1	0 1	1	0 1	0 1
Volume Module:												
Base Vol:	327	319	113	64	278	35	20	121	275	124	258	89
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	327	319	113	64	278	35	20	121	275	124	258	89
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	327	319	113	64	278	35	20	121	275	124	258	89
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	327	319	113	64	278	35	20	121	275	124	258	89
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	327	319	113	64	278	35	20	121	275	124	258	89
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	0.95	0.93	0.93	0.95	1.00	0.85	0.95	1.00	0.85
Lanes:	1.00	1.00	1.00	1.00	1.78	0.22	1.00	1.00	1.00	1.00	1.00	1.00
Final Sat.:	1805	1900	1615	1805	3152	397	1805	1900	1615	1805	1900	1615
Capacity Analysis Module:												
Vol/Sat:	0.18	0.17	0.07	0.04	0.09	0.09	0.01	0.06	0.17	0.07	0.14	0.06
Crit Moves:	****				****				****	****		
Green/Cycle:	0.36	0.44	0.44	0.09	0.17	0.17	0.04	0.33	0.33	0.14	0.43	0.43
Volume/Cap:	0.51	0.38	0.16	0.38	0.51	0.51	0.31	0.19	0.51	0.51	0.31	0.13
Delay/Veh:	26.0	19.3	17.1	44.2	38.2	38.2	49.8	23.8	27.5	41.9	18.7	17.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	26.0	19.3	17.1	44.2	38.2	38.2	49.8	23.8	27.5	41.9	18.7	17.0
LOS by Move:	C	B	B	D	D	D	D	C	C	D	B	B
HCM2kAvgQ:	8	7	2	2	5	5	1	3	7	4	5	2

Note: Queue reported is the number of cars per lane.

City of Murrieta General Plan
Existing
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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #40 Clinton Keith Rd & Calle de Oso Oro/Bear Creek Dr

Cycle (sec): 100 Critical Vol./Cap.(X): 0.183
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 16.2
Optimal Cycle: 23 Level Of Service: B

Street Name:	Clinton Keith Rd						Calle de Oso Oro/Bear Creek Dr					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	0 1	1	0 1	1 0
Volume Module:												
Base Vol:	1	255	35	83	233	105	67	22	3	75	37	53
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	1	255	35	83	233	105	67	22	3	75	37	53
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	1	255	35	83	233	105	67	22	3	75	37	53
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	1	255	35	83	233	105	67	22	3	75	37	53
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	1	255	35	83	233	105	67	22	3	75	37	53
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.93	0.93	0.95	0.91	0.91	0.66	0.98	0.98	0.72	0.87	0.87
Lanes:	1.00	1.76	0.24	1.00	1.38	0.62	1.00	0.88	0.12	1.00	1.00	1.00
Final Sat.:	1805	3117	428	1805	2372	1069	1245	1642	224	1370	1646	1646
Capacity Analysis Module:												
Vol/Sat:	0.00	0.08	0.08	0.05	0.10	0.10	0.05	0.01	0.01	0.05	0.02	0.03
Crit Moves:		****		****						****		
Green/Cycle:	0.00	0.45	0.45	0.25	0.70	0.70	0.30	0.30	0.30	0.30	0.30	0.30
Volume/Cap:	0.14	0.18	0.18	0.18	0.14	0.14	0.18	0.04	0.04	0.18	0.07	0.11
Delay/Veh:	58.6	16.6	16.6	29.5	5.1	5.1	26.1	24.9	24.9	26.1	25.1	25.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	58.6	16.6	16.6	29.5	5.1	5.1	26.1	24.9	24.9	26.1	25.1	25.4
LOS by Move:	E	B	B	C	A	A	C	C	C	C	C	C
HCM2kAvgQ:	0	3	3	2	2	2	2	1	1	2	1	1

Note: Queue reported is the number of cars per lane.

City of Murrieta General Plan
Existing
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Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #41 Jefferson Ave & Nutmeg St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.480
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 12.9
Optimal Cycle: 0 Level Of Service: B

Street Name:	Jefferson Ave						Nutmeg St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	0 1	0	1	0 0 1	0	1	0 1 1	0	1	0 1 0
Volume Module:												
Base Vol:	221	84	195	14	44	9	11	179	94	125	227	29
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	221	84	195	14	44	9	11	179	94	125	227	29
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	221	84	195	14	44	9	11	179	94	125	227	29
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	221	84	195	14	44	9	11	179	94	125	227	29
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	221	84	195	14	44	9	11	179	94	125	227	29
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	0.30	0.70	1.00	0.83	0.17	1.00	1.31	0.69	1.00	1.77	0.23
Final Sat.:	500	175	406	434	390	80	443	634	350	462	883	114
Capacity Analysis Module:												
Vol/Sat:	0.44	0.48	0.48	0.03	0.11	0.11	0.02	0.28	0.27	0.27	0.26	0.25
Crit Moves:		****			****			****		****		
Delay/Veh:	14.9	13.8	13.8	10.6	10.6	10.6	10.6	12.4	11.7	12.8	11.9	11.7
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	14.9	13.8	13.8	10.6	10.6	10.6	10.6	12.4	11.7	12.8	11.9	11.7
LOS by Move:	B	B	B	B	B	B	B	B	B	B	B	B
ApproachDel:		14.3			10.6			12.1			12.2	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		14.3			10.6			12.1			12.2	
LOS by Appr:		B			B			B			B	
AllWayAvgQ:	0.7	0.8	0.8	0.0	0.1	0.1	0.0	0.4	0.3	0.3	0.3	0.3

Note: Queue reported is the number of cars per lane.

City of Murrieta General Plan
Existing
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Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #42 Jefferson Ave & Magnolia St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.841
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 21.2
Optimal Cycle: 0 Level Of Service: C

Street Name:	Jefferson Ave						Magnolia St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	1	0 0 1	0	0	1! 0 0	0	0	1! 0 0	0	0	1! 0 0
Volume Module:												
Base Vol:	96	480	9	4	264	38	67	7	33	5	7	7
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	96	480	9	4	264	38	67	7	33	5	7	7
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	96	480	9	4	264	38	67	7	33	5	7	7
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	96	480	9	4	264	38	67	7	33	5	7	7
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	96	480	9	4	264	38	67	7	33	5	7	7
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.17	0.83	1.00	0.01	0.87	0.12	0.63	0.06	0.31	0.26	0.37	0.37
Final Sat.:	114	571	805	9	603	87	351	37	173	141	197	197
Capacity Analysis Module:												
Vol/Sat:	0.84	0.84	0.01	0.44	0.44	0.44	0.19	0.19	0.19	0.04	0.04	0.04
Crit Moves:		****				****	****					****
Delay/Veh:	28.8	28.8	7.2	11.7	11.7	11.7	10.2	10.2	10.2	9.3	9.3	9.3
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	28.8	28.8	7.2	11.7	11.7	11.7	10.2	10.2	10.2	9.3	9.3	9.3
LOS by Move:	D	D	A	B	B	B	B	B	B	A	A	A
ApproachDel:		28.5			11.7			10.2			9.3	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		28.5			11.7			10.2			9.3	
LOS by Appr:		D			B			B			A	
AllWayAvgQ:	4.0	4.0	0.0	0.7	0.7	0.7	0.2	0.2	0.2	0.0	0.0	0.0

Note: Queue reported is the number of cars per lane.

City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #43 Jefferson Ave & Lemon St

Cycle (sec):	100	Critical Vol./Cap.(X):	0.353
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	6.6
Optimal Cycle:	29	Level Of Service:	A

Street Name:	Jefferson Ave						Lemon St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	0 1	1	0 1	0 1	0	0 1!	0 0	0	0 1!	0 0
Volume Module:												
Base Vol:	78	616	1	2	324	6	7	0	37	4	4	4
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	78	616	1	2	324	6	7	0	37	4	4	4
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	78	616	1	2	324	6	7	0	37	4	4	4
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	78	616	1	2	324	6	7	0	37	4	4	4
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	78	616	1	2	324	6	7	0	37	4	4	4
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	0.95	1.00	0.85	0.85	1.00	0.85	0.90	0.90	0.90
Lanes:	1.00	1.00	1.00	1.00	1.00	1.00	0.16	0.00	0.84	0.34	0.33	0.33
Final Sat.:	1805	1900	1615	1805	1900	1615	257	0	1359	572	572	572
Capacity Analysis Module:												
Vol/Sat:	0.04	0.32	0.00	0.00	0.17	0.00	0.03	0.00	0.03	0.01	0.01	0.01
Crit Moves:		****		****			****					
Green/Cycle:	0.19	0.92	0.92	0.00	0.74	0.74	0.08	0.00	0.08	0.08	0.08	0.08
Volume/Cap:	0.23	0.35	0.00	0.35	0.23	0.01	0.35	0.00	0.35	0.09	0.09	0.09
Delay/Veh:	34.9	0.6	0.3	83.8	4.3	3.5	45.5	0.0	45.5	43.2	43.2	43.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	34.9	0.6	0.3	83.8	4.3	3.5	45.5	0.0	45.5	43.2	43.2	43.2
LOS by Move:	C	A	A	F	A	A	D	A	D	D	D	D
HCM2kAvgQ:	2	3	0	0	3	0	2	0	2	0	0	0

Note: Queue reported is the number of cars per lane.

City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #44 Jefferson Ave & Kalmia St

Cycle (sec):	100	Critical Vol./Cap.(X):	0.517
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	26.7
Optimal Cycle:	47	Level Of Service:	C

Street Name:	Jefferson Ave						Kalmia St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	0 1	1	0 1	1 0	1	0 2	0 1	1	0 1	0 1
Volume Module:												
Base Vol:	191	326	233	168	186	11	20	515	198	128	458	298
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	191	326	233	168	186	11	20	515	198	128	458	298
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	191	326	233	168	186	11	20	515	198	128	458	298
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	191	326	233	168	186	11	20	515	198	128	458	298
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	191	326	233	168	186	11	20	515	198	128	458	298
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	0.95	0.94	0.94	0.95	0.95	0.85	0.95	1.00	0.85
Lanes:	1.00	1.00	1.00	1.00	1.89	0.11	1.00	2.00	1.00	1.00	1.00	1.00
Final Sat.:	1805	1900	1615	1805	3381	200	1805	3610	1615	1805	1900	1615
Capacity Analysis Module:												
Vol/Sat:	0.11	0.17	0.14	0.09	0.06	0.06	0.01	0.14	0.12	0.07	0.24	0.18
Crit Moves:		****		****			****				****	
Green/Cycle:	0.34	0.33	0.33	0.18	0.18	0.18	0.02	0.33	0.33	0.16	0.47	0.47
Volume/Cap:	0.31	0.52	0.43	0.52	0.31	0.31	0.52	0.44	0.38	0.44	0.52	0.40
Delay/Veh:	24.9	27.7	26.6	38.5	36.3	36.3	60.1	26.8	26.3	38.8	19.3	17.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	24.9	27.7	26.6	38.5	36.3	36.3	60.1	26.8	26.3	38.8	19.3	17.8
LOS by Move:	C	C	C	D	D	D	E	C	C	D	B	B
HCM2kAvgQ:	4	8	6	5	3	3	1	7	5	4	10	6

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #45 Jefferson Ave & Juniper St

Cycle (sec):	100	Critical Vol./Cap.(X):	0.285
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	13.8
Optimal Cycle:	32	Level Of Service:	B

Street Name:	Jefferson Ave						Juniper St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	0 1	1	0 2	0 1	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	61	738	74	47	392	28	48	53	55	10	47	45
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	61	738	74	47	392	28	48	53	55	10	47	45
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	61	738	74	47	392	28	48	53	55	10	47	45
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	61	738	74	47	392	28	48	53	55	10	47	45
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	61	738	74	47	392	28	48	53	55	10	47	45
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.85	0.95	0.95	0.85	0.95	0.88	0.88	0.95	0.88	0.88
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	1.00	1.00	1.00	1.02	0.98
Final Sat.:	1805	3610	1615	1805	3610	1615	1805	1668	1668	1805	1710	1637
Capacity Analysis Module:												
Vol/Sat:	0.03	0.20	0.05	0.03	0.11	0.02	0.03	0.03	0.03	0.01	0.03	0.03
Crit Moves:		****		****			****				****	
Green/Cycle:	0.19	0.72	0.72	0.09	0.62	0.62	0.09	0.16	0.16	0.03	0.10	0.10
Volume/Cap:	0.18	0.28	0.06	0.28	0.18	0.03	0.28	0.20	0.20	0.20	0.28	0.28
Delay/Veh:	34.0	5.0	4.2	43.3	8.2	7.4	43.1	36.4	36.4	49.6	42.4	42.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	34.0	5.0	4.2	43.3	8.2	7.4	43.1	36.4	36.4	49.6	42.4	42.4
LOS by Move:	C	A	A	D	A	A	D	D	D	D	D	D
HCM2kAvgQ:	2	4	1	2	3	0	2	2	2	1	2	2

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #46 Jefferson Ave & Ivy St/Los Alamos Rd

Cycle (sec):	100	Critical Vol./Cap.(X):	0.494
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	25.2
Optimal Cycle:	45	Level Of Service:	C

Street Name:	Jefferson Ave						Ivy St/Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	0 1	1	0 2	0 1	1	0 1	1 0	1	0 1	0 1
Volume Module:												
Base Vol:	180	627	402	148	297	36	44	245	129	98	161	132
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	180	627	402	148	297	36	44	245	129	98	161	132
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	180	627	402	148	297	36	44	245	129	98	161	132
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	180	627	402	148	297	36	44	245	129	98	161	132
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	180	627	402	148	297	36	44	245	129	98	161	132
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.85	0.95	0.95	0.85	0.95	0.90	0.90	0.95	1.00	0.85
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	1.31	0.69	1.00	1.00	1.00
Final Sat.:	1805	3610	1615	1805	3610	1615	1805	2242	1180	1805	1900	1615
Capacity Analysis Module:												
Vol/Sat:	0.10	0.17	0.25	0.08	0.08	0.02	0.02	0.11	0.11	0.05	0.08	0.08
Crit Moves:				****	****					****		
Green/Cycle:	0.37	0.50	0.50	0.17	0.30	0.30	0.07	0.22	0.22	0.11	0.26	0.26
Volume/Cap:	0.27	0.35	0.49	0.49	0.27	0.07	0.33	0.49	0.49	0.49	0.33	0.32
Delay/Veh:	22.5	15.0	16.9	39.2	26.6	24.9	45.4	34.6	34.6	43.8	30.6	30.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	22.5	15.0	16.9	39.2	26.6	24.9	45.4	34.6	34.6	43.8	30.6	30.5
LOS by Move:	C	B	B	D	C	C	D	C	C	D	C	C
HCM2kAvgQ:	4	6	8	5	4	1	2	6	6	3	4	3

Note: Queue reported is the number of cars per lane.

City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #47 Madison Ave & Kalmia St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.491
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 20.3
Optimal Cycle: 45 Level Of Service: C

Street Name:	Madison Ave						Kalmia St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	1! 0	1	0	0	0	0	3	0	1	2	0	2	0	0
Volume Module:												
Base Vol:	190	0	537	0	0	0	0	1020	172	383	952	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	190	0	537	0	0	0	0	1020	172	383	952	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	190	0	537	0	0	0	0	1020	172	383	952	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	190	0	537	0	0	0	0	1020	172	383	952	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	190	0	537	0	0	0	0	1020	172	383	952	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.88	1.00	0.88	1.00	1.00	1.00	1.00	0.91	0.85	0.92	0.95	1.00
Lanes:	1.26	0.00	1.74	0.00	0.00	0.00	0.00	3.00	1.00	2.00	2.00	0.00
Final Sat.:	2103	0	2899	0	0	0	0	5187	1615	3502	3610	0
Capacity Analysis Module:												
Vol/Sat:	0.09	0.00	0.19	0.00	0.00	0.00	0.00	0.20	0.11	0.11	0.26	0.00
Crit Moves:			****					****		****		
Green/Cycle:	0.38	0.00	0.38	0.00	0.00	0.00	0.00	0.40	0.40	0.22	0.62	0.00
Volume/Cap:	0.24	0.00	0.49	0.00	0.00	0.00	0.00	0.49	0.27	0.49	0.42	0.00
Delay/Veh:	21.4	0.0	24.1	0.0	0.0	0.0	0.0	22.6	20.3	34.4	9.8	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	21.4	0.0	24.1	0.0	0.0	0.0	0.0	22.6	20.3	34.4	9.8	0.0
LOS by Move:	C	A	C	A	A	A	A	C	C	C	A	A
HCM2kAvgQ:	3	0	8	0	0	0	0	9	4	6	8	0

Note: Queue reported is the number of cars per lane.

City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #48 Madison Ave/I-15 SB Ramps & Kalmia St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.639
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 21.0
Optimal Cycle: 63 Level Of Service: C

Street Name:	Madison Ave/I-15 SB Ramps						Kalmia St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	1	0	0	1	0	0	2	0	1	2	0	2	0	0
Volume Module:												
Base Vol:	0	0	0	359	2	361	0	1109	408	385	987	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	359	2	361	0	1109	408	385	987	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	359	2	361	0	1109	408	385	987	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	359	2	361	0	1109	408	385	987	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	359	2	361	0	1109	408	385	987	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.85	0.85	0.85	1.00	0.95	0.85	0.92	0.95	1.00
Lanes:	0.00	0.00	0.00	1.00	0.01	0.99	0.00	2.00	1.00	2.00	2.00	0.00
Final Sat.:	0	0	0	1615	9	1608	0	3610	1615	3502	3610	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.22	0.22	0.22	0.00	0.31	0.25	0.11	0.27	0.00
Crit Moves:				****				****		****		
Green/Cycle:	0.00	0.00	0.00	0.35	0.35	0.35	0.00	0.48	0.48	0.17	0.65	0.00
Volume/Cap:	0.00	0.00	0.00	0.64	0.65	0.65	0.00	0.64	0.53	0.64	0.42	0.00
Delay/Veh:	0.0	0.0	0.0	29.8	30.0	30.0	0.0	20.3	18.7	40.8	8.4	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	29.8	30.0	30.0	0.0	20.3	18.7	40.8	8.4	0.0
LOS by Move:	A	A	A	C	C	C	A	C	B	D	A	A
HCM2kAvgQ:	0	0	0	10	10	10	0	14	9	7	8	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #49 Monroe Ave & Murrieta Hot Springs Rd

Average Delay (sec/veh): 1.8 Worst Case Level Of Service: C[23.8]

Street Name:	Monroe Ave								Murrieta Hot Springs Rd							
Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Stop Sign				Stop Sign				Uncontrolled				Uncontrolled			
Rights:	Include				Include				Include				Include			
Lanes:	0	0	0	0 0	0	0	0	0 1	1	0	4	0 0	0	0	3	0 1
Volume Module:																
Base Vol:	0	0	0	0	0	130	227	2111	0	0	1574	30				
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Initial Bse:	0	0	0	0	0	130	227	2111	0	0	1574	30				
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
PHF Volume:	0	0	0	0	0	130	227	2111	0	0	1574	30				
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0				
FinalVolume:	0	0	0	0	0	130	227	2111	0	0	1574	30				
Critical Gap Module:																
Critical Gp:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	6.9	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx				
FollowUpTim:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx				
Capacity Module:																
Cnflict Vol:	xxxx	xxxx	xxxxx	xxxx	xxxx	525	1604	xxxx	xxxxx	xxxx	xxxx	xxxxx				
Potent Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	503	413	xxxx	xxxxx	xxxx	xxxx	xxxxx				
Move Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	503	413	xxxx	xxxxx	xxxx	xxxx	xxxxx				
Volume/Cap:	xxxx	xxxx	xxxx	xxxx	xxxx	0.26	0.55	xxxx	xxxx	xxxx	xxxx	xxxx				
Level Of Service Module:																
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.0	3.2	xxxx	xxxxx	xxxx	xxxx	xxxxx				
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	14.6	23.8	xxxx	xxxxx	xxxxx	xxxx	xxxxx				
LOS by Move:	*	*	*	*	*	B	C	*	*	*	*	*				
Movement:	LT - LTR - RT				LT - LTR - RT			LT - LTR - RT			LT - LTR - RT					
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx				
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx				
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx				
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*				
ApproachDel:	xxxxxx			14.6			xxxxxx			xxxxxx						
ApproachLOS:	*			B			*			*						

Note: Queue reported is the number of cars per lane.

City of Murrieta General Plan
Existing
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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #50 Hancock Ave & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.513
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 14.7
Optimal Cycle: 47 Level Of Service: B

Street Name:	Hancock Ave								Murrieta Hot Springs Rd							
Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Protected				Protected				Protected				Protected			
Rights:	Include				Include				Include				Include			
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0 0	2	0	0	0 2	2	0	4	0 0	0	0	3	0 1
Volume Module:																
Base Vol:	0	0	0	569	0	183	237	1924	0	0	1465	421				
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Initial Bse:	0	0	0	569	0	183	237	1924	0	0	1465	421				
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
PHF Volume:	0	0	0	569	0	183	237	1924	0	0	1465	421				
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0				
Reduced Vol:	0	0	0	569	0	183	237	1924	0	0	1465	421				
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
FinalVolume:	0	0	0	569	0	183	237	1924	0	0	1465	421				
Saturation Flow Module:																
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900				
Adjustment:	1.00	1.00	1.00	0.92	1.00	0.75	0.92	0.91	1.00	1.00	0.91	0.85				
Lanes:	0.00	0.00	0.00	2.00	0.00	2.00	2.00	4.00	0.00	0.00	3.00	1.00				
Final Sat.:	0	0	0	3502	0	2842	3502	6916	0	0	5187	1615				
Capacity Analysis Module:																
Vol/Sat:	0.00	0.00	0.00	0.16	0.00	0.06	0.07	0.28	0.00	0.00	0.28	0.26				
Crit Moves:				****			****				****					
Green/Cycle:	0.00	0.00	0.00	0.32	0.00	0.32	0.13	0.68	0.00	0.00	0.55	0.55				
Volume/Cap:	0.00	0.00	0.00	0.51	0.00	0.20	0.51	0.41	0.00	0.00	0.51	0.47				
Delay/Veh:	0.0	0.0	0.0	28.3	0.0	25.0	41.4	7.0	0.0	0.0	14.2	14.0				
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
AdjDel/Veh:	0.0	0.0	0.0	28.3	0.0	25.0	41.4	7.0	0.0	0.0	14.2	14.0				
LOS by Move:	A	A	A	C	A	C	D	A	A	A	B	B				
HCM2kAvgQ:	0	0	0	8	0	2	4	7	0	0	10	8				

Note: Queue reported is the number of cars per lane.

City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #51 Alta Murrieta Dr & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.746
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 28.1
Optimal Cycle: 90 Level Of Service: C

Street Name:	Alta Murrieta Dr						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 1	0 1	2	0	0 1 1	2	0 2	1 0	2	0 4	0 1
Volume Module:												
Base Vol:	394	195	45	208	132	412	717	1697	499	119	1293	112
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	394	195	45	208	132	412	717	1697	499	119	1293	112
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	394	195	45	208	132	412	717	1697	499	119	1293	112
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	394	195	45	208	132	412	717	1697	499	119	1293	112
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	394	195	45	208	132	412	717	1697	499	119	1293	112
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.85	0.92	0.89	0.89	0.92	0.88	0.88	0.92	0.91	0.85
Lanes:	2.00	1.00	1.00	2.00	0.49	1.51	2.00	2.32	0.68	2.00	4.00	1.00
Final Sat.:	3502	1900	1615	3502	817	2550	3502	3872	1139	3502	6916	1615
Capacity Analysis Module:												
Vol/Sat:	0.11	0.10	0.03	0.06	0.16	0.16	0.20	0.44	0.44	0.03	0.19	0.07
Crit Moves:	****				****			****			****	
Green/Cycle:	0.15	0.23	0.23	0.13	0.22	0.22	0.33	0.59	0.59	0.05	0.30	0.30
Volume/Cap:	0.75	0.44	0.12	0.44	0.75	0.75	0.62	0.75	0.75	0.75	0.62	0.23
Delay/Veh:	46.4	33.5	30.4	40.5	40.8	40.8	29.2	16.2	16.2	64.6	30.5	26.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	46.4	33.5	30.4	40.5	40.8	40.8	29.2	16.2	16.2	64.6	30.5	26.4
LOS by Move:	D	C	C	D	D	D	C	B	B	E	C	C
HCM2kAvgQ:	8	5	1	3	9	9	10	19	19	3	10	3

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #52 Winchester Road - SR-79 & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.668
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 26.4
Optimal Cycle: 69 Level Of Service: C

Street Name:	Winchester Road - SR-79						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 3	0 1	2	0	3 0 1	2	0 3	0 1	2	0 2	0 1
Volume Module:												
Base Vol:	250	1689	204	122	1064	498	611	522	207	273	412	62
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	250	1689	204	122	1064	498	611	522	207	273	412	62
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	250	1689	204	122	1064	498	611	522	207	273	412	62
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	250	1689	204	122	1064	498	611	522	207	273	412	62
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	250	1689	204	122	1064	498	611	522	207	273	412	62
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.91	0.85	0.92	0.91	0.85	0.92	0.91	0.85	0.92	0.95	0.85
Lanes:	2.00	3.00	1.00	2.00	3.00	1.00	2.00	3.00	1.00	2.00	2.00	1.00
Final Sat.:	3502	5187	1615	3502	5187	1615	3502	5187	1615	3502	3610	1615
Capacity Analysis Module:												
Vol/Sat:	0.07	0.33	0.13	0.03	0.21	0.31	0.17	0.10	0.13	0.08	0.11	0.04
Crit Moves:	****					****	****				****	
Green/Cycle:	0.11	0.51	0.51	0.05	0.46	0.46	0.26	0.27	0.27	0.16	0.17	0.17
Volume/Cap:	0.67	0.63	0.25	0.63	0.44	0.67	0.67	0.37	0.48	0.48	0.67	0.22
Delay/Veh:	47.6	18.1	13.7	53.1	18.4	23.3	35.0	29.9	31.5	38.6	41.6	36.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	47.6	18.1	13.7	53.1	18.4	23.3	35.0	29.9	31.5	38.6	41.6	36.2
LOS by Move:	D	B	B	D	B	C	C	C	C	D	D	D
HCM2kAvgQ:	5	14	3	3	8	13	10	5	6	4	7	2

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #53 Hancock Ave & Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.756
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 34.5
Optimal Cycle: 94 Level Of Service: C

Street Name:	Hancock Ave						Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	1	1	0	2	0	0	1	0	1	0	1	1	0	1	0	1	1	0
Volume Module:												
Base Vol:	149	559	290	459	222	65	198	965	62	163	537	295
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	149	559	290	459	222	65	198	965	62	163	537	295
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	149	559	290	459	222	65	198	965	62	163	537	295
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	149	559	290	459	222	65	198	965	62	163	537	295
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	149	559	290	459	222	65	198	965	62	163	537	295
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.90	0.90	0.92	0.97	0.97	0.95	0.94	0.94	0.95	0.90	0.90
Lanes:	1.00	1.32	0.68	2.00	0.77	0.23	1.00	1.88	0.12	1.00	1.29	0.71
Final Sat.:	1805	2256	1170	3502	1420	416	1805	3362	216	1805	2207	1212
Capacity Analysis Module:												
Vol/Sat:	0.08	0.25	0.25	0.13	0.16	0.16	0.11	0.29	0.29	0.09	0.24	0.24
Crit Moves:		****		****				****		****		
Green/Cycle:	0.17	0.33	0.33	0.17	0.33	0.33	0.16	0.38	0.38	0.12	0.34	0.34
Volume/Cap:	0.48	0.76	0.76	0.76	0.48	0.48	0.71	0.76	0.76	0.76	0.71	0.71
Delay/Veh:	38.4	33.0	33.0	44.8	27.4	27.4	48.2	29.5	29.5	56.8	30.4	30.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	38.4	33.0	33.0	44.8	27.4	27.4	48.2	29.5	29.5	56.8	30.4	30.4
LOS by Move:	D	C	C	D	C	C	D	C	C	E	C	C
HCM2kAvgQ:	5	14	14	9	7	7	7	16	16	7	13	13

Note: Queue reported is the number of cars per lane.

City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #54 I-215 SB Ramps & Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.574
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 15.6
Optimal Cycle: 54 Level Of Service: B

Street Name:	I-215 SB Ramps						Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	1	0	1!	0	1	0	0	2	1	0	2	0	2	0	0
Volume Module:												
Base Vol:	0	0	0	192	3	408	0	1441	287	160	738	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	192	3	408	0	1441	287	160	738	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	192	3	408	0	1441	287	160	738	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	192	3	408	0	1441	287	160	738	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	192	3	408	0	1441	287	160	738	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.85	0.85	0.85	1.00	0.89	0.89	0.92	0.95	1.00
Lanes:	0.00	0.00	0.00	1.32	0.01	1.67	0.00	2.50	0.50	2.00	2.00	0.00
Final Sat.:	0	0	0	2139	16	2718	0	4217	840	3502	3610	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.09	0.19	0.15	0.00	0.34	0.34	0.05	0.20	0.00
Crit Moves:					****					****		
Green/Cycle:	0.00	0.00	0.00	0.33	0.33	0.33	0.00	0.60	0.60	0.08	0.67	0.00
Volume/Cap:	0.00	0.00	0.00	0.28	0.57	0.46	0.00	0.57	0.57	0.57	0.30	0.00
Delay/Veh:	0.0	0.0	0.0	25.1	28.8	27.1	0.0	12.7	12.7	47.3	6.7	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	25.1	28.8	27.1	0.0	12.7	12.7	47.3	6.7	0.0
LOS by Move:	A	A	A	C	C	C	A	B	B	D	A	A
HCM2kAvgQ:	0	0	0	3	8	6	0	12	12	3	5	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #55 I-215 NB Ramps & Los Alamos Rd

Cycle (sec):	100	Critical Vol./Cap.(X):	0.437
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	15.0
Optimal Cycle:	41	Level Of Service:	B

Street Name:	I-215 NB Ramps						Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	0 1	0	0	0 0	2	0	3 0	0	0	0 1
Volume Module:												
Base Vol:	129	4	175	0	0	0	394	1181	0	0	774	165
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	129	4	175	0	0	0	394	1181	0	0	774	165
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	129	4	175	0	0	0	394	1181	0	0	774	165
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	129	4	175	0	0	0	394	1181	0	0	774	165
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	129	4	175	0	0	0	394	1181	0	0	774	165
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.85	0.85	0.85	1.00	1.00	1.00	0.92	0.91	1.00	1.00	0.95	0.85
Lanes:	1.00	0.02	0.98	0.00	0.00	0.00	2.00	3.00	0.00	0.00	2.00	1.00
Final Sat.:	1615	36	1584	0	0	0	3502	5187	0	0	3610	1615
Capacity Analysis Module:												
Vol/Sat:	0.08	0.11	0.11	0.00	0.00	0.00	0.11	0.23	0.00	0.00	0.21	0.10
Crit Moves:		****					****				****	
Green/Cycle:	0.25	0.25	0.25	0.00	0.00	0.00	0.26	0.75	0.00	0.00	0.49	0.49
Volume/Cap:	0.32	0.44	0.44	0.00	0.00	0.00	0.44	0.30	0.00	0.00	0.44	0.21
Delay/Veh:	30.8	32.2	32.2	0.0	0.0	0.0	31.4	4.2	0.0	0.0	16.7	14.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	30.8	32.2	32.2	0.0	0.0	0.0	31.4	4.2	0.0	0.0	16.7	14.6
LOS by Move:	C	C	C	A	A	A	C	A	A	A	B	B
HCM2kAvgQ:	3	5	5	0	0	0	5	4	0	0	8	3

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #56 Whitewood Rd & Los Alamos Rd

Cycle (sec):	100	Critical Vol./Cap.(X):	0.422
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	26.0
Optimal Cycle:	39	Level Of Service:	C

Street Name:	Whitewood Rd						Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	1 1	0	1	0 2	0	1	1 0	2	0	1 1
Volume Module:												
Base Vol:	197	343	64	13	196	162	269	353	265	70	207	18
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	197	343	64	13	196	162	269	353	265	70	207	18
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	197	343	64	13	196	162	269	353	265	70	207	18
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	197	343	64	13	196	162	269	353	265	70	207	18
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	197	343	64	13	196	162	269	353	265	70	207	18
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.93	0.93	0.95	0.95	0.85	0.95	0.95	0.85	0.95	0.94	0.94
Lanes:	1.00	1.69	0.31	1.00	2.00	1.00	1.00	2.00	1.00	1.00	1.84	0.16
Final Sat.:	1805	2969	554	1805	3610	1615	1805	3610	1615	1805	3281	285
Capacity Analysis Module:												
Vol/Sat:	0.11	0.12	0.12	0.01	0.05	0.10	0.15	0.10	0.16	0.04	0.06	0.06
Crit Moves:	****					****	****				****	
Green/Cycle:	0.26	0.47	0.47	0.03	0.24	0.24	0.35	0.41	0.41	0.10	0.15	0.15
Volume/Cap:	0.42	0.25	0.25	0.25	0.23	0.42	0.42	0.24	0.40	0.40	0.42	0.42
Delay/Veh:	31.4	16.1	16.1	49.9	30.8	33.0	25.0	19.6	21.4	44.0	39.1	39.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	31.4	16.1	16.1	49.9	30.8	33.0	25.0	19.6	21.4	44.0	39.1	39.1
LOS by Move:	C	B	B	D	C	C	C	B	C	D	D	D
HCM2kAvgQ:	5	4	4	1	3	5	6	4	6	2	4	4

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #57 Whitewood Rd & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.594
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 9.7
Optimal Cycle: 56 Level Of Service: A

Street Name:	Whitewood Rd						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	0 1	0	2	0 1	0 1	0	2 1	0	1	0 2 1 0
Volume Module:												
Base Vol:	6	5	16	316	7	93	101	1903	6	21	1776	417
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	6	5	16	316	7	93	101	1903	6	21	1776	417
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	6	5	16	316	7	93	101	1903	6	21	1776	417
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	6	5	16	316	7	93	101	1903	6	21	1776	417
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	6	5	16	316	7	93	101	1903	6	21	1776	417
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.89	0.89	0.92	1.00	0.85	0.95	0.91	0.91	0.95	0.88	0.88
Lanes:	1.00	0.24	0.76	2.00	1.00	1.00	1.00	2.99	0.01	1.00	2.43	0.57
Final Sat.:	1805	401	1283	3502	1900	1615	1805	5171	16	1805	4083	959
Capacity Analysis Module:												
Vol/Sat:	0.00	0.01	0.01	0.09	0.00	0.06	0.06	0.37	0.37	0.01	0.43	0.43
Crit Moves:		****		****			****				****	
Green/Cycle:	0.01	0.02	0.02	0.15	0.16	0.16	0.09	0.80	0.80	0.03	0.73	0.73
Volume/Cap:	0.35	0.59	0.59	0.59	0.02	0.35	0.59	0.46	0.46	0.46	0.59	0.59
Delay/Veh:	61.3	72.8	72.8	41.3	35.1	37.9	49.0	3.2	3.2	55.2	6.6	6.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	61.3	72.8	72.8	41.3	35.1	37.9	49.0	3.2	3.2	55.2	6.6	6.6
LOS by Move:	E	E	E	D	D	D	D	A	A	E	A	A
HCM2kAvgQ:	1	2	2	6	0	3	4	7	7	1	12	12

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #58 Adams Ave & Guava St

Average Delay (sec/veh): 4.8 Worst Case Level Of Service: A[9.3]

Street Name:	Adams Ave						Guava St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0	0	0 1 0	0	1	0 0 0	0	0	0 0 0	0	0	1! 0 0
Volume Module:												
Base Vol:	0	86	26	77	22	0	0	0	0	7	0	90
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	86	26	77	22	0	0	0	0	7	0	90
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	86	26	77	22	0	0	0	0	7	0	90
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	86	26	77	22	0	0	0	0	7	0	90
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.4	6.5	6.2
FollowUpTim:	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.5	4.0	3.3
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	112	xxxx	xxxxx	xxxx	xxxx	xxxxx	275	275	99
Potent Cap.:	xxxx	xxxx	xxxxx	1490	xxxx	xxxxx	xxxx	xxxx	xxxxx	719	636	962
Move Cap.:	xxxx	xxxx	xxxxx	1490	xxxx	xxxxx	xxxx	xxxx	xxxxx	689	601	962
Volume/Cap:	xxxx	xxxx	xxxx	0.05	xxxx	xxxx	xxxx	xxxx	xxxx	0.01	0.00	0.09
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	0.2	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	7.5	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	A	*	*	*	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	936	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	0.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.3	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	7.5	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	9.3	xxxxx
Shared LOS:	*	*	*	A	*	*	*	*	*	*	A	*
ApproachDel:	xxxxxx			xxxxxx			xxxxxx			9.3		
ApproachLOS:	*			*			*			A		

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #59 Nutmeg St & Clinton Keith Rd

Cycle (sec):	100	Critical Vol./Cap.(X):	0.406
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	21.0
Optimal Cycle:	31	Level Of Service:	C

Street Name:	Nutmeg St						Clinton Keith Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	48	61	192	61	23	21	52	533	69	210	397	73
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	48	61	192	61	23	21	52	533	69	210	397	73
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	48	61	192	61	23	21	52	533	69	210	397	73
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	48	61	192	61	23	21	52	533	69	210	397	73
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	48	61	192	61	23	21	52	533	69	210	397	73
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.71	0.84	0.84	0.48	0.88	0.88	0.95	0.93	0.93	0.95	0.93	0.93
Lanes:	1.00	1.00	1.00	1.00	1.05	0.95	1.00	1.77	0.23	1.00	1.69	0.31
Final Sat.:	1345	1599	1599	906	1751	1599	1805	3142	407	1805	2979	548
Capacity Analysis Module:												
Vol/Sat:	0.04	0.04	0.12	0.07	0.01	0.01	0.03	0.17	0.17	0.12	0.13	0.13
Crit Moves:			****					****		****		
Green/Cycle:	0.30	0.30	0.30	0.30	0.30	0.30	0.13	0.42	0.42	0.29	0.58	0.58
Volume/Cap:	0.12	0.13	0.41	0.23	0.04	0.04	0.23	0.41	0.41	0.41	0.23	0.23
Delay/Veh:	25.9	25.8	28.6	27.0	25.2	25.2	39.9	20.6	20.6	29.3	10.3	10.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	25.9	25.8	28.6	27.0	25.2	25.2	39.9	20.6	20.6	29.3	10.3	10.3
LOS by Move:	C	C	C	C	C	C	D	C	C	C	B	B
HCM2kAvgQ:	1	1	5	2	1	1	2	7	7	5	4	4

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #61 I-215 SB Ramps & Scott Rd

Cycle (sec):	100	Critical Vol./Cap.(X):	0.763
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	25.6
Optimal Cycle:	96	Level Of Service:	C

Street Name:	I-215 SB Ramps						Scott Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0 0	0 0	0	1 0	0 1	0	0 1	0 1	1	0 1	0 0
Volume Module:												
Base Vol:	0	0	0	334	4	114	0	580	165	465	603	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	334	4	114	0	580	165	465	603	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	334	4	114	0	580	165	465	603	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	334	4	114	0	580	165	465	603	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	334	4	114	0	580	165	465	603	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.89	0.89	0.85	1.00	1.00	0.85	0.95	1.00	1.00
Lanes:	0.00	0.00	0.00	0.99	0.01	1.00	0.00	1.00	1.00	1.00	1.00	0.00
Final Sat.:	0	0	0	1669	20	1615	0	1900	1615	1805	1900	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.20	0.20	0.07	0.00	0.31	0.10	0.26	0.32	0.00
Crit Moves:				****				****		****		
Green/Cycle:	0.00	0.00	0.00	0.26	0.26	0.26	0.00	0.40	0.40	0.34	0.74	0.00
Volume/Cap:	0.00	0.00	0.00	0.76	0.76	0.27	0.00	0.76	0.26	0.76	0.43	0.00
Delay/Veh:	0.0	0.0	0.0	41.7	41.7	29.6	0.0	30.5	20.3	35.2	5.3	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	41.7	41.7	29.6	0.0	30.5	20.3	35.2	5.3	0.0
LOS by Move:	A	A	A	D	D	C	A	C	C	D	A	A
HCM2kAvgQ:	0	0	0	11	11	3	0	17	3	14	7	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #62 I-215 NB Ramps & Scott Rd

Cycle (sec):	100	Critical Vol./Cap.(X):	0.832
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	23.4
Optimal Cycle:	136	Level Of Service:	C

Street Name:	I-215 NB Ramps						Scott Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 1	0	0 1	0	0 0	0 0	1	0 1	0 0	0	0 1	0 1
Volume Module:												
Base Vol:	182	6	468	0	0	0	112	780	0	0	913	364
Growth Adj:	1.00 1.00	1.00	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00	
Initial Bse:	182	6	468	0	0	0	112	780	0	0	913	364
User Adj:	1.00 1.00	1.00	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00	
PHF Adj:	1.00 1.00	1.00	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00	
PHF Volume:	182	6	468	0	0	0	112	780	0	0	913	364
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	182	6	468	0	0	0	112	780	0	0	913	364
PCE Adj:	1.00 1.00	1.00	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00	
MLF Adj:	1.00 1.00	1.00	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00	
FinalVolume:	182	6	468	0	0	0	112	780	0	0	913	364
Saturation Flow Module:												
Sat/Lane:	1900 1900	1900	1900 1900	1900	1900	1900 1900	1900	1900	1900 1900	1900	1900	
Adjustment:	0.96 0.96	0.85	1.00 1.00	1.00	0.95	1.00 1.00	1.00	1.00	1.00 1.00	1.00	0.85	
Lanes:	0.97 0.03	1.00	0.00 0.00	0.00	1.00	1.00 0.00	0.00	0.00	1.00 1.00	1.00	1.00	
Final Sat.:	1762	58	1615	0	0	0	1805	1900	0	0	1900	1615
Capacity Analysis Module:												
Vol/Sat:	0.10 0.10	0.29	0.00 0.00	0.00	0.06	0.41	0.00	0.00	0.48	0.23		
Crit Moves:		****			****				****			
Green/Cycle:	0.35 0.35	0.35	0.00 0.00	0.00	0.07	0.65	0.00	0.00	0.58	0.58		
Volume/Cap:	0.30 0.30	0.83	0.00 0.00	0.00	0.83	0.63	0.00	0.00	0.83	0.39		
Delay/Veh:	24.0 24.0	40.2	0.0 0.0	0.0	79.3	11.3	0.0	0.0	22.8	11.8		
User DelAdj:	1.00 1.00	1.00	1.00 1.00	1.00	1.00	1.00 1.00	1.00	1.00	1.00 1.00	1.00		
AdjDel/Veh:	24.0 24.0	40.2	0.0 0.0	0.0	79.3	11.3	0.0	0.0	22.8	11.8		
LOS by Move:	C	C	D	A	A	A	E	B	A	A	C	B
HCM2kAvgQ:	4	4	16	0	0	0	6	14	0	0	25	6

Note: Queue reported is the number of cars per lane.

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EXISTING GENERAL PLAN

City of Murrieta General Plan
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Scenario Report

Scenario:	Existing GP AM
Command:	Existing GP AM
Volume:	Existing GP AM
Geometry:	Future
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	Default Trip Distribution
Paths:	Default Path
Routes:	Default Route
Configuration:	Existing GP AM

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Turning Movement Report

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#1 Menifee Road & Scott Road													
Base	280	408	428	238	638	89	99	499	248	719	508	258	4412
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	280	408	428	238	638	89	99	499	248	719	508	258	4412
#2 Leon Road & Scott Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#3 Winchester Road/SR-79 & Scott Road													
Base	118	1449	54	935	2477	74	113	174	63	16	157	984	6614
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	118	1449	54	935	2477	74	113	174	63	16	157	984	6614
#4 Antelope Road & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#5 Menifee Road - Meadowlark Road & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#6 Briggs Road & Keller Road													
Base	275	18	53	0	9	21	2	149	384	6	308	1	1226
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	275	18	53	0	9	21	2	149	384	6	308	1	1226
#7 Leon Road & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#8 Winchester Road - SR-79 & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#9 Antelope Road & Golden City Drive - Baxter Road													
Base	1	51	319	215	808	22	0	33	6	377	209	402	2443
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	51	319	215	808	22	0	33	6	377	209	402	2443

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#10 Whitewood Roa - /Meadowlark Road & Golden City Drive - Baxter Road													
Base	297	407	3	0	872	639	19	3	475	1	15	1	2732
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	297	407	3	0	872	639	19	3	475	1	15	1	2732
#11 Briggs Road & Baxter Road - Jean Nicholas													
Base	0	151	27	60	363	0	0	0	0	2	0	54	657
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	151	27	60	363	0	0	0	0	2	0	54	657
#12 Leon Road & Jean Nicholas													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#13 Winchester Road - SR-79 & Nicholas - Skyview													
Base	134	1425	334	18	2705	26	35	297	138	123	322	173	5730
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	134	1425	334	18	2705	26	35	297	138	123	322	173	5730
#14 Antelope Road & Linnel Lane Extension													
Base	23	400	60	37	522	364	65	197	137	18	258	220	2301
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	23	400	60	37	522	364	65	197	137	18	258	220	2301
#15 Whitewood Road - Meadowlark Road & Linnel Lane Extension													
Base	28	665	5	3	813	454	97	13	184	1	14	16	2293
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	28	665	5	3	813	454	97	13	184	1	14	16	2293
#16 Leon Road & Max Gillis Road													
Base	411	118	417	345	282	129	98	440	618	493	274	173	3798
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	411	118	417	345	282	129	98	440	618	493	274	173	3798
#17 Winchester Road - SR-79 & Max Gillis - Thompson													
Base	152	1324	38	127	2110	604	622	137	245	34	279	50	5722
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	152	1324	38	127	2110	604	622	137	245	34	279	50	5722
#18 California Oaks Road & Clinton Keith Road													
Base	216	0	542	0	0	0	0	2182	298	706	1680	0	5624
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	216	0	542	0	0	0	0	2182	298	706	1680	0	5624

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#19 I-215 SB Off-Ramp & Clinton Keith Road													
Base	0	0	0	57	0	417	0	2167	509	0	1860	225	5235
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	57	0	417	0	2167	509	0	1860	225	5235
#20 I-215 NB Off Ramp & Clinton Keith Road													
Base	122	0	1233	0	0	0	0	1555	302	0	2136	265	5613
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	122	0	1233	0	0	0	0	1555	302	0	2136	265	5613
#21 Antelope Road & Clinton Keith Road													
Base	0	0	0	26	0	514	253	1768	0	0	1308	238	4107
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	26	0	514	253	1768	0	0	1308	238	4107
#22 Meadowlark Lane - Whitewood Road & Clinton Keith Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#23 Liberty Road & Clinton Keith Road													
Base	14	0	72	0	0	0	0	1998	169	34	1999	0	4286
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	14	0	72	0	0	0	0	1998	169	34	1999	0	4286
#24 Leon Road & Clinton Keith Road													
Base	0	0	0	127	0	1180	461	1597	0	0	669	518	4552
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	127	0	1180	461	1597	0	0	669	518	4552
#25 Winchester Road - SR-79 & Benton Road													
Base	431	1337	332	86	1977	353	45	502	1122	316	514	30	7045
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	431	1337	332	86	1977	353	45	502	1122	316	514	30	7045
#26 Winchester Road - SR-79 & Via Mira Mosa													
Base	27	1572	841	331	2662	228	349	51	91	176	19	30	6377
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	27	1572	841	331	2662	228	349	51	91	176	19	30	6377
#27 Monroe Ave & Los Alamos													
Base	27	206	176	515	446	194	42	321	127	62	959	438	3513
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	27	206	176	515	446	194	42	321	127	62	959	438	3513

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#28 Jefferson Avenue & Murrieta Hot Springs Road													
Base	13	981	579	815	1199	75	13	82	24	931	99	699	5510
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	13	981	579	815	1199	75	13	82	24	931	99	699	5510
#29 Madison Avenue & Murrieta Hot Springs Road													
Base	140	79	322	150	144	141	140	1141	260	647	1759	79	5002
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	140	79	322	150	144	141	140	1141	260	647	1759	79	5002
#30 I-15 SB Off-Ramp & Murrieta Hot Springs Road													
Base	0	0	0	813	0	394	0	1348	225	0	2235	47	5062
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	813	0	394	0	1348	225	0	2235	47	5062
#31 I-15 NB Off-Ramp & Murrieta Hot Springs Road													
Base	281	0	73	0	0	0	0	2144	181	0	1455	627	4761
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	281	0	73	0	0	0	0	2144	181	0	1455	627	4761
#32 I-215 SB Off-Ramp & Murrieta Hot Springs Road													
Base	0	0	0	541	0	438	0	1944	53	0	2529	378	5883
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	541	0	438	0	1944	53	0	2529	378	5883
#33 I-215 NB Off-Ramp & Murrieta Hot Springs Road													
Base	347	0	19	0	0	0	0	1588	115	0	2578	679	5326
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	347	0	19	0	0	0	0	1588	115	0	2578	679	5326
#34 Jackson Avenue & Murrieta Hot Springs Road													
Base	70	0	51	0	0	0	0	1218	43	159	2010	0	3551
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	70	0	51	0	0	0	0	1218	43	159	2010	0	3551
#35 Margarita Road & Murrieta Hot Springs Road													
Base	616	60	128	42	17	6	163	749	462	302	1723	71	4339
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	616	60	128	42	17	6	163	749	462	302	1723	71	4339
#36 French Valley Parkway & Murrieta Hot Springs Road													
Base	20	0	821	0	0	0	0	1224	277	723	1947	0	5012
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	20	0	821	0	0	0	0	1224	277	723	1947	0	5012

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#37 Jefferson Avenue & Guava Street													
Base	26	1339	1	3	1360	322	190	55	105	2	33	9	3445
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	26	1339	1	3	1360	322	190	55	105	2	33	9	3445
#38 Jefferson Avenue & Cherry Street													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#39 Washington Ave & Calle Del Oso Oro/Nutmeg													
Base	251	159	122	92	196	90	64	602	638	143	205	42	2604
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	251	159	122	92	196	90	64	602	638	143	205	42	2604
#40 Clinton Keith Rd & Calle de Oso Oro/Bear Creek Dr													
Base	58	108	274	5	112	197	266	612	147	410	614	22	2825
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	58	108	274	5	112	197	266	612	147	410	614	22	2825
#41 Jefferson Ave & Nutmeg St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#42 Jefferson Ave & Magnolia St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#43 Jefferson Ave & Lemon St													
Base	249	774	28	4	2426	152	30	3	251	6	10	6	3939
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	249	774	28	4	2426	152	30	3	251	6	10	6	3939
#44 Jefferson Ave & Kalmia St													
Base	260	903	245	860	1613	151	48	458	333	207	316	469	5863
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	260	903	245	860	1613	151	48	458	333	207	316	469	5863
#45 Jefferson Ave & Juniper St													
Base	257	1291	63	110	1943	82	74	96	112	13	92	36	4169
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	257	1291	63	110	1943	82	74	96	112	13	92	36	4169

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#46 Jefferson Ave & Ivy St/Los Alamos Rd													
Base	140	1181	64	235	1748	49	59	75	135	289	68	366	4409
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	140	1181	64	235	1748	49	59	75	135	289	68	366	4409
#47 Madison Ave & Kalmia St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#48 Madison Ave/I-15 SB Ramps & Kalmia St													
Base	117	0	220	253	48	270	0	1352	212	340	1054	495	4361
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	117	0	220	253	48	270	0	1352	212	340	1054	495	4361
#49 Monroe Ave & Murrieta Hot Springs Rd													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#50 Hancock Ave & Murrieta Hot Springs Rd													
Base	0	0	0	427	0	673	659	1554	0	0	2501	502	6316
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	427	0	673	659	1554	0	0	2501	502	6316
#51 Alta Murrieta Dr & Murrieta Hot Springs Rd													
Base	224	80	20	68	133	305	248	982	294	137	1863	162	4516
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	224	80	20	68	133	305	248	982	294	137	1863	162	4516
#52 Winchester Road - SR-79 & Murrieta Hot Springs Rd													
Base	292	1516	160	150	1534	1319	774	273	109	299	856	78	7360
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	292	1516	160	150	1534	1319	774	273	109	299	856	78	7360
#53 Hancock Ave & Los Alamos Rd													
Base	49	125	202	693	252	91	72	869	74	902	1617	602	5548
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	49	125	202	693	252	91	72	869	74	902	1617	602	5548
#54 I-215 SB Ramps & Los Alamos Rd													
Base	0	0	0	409	0	1895	0	1264	457	250	1470	0	5745
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	409	0	1895	0	1264	457	250	1470	0	5745

City of Murrieta General Plan
Existing General Plan
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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#55 I-215 NB Ramps & Los Alamos Rd													
Base	457	2	105	0	0	0	601	1028	0	0	1272	70	3535
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	457	2	105	0	0	0	601	1028	0	0	1272	70	3535
#56 Whitewood Rd & Los Alamos Rd													
Base	87	237	51	30	449	557	361	215	90	58	256	22	2413
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	87	237	51	30	449	557	361	215	90	58	256	22	2413
#57 Whitewood Rd & Murrieta Hot Springs Rd													
Base	57	203	255	250	541	107	25	996	138	486	2064	120	5242
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	57	203	255	250	541	107	25	996	138	486	2064	120	5242
#58 Adams Ave & Guava St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#59 Nutmeg St & Clinton Keith Rd													
Base	75	45	460	387	53	71	46	1690	94	366	1366	159	4812
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	75	45	460	387	53	71	46	1690	94	366	1366	159	4812
#60 Murrieta Oaks Ave-Mitchell Rd & Clinton Keith Rd													
Base	121	147	143	8	32	58	65	2553	302	120	2084	206	5839
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	121	147	143	8	32	58	65	2553	302	120	2084	206	5839
#61 I-215 SB Ramps & Scott Rd													
Base	0	0	0	170	0	148	0	858	475	0	906	293	2850
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	170	0	148	0	858	475	0	906	293	2850
#62 I-215 NB Ramps & Scott Rd													
Base	0	17	566	0	0	297	147	929	0	0	1002	336	3294
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	17	566	0	0	297	147	929	0	0	1002	336	3294
#102 Leon Road & Scott Road													
Base	97	182	2	96	285	526	401	448	344	8	376	161	2926
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	97	182	2	96	285	526	401	448	344	8	376	161	2926

City of Murrieta General Plan
Existing General Plan
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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#104 Antelope Road & Keller Road													
Base	55	39	269	159	297	298	400	711	831	633	511	33	4236
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	55	39	269	159	297	298	400	711	831	633	511	33	4236
#105 Menifee Road - Meadowlark Road & Keller Road													
Base	21	283	247	136	919	621	567	180	352	196	339	150	4011
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	21	283	247	136	919	621	567	180	352	196	339	150	4011
#107 Leon Road & Keller Road													
Base	125	309	11	2	570	122	4	66	182	3	33	2	1429
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	125	309	11	2	570	122	4	66	182	3	33	2	1429
#108 Winchester Road - SR-79 & Keller Road													
Base	0	1593	27	4	2559	1	1	9	1	12	10	49	4266
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1593	27	4	2559	1	1	9	1	12	10	49	4266
#112 Leon Road & Jean Nicholas													
Base	7	180	126	186	503	47	2	175	16	161	26	231	1660
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	7	180	126	186	503	47	2	175	16	161	26	231	1660
#122 Meadowlark Lane - Whitewood Road & Clinton Keith Road													
Base	55	37	784	296	117	567	636	997	106	865	988	195	5643
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	55	37	784	296	117	567	636	997	106	865	988	195	5643
#138 Jefferson Avenue & Cherry Street													
Base	84	575	187	35	644	21	2	55	7	141	1237	800	3788
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	84	575	187	35	644	21	2	55	7	141	1237	800	3788
#141 Jefferson Ave & Nutmeg St													
Base	207	364	240	65	1665	61	97	182	544	369	171	66	4031
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	207	364	240	65	1665	61	97	182	544	369	171	66	4031
#142 Jefferson Ave & Magnolia St													
Base	84	676	8	7	2381	226	154	1	151	27	3	1	3719
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	84	676	8	7	2381	226	154	1	151	27	3	1	3719

City of Murrieta General Plan
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AM Peak Hour

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#149 Monroe Ave & Murrieta Hot Springs Rd													
Base	40	79	48	1	36	77	113	1200	15	4	1576	26	3215
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	40	79	48	1	36	77	113	1200	15	4	1576	26	3215
#158 Adams Ave & Guava St													
Base	64	67	17	100	21	41	19	308	46	3	286	101	1073
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	64	67	17	100	21	41	19	308	46	3	286	101	1073

City of Murrieta General Plan
Existing General Plan
AM Peak Hour

Impact Analysis Report
Level Of Service

Intersection	Base LOS	Del/ Veh	V/ C	Future LOS	Del/ Veh	V/ C	Change in
# 1 Menifee Road & Scott Road	D	47.3	0.939	D	47.3	0.939	+ 0.000 D/V
# 3 Winchester Road/SR-79 & Scott	F	177.0	1.525	F	177.0	1.525	+ 0.000 D/V
# 6 Briggs Road & Keller Road	B	16.9	0.400	B	16.9	0.400	+ 0.000 D/V
# 9 Antelope Road & Golden City Dr	B	16.8	0.519	B	16.8	0.519	+ 0.000 D/V
# 10 Whitewood Roa - /Meadowlark Ro	D	37.0	0.921	D	37.0	0.921	+ 0.000 D/V
# 11 Briggs Road & Baxter Road - Je	B	11.0	0.134	B	11.0	0.134	+ 0.000 D/V
# 13 Winchester Road - SR-79 & Nich	B	18.8	0.796	B	18.8	0.796	+ 0.000 D/V
# 14 Antelope Road & Linnel Lane Ex	B	19.4	0.453	B	19.4	0.453	+ 0.000 D/V
# 15 Whitewood Road - Meadowlark Ro	B	10.1	0.506	B	10.1	0.506	+ 0.000 D/V
# 16 Leon Road & Max Gillis Road	D	38.0	0.873	D	38.0	0.873	+ 0.000 D/V
# 17 Winchester Road - SR-79 & Max	C	25.1	0.762	C	25.1	0.762	+ 0.000 D/V
# 18 California Oaks Road & Clinton	C	32.7	0.998	C	32.7	0.998	+ 0.000 D/V
# 19 I-215 SB Off-Ramp & Clinton Ke	A	8.2	0.564	A	8.2	0.564	+ 0.000 D/V
# 20 I-215 NB Off Ramp & Clinton Ke	F	83.2	1.175	F	83.2	1.175	+ 0.000 D/V
# 21 Antelope Road & Clinton Keith	A	4.3	0.385	A	4.3	0.385	+ 0.000 D/V
# 23 Liberty Road & Clinton Keith R	A	2.5	0.486	A	2.5	0.486	+ 0.000 D/V
# 24 Leon Road & Clinton Keith Road	B	19.3	0.736	B	19.3	0.736	+ 0.000 D/V
# 25 Winchester Road - SR-79 & Bent	D	41.0	0.989	D	41.0	0.989	+ 0.000 D/V
# 26 Winchester Road - SR-79 & Via	C	24.1	0.918	C	24.1	0.918	+ 0.000 D/V
# 27 Monroe Ave & Los Alamos	C	23.9	0.550	C	23.9	0.550	+ 0.000 D/V
# 28 Jefferson Avenue & Murrieta Ho	F	116.4	1.347	F	116.4	1.347	+ 0.000 D/V
# 29 Madison Avenue & Murrieta Hot	C	26.2	0.635	C	26.2	0.635	+ 0.000 D/V
# 30 I-15 SB Off-Ramp & Murrieta Ho	B	16.0	0.709	B	16.0	0.709	+ 0.000 D/V

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City of Murrieta General Plan
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Intersection	Base LOS	Del/ Veh	V/ C	Future LOS	Del/ Veh	V/ C	Change in
# 31 I-15 NB Off-Ramp & Murrieta Ho	A	5.8	0.390	A	5.8	0.390	+ 0.000 D/V
# 32 I-215 SB Off-Ramp & Murrieta H	B	12.4	0.690	B	12.4	0.690	+ 0.000 D/V
# 33 I-215 NB Off-Ramp & Murrieta H	A	5.6	0.596	A	5.6	0.596	+ 0.000 D/V
# 34 Jackson Avenue & Murrieta Hot	A	5.3	0.407	A	5.3	0.407	+ 0.000 D/V
# 35 Margarita Road & Murrieta Hot	C	24.4	0.659	C	24.4	0.659	+ 0.000 D/V
# 36 French Valley Parkway & Murrie	B	12.7	0.709	B	12.7	0.709	+ 0.000 D/V
# 37 Jefferson Avenue & Guava Stree	A	9.8	0.489	A	9.8	0.489	+ 0.000 D/V
# 39 Washington Ave & Calle Del Oso	C	26.5	0.659	C	26.5	0.659	+ 0.000 D/V
# 40 Clinton Keith Rd & Calle de Os	C	21.5	0.914	C	21.5	0.914	+ 0.000 D/V
# 43 Jefferson Ave & Lemon St	B	18.2	0.798	B	18.2	0.798	+ 0.000 D/V
# 44 Jefferson Ave & Kalmia St	D	43.2	0.971	D	43.2	0.971	+ 0.000 D/V
# 45 Jefferson Ave & Juniper St	B	15.5	0.613	B	15.5	0.613	+ 0.000 D/V
# 46 Jefferson Ave & Ivy St/Los Ala	C	24.1	0.642	C	24.1	0.642	+ 0.000 D/V
# 48 Madison Ave/I-15 SB Ramps & Ka	C	29.0	0.533	C	29.0	0.533	+ 0.000 D/V
# 50 Hancock Ave & Murrieta Hot Spr	B	17.7	0.755	B	17.7	0.755	+ 0.000 D/V
# 51 Alta Murrieta Dr & Murrieta Ho	C	23.7	0.593	C	23.7	0.593	+ 0.000 D/V
# 52 Winchester Road - SR-79 & Murr	F	90.6	1.304	F	90.6	1.304	+ 0.000 D/V
# 53 Hancock Ave & Los Alamos Rd	E	64.0	1.085	E	64.0	1.085	+ 0.000 D/V
# 54 I-215 SB Ramps & Los Alamos Rd	E	58.3	1.051	E	58.3	1.051	+ 0.000 D/V
# 55 I-215 NB Ramps & Los Alamos Rd	C	26.1	0.820	C	26.1	0.820	+ 0.000 D/V
# 56 Whitewood Rd & Los Alamos Rd	C	26.5	0.671	C	26.5	0.671	+ 0.000 D/V
# 57 Whitewood Rd & Murrieta Hot Sp	C	27.8	0.785	C	27.8	0.785	+ 0.000 D/V
# 59 Nutmeg St & Clinton Keith Rd	E	60.8	1.059	E	60.8	1.059	+ 0.000 D/V
# 60 Murrieta Oaks Ave-Mitchell Rd	B	14.6	0.795	B	14.6	0.795	+ 0.000 D/V
# 61 I-215 SB Ramps & Scott Rd	A	7.3	0.223	A	7.3	0.223	+ 0.000 D/V

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City of Murrieta General Plan
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Intersection	Base LOS	Del/ Veh	V/ C	Future LOS	Del/ Veh	V/ C	Change in
# 62 I-215 NB Ramps & Scott Rd	B	15.9	0.371	B	15.9	0.371	+ 0.000 D/V
#102 Leon Road & Scott Road	C	28.5	0.707	C	28.5	0.707	+ 0.000 D/V
#104 Antelope Road & Keller Road	E	66.4	1.120	E	66.4	1.120	+ 0.000 D/V
#105 Menifee Road - Meadowlark Road	C	30.6	0.790	C	30.6	0.790	+ 0.000 D/V
#107 Leon Road & Keller Road	B	16.6	0.307	B	16.6	0.307	+ 0.000 D/V
#108 Winchester Road - SR-79 & Kell	A	1.4	0.525	A	1.4	0.525	+ 0.000 D/V
#112 Leon Road & Jean Nicholas	C	23.0	0.342	C	23.0	0.342	+ 0.000 D/V
#122 Meadowlark Lane - Whitewood Ro	D	54.9	1.009	D	54.9	1.009	+ 0.000 D/V
#138 Jefferson Avenue & Cherry Stre	C	21.0	0.724	C	21.0	0.724	+ 0.000 D/V
#141 Jefferson Ave & Nutmeg St	D	52.0	0.993	D	52.0	0.993	+ 0.000 D/V
#142 Jefferson Ave & Magnolia St	B	10.4	0.665	B	10.4	0.665	+ 0.000 D/V
#149 Monroe Ave & Murrieta Hot Spri	A	7.9	0.327	A	7.9	0.327	+ 0.000 D/V
#158 Adams Ave & Guava St	B	11.5	0.293	B	11.5	0.293	+ 0.000 D/V

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City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #1 Menifee Road & Scott Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.939
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 47.3
Optimal Cycle: 180 Level Of Service: D

Street Name:	Menifee Rd						Scott Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	280	408	428	238	638	89	99	499	248	719	508	258
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	280	408	428	238	638	89	99	499	248	719	508	258
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	280	408	428	238	638	89	99	499	248	719	508	258
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	280	408	428	238	638	89	99	499	248	719	508	258
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	280	408	428	238	638	89	99	499	248	719	508	258
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	280	408	428	238	638	89	99	499	248	719	508	258
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.88	0.88	0.95	0.93	0.93	0.95	0.86	0.86	0.95	0.86	0.86
Lanes:	1.00	1.00	1.00	1.00	1.76	0.24	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1805	1666	1666	1805	3111	434	1805	3292	1636	1805	3282	1641
Capacity Analysis Module:												
Vol/Sat:	0.16	0.24	0.26	0.13	0.21	0.21	0.05	0.15	0.15	0.40	0.15	0.16
Crit Moves:			****	****				****		****		
Green/Cycle:	0.18	0.27	0.27	0.14	0.24	0.24	0.15	0.16	0.16	0.42	0.43	0.43
Volume/Cap:	0.87	0.89	0.94	0.94	0.87	0.87	0.36	0.94	0.94	0.94	0.36	0.36
Delay/Veh:	61.5	46.0	52.7	82.6	46.5	46.5	38.9	60.1	60.1	46.7	19.0	19.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	61.5	46.0	52.7	82.6	46.5	46.5	38.9	60.1	60.1	46.7	19.0	19.1
LOS by Move:	E	D	D	F	D	D	D	E	E	D	B	B
HCM2kAvgQ:	11	16	18	11	14	14	3	12	12	26	6	6

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #3 Winchester Road/SR-79 & Scott Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.525
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 177.0
Optimal Cycle: 180 Level Of Service: F

Street Name:	Winchester Road/SR-79						Scott Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0	2	1 0	1 0	2	1 0	1 0	2	1 0	1 0	2	1 0
Volume Module:												
Base Vol:	118	1449	54	935	2477	74	113	174	63	16	157	984
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	118	1449	54	935	2477	74	113	174	63	16	157	984
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	118	1449	54	935	2477	74	113	174	63	16	157	984
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	118	1449	54	935	2477	74	113	174	63	16	157	984
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	118	1449	54	935	2477	74	113	174	63	16	157	984
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	118	1449	54	935	2477	74	113	174	63	16	157	984
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.91	0.91	0.95	0.87	0.87	0.95	0.79	0.79
Lanes:	1.00	2.89	0.11	1.00	2.91	0.09	1.00	2.20	0.80	1.00	2.00	1.00
Final Sat.:	1805	4976	185	1805	5016	150	1805	3656	1324	1805	3012	1506
Capacity Analysis Module:												
Vol/Sat:	0.07	0.29	0.29	0.52	0.49	0.49	0.06	0.05	0.05	0.01	0.05	0.65
Crit Moves:		****		****			****					****
Green/Cycle:	0.06	0.19	0.19	0.34	0.47	0.47	0.04	0.40	0.40	0.07	0.43	0.43
Volume/Cap:	1.05	1.53	1.53	1.53	1.05	1.05	1.53	0.12	0.12	0.12	0.12	1.53
Delay/Veh:	147.2	282	282.0	277.6	61.1	61.1	341.2	19.2	19.2	43.7	17.2	271.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	147.2	282	282.0	277.6	61.1	61.1	341.2	19.2	19.2	43.7	17.2	271.7
LOS by Move:	F	F	F	F	E	E	F	B	B	D	B	F
HCM2kAvgQ:	8	42	42	69	40	40	10	2	2	1	2	79

Note: Queue reported is the number of cars per lane.

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Intersection #6 Briggs Road & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.400
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 16.9
Optimal Cycle: 38 Level Of Service: B

Street Name:	Briggs Road						Keller Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0	1	1 0	1 0	1	1 0	1 0	1	1 0	1 0	1	1 0
Volume Module:												
Base Vol:	275	18	53	0	9	21	2	149	384	6	308	1
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	275	18	53	0	9	21	2	149	384	6	308	1
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	275	18	53	0	9	21	2	149	384	6	308	1
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	275	18	53	0	9	21	2	149	384	6	308	1
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	275	18	53	0	9	21	2	149	384	6	308	1
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	275	18	53	0	9	21	2	149	384	6	308	1
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.84	0.84	1.00	0.85	0.85	0.95	0.85	0.85	0.95	0.95	0.95
Lanes:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.99	0.01
Final Sat.:	1805	1603	1603	1900	1615	1615	1805	1610	1610	1805	3598	12
Capacity Analysis Module:												
Vol/Sat:	0.15	0.01	0.03	0.00	0.01	0.01	0.00	0.09	0.24	0.00	0.09	0.09
Crit Moves:	****				****				****	****		
Green/Cycle:	0.38	0.40	0.40	0.00	0.01	0.01	0.01	0.60	0.60	0.01	0.60	0.60
Volume/Cap:	0.40	0.03	0.08	0.00	0.40	0.93	0.14	0.16	0.40	0.40	0.14	0.14
Delay/Veh:	23.0	18.5	19.0	0.0	52.4	179.7	54.0	9.0	10.9	65.9	8.9	8.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	23.0	18.5	19.0	0.0	52.4	179.7	54.0	9.0	10.9	65.9	8.9	8.9
LOS by Move:	C	B	B	A	D	F	D	A	B	E	A	A
HCM2kAvgQ:	6	0	1	0	1	2	0	2	7	1	2	2

Note: Queue reported is the number of cars per lane.

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Intersection #9 Antelope Road & Golden City Drive - Baxter Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.519
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 16.8
Optimal Cycle: 30 Level Of Service: B

Street Name:	Antelope Road						Golden City Drive - Baxter Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	1	51	319	215	808	22	0	33	6	377	209	402
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	1	51	319	215	808	22	0	33	6	377	209	402
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	1	51	319	215	808	22	0	33	6	377	209	402
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	1	51	319	215	808	22	0	33	6	377	209	402
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	1	51	319	215	808	22	0	33	6	377	209	402
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	1	51	319	215	808	22	0	33	6	377	209	402
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.22	0.83	0.83	0.46	0.95	0.95	1.00	0.93	0.93	0.73	0.86	0.86
Lanes:	1.00	1.00	1.00	1.00	1.95	0.05	1.00	1.69	0.31	1.00	1.00	1.00
Final Sat.:	410	1572	1572	874	3500	95	1900	2984	543	1381	1626	1626
Capacity Analysis Module:												
Vol/Sat:	0.00	0.03	0.20	0.25	0.23	0.23	0.00	0.01	0.01	0.27	0.13	0.25
Crit Moves:				****						****		
Green/Cycle:	0.47	0.47	0.47	0.47	0.47	0.47	0.00	0.53	0.53	0.53	0.53	0.53
Volume/Cap:	0.01	0.07	0.43	0.52	0.49	0.49	0.00	0.02	0.02	0.52	0.24	0.47
Delay/Veh:	13.9	14.3	17.7	19.5	18.2	18.2	0.0	11.4	11.4	16.1	12.9	15.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	13.9	14.3	17.7	19.5	18.2	18.2	0.0	11.4	11.4	16.1	12.9	15.2
LOS by Move:	B	B	B	B	B	B	A	B	B	B	B	B
HCM2kAvgQ:	0	1	7	5	9	9	0	0	0	8	4	8

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
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Intersection #10 Whitewood Roa - /Meadowlark Road & Golden City Drive - Baxter R

Cycle (sec): 100 Critical Vol./Cap.(X): 0.921
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 37.0
Optimal Cycle: 180 Level Of Service: D

Street Name:	Whitewood Road - Meadowlark Road						Golden City Drive - Baxter Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	297	407	3	0	872	639	19	3	475	1	15	1
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	297	407	3	0	872	639	19	3	475	1	15	1
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	297	407	3	0	872	639	19	3	475	1	15	1
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	297	407	3	0	872	639	19	3	475	1	15	1
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	297	407	3	0	872	639	19	3	475	1	15	1
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	297	407	3	0	872	639	19	3	475	1	15	1
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.95	1.00	0.89	0.89	0.95	0.81	0.81	0.95	0.94	0.94
Lanes:	1.00	1.99	0.01	1.00	1.15	0.85	1.00	1.00	1.00	1.00	1.88	0.12
Final Sat.:	1805	3580	26	1900	1952	1430	1805	1536	1536	1805	3354	224
Capacity Analysis Module:												
Vol/Sat:	0.16	0.11	0.11	0.00	0.45	0.45	0.01	0.00	0.31	0.00	0.00	0.00
Crit Moves:	****				****				****	****		
Green/Cycle:	0.18	0.66	0.66	0.00	0.49	0.49	0.24	0.34	0.34	0.00	0.10	0.10
Volume/Cap:	0.92	0.17	0.17	0.00	0.92	0.92	0.04	0.01	0.92	0.92	0.04	0.04
Delay/Veh:	70.9	6.4	6.4	0.0	32.9	32.9	29.5	22.1	53.8	807.2	40.7	40.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	70.9	6.4	6.4	0.0	32.9	32.9	29.5	22.1	53.8	807.2	40.7	40.7
LOS by Move:	E	A	A	A	C	C	C	C	D	F	D	D
HCM2kAvgQ:	13	2	2	0	27	27	0	0	19	0	0	0

Note: Queue reported is the number of cars per lane.

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Intersection #11 Briggs Road & Baxter Road - Jean Nicholas

Cycle (sec): 100 Critical Vol./Cap.(X): 0.134
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 11.0
Optimal Cycle: 26 Level Of Service: B

Street Name:	Briggs Road						Baxter Road - Jean Nicholas					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0 1	1 0	1	0 2	0 0	0	0 0	0 0	1	0 0	0 1
Volume Module:												
Base Vol:	0	151	27	60	363	0	0	0	0	2	0	54
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	151	27	60	363	0	0	0	0	2	0	54
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	151	27	60	363	0	0	0	0	2	0	54
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	151	27	60	363	0	0	0	0	2	0	54
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	151	27	60	363	0	0	0	0	2	0	54
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	151	27	60	363	0	0	0	0	2	0	54
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.93	0.93	0.95	0.95	1.00	1.00	1.00	1.00	0.95	1.00	0.85
Lanes:	0.00	1.70	0.30	1.00	2.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00
Final Sat.:	0	2992	535	1805	3610	0	0	0	0	1805	0	1615
Capacity Analysis Module:												
Vol/Sat:	0.00	0.05	0.05	0.03	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Crit Moves:	****				****							****
Green/Cycle:	0.00	0.45	0.45	0.30	0.75	0.00	0.00	0.00	0.00	0.25	0.00	0.25
Volume/Cap:	0.00	0.11	0.11	0.11	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.13
Delay/Veh:	0.0	15.8	15.8	25.6	3.5	0.0	0.0	0.0	0.0	28.2	0.0	29.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	15.8	15.8	25.6	3.5	0.0	0.0	0.0	0.0	28.2	0.0	29.3
LOS by Move:	A	B	B	C	A	A	A	A	A	C	A	C
HCM2kAvgQ:	0	2	2	1	2	0	0	0	0	0	0	1

Note: Queue reported is the number of cars per lane.

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Intersection #13 Winchester Road - SR-79 & Nicholas - Skyview

Cycle (sec): 100 Critical Vol./Cap.(X): 0.796
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 18.8
Optimal Cycle: 112 Level Of Service: B

Street Name:	Winchester Road - SR-79						Nicholas - Skyview					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	134	1425	334	18	2705	26	35	297	138	123	322	173
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	134	1425	334	18	2705	26	35	297	138	123	322	173
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	134	1425	334	18	2705	26	35	297	138	123	322	173
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	134	1425	334	18	2705	26	35	297	138	123	322	173
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	134	1425	334	18	2705	26	35	297	138	123	322	173
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	134	1425	334	18	2705	26	35	297	138	123	322	173
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.88	0.88	0.95	0.91	0.91	0.95	0.90	0.90	0.95	0.90	0.90
Lanes:	1.00	2.43	0.57	1.00	2.97	0.03	1.00	1.37	0.63	1.00	1.30	0.70
Final Sat.:	1805	4084	957	1805	5132	49	1805	2346	1090	1805	2226	1196
Capacity Analysis Module:												
Vol/Sat:	0.07	0.35	0.35	0.01	0.53	0.53	0.02	0.13	0.13	0.07	0.14	0.14
Crit Moves:	****				****			****		****		
Green/Cycle:	0.09	0.73	0.73	0.02	0.66	0.66	0.03	0.16	0.16	0.09	0.22	0.22
Volume/Cap:	0.80	0.48	0.48	0.48	0.80	0.80	0.67	0.80	0.80	0.80	0.67	0.67
Delay/Veh:	67.0	5.5	5.5	57.5	13.4	13.4	77.0	48.5	48.5	69.1	38.4	38.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	67.0	5.5	5.5	57.5	13.4	13.4	77.0	48.5	48.5	69.1	38.4	38.4
LOS by Move:	E	A	A	E	B	B	E	D	D	E	D	D
HCM2kAvgQ:	6	8	8	1	23	23	2	9	9	6	8	8

Note: Queue reported is the number of cars per lane.

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Intersection #14 Antelope Road & Linnel Lane Extension

Cycle (sec): 100 Critical Vol./Cap.(X): 0.453
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 19.4
Optimal Cycle: 42 Level Of Service: B

Street Name:	Antelope Road						Linnel Lane Extension					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	23	400	60	37	522	364	65	197	137	18	258	220
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	23	400	60	37	522	364	65	197	137	18	258	220
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	23	400	60	37	522	364	65	197	137	18	258	220
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	23	400	60	37	522	364	65	197	137	18	258	220
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	23	400	60	37	522	364	65	197	137	18	258	220
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	23	400	60	37	522	364	65	197	137	18	258	220
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.93	0.93	0.95	0.89	0.89	0.95	0.89	0.89	0.95	0.88	0.88
Lanes:	1.00	1.74	0.26	1.00	1.18	0.82	1.00	1.18	0.82	1.00	1.08	0.92
Final Sat.:	1805	3079	462	1805	1995	1391	1805	1999	1390	1805	1814	1547
Capacity Analysis Module:												
Vol/Sat:	0.01	0.13	0.13	0.02	0.26	0.26	0.04	0.10	0.10	0.01	0.14	0.14
Crit Moves:	****				****		****				****	
Green/Cycle:	0.03	0.52	0.52	0.08	0.58	0.58	0.08	0.36	0.36	0.04	0.31	0.31
Volume/Cap:	0.45	0.25	0.25	0.25	0.45	0.45	0.45	0.28	0.28	0.28	0.45	0.45
Delay/Veh:	54.1	13.1	13.1	43.8	12.2	12.2	46.2	23.0	23.0	49.2	27.7	27.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	54.1	13.1	13.1	43.8	12.2	12.2	46.2	23.0	23.0	49.2	27.7	27.7
LOS by Move:	D	B	B	D	B	B	D	C	C	D	C	C
HCM2kAvgQ:	1	4	4	1	8	8	2	4	4	1	6	6

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #15 Whitewood Road - Meadowlark Road & Linnel Lane Extension

Cycle (sec): 100 Critical Vol./Cap.(X): 0.506
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 10.1
Optimal Cycle: 46 Level Of Service: B

Street Name:	Whitewood Road - Meadowlark Road						Linnel Lane Extension (Future)					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	28	665	5	3	813	454	97	13	184	1	14	16
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	28	665	5	3	813	454	97	13	184	1	14	16
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	28	665	5	3	813	454	97	13	184	1	14	16
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	28	665	5	3	813	454	97	13	184	1	14	16
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	28	665	5	3	813	454	97	13	184	1	14	16
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	28	665	5	3	813	454	97	13	184	1	14	16
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.95	0.95	0.90	0.90	0.95	0.82	0.82	0.95	0.87	0.87
Lanes:	1.00	1.99	0.01	1.00	1.28	0.72	1.00	1.00	1.00	1.00	1.00	1.00
Final Sat.:	1805	3579	27	1805	2191	1224	1805	1552	1552	1805	1661	1661
Capacity Analysis Module:												
Vol/Sat:	0.02	0.19	0.19	0.00	0.37	0.37	0.05	0.01	0.12	0.00	0.01	0.01
Crit Moves:	****				****				****	****		
Green/Cycle:	0.03	0.76	0.76	0.01	0.73	0.73	0.20	0.23	0.23	0.00	0.04	0.04
Volume/Cap:	0.51	0.25	0.25	0.25	0.51	0.51	0.27	0.04	0.51	0.51	0.24	0.27
Delay/Veh:	55.1	3.7	3.7	59.6	5.8	5.8	34.2	29.6	34.3	183.2	47.8	48.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	55.1	3.7	3.7	59.6	5.8	5.8	34.2	29.6	34.3	183.2	47.8	48.2
LOS by Move:	E	A	A	E	A	A	C	C	C	F	D	D
HCM2kAvgQ:	2	3	3	0	9	9	3	0	6	0	1	1

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #16 Leon Road & Max Gillis Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.873
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 38.0
Optimal Cycle: 179 Level Of Service: D

Street Name:	Leon Road						Max Gillis Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	2	0	1	2	0	1	1	0	2	0	1	0	1
Volume Module:												
Base Vol:	411	118	417	345	282	129	98	440	618	493	274	173
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	411	118	417	345	282	129	98	440	618	493	274	173
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	411	118	417	345	282	129	98	440	618	493	274	173
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	411	118	417	345	282	129	98	440	618	493	274	173
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	411	118	417	345	282	129	98	440	618	493	274	173
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	411	118	417	345	282	129	98	440	618	493	274	173
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.95	0.85	0.92	0.91	0.91	0.92	0.87	0.87	0.92	1.00	0.85
Lanes:	2.00	2.00	1.00	2.00	1.37	0.63	2.00	1.00	1.00	2.00	1.00	1.00
Final Sat.:	3502	3610	1615	3502	2361	1080	3502	1646	1646	3502	1900	1615
Capacity Analysis Module:												
Vol/Sat:	0.12	0.03	0.26	0.10	0.12	0.12	0.03	0.27	0.38	0.14	0.14	0.11
Crit Moves:			****	****					****	****		
Green/Cycle:	0.20	0.30	0.30	0.11	0.21	0.21	0.10	0.43	0.43	0.16	0.50	0.50
Volume/Cap:	0.58	0.11	0.87	0.87	0.58	0.58	0.29	0.62	0.87	0.87	0.29	0.22
Delay/Veh:	37.2	25.7	49.5	62.4	37.0	37.0	42.5	22.9	33.2	54.9	15.1	14.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	37.2	25.7	49.5	62.4	37.0	37.0	42.5	22.9	33.2	54.9	15.1	14.4
LOS by Move:	D	C	D	E	D	D	D	C	C	D	B	B
HCM2kAvgQ:	7	1	15	8	7	7	2	12	21	11	5	3

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #17 Winchester Road - SR-79 & Max Gillis - Thompson

Cycle (sec): 100 Critical Vol./Cap.(X): 0.762
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 25.1
Optimal Cycle: 96 Level Of Service: C

Street Name:	Winchester Road - SR-79									Max Gillis - Thompson					
Approach:	North Bound			South Bound			East Bound			West Bound					
Movement:	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected					
Rights:	Include			Include			Include			Include					
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	2	1	0	1	0	3	0	1	2	0	2	0	1	1	0	1	1	0
Volume Module:															
Base Vol:	152	1324	38	127	2110	604	622	137	245	34	279	50			
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Initial Bse:	152	1324	38	127	2110	604	622	137	245	34	279	50			
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0			
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0			
Initial Fut:	152	1324	38	127	2110	604	622	137	245	34	279	50			
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
PHF Volume:	152	1324	38	127	2110	604	622	137	245	34	279	50			
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0			
Reduced Vol:	152	1324	38	127	2110	604	622	137	245	34	279	50			
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
FinalVolume:	152	1324	38	127	2110	604	622	137	245	34	279	50			
Saturation Flow Module:															
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900			
Adjustment:	0.95	0.91	0.91	0.95	0.91	0.85	0.92	0.95	0.85	0.95	0.93	0.93			
Lanes:	1.00	2.92	0.08	1.00	3.00	1.00	2.00	2.00	1.00	1.00	1.70	0.30			
Final Sat.:	1805	5022	144	1805	5187	1615	3502	3610	1615	1805	2991	536			
Capacity Analysis Module:															
Vol/Sat:	0.08	0.26	0.26	0.07	0.41	0.37	0.18	0.04	0.15	0.02	0.09	0.09			
Crit Moves:	****				****		****				****				
Green/Cycle:	0.11	0.51	0.51	0.14	0.53	0.53	0.23	0.32	0.32	0.04	0.12	0.12			
Volume/Cap:	0.76	0.52	0.52	0.52	0.76	0.70	0.76	0.12	0.48	0.48	0.76	0.76			
Delay/Veh:	59.0	16.6	16.6	42.1	19.6	19.9	40.0	24.3	28.3	52.1	50.3	50.3			
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
AdjDel/Veh:	59.0	16.6	16.6	42.1	19.6	19.9	40.0	24.3	28.3	52.1	50.3	50.3			
LOS by Move:	E	B	B	D	B	B	D	C	C	D	D	D			
HCM2kAvgQ:	6	10	10	4	20	15	11	2	6	2	7	7			

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #18 California Oaks Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.998
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 32.7
Optimal Cycle: 180 Level Of Service: C

Street Name:	California Oaks Road									Clinton Keith Road								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected					Protected				
Rights:	Ovl					Include					Include					Include				
Min. Green:	0	0	0			0	0	0			0	0	0			0	0	0		
Lanes:	1	0	0	0	2	0	0	0	0	0	0	0	2	1	0	1	0	3	0	0
Volume Module:																				
Base Vol:	216	0	542			0	0	0			0	2182	298			706	1680	0		
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Initial Bse:	216	0	542			0	0	0			0	2182	298			706	1680	0		
Added Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
PasserByVol:	0	0	0			0	0	0			0	0	0			0	0	0		
Initial Fut:	216	0	542			0	0	0			0	2182	298			706	1680	0		
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Volume:	216	0	542			0	0	0			0	2182	298			706	1680	0		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
Reduced Vol:	216	0	542			0	0	0			0	2182	298			706	1680	0		
PCE Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
MLF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
FinalVolume:	216	0	542			0	0	0			0	2182	298			706	1680	0		
Saturation Flow Module:																				
Sat/Lane:	1900	1900	1900			1900	1900	1900			1900	1900	1900			1900	1900	1900		
Adjustment:	0.95	1.00	0.75			1.00	1.00	1.00			1.00	0.89	0.89			0.95	0.91	1.00		
Lanes:	1.00	0.00	2.00			0.00	0.00	0.00			0.00	2.64	0.36			1.00	3.00	0.00		
Final Sat.:	1805	0	2842			0	0	0			0	4482	612			1805	5187	0		
Capacity Analysis Module:																				
Vol/Sat:	0.12	0.00	0.19			0.00	0.00	0.00			0.00	0.49	0.49			0.39	0.32	0.00		
Crit Moves:	****											****				****				
Green/Cycle:	0.12	0.00	0.51			0.00	0.00	0.00			0.00	0.49	0.49			0.39	0.88	0.00		
Volume/Cap:	1.00	0.00	0.37			0.00	0.00	0.00			0.00	1.00	1.00			1.00	0.37	0.00		
Delay/Veh:	104.5	0.0	14.9			0.0	0.0	0.0			0.0	43.0	43.0			63.6	1.1	0.0		
User DelAdj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
AdjDel/Veh:	104.5	0.0	14.9			0.0	0.0	0.0			0.0	43.0	43.0			63.6	1.1	0.0		
LOS by Move:	F		A			B		A			A	D	D			E	A	A		
HCM2kAvgQ:	11		0			6		0			0	36	36			29	4	0		

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #19 I-215 SB Off-Ramp & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.564
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 8.2
Optimal Cycle: 52 Level Of Service: A

Street Name:	I-215 SB Off-Ramp									Clinton Keith Road								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Split Phase					Split Phase					Protected					Protected				
Rights:	Include					Include					Include					Ignore				
Min. Green:	0	0	0			0	0	0			0	0	0			0	0	0		
Lanes:	0	0	0	0	0	0	1	0	0	2	0	0	3	0	1	0	0	3	0	1
Volume Module:																				
Base Vol:	0	0	0			57	0	417			0	2167	509			0	1860	225		
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Initial Bse:	0	0	0			57	0	417			0	2167	509			0	1860	225		
Added Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
PasserByVol:	0	0	0			0	0	0			0	0	0			0	0	0		
Initial Fut:	0	0	0			57	0	417			0	2167	509			0	1860	225		
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	0.00		
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	0.00		
PHF Volume:	0	0	0			57	0	417			0	2167	509			0	1860	0		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
Reduced Vol:	0	0	0			57	0	417			0	2167	509			0	1860	0		
PCE Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	0.00		
MLF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	0.00		
FinalVolume:	0	0	0			57	0	417			0	2167	509			0	1860	0		
Saturation Flow Module:																				
Sat/Lane:	1900	1900	1900			1900	1900	1900			1900	1900	1900			1900	1900	1900		
Adjustment:	1.00	1.00	1.00			0.95	1.00	0.75			1.00	0.91	0.85			1.00	0.91	1.00		
Lanes:	0.00	0.00	0.00			1.00	0.00	2.00			0.00	3.00	1.00			0.00	3.00	1.00		
Final Sat.:	0	0	0			1809	0	2842			0	5187	1615			0	5187	1900		
Capacity Analysis Module:																				
Vol/Sat:	0.00	0.00	0.00			0.03	0.00	0.15			0.00	0.42	0.32			0.00	0.36	0.00		
Crit Moves:								****				****				****				
Green/Cycle:	0.00	0.00	0.00			0.26	0.00	0.26			0.00	0.74	0.74			0.00	0.74	0.00		
Volume/Cap:	0.00	0.00	0.00			0.12	0.00	0.56			0.00	0.56	0.43			0.00	0.48	0.00		
Delay/Veh:	0.0	0.0	0.0			28.4	0.0	33.1			0.0	6.0	5.2			0.0	5.4	0.0		
User DelAdj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
AdjDel/Veh:	0.0	0.0	0.0			28.4	0.0	33.1			0.0	6.0	5.2			0.0	5.4	0.0		
LOS by Move:	A		A			C		A			A	A	A			A	A	A		
HCM2kAvgQ:	0		0			1		7			0	11	6			0	9	0		

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #20 I-215 NB Off Ramp & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.175
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 83.2
Optimal Cycle: 180 Level Of Service: F

Street Name:	I-215 NB Off Ramp						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0	0	0 1	0	0 0	0 0	0	0 3	0 1	0	0 3	0 1
Volume Module:												
Base Vol:	122	0	1233	0	0	0	0	1555	302	0	2136	265
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	122	0	1233	0	0	0	0	1555	302	0	2136	265
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	122	0	1233	0	0	0	0	1555	302	0	2136	265
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
PHF Volume:	122	0	1233	0	0	0	0	1555	302	0	2136	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	122	0	1233	0	0	0	0	1555	302	0	2136	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
FinalVolume:	122	0	1233	0	0	0	0	1555	302	0	2136	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	1.00	1.00	1.00	1.00	0.91	0.85	1.00	0.91	1.00
Lanes:	1.00	0.00	1.00	0.00	0.00	0.00	0.00	3.00	1.00	0.00	3.00	1.00
Final Sat.:	1805	0	1615	0	0	0	0	5187	1615	0	5187	1900
Capacity Analysis Module:												
Vol/Sat:	0.07	0.00	0.76	0.00	0.00	0.00	0.00	0.30	0.19	0.00	0.41	0.00
Crit Moves:			****				****				****	
Green/Cycle:	0.65	0.00	0.65	0.00	0.00	0.00	0.00	0.35	0.35	0.00	0.35	0.00
Volume/Cap:	0.10	0.00	1.18	0.00	0.00	0.00	0.00	0.86	0.53	0.00	1.18	0.00
Delay/Veh:	6.6	0.0	106.6	0.0	0.0	0.0	0.0	34.4	26.9	0.0	118	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	6.6	0.0	106.6	0.0	0.0	0.0	0.0	34.4	26.9	0.0	118	0.0
LOS by Move:	A	A	F	A	A	A	A	C	C	A	F	A
HCM2kAvgQ:	1	0	63	0	0	0	0	19	8	0	41	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #21 Antelope Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.385
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 4.3
Optimal Cycle: 37 Level Of Service: A

Street Name:	Antelope Road						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ignore			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	0	0 0	2	0 0	0 2	2	0 3	0 0	0	0 2	1 0
Volume Module:												
Base Vol:	0	0	0	26	0	514	253	1768	0	0	1308	238
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	26	0	514	253	1768	0	0	1308	238
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	26	0	514	253	1768	0	0	1308	238
User Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	26	0	0	253	1768	0	0	1308	238
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	26	0	0	253	1768	0	0	1308	238
PCE Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	26	0	0	253	1768	0	0	1308	238
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.92	1.00	0.88	0.92	0.91	1.00	1.00	0.89	0.89
Lanes:	0.00	0.00	0.00	2.00	0.00	2.00	2.00	3.00	0.00	0.00	2.54	0.46
Final Sat.:	0	0	0	3502	0	3344	3502	5187	0	0	4288	780
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.01	0.00	0.00	0.07	0.34	0.00	0.00	0.31	0.31
Crit Moves:				****			****				****	
Green/Cycle:	0.00	0.00	0.00	0.02	0.00	0.00	0.19	0.98	0.00	0.00	0.79	0.79
Volume/Cap:	0.00	0.00	0.00	0.38	0.00	0.00	0.38	0.35	0.00	0.00	0.38	0.38
Delay/Veh:	0.0	0.0	0.0	52.1	0.0	0.0	35.9	0.1	0.0	0.0	3.1	3.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	52.1	0.0	0.0	35.9	0.1	0.0	0.0	3.1	3.1
LOS by Move:	A	A	A	D	A	A	D	A	A	A	A	A
HCM2kAvgQ:	0	0	0	1	0	0	4	1	0	0	5	5

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #23 Liberty Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.486
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 2.5
Optimal Cycle: 44 Level Of Service: A

Street Name:	Liberty Road						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	0	0	1	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	14	0	72	0	0	0	0	1998	169	34	1999	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	14	0	72	0	0	0	0	1998	169	34	1999	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	14	0	72	0	0	0	0	1998	169	34	1999	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	14	0	72	0	0	0	0	1998	169	34	1999	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	14	0	72	0	0	0	0	1998	169	34	1999	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	14	0	72	0	0	0	0	1998	169	34	1999	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.85	1.00	1.00	1.00	1.00	0.90	0.90	0.95	0.91	1.00
Lanes:	2.00	0.00	1.00	0.00	0.00	0.00	0.00	2.77	0.23	1.00	3.00	0.00
Final Sat.:	3502	0	1615	0	0	0	0	4725	400	1805	5187	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.42	0.42	0.02	0.39	0.00
Crit Moves:			****					****		****		
Green/Cycle:	0.09	0.00	0.09	0.00	0.00	0.00	0.00	0.87	0.87	0.04	0.91	0.00
Volume/Cap:	0.04	0.00	0.49	0.00	0.00	0.00	0.00	0.49	0.49	0.49	0.42	0.00
Delay/Veh:	41.5	0.0	45.7	0.0	0.0	0.0	0.0	1.6	1.6	52.3	0.7	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	41.5	0.0	45.7	0.0	0.0	0.0	0.0	1.6	1.6	52.3	0.7	0.0
LOS by Move:	D	A	D	A	A	A	A	A	A	D	A	A
HCM2kAvgQ:	0	0	3	0	0	0	0	6	6	2	4	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #24 Leon Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.736
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 19.3
Optimal Cycle: 86 Level Of Service: B

Street Name:	Leon Road						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ovl			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	1	0	0	0	2	0	0
Volume Module:												
Base Vol:	0	0	0	127	0	1180	461	1597	0	0	669	518
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	127	0	1180	461	1597	0	0	669	518
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	127	0	1180	461	1597	0	0	669	518
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	127	0	1180	461	1597	0	0	669	518
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	127	0	1180	461	1597	0	0	669	518
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	127	0	1180	461	1597	0	0	669	518
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.95	1.00	0.75	0.92	0.91	1.00	1.00	0.91	0.85
Lanes:	0.00	0.00	0.00	1.00	0.00	2.00	2.00	3.00	0.00	0.00	3.00	1.00
Final Sat.:	0	0	0	1805	0	2842	3502	5187	0	0	5187	1615
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.07	0.00	0.42	0.13	0.31	0.00	0.00	0.13	0.32
Crit Moves:						****	****					****
Green/Cycle:	0.00	0.00	0.00	0.39	0.00	0.56	0.18	0.61	0.00	0.00	0.44	0.44
Volume/Cap:	0.00	0.00	0.00	0.18	0.00	0.74	0.74	0.50	0.00	0.00	0.30	0.74
Delay/Veh:	0.0	0.0	0.0	20.5	0.0	18.1	43.4	10.8	0.0	0.0	18.3	27.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	20.5	0.0	18.1	43.4	10.8	0.0	0.0	18.3	27.5
LOS by Move:	A	A	A	C	A	B	D	B	A	A	B	C
HCM2kAvgQ:	0	0	0	3	0	16	9	10	0	0	5	14

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #25 Winchester Road - SR-79 & Benton Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.989
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 41.0
Optimal Cycle: 180 Level Of Service: D

Street Name:	Winchester Road - SR-79						Benton Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 3	0 1	2	0 3	0 1	2	0 2	0 2	2	0 2	0 1
Volume Module:												
Base Vol:	431	1337	332	86	1977	353	45	502	1122	316	514	30
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	431	1337	332	86	1977	353	45	502	1122	316	514	30
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	431	1337	332	86	1977	353	45	502	1122	316	514	30
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	431	1337	332	86	1977	353	45	502	1122	316	514	30
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	431	1337	332	86	1977	353	45	502	1122	316	514	30
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	431	1337	332	86	1977	353	45	502	1122	316	514	30
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.91	0.85	0.92	0.91	0.85	0.92	0.95	0.75	0.92	0.95	0.85
Lanes:	2.00	3.00	1.00	2.00	3.00	1.00	2.00	2.00	2.00	2.00	2.00	1.00
Final Sat.:	3502	5187	1615	3502	5187	1615	3502	3610	2842	3502	3610	1615
Capacity Analysis Module:												
Vol/Sat:	0.12	0.26	0.21	0.02	0.38	0.22	0.01	0.14	0.39	0.09	0.14	0.02
Crit Moves:	****				****				****	****		
Green/Cycle:	0.12	0.47	0.47	0.04	0.39	0.39	0.04	0.40	0.40	0.09	0.45	0.45
Volume/Cap:	0.99	0.55	0.44	0.55	0.99	0.57	0.32	0.35	0.99	0.99	0.32	0.04
Delay/Veh:	83.9	19.5	18.4	51.1	48.1	25.4	47.9	21.1	53.9	92.7	17.8	15.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	83.9	19.5	18.4	51.1	48.1	25.4	47.9	21.1	53.9	92.7	17.8	15.5
LOS by Move:	F	B	B	D	D	C	D	C	D	F	B	B
HCM2kAvgQ:	11	11	7	2	29	9	1	6	26	9	5	1

Note: Queue reported is the number of cars per lane.

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Intersection #26 Winchester Road - SR-79 & Via Mira Mosa

Cycle (sec): 100 Critical Vol./Cap.(X): 0.918
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 24.1
Optimal Cycle: 180 Level Of Service: C

Street Name:	Winchester Road - SR-79						Via Mira Mosa					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 0	1 0	1	0 0	1 0
Volume Module:												
Base Vol:	27	1572	841	331	2662	228	349	51	91	176	19	30
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	27	1572	841	331	2662	228	349	51	91	176	19	30
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	27	1572	841	331	2662	228	349	51	91	176	19	30
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	27	1572	841	331	2662	228	349	51	91	176	19	30
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	27	1572	841	331	2662	228	349	51	91	176	19	30
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	27	1572	841	331	2662	228	349	51	91	176	19	30
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.86	0.86	0.95	0.90	0.90	0.95	0.90	0.90	0.95	0.91	0.91
Lanes:	1.00	2.00	1.00	1.00	2.76	0.24	1.00	0.36	0.64	1.00	0.39	0.61
Final Sat.:	1805	3278	1639	1805	4720	404	1805	617	1101	1805	669	1056
Capacity Analysis Module:												
Vol/Sat:	0.01	0.48	0.51	0.18	0.56	0.56	0.19	0.08	0.08	0.10	0.03	0.03
Crit Moves:			****	****			****				****	
Green/Cycle:	0.02	0.56	0.56	0.20	0.74	0.74	0.21	0.11	0.11	0.13	0.03	0.03
Volume/Cap:	0.76	0.86	0.92	0.92	0.76	0.76	0.92	0.75	0.75	0.75	0.92	0.92
Delay/Veh:	113.1	21.6	25.8	67.0	8.8	8.8	65.4	58.0	58.0	54.1	142	141.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	113.1	21.6	25.8	67.0	8.8	8.8	65.4	58.0	58.0	54.1	142	141.5
LOS by Move:	F	C	C	E	A	A	E	E	E	D	F	F
HCM2kAvgQ:	2	25	30	14	21	21	14	6	6	7	4	4

Note: Queue reported is the number of cars per lane.

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Intersection #27 Monroe Ave & Los Alamos

Cycle (sec): 100 Critical Vol./Cap.(X): 0.550
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 23.9
Optimal Cycle: 51 Level Of Service: C

Street Name:	Monroe Ave						Los Alamos					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	2	0 2	0 1	1	0 1	1 0	1	0 2	0 1
Volume Module:												
Base Vol:	27	206	176	515	446	194	42	321	127	62	959	438
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	27	206	176	515	446	194	42	321	127	62	959	438
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	27	206	176	515	446	194	42	321	127	62	959	438
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	27	206	176	515	446	194	42	321	127	62	959	438
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	27	206	176	515	446	194	42	321	127	62	959	438
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	27	206	176	515	446	194	42	321	127	62	959	438
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.88	0.88	0.92	0.95	0.85	0.95	0.91	0.91	0.95	0.95	0.85
Lanes:	1.00	1.08	0.92	2.00	2.00	1.00	1.00	1.43	0.57	1.00	2.00	1.00
Final Sat.:	1805	1812	1548	3502	3610	1615	1805	2478	980	1805	3610	1615
Capacity Analysis Module:												
Vol/Sat:	0.01	0.11	0.11	0.15	0.12	0.12	0.02	0.13	0.13	0.03	0.27	0.27
Crit Moves:		****		****			****				****	
Green/Cycle:	0.05	0.21	0.21	0.27	0.42	0.42	0.04	0.42	0.42	0.11	0.48	0.48
Volume/Cap:	0.29	0.55	0.55	0.55	0.29	0.28	0.55	0.31	0.31	0.31	0.55	0.56
Delay/Veh:	47.4	36.4	36.4	32.1	19.1	19.1	55.2	19.8	19.8	41.9	18.6	19.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	47.4	36.4	36.4	32.1	19.1	19.1	55.2	19.8	19.8	41.9	18.6	19.2
LOS by Move:	D	D	D	C	B	B	E	B	B	D	B	B
HCM2kAvgQ:	1	6	6	8	5	4	2	5	5	2	11	10

Note: Queue reported is the number of cars per lane.

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Intersection #28 Jefferson Avenue & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.347
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 116.4
Optimal Cycle: 180 Level Of Service: F

Street Name:	Jefferson Avenue						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 3	0 1	1	0 2	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	13	981	579	815	1199	75	13	82	24	931	99	699
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	13	981	579	815	1199	75	13	82	24	931	99	699
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	13	981	579	815	1199	75	13	82	24	931	99	699
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	13	981	579	815	1199	75	13	82	24	931	99	699
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	13	981	579	815	1199	75	13	82	24	931	99	699
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	13	981	579	815	1199	75	13	82	24	931	99	699
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.85	0.95	0.90	0.90	0.95	0.88	0.88	0.95	0.79	0.79
Lanes:	1.00	3.00	1.00	1.00	2.82	0.18	1.00	2.32	0.68	1.00	2.00	1.00
Final Sat.:	1805	5187	1615	1805	4838	303	1805	3876	1134	1805	3005	1503
Capacity Analysis Module:												
Vol/Sat:	0.01	0.19	0.36	0.45	0.25	0.25	0.01	0.02	0.02	0.52	0.03	0.47
Crit Moves:			****	****				****		****		
Green/Cycle:	0.02	0.27	0.27	0.34	0.58	0.58	0.01	0.02	0.02	0.38	0.39	0.39
Volume/Cap:	0.42	0.71	1.35	1.35	0.42	0.42	1.19	1.35	1.35	1.35	0.08	1.19
Delay/Veh:	57.9	35.0	207.7	200.2	11.6	11.6	390.1	269	268.6	196.5	19.1	128.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	57.9	35.0	207.7	200.2	11.6	11.6	390.1	269	268.6	196.5	19.1	128.2
LOS by Move:	E	C	F	F	B	B	F	F	F	F	B	F
HCM2kAvgQ:	1	11	38	52	8	8	2	4	4	59	1	41

Note: Queue reported is the number of cars per lane.

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Intersection #29 Madison Avenue & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.635
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 26.2
Optimal Cycle: 63 Level Of Service: C

Street Name:	Madison Avenue						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 2	0 1	2	0 1	1 0	2	0 3	1 0	2	0 3	0 1
Volume Module:												
Base Vol:	140	79	322	150	144	141	140	1141	260	647	1759	79
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	140	79	322	150	144	141	140	1141	260	647	1759	79
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	140	79	322	150	144	141	140	1141	260	647	1759	79
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	140	79	322	150	144	141	140	1141	260	647	1759	79
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	140	79	322	150	144	141	140	1141	260	647	1759	79
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	140	79	322	150	144	141	140	1141	260	647	1759	79
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.95	0.85	0.92	0.88	0.88	0.92	0.88	0.88	0.92	0.91	0.85
Lanes:	2.00	2.00	1.00	2.00	1.01	0.99	2.00	3.26	0.74	2.00	3.00	1.00
Final Sat.:	3502	3610	1615	3502	1689	1654	3502	5475	1248	3502	5187	1615
Capacity Analysis Module:												
Vol/Sat:	0.04	0.02	0.20	0.04	0.09	0.09	0.04	0.21	0.21	0.18	0.34	0.05
Crit Moves:			****	****				****		****		
Green/Cycle:	0.12	0.31	0.31	0.07	0.26	0.26	0.07	0.33	0.33	0.29	0.55	0.55
Volume/Cap:	0.33	0.07	0.64	0.64	0.33	0.33	0.61	0.64	0.64	0.64	0.61	0.09
Delay/Veh:	40.6	24.1	32.1	51.0	30.2	30.2	50.4	29.1	29.1	32.2	15.5	10.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	40.6	24.1	32.1	51.0	30.2	30.2	50.4	29.1	29.1	32.2	15.5	10.5
LOS by Move:	D	C	C	D	C	C	D	C	C	C	B	B
HCM2kAvgQ:	2	1	9	3	4	4	3	11	11	10	14	1

Note: Queue reported is the number of cars per lane.

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Intersection #30 I-15 SB Off-Ramp & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.709
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 16.0
Optimal Cycle: 78 Level Of Service: B

Street Name:	I-15 SB Off-Ramp						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0 0	0 0	1	0 1!	0 1	0	0 3	0 1	0	0 3	0 1
Volume Module:												
Base Vol:	0	0	0	813	0	394	0	1348	225	0	2235	47
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	813	0	394	0	1348	225	0	2235	47
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	813	0	394	0	1348	225	0	2235	47
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	0	0	0	813	0	394	0	1348	0	0	2235	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	813	0	394	0	1348	0	0	2235	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	0	0	0	813	0	394	0	1348	0	0	2235	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.91	1.00	1.00	0.91	1.00
Lanes:	0.00	0.00	0.00	1.67	0.00	1.33	0.00	3.00	1.00	0.00	3.00	1.00
Final Sat.:	0	0	0	2924	0	2318	0	5187	1900	0	5187	1900
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.28	0.00	0.17	0.00	0.26	0.00	0.00	0.43	0.00
Crit Moves:				****			****				****	
Green/Cycle:	0.00	0.00	0.00	0.39	0.00	0.39	0.00	0.61	0.00	0.00	0.61	0.00
Volume/Cap:	0.00	0.00	0.00	0.71	0.00	0.43	0.00	0.43	0.00	0.00	0.71	0.00
Delay/Veh:	0.0	0.0	0.0	27.0	0.0	22.4	0.0	10.5	0.0	0.0	14.3	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	27.0	0.0	22.4	0.0	10.5	0.0	0.0	14.3	0.0
LOS by Move:	A	A	A	C	A	C	A	B	A	A	B	A
HCM2kAvgQ:	0	0	0	14	0	7	0	8	0	0	18	0

Note: Queue reported is the number of cars per lane.

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Intersection #31 I-15 NB Off-Ramp & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.390
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 5.8
Optimal Cycle: 37 Level Of Service: A

Street Name:	I-15 NB Off-Ramp						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 0	0 1	0	0 0	0 0	0	0 4	0 1	0	0 4	0 1
Volume Module:												
Base Vol:	281	0	73	0	0	0	0	2144	181	0	1455	627
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	281	0	73	0	0	0	0	2144	181	0	1455	627
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	281	0	73	0	0	0	0	2144	181	0	1455	627
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	281	0	73	0	0	0	0	2144	0	0	1455	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	281	0	73	0	0	0	0	2144	0	0	1455	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	281	0	73	0	0	0	0	2144	0	0	1455	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.85	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Lanes:	2.00	0.00	1.00	0.00	0.00	0.00	0.00	4.00	1.00	0.00	4.00	1.00
Final Sat.:	3502	0	1615	0	0	0	0	6916	1900	0	6916	1900
Capacity Analysis Module:												
Vol/Sat:	0.08	0.00	0.05	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.21	0.00
Crit Moves:	****							****		****		
Green/Cycle:	0.21	0.00	0.21	0.00	0.00	0.00	0.00	0.79	0.00	0.00	0.79	0.00
Volume/Cap:	0.39	0.00	0.22	0.00	0.00	0.00	0.00	0.39	0.00	0.00	0.26	0.00
Delay/Veh:	34.7	0.0	33.4	0.0	0.0	0.0	0.0	3.1	0.0	0.0	2.7	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	34.7	0.0	33.4	0.0	0.0	0.0	0.0	3.1	0.0	0.0	2.7	0.0
LOS by Move:	C	A	C	A	A	A	A	A	A	A	A	A
HCM2kAvgQ:	4	0	2	0	0	0	0	6	0	0	3	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #32 I-215 SB Off-Ramp & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.690
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 12.4
Optimal Cycle: 60 Level Of Service: B

Street Name:	I-215 SB Off-Ramp						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0 0	0 0	1	0	1! 0	1	0	3	0	3	0 1
Volume Module:												
Base Vol:	0	0	0	541	0	438	0	1944	53	0	2529	378
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	541	0	438	0	1944	53	0	2529	378
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	541	0	438	0	1944	53	0	2529	378
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	0	0	0	541	0	438	0	1944	0	0	2529	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	541	0	438	0	1944	0	0	2529	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	0	0	0	541	0	438	0	1944	0	0	2529	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.91	1.00	0.91	1.00	0.91	1.00	1.00	0.91	1.00
Lanes:	0.00	0.00	0.00	1.55	0.00	1.45	0.00	3.00	1.00	0.00	3.00	1.00
Final Sat.:	0	0	0	2678	0	2497	0	5187	1900	0	5187	1900
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.20	0.00	0.18	0.00	0.37	0.00	0.00	0.49	0.00
Crit Moves:				****							****	
Green/Cycle:	0.00	0.00	0.00	0.29	0.00	0.29	0.00	0.71	0.00	0.00	0.71	0.00
Volume/Cap:	0.00	0.00	0.00	0.69	0.00	0.60	0.00	0.53	0.00	0.00	0.69	0.00
Delay/Veh:	0.0	0.0	0.0	32.8	0.0	30.9	0.0	7.0	0.0	0.0	8.9	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	32.8	0.0	30.9	0.0	7.0	0.0	0.0	8.9	0.0
LOS by Move:	A	A	A	C	A	C	A	A	A	A	A	A
HCM2kAvgQ:	0	0	0	11	0	9	0	10	0	0	17	0

Note: Queue reported is the number of cars per lane.

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Intersection #33 I-215 NB Off-Ramp & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.596
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 5.6
Optimal Cycle: 46 Level Of Service: A

Street Name:	I-215 NB Off-Ramp						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	0	0	2	0	0	0	0	0	0	3	0	1	0	0	3	0	1	1	0	1
Volume Module:																						
Base Vol:	347	0	19	0	0	0	0	1588	115	0	2578	679										
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00										
Initial Bse:	347	0	19	0	0	0	0	1588	115	0	2578	679										
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0										
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0										
Initial Fut:	347	0	19	0	0	0	0	1588	115	0	2578	679										
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00										
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00										
PHF Volume:	347	0	19	0	0	0	0	1588	0	0	2578	0										
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0										
Reduced Vol:	347	0	19	0	0	0	0	1588	0	0	2578	0										
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00										
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00										
FinalVolume:	347	0	19	0	0	0	0	1588	0	0	2578	0										
Saturation Flow Module:																						
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900										
Adjustment:	0.92	1.00	0.75	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00										
Lanes:	2.00	0.00	2.00	0.00	0.00	0.00	0.00	3.00	1.00	0.00	3.00	1.00										
Final Sat.:	3502	0	2842	0	0	0	0	5187	1900	0	5187	1900										
Capacity Analysis Module:																						
Vol/Sat:	0.10	0.00	0.01	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.50	0.00										
Crit Moves:	****										****											
Green/Cycle:	0.17	0.00	0.17	0.00	0.00	0.00	0.00	0.83	0.00	0.00	0.83	0.00										
Volume/Cap:	0.60	0.00	0.04	0.00	0.00	0.00	0.00	0.37	0.00	0.00	0.60	0.00										
Delay/Veh:	40.3	0.0	35.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	3.0	0.0										
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00										
AdjDel/Veh:	40.3	0.0	35.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	3.0	0.0										
LOS by Move:	D	A	D	A	A	A	A	A	A	A	A	A										
HCM2kAvgQ:	6	0	0	0	0	0	0	4	0	0	10	0										

Note: Queue reported is the number of cars per lane.

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Intersection #34 Jackson Avenue & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.407
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 5.3
Optimal Cycle: 38 Level Of Service: A

Street Name:	Jackson Avenue						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	0	0	2	0	0	0	0	0	0	3	0	1	1	0	3	0	0
Volume Module:																			
Base Vol:	70	0	51	0	0	0	0	1218	43	159	2010	0							
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00							
Initial Bse:	70	0	51	0	0	0	0	1218	43	159	2010	0							
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0							
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0							
Initial Fut:	70	0	51	0	0	0	0	1218	43	159	2010	0							
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00							
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00							
PHF Volume:	70	0	51	0	0	0	0	1218	43	159	2010	0							
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0							
Reduced Vol:	70	0	51	0	0	0	0	1218	43	159	2010	0							
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00							
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00							
FinalVolume:	70	0	51	0	0	0	0	1218	43	159	2010	0							
Saturation Flow Module:																			
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900							
Adjustment:	0.92	1.00	0.75	1.00	1.00	1.00	1.00	0.91	0.85	0.95	0.91	1.00							
Lanes:	2.00	0.00	2.00	0.00	0.00	0.00	0.00	3.00	1.00	1.00	3.00	0.00							
Final Sat.:	3502	0	2842	0	0	0	0	5187	1615	1805	5187	0							
Capacity Analysis Module:																			
Vol/Sat:	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.23	0.03	0.09	0.39	0.00							
Crit Moves:	****						****				****								
Green/Cycle:	0.05	0.00	0.05	0.00	0.00	0.00	0.00	0.69	0.69	0.26	0.95	0.00							
Volume/Cap:	0.41	0.00	0.37	0.00	0.00	0.00	0.00	0.34	0.04	0.34	0.41	0.00							
Delay/Veh:	47.7	0.0	47.7	0.0	0.0	0.0	0.0	6.3	4.9	30.5	0.3	0.0							
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00							
AdjDel/Veh:	47.7	0.0	47.7	0.0	0.0	0.0	0.0	6.3	4.9	30.5	0.3	0.0							
LOS by Move:	D	A	D	A	A	A	A	A	A	C	A	A							
HCM2kAvgQ:	2	0	1	0	0	0	0	6	0	4	2	0							

Note: Queue reported is the number of cars per lane.

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Intersection #35 Margarita Road & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.659
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 24.4
Optimal Cycle: 67 Level Of Service: C

Street Name:	Margarita Road						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 1	0 1	0	1 0	0 1	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	616	60	128	42	17	6	163	749	462	302	1723	71
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	616	60	128	42	17	6	163	749	462	302	1723	71
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	616	60	128	42	17	6	163	749	462	302	1723	71
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	616	60	128	42	17	6	163	749	462	302	1723	71
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	616	60	128	42	17	6	163	749	462	302	1723	71
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	616	60	128	42	17	6	163	749	462	302	1723	71
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.85	0.97	0.97	0.85	0.95	0.86	0.86	0.95	0.90	0.90
Lanes:	2.00	1.00	1.00	0.71	0.29	1.00	1.00	2.00	1.00	1.00	2.88	0.12
Final Sat.:	3502	1900	1615	1307	529	1615	1805	3261	1630	1805	4952	204
Capacity Analysis Module:												
Vol/Sat:	0.18	0.03	0.08	0.03	0.03	0.00	0.09	0.23	0.28	0.17	0.35	0.35
Crit Moves:	****			****					****	****		
Green/Cycle:	0.27	0.27	0.27	0.05	0.05	0.05	0.14	0.43	0.43	0.25	0.54	0.54
Volume/Cap:	0.66	0.12	0.30	0.66	0.66	0.08	0.64	0.53	0.66	0.66	0.64	0.64
Delay/Veh:	34.3	27.8	29.6	63.3	63.3	45.8	46.0	21.3	23.5	36.9	16.5	16.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	34.3	27.8	29.6	63.3	63.3	45.8	46.0	21.3	23.5	36.9	16.5	16.5
LOS by Move:	C	C	C	E	E	D	D	C	C	D	B	B
HCM2kAvgQ:	10	1	3	3	3	0	6	10	13	9	15	15

Note: Queue reported is the number of cars per lane.

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Intersection #36 French Valley Parkway & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.709
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 12.7
Optimal Cycle: 78 Level Of Service: B

Street Name:	French Valley Parkway						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 0	0 2	0	0 0	0 0	0	0 2	1 0	1	0 3	0 0
Volume Module:												
Base Vol:	20	0	821	0	0	0	0	1224	277	723	1947	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	20	0	821	0	0	0	0	1224	277	723	1947	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	20	0	821	0	0	0	0	1224	277	723	1947	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	20	0	821	0	0	0	0	1224	277	723	1947	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	20	0	821	0	0	0	0	1224	277	723	1947	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	20	0	821	0	0	0	0	1224	277	723	1947	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.75	1.00	1.00	1.00	1.00	0.88	0.88	0.95	0.91	1.00
Lanes:	1.00	0.00	2.00	0.00	0.00	0.00	0.00	2.45	0.55	1.00	3.00	0.00
Final Sat.:	1805	0	2842	0	0	0	0	4111	930	1805	5187	0
Capacity Analysis Module:												
Vol/Sat:	0.01	0.00	0.29	0.00	0.00	0.00	0.00	0.30	0.30	0.40	0.38	0.00
Crit Moves:	****							****		****		
Green/Cycle:	0.02	0.00	0.58	0.00	0.00	0.00	0.00	0.42	0.42	0.56	0.98	0.00
Volume/Cap:	0.71	0.00	0.50	0.00	0.00	0.00	0.00	0.71	0.71	0.71	0.38	0.00
Delay/Veh:	108.3	0.0	12.6	0.0	0.0	0.0	0.0	25.1	25.1	18.1	0.1	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	108.3	0.0	12.6	0.0	0.0	0.0	0.0	25.1	25.1	18.1	0.1	0.0
LOS by Move:	F	A	B	A	A	A	A	C	C	B	A	A
HCM2kAvgQ:	2	0	9	0	0	0	0	15	15	17	1	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #37 Jefferson Avenue & Guava Street

Cycle (sec): 100 Critical Vol./Cap.(X): 0.489
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 9.8
Optimal Cycle: 36 Level Of Service: A

Street Name:	Jefferson Avenue						Guava Street					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 0	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	26	1339	1	3	1360	322	190	55	105	2	33	9
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	26	1339	1	3	1360	322	190	55	105	2	33	9
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	26	1339	1	3	1360	322	190	55	105	2	33	9
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	26	1339	1	3	1360	322	190	55	105	2	33	9
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	26	1339	1	3	1360	322	190	55	105	2	33	9
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	26	1339	1	3	1360	322	190	55	105	2	33	9
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.88	0.88	0.71	0.90	0.90	0.48	0.92	0.92
Lanes:	1.00	2.99	0.01	1.00	2.43	0.57	1.00	0.34	0.66	1.00	1.57	0.43
Final Sat.:	1805	5183	4	1805	4072	964	1353	589	1125	910	2746	749
Capacity Analysis Module:												
Vol/Sat:	0.01	0.26	0.26	0.00	0.33	0.33	0.14	0.09	0.09	0.00	0.01	0.01
Crit Moves:	****				****		****					
Green/Cycle:	0.03	0.71	0.71	0.00	0.68	0.68	0.29	0.29	0.29	0.29	0.29	0.29
Volume/Cap:	0.49	0.36	0.36	0.36	0.49	0.49	0.49	0.32	0.32	0.01	0.04	0.04
Delay/Veh:	54.7	5.8	5.8	75.0	7.6	7.6	30.5	28.4	28.4	25.5	25.7	25.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	54.7	5.8	5.8	75.0	7.6	7.6	30.5	28.4	28.4	25.5	25.7	25.7
LOS by Move:	D	A	A	E	A	A	C	C	C	C	C	C
HCM2kAvgQ:	1	6	6	0	9	9	5	4	4	0	0	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #39 Washington Ave & Calle Del Oso Oro/Nutmeg

Cycle (sec): 100 Critical Vol./Cap.(X): 0.659
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 26.5
Optimal Cycle: 67 Level Of Service: C

Street Name:	Washington Ave						Calle Del Oso Oro/Nutmeg					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	251	159	122	92	196	90	64	602	638	143	205	42
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	251	159	122	92	196	90	64	602	638	143	205	42
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	251	159	122	92	196	90	64	602	638	143	205	42
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	251	159	122	92	196	90	64	602	638	143	205	42
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	251	159	122	92	196	90	64	602	638	143	205	42
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	251	159	122	92	196	90	64	602	638	143	205	42
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.85	0.85	0.95	0.87	0.87	0.95	0.88	0.88	0.95	0.93	0.93
Lanes:	1.00	2.00	1.00	1.00	2.06	0.94	1.00	1.00	1.00	1.00	1.66	0.34
Final Sat.:	1805	3233	1617	1805	3388	1556	1805	1666	1666	1805	2921	599
Capacity Analysis Module:												
Vol/Sat:	0.14	0.05	0.08	0.05	0.06	0.06	0.04	0.36	0.38	0.08	0.07	0.07
Crit Moves:	****				****				****	****		
Green/Cycle:	0.21	0.18	0.18	0.12	0.09	0.09	0.24	0.58	0.58	0.12	0.47	0.47
Volume/Cap:	0.66	0.28	0.42	0.42	0.66	0.66	0.15	0.62	0.66	0.66	0.15	0.15
Delay/Veh:	40.4	35.7	36.9	42.1	47.9	47.9	30.5	14.4	15.1	49.3	15.4	15.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	40.4	35.7	36.9	42.1	47.9	47.9	30.5	14.4	15.1	49.3	15.4	15.4
LOS by Move:	D	D	D	D	D	D	C	B	B	D	B	B
HCM2kAvgQ:	8	2	4	3	4	4	2	13	15	5	2	2

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #40 Clinton Keith Rd & Calle de Oso Oro/Bear Creek Dr

Cycle (sec): 100 Critical Vol./Cap.(X): 0.914
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 21.5
Optimal Cycle: 180 Level Of Service: C

Street Name:	Clinton Keith Rd						Calle de Oso Oro/Bear Creek Dr					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 0 1	0	1	0 1	1 0
Volume Module:												
Base Vol:	58	108	274	5	112	197	266	612	147	410	614	22
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	58	108	274	5	112	197	266	612	147	410	614	22
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	58	108	274	5	112	197	266	612	147	410	614	22
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	58	108	274	5	112	197	266	612	147	410	614	22
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	58	108	274	5	112	197	266	612	147	410	614	22
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	58	108	274	5	112	197	266	612	147	410	614	22
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.85	0.85	0.95	0.86	0.86	0.40	0.97	0.97	0.29	0.95	0.95
Lanes:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.81	0.19	1.00	1.93	0.07
Final Sat.:	1805	1610	1610	1805	1632	1632	754	1488	357	553	3468	124
Capacity Analysis Module:												
Vol/Sat:	0.03	0.07	0.17	0.00	0.07	0.12	0.35	0.41	0.41	0.74	0.18	0.18
Crit Moves:			****	****						****		
Green/Cycle:	0.04	0.19	0.19	0.00	0.15	0.15	0.81	0.81	0.81	0.81	0.81	0.81
Volume/Cap:	0.81	0.36	0.91	0.91	0.46	0.81	0.43	0.51	0.51	0.91	0.22	0.22
Delay/Veh:	95.0	35.7	64.3	373.1	39.3	53.2	3.3	3.3	3.3	30.1	2.2	2.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	95.0	35.7	64.3	373.1	39.3	53.2	3.3	3.3	3.3	30.1	2.2	2.2
LOS by Move:	F	D	E	F	D	D	A	A	A	C	A	A
HCM2kAvgQ:	4	3	12	1	4	8	3	8	8	13	2	2

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #43 Jefferson Ave & Lemon St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.798
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 18.2
Optimal Cycle: 113 Level Of Service: B

Street Name:	Jefferson Ave						Lemon St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	0 1	1	0 0	1 0
Volume Module:												
Base Vol:	249	774	28	4	2426	152	30	3	251	6	10	6
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	249	774	28	4	2426	152	30	3	251	6	10	6
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	249	774	28	4	2426	152	30	3	251	6	10	6
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	249	774	28	4	2426	152	30	3	251	6	10	6
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	249	774	28	4	2426	152	30	3	251	6	10	6
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	249	774	28	4	2426	152	30	3	251	6	10	6
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.90	0.90	0.95	1.00	0.85	0.95	0.94	0.94
Lanes:	1.00	2.90	0.10	1.00	2.82	0.18	1.00	1.00	1.00	1.00	0.62	0.38
Final Sat.:	1805	4981	180	1805	4837	303	1805	1900	1615	1805	1121	673
Capacity Analysis Module:												
Vol/Sat:	0.14	0.16	0.16	0.00	0.50	0.50	0.02	0.00	0.16	0.00	0.01	0.01
Crit Moves:	****				****					****	****	
Green/Cycle:	0.17	0.79	0.79	0.01	0.63	0.63	0.13	0.19	0.19	0.00	0.07	0.07
Volume/Cap:	0.80	0.20	0.20	0.20	0.80	0.80	0.13	0.01	0.80	0.80	0.13	0.13
Delay/Veh:	53.2	2.6	2.6	53.7	15.3	15.3	38.8	32.5	51.8	250.0	44.2	44.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	53.2	2.6	2.6	53.7	15.3	15.3	38.8	32.5	51.8	250.0	44.2	44.2
LOS by Move:	D	A	A	D	B	B	D	C	D	F	D	D
HCM2kAvgQ:	10	2	2	0	23	23	1	0	10	1	1	1

Note: Queue reported is the number of cars per lane.

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Intersection #44 Jefferson Ave & Kalmia St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.971
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 43.2
Optimal Cycle: 180 Level Of Service: D

Street Name:	Jefferson Ave									Kalmia St								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected				Protected				Protected				Protected					
Rights:	Include				Include				Include				Include					
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0			
Lanes:	2	0	3	0	1	1	0	2	1	0	1	0	2	1	0	1	0	1	1	0
Volume Module:																				
Base Vol:	260	903	245		860	1613	151		48	458	333		207	316	469					
Growth Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00					
Initial Bse:	260	903	245		860	1613	151		48	458	333		207	316	469					
Added Vol:	0	0	0		0	0	0		0	0	0		0	0	0					
PasserByVol:	0	0	0		0	0	0		0	0	0		0	0	0					
Initial Fut:	260	903	245		860	1613	151		48	458	333		207	316	469					
User Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00					
PHF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00					
PHF Volume:	260	903	245		860	1613	151		48	458	333		207	316	469					
Reduct Vol:	0	0	0		0	0	0		0	0	0		0	0	0					
Reduced Vol:	260	903	245		860	1613	151		48	458	333		207	316	469					
PCE Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00					
MLF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00					
FinalVolume:	260	903	245		860	1613	151		48	458	333		207	316	469					
Saturation Flow Module:																				
Sat/Lane:	1900	1900	1900		1900	1900	1900		1900	1900	1900		1900	1900	1900					
Adjustment:	0.92	0.91	0.85		0.95	0.90	0.90		0.95	0.85	0.85		0.95	0.86	0.86					
Lanes:	2.00	3.00	1.00		1.00	2.74	0.26		1.00	2.00	1.00		1.00	1.00	1.00					
Final Sat.:	3502	5187	1615		1805	4681	438		1805	3240	1620		1805	1643	1643					
Capacity Analysis Module:																				
Vol/Sat:	0.07	0.17	0.15		0.48	0.34	0.34		0.03	0.14	0.21		0.11	0.19	0.29					
Crit Moves:		****			****						****		****							
Green/Cycle:	0.12	0.18	0.18		0.49	0.55	0.55		0.03	0.21	0.21		0.12	0.30	0.30					
Volume/Cap:	0.62	0.97	0.85		0.97	0.62	0.62		0.95	0.67	0.97		0.97	0.64	0.95					
Delay/Veh:	44.9	63.3	59.7		48.0	15.8	15.8		154.5	37.7	63.6		97.0	31.3	53.5					
User DelAdj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00					
AdjDel/Veh:	44.9	63.3	59.7		48.0	15.8	15.8		154.5	37.7	63.6		97.0	31.3	53.5					
LOS by Move:	D	E	E		D	B	B		F	D	E		F	C	D					
HCM2kAvgQ:	5	15	10		32	14	14		4	8	16		10	10	20					

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #45 Jefferson Ave & Juniper St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.613
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 15.5
Optimal Cycle: 59 Level Of Service: B

Street Name:	Jefferson Ave									Juniper St								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected				Protected				Protected				Protected					
Rights:	Include				Include				Include				Include					
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0			
Lanes:	1	0	2	1	0	1	0	2	1	0	1	0	1	1	0	1	0	1	1	0
Volume Module:																				
Base Vol:	257	1291	63		110	1943	82		74	96	112		13	92	36					
Growth Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00					
Initial Bse:	257	1291	63		110	1943	82		74	96	112		13	92	36					
Added Vol:	0	0	0		0	0	0		0	0	0		0	0	0					
PasserByVol:	0	0	0		0	0	0		0	0	0		0	0	0					
Initial Fut:	257	1291	63		110	1943	82		74	96	112		13	92	36					
User Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00					
PHF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00					
PHF Volume:	257	1291	63		110	1943	82		74	96	112		13	92	36					
Reduct Vol:	0	0	0		0	0	0		0	0	0		0	0	0					
Reduced Vol:	257	1291	63		110	1943	82		74	96	112		13	92	36					
PCE Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00					
MLF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00					
FinalVolume:	257	1291	63		110	1943	82		74	96	112		13	92	36					
Saturation Flow Module:																				
Sat/Lane:	1900	1900	1900		1900	1900	1900		1900	1900	1900		1900	1900	1900					
Adjustment:	0.95	0.90	0.90		0.95	0.90	0.90		0.95	0.87	0.87		0.95	0.91	0.91					
Lanes:	1.00	2.86	0.14		1.00	2.88	0.12		1.00	1.00	1.00		1.00	1.44	0.56					
Final Sat.:	1805	4911	240		1805	4947	209		1805	1659	1659		1805	2486	973					
Capacity Analysis Module:																				
Vol/Sat:	0.14	0.26	0.26		0.06	0.39	0.39		0.04	0.06	0.07		0.01	0.04	0.04					
Crit Moves:	****					****			****					****						
Green/Cycle:	0.23	0.71	0.71		0.16	0.64	0.64		0.07	0.11	0.11		0.01	0.06	0.06					
Volume/Cap:	0.61	0.37	0.37		0.37	0.61	0.61		0.61	0.50	0.59		0.59	0.61	0.61					
Delay/Veh:	37.1	5.8	5.8		38.0	11.0	11.0		54.4	42.6	44.6		84.2	51.2	51.2					
User DelAdj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00					
AdjDel/Veh:	37.1	5.8	5.8		38.0	11.0	11.0		54.4	42.6	44.6		84.2	51.2	51.2					
LOS by Move:	D	A	A		D	B	B		D	D	D		F	D	D					
HCM2kAvgQ:	8	6	6		3	14	14		3	4	4		1	3	3					

Note: Queue reported is the number of cars per lane.

Traffix 7.9.0215 (c) 2008 Dowling Assoc. Licensed to MMA, LONG BEACH, CA

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #46 Jefferson Ave & Ivy St/Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.642
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 24.1
Optimal Cycle: 64 Level Of Service: C

Street Name:	Jefferson Ave									Ivy St/Los Alamos Rd								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected				Protected				Protected				Protected					
Rights:	Include				Include				Include				Include					
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0			
Lanes:	2	0	3	0	1	2	0	3	0	1	1	0	1	1	0	1	0	1	1	0
Volume Module:																				
Base Vol:	140	1181		64		235	1748		49		59		75		135		289		68	366
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00		1.00	1.00
Initial Bse:	140	1181		64		235	1748		49		59		75		135		289		68	366
Added Vol:	0	0		0		0	0		0		0		0		0		0		0	0
PasserByVol:	0	0		0		0	0		0		0		0		0		0		0	0
Initial Fut:	140	1181		64		235	1748		49		59		75		135		289		68	366
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00		1.00	1.00
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00		1.00	1.00
PHF Volume:	140	1181		64		235	1748		49		59		75		135		289		68	366
Reduct Vol:	0	0		0		0	0		0		0		0		0		0		0	0
Reduced Vol:	140	1181		64		235	1748		49		59		75		135		289		68	366
PCE Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00		1.00	1.00
MLF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00		1.00	1.00
FinalVolume:	140	1181		64		235	1748		49		59		75		135		289		68	366
Saturation Flow Module:																				
Sat/Lane:	1900	1900		1900		1900	1900		1900		1900		1900		1900		1900		1900	1900
Adjustment:	0.92	0.91		0.85		0.92	0.91		0.85		0.95		0.86		0.86		0.95		0.83	0.83
Lanes:	2.00	3.00		1.00		2.00	3.00		1.00		1.00		1.00		1.00		1.00		1.00	1.00
Final Sat.:	3502	5187		1615		3502	5187		1615		1805		1632		1632		1805		1578	1578
Capacity Analysis Module:																				
Vol/Sat:	0.04	0.23		0.04		0.07	0.34		0.03		0.03		0.05		0.08		0.16		0.04	0.23
Crit Moves:	****						****				****									****
Green/Cycle:	0.06	0.45		0.45		0.13	0.53		0.53		0.05		0.14		0.14		0.27		0.36	0.36
Volume/Cap:	0.64	0.50		0.09		0.50	0.64		0.06		0.64		0.33		0.59		0.59		0.12	0.64
Delay/Veh:	52.1	19.5		15.6		41.1	17.5		11.7		60.9		39.0		42.8		33.4		21.3	28.6
User DelAdj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00		1.00	1.00
AdjDel/Veh:	52.1	19.5		15.6		41.1	17.5		11.7		60.9		39.0		42.8		33.4		21.3	28.6
LOS by Move:	D	B		B		D	B		B		E		D		D		C		C	C
HCM2kAvgQ:	3	9		1		4	14		1		3		2		5		8		1	11

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #48 Madison Ave/I-15 SB Ramps & Kalmia St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.533
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 29.0
Optimal Cycle: 49 Level Of Service: C

Street Name:	Madison Ave/I-15 SB Ramps									Kalmia St								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected				Protected				Protected				Protected					
Rights:	Include				Include				Include				Include					
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0			
Lanes:	2	0	0	0	2	2	0	1	1	0	0	0	3	1	0	2	0	2	1	1
Volume Module:																				
Base Vol:	117	0		220		253	48		270		0	1352		212		340	1054		495	
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
Initial Bse:	117	0		220		253	48		270		0	1352		212		340	1054		495	
Added Vol:	0	0		0		0	0		0		0	0		0		0	0		0	
PasserByVol:	0	0		0		0	0		0		0	0		0		0	0		0	
Initial Fut:	117	0		220		253	48		270		0	1352		212		340	1054		495	
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Volume:	117	0		220		253	48		270		0	1352		212		340	1054		495	
Reduct Vol:	0	0		0		0	0		0		0	0		0		0	0		0	
Reduced Vol:	117	0		220		253	48		270		0	1352		212		340	1054		495	
PCE Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
MLF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
FinalVolume:	117	0		220		253	48		270		0	1352		212		340	1054		495	
Saturation Flow Module:																				
Sat/Lane:	1900	1900		1900		1900	1900		1900		1900	1900		1900		1900	1900		1900	
Adjustment:	0.92	1.00		0.75		0.92	0.83		0.83		1.00	0.89		0.89		0.92	0.87		0.87	
Lanes:	2.00	0.00		2.00		2.00	1.00		1.00		0.00	3.46		0.54		2.00	2.72		1.28	
Final Sat.:	3502	0		2842		3502	1576		1576		0	5859		919		3502	4480		2104	
Capacity Analysis Module:																				
Vol/Sat:	0.03	0.00		0.08		0.07	0.03		0.17		0.00	0.23		0.23		0.10	0.24		0.24	
Crit Moves:	****								****			****				****				
Green/Cycle:	0.06	0.00		0.06		0.19	0.32		0.32		0.00	0.43		0.43		0.18	0.62		0.62	
Volume/Cap:	0.53	0.00		1.23		0.39	0.09		0.53		0.00	0.53		0.53		0.53	0.38		0.38	
Delay/Veh:	48.0	0.0		191.0		36.1	23.7		28.7		0.0	21.1		21.1		37.9	9.7		9.7	
User DelAdj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
AdjDel/Veh:	48.0	0.0		191.0		36.1	23.7		28.7		0.0	21.1		21.1		37.9	9.7		9.7	
LOS by Move:	D	A		F		D	C		C		A	C		C		D	A		A	
HCM2kAvgQ:	3	0		9		4	1		8		0	10		10		5	7		7	

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #50 Hancock Ave & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.755
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 17.7
Optimal Cycle: 93 Level Of Service: B

Street Name:	Hancock Ave						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ovl			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	2	0	0	2	0	4	0	3	1
Volume Module:												
Base Vol:	0	0	0	427	0	673	659	1554	0	0	2501	502
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	427	0	673	659	1554	0	0	2501	502
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	427	0	673	659	1554	0	0	2501	502
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	427	0	673	659	1554	0	0	2501	502
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	427	0	673	659	1554	0	0	2501	502
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	427	0	673	659	1554	0	0	2501	502
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.92	1.00	0.75	0.92	0.91	1.00	1.00	0.89	0.89
Lanes:	0.00	0.00	0.00	2.00	0.00	2.00	2.00	4.00	0.00	0.00	3.33	0.67
Final Sat.:	0	0	0	3502	0	2842	3502	6916	0	0	5616	1127
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.12	0.00	0.24	0.19	0.22	0.00	0.00	0.45	0.45
Crit Moves:				****			****				****	
Green/Cycle:	0.00	0.00	0.00	0.16	0.00	0.41	0.25	0.84	0.00	0.00	0.59	0.59
Volume/Cap:	0.00	0.00	0.00	0.76	0.00	0.58	0.76	0.27	0.00	0.00	0.76	0.76
Delay/Veh:	0.0	0.0	0.0	45.8	0.0	23.5	38.5	1.7	0.0	0.0	16.0	16.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	45.8	0.0	23.5	38.5	1.7	0.0	0.0	16.0	16.0
LOS by Move:	A	A	A	D	A	C	D	A	A	A	B	B
HCM2kAvgQ:	0	0	0	8	0	10	11	3	0	0	20	20

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #51 Alta Murrieta Dr & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.593
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 23.7
Optimal Cycle: 56 Level Of Service: C

Street Name:	Alta Murrieta Dr						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Ovl		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	1	0	1	2	0	1	1	0	2	0
Volume Module:												
Base Vol:	224	80	20	68	133	305	248	982	294	137	1863	162
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	224	80	20	68	133	305	248	982	294	137	1863	162
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	224	80	20	68	133	305	248	982	294	137	1863	162
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	224	80	20	68	133	305	248	982	294	137	1863	162
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	224	80	20	68	133	305	248	982	294	137	1863	162
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	224	80	20	68	133	305	248	982	294	137	1863	162
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.85	0.92	0.85	0.85	0.92	0.88	0.88	0.92	0.91	0.85
Lanes:	2.00	1.00	1.00	2.00	1.00	1.00	2.00	2.31	0.69	2.00	4.00	1.00
Final Sat.:	3502	1900	1615	3502	1617	1617	3502	3856	1154	3502	6916	1615
Capacity Analysis Module:												
Vol/Sat:	0.06	0.04	0.01	0.02	0.08	0.19	0.07	0.25	0.25	0.04	0.27	0.10
Crit Moves:	****					****	****				****	
Green/Cycle:	0.11	0.29	0.29	0.13	0.32	0.32	0.12	0.50	0.50	0.08	0.45	0.59
Volume/Cap:	0.59	0.14	0.04	0.14	0.26	0.59	0.59	0.51	0.51	0.51	0.59	0.17
Delay/Veh:	45.0	26.3	25.4	38.3	25.4	29.9	44.0	17.1	17.1	46.1	20.7	9.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	45.0	26.3	25.4	38.3	25.4	29.9	44.0	17.1	17.1	46.1	20.7	9.5
LOS by Move:	D	C	C	D	C	C	D	B	B	D	C	A
HCM2kAvgQ:	4	2	0	1	3	9	5	10	10	3	12	2

Note: Queue reported is the number of cars per lane.

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2000 HCM Operations Method (Future Volume Alternative)

Intersection #52 Winchester Road - SR-79 & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.304
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 90.6
Optimal Cycle: 180 Level Of Service: F

Street Name:	Winchester Road - SR-79						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 3	0 1	2	0 3	0 1	2	0 3	0 1	2	0 2	1 0
Volume Module:												
Base Vol:	292	1516	160	150	1534	1319	774	273	109	299	856	78
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	292	1516	160	150	1534	1319	774	273	109	299	856	78
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	292	1516	160	150	1534	1319	774	273	109	299	856	78
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	292	1516	160	150	1534	1319	774	273	109	299	856	78
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	292	1516	160	150	1534	1319	774	273	109	299	856	78
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	292	1516	160	150	1534	1319	774	273	109	299	856	78
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.91	0.85	0.92	0.91	0.85	0.92	0.91	0.85	0.92	0.90	0.90
Lanes:	2.00	3.00	1.00	2.00	3.00	1.00	2.00	3.00	1.00	2.00	2.75	0.25
Final Sat.:	3502	5187	1615	3502	5187	1615	3502	5187	1615	3502	4692	428
Capacity Analysis Module:												
Vol/Sat:	0.08	0.29	0.10	0.04	0.30	0.82	0.22	0.05	0.07	0.09	0.18	0.18
Crit Moves:	****					****	****				****	
Green/Cycle:	0.06	0.60	0.78	0.09	0.63	0.63	0.17	0.14	0.14	0.17	0.14	0.14
Volume/Cap:	1.30	0.49	0.13	0.49	0.47	1.30	1.30	0.39	0.49	0.49	1.30	1.30
Delay/Veh:	212.0	11.3	2.9	44.6	10.0	162.5	190.1	39.7	41.7	38.0	190	189.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	212.0	11.3	2.9	44.6	10.0	162.5	190.1	39.7	41.7	38.0	190	189.7
LOS by Move:	F	B	A	D	B	F	F	D	D	D	F	F
HCM2kAvgQ:	11	10	1	3	9	79	26	3	4	5	23	23

Note: Queue reported is the number of cars per lane.

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Intersection #53 Hancock Ave & Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.085
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 64.0
Optimal Cycle: 180 Level Of Service: E

Street Name:	Hancock Ave						Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	2	0 0	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	49	125	202	693	252	91	72	869	74	902	1617	602
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	49	125	202	693	252	91	72	869	74	902	1617	602
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	49	125	202	693	252	91	72	869	74	902	1617	602
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	49	125	202	693	252	91	72	869	74	902	1617	602
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	49	125	202	693	252	91	72	869	74	902	1617	602
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	49	125	202	693	252	91	72	869	74	902	1617	602
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.86	0.86	0.92	0.96	0.96	0.95	0.94	0.94	0.95	0.91	0.91
Lanes:	1.00	1.00	1.00	2.00	0.73	0.27	1.00	1.84	0.16	1.00	1.46	0.54
Final Sat.:	1805	1637	1637	3502	1340	484	1805	3287	280	1805	2523	939
Capacity Analysis Module:												
Vol/Sat:	0.03	0.08	0.12	0.20	0.19	0.19	0.04	0.26	0.26	0.50	0.64	0.64
Crit Moves:			****	****				****		****		
Green/Cycle:	0.04	0.11	0.11	0.18	0.26	0.26	0.04	0.24	0.24	0.46	0.66	0.66
Volume/Cap:	0.73	0.67	1.09	1.09	0.73	0.73	0.97	1.09	1.09	1.09	0.97	0.97
Delay/Veh:	80.1	46.2	120.9	101.9	39.5	39.5	140.6	94.2	94.2	84.0	27.9	27.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	80.1	46.2	120.9	101.9	39.5	39.5	140.6	94.2	94.2	84.0	27.9	27.9
LOS by Move:	F	D	F	F	D	D	F	F	F	F	C	C
HCM2kAvgQ:	3	5	12	19	11	11	5	24	24	41	40	40

Note: Queue reported is the number of cars per lane.

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Intersection #54 I-215 SB Ramps & Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.051
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 58.3
Optimal Cycle: 180 Level Of Service: E

Street Name:	I-215 SB Ramps						Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	1	0	1! 0 1	0	0	2 0 1	2	0	2 0 0
Volume Module:												
Base Vol:	0	0	0	409	0	1895	0	1264	457	250	1470	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	409	0	1895	0	1264	457	250	1470	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	409	0	1895	0	1264	457	250	1470	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	409	0	1895	0	1264	457	250	1470	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	409	0	1895	0	1264	457	250	1470	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	409	0	1895	0	1264	457	250	1470	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.87	1.00	0.87	1.00	0.95	0.85	0.92	0.95	1.00
Lanes:	0.00	0.00	0.00	1.18	0.00	1.82	0.00	2.00	1.00	2.00	2.00	0.00
Final Sat.:	0	0	0	1944	0	3009	0	3610	1615	3502	3610	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.21	0.00	0.63	0.00	0.35	0.28	0.07	0.41	0.00
Crit Moves:						****		****		****		
Green/Cycle:	0.00	0.00	0.00	0.60	0.00	0.60	0.00	0.33	0.33	0.07	0.40	0.00
Volume/Cap:	0.00	0.00	0.00	0.35	0.00	1.05	0.00	1.05	0.85	1.05	1.02	0.00
Delay/Veh:	0.0	0.0	0.0	10.2	0.0	54.4	0.0	73.9	43.2	119.1	57.5	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	10.2	0.0	54.4	0.0	73.9	43.2	119.1	57.5	0.0
LOS by Move:	A	A	A	B	A	D	A	E	D	F	E	A
HCM2kAvgQ:	0	0	0	5	0	44	0	30	16	8	32	0

Note: Queue reported is the number of cars per lane.

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Intersection #55 I-215 NB Ramps & Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.820
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 26.1
Optimal Cycle: 127 Level Of Service: C

Street Name:	I-215 NB Ramps						Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	1	0 1 0	0	0	0 0 0	2	0	3 0 0	0	0	2 0 1
Volume Module:												
Base Vol:	457	2	105	0	0	0	601	1028	0	0	1272	70
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	457	2	105	0	0	0	601	1028	0	0	1272	70
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	457	2	105	0	0	0	601	1028	0	0	1272	70
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	457	2	105	0	0	0	601	1028	0	0	1272	70
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	457	2	105	0	0	0	601	1028	0	0	1272	70
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	457	2	105	0	0	0	601	1028	0	0	1272	70
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.81	0.81	0.81	1.00	1.00	1.00	0.92	0.91	1.00	1.00	0.95	0.85
Lanes:	1.00	0.02	0.98	0.00	0.00	0.00	2.00	3.00	0.00	0.00	2.00	1.00
Final Sat.:	1542	29	1513	0	0	0	3502	5187	0	0	3610	1615
Capacity Analysis Module:												
Vol/Sat:	0.30	0.07	0.07	0.00	0.00	0.00	0.17	0.20	0.00	0.00	0.35	0.04
Crit Moves:	****						****				****	
Green/Cycle:	0.36	0.36	0.36	0.00	0.00	0.00	0.21	0.64	0.00	0.00	0.43	0.43
Volume/Cap:	0.82	0.19	0.19	0.00	0.00	0.00	0.82	0.31	0.00	0.00	0.82	0.10
Delay/Veh:	36.8	22.0	22.0	0.0	0.0	0.0	45.1	8.2	0.0	0.0	28.7	17.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	36.8	22.0	22.0	0.0	0.0	0.0	45.1	8.2	0.0	0.0	28.7	17.1
LOS by Move:	D	C	C	A	A	A	D	A	A	A	C	B
HCM2kAvgQ:	16	2	2	0	0	0	12	5	0	0	20	1

Note: Queue reported is the number of cars per lane.

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Intersection #56 Whitewood Rd & Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.671
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 26.5
Optimal Cycle: 69 Level Of Service: C

Street Name:	Whitewood Rd						Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 2	0 1	1	0 2	0 1	1	0 1	1 0
Volume Module:												
Base Vol:	87	237	51	30	449	557	361	215	90	58	256	22
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	87	237	51	30	449	557	361	215	90	58	256	22
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	87	237	51	30	449	557	361	215	90	58	256	22
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	87	237	51	30	449	557	361	215	90	58	256	22
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	87	237	51	30	449	557	361	215	90	58	256	22
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	87	237	51	30	449	557	361	215	90	58	256	22
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.92	0.92	0.95	0.95	0.85	0.95	0.95	0.85	0.95	0.94	0.94
Lanes:	1.00	1.65	0.35	1.00	2.00	1.00	1.00	2.00	1.00	1.00	1.84	0.16
Final Sat.:	1805	2891	622	1805	3610	1615	1805	3610	1615	1805	3284	282
Capacity Analysis Module:												
Vol/Sat:	0.05	0.08	0.08	0.02	0.12	0.34	0.20	0.06	0.06	0.03	0.08	0.08
Crit Moves:	****					****	****				****	
Green/Cycle:	0.07	0.49	0.49	0.10	0.51	0.51	0.30	0.27	0.27	0.15	0.12	0.12
Volume/Cap:	0.67	0.17	0.17	0.17	0.24	0.67	0.67	0.22	0.21	0.22	0.67	0.67
Delay/Veh:	58.1	14.4	14.4	41.7	13.6	20.2	34.1	28.5	28.5	38.2	46.6	46.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	58.1	14.4	14.4	41.7	13.6	20.2	34.1	28.5	28.5	38.2	46.6	46.6
LOS by Move:	E	B	B	D	B	C	C	C	C	D	D	D
HCM2kAvgQ:	4	3	3	1	4	13	11	3	2	2	6	6

Note: Queue reported is the number of cars per lane.

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Intersection #57 Whitewood Rd & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.785
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 27.8
Optimal Cycle: 106 Level Of Service: C

Street Name:	Whitewood Rd						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	57	203	255	250	541	107	25	996	138	486	2064	120
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	57	203	255	250	541	107	25	996	138	486	2064	120
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	57	203	255	250	541	107	25	996	138	486	2064	120
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	57	203	255	250	541	107	25	996	138	486	2064	120
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	57	203	255	250	541	107	25	996	138	486	2064	120
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	57	203	255	250	541	107	25	996	138	486	2064	120
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.87	0.87	0.95	0.93	0.93	0.95	0.89	0.89	0.95	0.90	0.90
Lanes:	1.00	1.00	1.00	1.00	1.67	0.33	1.00	2.63	0.37	1.00	2.84	0.16
Final Sat.:	1805	1653	1653	1805	2939	581	1805	4474	620	1805	4863	283
Capacity Analysis Module:												
Vol/Sat:	0.03	0.12	0.15	0.14	0.18	0.18	0.01	0.22	0.22	0.27	0.42	0.42
Crit Moves:			****	****				****		****		
Green/Cycle:	0.05	0.20	0.20	0.18	0.32	0.32	0.02	0.28	0.28	0.34	0.61	0.61
Volume/Cap:	0.58	0.62	0.78	0.78	0.58	0.58	0.70	0.78	0.78	0.78	0.70	0.70
Delay/Veh:	54.4	38.5	45.1	51.4	29.2	29.2	95.5	35.9	35.9	36.1	14.1	14.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	54.4	38.5	45.1	51.4	29.2	29.2	95.5	35.9	35.9	36.1	14.1	14.1
LOS by Move:	D	D	D	D	C	C	F	D	D	D	B	B
HCM2kAvgQ:	3	7	10	9	9	9	2	14	14	15	17	17

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #59 Nutmeg St & Clinton Keith Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.059
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 60.8
Optimal Cycle: 180 Level Of Service: E

Street Name:	Nutmeg St						Clinton Keith Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	75	45	460	387	53	71	46	1690	94	366	1366	159
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	75	45	460	387	53	71	46	1690	94	366	1366	159
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	75	45	460	387	53	71	46	1690	94	366	1366	159
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	75	45	460	387	53	71	46	1690	94	366	1366	159
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	75	45	460	387	53	71	46	1690	94	366	1366	159
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	75	45	460	387	53	71	46	1690	94	366	1366	159
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.82	0.82	0.95	0.87	0.87	0.95	0.90	0.90	0.95	0.90	0.90
Lanes:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.84	0.16	1.00	2.69	0.31
Final Sat.:	1805	1558	1558	1805	1650	1650	1805	4874	271	1805	4572	532
Capacity Analysis Module:												
Vol/Sat:	0.04	0.03	0.30	0.21	0.03	0.04	0.03	0.35	0.35	0.20	0.30	0.30
Crit Moves:			****	****				****		****		
Green/Cycle:	0.24	0.28	0.28	0.20	0.24	0.24	0.04	0.33	0.33	0.19	0.48	0.48
Volume/Cap:	0.18	0.10	1.06	1.06	0.13	0.18	0.63	1.06	1.06	1.06	0.63	0.63
Delay/Veh:	30.6	26.8	93.8	103.5	29.5	29.9	62.9	73.2	73.2	105.3	19.9	19.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	30.6	26.8	93.8	103.5	29.5	29.9	62.9	73.2	73.2	105.3	19.9	19.9
LOS by Move:	C	C	F	F	C	C	E	E	E	F	B	B
HCM2kAvgQ:	2	1	23	19	1	2	2	30	30	18	13	13

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #60 Murrieta Oaks Ave-Mitchell Rd & Clinton Keith Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.795
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 14.6
Optimal Cycle: 111 Level Of Service: B

Street Name:	Murrieta Oaks Ave-Mitchell Rd						Clinton Keith Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 0	1 0	1	0 1	0 1	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	121	147	143	8	32	58	65	2553	302	120	2084	206
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	121	147	143	8	32	58	65	2553	302	120	2084	206
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	121	147	143	8	32	58	65	2553	302	120	2084	206
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	121	147	143	8	32	58	65	2553	302	120	2084	206
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	121	147	143	8	32	58	65	2553	302	120	2084	206
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	121	147	143	8	32	58	65	2553	302	120	2084	206
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.93	0.93	0.95	1.00	0.85	0.95	0.90	0.90	0.95	0.90	0.90
Lanes:	1.00	0.51	0.49	1.00	1.00	1.00	1.00	2.68	0.32	1.00	2.73	0.27
Final Sat.:	1805	892	868	1805	1900	1615	1805	4564	540	1805	4659	461
Capacity Analysis Module:												
Vol/Sat:	0.07	0.16	0.16	0.00	0.02	0.04	0.04	0.56	0.56	0.07	0.45	0.45
Crit Moves:		****		****				****		****		
Green/Cycle:	0.14	0.21	0.21	0.01	0.07	0.07	0.06	0.70	0.70	0.08	0.73	0.73
Volume/Cap:	0.48	0.80	0.80	0.80	0.23	0.48	0.61	0.80	0.80	0.80	0.61	0.61
Delay/Veh:	41.2	49.1	49.1	216.2	44.4	47.5	56.2	11.3	11.3	69.6	7.0	7.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	41.2	49.1	49.1	216.2	44.4	47.5	56.2	11.3	11.3	69.6	7.0	7.0
LOS by Move:	D	D	D	F	D	D	E	B	B	E	A	A
HCM2kAvgQ:	4	11	11	1	1	2	3	23	23	6	13	13

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #61 I-215 SB Ramps & Scott Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.223
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 7.3
Optimal Cycle: 29 Level Of Service: A

Street Name:	I-215 SB Ramps						Scott Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	2	0	0	4	0	1	0	0	3	0	2
Volume Module:																
Base Vol:	0	0	0	170	0	148	0	858	475	0	906	293
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	170	0	148	0	858	475	0	906	293
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	170	0	148	0	858	475	0	906	293
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	0	0	0	170	0	148	0	858	0	0	906	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	170	0	148	0	858	0	0	906	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	0	0	0	170	0	148	0	858	0	0	906	0
Saturation Flow Module:																
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.92	1.00	0.75	1.00	0.91	1.00	1.00	0.91	0.88
Lanes:	0.00	0.00	0.00	2.00	0.00	2.00	0.00	4.00	1.00	0.00	3.00	2.00
Final Sat.:	0	0	0	3502	0	2842	0	6916	1900	0	5187	3344
Capacity Analysis Module:																
Vol/Sat:	0.00	0.00	0.00	0.05	0.00	0.05	0.00	0.12	0.00	0.00	0.17	0.00
Crit Moves:				****			****				****	
Green/Cycle:	0.00	0.00	0.00	0.22	0.00	0.22	0.00	0.78	0.00	0.00	0.78	0.00
Volume/Cap:	0.00	0.00	0.00	0.22	0.00	0.24	0.00	0.16	0.00	0.00	0.22	0.00
Delay/Veh:	0.0	0.0	0.0	32.3	0.0	32.5	0.0	2.7	0.0	0.0	2.9	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	32.3	0.0	32.5	0.0	2.7	0.0	0.0	2.9	0.0
LOS by Move:	A	A	A	C	A	C	A	A	A	A	A	A
HCM2kAvgQ:	0	0	0	2	0	2	0	2	0	0	3	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #62 I-215 NB Ramps & Scott Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.371
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 15.9
Optimal Cycle: 36 Level Of Service: B

Street Name:	I-215 NB Ramps						Scott Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Ovl		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	1	2	0	0	0	0	0	2	2	0	4	0	0	0	0	3	0	2
Volume Module:																
Base Vol:	0	17	566	0	0	297	147	929	0	0	1002	336
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	17	566	0	0	297	147	929	0	0	1002	336
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	17	566	0	0	297	147	929	0	0	1002	336
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	17	566	0	0	297	147	929	0	0	1002	336
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	17	566	0	0	297	147	929	0	0	1002	336
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	17	566	0	0	297	147	929	0	0	1002	336
Saturation Flow Module:																
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.85	0.75	1.00	1.00	0.75	0.92	0.91	1.00	1.00	0.91	0.75
Lanes:	0.00	0.08	2.92	0.00	0.00	2.00	2.00	4.00	0.00	0.00	3.00	2.00
Final Sat.:	0	125	4173	0	0	2842	3502	6916	0	0	5187	2842
Capacity Analysis Module:																
Vol/Sat:	0.00	0.14	0.14	0.00	0.00	0.10	0.04	0.13	0.00	0.00	0.19	0.12
Crit Moves:		****		****			****				****	
Green/Cycle:	0.00	0.37	0.37	0.00	0.00	0.37	0.11	0.63	0.00	0.00	0.52	0.52
Volume/Cap:	0.00	0.37	0.37	0.00	0.00	0.29	0.37	0.21	0.00	0.00	0.37	0.23
Delay/Veh:	0.0	23.4	23.4	0.0	0.0	22.6	41.6	7.8	0.0	0.0	14.3	13.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	23.4	23.4	0.0	0.0	22.6	41.6	7.8	0.0	0.0	14.3	13.1
LOS by Move:	A	C	C	A	A	C	D	A	A	A	B	B
HCM2kAvgQ:	0	5	5	0	0	4	3	3	0	0	7	3

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #102 Leon Road & Scott Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.707
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 28.5
Optimal Cycle: 78 Level Of Service: C

Street Name:	Leon Road						Scott Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	97	182	2	96	285	526	401	448	344	8	376	161
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	97	182	2	96	285	526	401	448	344	8	376	161
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	97	182	2	96	285	526	401	448	344	8	376	161
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	97	182	2	96	285	526	401	448	344	8	376	161
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	97	182	2	96	285	526	401	448	344	8	376	161
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	97	182	2	96	285	526	401	448	344	8	376	161
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.95	0.95	0.86	0.86	0.95	0.85	0.85	0.95	0.87	0.87
Lanes:	1.00	1.98	0.02	1.00	1.00	1.00	1.00	2.00	1.00	1.00	2.10	0.90
Final Sat.:	1805	3564	39	1805	1630	1630	1805	3233	1617	1805	3468	1485
Capacity Analysis Module:												
Vol/Sat:	0.05	0.05	0.05	0.05	0.17	0.32	0.22	0.14	0.21	0.00	0.11	0.11
Crit Moves:	****					****	****				****	
Green/Cycle:	0.08	0.26	0.26	0.27	0.46	0.46	0.31	0.46	0.46	0.01	0.15	0.15
Volume/Cap:	0.71	0.20	0.20	0.20	0.38	0.71	0.71	0.30	0.46	0.46	0.71	0.71
Delay/Veh:	60.7	28.9	28.9	28.2	18.0	23.9	34.3	17.1	18.9	67.8	43.3	43.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	60.7	28.9	28.9	28.2	18.0	23.9	34.3	17.1	18.9	67.8	43.3	43.3
LOS by Move:	E	C	C	C	B	C	C	B	B	E	D	D
HCM2kAvgQ:	4	2	2	2	6	15	12	5	8	1	7	7

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #104 Antelope Road & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.120
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 66.4
Optimal Cycle: 180 Level Of Service: E

Street Name:	Antelope Road						Keller Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 2	0 1	1	0 2	0 1	2	0 3	0 1	1	0 3	0 1
Volume Module:												
Base Vol:	55	39	269	159	297	298	400	711	831	633	511	33
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	55	39	269	159	297	298	400	711	831	633	511	33
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	55	39	269	159	297	298	400	711	831	633	511	33
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	55	39	269	159	297	298	400	711	831	633	511	33
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	55	39	269	159	297	298	400	711	831	633	511	33
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	55	39	269	159	297	298	400	711	831	633	511	33
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.95	0.85	0.95	0.95	0.85	0.92	0.91	0.85	0.95	0.91	0.85
Lanes:	2.00	2.00	1.00	1.00	2.00	1.00	2.00	3.00	1.00	1.00	3.00	1.00
Final Sat.:	3502	3610	1615	1805	3610	1615	3502	5187	1615	1805	5187	1615
Capacity Analysis Module:												
Vol/Sat:	0.02	0.01	0.17	0.09	0.08	0.18	0.11	0.14	0.51	0.35	0.10	0.02
Crit Moves:			****	****					****	****		
Green/Cycle:	0.02	0.15	0.15	0.08	0.21	0.21	0.41	0.46	0.46	0.31	0.36	0.36
Volume/Cap:	0.88	0.07	1.12	1.12	0.39	0.88	0.28	0.30	1.12	1.12	0.28	0.06
Delay/Veh:	121.9	36.7	136.7	157.4	34.4	60.7	19.4	17.0	98.2	109.6	23.0	21.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	121.9	36.7	136.7	157.4	34.4	60.7	19.4	17.0	98.2	109.6	23.0	21.1
LOS by Move:	F	D	F	F	C	E	B	B	F	F	C	C
HCM2kAvgQ:	2	1	15	10	4	12	4	5	40	32	4	1

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #105 Menifee Road - Meadowlark Road & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.790
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 30.6
Optimal Cycle: 109 Level Of Service: C

Street Name:	Menifee Road - Meadowlark Road									Keller Road								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected					Protected				
Rights:	Include					Include					Include					Include				
Min. Green:	0	0	0			0	0	0			0	0	0			0	0	0		
Lanes:	1	0	1	1	0	1	0	1	1	0	2	0	1	1	0	1	0	1	1	0
Volume Module:																				
Base Vol:	21	283	247			136	919	621			567	180	352			196	339	150		
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Initial Bse:	21	283	247			136	919	621			567	180	352			196	339	150		
Added Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
PasserByVol:	0	0	0			0	0	0			0	0	0			0	0	0		
Initial Fut:	21	283	247			136	919	621			567	180	352			196	339	150		
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Volume:	21	283	247			136	919	621			567	180	352			196	339	150		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
Reduced Vol:	21	283	247			136	919	621			567	180	352			196	339	150		
PCE Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
MLF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
FinalVolume:	21	283	247			136	919	621			567	180	352			196	339	150		
Saturation Flow Module:																				
Sat/Lane:	1900	1900	1900			1900	1900	1900			1900	1900	1900			1900	1900	1900		
Adjustment:	0.95	0.88	0.88			0.95	0.89	0.89			0.92	0.86	0.86			0.95	0.91	0.91		
Lanes:	1.00	1.07	0.93			1.00	1.19	0.81			2.00	1.00	1.00			1.00	1.39	0.61		
Final Sat.:	1805	1793	1565			1805	2025	1368			3502	1626	1626			1805	2388	1056		
Capacity Analysis Module:																				
Vol/Sat:	0.01	0.16	0.16			0.08	0.45	0.45			0.16	0.11	0.22			0.11	0.14	0.14		
Crit Moves:	****						****						****			****				
Green/Cycle:	0.01	0.40	0.40			0.19	0.57	0.57			0.22	0.27	0.27			0.14	0.19	0.19		
Volume/Cap:	0.79	0.40	0.40			0.40	0.79	0.79			0.74	0.40	0.79			0.79	0.74	0.74		
Delay/Veh:	137.2	21.7	21.7			36.2	18.9	18.9			40.2	29.9	40.0			57.4	42.5	42.5		
User DelAdj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
AdjDel/Veh:	137.2	21.7	21.7			36.2	18.9	18.9			40.2	29.9	40.0			57.4	42.5	42.5		
LOS by Move:	F	C	C			D	B	B			D	C	D			E	D	D		
HCM2kAvgQ:	2	6	6			4	21	21			10	5	13			8	9	9		

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #107 Leon Road & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.307
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 16.6
Optimal Cycle: 27 Level Of Service: B

Street Name:	Leon Road									Keller Road								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Permitted					Protected					Permitted				
Rights:	Include					Include					Include					Include				
Min. Green:	0	0	0			0	0	0			0	0	0			0	0	0		
Lanes:	1	0	1	1	0	1	0	1	1	0	1	0	1	1	0	1	0	1	1	0
Volume Module:																				
Base Vol:	125	309	11			2	570	122			4	66	182			3	33	2		
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Initial Bse:	125	309	11			2	570	122			4	66	182			3	33	2		
Added Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
PasserByVol:	0	0	0			0	0	0			0	0	0			0	0	0		
Initial Fut:	125	309	11			2	570	122			4	66	182			3	33	2		
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Volume:	125	309	11			2	570	122			4	66	182			3	33	2		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
Reduced Vol:	125	309	11			2	570	122			4	66	182			3	33	2		
PCE Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
MLF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
FinalVolume:	125	309	11			2	570	122			4	66	182			3	33	2		
Saturation Flow Module:																				
Sat/Lane:	1900	1900	1900			1900	1900	1900			1900	1900	1900			1900	1900	1900		
Adjustment:	0.95	0.95	0.95			0.54	0.93	0.93			0.95	0.85	0.85			1.00	0.94	0.94		
Lanes:	1.00	1.93	0.07			1.00	1.65	0.35			1.00	1.00	1.00			1.00	1.89	0.11		
Final Sat.:	1805	3468	123			1024	2896	620			1805	1606	1606			1900	3373	204		
Capacity Analysis Module:																				
Vol/Sat:	0.07	0.09	0.09			0.00	0.20	0.20			0.00	0.04	0.11			0.00	0.01	0.01		
Crit Moves:	****						****					****								
Green/Cycle:	0.22	0.84	0.84			0.62	0.62	0.62			0.13	0.16	0.16			0.03	0.03	0.03		
Volume/Cap:	0.32	0.11	0.11			0.00	0.32	0.32			0.02	0.26	0.71			0.04	0.32	0.32		
Delay/Veh:	33.3	1.4	1.4			7.2	9.0	9.0			38.0	36.9	46.2			47.3	49.1	49.1		
User DelAdj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
AdjDel/Veh:	33.3	1.4	1.4			7.2	9.0	9.0			38.0	36.9	46.2			47.3	49.1	49.1		
LOS by Move:	C	A	A			A	A	A			D	D	D			D	D	D		
HCM2kAvgQ:	3	1	1			0	5	5			0	2	7			0	1	1		

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #108 Winchester Road - SR-79 & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.525
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 1.4
Optimal Cycle: 39 Level Of Service: A

Street Name:	Winchester Road - SR-79						Keller Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	0	1593	27	4	2559	1	1	9	1	12	10	49
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1593	27	4	2559	1	1	9	1	12	10	49
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	1593	27	4	2559	1	1	9	1	12	10	49
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	1593	27	4	2559	1	1	9	1	12	10	49
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1593	27	4	2559	1	1	9	1	12	10	49
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	1593	27	4	2559	1	1	9	1	12	10	49
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.91	0.91	0.95	0.91	0.91	0.68	0.94	0.94	0.72	0.83	0.83
Lanes:	1.00	2.95	0.05	1.00	2.99	0.01	1.00	1.80	0.20	1.00	1.00	1.00
Final Sat.:	1900	5085	86	1805	5185	2	1286	3200	356	1376	1579	1579
Capacity Analysis Module:												
Vol/Sat:	0.00	0.31	0.31	0.00	0.49	0.49	0.00	0.00	0.00	0.01	0.01	0.03
Crit Moves:	****				****							****
Green/Cycle:	0.00	0.93	0.93	0.01	0.94	0.94	0.06	0.06	0.06	0.06	0.06	0.06
Volume/Cap:	0.00	0.34	0.34	0.34	0.52	0.52	0.01	0.05	0.05	0.15	0.11	0.52
Delay/Veh:	0.0	0.4	0.4	65.4	0.5	0.5	44.4	44.5	44.5	45.5	44.6	50.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.4	0.4	65.4	0.5	0.5	44.4	44.5	44.5	45.5	44.6	50.2
LOS by Move:	A	A	A	E	A	A	D	D	D	D	D	D
HCM2kAvgQ:	0	2	2	0	4	4	0	0	0	0	0	2

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #112 Leon Road & Jean Nicholas

Cycle (sec): 100 Critical Vol./Cap.(X): 0.342
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 23.0
Optimal Cycle: 35 Level Of Service: C

Street Name:	Leon Road						Jean Nicholas					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	7	180	126	186	503	47	2	175	16	161	26	231
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	7	180	126	186	503	47	2	175	16	161	26	231
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	7	180	126	186	503	47	2	175	16	161	26	231
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	7	180	126	186	503	47	2	175	16	161	26	231
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	7	180	126	186	503	47	2	175	16	161	26	231
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	7	180	126	186	503	47	2	175	16	161	26	231
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.89	0.89	0.95	0.94	0.94	0.95	0.94	0.94	0.95	0.82	0.82
Lanes:	1.00	1.18	0.82	1.00	1.83	0.17	1.00	1.83	0.17	1.00	1.00	1.00
Final Sat.:	1805	1992	1394	1805	3259	304	1805	3265	298	1805	1561	1561
Capacity Analysis Module:												
Vol/Sat:	0.00	0.09	0.09	0.10	0.15	0.15	0.00	0.05	0.05	0.09	0.02	0.15
Crit Moves:		****		****			****					****
Green/Cycle:	0.01	0.26	0.26	0.30	0.55	0.55	0.00	0.16	0.16	0.27	0.43	0.43
Volume/Cap:	0.28	0.34	0.34	0.34	0.28	0.28	0.34	0.33	0.33	0.33	0.04	0.34
Delay/Veh:	54.9	30.0	30.0	27.6	12.0	12.0	81.6	37.3	37.3	29.5	16.4	19.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	54.9	30.0	30.0	27.6	12.0	12.0	81.6	37.3	37.3	29.5	16.4	19.2
LOS by Move:	D	C	C	C	B	B	F	D	D	C	B	B
HCM2kAvgQ:	1	4	4	5	5	5	0	3	3	4	0	5

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #122 Meadowlark Lane - Whitewood Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.009
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 54.9
Optimal Cycle: 180 Level Of Service: D

Street Name:	Meadowlark Lane - Whitewood Road						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 2	0 1	2	0 1	1 0	2	0 3	0 1	2	0 3	0 1
Volume Module:												
Base Vol:	55	37	784	296	117	567	636	997	106	865	988	195
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	55	37	784	296	117	567	636	997	106	865	988	195
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	55	37	784	296	117	567	636	997	106	865	988	195
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	55	37	784	296	117	567	636	997	106	865	988	195
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	55	37	784	296	117	567	636	997	106	865	988	195
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	55	37	784	296	117	567	636	997	106	865	988	195
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.95	0.85	0.92	0.83	0.83	0.92	0.91	0.85	0.92	0.91	0.85
Lanes:	2.00	2.00	1.00	2.00	1.00	1.00	2.00	3.00	1.00	2.00	3.00	1.00
Final Sat.:	3502	3610	1615	3502	1581	1581	3502	5187	1615	3502	5187	1615
Capacity Analysis Module:												
Vol/Sat:	0.02	0.01	0.49	0.08	0.07	0.36	0.18	0.19	0.07	0.25	0.19	0.12
Crit Moves:			****	****				****		****		
Green/Cycle:	0.02	0.48	0.48	0.08	0.54	0.54	0.21	0.19	0.19	0.24	0.22	0.22
Volume/Cap:	0.66	0.02	1.01	1.01	0.14	0.66	0.85	1.01	0.34	1.01	0.85	0.54
Delay/Veh:	66.7	13.6	60.5	100.7	11.4	18.0	47.5	71.4	35.7	70.8	43.7	36.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	66.7	13.6	60.5	100.7	11.4	18.0	47.5	71.4	35.7	70.8	43.7	36.0
LOS by Move:	E	B	E	F	B	B	D	E	D	E	D	D
HCM2kAvgQ:	2	0	32	9	2	14	13	17	3	20	14	6

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #138 Jefferson Avenue & Cherry Street

Cycle (sec): 100 Critical Vol./Cap.(X): 0.724
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 21.0
Optimal Cycle: 83 Level Of Service: C

Street Name:	Jefferson Avenue						Cherry Street					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	0 1	1	0 1	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	84	575	187	35	644	21	2	55	7	141	1237	800
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	84	575	187	35	644	21	2	55	7	141	1237	800
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	84	575	187	35	644	21	2	55	7	141	1237	800
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	84	575	187	35	644	21	2	55	7	141	1237	800
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	84	575	187	35	644	21	2	55	7	141	1237	800
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	84	575	187	35	644	21	2	55	7	141	1237	800
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.85	0.95	0.95	0.95	0.95	0.89	0.89	0.95	0.86	0.86
Lanes:	1.00	2.00	1.00	1.00	1.94	0.06	1.00	2.66	0.34	1.00	2.00	1.00
Final Sat.:	1805	3610	1615	1805	3479	113	1805	4523	576	1805	3254	1627
Capacity Analysis Module:												
Vol/Sat:	0.05	0.16	0.12	0.02	0.19	0.19	0.00	0.01	0.01	0.08	0.38	0.49
Crit Moves:	****				****		****					****
Green/Cycle:	0.06	0.29	0.29	0.03	0.26	0.26	0.00	0.09	0.09	0.59	0.68	0.68
Volume/Cap:	0.72	0.56	0.41	0.56	0.72	0.72	0.72	0.13	0.13	0.13	0.56	0.72
Delay/Veh:	66.1	31.1	29.5	58.3	36.9	36.9	342.8	41.9	41.9	9.2	8.5	11.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	66.1	31.1	29.5	58.3	36.9	36.9	342.8	41.9	41.9	9.2	8.5	11.1
LOS by Move:	E	C	C	E	D	D	F	D	D	A	A	B
HCM2kAvgQ:	4	8	5	2	11	11	1	1	1	2	11	18

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #141 Jefferson Ave & Nutmeg St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.993
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 52.0
Optimal Cycle: 180 Level Of Service: D

Street Name:	Jefferson Ave						Nutmeg St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	207	364	240	65	1665	61	97	182	544	369	171	66
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	207	364	240	65	1665	61	97	182	544	369	171	66
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	207	364	240	65	1665	61	97	182	544	369	171	66
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	207	364	240	65	1665	61	97	182	544	369	171	66
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	207	364	240	65	1665	61	97	182	544	369	171	66
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	207	364	240	65	1665	61	97	182	544	369	171	66
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.86	0.86	0.95	0.91	0.91	0.95	0.84	0.84	0.95	0.91	0.91
Lanes:	1.00	2.00	1.00	1.00	2.89	0.11	1.00	1.00	1.00	1.00	1.44	0.56
Final Sat.:	1805	3251	1625	1805	4979	182	1805	1603	1603	1805	2495	963
Capacity Analysis Module:												
Vol/Sat:	0.11	0.11	0.15	0.04	0.33	0.33	0.05	0.11	0.34	0.20	0.07	0.07
Crit Moves:	****				****				****	****		
Green/Cycle:	0.12	0.36	0.36	0.09	0.34	0.34	0.24	0.34	0.34	0.21	0.31	0.31
Volume/Cap:	0.99	0.31	0.41	0.41	0.99	0.99	0.22	0.33	0.99	0.99	0.22	0.22
Delay/Veh:	104.4	22.9	23.9	44.8	52.9	52.9	30.7	24.5	64.2	84.3	25.9	25.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	104.4	22.9	23.9	44.8	52.9	52.9	30.7	24.5	64.2	84.3	25.9	25.9
LOS by Move:	F	C	C	D	D	D	C	C	E	F	C	C
HCM2kAvgQ:	11	4	6	2	26	26	2	4	24	17	3	3

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #142 Jefferson Ave & Magnolia St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.665
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 10.4
Optimal Cycle: 68 Level Of Service: B

Street Name:	Jefferson Ave						Magnolia St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 0	1 0	1	0 0	1 0
Volume Module:												
Base Vol:	84	676	8	7	2381	226	154	1	151	27	3	1
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	84	676	8	7	2381	226	154	1	151	27	3	1
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	84	676	8	7	2381	226	154	1	151	27	3	1
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	84	676	8	7	2381	226	154	1	151	27	3	1
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	84	676	8	7	2381	226	154	1	151	27	3	1
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	84	676	8	7	2381	226	154	1	151	27	3	1
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.90	0.90	0.95	0.85	0.85	0.95	0.96	0.96
Lanes:	1.00	2.96	0.04	1.00	2.74	0.26	1.00	0.01	0.99	1.00	0.75	0.25
Final Sat.:	1805	5116	61	1805	4676	444	1805	11	1606	1805	1372	457
Capacity Analysis Module:												
Vol/Sat:	0.05	0.13	0.13	0.00	0.51	0.51	0.09	0.09	0.09	0.01	0.00	0.00
Crit Moves:	****				****				****		****	
Green/Cycle:	0.07	0.81	0.81	0.02	0.77	0.77	0.16	0.14	0.14	0.02	0.00	0.00
Volume/Cap:	0.66	0.16	0.16	0.16	0.66	0.66	0.53	0.66	0.66	0.66	0.53	0.53
Delay/Veh:	58.0	2.0	2.0	49.6	6.0	6.0	40.5	47.9	47.9	83.1	109	108.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	58.0	2.0	2.0	49.6	6.0	6.0	40.5	47.9	47.9	83.1	109	108.6
LOS by Move:	E	A	A	D	A	A	D	D	D	F	F	F
HCM2kAvgQ:	4	2	2	0	15	15	5	6	6	2	1	1

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #149 Monroe Ave & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.327
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 7.9
Optimal Cycle: 34 Level Of Service: A

Street Name:	Monroe Ave						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ovl			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0	2 0	1	1 0	2 0	1	1 0	4 0	1	1 0	3 1	0
Volume Module:												
Base Vol:	40	79	48	1	36	77	113	1200	15	4	1576	26
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	40	79	48	1	36	77	113	1200	15	4	1576	26
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	40	79	48	1	36	77	113	1200	15	4	1576	26
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	40	79	48	1	36	77	113	1200	15	4	1576	26
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	40	79	48	1	36	77	113	1200	15	4	1576	26
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	40	79	48	1	36	77	113	1200	15	4	1576	26
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.85	0.95	0.95	0.85	0.95	0.91	0.85	0.95	0.91	0.91
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	4.00	1.00	1.00	3.94	0.06
Final Sat.:	1805	3610	1615	1805	3610	1615	1805	6916	1615	1805	6790	112
Capacity Analysis Module:												
Vol/Sat:	0.02	0.02	0.03	0.00	0.01	0.05	0.06	0.17	0.01	0.00	0.23	0.23
Crit Moves:	****				****		****				****	
Green/Cycle:	0.07	0.10	0.10	0.00	0.03	0.22	0.19	0.89	0.96	0.01	0.71	0.71
Volume/Cap:	0.33	0.23	0.31	0.31	0.33	0.21	0.33	0.19	0.01	0.19	0.33	0.33
Delay/Veh:	46.0	42.1	43.2	97.0	49.2	32.1	35.4	0.7	0.1	53.6	5.5	5.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	46.0	42.1	43.2	97.0	49.2	32.1	35.4	0.7	0.1	53.6	5.5	5.5
LOS by Move:	D	D	D	F	D	C	D	A	A	D	A	A
HCM2kAvgQ:	2	1	2	0	1	2	3	1	0	0	5	5

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #158 Adams Ave & Guava St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.293
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 11.5
Optimal Cycle: 20 Level Of Service: B

Street Name:	Adams Ave									Guava St		
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0	1 1	0	1 0	1 1	0	1 0	0 1	0	1 0	0 1	0
Volume Module:												
Base Vol:	64	67	17	100	21	41	19	308	46	3	286	101
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	64	67	17	100	21	41	19	308	46	3	286	101
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	64	67	17	100	21	41	19	308	46	3	286	101
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	64	67	17	100	21	41	19	308	46	3	286	101
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	64	67	17	100	21	41	19	308	46	3	286	101
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	64	67	17	100	21	41	19	308	46	3	286	101
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.68	0.92	0.92	0.65	0.86	0.86	0.48	0.98	0.98	0.50	0.96	0.96
Lanes:	1.00	1.60	0.40	1.00	1.00	1.00	1.00	0.87	0.13	1.00	0.74	0.26
Final Sat.:	1294	2793	709	1239	1626	1626	904	1622	242	941	1349	477
Capacity Analysis Module:												
Vol/Sat:	0.05	0.02	0.02	0.08	0.01	0.03	0.02	0.19	0.19	0.00	0.21	0.21
Crit Moves:				****							****	
Green/Cycle:	0.28	0.28	0.28	0.28	0.28	0.28	0.72	0.72	0.72	0.72	0.72	0.72
Volume/Cap:	0.18	0.09	0.09	0.29	0.05	0.09	0.03	0.26	0.26	0.00	0.29	0.29
Delay/Veh:	27.8	26.9	26.9	29.0	26.6	27.0	3.9	4.8	4.8	3.8	5.0	5.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	27.8	26.9	26.9	29.0	26.6	27.0	3.9	4.8	4.8	3.8	5.0	5.0
LOS by Move:	C	C	C	C	C	C	A	A	A	A	A	A
HCM2kAvgQ:	2	1	1	3	0	1	0	4	4	0	4	4

Note: Queue reported is the number of cars per lane.

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Scenario Report

Scenario:	Existing GP PM
Command:	Existing GP PM
Volume:	Existing GP PM
Geometry:	Future
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	Default Trip Distribution
Paths:	Default Path
Routes:	Default Route
Configuration:	Existing GP PM

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Turning Movement Report

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#1 Menifee Road & Scott Road													
Base	266	573	803	183	308	90	219	850	466	491	555	538	5342
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	266	573	803	183	308	90	219	850	466	491	555	538	5342
#2 Leon Road & Scott Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#3 Winchester Road/SR-79 & Scott Road													
Base	120	2428	27	1146	1909	132	110	269	111	0	219	1083	7554
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	120	2428	27	1146	1909	132	110	269	111	0	219	1083	7554
#4 Antelope Road & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#5 Menifee Road - Meadowlark Road & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#6 Briggs Road & Keller Road													
Base	310	85	102	1	51	83	11	261	609	9	283	4	1809
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	310	85	102	1	51	83	11	261	609	9	283	4	1809
#7 Leon Road & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#8 Winchester Road - SR-79 & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#9 Antelope Road & Golden City Drive - Baxter Road													
Base	2	286	800	230	831	14	3	182	33	279	92	691	3443
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	286	800	230	831	14	3	182	33	279	92	691	3443

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#10 Whitewood Roa - /Meadowlark Road & Golden City Drive - Baxter Road													
Base	208	1107	3	0	538	762	263	12	875	0	7	2	3777
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	208	1107	3	0	538	762	263	12	875	0	7	2	3777
#11 Briggs Road & Baxter Road - Jean Nicholas													
Base	0	384	85	34	525	0	0	0	0	16	0	113	1157
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	384	85	34	525	0	0	0	0	16	0	113	1157
#12 Leon Road & Jean Nicholas													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#13 Winchester Road - SR-79 & Nicholas - Skyview													
Base	207	2617	191	66	1966	17	33	538	112	141	415	110	6413
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	207	2617	191	66	1966	17	33	538	112	141	415	110	6413
#14 Antelope Road & Linnel Lane Extension													
Base	16	460	75	97	640	519	164	532	175	10	160	231	3079
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	16	460	75	97	640	519	164	532	175	10	160	231	3079
#15 Whitewood Road - Meadowlark Road & Linnel Lane Extension													
Base	13	901	4	5	1049	379	340	29	339	1	8	27	3095
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	13	901	4	5	1049	379	340	29	339	1	8	27	3095
#16 Leon Road & Max Gillis Road													
Base	495	409	485	368	261	148	97	164	373	461	326	359	3946
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	495	409	485	368	261	148	97	164	373	461	326	359	3946
#17 Winchester Road - SR-79 & Max Gillis - Thompson													
Base	202	2469	88	306	1298	550	651	291	124	37	243	98	6357
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	202	2469	88	306	1298	550	651	291	124	37	243	98	6357
#18 California Oaks Road & Clinton Keith Road													
Base	309	0	1008	0	0	0	0	2183	132	477	2389	0	6498
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	309	0	1008	0	0	0	0	2183	132	477	2389	0	6498

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#19 I-215 SB Off-Ramp & Clinton Keith Road													
Base	0	0	0	34	1	626	0	2385	650	0	2165	145	6006
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	34	1	626	0	2385	650	0	2165	145	6006
#20 I-215 NB Off Ramp & Clinton Keith Road													
Base	347	1	384	0	0	0	0	1391	271	0	2404	265	5063
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	347	1	384	0	0	0	0	1391	271	0	2404	265	5063
#21 Antelope Road & Clinton Keith Road													
Base	0	0	0	39	0	627	136	1706	0	0	1684	211	4403
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	39	0	627	136	1706	0	0	1684	211	4403
#22 Meadowlark Lane - Whitewood Road & Clinton Keith Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#23 Liberty Road & Clinton Keith Road													
Base	54	0	191	0	0	0	0	2141	122	16	2007	0	4531
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	54	0	191	0	0	0	0	2141	122	16	2007	0	4531
#24 Leon Road & Clinton Keith Road													
Base	0	0	0	131	0	1031	481	1831	0	0	996	834	5304
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	131	0	1031	481	1831	0	0	996	834	5304
#25 Winchester Road - SR-79 & Benton Road													
Base	598	2525	712	55	1001	480	69	556	1481	230	683	69	8459
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	598	2525	712	55	1001	480	69	556	1481	230	683	69	8459
#26 Winchester Road - SR-79 & Via Mira Mosa													
Base	62	3221	238	125	2142	363	243	32	52	223	39	136	6876
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	62	3221	238	125	2142	363	243	32	52	223	39	136	6876
#27 Monroe Ave & Los Alamos													
Base	28	450	277	269	347	63	207	1442	176	98	954	464	4775
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	28	450	277	269	347	63	207	1442	176	98	954	464	4775

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#28 Jefferson Avenue & Murrieta Hot Springs Road													
Base	7	2262	1299	650	1005	66	33	187	121	648	97	752	7127
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	7	2262	1299	650	1005	66	33	187	121	648	97	752	7127
#29 Madison Avenue & Murrieta Hot Springs Road													
Base	326	599	1158	335	252	123	398	1650	318	824	1291	199	7473
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	326	599	1158	335	252	123	398	1650	318	824	1291	199	7473
#30 I-15 SB Off-Ramp & Murrieta Hot Springs Road													
Base	0	0	0	685	0	412	0	2604	495	0	2333	112	6641
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	685	0	412	0	2604	495	0	2333	112	6641
#31 I-15 NB Off-Ramp & Murrieta Hot Springs Road													
Base	197	0	259	0	0	0	0	3038	315	0	1736	1673	7218
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	197	0	259	0	0	0	0	3038	315	0	1736	1673	7218
#32 I-215 SB Off-Ramp & Murrieta Hot Springs Road													
Base	0	0	0	454	0	377	0	3355	139	0	2497	238	7060
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	454	0	377	0	3355	139	0	2497	238	7060
#33 I-215 NB Off-Ramp & Murrieta Hot Springs Road													
Base	82	0	479	0	0	0	0	2317	104	0	2514	1369	6865
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	82	0	479	0	0	0	0	2317	104	0	2514	1369	6865
#34 Jackson Avenue & Murrieta Hot Springs Road													
Base	243	0	183	0	0	0	0	1896	62	205	2590	0	5179
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	243	0	183	0	0	0	0	1896	62	205	2590	0	5179
#35 Margarita Road & Murrieta Hot Springs Road													
Base	920	70	411	196	80	146	47	1676	506	302	1659	40	6053
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	920	70	411	196	80	146	47	1676	506	302	1659	40	6053
#36 French Valley Parkway & Murrieta Hot Springs Road													
Base	39	0	1065	0	0	0	0	1730	367	395	1715	0	5311
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	39	0	1065	0	0	0	0	1730	367	395	1715	0	5311

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#37 Jefferson Avenue & Guava Street													
Base	19	3211	10	8	1077	377	99	81	148	1	27	4	5062
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	19	3211	10	8	1077	377	99	81	148	1	27	4	5062
#38 Jefferson Avenue & Cherry Street													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#39 Washington Ave & Calle Del Oso Oro/Nutmeg													
Base	375	257	150	105	234	49	23	229	268	175	613	148	2626
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	375	257	150	105	234	49	23	229	268	175	613	148	2626
#40 Clinton Keith Rd & Calle de Oso Oro/Bear Creek Dr													
Base	72	174	204	17	90	270	190	532	134	225	743	10	2661
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	72	174	204	17	90	270	190	532	134	225	743	10	2661
#41 Jefferson Ave & Nutmeg St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#42 Jefferson Ave & Magnolia St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#43 Jefferson Ave & Lemon St													
Base	288	2116	2	6	1657	32	35	32	193	16	17	16	4410
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	288	2116	2	6	1657	32	35	32	193	16	17	16	4410
#44 Jefferson Ave & Kalmia St													
Base	375	1717	938	863	1193	28	28	553	266	308	429	750	7448
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	375	1717	938	863	1193	28	28	553	266	308	429	750	7448
#45 Jefferson Ave & Juniper St													
Base	76	2804	103	67	1622	36	168	68	203	33	48	140	5368
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	76	2804	103	67	1622	36	168	68	203	33	48	140	5368

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#46 Jefferson Ave & Ivy St/Los Alamos Rd													
Base	172	2384	604	424	1349	66	81	179	149	211	139	452	6210
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	172	2384	604	424	1349	66	81	179	149	211	139	452	6210
#47 Madison Ave & Kalmia St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#48 Madison Ave/I-15 SB Ramps & Kalmia St													
Base	365	0	904	315	30	362	0	2375	260	267	1344	623	6845
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	365	0	904	315	30	362	0	2375	260	267	1344	623	6845
#49 Monroe Ave & Murrieta Hot Springs Rd													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#50 Hancock Ave & Murrieta Hot Springs Rd													
Base	0	0	0	593	0	886	869	3294	0	0	2591	343	8576
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	593	0	886	869	3294	0	0	2591	343	8576
#51 Alta Murrieta Dr & Murrieta Hot Springs Rd													
Base	597	213	51	187	123	492	691	1712	523	173	2399	150	7311
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	597	213	51	187	123	492	691	1712	523	173	2399	150	7311
#52 Winchester Road - SR-79 & Murrieta Hot Springs Rd													
Base	328	2015	202	194	1225	1054	1397	989	283	273	758	104	8822
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	328	2015	202	194	1225	1054	1397	989	283	273	758	104	8822
#53 Hancock Ave & Los Alamos Rd													
Base	125	456	917	649	136	24	100	1883	52	602	1217	649	6810
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	125	456	917	649	136	24	100	1883	52	602	1217	649	6810
#54 I-215 SB Ramps & Los Alamos Rd													
Base	0	0	0	529	0	1508	0	3000	483	152	1171	0	6843
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	529	0	1508	0	3000	483	152	1171	0	6843

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#55 I-215 NB Ramps & Los Alamos Rd													
Base	211	7	114	0	0	0	1587	1856	0	0	1110	242	5127
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	211	7	114	0	0	0	1587	1856	0	0	1110	242	5127
#56 Whitewood Rd & Los Alamos Rd													
Base	131	558	41	33	482	433	690	356	256	60	191	41	3272
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	131	558	41	33	482	433	690	356	256	60	191	41	3272
#57 Whitewood Rd & Murrieta Hot Springs Rd													
Base	438	307	484	299	219	212	173	1608	168	367	2267	448	6990
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	438	307	484	299	219	212	173	1608	168	367	2267	448	6990
#58 Adams Ave & Guava St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#59 Nutmeg St & Clinton Keith Rd													
Base	57	78	423	277	29	52	96	1702	62	479	1742	341	5338
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	57	78	423	277	29	52	96	1702	62	479	1742	341	5338
#60 Murrieta Oaks Ave-Mitchell Rd & Clinton Keith Rd													
Base	21	114	25	57	147	488	80	2903	25	40	2677	250	6827
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	21	114	25	57	147	488	80	2903	25	40	2677	250	6827
#61 I-215 SB Ramps & Scott Rd													
Base	0	0	0	153	0	273	0	763	404	0	1500	409	3502
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	153	0	273	0	763	404	0	1500	409	3502
#62 I-215 NB Ramps & Scott Rd													
Base	0	9	742	0	0	496	128	920	0	0	1538	345	4178
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	9	742	0	0	496	128	920	0	0	1538	345	4178
#102 Leon Road & Scott Road													
Base	515	367	15	62	192	398	575	495	441	4	385	155	3604
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	515	367	15	62	192	398	575	495	441	4	385	155	3604

City of Murrieta General Plan
Existing General Plan
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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#104 Antelope Road & Keller Road													
Base	623	379	728	79	78	484	722	807	227	186	426	109	4848
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	623	379	728	79	78	484	722	807	227	186	426	109	4848
#105 Menifee Road - Meadowlark Road & Keller Road													
Base	63	775	543	126	819	293	783	295	361	202	300	184	4744
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	63	775	543	126	819	293	783	295	361	202	300	184	4744
#107 Leon Road & Keller Road													
Base	66	837	0	0	609	76	80	19	270	15	181	3	2156
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	66	837	0	0	609	76	80	19	270	15	181	3	2156
#108 Winchester Road - SR-79 & Keller Road													
Base	0	2596	37	12	2148	1	0	20	1	13	13	30	4871
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	2596	37	12	2148	1	0	20	1	13	13	30	4871
#112 Leon Road & Jean Nicholas													
Base	3	524	233	236	556	12	2	103	13	117	144	368	2311
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	3	524	233	236	556	12	2	103	13	117	144	368	2311
#122 Meadowlark Lane - Whitewood Road & Clinton Keith Road													
Base	596	207	691	495	226	321	162	1279	379	430	768	869	6423
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	596	207	691	495	226	321	162	1279	379	430	768	869	6423
#138 Jefferson Avenue & Cherry Street													
Base	33	1291	786	145	783	5	2	1002	47	127	785	616	5622
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	33	1291	786	145	783	5	2	1002	47	127	785	616	5622
#141 Jefferson Ave & Nutmeg St													
Base	635	1173	348	91	1196	94	64	133	293	259	181	112	4579
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	635	1173	348	91	1196	94	64	133	293	259	181	112	4579
#142 Jefferson Ave & Magnolia St													
Base	131	2054	12	9	1643	93	123	4	49	7	4	13	4142
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	131	2054	12	9	1643	93	123	4	49	7	4	13	4142

City of Murrieta General Plan
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PM Peak Hour

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#149 Monroe Ave & Murrieta Hot Springs Rd													
Base	165	260	195	1	262	131	186	2601	135	34	2056	31	6057
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	165	260	195	1	262	131	186	2601	135	34	2056	31	6057
#158 Adams Ave & Guava St													
Base	31	181	21	70	19	178	72	275	134	5	262	158	1406
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	31	181	21	70	19	178	72	275	134	5	262	158	1406

City of Murrieta General Plan
Existing General Plan
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Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
# 1 Menifee Road & Scott Road	E	72.8	1.146	E	72.8	1.146	+ 0.000 D/V
# 3 Winchester Road/SR-79 & Scott	F	287.5	1.886	F	287.5	1.886	+ 0.000 D/V
# 6 Briggs Road & Keller Road	B	19.0	0.604	B	19.0	0.604	+ 0.000 D/V
# 9 Antelope Road & Golden City Dr	D	39.2	1.106	D	39.2	1.106	+ 0.000 D/V
# 10 Whitewood Roa - /Meadowlark Ro	E	65.7	1.147	E	65.7	1.147	+ 0.000 D/V
# 11 Briggs Road & Baxter Road - Je	B	10.5	0.222	B	10.5	0.222	+ 0.000 D/V
# 13 Winchester Road - SR-79 & Nich	C	24.6	0.846	C	24.6	0.846	+ 0.000 D/V
# 14 Antelope Road & Linnel Lane Ex	C	22.1	0.584	C	22.1	0.584	+ 0.000 D/V
# 15 Whitewood Road - Meadowlark Ro	B	15.8	0.638	B	15.8	0.638	+ 0.000 D/V
# 16 Leon Road & Max Gillis Road	C	32.8	0.768	C	32.8	0.768	+ 0.000 D/V
# 17 Winchester Road - SR-79 & Max	D	35.3	0.950	D	35.3	0.950	+ 0.000 D/V
# 18 California Oaks Road & Clinton	C	20.6	0.886	C	20.6	0.886	+ 0.000 D/V
# 19 I-215 SB Off-Ramp & Clinton Ke	B	12.2	0.680	B	12.2	0.680	+ 0.000 D/V
# 20 I-215 NB Off Ramp & Clinton Ke	B	13.4	0.712	B	13.4	0.712	+ 0.000 D/V
# 21 Antelope Road & Clinton Keith	A	2.7	0.422	A	2.7	0.422	+ 0.000 D/V
# 23 Liberty Road & Clinton Keith R	A	6.2	0.567	A	6.2	0.567	+ 0.000 D/V
# 24 Leon Road & Clinton Keith Road	C	20.7	0.879	C	20.7	0.879	+ 0.000 D/V
# 25 Winchester Road - SR-79 & Bent	E	63.2	1.089	E	63.2	1.089	+ 0.000 D/V
# 26 Winchester Road - SR-79 & Via	C	27.7	0.982	C	27.7	0.982	+ 0.000 D/V
# 27 Monroe Ave & Los Alamos	C	28.0	0.800	C	28.0	0.800	+ 0.000 D/V
# 28 Jefferson Avenue & Murrieta Ho	F	173.6	1.684	F	173.6	1.684	+ 0.000 D/V
# 29 Madison Avenue & Murrieta Hot	F	128.8	1.340	F	128.8	1.340	+ 0.000 D/V
# 30 I-15 SB Off-Ramp & Murrieta Ho	B	14.4	0.744	B	14.4	0.744	+ 0.000 D/V

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City of Murrieta General Plan
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Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
# 31 I-15 NB Off-Ramp & Murrieta Ho	A	8.2	0.600	A	8.2	0.600	+ 0.000 D/V
# 32 I-215 SB Off-Ramp & Murrieta H	B	10.6	0.817	B	10.6	0.817	+ 0.000 D/V
# 33 I-215 NB Off-Ramp & Murrieta H	A	9.5	0.653	A	9.5	0.653	+ 0.000 D/V
# 34 Jackson Avenue & Murrieta Hot	A	9.1	0.569	A	9.1	0.569	+ 0.000 D/V
# 35 Margarita Road & Murrieta Hot	D	50.5	1.016	D	50.5	1.016	+ 0.000 D/V
# 36 French Valley Parkway & Murrie	B	17.6	0.790	B	17.6	0.790	+ 0.000 D/V
# 37 Jefferson Avenue & Guava Stree	A	7.9	0.759	A	7.9	0.759	+ 0.000 D/V
# 39 Washington Ave & Calle Del Oso	C	27.2	0.522	C	27.2	0.522	+ 0.000 D/V
# 40 Clinton Keith Rd & Calle de Os	B	16.2	0.644	B	16.2	0.644	+ 0.000 D/V
# 43 Jefferson Ave & Lemon St	B	13.7	0.615	B	13.7	0.615	+ 0.000 D/V
# 44 Jefferson Ave & Kalmia St	F	129.1	1.534	F	129.1	1.534	+ 0.000 D/V
# 45 Jefferson Ave & Juniper St	B	15.5	0.781	B	15.5	0.781	+ 0.000 D/V
# 46 Jefferson Ave & Ivy St/Los Ala	C	30.9	0.909	C	30.9	0.909	+ 0.000 D/V
# 48 Madison Ave/I-15 SB Ramps & Ka	C	30.4	0.871	C	30.4	0.871	+ 0.000 D/V
# 50 Hancock Ave & Murrieta Hot Spr	B	19.0	0.850	B	19.0	0.850	+ 0.000 D/V
# 51 Alta Murrieta Dr & Murrieta Ho	D	53.7	1.024	D	53.7	1.024	+ 0.000 D/V
# 52 Winchester Road - SR-79 & Murr	F	91.7	1.314	F	91.7	1.314	+ 0.000 D/V
# 53 Hancock Ave & Los Alamos Rd	F	224.1	1.622	F	224.1	1.622	+ 0.000 D/V
# 54 I-215 SB Ramps & Los Alamos Rd	F	145.6	1.394	F	145.6	1.394	+ 0.000 D/V
# 55 I-215 NB Ramps & Los Alamos Rd	C	23.1	0.897	C	23.1	0.897	+ 0.000 D/V
# 56 Whitewood Rd & Los Alamos Rd	C	29.5	0.789	C	29.5	0.789	+ 0.000 D/V
# 57 Whitewood Rd & Murrieta Hot Sp	E	67.7	1.094	E	67.7	1.094	+ 0.000 D/V
# 59 Nutmeg St & Clinton Keith Rd	D	51.6	1.029	D	51.6	1.029	+ 0.000 D/V
# 60 Murrieta Oaks Ave-Mitchell Rd	C	26.2	0.930	C	26.2	0.930	+ 0.000 D/V
# 61 I-215 SB Ramps & Scott Rd	A	8.4	0.385	A	8.4	0.385	+ 0.000 D/V

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City of Murrieta General Plan
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Intersection	Base LOS	Del/ Veh	V/ C	Future LOS	Del/ Veh	V/ C	Change in
# 62 I-215 NB Ramps & Scott Rd	B	16.2	0.509	B	16.2	0.509	+ 0.000 D/V
#102 Leon Road & Scott Road	D	45.9	0.958	D	45.9	0.958	+ 0.000 D/V
#104 Antelope Road & Keller Road	D	35.1	0.783	D	35.1	0.783	+ 0.000 D/V
#105 Menifee Road - Meadowlark Road	C	33.1	0.825	C	33.1	0.825	+ 0.000 D/V
#107 Leon Road & Keller Road	B	16.0	0.325	B	16.0	0.325	+ 0.000 D/V
#108 Winchester Road - SR-79 & Kell	A	1.2	0.534	A	1.2	0.534	+ 0.000 D/V
#112 Leon Road & Jean Nicholas	C	23.3	0.580	C	23.3	0.580	+ 0.000 D/V
#122 Meadowlark Lane - Whitewood Ro	E	62.9	1.154	E	62.9	1.154	+ 0.000 D/V
#138 Jefferson Avenue & Cherry Stre	C	30.7	0.950	C	30.7	0.950	+ 0.000 D/V
#141 Jefferson Ave & Nutmeg St	D	37.6	0.928	D	37.6	0.928	+ 0.000 D/V
#142 Jefferson Ave & Magnolia St	A	7.8	0.488	A	7.8	0.488	+ 0.000 D/V
#149 Monroe Ave & Murrieta Hot Spri	B	16.4	0.569	B	16.4	0.569	+ 0.000 D/V
#158 Adams Ave & Guava St	B	13.3	0.348	B	13.3	0.348	+ 0.000 D/V

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City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #1 Menifee Road & Scott Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.146
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 72.8
Optimal Cycle: 180 Level Of Service: E

Street Name:	Menifee Rd						Scott Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	266	573	803	183	308	90	219	850	466	491	555	538
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	266	573	803	183	308	90	219	850	466	491	555	538
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	266	573	803	183	308	90	219	850	466	491	555	538
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	266	573	803	183	308	90	219	850	466	491	555	538
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	266	573	803	183	308	90	219	850	466	491	555	538
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	266	573	803	183	308	90	219	850	466	491	555	538
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.87	0.87	0.95	0.92	0.92	0.95	0.86	0.86	0.95	0.84	0.84
Lanes:	1.00	1.00	1.00	1.00	1.55	0.45	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1805	1646	1646	1805	2699	789	1805	3275	1637	1805	3202	1601
Capacity Analysis Module:												
Vol/Sat:	0.15	0.35	0.49	0.10	0.11	0.11	0.12	0.26	0.28	0.27	0.17	0.34
Crit Moves:			****	****					****	****		
Green/Cycle:	0.29	0.43	0.43	0.09	0.22	0.22	0.13	0.25	0.25	0.24	0.36	0.36
Volume/Cap:	0.51	0.82	1.15	1.15	0.51	0.51	0.94	1.05	1.15	1.15	0.49	0.94
Delay/Veh:	30.4	28.6	104.5	161.4	34.5	34.5	86.1	75.5	113.8	127.9	25.2	45.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	30.4	28.6	104.5	161.4	34.5	34.5	86.1	75.5	113.8	127.9	25.2	45.7
LOS by Move:	C	C	F	F	C	C	F	E	F	F	C	D
HCM2kAvgQ:	7	18	42	12	6	6	10	22	27	26	8	23

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #3 Winchester Road/SR-79 & Scott Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.886
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 287.5
Optimal Cycle: 180 Level Of Service: F

Street Name:	Winchester Road/SR-79									Scott Road								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected					Protected				
Rights:	Include					Include					Include					Include				
Min. Green:	0	0	0			0	0	0			0	0	0			0	0	0		
Lanes:	1	0	2	1	0	1	0	2	1	0	1	0	2	1	0	1	0	2	1	0
Volume Module:																				
Base Vol:	120	2428		27		1146	1909		132		110		269		111		0	219		1083
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00	1.00		1.00
Initial Bse:	120	2428		27		1146	1909		132		110		269		111		0	219		1083
Added Vol:	0	0		0		0	0		0		0		0		0		0	0		0
PasserByVol:	0	0		0		0	0		0		0		0		0		0	0		0
Initial Fut:	120	2428		27		1146	1909		132		110		269		111		0	219		1083
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00	1.00		1.00
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00	1.00		1.00
PHF Volume:	120	2428		27		1146	1909		132		110		269		111		0	219		1083
Reduct Vol:	0	0		0		0	0		0		0		0		0		0	0		0
Reduced Vol:	120	2428		27		1146	1909		132		110		269		111		0	219		1083
PCE Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00	1.00		1.00
MLF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00	1.00		1.00
FinalVolume:	120	2428		27		1146	1909		132		110		269		111		0	219		1083
Saturation Flow Module:																				
Sat/Lane:	1900	1900		1900		1900	1900		1900		1900		1900		1900		1900	1900		1900
Adjustment:	0.95	0.91		0.91		0.95	0.90		0.90		0.95		0.87		0.87		1.00	0.80		0.80
Lanes:	1.00	2.97		0.03		1.00	2.81		0.19		1.00		2.12		0.88		1.00	2.00		1.00
Final Sat.:	1805	5120		57		1805	4803		332		1805		3510		1448		1900	3026		1513
Capacity Analysis Module:																				
Vol/Sat:	0.07	0.47		0.47		0.63	0.40		0.40		0.06		0.08		0.08		0.00	0.07		0.72
Crit Moves:		****				****					****									****
Green/Cycle:	0.08	0.25		0.25		0.34	0.50		0.50		0.03		0.41		0.41		0.00	0.38		0.38
Volume/Cap:	0.79	1.89		1.89		1.89	0.79		0.79		1.89		0.19		0.19		0.00	0.19		1.89
Delay/Veh:	68.5	439		439.0		438.1	22.1		22.1		504.5		18.8		18.8		0.0	20.8		435.2
User DelAdj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00	1.00		1.00
AdjDel/Veh:	68.5	439		439.0		438.1	22.1		22.1		504.5		18.8		18.8		0.0	20.8		435.2
LOS by Move:	E	F		F		F	C		C		F		B		B		A	C		F
HCM2kAvgQ:	6	80		80		101	20		20		11		3		3		0	2		105

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #6 Briggs Road & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.604
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 19.0
Optimal Cycle: 58 Level Of Service: B

Street Name:	Briggs Road									Keller Road								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected					Protected				
Rights:	Include					Include					Include					Include				
Min. Green:	0	0	0			0	0	0			0	0	0			0	0	0		
Lanes:	1	0	1	1	0	1	0	1	1	0	1	0	1	1	0	1	0	1	1	0
Volume Module:																				
Base Vol:	310	85		102		1	51		83		11		261		609		9	283		4
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00	1.00		1.00
Initial Bse:	310	85		102		1	51		83		11		261		609		9	283		4
Added Vol:	0	0		0		0	0		0		0		0		0		0	0		0
PasserByVol:	0	0		0		0	0		0		0		0		0		0	0		0
Initial Fut:	310	85		102		1	51		83		11		261		609		9	283		4
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00	1.00		1.00
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00	1.00		1.00
PHF Volume:	310	85		102		1	51		83		11		261		609		9	283		4
Reduct Vol:	0	0		0		0	0		0		0		0		0		0	0		0
Reduced Vol:	310	85		102		1	51		83		11		261		609		9	283		4
PCE Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00	1.00		1.00
MLF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00	1.00		1.00
FinalVolume:	310	85		102		1	51		83		11		261		609		9	283		4
Saturation Flow Module:																				
Sat/Lane:	1900	1900		1900		1900	1900		1900		1900		1900		1900		1900	1900		1900
Adjustment:	0.95	0.87		0.87		0.95	0.86		0.86		0.95		0.85		0.85		0.95	0.95		0.95
Lanes:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00	1.97		0.03
Final Sat.:	1805	1657		1657		1805	1637		1637		1805		1615		1615		1805	3553		50
Capacity Analysis Module:																				
Vol/Sat:	0.17	0.05		0.06		0.00	0.03		0.05		0.01		0.16		0.38		0.00	0.08		0.08
Crit Moves:	****								****						****		****			
Green/Cycle:	0.28	0.36		0.36		0.00	0.08		0.08		0.04		0.62		0.62		0.01	0.59		0.59
Volume/Cap:	0.60	0.14		0.17		0.17	0.37		0.60		0.14		0.26		0.60		0.60	0.14		0.14
Delay/Veh:	33.0	21.3		21.6		62.8	44.0		48.9		46.7		8.5		12.1		104.1	9.3		9.3
User DelAdj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00	1.00		1.00
AdjDel/Veh:	33.0	21.3		21.6		62.8	44.0		48.9		46.7		8.5		12.1		104.1	9.3		9.3
LOS by Move:	C	C		C		E	D		D		D		A		B		F	A		A
HCM2kAvgQ:	9	2		2		0	2		4		0		4		12		1	2		2

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #9 Antelope Road & Golden City Drive - Baxter Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.106
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 39.2
Optimal Cycle: 180 Level Of Service: D

Street Name:	Antelope Road						Golden City Drive - Baxter Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	2	286	800	230	831	14	3	182	33	279	92	691
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	2	286	800	230	831	14	3	182	33	279	92	691
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	2	286	800	230	831	14	3	182	33	279	92	691
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	2	286	800	230	831	14	3	182	33	279	92	691
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	2	286	800	230	831	14	3	182	33	279	92	691
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	2	286	800	230	831	14	3	182	33	279	92	691
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.26	0.84	0.84	0.18	0.95	0.95	0.19	0.93	0.93	0.55	0.82	0.82
Lanes:	1.00	1.00	1.00	1.00	1.97	0.03	1.00	1.69	0.31	1.00	1.00	1.00
Final Sat.:	492	1605	1605	346	3540	60	367	2986	541	1041	1567	1567
Capacity Analysis Module:												
Vol/Sat:	0.00	0.18	0.50	0.67	0.23	0.23	0.01	0.06	0.06	0.27	0.06	0.44
Crit Moves:				****								****
Green/Cycle:	0.60	0.60	0.60	0.60	0.60	0.60	0.40	0.40	0.40	0.40	0.40	0.40
Volume/Cap:	0.01	0.30	0.83	1.11	0.39	0.39	0.02	0.15	0.15	0.67	0.15	1.11
Delay/Veh:	8.0	9.7	20.4	113.7	10.5	10.5	18.3	19.3	19.3	29.0	19.2	96.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	8.0	9.7	20.4	113.7	10.5	10.5	18.3	19.3	19.3	29.0	19.2	96.8
LOS by Move:	A	A	C	F	B	B	B	B	B	C	B	F
HCM2kAvgQ:	0	4	23	13	7	7	0	2	2	8	2	35

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #10 Whitewood Roa - /Meadowlark Road & Golden City Drive - Baxter R

Cycle (sec): 100 Critical Vol./Cap.(X): 1.147
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 65.7
Optimal Cycle: 180 Level Of Service: E

Street Name:	Whitewood Road - Meadowlark Road						Golden City Drive - Baxter Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	208	1107	3	0	538	762	263	12	875	0	7	2
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	208	1107	3	0	538	762	263	12	875	0	7	2
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	208	1107	3	0	538	762	263	12	875	0	7	2
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	208	1107	3	0	538	762	263	12	875	0	7	2
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	208	1107	3	0	538	762	263	12	875	0	7	2
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	208	1107	3	0	538	762	263	12	875	0	7	2
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.95	1.00	0.87	0.87	0.95	0.81	0.81	1.00	0.92	0.92
Lanes:	1.00	1.99	0.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.56	0.44
Final Sat.:	1805	3600	10	1900	1646	1646	1805	1538	1538	1900	2715	776
Capacity Analysis Module:												
Vol/Sat:	0.12	0.31	0.31	0.00	0.33	0.46	0.15	0.01	0.57	0.00	0.00	0.00
Crit Moves:	****					****			****	****		
Green/Cycle:	0.10	0.50	0.50	0.00	0.40	0.40	0.49	0.50	0.50	0.00	0.01	0.01
Volume/Cap:	1.15	0.61	0.61	0.00	0.81	1.15	0.30	0.02	1.15	0.00	0.30	0.30
Delay/Veh:	156.9	18.4	18.4	0.0	29.6	106.7	15.6	12.8	106.2	0.0	54.8	54.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	156.9	18.4	18.4	0.0	29.6	106.7	15.6	12.8	106.2	0.0	54.8	54.8
LOS by Move:	F	B	B	A	C	F	B	B	F	A	D	D
HCM2kAvgQ:	13	13	13	0	17	41	5	0	46	0	0	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #11 Briggs Road & Baxter Road - Jean Nicholas

Cycle (sec): 100 Critical Vol./Cap.(X): 0.222
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 10.5
Optimal Cycle: 29 Level Of Service: B

Street Name:	Briggs Road						Baxter Road - Jean Nicholas					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0 1	1 0	1	0 2	0 0	0	0 0	0 0	1	0 0	0 1
Volume Module:												
Base Vol:	0	384	85	34	525	0	0	0	0	16	0	113
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	384	85	34	525	0	0	0	0	16	0	113
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	384	85	34	525	0	0	0	0	16	0	113
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	384	85	34	525	0	0	0	0	16	0	113
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	384	85	34	525	0	0	0	0	16	0	113
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	384	85	34	525	0	0	0	0	16	0	113
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.92	0.92	0.95	0.95	1.00	1.00	1.00	1.00	0.95	1.00	0.85
Lanes:	0.00	1.64	0.36	1.00	2.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00
Final Sat.:	0	2876	637	1805	3610	0	0	0	0	1805	0	1615
Capacity Analysis Module:												
Vol/Sat:	0.00	0.13	0.13	0.02	0.15	0.00	0.00	0.00	0.00	0.01	0.00	0.07
Crit Moves:		****		****								****
Green/Cycle:	0.00	0.60	0.60	0.08	0.69	0.00	0.00	0.00	0.00	0.31	0.00	0.31
Volume/Cap:	0.00	0.22	0.22	0.22	0.21	0.00	0.00	0.00	0.00	0.03	0.00	0.22
Delay/Veh:	0.0	9.3	9.3	43.4	5.8	0.0	0.0	0.0	0.0	23.7	0.0	25.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	9.3	9.3	43.4	5.8	0.0	0.0	0.0	0.0	23.7	0.0	25.5
LOS by Move:	A	A	A	D	A	A	A	A	A	C	A	C
HCM2kAvgQ:	0	3	3	1	3	0	0	0	0	0	0	3

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #13 Winchester Road - SR-79 & Nicholas - Skyview

Cycle (sec): 100 Critical Vol./Cap.(X): 0.846
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 24.6
Optimal Cycle: 148 Level Of Service: C

Street Name:	Winchester Road - SR-79						Nicholas - Skyview					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	207	2617	191	66	1966	17	33	538	112	141	415	110
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	207	2617	191	66	1966	17	33	538	112	141	415	110
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	207	2617	191	66	1966	17	33	538	112	141	415	110
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	207	2617	191	66	1966	17	33	538	112	141	415	110
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	207	2617	191	66	1966	17	33	538	112	141	415	110
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	207	2617	191	66	1966	17	33	538	112	141	415	110
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.90	0.90	0.95	0.91	0.91	0.95	0.93	0.93	0.95	0.92	0.92
Lanes:	1.00	2.80	0.20	1.00	2.97	0.03	1.00	1.66	0.34	1.00	1.58	0.42
Final Sat.:	1805	4786	349	1805	5137	44	1805	2910	606	1805	2765	733
Capacity Analysis Module:												
Vol/Sat:	0.11	0.55	0.55	0.04	0.38	0.38	0.02	0.18	0.18	0.08	0.15	0.15
Crit Moves:		****		****				****		****		
Green/Cycle:	0.16	0.65	0.65	0.04	0.53	0.53	0.03	0.22	0.22	0.09	0.28	0.28
Volume/Cap:	0.72	0.85	0.85	0.85	0.72	0.72	0.54	0.85	0.85	0.85	0.54	0.54
Delay/Veh:	48.6	16.0	16.0	101.4	18.8	18.8	57.1	46.1	46.1	75.7	31.4	31.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	48.6	16.0	16.0	101.4	18.8	18.8	57.1	46.1	46.1	75.7	31.4	31.4
LOS by Move:	D	B	B	F	B	B	E	D	D	E	C	C
HCM2kAvgQ:	8	27	27	4	18	18	2	13	13	7	8	8

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #14 Antelope Road & Linnel Lane Extension

Cycle (sec): 100 Critical Vol./Cap.(X): 0.584
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 22.1
Optimal Cycle: 55 Level Of Service: C

Street Name:	Antelope Road						Linnel Lane Extension					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	16	460	75	97	640	519	164	532	175	10	160	231
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	16	460	75	97	640	519	164	532	175	10	160	231
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	16	460	75	97	640	519	164	532	175	10	160	231
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	16	460	75	97	640	519	164	532	175	10	160	231
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	16	460	75	97	640	519	164	532	175	10	160	231
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	16	460	75	97	640	519	164	532	175	10	160	231
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.93	0.93	0.95	0.89	0.89	0.95	0.91	0.91	0.95	0.87	0.87
Lanes:	1.00	1.72	0.28	1.00	1.10	0.90	1.00	1.50	0.50	1.00	1.00	1.00
Final Sat.:	1805	3039	495	1805	1860	1508	1805	2616	861	1805	1644	1644
Capacity Analysis Module:												
Vol/Sat:	0.01	0.15	0.15	0.05	0.34	0.34	0.09	0.20	0.20	0.01	0.10	0.14
Crit Moves:	****				****		****					****
Green/Cycle:	0.02	0.45	0.45	0.16	0.59	0.59	0.16	0.39	0.39	0.01	0.24	0.24
Volume/Cap:	0.58	0.34	0.34	0.34	0.58	0.58	0.58	0.53	0.53	0.53	0.40	0.58
Delay/Veh:	77.4	18.2	18.2	38.1	13.3	13.3	42.4	24.1	24.1	74.3	32.2	34.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	77.4	18.2	18.2	38.1	13.3	13.3	42.4	24.1	24.1	74.3	32.2	34.9
LOS by Move:	E	B	B	D	B	B	D	C	C	E	C	C
HCM2kAvgQ:	1	6	6	3	12	12	6	9	9	1	5	7

Note: Queue reported is the number of cars per lane.

Traffix 7.9.0215 (c) 2008 Dowling Assoc. Licensed to MMA, LONG BEACH, CA

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #15 Whitewood Road - Meadowlark Road & Linnel Lane Extension

Cycle (sec): 100 Critical Vol./Cap.(X): 0.638
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 15.8
Optimal Cycle: 63 Level Of Service: B

Street Name:	Whitewood Road - Meadowlark Road						Linnel Lane Extension (Future)					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	13	901	4	5	1049	379	340	29	339	1	8	27
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	13	901	4	5	1049	379	340	29	339	1	8	27
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	13	901	4	5	1049	379	340	29	339	1	8	27
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	13	901	4	5	1049	379	340	29	339	1	8	27
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	13	901	4	5	1049	379	340	29	339	1	8	27
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	13	901	4	5	1049	379	340	29	339	1	8	27
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.95	0.95	0.91	0.91	0.95	0.82	0.82	0.95	0.84	0.84
Lanes:	1.00	1.99	0.01	1.00	1.47	0.53	1.00	1.00	1.00	1.00	1.00	1.00
Final Sat.:	1805	3590	16	1805	2546	920	1805	1556	1556	1805	1596	1596
Capacity Analysis Module:												
Vol/Sat:	0.01	0.25	0.25	0.00	0.41	0.41	0.19	0.02	0.22	0.00	0.01	0.02
Crit Moves:	****				****				****	****		
Green/Cycle:	0.01	0.65	0.65	0.01	0.65	0.65	0.31	0.34	0.34	0.00	0.03	0.03
Volume/Cap:	0.64	0.39	0.39	0.39	0.64	0.64	0.60	0.05	0.64	0.64	0.18	0.60
Delay/Veh:	101.1	8.3	8.3	67.5	11.3	11.3	30.7	22.1	30.1	357.9	47.9	64.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	101.1	8.3	8.3	67.5	11.3	11.3	30.7	22.1	30.1	357.9	47.9	64.1
LOS by Move:	F	A	A	E	B	B	C	C	C	F	D	E
HCM2kAvgQ:	1	7	7	1	14	14	9	1	10	0	0	2

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #16 Leon Road & Max Gillis Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.768
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 32.8
Optimal Cycle: 98 Level Of Service: C

Street Name:	Leon Road						Max Gillis Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	2	0	1	2	0	1	1	0	2	0	1	0	1
Volume Module:												
Base Vol:	495	409	485	368	261	148	97	164	373	461	326	359
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	495	409	485	368	261	148	97	164	373	461	326	359
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	495	409	485	368	261	148	97	164	373	461	326	359
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	495	409	485	368	261	148	97	164	373	461	326	359
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	495	409	485	368	261	148	97	164	373	461	326	359
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	495	409	485	368	261	148	97	164	373	461	326	359
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.95	0.85	0.92	0.90	0.90	0.92	0.85	0.85	0.92	1.00	0.85
Lanes:	2.00	2.00	1.00	2.00	1.28	0.72	2.00	1.00	1.00	2.00	1.00	1.00
Final Sat.:	3502	3610	1615	3502	2179	1236	3502	1617	1617	3502	1900	1615
Capacity Analysis Module:												
Vol/Sat:	0.14	0.11	0.30	0.11	0.12	0.12	0.03	0.10	0.23	0.13	0.17	0.22
Crit Moves:			****	****					****	****		
Green/Cycle:	0.29	0.39	0.39	0.14	0.24	0.24	0.05	0.30	0.30	0.17	0.42	0.42
Volume/Cap:	0.49	0.29	0.77	0.77	0.49	0.49	0.53	0.34	0.77	0.77	0.41	0.53
Delay/Veh:	30.1	21.0	32.2	49.0	33.1	33.1	49.1	27.4	36.9	45.5	20.7	22.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	30.1	21.0	32.2	49.0	33.1	33.1	49.1	27.4	36.9	45.5	20.7	22.5
LOS by Move:	C	C	C	D	C	C	D	C	D	D	C	C
HCM2kAvgQ:	7	5	15	8	6	6	2	4	13	9	7	9

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #17 Winchester Road - SR-79 & Max Gillis - Thompson

Cycle (sec): 100 Critical Vol./Cap.(X): 0.950
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 35.3
Optimal Cycle: 180 Level Of Service: D

Street Name:	Winchester Road - SR-79									Max Gillis - Thompson					
Approach:	North Bound			South Bound			East Bound			West Bound					
Movement:	L	T	R	L	T	R	L	T	R	L	T	R			
Control:	Protected			Protected			Protected			Protected					
Rights:	Include			Include			Include			Include					
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0			
Lanes:	1	0	2	1	0	1	0	3	0	1	2	0	2	0	1	1	0	1	1	0	
Volume Module:															
Base Vol:	202	2469	88	306	1298	550	651	291	124	37	243	98			
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Initial Bse:	202	2469	88	306	1298	550	651	291	124	37	243	98			
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0			
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0			
Initial Fut:	202	2469	88	306	1298	550	651	291	124	37	243	98			
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
PHF Volume:	202	2469	88	306	1298	550	651	291	124	37	243	98			
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0			
Reduced Vol:	202	2469	88	306	1298	550	651	291	124	37	243	98			
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
FinalVolume:	202	2469	88	306	1298	550	651	291	124	37	243	98			
Saturation Flow Module:															
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900			
Adjustment:	0.95	0.91	0.91	0.95	0.91	0.85	0.92	0.95	0.85	0.95	0.91	0.91			
Lanes:	1.00	2.90	0.10	1.00	3.00	1.00	2.00	2.00	1.00	1.00	1.43	0.57			
Final Sat.:	1805	4983	178	1805	5187	1615	3502	3610	1615	1805	2462	993			
Capacity Analysis Module:															
Vol/Sat:	0.11	0.50	0.50	0.17	0.25	0.34	0.19	0.08	0.08	0.02	0.10	0.10			
Crit Moves:		****		****			****				****				
Green/Cycle:	0.17	0.52	0.52	0.18	0.53	0.53	0.20	0.24	0.24	0.06	0.10	0.10			
Volume/Cap:	0.65	0.95	0.95	0.95	0.47	0.65	0.95	0.34	0.32	0.34	0.95	0.95			
Delay/Veh:	43.1	31.1	31.1	77.5	15.0	18.7	62.4	31.7	31.9	46.9	79.0	79.0			
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
AdjDel/Veh:	43.1	31.1	31.1	77.5	15.0	18.7	62.4	31.7	31.9	46.9	79.0	79.0			
LOS by Move:	D	C	C	E	B	B	E	C	C	D	E	E			
HCM2kAvgQ:	7	33	33	14	9	13	15	4	3	1	9	9			

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #18 California Oaks Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.886
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 20.6
Optimal Cycle: 180 Level Of Service: C

Street Name:	California Oaks Road									Clinton Keith Road								
Approach:	North Bound				South Bound					East Bound					West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected					Protected				
Rights:	Ovl					Include					Include					Include				
Min. Green:	0	0	0			0	0	0			0	0	0			0	0	0		
Lanes:	1	0	0	0	2	0	0	0	0	0	0	0	2	1	0	1	0	3	0	0
Volume Module:																				
Base Vol:	309	0	1008			0	0	0			0	2183	132			477	2389	0		
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Initial Bse:	309	0	1008			0	0	0			0	2183	132			477	2389	0		
Added Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
PasserByVol:	0	0	0			0	0	0			0	0	0			0	0	0		
Initial Fut:	309	0	1008			0	0	0			0	2183	132			477	2389	0		
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Volume:	309	0	1008			0	0	0			0	2183	132			477	2389	0		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
Reduced Vol:	309	0	1008			0	0	0			0	2183	132			477	2389	0		
PCE Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
MLF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
FinalVolume:	309	0	1008			0	0	0			0	2183	132			477	2389	0		
Saturation Flow Module:																				
Sat/Lane:	1900	1900	1900			1900	1900	1900			1900	1900	1900			1900	1900	1900		
Adjustment:	0.95	1.00	0.75			1.00	1.00	1.00			1.00	0.90	0.90			0.95	0.91	1.00		
Lanes:	1.00	0.00	2.00			0.00	0.00	0.00			0.00	2.83	0.17			1.00	3.00	0.00		
Final Sat.:	1805	0	2842			0	0	0			0	4847	293			1805	5187	0		
Capacity Analysis Module:																				
Vol/Sat:	0.17	0.00	0.35			0.00	0.00	0.00			0.00	0.45	0.45			0.26	0.46	0.00		
Crit Moves:	****											****				****				
Green/Cycle:	0.19	0.00	0.49			0.00	0.00	0.00			0.00	0.51	0.51			0.30	0.81	0.00		
Volume/Cap:	0.89	0.00	0.72			0.00	0.00	0.00			0.00	0.89	0.89			0.89	0.57	0.00		
Delay/Veh:	62.0	0.0	21.9			0.0	0.0	0.0			0.0	26.0	26.0			49.6	3.7	0.0		
User DelAdj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
AdjDel/Veh:	62.0	0.0	21.9			0.0	0.0	0.0			0.0	26.0	26.0			49.6	3.7	0.0		
LOS by Move:	E		A			C		A			A		C			D		A		
HCM2kAvgQ:	13		0			15		0			0		27			17		10		

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #19 I-215 SB Off-Ramp & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.680
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 12.2
Optimal Cycle: 71 Level Of Service: B

Street Name:	I-215 SB Off-Ramp									Clinton Keith Road								
Approach:	North Bound				South Bound					East Bound					West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Split Phase					Split Phase					Protected					Protected				
Rights:	Include					Include					Include					Ignore				
Min. Green:	0	0	0			0	0	0			0	0	0			0	0	0		
Lanes:	0	0	0	0	0	0	1	0	0	2	0	0	3	0	1	0	0	3	0	1
Volume Module:																				
Base Vol:	0	0	0			34	1	626			0	2385	650			0	2165	145		
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Initial Bse:	0	0	0			34	1	626			0	2385	650			0	2165	145		
Added Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
PasserByVol:	0	0	0			0	0	0			0	0	0			0	0	0		
Initial Fut:	0	0	0			34	1	626			0	2385	650			0	2165	145		
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	0.00		
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	0.00		
PHF Volume:	0	0	0			34	1	626			0	2385	650			0	2165	0		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
Reduced Vol:	0	0	0			34	1	626			0	2385	650			0	2165	0		
PCE Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	0.00		
MLF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	0.00		
FinalVolume:	0	0	0			34	1	626			0	2385	650			0	2165	0		
Saturation Flow Module:																				
Sat/Lane:	1900	1900	1900			1900	1900	1900			1900	1900	1900			1900	1900	1900		
Adjustment:	1.00	1.00	1.00			0.99	0.99	0.75			1.00	0.91	0.85			1.00	0.91	1.00		
Lanes:	0.00	0.00	0.00			0.97	0.03	2.00			0.00	3.00	1.00			0.00	3.00	1.00		
Final Sat.:	0	0	0			1831	54	2842			0	5187	1615			0	5187	1900		
Capacity Analysis Module:																				
Vol/Sat:	0.00	0.00	0.00			0.02	0.02	0.22			0.00	0.46	0.40			0.00	0.42	0.00		
Crit Moves:								****				****				****				
Green/Cycle:	0.00	0.00	0.00			0.32	0.32	0.32			0.00	0.68	0.68			0.00	0.68	0.00		
Volume/Cap:	0.00	0.00	0.00			0.06	0.06	0.68			0.00	0.68	0.60			0.00	0.62	0.00		
Delay/Veh:	0.0	0.0	0.0			23.3	23.3	31.4			0.0	10.3	9.7			0.0	9.3	0.0		
User DelAdj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
AdjDel/Veh:	0.0	0.0	0.0			23.3	23.3	31.4			0.0	10.3	9.7			0.0	9.3	0.0		
LOS by Move:	A		A			C		C			A		B			A		A		
HCM2kAvgQ:	0		0			1		11			0		17			11		0		

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #20 I-215 NB Off Ramp & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.712
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 13.4
Optimal Cycle: 79 Level Of Service: B

Street Name:	I-215 NB Off Ramp						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 1	0 1	0	0 0	0 0	0	0 0	3 0	1	0 0	3 0	1
Volume Module:												
Base Vol:	347	1	384	0	0	0	0	1391	271	0	2404	265
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	347	1	384	0	0	0	0	1391	271	0	2404	265
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	347	1	384	0	0	0	0	1391	271	0	2404	265
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
PHF Volume:	347	1	384	0	0	0	0	1391	271	0	2404	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	347	1	384	0	0	0	0	1391	271	0	2404	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
FinalVolume:	347	1	384	0	0	0	0	1391	271	0	2404	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.81	0.81	0.81	1.00	1.00	1.00	1.00	0.91	0.85	1.00	0.91	1.00
Lanes:	0.99	0.01	1.00	0.00	0.00	0.00	0.00	3.00	1.00	0.00	3.00	1.00
Final Sat.:	1540	4	1544	0	0	0	0	5187	1615	0	5187	1900
Capacity Analysis Module:												
Vol/Sat:	0.23	0.23	0.25	0.00	0.00	0.00	0.00	0.27	0.17	0.00	0.46	0.00
Crit Moves:			****				****				****	
Green/Cycle:	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.65	0.65	0.00	0.65	0.00
Volume/Cap:	0.65	0.65	0.71	0.00	0.00	0.00	0.00	0.41	0.26	0.00	0.71	0.00
Delay/Veh:	28.6	28.6	30.6	0.0	0.0	0.0	0.0	8.4	7.5	0.0	12.1	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	28.6	28.6	30.6	0.0	0.0	0.0	0.0	8.4	7.5	0.0	12.1	0.0
LOS by Move:	C	C	C	A	A	A	A	A	A	A	B	A
HCM2kAvgQ:	10	10	12	0	0	0	0	7	4	0	18	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #21 Antelope Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.422
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 2.7
Optimal Cycle: 39 Level Of Service: A

Street Name:	Antelope Road						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ignore			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	0 0	0	2 0	0 0	2	2 0	3 0	0	0 0	2 1	0
Volume Module:												
Base Vol:	0	0	0	39	0	627	136	1706	0	0	1684	211
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	39	0	627	136	1706	0	0	1684	211
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	39	0	627	136	1706	0	0	1684	211
User Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	39	0	0	136	1706	0	0	1684	211
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	39	0	0	136	1706	0	0	1684	211
PCE Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	39	0	0	136	1706	0	0	1684	211
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.92	1.00	0.88	0.92	0.91	1.00	1.00	0.89	0.89
Lanes:	0.00	0.00	0.00	2.00	0.00	2.00	2.00	3.00	0.00	0.00	2.67	0.33
Final Sat.:	0	0	0	3502	0	3344	3502	5187	0	0	4531	568
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.01	0.00	0.00	0.04	0.33	0.00	0.00	0.37	0.37
Crit Moves:				****			****				****	
Green/Cycle:	0.00	0.00	0.00	0.03	0.00	0.00	0.09	0.97	0.00	0.00	0.88	0.88
Volume/Cap:	0.00	0.00	0.00	0.42	0.00	0.00	0.42	0.34	0.00	0.00	0.42	0.42
Delay/Veh:	0.0	0.0	0.0	51.0	0.0	0.0	43.8	0.1	0.0	0.0	1.2	1.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	51.0	0.0	0.0	43.8	0.1	0.0	0.0	1.2	1.2
LOS by Move:	A	A	A	D	A	A	D	A	A	A	A	A
HCM2kAvgQ:	0	0	0	1	0	0	3	1	0	0	4	4

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #23 Liberty Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.567
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 6.2
Optimal Cycle: 53 Level Of Service: A

Street Name:	Liberty Road						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	0	0	1	0	0	0	0	0	1	0	2	1	0	1	0	3	0	0
Volume Module:																				
Base Vol:	54	0	191	0	0	0	0	2141	122	16	2007	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	54	0	191	0	0	0	0	2141	122	16	2007	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	54	0	191	0	0	0	0	2141	122	16	2007	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	54	0	191	0	0	0	0	2141	122	16	2007	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	54	0	191	0	0	0	0	2141	122	16	2007	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	54	0	191	0	0	0	0	2141	122	16	2007	0
Saturation Flow Module:																				
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.85	1.00	1.00	1.00	1.00	0.90	0.90	0.95	0.91	1.00
Lanes:	2.00	0.00	1.00	0.00	0.00	0.00	0.00	2.84	0.16	1.00	3.00	0.00
Final Sat.:	3502	0	1615	0	0	0	0	4868	277	1805	5187	0
Capacity Analysis Module:																				
Vol/Sat:	0.02	0.00	0.12	0.00	0.00	0.00	0.00	0.44	0.44	0.01	0.39	0.00
Crit Moves:			****					****		****		
Green/Cycle:	0.21	0.00	0.21	0.00	0.00	0.00	0.00	0.78	0.78	0.02	0.79	0.00
Volume/Cap:	0.07	0.00	0.57	0.00	0.00	0.00	0.00	0.57	0.57	0.57	0.49	0.00
Delay/Veh:	31.8	0.0	37.8	0.0	0.0	0.0	0.0	4.7	4.7	73.2	3.6	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	31.8	0.0	37.8	0.0	0.0	0.0	0.0	4.7	4.7	73.2	3.6	0.0
LOS by Move:	C	A	D	A	A	A	A	A	A	E	A	A
HCM2kAvgQ:	1	0	6	0	0	0	0	11	11	1	8	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #24 Leon Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.879
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 20.7
Optimal Cycle: 180 Level Of Service: C

Street Name:	Leon Road						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ovl			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	1	0	0	0	2	2	0	3	0	0	0	0	3	0	1
Volume Module:																				
Base Vol:	0	0	0	131	0	1031	481	1831	0	0	996	834
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	131	0	1031	481	1831	0	0	996	834
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	131	0	1031	481	1831	0	0	996	834
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	131	0	1031	481	1831	0	0	996	834
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	131	0	1031	481	1831	0	0	996	834
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	131	0	1031	481	1831	0	0	996	834
Saturation Flow Module:																				
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.95	1.00	0.75	0.92	0.91	1.00	1.00	0.91	0.85
Lanes:	0.00	0.00	0.00	1.00	0.00	2.00	2.00	3.00	0.00	0.00	3.00	1.00
Final Sat.:	0	0	0	1805	0	2842	3502	5187	0	0	5187	1615
Capacity Analysis Module:																				
Vol/Sat:	0.00	0.00	0.00	0.07	0.00	0.36	0.14	0.35	0.00	0.00	0.19	0.52
Crit Moves:						****	****					****
Green/Cycle:	0.00	0.00	0.00	0.26	0.00	0.41	0.16	0.74	0.00	0.00	0.59	0.59
Volume/Cap:	0.00	0.00	0.00	0.28	0.00	0.88	0.88	0.47	0.00	0.00	0.33	0.88
Delay/Veh:	0.0	0.0	0.0	30.2	0.0	34.9	56.4	5.2	0.0	0.0	10.6	27.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	30.2	0.0	34.9	56.4	5.2	0.0	0.0	10.6	27.1
LOS by Move:	A	A	A	C	A	C	E	A	A	A	B	C
HCM2kAvgQ:	0	0	0	3	0	20	11	8	0	0	6	25

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #25 Winchester Road - SR-79 & Benton Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.089
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 63.2
Optimal Cycle: 180 Level Of Service: E

Street Name:	Winchester Road - SR-79						Benton Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 3	0 1	2	0 3	0 1	2	0 2	0 2	2	0 2	0 1
Volume Module:												
Base Vol:	598	2525	712	55	1001	480	69	556	1481	230	683	69
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	598	2525	712	55	1001	480	69	556	1481	230	683	69
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	598	2525	712	55	1001	480	69	556	1481	230	683	69
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	598	2525	712	55	1001	480	69	556	1481	230	683	69
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	598	2525	712	55	1001	480	69	556	1481	230	683	69
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	598	2525	712	55	1001	480	69	556	1481	230	683	69
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.91	0.85	0.92	0.91	0.85	0.92	0.95	0.75	0.92	0.95	0.85
Lanes:	2.00	3.00	1.00	2.00	3.00	1.00	2.00	2.00	2.00	2.00	2.00	1.00
Final Sat.:	3502	5187	1615	3502	5187	1615	3502	3610	2842	3502	3610	1615
Capacity Analysis Module:												
Vol/Sat:	0.17	0.49	0.44	0.02	0.19	0.30	0.02	0.15	0.52	0.07	0.19	0.04
Crit Moves:		****		****					****	****		
Green/Cycle:	0.17	0.45	0.45	0.01	0.29	0.29	0.05	0.48	0.48	0.06	0.49	0.49
Volume/Cap:	1.01	1.09	0.99	1.09	0.66	1.01	0.39	0.32	1.09	1.09	0.39	0.09
Delay/Veh:	82.3	75.7	57.4	203.1	32.0	80.4	47.4	16.2	78.6	134.7	16.3	13.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	82.3	75.7	57.4	203.1	32.0	80.4	47.4	16.2	78.6	134.7	16.3	13.7
LOS by Move:	F	E	E	F	C	F	D	B	E	F	B	B
HCM2kAvgQ:	15	42	28	3	11	22	2	5	39	8	7	1

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #26 Winchester Road - SR-79 & Via Mira Mosa

Cycle (sec): 100 Critical Vol./Cap.(X): 0.982
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 27.7
Optimal Cycle: 180 Level Of Service: C

Street Name:	Winchester Road - SR-79						Via Mira Mosa					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 0	1 0	1	0 0	1 0
Volume Module:												
Base Vol:	62	3221	238	125	2142	363	243	32	52	223	39	136
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	62	3221	238	125	2142	363	243	32	52	223	39	136
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	62	3221	238	125	2142	363	243	32	52	223	39	136
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	62	3221	238	125	2142	363	243	32	52	223	39	136
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	62	3221	238	125	2142	363	243	32	52	223	39	136
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	62	3221	238	125	2142	363	243	32	52	223	39	136
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.90	0.90	0.95	0.89	0.89	0.95	0.91	0.91	0.95	0.88	0.88
Lanes:	1.00	2.79	0.21	1.00	2.57	0.43	1.00	0.38	0.62	1.00	0.22	0.78
Final Sat.:	1805	4782	353	1805	4338	735	1805	656	1067	1805	374	1304
Capacity Analysis Module:												
Vol/Sat:	0.03	0.67	0.67	0.07	0.49	0.49	0.13	0.05	0.05	0.12	0.10	0.10
Crit Moves:		****		****			****				****	
Green/Cycle:	0.05	0.69	0.69	0.07	0.71	0.71	0.14	0.07	0.07	0.17	0.11	0.11
Volume/Cap:	0.70	0.98	0.98	0.98	0.70	0.70	0.98	0.71	0.71	0.71	0.98	0.98
Delay/Veh:	68.5	26.4	26.4	120.3	9.1	9.1	94.9	63.4	63.4	46.1	106	106.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	68.5	26.4	26.4	120.3	9.1	9.1	94.9	63.4	63.4	46.1	106	106.4
LOS by Move:	E	C	C	F	A	A	F	E	E	D	F	F
HCM2kAvgQ:	3	45	45	7	17	17	12	4	4	8	9	9

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #27 Monroe Ave & Los Alamos

Cycle (sec): 100 Critical Vol./Cap.(X): 0.800
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 28.0
Optimal Cycle: 114 Level Of Service: C

Street Name:	Monroe Ave						Los Alamos					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	2	0 2	0 1	1	0 1	1 0	1	0 2	0 1
Volume Module:												
Base Vol:	28	450	277	269	347	63	207	1442	176	98	954	464
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	28	450	277	269	347	63	207	1442	176	98	954	464
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	28	450	277	269	347	63	207	1442	176	98	954	464
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	28	450	277	269	347	63	207	1442	176	98	954	464
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	28	450	277	269	347	63	207	1442	176	98	954	464
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	28	450	277	269	347	63	207	1442	176	98	954	464
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.90	0.90	0.92	0.95	0.85	0.95	0.93	0.93	0.95	0.95	0.85
Lanes:	1.00	1.24	0.76	2.00	2.00	1.00	1.00	1.78	0.22	1.00	2.00	1.00
Final Sat.:	1805	2107	1297	3502	3610	1615	1805	3166	386	1805	3610	1615
Capacity Analysis Module:												
Vol/Sat:	0.02	0.21	0.21	0.08	0.10	0.04	0.11	0.46	0.46	0.05	0.26	0.29
Crit Moves:		****		****				****		****		
Green/Cycle:	0.05	0.27	0.27	0.10	0.31	0.31	0.18	0.57	0.57	0.07	0.46	0.46
Volume/Cap:	0.31	0.80	0.80	0.80	0.31	0.12	0.63	0.80	0.80	0.80	0.58	0.63
Delay/Veh:	47.7	39.3	39.3	57.0	26.3	24.7	41.7	19.4	19.4	76.0	20.7	22.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	47.7	39.3	39.3	57.0	26.3	24.7	41.7	19.4	19.4	76.0	20.7	22.6
LOS by Move:	D	D	D	E	C	C	D	B	B	E	C	C
HCM2kAvgQ:	1	13	13	6	4	1	7	22	22	5	12	11

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #28 Jefferson Avenue & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.684
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 173.6
Optimal Cycle: 180 Level Of Service: F

Street Name:	Jefferson Avenue						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 3	0 1	1	0 2	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	7	2262	1299	650	1005	66	33	187	121	648	97	752
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	7	2262	1299	650	1005	66	33	187	121	648	97	752
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	7	2262	1299	650	1005	66	33	187	121	648	97	752
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	7	2262	1299	650	1005	66	33	187	121	648	97	752
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	7	2262	1299	650	1005	66	33	187	121	648	97	752
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	7	2262	1299	650	1005	66	33	187	121	648	97	752
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.85	0.95	0.90	0.90	0.95	0.86	0.86	0.95	0.79	0.79
Lanes:	1.00	3.00	1.00	1.00	2.82	0.18	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1805	5187	1615	1805	4824	317	1805	3254	1627	1805	2998	1499
Capacity Analysis Module:												
Vol/Sat:	0.00	0.44	0.80	0.36	0.21	0.21	0.02	0.06	0.07	0.36	0.03	0.50
Crit Moves:			****	****				****				****
Green/Cycle:	0.01	0.48	0.48	0.21	0.68	0.68	0.01	0.05	0.05	0.26	0.30	0.30
Volume/Cap:	0.31	0.91	1.68	1.68	0.31	0.31	1.68	1.08	1.40	1.40	0.11	1.68
Delay/Veh:	56.4	29.9	339.7	358.4	6.6	6.6	509.0	125	254.2	231.7	25.5	351.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	56.4	29.9	339.7	358.4	6.6	6.6	509.0	125	254.2	231.7	25.5	351.6
LOS by Move:	E	C	F	F	A	A	F	F	F	F	C	F
HCM2kAvgQ:	1	28	104	53	5	5	4	7	11	44	1	67

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #29 Madison Avenue & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.340
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 128.8
Optimal Cycle: 180 Level Of Service: F

Street Name:	Madison Avenue						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	2	0	1	2	0	1	1	0	2	0	3	0	1
Volume Module:															
Base Vol:	326	599	1158	335	252	123	398	1650	318	824	1291	199
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	326	599	1158	335	252	123	398	1650	318	824	1291	199
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	326	599	1158	335	252	123	398	1650	318	824	1291	199
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	326	599	1158	335	252	123	398	1650	318	824	1291	199
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	326	599	1158	335	252	123	398	1650	318	824	1291	199
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	326	599	1158	335	252	123	398	1650	318	824	1291	199
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.95	0.85	0.92	0.90	0.90	0.92	0.89	0.89	0.92	0.91	0.85
Lanes:	2.00	2.00	1.00	2.00	1.34	0.66	2.00	3.35	0.65	2.00	3.00	1.00
Final Sat.:	3502	3610	1615	3502	2307	1126	3502	5659	1091	3502	5187	1615
Capacity Analysis Module:												
Vol/Sat:	0.09	0.17	0.72	0.10	0.11	0.11	0.11	0.29	0.29	0.24	0.25	0.12
Crit Moves:			****	****				****		****		
Green/Cycle:	0.28	0.54	0.54	0.07	0.33	0.33	0.12	0.22	0.22	0.18	0.27	0.27
Volume/Cap:	0.33	0.31	1.34	1.34	0.33	0.33	0.92	1.34	1.34	1.34	0.92	0.46
Delay/Veh:	28.9	13.0	183.9	223.7	25.6	25.6	68.5	197	196.6	204.8	45.7	31.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	28.9	13.0	183.9	223.7	25.6	25.6	68.5	197	196.6	204.8	45.7	31.1
LOS by Move:	C	B	F	F	C	C	E	F	F	F	D	C
HCM2kAvgQ:	4	5	72	13	5	5	10	35	35	28	18	5

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #30 I-15 SB Off-Ramp & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.744
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 14.4
Optimal Cycle: 89 Level Of Service: B

Street Name:	I-15 SB Off-Ramp						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	1	0	1!	0	1	0	0	3	0	1	0	0	3	0	1
Volume Module:															
Base Vol:	0	0	0	685	0	412	0	2604	495	0	2333	112
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	685	0	412	0	2604	495	0	2333	112
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	685	0	412	0	2604	495	0	2333	112
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	0	0	0	685	0	412	0	2604	0	0	2333	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	685	0	412	0	2604	0	0	2333	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	0	0	0	685	0	412	0	2604	0	0	2333	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.91	1.00	1.00	0.91	1.00
Lanes:	0.00	0.00	0.00	1.62	0.00	1.38	0.00	3.00	1.00	0.00	3.00	1.00
Final Sat.:	0	0	0	2826	0	2393	0	5187	1900	0	5187	1900
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.24	0.00	0.17	0.00	0.50	0.00	0.00	0.45	0.00
Crit Moves:				****				****		****		
Green/Cycle:	0.00	0.00	0.00	0.33	0.00	0.33	0.00	0.67	0.00	0.00	0.67	0.00
Volume/Cap:	0.00	0.00	0.00	0.74	0.00	0.53	0.00	0.74	0.00	0.00	0.67	0.00
Delay/Veh:	0.0	0.0	0.0	32.1	0.0	27.7	0.0	11.5	0.0	0.0	10.1	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	32.1	0.0	27.7	0.0	11.5	0.0	0.0	10.1	0.0
LOS by Move:	A	A	A	C	A	C	A	B	A	A	B	A
HCM2kAvgQ:	0	0	0	13	0	8	0	20	0	0	16	0

Note: Queue reported is the number of cars per lane.

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2000 HCM Operations Method (Future Volume Alternative)

Intersection #31 I-15 NB Off-Ramp & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.600
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 8.2
Optimal Cycle: 57 Level Of Service: A

Street Name:	I-15 NB Off-Ramp						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	0	0	1	0	0	0	0	0	4	0	1	0	0	1
Volume Module:												
Base Vol:	197	0	259	0	0	0	0	3038	315	0	1736	1673
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	197	0	259	0	0	0	0	3038	315	0	1736	1673
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	197	0	259	0	0	0	0	3038	315	0	1736	1673
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	197	0	259	0	0	0	0	3038	0	0	1736	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	197	0	259	0	0	0	0	3038	0	0	1736	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	197	0	259	0	0	0	0	3038	0	0	1736	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.85	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Lanes:	2.00	0.00	1.00	0.00	0.00	0.00	0.00	4.00	1.00	0.00	4.00	1.00
Final Sat.:	3502	0	1615	0	0	0	0	6916	1900	0	6916	1900
Capacity Analysis Module:												
Vol/Sat:	0.06	0.00	0.16	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.25	0.00
Crit Moves:			****					****		****		
Green/Cycle:	0.27	0.00	0.27	0.00	0.00	0.00	0.00	0.73	0.00	0.00	0.73	0.00
Volume/Cap:	0.21	0.00	0.60	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.34	0.00
Delay/Veh:	28.5	0.0	34.3	0.0	0.0	0.0	0.0	6.6	0.0	0.0	4.8	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	28.5	0.0	34.3	0.0	0.0	0.0	0.0	6.6	0.0	0.0	4.8	0.0
LOS by Move:	C	A	C	A	A	A	A	A	A	A	A	A
HCM2kAvgQ:	2	0	8	0	0	0	0	13	0	0	5	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #32 I-215 SB Off-Ramp & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.817
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 10.6
Optimal Cycle: 102 Level Of Service: B

Street Name:	I-215 SB Off-Ramp						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	1	0	1!	0	1	0	0	3	0	1	0	0	3	0	1
Volume Module:												
Base Vol:	0	0	0	454	0	377	0	3355	139	0	2497	238
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	454	0	377	0	3355	139	0	2497	238
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	454	0	377	0	3355	139	0	2497	238
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	0	0	0	454	0	377	0	3355	0	0	2497	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	454	0	377	0	3355	0	0	2497	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	0	0	0	454	0	377	0	3355	0	0	2497	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.91	1.00	0.91	1.00	0.91	1.00	1.00	0.91	1.00
Lanes:	0.00	0.00	0.00	1.55	0.00	1.45	0.00	3.00	1.00	0.00	3.00	1.00
Final Sat.:	0	0	0	2664	0	2505	0	5187	1900	0	5187	1900
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.17	0.00	0.15	0.00	0.65	0.00	0.00	0.48	0.00
Crit Moves:				****				****				
Green/Cycle:	0.00	0.00	0.00	0.21	0.00	0.21	0.00	0.79	0.00	0.00	0.79	0.00
Volume/Cap:	0.00	0.00	0.00	0.82	0.00	0.72	0.00	0.82	0.00	0.00	0.61	0.00
Delay/Veh:	0.0	0.0	0.0	43.0	0.0	39.1	0.0	7.5	0.0	0.0	4.5	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	43.0	0.0	39.1	0.0	7.5	0.0	0.0	4.5	0.0
LOS by Move:	A	A	A	D	A	D	A	A	A	A	A	A
HCM2kAvgQ:	0	0	0	11	0	9	0	24	0	0	12	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #33 I-215 NB Off-Ramp & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.653
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 9.5
Optimal Cycle: 54 Level Of Service: A

Street Name:	I-215 NB Off-Ramp						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	0	0	2	0	0	0	0	0	0	3	0	1	0	0	3	0	1
Volume Module:																			
Base Vol:	82	0	479	0	0	0	0	2317	104	0	2514	1369
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	82	0	479	0	0	0	0	2317	104	0	2514	1369
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	82	0	479	0	0	0	0	2317	104	0	2514	1369
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	82	0	479	0	0	0	0	2317	0	0	2514	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	82	0	479	0	0	0	0	2317	0	0	2514	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	82	0	479	0	0	0	0	2317	0	0	2514	0
Saturation Flow Module:																			
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.75	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Lanes:	2.00	0.00	2.00	0.00	0.00	0.00	0.00	3.00	1.00	0.00	3.00	1.00
Final Sat.:	3502	0	2842	0	0	0	0	5187	1900	0	5187	1900
Capacity Analysis Module:																			
Vol/Sat:	0.02	0.00	0.17	0.00	0.00	0.00	0.00	0.45	0.00	0.00	0.48	0.00
Crit Moves:			****								****	
Green/Cycle:	0.26	0.00	0.26	0.00	0.00	0.00	0.00	0.74	0.00	0.00	0.74	0.00
Volume/Cap:	0.09	0.00	0.65	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.65	0.00
Delay/Veh:	28.2	0.0	35.2	0.0	0.0	0.0	0.0	6.3	0.0	0.0	6.9	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	28.2	0.0	35.2	0.0	0.0	0.0	0.0	6.3	0.0	0.0	6.9	0.0
LOS by Move:	C	A	D	A	A	A	A	A	A	A	A	A
HCM2kAvgQ:	1	0	8	0	0	0	0	12	0	0	15	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #34 Jackson Avenue & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.569
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 9.1
Optimal Cycle: 53 Level Of Service: A

Street Name:	Jackson Avenue						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	0	0	2	0	0	0	0	0	0	3	0	1	1	0	3	0	0
Volume Module:																			
Base Vol:	243	0	183	0	0	0	0	1896	62	205	2590	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	243	0	183	0	0	0	0	1896	62	205	2590	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	243	0	183	0	0	0	0	1896	62	205	2590	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	243	0	183	0	0	0	0	1896	62	205	2590	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	243	0	183	0	0	0	0	1896	62	205	2590	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	243	0	183	0	0	0	0	1896	62	205	2590	0
Saturation Flow Module:																			
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.75	1.00	1.00	1.00	1.00	0.91	0.85	0.95	0.91	1.00
Lanes:	2.00	0.00	2.00	0.00	0.00	0.00	0.00	3.00	1.00	1.00	3.00	0.00
Final Sat.:	3502	0	2842	0	0	0	0	5187	1615	1805	5187	0
Capacity Analysis Module:																			
Vol/Sat:	0.07	0.00	0.06	0.00	0.00	0.00	0.00	0.37	0.04	0.11	0.50	0.00
Crit Moves:	****						****				****	
Green/Cycle:	0.12	0.00	0.12	0.00	0.00	0.00	0.00	0.67	0.67	0.21	0.88	0.00
Volume/Cap:	0.57	0.00	0.53	0.00	0.00	0.00	0.00	0.55	0.06	0.55	0.57	0.00
Delay/Veh:	43.2	0.0	42.7	0.0	0.0	0.0	0.0	8.8	5.7	37.0	1.7	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	43.2	0.0	42.7	0.0	0.0	0.0	0.0	8.8	5.7	37.0	1.7	0.0
LOS by Move:	D	A	D	A	A	A	A	A	A	D	A	A
HCM2kAvgQ:	4	0	4	0	0	0	0	11	1	6	8	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #35 Margarita Road & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.016
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 50.5
Optimal Cycle: 180 Level Of Service: D

Street Name:	Margarita Road							Murrieta Hot Springs Road							
Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Split Phase				Split Phase				Protected				Protected			
Rights:	Include				Include				Include				Include			
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0	
Lanes:	2	0	1	0 1	0	1	0	0 1	1	0	2	1 0	1	0	2	1 0
Volume Module:																
Base Vol:	920	70	411		196	80	146		47	1676		506	302	1659		40
Growth Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00
Initial Bse:	920	70	411		196	80	146		47	1676		506	302	1659		40
Added Vol:	0	0	0		0	0	0		0	0		0	0	0		0
PasserByVol:	0	0	0		0	0	0		0	0		0	0	0		0
Initial Fut:	920	70	411		196	80	146		47	1676		506	302	1659		40
User Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00
PHF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00
PHF Volume:	920	70	411		196	80	146		47	1676		506	302	1659		40
Reduct Vol:	0	0	0		0	0	0		0	0		0	0	0		0
Reduced Vol:	920	70	411		196	80	146		47	1676		506	302	1659		40
PCE Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00
MLF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00
FinalVolume:	920	70	411		196	80	146		47	1676		506	302	1659		40
Saturation Flow Module:																
Sat/Lane:	1900	1900	1900		1900	1900	1900		1900	1900		1900	1900	1900		1900
Adjustment:	0.92	1.00	0.85		0.97	0.97	0.85		0.95	0.88		0.88	0.95	0.91		0.91
Lanes:	2.00	1.00	1.00		0.71	0.29	1.00		1.00	2.30		0.70	1.00	2.93		0.07
Final Sat.:	3502	1900	1615		1303	532	1615		1805	3845		1161	1805	5045		122
Capacity Analysis Module:																
Vol/Sat:	0.26	0.04	0.25		0.15	0.15	0.09		0.03	0.44		0.44	0.17	0.33		0.33
Crit Moves:	****					****				****			****			
Green/Cycle:	0.26	0.26	0.26		0.15	0.15	0.15		0.04	0.43		0.43	0.16	0.55		0.55
Volume/Cap:	1.02	0.14	0.98		1.02	1.02	0.61		0.60	1.02		1.02	1.02	0.60		0.60
Delay/Veh:	71.1	28.7	76.7		101.5	101	44.5		59.0	52.2		52.2	98.2	15.4		15.4
User DelAdj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00
AdjDel/Veh:	71.1	28.7	76.7		101.5	101	44.5		59.0	52.2		52.2	98.2	15.4		15.4
LOS by Move:	E	C	E		F	F	D		E	D		D	F	B		B
HCM2kAvgQ:	21	2	18		14	14	5		2	33		33	15	13		13

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #36 French Valley Parkway & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.790
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 17.6
Optimal Cycle: 108 Level Of Service: B

Street Name:	French Valley Parkway							Murrieta Hot Springs Road							
Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	- R	L	-	T	- R	L	-	T	- R	L	-	T	- R
Control:	Protected				Protected				Protected				Protected			
Rights:	Ovl				Include				Include				Include			
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0	
Lanes:	1	0	0	0 2	0	0	0	0 0	0	0	2	1 0	1	0	3	0 0
Volume Module:																
Base Vol:	39	0	1065		0	0	0		0	1730		367	395	1715		0
Growth Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00
Initial Bse:	39	0	1065		0	0	0		0	1730		367	395	1715		0
Added Vol:	0	0	0		0	0	0		0	0		0	0	0		0
PasserByVol:	0	0	0		0	0	0		0	0		0	0	0		0
Initial Fut:	39	0	1065		0	0	0		0	1730		367	395	1715		0
User Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00
PHF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00
PHF Volume:	39	0	1065		0	0	0		0	1730		367	395	1715		0
Reduct Vol:	0	0	0		0	0	0		0	0		0	0	0		0
Reduced Vol:	39	0	1065		0	0	0		0	1730		367	395	1715		0
PCE Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00
MLF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00
FinalVolume:	39	0	1065		0	0	0		0	1730		367	395	1715		0
Saturation Flow Module:																
Sat/Lane:	1900	1900	1900		1900	1900	1900		1900	1900		1900	1900	1900		1900
Adjustment:	0.95	1.00	0.75		1.00	1.00	1.00		1.00	0.89		0.89	0.95	0.91		1.00
Lanes:	1.00	0.00	2.00		0.00	0.00	0.00		0.00	2.47		0.53	1.00	3.00		0.00
Final Sat.:	1805	0	2842		0	0	0		0	4168		884	1805	5187		0
Capacity Analysis Module:																
Vol/Sat:	0.02	0.00	0.37		0.00	0.00	0.00		0.00	0.42		0.42	0.22	0.33		0.00
Crit Moves:			****							****			****			
Green/Cycle:	0.20	0.00	0.47		0.00	0.00	0.00		0.00	0.53		0.53	0.28	0.80		0.00
Volume/Cap:	0.11	0.00	0.79		0.00	0.00	0.00		0.00	0.79		0.79	0.79	0.41		0.00
Delay/Veh:	33.1	0.0	25.3		0.0	0.0	0.0		0.0	20.9		20.9	41.7	3.0		0.0
User DelAdj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00
AdjDel/Veh:	33.1	0.0	25.3		0.0	0.0	0.0		0.0	20.9		20.9	41.7	3.0		0.0
LOS by Move:	C	A	C		A	A	A		A	C		C	D	A		A
HCM2kAvgQ:	1	0	17		0	0	0		0	21		21	13	6		0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #37 Jefferson Avenue & Guava Street

Cycle (sec): 100 Critical Vol./Cap.(X): 0.759
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 7.9
Optimal Cycle: 77 Level Of Service: A

Street Name:	Jefferson Avenue						Guava Street					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 0	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	19	3211	10	8	1077	377	99	81	148	1	27	4
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	19	3211	10	8	1077	377	99	81	148	1	27	4
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	19	3211	10	8	1077	377	99	81	148	1	27	4
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	19	3211	10	8	1077	377	99	81	148	1	27	4
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	19	3211	10	8	1077	377	99	81	148	1	27	4
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	19	3211	10	8	1077	377	99	81	148	1	27	4
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.87	0.87	0.71	0.90	0.90	0.23	0.93	0.93
Lanes:	1.00	2.99	0.01	1.00	2.22	0.78	1.00	0.35	0.65	1.00	1.74	0.26
Final Sat.:	1805	5171	16	1805	3692	1292	1353	607	1109	431	3084	457
Capacity Analysis Module:												
Vol/Sat:	0.01	0.62	0.62	0.00	0.29	0.29	0.07	0.13	0.13	0.00	0.01	0.01
Crit Moves:		****		****				****				
Green/Cycle:	0.03	0.82	0.82	0.01	0.80	0.80	0.18	0.18	0.18	0.18	0.18	0.18
Volume/Cap:	0.37	0.76	0.76	0.76	0.37	0.37	0.42	0.76	0.76	0.01	0.05	0.05
Delay/Veh:	52.0	5.2	5.2	193.5	3.0	3.0	37.8	49.8	49.8	34.1	34.3	34.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	52.0	5.2	5.2	193.5	3.0	3.0	37.8	49.8	49.8	34.1	34.3	34.3
LOS by Move:	D	A	A	F	A	A	D	D	D	C	C	C
HCM2kAvgQ:	1	19	19	1	5	5	3	9	9	0	0	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #39 Washington Ave & Calle Del Oso Oro/Nutmeg

Cycle (sec): 100 Critical Vol./Cap.(X): 0.522
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 27.2
Optimal Cycle: 48 Level Of Service: C

Street Name:	Washington Ave						Calle Del Oso Oro/Nutmeg					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	375	257	150	105	234	49	23	229	268	175	613	148
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	375	257	150	105	234	49	23	229	268	175	613	148
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	375	257	150	105	234	49	23	229	268	175	613	148
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	375	257	150	105	234	49	23	229	268	175	613	148
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	375	257	150	105	234	49	23	229	268	175	613	148
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	375	257	150	105	234	49	23	229	268	175	613	148
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.86	0.86	0.95	0.89	0.89	0.95	0.87	0.87	0.95	0.92	0.92
Lanes:	1.00	2.00	1.00	1.00	2.48	0.52	1.00	1.00	1.00	1.00	1.61	0.39
Final Sat.:	1805	3268	1634	1805	4177	875	1805	1659	1659	1805	2824	682
Capacity Analysis Module:												
Vol/Sat:	0.21	0.08	0.09	0.06	0.06	0.06	0.01	0.14	0.16	0.10	0.22	0.22
Crit Moves:	****				****				****	****		
Green/Cycle:	0.40	0.31	0.31	0.20	0.11	0.11	0.03	0.31	0.31	0.19	0.47	0.47
Volume/Cap:	0.52	0.25	0.30	0.30	0.52	0.52	0.46	0.45	0.52	0.52	0.46	0.46
Delay/Veh:	23.6	26.0	26.4	34.8	43.1	43.1	54.6	28.0	29.0	38.2	18.3	18.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	23.6	26.0	26.4	34.8	43.1	43.1	54.6	28.0	29.0	38.2	18.3	18.3
LOS by Move:	C	C	C	C	D	D	D	C	C	D	B	B
HCM2kAvgQ:	9	3	4	3	4	4	1	6	8	5	8	8

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #40 Clinton Keith Rd & Calle de Oso Oro/Bear Creek Dr

Cycle (sec): 100 Critical Vol./Cap.(X): 0.644
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 16.2
Optimal Cycle: 52 Level Of Service: B

Street Name:	Clinton Keith Rd						Calle de Oso Oro/Bear Creek Dr					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 0 1	0	1	0 1	1 0
Volume Module:												
Base Vol:	72	174	204	17	90	270	190	532	134	225	743	10
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	72	174	204	17	90	270	190	532	134	225	743	10
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	72	174	204	17	90	270	190	532	134	225	743	10
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	72	174	204	17	90	270	190	532	134	225	743	10
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	72	174	204	17	90	270	190	532	134	225	743	10
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	72	174	204	17	90	270	190	532	134	225	743	10
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.87	0.87	0.95	0.84	0.84	0.33	0.97	0.97	0.27	0.95	0.95
Lanes:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.80	0.20	1.00	1.97	0.03
Final Sat.:	1805	1659	1659	1805	1603	1603	619	1472	371	517	3555	48
Capacity Analysis Module:												
Vol/Sat:	0.04	0.10	0.12	0.01	0.06	0.17	0.31	0.36	0.36	0.44	0.21	0.21
Crit Moves:	****					****				****		
Green/Cycle:	0.06	0.30	0.30	0.02	0.26	0.26	0.68	0.68	0.68	0.68	0.68	0.68
Volume/Cap:	0.64	0.35	0.41	0.41	0.21	0.64	0.45	0.53	0.53	0.64	0.31	0.31
Delay/Veh:	58.0	27.5	28.2	54.6	28.9	35.4	8.3	8.7	8.7	13.4	6.7	6.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	58.0	27.5	28.2	54.6	28.9	35.4	8.3	8.7	8.7	13.4	6.7	6.7
LOS by Move:	E	C	C	D	C	D	A	A	A	B	A	A
HCM2kAvgQ:	3	5	5	1	2	9	3	11	11	5	5	5

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #43 Jefferson Ave & Lemon St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.615
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 13.7
Optimal Cycle: 59 Level Of Service: B

Street Name:	Jefferson Ave						Lemon St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	0 1	1	0 0	1 0
Volume Module:												
Base Vol:	288	2116	2	6	1657	32	35	32	193	16	17	16
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	288	2116	2	6	1657	32	35	32	193	16	17	16
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	288	2116	2	6	1657	32	35	32	193	16	17	16
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	288	2116	2	6	1657	32	35	32	193	16	17	16
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	288	2116	2	6	1657	32	35	32	193	16	17	16
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	288	2116	2	6	1657	32	35	32	193	16	17	16
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.91	0.91	0.91	0.95	1.00	0.85	0.95	0.93	0.93
Lanes:	1.00	2.99	0.01	1.00	2.94	0.06	1.00	1.00	1.00	1.00	0.52	0.48
Final Sat.:	1805	5182	5	1805	5073	98	1805	1900	1615	1805	907	854
Capacity Analysis Module:												
Vol/Sat:	0.16	0.41	0.41	0.00	0.33	0.33	0.02	0.02	0.12	0.01	0.02	0.02
Crit Moves:	****				****				****	****		
Green/Cycle:	0.26	0.78	0.78	0.01	0.53	0.53	0.11	0.19	0.19	0.01	0.10	0.10
Volume/Cap:	0.61	0.52	0.52	0.52	0.61	0.61	0.18	0.09	0.61	0.61	0.18	0.18
Delay/Veh:	35.0	4.0	4.0	86.1	16.7	16.7	41.2	33.1	40.5	85.7	41.5	41.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	35.0	4.0	4.0	86.1	16.7	16.7	41.2	33.1	40.5	85.7	41.5	41.5
LOS by Move:	D	A	A	F	B	B	D	C	D	F	D	D
HCM2kAvgQ:	9	9	9	1	14	14	1	1	6	1	1	1

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #44 Jefferson Ave & Kalmia St

Cycle (sec): 100 Critical Vol./Cap.(X): 1.534
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 129.1
Optimal Cycle: 180 Level Of Service: F

Street Name:	Jefferson Ave						Kalmia St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 3	0 1	1	0 2	1 0	1	0 2	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	375	1717	938	863	1193	28	28	553	266	308	429	750
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	375	1717	938	863	1193	28	28	553	266	308	429	750
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	375	1717	938	863	1193	28	28	553	266	308	429	750
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	375	1717	938	863	1193	28	28	553	266	308	429	750
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	375	1717	938	863	1193	28	28	553	266	308	429	750
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	375	1717	938	863	1193	28	28	553	266	308	429	750
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.91	0.85	0.95	0.91	0.91	0.95	0.87	0.87	0.95	0.86	0.86
Lanes:	2.00	3.00	1.00	1.00	2.93	0.07	1.00	2.03	0.97	1.00	1.00	1.00
Final Sat.:	3502	5187	1615	1805	5053	119	1805	3331	1602	1805	1634	1634
Capacity Analysis Module:												
Vol/Sat:	0.11	0.33	0.58	0.48	0.24	0.24	0.02	0.17	0.17	0.17	0.26	0.46
Crit Moves:			****	****			****					****
Green/Cycle:	0.22	0.38	0.38	0.31	0.48	0.48	0.01	0.15	0.15	0.16	0.30	0.30
Volume/Cap:	0.50	0.87	1.53	1.53	0.50	0.50	1.53	1.09	1.09	1.09	0.88	1.53
Delay/Veh:	35.0	33.5	279.3	283.4	18.2	18.2	456.7	102	101.6	121.1	40.1	281.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	35.0	33.5	279.3	283.4	18.2	18.2	456.7	102	101.6	121.1	40.1	281.7
LOS by Move:	C	C	F	F	B	B	F	F	F	F	D	F
HCM2kAvgQ:	6	21	70	64	10	10	3	16	16	17	16	59

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #45 Jefferson Ave & Juniper St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.781
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 15.5
Optimal Cycle: 104 Level Of Service: B

Street Name:	Jefferson Ave						Juniper St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	76	2804	103	67	1622	36	168	68	203	33	48	140
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	76	2804	103	67	1622	36	168	68	203	33	48	140
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	76	2804	103	67	1622	36	168	68	203	33	48	140
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	76	2804	103	67	1622	36	168	68	203	33	48	140
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	76	2804	103	67	1622	36	168	68	203	33	48	140
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	76	2804	103	67	1622	36	168	68	203	33	48	140
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.91	0.91	0.95	0.84	0.84	0.95	0.84	0.84
Lanes:	1.00	2.89	0.11	1.00	2.93	0.07	1.00	1.00	1.00	1.00	1.00	1.00
Final Sat.:	1805	4978	183	1805	5059	112	1805	1603	1603	1805	1603	1603
Capacity Analysis Module:												
Vol/Sat:	0.04	0.56	0.56	0.04	0.32	0.32	0.09	0.04	0.13	0.02	0.03	0.09
Crit Moves:		****		****			****					****
Green/Cycle:	0.09	0.72	0.72	0.05	0.68	0.68	0.12	0.20	0.20	0.03	0.11	0.11
Volume/Cap:	0.47	0.78	0.78	0.78	0.47	0.47	0.78	0.21	0.63	0.63	0.27	0.78
Delay/Veh:	45.5	10.0	10.0	82.9	7.7	7.7	59.4	33.3	39.4	69.6	40.9	58.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	45.5	10.0	10.0	82.9	7.7	7.7	59.4	33.3	39.4	69.6	40.9	58.3
LOS by Move:	D	A	A	F	A	A	E	C	D	E	D	E
HCM2kAvgQ:	3	22	22	4	9	9	7	2	7	2	2	6

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #46 Jefferson Ave & Ivy St/Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.909
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 30.9
Optimal Cycle: 180 Level Of Service: C

Street Name:	Jefferson Ave									Ivy St/Los Alamos Rd								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected				Protected				Protected				Protected					
Rights:	Include				Include				Include				Include					
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0			
Lanes:	2	0	3	0	1	2	0	3	0	1	1	0	1	1	0	1	0	1	1	0
Volume Module:																				
Base Vol:	172	2384		604		424	1349		66		81	179		149		211	139		452	
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
Initial Bse:	172	2384		604		424	1349		66		81	179		149		211	139		452	
Added Vol:	0	0		0		0	0		0		0	0		0		0	0		0	
PasserByVol:	0	0		0		0	0		0		0	0		0		0	0		0	
Initial Fut:	172	2384		604		424	1349		66		81	179		149		211	139		452	
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Volume:	172	2384		604		424	1349		66		81	179		149		211	139		452	
Reduct Vol:	0	0		0		0	0		0		0	0		0		0	0		0	
Reduced Vol:	172	2384		604		424	1349		66		81	179		149		211	139		452	
PCE Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
MLF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
FinalVolume:	172	2384		604		424	1349		66		81	179		149		211	139		452	
Saturation Flow Module:																				
Sat/Lane:	1900	1900		1900		1900	1900		1900		1900	1900		1900		1900	1900		1900	
Adjustment:	0.92	0.91		0.85		0.92	0.91		0.85		0.95	0.89		0.89		0.95	0.84		0.84	
Lanes:	2.00	3.00		1.00		2.00	3.00		1.00		1.00	1.09		0.91		1.00	1.00		1.00	
Final Sat.:	3502	5187		1615		3502	5187		1615		1805	1836		1528		1805	1597		1597	
Capacity Analysis Module:																				
Vol/Sat:	0.05	0.46		0.37		0.12	0.26		0.04		0.04	0.10		0.10		0.12	0.09		0.28	
Crit Moves:		****				****					****								****	
Green/Cycle:	0.10	0.51		0.51		0.13	0.54		0.54		0.05	0.16		0.16		0.20	0.31		0.31	
Volume/Cap:	0.48	0.91		0.74		0.91	0.48		0.08		0.91	0.59		0.59		0.59	0.28		0.91	
Delay/Veh:	43.5	27.8		23.1		64.2	14.6		11.2		113.2	40.5		40.5		39.2	26.0		49.8	
User DelAdj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
AdjDel/Veh:	43.5	27.8		23.1		64.2	14.6		11.2		113.2	40.5		40.5		39.2	26.0		49.8	
LOS by Move:	D	C		C		E	B		B		F	D		D		D	C		D	
HCM2kAvgQ:	3	28		16		10	10		1		5	6		6		7	3		18	

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #48 Madison Ave/I-15 SB Ramps & Kalmia St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.871
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 30.4
Optimal Cycle: 177 Level Of Service: C

Street Name:	Madison Ave/I-15 SB Ramps									Kalmia St								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected				Protected				Protected				Protected					
Rights:	Include				Include				Include				Include					
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0			
Lanes:	2	0	0	0	2	2	0	1	1	0	0	0	3	1	0	2	0	2	1	1
Volume Module:																				
Base Vol:	365		0		904	315		30		362		0	2375		260	267	1344		623	
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
Initial Bse:	365		0		904	315		30		362		0	2375		260	267	1344		623	
Added Vol:	0		0		0	0		0		0		0	0		0	0	0		0	
PasserByVol:	0		0		0	0		0		0		0	0		0	0	0		0	
Initial Fut:	365		0		904	315		30		362		0	2375		260	267	1344		623	
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Volume:	365		0		904	315		30		362		0	2375		260	267	1344		623	
Reduct Vol:	0		0		0	0		0		0		0	0		0	0	0		0	
Reduced Vol:	365		0		904	315		30		362		0	2375		260	267	1344		623	
PCE Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
MLF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
FinalVolume:	365		0		904	315		30		362		0	2375		260	267	1344		623	
Saturation Flow Module:																				
Sat/Lane:	1900	1900		1900		1900	1900		1900		1900	1900		1900		1900	1900		1900	
Adjustment:	0.92	1.00		0.75		0.92	0.82		0.82		1.00	0.90		0.90		0.92	0.87		0.87	
Lanes:	2.00	0.00		2.00		2.00	1.00		1.00		0.00	3.61		0.39		2.00	2.73		1.27	
Final Sat.:	3502		0		2842	3502	1556		1556		0	6140		672		3502	4499		2085	
Capacity Analysis Module:																				
Vol/Sat:	0.10	0.00		0.32		0.09	0.02		0.23		0.00	0.39		0.39		0.08	0.30		0.30	
Crit Moves:				****		****						****				****				
Green/Cycle:	0.14	0.00		0.37		0.10	0.32		0.32		0.00	0.44		0.44		0.09	0.53		0.53	
Volume/Cap:	0.72	0.00		0.87		0.87	0.06		0.72		0.00	0.87		0.87		0.87	0.56		0.56	
Delay/Veh:	45.8	0.0		37.7		64.1	23.3		34.5		0.0	28.2		28.2		67.7	15.9		15.9	
User DelAdj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
AdjDel/Veh:	45.8	0.0		37.7		64.1	23.3		34.5		0.0	28.2		28.2		67.7	15.9		15.9	
LOS by Move:	D	A		D		E	C		C		A	C		C		E	B		B	
HCM2kAvgQ:	7	0		18		8	1		12		0	23		23		7	11		11	

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #50 Hancock Ave & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.850
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 19.0
Optimal Cycle: 152 Level Of Service: B

Street Name:	Hancock Ave						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ovl			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	2	0	0	2	0	4	0	3	1
Volume Module:												
Base Vol:	0	0	0	593	0	886	869	3294	0	0	2591	343
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	593	0	886	869	3294	0	0	2591	343
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	593	0	886	869	3294	0	0	2591	343
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	593	0	886	869	3294	0	0	2591	343
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	593	0	886	869	3294	0	0	2591	343
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	593	0	886	869	3294	0	0	2591	343
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.92	1.00	0.75	0.92	0.91	1.00	1.00	0.89	0.89
Lanes:	0.00	0.00	0.00	2.00	0.00	2.00	2.00	4.00	0.00	0.00	3.53	0.47
Final Sat.:	0	0	0	3502	0	2842	3502	6916	0	0	5998	794
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.17	0.00	0.31	0.25	0.48	0.00	0.00	0.43	0.43
Crit Moves:				****			****				****	
Green/Cycle:	0.00	0.00	0.00	0.20	0.00	0.49	0.29	0.80	0.00	0.00	0.51	0.51
Volume/Cap:	0.00	0.00	0.00	0.85	0.00	0.63	0.85	0.59	0.00	0.00	0.85	0.85
Delay/Veh:	0.0	0.0	0.0	48.3	0.0	19.8	40.2	4.0	0.0	0.0	23.4	23.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	48.3	0.0	19.8	40.2	4.0	0.0	0.0	23.4	23.4
LOS by Move:	A	A	A	D	A	B	D	A	A	A	C	C
HCM2kAvgQ:	0	0	0	12	0	12	16	11	0	0	24	24

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #51 Alta Murrieta Dr & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.024
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 53.7
Optimal Cycle: 180 Level Of Service: D

Street Name:	Alta Murrieta Dr						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Ovl		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	1	0	1	2	0	1	1	0	2	0
Volume Module:												
Base Vol:	597	213	51	187	123	492	691	1712	523	173	2399	150
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	597	213	51	187	123	492	691	1712	523	173	2399	150
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	597	213	51	187	123	492	691	1712	523	173	2399	150
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	597	213	51	187	123	492	691	1712	523	173	2399	150
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	597	213	51	187	123	492	691	1712	523	173	2399	150
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	597	213	51	187	123	492	691	1712	523	173	2399	150
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.85	0.92	0.84	0.84	0.92	0.88	0.88	0.92	0.91	0.85
Lanes:	2.00	1.00	1.00	2.00	1.00	1.00	2.00	2.30	0.70	2.00	4.00	1.00
Final Sat.:	3502	1900	1615	3502	1588	1588	3502	3834	1171	3502	6916	1615
Capacity Analysis Module:												
Vol/Sat:	0.17	0.11	0.03	0.05	0.08	0.31	0.20	0.45	0.45	0.05	0.35	0.09
Crit Moves:	****					****	****				****	
Green/Cycle:	0.17	0.32	0.32	0.15	0.30	0.30	0.19	0.48	0.48	0.05	0.34	0.49
Volume/Cap:	1.02	0.35	0.10	0.35	0.26	1.02	1.02	0.93	0.93	0.93	1.02	0.19
Delay/Veh:	85.3	26.6	24.1	38.5	26.4	78.0	81.4	32.1	32.1	94.4	58.2	14.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	85.3	26.6	24.1	38.5	26.4	78.0	81.4	32.1	32.1	94.4	58.2	14.5
LOS by Move:	F	C	C	D	C	E	F	C	C	F	E	B
HCM2kAvgQ:	15	5	1	3	3	23	17	29	29	5	28	3

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #52 Winchester Road - SR-79 & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.314
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 91.7
Optimal Cycle: 180 Level Of Service: F

Street Name:	Winchester Road - SR-79						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 3	0 1	2	0 3	0 1	2	0 3	0 1	2	0 2	1 0
Volume Module:												
Base Vol:	328	2015	202	194	1225	1054	1397	989	283	273	758	104
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	328	2015	202	194	1225	1054	1397	989	283	273	758	104
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	328	2015	202	194	1225	1054	1397	989	283	273	758	104
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	328	2015	202	194	1225	1054	1397	989	283	273	758	104
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	328	2015	202	194	1225	1054	1397	989	283	273	758	104
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	328	2015	202	194	1225	1054	1397	989	283	273	758	104
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.91	0.85	0.92	0.91	0.85	0.92	0.91	0.85	0.92	0.89	0.89
Lanes:	2.00	3.00	1.00	2.00	3.00	1.00	2.00	3.00	1.00	2.00	2.64	0.36
Final Sat.:	3502	5187	1615	3502	5187	1615	3502	5187	1615	3502	4479	615
Capacity Analysis Module:												
Vol/Sat:	0.09	0.39	0.13	0.06	0.24	0.65	0.40	0.19	0.18	0.08	0.17	0.17
Crit Moves:	****					****	****				****	
Green/Cycle:	0.07	0.50	0.62	0.07	0.50	0.50	0.30	0.31	0.31	0.13	0.13	0.13
Volume/Cap:	1.31	0.78	0.20	0.78	0.48	1.31	1.31	0.62	0.57	0.62	1.31	1.31
Delay/Veh:	213.5	22.3	8.3	60.5	16.7	175.5	183.1	30.5	30.7	44.2	196	195.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	213.5	22.3	8.3	60.5	16.7	175.5	183.1	30.5	30.7	44.2	196	195.7
LOS by Move:	F	C	A	E	B	F	F	C	C	D	F	F
HCM2kAvgQ:	12	20	3	5	9	65	45	10	8	5	21	21

Note: Queue reported is the number of cars per lane.

Traffix 7.9.0215 (c) 2008 Dowling Assoc. Licensed to MMA, LONG BEACH, CA

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #53 Hancock Ave & Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.622
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 224.1
Optimal Cycle: 180 Level Of Service: F

Street Name:	Hancock Ave						Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	2	0 0	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	125	456	917	649	136	24	100	1883	52	602	1217	649
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	125	456	917	649	136	24	100	1883	52	602	1217	649
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	125	456	917	649	136	24	100	1883	52	602	1217	649
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	125	456	917	649	136	24	100	1883	52	602	1217	649
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	125	456	917	649	136	24	100	1883	52	602	1217	649
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	125	456	917	649	136	24	100	1883	52	602	1217	649
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.86	0.86	0.92	0.98	0.98	0.95	0.95	0.95	0.95	0.90	0.90
Lanes:	1.00	1.00	1.00	2.00	0.85	0.15	1.00	1.95	0.05	1.00	1.30	0.70
Final Sat.:	1805	1625	1625	3502	1579	279	1805	3499	97	1805	2232	1190
Capacity Analysis Module:												
Vol/Sat:	0.07	0.28	0.56	0.19	0.09	0.09	0.06	0.54	0.54	0.33	0.55	0.55
Crit Moves:			****	****				****		****		
Green/Cycle:	0.21	0.35	0.35	0.11	0.26	0.26	0.05	0.33	0.33	0.21	0.49	0.49
Volume/Cap:	0.34	0.81	1.62	1.62	0.34	0.34	1.12	1.62	1.62	1.62	1.12	1.12
Delay/Veh:	34.4	32.5	317.7	335.2	30.7	30.7	177.9	317	317.0	331.5	87.2	87.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	34.4	32.5	317.7	335.2	30.7	30.7	177.9	317	317.0	331.5	87.2	87.2
LOS by Move:	C	C	F	F	C	C	F	F	F	F	F	F
HCM2kAvgQ:	3	15	76	28	4	4	7	80	80	48	47	47

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #54 I-215 SB Ramps & Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.394
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 145.6
Optimal Cycle: 180 Level Of Service: F

Street Name:	I-215 SB Ramps						Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	1	0	1! 0 1	0	0	2 0 1	2	0	2 0 0
Volume Module:												
Base Vol:	0	0	0	529	0	1508	0	3000	483	152	1171	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	529	0	1508	0	3000	483	152	1171	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	529	0	1508	0	3000	483	152	1171	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	529	0	1508	0	3000	483	152	1171	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	529	0	1508	0	3000	483	152	1171	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	529	0	1508	0	3000	483	152	1171	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.88	1.00	0.88	1.00	0.95	0.85	0.92	0.95	1.00
Lanes:	0.00	0.00	0.00	1.26	0.00	1.74	0.00	2.00	1.00	2.00	2.00	0.00
Final Sat.:	0	0	0	2100	0	2901	0	3610	1615	3502	3610	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.25	0.00	0.52	0.00	0.83	0.30	0.04	0.32	0.00
Crit Moves:						****		****		****		
Green/Cycle:	0.00	0.00	0.00	0.37	0.00	0.37	0.00	0.60	0.60	0.03	0.63	0.00
Volume/Cap:	0.00	0.00	0.00	0.68	0.00	1.39	0.00	1.39	0.50	1.39	0.52	0.00
Delay/Veh:	0.0	0.0	0.0	26.9	0.0	213.0	0.0	200	12.1	272.1	10.5	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	26.9	0.0	213.0	0.0	200	12.1	272.1	10.5	0.0
LOS by Move:	A	A	A	C	A	F	A	F	B	F	B	A
HCM2kAvgQ:	0	0	0	12	0	58	0	103	9	7	11	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #55 I-215 NB Ramps & Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.897
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 23.1
Optimal Cycle: 180 Level Of Service: C

Street Name:	I-215 NB Ramps						Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	1	0 1 0	0	0	0 0 0	2	0	3 0 0	0	0	2 0 1
Volume Module:												
Base Vol:	211	7	114	0	0	0	1587	1856	0	0	1110	242
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	211	7	114	0	0	0	1587	1856	0	0	1110	242
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	211	7	114	0	0	0	1587	1856	0	0	1110	242
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	211	7	114	0	0	0	1587	1856	0	0	1110	242
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	211	7	114	0	0	0	1587	1856	0	0	1110	242
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	211	7	114	0	0	0	1587	1856	0	0	1110	242
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.82	0.82	0.82	1.00	1.00	1.00	0.92	0.91	1.00	1.00	0.95	0.85
Lanes:	1.00	0.06	0.94	0.00	0.00	0.00	2.00	3.00	0.00	0.00	2.00	1.00
Final Sat.:	1550	90	1461	0	0	0	3502	5187	0	0	3610	1615
Capacity Analysis Module:												
Vol/Sat:	0.14	0.08	0.08	0.00	0.00	0.00	0.45	0.36	0.00	0.00	0.31	0.15
Crit Moves:	****						****				****	
Green/Cycle:	0.15	0.15	0.15	0.00	0.00	0.00	0.51	0.85	0.00	0.00	0.34	0.34
Volume/Cap:	0.90	0.51	0.51	0.00	0.00	0.00	0.90	0.42	0.00	0.00	0.90	0.44
Delay/Veh:	65.1	39.7	39.7	0.0	0.0	0.0	28.8	1.9	0.0	0.0	40.0	26.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	65.1	39.7	39.7	0.0	0.0	0.0	28.8	1.9	0.0	0.0	40.0	26.0
LOS by Move:	E	D	D	A	A	A	C	A	A	A	D	C
HCM2kAvgQ:	10	4	4	0	0	0	26	5	0	0	21	6

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #56 Whitewood Rd & Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.789
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 29.5
Optimal Cycle: 108 Level Of Service: C

Street Name:	Whitewood Rd						Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 2	0 1	1	0 2	0 1	1	0 1	1 0
Volume Module:												
Base Vol:	131	558	41	33	482	433	690	356	256	60	191	41
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	131	558	41	33	482	433	690	356	256	60	191	41
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	131	558	41	33	482	433	690	356	256	60	191	41
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	131	558	41	33	482	433	690	356	256	60	191	41
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	131	558	41	33	482	433	690	356	256	60	191	41
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	131	558	41	33	482	433	690	356	256	60	191	41
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.94	0.94	0.95	0.95	0.85	0.95	0.95	0.85	0.95	0.92	0.92
Lanes:	1.00	1.86	0.14	1.00	2.00	1.00	1.00	2.00	1.00	1.00	1.65	0.35
Final Sat.:	1805	3329	245	1805	3610	1615	1805	3610	1615	1805	2892	621
Capacity Analysis Module:												
Vol/Sat:	0.07	0.17	0.17	0.02	0.13	0.27	0.38	0.10	0.16	0.03	0.07	0.07
Crit Moves:	****					****	****				****	
Green/Cycle:	0.09	0.39	0.39	0.04	0.34	0.34	0.48	0.47	0.47	0.10	0.08	0.08
Volume/Cap:	0.79	0.43	0.43	0.43	0.39	0.79	0.79	0.21	0.34	0.34	0.79	0.79
Delay/Veh:	66.3	22.6	22.6	50.5	25.4	37.3	26.4	15.7	17.0	43.2	58.3	58.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	66.3	22.6	22.6	50.5	25.4	37.3	26.4	15.7	17.0	43.2	58.3	58.3
LOS by Move:	E	C	C	D	C	D	C	B	B	D	E	E
HCM2kAvgQ:	6	7	7	2	6	14	19	3	5	2	6	6

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #57 Whitewood Rd & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.094
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 67.7
Optimal Cycle: 180 Level Of Service: E

Street Name:	Whitewood Rd						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	438	307	484	299	219	212	173	1608	168	367	2267	448
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	438	307	484	299	219	212	173	1608	168	367	2267	448
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	438	307	484	299	219	212	173	1608	168	367	2267	448
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	438	307	484	299	219	212	173	1608	168	367	2267	448
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	438	307	484	299	219	212	173	1608	168	367	2267	448
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	438	307	484	299	219	212	173	1608	168	367	2267	448
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.86	0.86	0.95	0.88	0.88	0.95	0.90	0.90	0.95	0.89	0.89
Lanes:	1.00	1.00	1.00	1.00	1.02	0.98	1.00	2.72	0.28	1.00	2.50	0.50
Final Sat.:	1805	1639	1639	1805	1699	1644	1805	4631	484	1805	4223	835
Capacity Analysis Module:												
Vol/Sat:	0.24	0.19	0.30	0.17	0.13	0.13	0.10	0.35	0.35	0.20	0.54	0.54
Crit Moves:			****	****			****				****	
Green/Cycle:	0.28	0.27	0.27	0.15	0.15	0.15	0.09	0.36	0.36	0.21	0.49	0.49
Volume/Cap:	0.88	0.69	1.09	1.09	0.88	0.88	1.09	0.95	0.95	0.95	1.09	1.09
Delay/Veh:	51.3	34.7	98.4	124.2	58.7	58.7	144.4	42.4	42.4	72.2	74.8	74.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	51.3	34.7	98.4	124.2	58.7	58.7	144.4	42.4	42.4	72.2	74.8	74.8
LOS by Move:	D	C	F	F	E	E	F	D	D	E	E	E
HCM2kAvgQ:	16	10	25	16	10	10	10	25	25	16	45	45

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #59 Nutmeg St & Clinton Keith Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.029
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 51.6
Optimal Cycle: 180 Level Of Service: D

Street Name:	Nutmeg St						Clinton Keith Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	57	78	423	277	29	52	96	1702	62	479	1742	341
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	57	78	423	277	29	52	96	1702	62	479	1742	341
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	57	78	423	277	29	52	96	1702	62	479	1742	341
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	57	78	423	277	29	52	96	1702	62	479	1742	341
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	57	78	423	277	29	52	96	1702	62	479	1742	341
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	57	78	423	277	29	52	96	1702	62	479	1742	341
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.83	0.83	0.95	0.86	0.86	0.95	0.91	0.91	0.95	0.89	0.89
Lanes:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.89	0.11	1.00	2.51	0.49
Final Sat.:	1805	1576	1576	1805	1632	1632	1805	4980	181	1805	4229	828
Capacity Analysis Module:												
Vol/Sat:	0.03	0.05	0.27	0.15	0.02	0.03	0.05	0.34	0.34	0.27	0.41	0.41
Crit Moves:			****	****				****		****		
Green/Cycle:	0.20	0.26	0.26	0.15	0.21	0.21	0.07	0.33	0.33	0.26	0.52	0.52
Volume/Cap:	0.15	0.19	1.03	1.03	0.09	0.15	0.79	1.03	1.03	1.03	0.79	0.79
Delay/Veh:	32.9	28.8	85.4	105.1	32.1	32.7	74.1	62.9	62.9	86.5	21.0	21.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	32.9	28.8	85.4	105.1	32.1	32.7	74.1	62.9	62.9	86.5	21.0	21.0
LOS by Move:	C	C	F	F	C	C	E	E	E	F	C	C
HCM2kAvgQ:	1	2	21	14	1	1	5	28	28	22	21	21

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #60 Murrieta Oaks Ave-Mitchell Rd & Clinton Keith Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.930
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 26.2
Optimal Cycle: 180 Level Of Service: C

Street Name:	Murrieta Oaks Ave-Mitchell Rd						Clinton Keith Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 0	1 0	1	0 1	0 1	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	21	114	25	57	147	488	80	2903	25	40	2677	250
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	21	114	25	57	147	488	80	2903	25	40	2677	250
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	21	114	25	57	147	488	80	2903	25	40	2677	250
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	21	114	25	57	147	488	80	2903	25	40	2677	250
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	21	114	25	57	147	488	80	2903	25	40	2677	250
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	21	114	25	57	147	488	80	2903	25	40	2677	250
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.97	0.97	0.95	1.00	0.85	0.95	0.91	0.91	0.95	0.90	0.90
Lanes:	1.00	0.82	0.18	1.00	1.00	1.00	1.00	2.97	0.03	1.00	2.74	0.26
Final Sat.:	1805	1516	333	1805	1900	1615	1805	5138	44	1805	4682	437
Capacity Analysis Module:												
Vol/Sat:	0.01	0.08	0.08	0.03	0.08	0.30	0.04	0.57	0.57	0.02	0.57	0.57
Crit Moves:	****					****	****				****	
Green/Cycle:	0.01	0.24	0.24	0.10	0.32	0.32	0.05	0.64	0.64	0.03	0.61	0.61
Volume/Cap:	0.93	0.32	0.32	0.32	0.24	0.93	0.93	0.89	0.89	0.89	0.93	0.93
Delay/Veh:	206.3	31.8	31.8	42.9	24.9	55.9	121.2	18.4	18.4	139.9	23.0	23.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	206.3	31.8	31.8	42.9	24.9	55.9	121.2	18.4	18.4	139.9	23.0	23.0
LOS by Move:	F	C	C	D	C	E	F	B	B	F	C	C
HCM2kAvgQ:	2	4	4	2	3	19	5	31	31	3	34	34

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #61 I-215 SB Ramps & Scott Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.385
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 8.4
Optimal Cycle: 37 Level Of Service: A

Street Name:	I-215 SB Ramps						Scott Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	2	0	0	0	4	0	1	0	3	0	2
Volume Module:														
Base Vol:	0	0	0	153	0	273	0	763	404	0	1500	409
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	153	0	273	0	763	404	0	1500	409
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	153	0	273	0	763	404	0	1500	409
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	0	0	0	153	0	273	0	763	0	0	1500	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	153	0	273	0	763	0	0	1500	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	0	0	0	153	0	273	0	763	0	0	1500	0
Saturation Flow Module:														
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.92	1.00	0.75	1.00	0.91	1.00	1.00	0.91	0.88
Lanes:	0.00	0.00	0.00	2.00	0.00	2.00	0.00	4.00	1.00	0.00	3.00	2.00
Final Sat.:	0	0	0	3502	0	2842	0	6916	1900	0	5187	3344
Capacity Analysis Module:														
Vol/Sat:	0.00	0.00	0.00	0.04	0.00	0.10	0.00	0.11	0.00	0.00	0.29	0.00
Crit Moves:						****	****				****	
Green/Cycle:	0.00	0.00	0.00	0.25	0.00	0.25	0.00	0.75	0.00	0.00	0.75	0.00
Volume/Cap:	0.00	0.00	0.00	0.18	0.00	0.39	0.00	0.15	0.00	0.00	0.39	0.00
Delay/Veh:	0.0	0.0	0.0	29.6	0.0	31.5	0.0	3.5	0.0	0.0	4.4	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	29.6	0.0	31.5	0.0	3.5	0.0	0.0	4.4	0.0
LOS by Move:	A	A	A	C	A	C	A	A	A	A	A	A
HCM2kAvgQ:	0	0	0	2	0	4	0	2	0	0	6	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #62 I-215 NB Ramps & Scott Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.509
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 16.2
Optimal Cycle: 46 Level Of Service: B

Street Name:	I-215 NB Ramps						Scott Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Ovl		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	1	2	0	0	0	0	2	2	0	4	0	0	0	0	3	0	2
Volume Module:														
Base Vol:	0	9	742	0	0	496	128	920	0	0	1538	345
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	9	742	0	0	496	128	920	0	0	1538	345
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	9	742	0	0	496	128	920	0	0	1538	345
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	9	742	0	0	496	128	920	0	0	1538	345
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	9	742	0	0	496	128	920	0	0	1538	345
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	9	742	0	0	496	128	920	0	0	1538	345
Saturation Flow Module:														
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.85	0.75	1.00	1.00	0.75	0.92	0.91	1.00	1.00	0.91	0.75
Lanes:	0.00	0.03	2.97	0.00	0.00	2.00	2.00	4.00	0.00	0.00	3.00	2.00
Final Sat.:	0	51	4228	0	0	2842	3502	6916	0	0	5187	2842
Capacity Analysis Module:														
Vol/Sat:	0.00	0.18	0.18	0.00	0.00	0.17	0.04	0.13	0.00	0.00	0.30	0.12
Crit Moves:		****		****			****				****	
Green/Cycle:	0.00	0.35	0.35	0.00	0.00	0.35	0.07	0.65	0.00	0.00	0.58	0.58
Volume/Cap:	0.00	0.51	0.51	0.00	0.00	0.51	0.51	0.20	0.00	0.00	0.51	0.21
Delay/Veh:	0.0	26.3	26.3	0.0	0.0	26.4	46.4	6.9	0.0	0.0	12.5	10.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	26.3	26.3	0.0	0.0	26.4	46.4	6.9	0.0	0.0	12.5	10.0
LOS by Move:	A	C	C	A	A	C	D	A	A	A	B	A
HCM2kAvgQ:	0	7	7	0	0	7	3	3	0	0	10	3

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #102 Leon Road & Scott Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.958
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 45.9
Optimal Cycle: 180 Level Of Service: D

Street Name:	Leon Road						Scott Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	515	367	15	62	192	398	575	495	441	4	385	155
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	515	367	15	62	192	398	575	495	441	4	385	155
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	515	367	15	62	192	398	575	495	441	4	385	155
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	515	367	15	62	192	398	575	495	441	4	385	155
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	515	367	15	62	192	398	575	495	441	4	385	155
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	515	367	15	62	192	398	575	495	441	4	385	155
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.94	0.94	0.95	0.85	0.85	0.95	0.85	0.85	0.95	0.87	0.87
Lanes:	1.00	1.92	0.08	1.00	1.00	1.00	1.00	2.00	1.00	1.00	2.14	0.86
Final Sat.:	1805	3447	141	1805	1623	1623	1805	3212	1606	1805	3539	1425
Capacity Analysis Module:												
Vol/Sat:	0.29	0.11	0.11	0.03	0.12	0.25	0.32	0.15	0.27	0.00	0.11	0.11
Crit Moves:	****					****	****				****	
Green/Cycle:	0.30	0.42	0.42	0.14	0.26	0.26	0.33	0.44	0.44	0.00	0.11	0.11
Volume/Cap:	0.96	0.25	0.25	0.25	0.46	0.96	0.96	0.35	0.62	0.62	0.96	0.96
Delay/Veh:	62.9	19.0	19.0	39.3	31.7	62.8	59.2	18.4	22.2	163.0	71.7	71.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	62.9	19.0	19.0	39.3	31.7	62.8	59.2	18.4	22.2	163.0	71.7	71.7
LOS by Move:	E	B	B	D	C	E	E	B	C	F	E	E
HCM2kAvgQ:	21	4	4	2	6	18	23	6	12	1	10	10

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #104 Antelope Road & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.783
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 35.1
Optimal Cycle: 105 Level Of Service: D

Street Name:	Antelope Road						Keller Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 2	0 1	1	0 2	0 1	2	0 3	0 1	1	0 3	0 1
Volume Module:												
Base Vol:	623	379	728	79	78	484	722	807	227	186	426	109
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	623	379	728	79	78	484	722	807	227	186	426	109
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	623	379	728	79	78	484	722	807	227	186	426	109
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	623	379	728	79	78	484	722	807	227	186	426	109
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	623	379	728	79	78	484	722	807	227	186	426	109
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	623	379	728	79	78	484	722	807	227	186	426	109
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.95	0.85	0.95	0.95	0.85	0.92	0.91	0.85	0.95	0.91	0.85
Lanes:	2.00	2.00	1.00	1.00	2.00	1.00	2.00	3.00	1.00	1.00	3.00	1.00
Final Sat.:	3502	3610	1615	1805	3610	1615	3502	5187	1615	1805	5187	1615
Capacity Analysis Module:												
Vol/Sat:	0.18	0.10	0.45	0.04	0.02	0.30	0.21	0.16	0.14	0.10	0.08	0.07
Crit Moves:			****	****			****				****	
Green/Cycle:	0.24	0.58	0.58	0.06	0.40	0.40	0.26	0.22	0.22	0.15	0.10	0.10
Volume/Cap:	0.76	0.18	0.78	0.78	0.05	0.76	0.78	0.70	0.63	0.70	0.78	0.64
Delay/Veh:	39.6	10.1	20.8	78.4	18.6	31.2	38.6	37.9	39.0	48.8	50.9	51.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	39.6	10.1	20.8	78.4	18.6	31.2	38.6	37.9	39.0	48.8	50.9	51.2
LOS by Move:	D	B	C	E	B	C	D	D	D	D	D	D
HCM2kAvgQ:	11	3	19	4	1	14	13	10	7	7	7	4

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #105 Menifee Road - Meadowlark Road & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.825
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 33.1
Optimal Cycle: 130 Level Of Service: C

Street Name:	Menifee Road - Meadowlark Road						Keller Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	2	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	63	775	543	126	819	293	783	295	361	202	300	184
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	63	775	543	126	819	293	783	295	361	202	300	184
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	63	775	543	126	819	293	783	295	361	202	300	184
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	63	775	543	126	819	293	783	295	361	202	300	184
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	63	775	543	126	819	293	783	295	361	202	300	184
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	63	775	543	126	819	293	783	295	361	202	300	184
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.89	0.89	0.95	0.91	0.91	0.92	0.87	0.87	0.95	0.90	0.90
Lanes:	1.00	1.18	0.82	1.00	1.47	0.53	2.00	1.00	1.00	1.00	1.24	0.76
Final Sat.:	1805	1991	1395	1805	2555	914	3502	1657	1657	1805	2110	1294
Capacity Analysis Module:												
Vol/Sat:	0.03	0.39	0.39	0.07	0.32	0.32	0.22	0.18	0.22	0.11	0.14	0.14
Crit Moves:		****		****			****				****	
Green/Cycle:	0.05	0.47	0.47	0.08	0.50	0.50	0.27	0.29	0.29	0.15	0.17	0.17
Volume/Cap:	0.64	0.82	0.82	0.82	0.64	0.64	0.82	0.61	0.74	0.74	0.82	0.82
Delay/Veh:	59.5	26.5	26.5	74.2	19.1	19.1	40.2	31.4	35.4	51.2	49.2	49.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	59.5	26.5	26.5	74.2	19.1	19.1	40.2	31.4	35.4	51.2	49.2	49.2
LOS by Move:	E	C	C	E	B	B	D	C	D	D	D	D
HCM2kAvgQ:	3	21	21	6	14	14	14	9	12	8	10	10

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #107 Leon Road & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.325
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 16.0
Optimal Cycle: 28 Level Of Service: B

Street Name:	Leon Road						Keller Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Permitted			Protected			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	66	837	0	0	609	76	80	19	270	15	181	3
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	66	837	0	0	609	76	80	19	270	15	181	3
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	66	837	0	0	609	76	80	19	270	15	181	3
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	66	837	0	0	609	76	80	19	270	15	181	3
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	66	837	0	0	609	76	80	19	270	15	181	3
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	66	837	0	0	609	76	80	19	270	15	181	3
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.95	1.00	0.93	0.93	0.95	0.82	0.82	0.33	0.95	0.95
Lanes:	1.00	2.00	0.00	1.00	1.78	0.22	1.00	1.00	1.00	1.00	1.97	0.03
Final Sat.:	1805	3610	0	1900	3155	394	1805	1552	1552	633	3544	59
Capacity Analysis Module:												
Vol/Sat:	0.04	0.23	0.00	0.00	0.19	0.19	0.04	0.01	0.17	0.02	0.05	0.05
Crit Moves:	****				****		****				****	
Green/Cycle:	0.11	0.71	0.00	0.00	0.59	0.59	0.14	0.29	0.29	0.16	0.16	0.16
Volume/Cap:	0.33	0.33	0.00	0.00	0.32	0.32	0.32	0.04	0.59	0.15	0.33	0.33
Delay/Veh:	41.8	5.7	0.0	0.0	10.3	10.3	39.8	25.3	32.2	37.1	37.8	37.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	41.8	5.7	0.0	0.0	10.3	10.3	39.8	25.3	32.2	37.1	37.8	37.8
LOS by Move:	D	A	A	A	B	B	D	C	C	D	D	D
HCM2kAvgQ:	2	5	0	0	6	6	2	0	8	1	3	3

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #108 Winchester Road - SR-79 & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.534
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 1.2
Optimal Cycle: 40 Level Of Service: A

Street Name:	Winchester Road - SR-79						Keller Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	0	2596	37	12	2148	1	0	20	1	13	13	30
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	2596	37	12	2148	1	0	20	1	13	13	30
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	2596	37	12	2148	1	0	20	1	13	13	30
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	2596	37	12	2148	1	0	20	1	13	13	30
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	2596	37	12	2148	1	0	20	1	13	13	30
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	2596	37	12	2148	1	0	20	1	13	13	30
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.91	0.91	0.95	0.91	0.91	1.00	0.94	0.94	1.00	0.85	0.85
Lanes:	1.00	2.96	0.04	1.00	2.99	0.01	1.00	1.90	0.10	1.00	1.00	1.00
Final Sat.:	1900	5104	73	1805	5185	2	1900	3414	171	1900	1615	1615
Capacity Analysis Module:												
Vol/Sat:	0.00	0.51	0.51	0.01	0.41	0.41	0.00	0.01	0.01	0.01	0.01	0.02
Crit Moves:		****		****								****
Green/Cycle:	0.00	0.95	0.95	0.01	0.97	0.97	0.00	0.03	0.03	0.03	0.03	0.03
Volume/Cap:	0.00	0.53	0.53	0.53	0.43	0.43	0.00	0.17	0.17	0.18	0.23	0.53
Delay/Veh:	0.0	0.3	0.3	71.8	0.2	0.2	0.0	47.5	47.5	48.1	47.6	54.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.3	0.3	71.8	0.2	0.2	0.0	47.5	47.5	48.1	47.6	54.3
LOS by Move:	A	A	A	E	A	A	A	D	D	D	D	D
HCM2kAvgQ:	0	4	4	1	2	2	0	0	0	1	1	2

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #112 Leon Road & Jean Nicholas

Cycle (sec): 100 Critical Vol./Cap.(X): 0.580
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 23.3
Optimal Cycle: 54 Level Of Service: C

Street Name:	Leon Road						Jean Nicholas					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	3	524	233	236	556	12	2	103	13	117	144	368
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	3	524	233	236	556	12	2	103	13	117	144	368
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	3	524	233	236	556	12	2	103	13	117	144	368
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	3	524	233	236	556	12	2	103	13	117	144	368
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	3	524	233	236	556	12	2	103	13	117	144	368
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	3	524	233	236	556	12	2	103	13	117	144	368
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.95	0.95	0.95	0.93	0.93	0.95	0.85	0.85
Lanes:	1.00	1.38	0.62	1.00	1.96	0.04	1.00	1.78	0.22	1.00	1.00	1.00
Final Sat.:	1805	2384	1060	1805	3523	76	1805	3151	398	1805	1610	1610
Capacity Analysis Module:												
Vol/Sat:	0.00	0.22	0.22	0.13	0.16	0.16	0.00	0.03	0.03	0.06	0.09	0.23
Crit Moves:		****		****				****				****
Green/Cycle:	0.01	0.38	0.38	0.23	0.60	0.60	0.00	0.13	0.13	0.26	0.39	0.39
Volume/Cap:	0.26	0.58	0.58	0.58	0.26	0.26	0.58	0.25	0.25	0.25	0.23	0.58
Delay/Veh:	61.5	25.4	25.4	36.6	9.7	9.7	192.9	39.2	39.2	29.3	20.2	24.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	61.5	25.4	25.4	36.6	9.7	9.7	192.9	39.2	39.2	29.3	20.2	24.8
LOS by Move:	E	C	C	D	A	A	F	D	D	C	C	C
HCM2kAvgQ:	0	10	10	7	4	4	0	2	2	3	3	10

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #122 Meadowlark Lane - Whitewood Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.154
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 62.9
Optimal Cycle: 180 Level Of Service: E

Street Name:	Meadowlark Lane - Whitewood Road						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	2	0	1	2	0	1	1	0	2	0	3	0	1	2	0	3	0	1
Volume Module:																				
Base Vol:	596	207	691	495	226	321	162	1279	379	430	768	869
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	596	207	691	495	226	321	162	1279	379	430	768	869
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	596	207	691	495	226	321	162	1279	379	430	768	869
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	596	207	691	495	226	321	162	1279	379	430	768	869
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	596	207	691	495	226	321	162	1279	379	430	768	869
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	596	207	691	495	226	321	162	1279	379	430	768	869
Saturation Flow Module:																				
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.95	0.85	0.92	0.87	0.87	0.92	0.91	0.85	0.92	0.91	0.85
Lanes:	2.00	2.00	1.00	2.00	1.00	1.00	2.00	3.00	1.00	2.00	3.00	1.00
Final Sat.:	3502	3610	1615	3502	1646	1646	3502	5187	1615	3502	5187	1615
Capacity Analysis Module:																				
Vol/Sat:	0.17	0.06	0.43	0.14	0.14	0.19	0.05	0.25	0.23	0.12	0.15	0.54
Crit Moves:			****	****			****					****
Green/Cycle:	0.23	0.37	0.37	0.12	0.26	0.26	0.04	0.34	0.34	0.17	0.47	0.47
Volume/Cap:	0.74	0.15	1.15	1.15	0.52	0.74	1.15	0.73	0.69	0.73	0.32	1.15
Delay/Veh:	39.4	21.0	118.5	136.5	31.9	37.7	171.1	30.7	32.5	44.0	16.8	110.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	39.4	21.0	118.5	136.5	31.9	37.7	171.1	30.7	32.5	44.0	16.8	110.6
LOS by Move:	D	C	F	F	C	D	F	C	C	D	B	F
HCM2kAvgQ:	10	2	36	15	7	11	6	14	11	8	5	44

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #138 Jefferson Avenue & Cherry Street

Cycle (sec): 100 Critical Vol./Cap.(X): 0.950
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 30.7
Optimal Cycle: 180 Level Of Service: C

Street Name:	Jefferson Avenue						Cherry Street					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	2	0	1	1	0	1	1	0	1	0	2	1	0	1	0	2	1	0
Volume Module:																				
Base Vol:	33	1291	786	145	783	5	2	1002	47	127	785	616
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	33	1291	786	145	783	5	2	1002	47	127	785	616
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	33	1291	786	145	783	5	2	1002	47	127	785	616
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	33	1291	786	145	783	5	2	1002	47	127	785	616
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	33	1291	786	145	783	5	2	1002	47	127	785	616
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	33	1291	786	145	783	5	2	1002	47	127	785	616
Saturation Flow Module:																				
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.85	0.95	0.95	0.95	0.95	0.90	0.90	0.95	0.85	0.85
Lanes:	1.00	2.00	1.00	1.00	1.99	0.01	1.00	2.87	0.13	1.00	2.00	1.00
Final Sat.:	1805	3610	1615	1805	3584	23	1805	4920	231	1805	3230	1615
Capacity Analysis Module:																				
Vol/Sat:	0.02	0.36	0.49	0.08	0.22	0.22	0.00	0.20	0.20	0.07	0.24	0.38
Crit Moves:			****	****			****					****
Green/Cycle:	0.05	0.51	0.51	0.08	0.55	0.55	0.00	0.30	0.30	0.10	0.40	0.40
Volume/Cap:	0.40	0.70	0.95	0.95	0.40	0.40	0.95	0.68	0.68	0.68	0.61	0.95
Delay/Veh:	49.4	19.7	43.2	103.2	13.0	13.0	618.1	32.1	32.1	53.0	24.1	42.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	49.4	19.7	43.2	103.2	13.0	13.0	618.1	32.1	32.1	53.0	24.1	42.2
LOS by Move:	D	B	D	F	B	B	F	C	C	D	C	D
HCM2kAvgQ:	1	17	28	8	7	7	1	11	11	5	11	25

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #141 Jefferson Ave & Nutmeg St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.928
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 37.6
Optimal Cycle: 180 Level Of Service: D

Street Name:	Jefferson Ave						Nutmeg St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	635	1173	348	91	1196	94	64	133	293	259	181	112
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	635	1173	348	91	1196	94	64	133	293	259	181	112
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	635	1173	348	91	1196	94	64	133	293	259	181	112
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	635	1173	348	91	1196	94	64	133	293	259	181	112
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	635	1173	348	91	1196	94	64	133	293	259	181	112
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	635	1173	348	91	1196	94	64	133	293	259	181	112
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.88	0.88	0.95	0.90	0.90	0.95	0.85	0.85	0.95	0.90	0.90
Lanes:	1.00	2.31	0.69	1.00	2.78	0.22	1.00	1.00	1.00	1.00	1.24	0.76
Final Sat.:	1805	3864	1146	1805	4756	374	1805	1619	1619	1805	2103	1301
Capacity Analysis Module:												
Vol/Sat:	0.35	0.30	0.30	0.05	0.25	0.25	0.04	0.08	0.18	0.14	0.09	0.09
Crit Moves:	****				****				****	****		
Green/Cycle:	0.38	0.56	0.56	0.09	0.27	0.27	0.10	0.20	0.20	0.15	0.25	0.25
Volume/Cap:	0.93	0.54	0.54	0.54	0.93	0.93	0.35	0.42	0.93	0.93	0.35	0.35
Delay/Veh:	48.6	14.3	14.3	47.0	46.5	46.5	42.9	35.6	64.7	76.9	31.2	31.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	48.6	14.3	14.3	47.0	46.5	46.5	42.9	35.6	64.7	76.9	31.2	31.2
LOS by Move:	D	B	B	D	D	D	D	D	E	E	C	C
HCM2kAvgQ:	23	11	11	3	19	19	2	4	13	12	4	4

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #142 Jefferson Ave & Magnolia St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.488
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 7.8
Optimal Cycle: 45 Level Of Service: A

Street Name:	Jefferson Ave						Magnolia St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 0	1 0	1	0 0	1 0
Volume Module:												
Base Vol:	131	2054	12	9	1643	93	123	4	49	7	4	13
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	131	2054	12	9	1643	93	123	4	49	7	4	13
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	131	2054	12	9	1643	93	123	4	49	7	4	13
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	131	2054	12	9	1643	93	123	4	49	7	4	13
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	131	2054	12	9	1643	93	123	4	49	7	4	13
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	131	2054	12	9	1643	93	123	4	49	7	4	13
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.90	0.90	0.95	0.86	0.86	0.95	0.89	0.89
Lanes:	1.00	2.98	0.02	1.00	2.84	0.16	1.00	0.08	0.92	1.00	0.24	0.76
Final Sat.:	1805	5152	30	1805	4870	276	1805	123	1512	1805	396	1286
Capacity Analysis Module:												
Vol/Sat:	0.07	0.40	0.40	0.00	0.34	0.34	0.07	0.03	0.03	0.00	0.01	0.01
Crit Moves:	****				****		****				****	
Green/Cycle:	0.15	0.83	0.83	0.01	0.69	0.69	0.14	0.14	0.14	0.02	0.02	0.02
Volume/Cap:	0.49	0.48	0.48	0.48	0.49	0.49	0.49	0.23	0.23	0.23	0.49	0.49
Delay/Veh:	40.5	2.5	2.5	67.4	7.3	7.3	41.2	38.4	38.4	52.2	58.8	58.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	40.5	2.5	2.5	67.4	7.3	7.3	41.2	38.4	38.4	52.2	58.8	58.8
LOS by Move:	D	A	A	E	A	A	D	D	D	D	E	E
HCM2kAvgQ:	4	7	7	1	9	9	4	2	2	0	1	1

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
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PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #149 Monroe Ave & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.569
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 16.4
Optimal Cycle: 53 Level Of Service: B

Street Name:	Monroe Ave						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ovl			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	0 1	1	0 2	0 1	1	0 4	0 1	1	0 3	1 0
Volume Module:												
Base Vol:	165	260	195	1	262	131	186	2601	135	34	2056	31
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	165	260	195	1	262	131	186	2601	135	34	2056	31
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	165	260	195	1	262	131	186	2601	135	34	2056	31
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	165	260	195	1	262	131	186	2601	135	34	2056	31
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	165	260	195	1	262	131	186	2601	135	34	2056	31
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	165	260	195	1	262	131	186	2601	135	34	2056	31
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.85	0.95	0.95	0.85	0.95	0.91	0.85	0.95	0.91	0.91
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	4.00	1.00	1.00	3.94	0.06
Final Sat.:	1805	3610	1615	1805	3610	1615	1805	6916	1615	1805	6800	103
Capacity Analysis Module:												
Vol/Sat:	0.09	0.07	0.12	0.00	0.07	0.08	0.10	0.38	0.08	0.02	0.30	0.30
Crit Moves:	****				****		****				****	
Green/Cycle:	0.16	0.29	0.29	0.00	0.13	0.31	0.18	0.68	0.84	0.03	0.53	0.53
Volume/Cap:	0.57	0.25	0.42	0.42	0.57	0.26	0.57	0.55	0.10	0.55	0.57	0.57
Delay/Veh:	41.5	27.5	29.6	140.0	42.7	26.3	39.8	8.5	1.5	58.2	16.0	16.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	41.5	27.5	29.6	140.0	42.7	26.3	39.8	8.5	1.5	58.2	16.0	16.0
LOS by Move:	D	C	C	F	D	C	D	A	A	E	B	B
HCM2kAvgQ:	5	3	5	0	5	3	6	11	1	2	12	12

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
Existing General Plan
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #158 Adams Ave & Guava St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.348
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 13.3
Optimal Cycle: 22 Level Of Service: B

Street Name:	Adams Ave						Guava St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 0	1 0	1	0 0	1 0
Volume Module:												
Base Vol:	31	181	21	70	19	178	72	275	134	5	262	158
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	31	181	21	70	19	178	72	275	134	5	262	158
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	31	181	21	70	19	178	72	275	134	5	262	158
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	31	181	21	70	19	178	72	275	134	5	262	158
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	31	181	21	70	19	178	72	275	134	5	262	158
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	31	181	21	70	19	178	72	275	134	5	262	158
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.54	0.93	0.93	0.54	0.82	0.82	0.44	0.95	0.95	0.45	0.94	0.94
Lanes:	1.00	1.79	0.21	1.00	1.00	1.00	1.00	0.67	0.33	1.00	0.62	0.38
Final Sat.:	1032	3183	369	1022	1560	1560	834	1215	592	849	1119	675
Capacity Analysis Module:												
Vol/Sat:	0.03	0.06	0.06	0.07	0.01	0.11	0.09	0.23	0.23	0.01	0.23	0.23
Crit Moves:						****					****	
Green/Cycle:	0.33	0.33	0.33	0.33	0.33	0.33	0.67	0.67	0.67	0.67	0.67	0.67
Volume/Cap:	0.09	0.17	0.17	0.21	0.04	0.35	0.13	0.34	0.34	0.01	0.35	0.35
Delay/Veh:	23.4	24.0	24.0	24.6	22.9	25.9	6.0	7.1	7.1	5.4	7.2	7.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	23.4	24.0	24.0	24.6	22.9	25.9	6.0	7.1	7.1	5.4	7.2	7.2
LOS by Move:	C	C	C	C	C	C	A	A	A	A	A	A
HCM2kAvgQ:	1	2	2	2	0	4	1	5	5	0	6	6

Note: Queue reported is the number of cars per lane.

Traffix 7.9.0215 (c) 2008 Dowling Assoc. Licensed to MMA, LONG BEACH, CA

RECOMMENDED SCENARIO

City of Murrieta General Plan
Future Proposed General Plan
AM Peak Hour

Scenario Report

Scenario:	Future Proposed GP AM
Command:	Future Proposed GP AM
Volume:	Future Proposed GP AM
Geometry:	Future
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	Default Trip Distribution
Paths:	Default Path
Routes:	Default Route
Configuration:	Future Proposed GP AM

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Turning Movement Report

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#1 Menifee Road & Scott Road													
Base	238	358	374	253	845	93	102	510	316	864	479	251	4683
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	238	358	374	253	845	93	102	510	316	864	479	251	4683
#2 Leon Road & Scott Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#3 Winchester Road/SR-79 & Scott Road													
Base	110	1376	51	951	2658	75	117	178	68	17	151	963	6715
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	110	1376	51	951	2658	75	117	178	68	17	151	963	6715
#4 Antelope Road & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#5 Menifee Road - Meadowlark Road & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#6 Briggs Road & Keller Road													
Base	346	17	53	0	40	47	1	72	492	15	344	1	1428
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	346	17	53	0	40	47	1	72	492	15	344	1	1428
#7 Leon Road & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#8 Winchester Road - SR-79 & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#9 Antelope Road & Golden City Drive - Baxter Road													
Base	1	88	515	381	1070	27	1	75	11	397	203	604	3373
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	88	515	381	1070	27	1	75	11	397	203	604	3373

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#10 Whitewood Roa - /Meadowlark Road & Golden City Drive - Baxter Road													
Base	316	689	2	0	955	880	59	4	739	1	15	2	3662
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	316	689	2	0	955	880	59	4	739	1	15	2	3662
#11 Briggs Road & Baxter Road - Jean Nicholas													
Base	0	206	43	38	534	0	0	0	0	9	0	75	905
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	206	43	38	534	0	0	0	0	9	0	75	905
#12 Leon Road & Jean Nicholas													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#13 Winchester Road - SR-79 & Nicholas - Skyview													
Base	138	1381	338	22	2896	33	37	330	132	106	327	166	5906
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	138	1381	338	22	2896	33	37	330	132	106	327	166	5906
#14 Antelope Road & Linnel Lane Extension													
Base	21	757	96	99	487	530	199	507	125	6	120	220	3167
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	21	757	96	99	487	530	199	507	125	6	120	220	3167
#15 Whitewood Road - Meadowlark Road & Linnel Lane Extension													
Base	18	797	678	281	1152	183	33	556	114	45	144	324	4325
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	18	797	678	281	1152	183	33	556	114	45	144	324	4325
#16 Leon Road & Max Gillis Road													
Base	417	107	396	383	363	152	100	470	767	631	322	182	4290
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	417	107	396	383	363	152	100	470	767	631	322	182	4290
#17 Winchester Road - SR-79 & Max Gillis - Thompson													
Base	200	1300	46	140	2198	729	609	165	279	31	298	39	6034
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	200	1300	46	140	2198	729	609	165	279	31	298	39	6034
#18 California Oaks Road & Clinton Keith Road													
Base	204	0	669	0	0	0	0	2680	307	773	1675	0	6308
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	204	0	669	0	0	0	0	2680	307	773	1675	0	6308

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#19 I-215 SB Off-Ramp & Clinton Keith Road													
Base	0	0	0	58	0	420	0	2401	496	0	2089	227	5691
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	58	0	420	0	2401	496	0	2089	227	5691
#20 I-215 NB Off Ramp & Clinton Keith Road													
Base	162	0	1393	0	0	0	0	1797	334	0	2305	233	6224
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	162	0	1393	0	0	0	0	1797	334	0	2305	233	6224
#21 Antelope Road & Clinton Keith Road													
Base	0	0	0	15	0	426	388	1869	0	0	1643	296	4637
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	15	0	426	388	1869	0	0	1643	296	4637
#22 Meadowlark Lane - Whitewood Road & Clinton Keith Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#23 Liberty Road & Clinton Keith Road													
Base	65	0	217	0	0	0	0	1615	205	44	2610	0	4756
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	65	0	217	0	0	0	0	1615	205	44	2610	0	4756
#24 Leon Road & Clinton Keith Road													
Base	0	0	0	144	0	1537	396	1420	0	0	858	561	4916
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	144	0	1537	396	1420	0	0	858	561	4916
#25 Winchester Road - SR-79 & Benton Road													
Base	490	1366	368	96	2041	400	38	470	978	344	614	32	7237
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	490	1366	368	96	2041	400	38	470	978	344	614	32	7237
#26 Winchester Road - SR-79 & Via Mira Mosa													
Base	28	1593	798	319	2788	234	358	49	95	177	19	29	6487
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	28	1593	798	319	2788	234	358	49	95	177	19	29	6487
#27 Monroe Ave & Los Alamos													
Base	28	223	188	569	475	208	46	351	134	63	994	473	3752
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	28	223	188	569	475	208	46	351	134	63	994	473	3752

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#28 Jefferson Avenue & Murrieta Hot Springs Road													
Base	10	1074	495	919	1236	77	15	76	21	876	93	921	5813
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	10	1074	495	919	1236	77	15	76	21	876	93	921	5813
#29 Madison Avenue & Murrieta Hot Springs Road													
Base	127	67	324	183	184	156	117	1137	271	754	1769	74	5163
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	127	67	324	183	184	156	117	1137	271	754	1769	74	5163
#30 I-15 SB Off-Ramp & Murrieta Hot Springs Road													
Base	0	0	0	808	0	421	0	1385	215	0	2301	47	5177
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	808	0	421	0	1385	215	0	2301	47	5177
#31 I-15 NB Off-Ramp & Murrieta Hot Springs Road													
Base	292	0	60	0	0	0	0	2202	210	0	1546	598	4908
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	292	0	60	0	0	0	0	2202	210	0	1546	598	4908
#32 I-215 SB Off-Ramp & Murrieta Hot Springs Road													
Base	0	0	0	483	0	524	0	1838	53	0	2599	378	5875
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	483	0	524	0	1838	53	0	2599	378	5875
#33 I-215 NB Off-Ramp & Murrieta Hot Springs Road													
Base	343	0	24	0	0	0	0	1583	115	0	2623	663	5351
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	343	0	24	0	0	0	0	1583	115	0	2623	663	5351
#34 Jackson Avenue & Murrieta Hot Springs Road													
Base	68	0	52	0	0	0	0	1217	38	149	2024	0	3548
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	68	0	52	0	0	0	0	1217	38	149	2024	0	3548
#35 Margarita Road & Murrieta Hot Springs Road													
Base	640	60	128	41	17	7	161	750	462	302	1793	71	4432
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	640	60	128	41	17	7	161	750	462	302	1793	71	4432
#36 French Valley Parkway & Murrieta Hot Springs Road													
Base	19	0	829	0	0	0	0	1182	269	805	2004	0	5108
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	19	0	829	0	0	0	0	1182	269	805	2004	0	5108

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#37 Jefferson Avenue & Guava Street													
Base	22	1363	3	7	1420	306	176	108	89	2	32	10	3538
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	22	1363	3	7	1420	306	176	108	89	2	32	10	3538
#38 Jefferson Avenue & Cherry Street													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#39 Washington Ave & Calle Del Oso Oro/Nutmeg													
Base	262	164	126	88	218	88	64	602	742	151	189	38	2732
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	262	164	126	88	218	88	64	602	742	151	189	38	2732
#40 Clinton Keith Rd & Calle de Oso Oro/Bear Creek Dr													
Base	63	107	268	4	115	192	269	613	172	420	598	19	2840
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	63	107	268	4	115	192	269	613	172	420	598	19	2840
#41 Jefferson Ave & Nutmeg St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#42 Jefferson Ave & Magnolia St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#43 Jefferson Ave & Lemon St													
Base	320	733	28	4	2585	166	31	3	334	8	13	6	4231
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	320	733	28	4	2585	166	31	3	334	8	13	6	4231
#44 Jefferson Ave & Kalmia St													
Base	261	957	246	967	1732	170	55	502	349	223	355	556	6373
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	261	957	246	967	1732	170	55	502	349	223	355	556	6373
#45 Jefferson Ave & Juniper St													
Base	471	1298	35	71	2027	173	137	99	188	7	101	22	4629
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	471	1298	35	71	2027	173	137	99	188	7	101	22	4629

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#46 Jefferson Ave & Ivy St/Los Alamos Rd													
Base	259	1336	111	327	1823	72	49	95	129	363	121	400	5085
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	259	1336	111	327	1823	72	49	95	129	363	121	400	5085
#47 Madison Ave & Kalmia St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#48 Madison Ave/I-15 SB Ramps & Kalmia St													
Base	119	0	219	250	51	272	0	1459	245	386	1139	505	4645
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	119	0	219	250	51	272	0	1459	245	386	1139	505	4645
#49 Monroe Ave & Murrieta Hot Springs Rd													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#50 Hancock Ave & Murrieta Hot Springs Rd													
Base	0	0	0	379	0	598	697	1520	0	0	2602	566	6362
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	379	0	598	697	1520	0	0	2602	566	6362
#51 Alta Murrieta Dr & Murrieta Hot Springs Rd													
Base	221	82	19	69	130	313	258	982	282	131	1871	169	4527
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	221	82	19	69	130	313	258	982	282	131	1871	169	4527
#52 Winchester Road - SR-79 & Murrieta Hot Springs Rd													
Base	288	1507	155	161	1461	1426	768	265	95	276	897	83	7382
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	288	1507	155	161	1461	1426	768	265	95	276	897	83	7382
#53 Hancock Ave & Los Alamos Rd													
Base	48	120	221	793	252	93	71	969	72	916	1682	614	5851
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	48	120	221	793	252	93	71	969	72	916	1682	614	5851
#54 I-215 SB Ramps & Los Alamos Rd													
Base	0	0	0	405	0	2037	0	1419	478	220	1506	0	6065
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	405	0	2037	0	1419	478	220	1506	0	6065

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#55 I-215 NB Ramps & Los Alamos Rd													
Base	550	0	377	0	0	0	591	1233	0	0	1185	160	4096
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	550	0	377	0	0	0	591	1233	0	0	1185	160	4096
#56 Whitewood Rd & Los Alamos Rd													
Base	83	372	38	26	432	617	823	232	109	48	241	34	3055
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	83	372	38	26	432	617	823	232	109	48	241	34	3055
#57 Whitewood Rd & Murrieta Hot Springs Rd													
Base	50	240	241	260	536	102	32	1001	132	514	2105	166	5379
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	50	240	241	260	536	102	32	1001	132	514	2105	166	5379
#58 Adams Ave & Guava St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#59 Nutmeg St & Clinton Keith Rd													
Base	67	41	484	425	54	67	50	2123	110	386	1317	156	5280
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	67	41	484	425	54	67	50	2123	110	386	1317	156	5280
#60 Murrieta Oaks Ave-Mitchell Rd & Clinton Keith Rd													
Base	101	241	85	19	69	196	203	2903	312	78	2088	405	6700
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	101	241	85	19	69	196	203	2903	312	78	2088	405	6700
#61 I-215 SB Ramps & Scott Rd													
Base	0	0	0	246	0	104	0	1052	385	0	866	384	3037
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	246	0	104	0	1052	385	0	866	384	3037
#62 I-215 NB Ramps & Scott Rd													
Base	0	15	600	0	0	259	156	1199	0	0	978	329	3536
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	15	600	0	0	259	156	1199	0	0	978	329	3536
#102 Leon Road & Scott Road													
Base	104	198	2	101	444	489	353	438	498	14	360	157	3158
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	104	198	2	101	444	489	353	438	498	14	360	157	3158

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#104 Antelope Road & Keller Road													
Base	66	43	328	241	584	447	405	791	1203	758	467	27	5360
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	66	43	328	241	584	447	405	791	1203	758	467	27	5360
#105 Menifee Road - Meadowlark Road & Keller Road													
Base	23	226	251	133	1301	680	495	199	565	299	400	125	4697
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	23	226	251	133	1301	680	495	199	565	299	400	125	4697
#107 Leon Road & Keller Road													
Base	111	330	18	4	868	156	2	60	106	7	65	5	1732
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	111	330	18	4	868	156	2	60	106	7	65	5	1732
#108 Winchester Road - SR-79 & Keller Road													
Base	1	1512	25	5	2774	3	1	10	1	13	20	50	4415
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	1512	25	5	2774	3	1	10	1	13	20	50	4415
#112 Leon Road & Jean Nicholas													
Base	5	183	126	261	649	53	2	145	13	157	22	249	1865
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	5	183	126	261	649	53	2	145	13	157	22	249	1865
#122 Meadowlark Lane - Whitewood Road & Clinton Keith Road													
Base	133	230	1083	212	134	715	1386	486	82	943	1187	594	7185
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	133	230	1083	212	134	715	1386	486	82	943	1187	594	7185
#138 Jefferson Avenue & Cherry Street													
Base	86	620	196	37	640	22	1	48	6	147	1311	893	4007
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	86	620	196	37	640	22	1	48	6	147	1311	893	4007
#141 Jefferson Ave & Nutmeg St													
Base	181	321	272	96	1887	69	93	223	509	366	171	67	4255
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	181	321	272	96	1887	69	93	223	509	366	171	67	4255
#142 Jefferson Ave & Magnolia St													
Base	81	637	8	8	2543	247	158	1	155	27	3	1	3869
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	81	637	8	8	2543	247	158	1	155	27	3	1	3869

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#149 Monroe Ave & Murrieta Hot Springs Rd													
Base	46	73	48	1	47	50	101	1156	34	7	1552	21	3136
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	46	73	48	1	47	50	101	1156	34	7	1552	21	3136
#158 Adams Ave & Guava St													
Base	78	97	21	101	21	40	23	324	46	3	256	108	1118
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	78	97	21	101	21	40	23	324	46	3	256	108	1118

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City of Murrieta General Plan
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Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
# 1 Menifee Road & Scott Road	E	68.3	1.068	E	68.3	1.068	+ 0.000 D/V
# 3 Winchester Road/SR-79 & Scott	F	177.4	1.508	F	177.4	1.508	+ 0.000 D/V
# 6 Briggs Road & Keller Road	B	18.5	0.542	B	18.5	0.542	+ 0.000 D/V
# 9 Antelope Road & Golden City Dr	C	25.2	0.937	C	25.2	0.937	+ 0.000 D/V
# 10 Whitewood Roa - /Meadowlark Ro	F	107.7	1.204	F	107.7	1.204	+ 0.000 D/V
# 11 Briggs Road & Baxter Road - Je	A	8.8	0.194	A	8.8	0.194	+ 0.000 D/V
# 13 Winchester Road - SR-79 & Nich	B	19.7	0.835	B	19.7	0.835	+ 0.000 D/V
# 14 Antelope Road & Linnel Lane Ex	C	22.1	0.575	C	22.1	0.575	+ 0.000 D/V
# 15 Whitewood Road - Meadowlark Ro	C	26.0	0.813	C	26.0	0.813	+ 0.000 D/V
# 16 Leon Road & Max Gillis Road	D	51.9	1.003	D	51.9	1.003	+ 0.000 D/V
# 17 Winchester Road - SR-79 & Max	C	27.1	0.831	C	27.1	0.831	+ 0.000 D/V
# 18 California Oaks Road & Clinton	E	60.7	1.126	E	60.7	1.126	+ 0.000 D/V
# 19 I-215 SB Off-Ramp & Clinton Ke	A	7.9	0.611	A	7.9	0.611	+ 0.000 D/V
# 20 I-215 NB Off Ramp & Clinton Ke	F	124.7	1.307	F	124.7	1.307	+ 0.000 D/V
# 21 Antelope Road & Clinton Keith	A	5.1	0.493	A	5.1	0.493	+ 0.000 D/V
# 23 Liberty Road & Clinton Keith R	A	7.4	0.638	A	7.4	0.638	+ 0.000 D/V
# 24 Leon Road & Clinton Keith Road	C	26.0	0.888	C	26.0	0.888	+ 0.000 D/V
# 25 Winchester Road - SR-79 & Bent	D	38.8	0.976	D	38.8	0.976	+ 0.000 D/V
# 26 Winchester Road - SR-79 & Via	C	24.1	0.889	C	24.1	0.889	+ 0.000 D/V
# 27 Monroe Ave & Los Alamos	C	24.5	0.603	C	24.5	0.603	+ 0.000 D/V
# 28 Jefferson Avenue & Murrieta Ho	F	133.3	1.440	F	133.3	1.440	+ 0.000 D/V
# 29 Madison Avenue & Murrieta Hot	C	26.6	0.678	C	26.6	0.678	+ 0.000 D/V
# 30 I-15 SB Off-Ramp & Murrieta Ho	B	16.1	0.723	B	16.1	0.723	+ 0.000 D/V

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City of Murrieta General Plan
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Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
# 31 I-15 NB Off-Ramp & Murrieta Ho	A	5.7	0.402	A	5.7	0.402	+ 0.000 D/V
# 32 I-215 SB Off-Ramp & Murrieta H	B	12.5	0.702	B	12.5	0.702	+ 0.000 D/V
# 33 I-215 NB Off-Ramp & Murrieta H	A	5.6	0.604	A	5.6	0.604	+ 0.000 D/V
# 34 Jackson Avenue & Murrieta Hot	A	5.1	0.410	A	5.1	0.410	+ 0.000 D/V
# 35 Margarita Road & Murrieta Hot	C	24.6	0.665	C	24.6	0.665	+ 0.000 D/V
# 36 French Valley Parkway & Murrie	B	12.9	0.744	B	12.9	0.744	+ 0.000 D/V
# 37 Jefferson Avenue & Guava Stree	A	9.4	0.485	A	9.4	0.485	+ 0.000 D/V
# 39 Washington Ave & Calle Del Oso	C	27.6	0.739	C	27.6	0.739	+ 0.000 D/V
# 40 Clinton Keith Rd & Calle de Os	C	23.7	0.944	C	23.7	0.944	+ 0.000 D/V
# 43 Jefferson Ave & Lemon St	C	28.2	0.924	C	28.2	0.924	+ 0.000 D/V
# 44 Jefferson Ave & Kalmia St	E	59.3	1.090	E	59.3	1.090	+ 0.000 D/V
# 45 Jefferson Ave & Juniper St	C	23.4	0.801	C	23.4	0.801	+ 0.000 D/V
# 46 Jefferson Ave & Ivy St/Los Ala	C	26.8	0.705	C	26.8	0.705	+ 0.000 D/V
# 48 Madison Ave/I-15 SB Ramps & Ka	C	29.4	0.569	C	29.4	0.569	+ 0.000 D/V
# 50 Hancock Ave & Murrieta Hot Spr	B	17.6	0.778	B	17.6	0.778	+ 0.000 D/V
# 51 Alta Murrieta Dr & Murrieta Ho	C	23.8	0.601	C	23.8	0.601	+ 0.000 D/V
# 52 Winchester Road - SR-79 & Murr	F	107.8	1.376	F	107.8	1.376	+ 0.000 D/V
# 53 Hancock Ave & Los Alamos Rd	F	84.6	1.161	F	84.6	1.161	+ 0.000 D/V
# 54 I-215 SB Ramps & Los Alamos Rd	E	77.2	1.129	E	77.2	1.129	+ 0.000 D/V
# 55 I-215 NB Ramps & Los Alamos Rd	C	25.5	0.802	C	25.5	0.802	+ 0.000 D/V
# 56 Whitewood Rd & Los Alamos Rd	D	44.4	0.962	D	44.4	0.962	+ 0.000 D/V
# 57 Whitewood Rd & Murrieta Hot Sp	C	28.3	0.795	C	28.3	0.795	+ 0.000 D/V
# 59 Nutmeg St & Clinton Keith Rd	F	96.5	1.194	F	96.5	1.194	+ 0.000 D/V
# 60 Murrieta Oaks Ave-Mitchell Rd	C	20.4	0.862	C	20.4	0.862	+ 0.000 D/V
# 61 I-215 SB Ramps & Scott Rd	A	8.5	0.237	A	8.5	0.237	+ 0.000 D/V

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City of Murrieta General Plan
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Intersection	Base LOS	Del/ Veh	V/ C	Future LOS	Del/ Veh	V/ C	Change in
# 62 I-215 NB Ramps & Scott Rd	B	15.9	0.376	B	15.9	0.376	+ 0.000 D/V
#102 Leon Road & Scott Road	C	27.9	0.673	C	27.9	0.673	+ 0.000 D/V
#104 Antelope Road & Keller Road	F	158.6	1.501	F	158.6	1.501	+ 0.000 D/V
#105 Menifee Road - Meadowlark Road	E	68.8	1.109	E	68.8	1.109	+ 0.000 D/V
#107 Leon Road & Keller Road	B	12.3	0.389	B	12.3	0.389	+ 0.000 D/V
#108 Winchester Road - SR-79 & Kell	A	1.6	0.567	A	1.6	0.567	+ 0.000 D/V
#112 Leon Road & Jean Nicholas	C	22.1	0.397	C	22.1	0.397	+ 0.000 D/V
#122 Meadowlark Lane - Whitewood Ro	F	145.9	1.495	F	145.9	1.495	+ 0.000 D/V
#138 Jefferson Avenue & Cherry Stre	C	21.8	0.783	C	21.8	0.783	+ 0.000 D/V
#141 Jefferson Ave & Nutmeg St	D	51.1	0.997	D	51.1	0.997	+ 0.000 D/V
#142 Jefferson Ave & Magnolia St	B	10.7	0.701	B	10.7	0.701	+ 0.000 D/V
#149 Monroe Ave & Murrieta Hot Spri	A	8.0	0.322	A	8.0	0.322	+ 0.000 D/V
#158 Adams Ave & Guava St	B	12.2	0.287	B	12.2	0.287	+ 0.000 D/V

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City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #1 Menifee Road & Scott Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.068
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 68.3
Optimal Cycle: 180 Level Of Service: E

Street Name:	Menifee Rd						Scott Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	238	358	374	253	845	93	102	510	316	864	479	251
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	238	358	374	253	845	93	102	510	316	864	479	251
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	238	358	374	253	845	93	102	510	316	864	479	251
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	238	358	374	253	845	93	102	510	316	864	479	251
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	238	358	374	253	845	93	102	510	316	864	479	251
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	238	358	374	253	845	93	102	510	316	864	479	251
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.88	0.88	0.95	0.94	0.94	0.95	0.86	0.86	0.95	0.86	0.86
Lanes:	1.00	1.00	1.00	1.00	1.80	0.20	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1805	1666	1666	1805	3203	353	1805	3261	1630	1805	3278	1639
Capacity Analysis Module:												
Vol/Sat:	0.13	0.21	0.22	0.14	0.26	0.26	0.06	0.16	0.19	0.48	0.15	0.15
Crit Moves:	****				****				****	****		
Green/Cycle:	0.12	0.23	0.23	0.14	0.25	0.25	0.17	0.18	0.18	0.45	0.46	0.46
Volume/Cap:	1.07	0.94	0.98	0.98	1.07	1.07	0.33	0.86	1.07	1.07	0.32	0.33
Delay/Veh:	123.3	57.5	67.5	94.4	87.9	87.9	37.2	47.8	93.1	79.0	17.2	17.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	123.3	57.5	67.5	94.4	87.9	87.9	37.2	47.8	93.1	79.0	17.2	17.3
LOS by Move:	F	E	E	F	F	F	D	D	F	E	B	B
HCM2kAvgQ:	13	16	18	12	24	24	3	11	18	38	5	5

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #3 Winchester Road/SR-79 & Scott Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.508
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 177.4
Optimal Cycle: 180 Level Of Service: F

Street Name:	Winchester Road/SR-79						Scott Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0	2	1 0	1 0	2	1 0	1 0	2	1 0	1 0	2	1 0
Volume Module:												
Base Vol:	110	1376	51	951	2658	75	117	178	68	17	151	963
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	110	1376	51	951	2658	75	117	178	68	17	151	963
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	110	1376	51	951	2658	75	117	178	68	17	151	963
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	110	1376	51	951	2658	75	117	178	68	17	151	963
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	110	1376	51	951	2658	75	117	178	68	17	151	963
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	110	1376	51	951	2658	75	117	178	68	17	151	963
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.91	0.91	0.95	0.87	0.87	0.95	0.79	0.79
Lanes:	1.00	2.89	0.11	1.00	2.92	0.08	1.00	2.17	0.83	1.00	2.00	1.00
Final Sat.:	1805	4977	184	1805	5024	142	1805	3599	1375	1805	3008	1504
Capacity Analysis Module:												
Vol/Sat:	0.06	0.28	0.28	0.53	0.53	0.53	0.06	0.05	0.05	0.01	0.05	0.64
Crit Moves:		****		****			****					****
Green/Cycle:	0.06	0.18	0.18	0.35	0.48	0.48	0.04	0.39	0.39	0.07	0.42	0.42
Volume/Cap:	1.11	1.51	1.51	1.51	1.11	1.11	1.51	0.13	0.13	0.13	0.12	1.51
Delay/Veh:	169.6	275	275.1	269.5	81.2	81.2	332.0	19.4	19.4	43.6	17.4	264.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	169.6	275	275.1	269.5	81.2	81.2	332.0	19.4	19.4	43.6	17.4	264.6
LOS by Move:	F	F	F	F	F	F	F	B	B	D	B	F
HCM2kAvgQ:	7	39	39	69	47	47	10	2	2	1	2	77

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #6 Briggs Road & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.542
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 18.5
Optimal Cycle: 50 Level Of Service: B

Street Name:	Briggs Road						Keller Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0	1	1 0	1 0	1	1 0	1 0	1	1 0	1 0	1	1 0
Volume Module:												
Base Vol:	346	17	53	0	40	47	1	72	492	15	344	1
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	346	17	53	0	40	47	1	72	492	15	344	1
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	346	17	53	0	40	47	1	72	492	15	344	1
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	346	17	53	0	40	47	1	72	492	15	344	1
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	346	17	53	0	40	47	1	72	492	15	344	1
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	346	17	53	0	40	47	1	72	492	15	344	1
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.84	0.84	1.00	0.87	0.87	0.95	0.83	0.83	0.95	0.95	0.95
Lanes:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.99	0.01
Final Sat.:	1805	1599	1599	1900	1659	1659	1805	1569	1569	1805	3600	10
Capacity Analysis Module:												
Vol/Sat:	0.19	0.01	0.03	0.00	0.02	0.03	0.00	0.05	0.31	0.01	0.10	0.10
Crit Moves:	****					****			****	****		
Green/Cycle:	0.35	0.41	0.41	0.00	0.05	0.05	0.00	0.58	0.58	0.02	0.59	0.59
Volume/Cap:	0.54	0.03	0.08	0.00	0.46	0.54	0.16	0.08	0.54	0.54	0.16	0.16
Delay/Veh:	26.8	17.8	18.3	0.0	47.8	50.0	61.7	9.3	13.5	69.0	9.3	9.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	26.8	17.8	18.3	0.0	47.8	50.0	61.7	9.3	13.5	69.0	9.3	9.3
LOS by Move:	C	B	B	A	D	D	E	A	B	E	A	A
HCM2kAvgQ:	9	0	1	0	2	2	0	1	10	1	2	2

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #9 Antelope Road & Golden City Drive - Baxter Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.937
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 25.2
Optimal Cycle: 180 Level Of Service: C

Street Name:	Antelope Road						Golden City Drive - Baxter Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	1	88	515	381	1070	27	1	75	11	397	203	604
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	1	88	515	381	1070	27	1	75	11	397	203	604
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	1	88	515	381	1070	27	1	75	11	397	203	604
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	1	88	515	381	1070	27	1	75	11	397	203	604
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	1	88	515	381	1070	27	1	75	11	397	203	604
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	1	88	515	381	1070	27	1	75	11	397	203	604
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.18	0.83	0.83	0.36	0.95	0.95	0.19	0.93	0.93	0.67	0.84	0.84
Lanes:	1.00	1.00	1.00	1.00	1.95	0.05	1.00	1.74	0.26	1.00	1.00	1.00
Final Sat.:	336	1574	1574	680	3507	88	352	3088	453	1273	1603	1603
Capacity Analysis Module:												
Vol/Sat:	0.00	0.06	0.33	0.56	0.31	0.31	0.00	0.02	0.02	0.31	0.13	0.38
Crit Moves:				****								****
Green/Cycle:	0.60	0.60	0.60	0.60	0.60	0.60	0.40	0.40	0.40	0.40	0.40	0.40
Volume/Cap:	0.00	0.09	0.55	0.94	0.51	0.51	0.01	0.06	0.06	0.78	0.31	0.94
Delay/Veh:	8.1	8.6	12.6	47.6	11.8	11.8	17.9	18.3	18.3	33.3	20.5	46.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	8.1	8.6	12.6	47.6	11.8	11.8	17.9	18.3	18.3	33.3	20.5	46.0
LOS by Move:	A	A	B	D	B	B	B	B	B	C	C	D
HCM2kAvgQ:	0	1	10	15	10	10	0	1	1	12	5	24

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #10 Whitewood Roa - /Meadowlark Road & Golden City Drive - Baxter R

Cycle (sec): 100 Critical Vol./Cap.(X): 1.204
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 107.7
Optimal Cycle: 180 Level Of Service: F

Street Name:	Whitewood Road - Meadowlark Road						Golden City Drive - Baxter Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	316	689	2	0	955	880	59	4	739	1	15	2
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	316	689	2	0	955	880	59	4	739	1	15	2
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	316	689	2	0	955	880	59	4	739	1	15	2
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	316	689	2	0	955	880	59	4	739	1	15	2
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	316	689	2	0	955	880	59	4	739	1	15	2
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	316	689	2	0	955	880	59	4	739	1	15	2
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.95	1.00	0.88	0.88	0.95	0.81	0.81	0.95	0.93	0.93
Lanes:	1.00	1.99	0.01	1.00	1.04	0.96	1.00	1.00	1.00	1.00	1.76	0.24
Final Sat.:	1805	3600	10	1900	1744	1607	1805	1536	1536	1805	3128	417
Capacity Analysis Module:												
Vol/Sat:	0.18	0.19	0.19	0.00	0.55	0.55	0.03	0.00	0.48	0.00	0.00	0.00
Crit Moves:	****				****				****	****		
Green/Cycle:	0.15	0.60	0.60	0.00	0.45	0.45	0.35	0.40	0.40	0.00	0.05	0.05
Volume/Cap:	1.20	0.32	0.32	0.00	1.20	1.20	0.09	0.01	1.20	1.20	0.09	0.09
Delay/Veh:	165.1	10.0	10.0	0.0	126	125.8	22.0	18.1	136.8	1181	45.5	45.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	165.1	10.0	10.0	0.0	126	125.8	22.0	18.1	136.8	1181	45.5	45.5
LOS by Move:	F	A	A	A	F	F	C	B	F	F	D	D
HCM2kAvgQ:	19	5	5	0	52	52	1	0	43	0	0	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
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Intersection #11 Briggs Road & Baxter Road - Jean Nicholas

Cycle (sec): 100 Critical Vol./Cap.(X): 0.194
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 8.8
Optimal Cycle: 28 Level Of Service: A

Street Name:	Briggs Road						Baxter Road - Jean Nicholas					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0 1	1 0	1	0 2	0 0	0	0 0	0 0	1	0 0	0 1
Volume Module:												
Base Vol:	0	206	43	38	534	0	0	0	0	9	0	75
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	206	43	38	534	0	0	0	0	9	0	75
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	206	43	38	534	0	0	0	0	9	0	75
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	206	43	38	534	0	0	0	0	9	0	75
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	206	43	38	534	0	0	0	0	9	0	75
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	206	43	38	534	0	0	0	0	9	0	75
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.93	0.93	0.95	0.95	1.00	1.00	1.00	1.00	0.95	1.00	0.85
Lanes:	0.00	1.65	0.35	1.00	2.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00
Final Sat.:	0	2909	607	1805	3610	0	0	0	0	1805	0	1615
Capacity Analysis Module:												
Vol/Sat:	0.00	0.07	0.07	0.02	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.05
Crit Moves:	****				****							****
Green/Cycle:	0.00	0.59	0.59	0.17	0.76	0.00	0.00	0.00	0.00	0.24	0.00	0.24
Volume/Cap:	0.00	0.12	0.12	0.12	0.19	0.00	0.00	0.00	0.00	0.02	0.00	0.19
Delay/Veh:	0.0	9.2	9.2	35.0	3.4	0.0	0.0	0.0	0.0	29.1	0.0	30.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	9.2	9.2	35.0	3.4	0.0	0.0	0.0	0.0	29.1	0.0	30.6
LOS by Move:	A	A	A	C	A	A	A	A	A	C	A	C
HCM2kAvgQ:	0	2	2	1	2	0	0	0	0	0	0	2

Note: Queue reported is the number of cars per lane.

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Intersection #13 Winchester Road - SR-79 & Nicholas - Skyview

Cycle (sec): 100 Critical Vol./Cap.(X): 0.835
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 19.7
Optimal Cycle: 138 Level Of Service: B

Street Name:	Winchester Road - SR-79						Nicholas - Skyview					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	138	1381	338	22	2896	33	37	330	132	106	327	166
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	138	1381	338	22	2896	33	37	330	132	106	327	166
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	138	1381	338	22	2896	33	37	330	132	106	327	166
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	138	1381	338	22	2896	33	37	330	132	106	327	166
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	138	1381	338	22	2896	33	37	330	132	106	327	166
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	138	1381	338	22	2896	33	37	330	132	106	327	166
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.88	0.88	0.95	0.91	0.91	0.95	0.91	0.91	0.95	0.90	0.90
Lanes:	1.00	2.41	0.59	1.00	2.97	0.03	1.00	1.43	0.57	1.00	1.33	0.67
Final Sat.:	1805	4042	989	1805	5118	58	1805	2468	987	1805	2272	1154
Capacity Analysis Module:												
Vol/Sat:	0.08	0.34	0.34	0.01	0.57	0.57	0.02	0.13	0.13	0.06	0.14	0.14
Crit Moves:	****				****			****		****		
Green/Cycle:	0.09	0.74	0.74	0.03	0.68	0.68	0.03	0.16	0.16	0.07	0.20	0.20
Volume/Cap:	0.83	0.46	0.46	0.46	0.83	0.83	0.71	0.83	0.83	0.83	0.71	0.71
Delay/Veh:	73.8	5.1	5.1	54.8	13.8	13.8	85.5	51.3	51.3	81.5	40.7	40.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	73.8	5.1	5.1	54.8	13.8	13.8	85.5	51.3	51.3	81.5	40.7	40.7
LOS by Move:	E	A	A	D	B	B	F	D	D	F	D	D
HCM2kAvgQ:	7	8	8	1	26	26	2	10	10	5	9	9

Note: Queue reported is the number of cars per lane.

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Intersection #14 Antelope Road & Linnel Lane Extension

Cycle (sec): 100 Critical Vol./Cap.(X): 0.575
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 22.1
Optimal Cycle: 54 Level Of Service: C

Street Name:	Antelope Road						Linnel Lane Extension					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	21	757	96	99	487	530	199	507	125	6	120	220
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	21	757	96	99	487	530	199	507	125	6	120	220
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	21	757	96	99	487	530	199	507	125	6	120	220
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	21	757	96	99	487	530	199	507	125	6	120	220
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	21	757	96	99	487	530	199	507	125	6	120	220
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	21	757	96	99	487	530	199	507	125	6	120	220
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.93	0.93	0.95	0.88	0.88	0.95	0.92	0.92	0.95	0.86	0.86
Lanes:	1.00	1.77	0.23	1.00	1.00	1.00	1.00	1.60	0.40	1.00	1.00	1.00
Final Sat.:	1805	3149	399	1805	1664	1664	1805	2809	693	1805	1630	1630
Capacity Analysis Module:												
Vol/Sat:	0.01	0.24	0.24	0.05	0.29	0.32	0.11	0.18	0.18	0.00	0.07	0.13
Crit Moves:	****					****	****					****
Green/Cycle:	0.02	0.47	0.47	0.11	0.55	0.55	0.19	0.42	0.42	0.01	0.23	0.23
Volume/Cap:	0.58	0.51	0.51	0.51	0.53	0.58	0.58	0.43	0.43	0.43	0.31	0.58
Delay/Veh:	69.1	19.0	19.0	44.6	14.4	15.1	39.1	20.8	20.8	69.4	31.8	35.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	69.1	19.0	19.0	44.6	14.4	15.1	39.1	20.8	20.8	69.4	31.8	35.3
LOS by Move:	E	B	B	D	B	B	D	C	C	E	C	D
HCM2kAvgQ:	1	10	10	4	10	11	6	7	7	1	3	7

Note: Queue reported is the number of cars per lane.

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Intersection #15 Whitewood Road - Meadowlark Road & Linnel Lane Extension

Cycle (sec): 100 Critical Vol./Cap.(X): 0.813
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 26.0
Optimal Cycle: 122 Level Of Service: C

Street Name:	Whitewood Road - Meadowlark Road						Linnel Lane Extension (Future)					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	18	797	678	281	1152	183	33	556	114	45	144	324
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	18	797	678	281	1152	183	33	556	114	45	144	324
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	18	797	678	281	1152	183	33	556	114	45	144	324
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	18	797	678	281	1152	183	33	556	114	45	144	324
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	18	797	678	281	1152	183	33	556	114	45	144	324
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	18	797	678	281	1152	183	33	556	114	45	144	324
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.88	0.88	0.95	0.93	0.93	0.95	0.93	0.93	0.95	0.85	0.85
Lanes:	1.00	1.08	0.92	1.00	1.73	0.27	1.00	1.66	0.34	1.00	1.00	1.00
Final Sat.:	1805	1816	1545	1805	3050	484	1805	2921	599	1805	1617	1617
Capacity Analysis Module:												
Vol/Sat:	0.01	0.44	0.44	0.16	0.38	0.38	0.02	0.19	0.19	0.02	0.09	0.20
Crit Moves:		****		****			****					****
Green/Cycle:	0.02	0.54	0.54	0.19	0.71	0.71	0.02	0.24	0.24	0.03	0.25	0.25
Volume/Cap:	0.53	0.81	0.81	0.81	0.53	0.53	0.81	0.80	0.80	0.80	0.36	0.81
Delay/Veh:	63.6	21.8	21.8	52.4	6.9	6.9	121.3	41.4	41.4	102.7	31.3	44.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	63.6	21.8	21.8	52.4	6.9	6.9	121.3	41.4	41.4	102.7	31.3	44.2
LOS by Move:	E	C	C	D	A	A	F	D	D	F	C	D
HCM2kAvgQ:	1	21	21	11	10	10	3	12	12	3	4	12

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #16 Leon Road & Max Gillis Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.003
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 51.9
Optimal Cycle: 180 Level Of Service: D

Street Name:	Leon Road						Max Gillis Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	2	0	1	2	0	1	1	0	2	0	1	0	1
Volume Module:												
Base Vol:	417	107	396	383	363	152	100	470	767	631	322	182
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	417	107	396	383	363	152	100	470	767	631	322	182
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	417	107	396	383	363	152	100	470	767	631	322	182
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	417	107	396	383	363	152	100	470	767	631	322	182
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	417	107	396	383	363	152	100	470	767	631	322	182
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	417	107	396	383	363	152	100	470	767	631	322	182
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.95	0.85	0.92	0.91	0.91	0.92	0.86	0.86	0.92	1.00	0.85
Lanes:	2.00	2.00	1.00	2.00	1.41	0.59	2.00	1.00	1.00	2.00	1.00	1.00
Final Sat.:	3502	3610	1615	3502	2433	1019	3502	1637	1637	3502	1900	1615
Capacity Analysis Module:												
Vol/Sat:	0.12	0.03	0.25	0.11	0.15	0.15	0.03	0.29	0.47	0.18	0.17	0.11
Crit Moves:			****	****					****	****		
Green/Cycle:	0.16	0.24	0.24	0.11	0.20	0.20	0.09	0.47	0.47	0.18	0.55	0.55
Volume/Cap:	0.76	0.12	1.00	1.00	0.76	0.76	0.31	0.61	1.00	1.00	0.31	0.20
Delay/Veh:	46.4	29.5	83.9	91.4	42.9	42.9	42.9	20.5	53.1	77.7	12.2	11.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	46.4	29.5	83.9	91.4	42.9	42.9	42.9	20.5	53.1	77.7	12.2	11.4
LOS by Move:	D	C	F	F	D	D	D	C	D	E	B	B
HCM2kAvgQ:	8	1	18	10	10	10	2	12	33	15	5	3

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #17 Winchester Road - SR-79 & Max Gillis - Thompson

Cycle (sec): 100 Critical Vol./Cap.(X): 0.831
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 27.1
Optimal Cycle: 135 Level Of Service: C

Street Name:	Winchester Road - SR-79						Max Gillis - Thompson					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	2	1	0	1	0	3	0	1	2	0	2	0	1	1	0	1	1	0
Volume Module:												
Base Vol:	200	1300	46	140	2198	729	609	165	279	31	298	39
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	200	1300	46	140	2198	729	609	165	279	31	298	39
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	200	1300	46	140	2198	729	609	165	279	31	298	39
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	200	1300	46	140	2198	729	609	165	279	31	298	39
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	200	1300	46	140	2198	729	609	165	279	31	298	39
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	200	1300	46	140	2198	729	609	165	279	31	298	39
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.91	0.85	0.92	0.95	0.85	0.95	0.93	0.93
Lanes:	1.00	2.90	0.10	1.00	3.00	1.00	2.00	2.00	1.00	1.00	1.77	0.23
Final Sat.:	1805	4985	176	1805	5187	1615	3502	3610	1615	1805	3138	411
Capacity Analysis Module:												
Vol/Sat:	0.11	0.26	0.26	0.08	0.42	0.45	0.17	0.05	0.17	0.02	0.09	0.09
Crit Moves:	****					****	****				****	
Green/Cycle:	0.13	0.52	0.52	0.16	0.54	0.54	0.21	0.29	0.29	0.03	0.11	0.11
Volume/Cap:	0.83	0.50	0.50	0.50	0.78	0.83	0.83	0.16	0.59	0.59	0.83	0.83
Delay/Veh:	63.3	15.6	15.6	40.1	19.6	25.8	45.8	26.2	32.0	64.0	56.9	56.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	63.3	15.6	15.6	40.1	19.6	25.8	45.8	26.2	32.0	64.0	56.9	56.9
LOS by Move:	E	B	B	D	B	C	D	C	C	E	E	E
HCM2kAvgQ:	8	10	10	5	21	21	12	2	8	2	8	8

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #18 California Oaks Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.126
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 60.7
Optimal Cycle: 180 Level Of Service: E

Street Name:	California Oaks Road									Clinton Keith Road								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected					Protected				
Rights:	Ovl					Include					Include					Include				
Min. Green:	0	0	0			0	0	0			0	0	0			0	0	0		
Lanes:	1	0	0	0	2	0	0	0	0	0	0	0	2	1	0	1	0	3	0	0
Volume Module:																				
Base Vol:	204	0	669			0	0	0			0	2680	307			773	1675	0		
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Initial Bse:	204	0	669			0	0	0			0	2680	307			773	1675	0		
Added Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
PasserByVol:	0	0	0			0	0	0			0	0	0			0	0	0		
Initial Fut:	204	0	669			0	0	0			0	2680	307			773	1675	0		
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Volume:	204	0	669			0	0	0			0	2680	307			773	1675	0		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
Reduced Vol:	204	0	669			0	0	0			0	2680	307			773	1675	0		
PCE Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
MLF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
FinalVolume:	204	0	669			0	0	0			0	2680	307			773	1675	0		
Saturation Flow Module:																				
Sat/Lane:	1900	1900	1900			1900	1900	1900			1900	1900	1900			1900	1900	1900		
Adjustment:	0.95	1.00	0.75			1.00	1.00	1.00			1.00	0.90	0.90			0.95	0.91	1.00		
Lanes:	1.00	0.00	2.00			0.00	0.00	0.00			0.00	2.69	0.31			1.00	3.00	0.00		
Final Sat.:	1805	0	2842			0	0	0			0	4584	525			1805	5187	0		
Capacity Analysis Module:																				
Vol/Sat:	0.11	0.00	0.24			0.00	0.00	0.00			0.00	0.58	0.58			0.43	0.32	0.00		
Crit Moves:	****											****				****				
Green/Cycle:	0.10	0.00	0.48			0.00	0.00	0.00			0.00	0.52	0.52			0.38	0.90	0.00		
Volume/Cap:	1.13	0.00	0.49			0.00	0.00	0.00			0.00	1.13	1.13			1.13	0.36	0.00		
Delay/Veh:	149.7	0.0	17.9			0.0	0.0	0.0			0.0	86.2	86.2			105.5	0.8	0.0		
User DelAdj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
AdjDel/Veh:	149.7	0.0	17.9			0.0	0.0	0.0			0.0	86.2	86.2			105.5	0.8	0.0		
LOS by Move:	F		A			B		A			A		F			F		A		
HCM2kAvgQ:	12		0			8		0			0		52			38		3		

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #19 I-215 SB Off-Ramp & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.611
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 7.9
Optimal Cycle: 59 Level Of Service: A

Street Name:	I-215 SB Off-Ramp									Clinton Keith Road								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Split Phase					Split Phase					Protected					Protected				
Rights:	Include					Include					Include					Ignore				
Min. Green:	0	0	0			0	0	0			0	0	0			0	0	0		
Lanes:	0	0	0	0	0	0	1	0	0	2	0	0	3	0	1	0	0	3	0	1
Volume Module:																				
Base Vol:	0	0	0			58	0	420			0	2401	496			0	2089	227		
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Initial Bse:	0	0	0			58	0	420			0	2401	496			0	2089	227		
Added Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
PasserByVol:	0	0	0			0	0	0			0	0	0			0	0	0		
Initial Fut:	0	0	0			58	0	420			0	2401	496			0	2089	227		
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	0.00		
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	0.00		
PHF Volume:	0	0	0			58	0	420			0	2401	496			0	2089	0		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
Reduced Vol:	0	0	0			58	0	420			0	2401	496			0	2089	0		
PCE Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	0.00		
MLF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	0.00		
FinalVolume:	0	0	0			58	0	420			0	2401	496			0	2089	0		
Saturation Flow Module:																				
Sat/Lane:	1900	1900	1900			1900	1900	1900			1900	1900	1900			1900	1900	1900		
Adjustment:	1.00	1.00	1.00			0.95	1.00	0.75			1.00	0.91	0.85			1.00	0.91	1.00		
Lanes:	0.00	0.00	0.00			1.00	0.00	2.00			0.00	3.00	1.00			0.00	3.00	1.00		
Final Sat.:	0	0	0			1809	0	2842			0	5187	1615			0	5187	1900		
Capacity Analysis Module:																				
Vol/Sat:	0.00	0.00	0.00			0.03	0.00	0.15			0.00	0.46	0.31			0.00	0.40	0.00		
Crit Moves:								****				****				****				
Green/Cycle:	0.00	0.00	0.00			0.24	0.00	0.24			0.00	0.76	0.76			0.00	0.76	0.00		
Volume/Cap:	0.00	0.00	0.00			0.13	0.00	0.61			0.00	0.61	0.41			0.00	0.53	0.00		
Delay/Veh:	0.0	0.0	0.0			29.8	0.0	35.3			0.0	5.7	4.4			0.0	5.0	0.0		
User DelAdj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
AdjDel/Veh:	0.0	0.0	0.0			29.8	0.0	35.3			0.0	5.7	4.4			0.0	5.0	0.0		
LOS by Move:	A		A			C		A			D		A			A		A		
HCM2kAvgQ:	0		0			1		7			0		13			5		0		

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #20 I-215 NB Off Ramp & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.307
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 124.7
Optimal Cycle: 180 Level Of Service: F

Street Name:	I-215 NB Off Ramp						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 0	0 1	0	0 0	0 0	0	0 3	0 1	0	0 3	0 1
Volume Module:												
Base Vol:	162	0	1393	0	0	0	0	1797	334	0	2305	233
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	162	0	1393	0	0	0	0	1797	334	0	2305	233
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	162	0	1393	0	0	0	0	1797	334	0	2305	233
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
PHF Volume:	162	0	1393	0	0	0	0	1797	334	0	2305	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	162	0	1393	0	0	0	0	1797	334	0	2305	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
FinalVolume:	162	0	1393	0	0	0	0	1797	334	0	2305	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	1.00	1.00	1.00	1.00	0.91	0.85	1.00	0.91	1.00
Lanes:	1.00	0.00	1.00	0.00	0.00	0.00	0.00	3.00	1.00	0.00	3.00	1.00
Final Sat.:	1805	0	1615	0	0	0	0	5187	1615	0	5187	1900
Capacity Analysis Module:												
Vol/Sat:	0.09	0.00	0.86	0.00	0.00	0.00	0.00	0.35	0.21	0.00	0.44	0.00
Crit Moves:			****				****				****	
Green/Cycle:	0.66	0.00	0.66	0.00	0.00	0.00	0.00	0.34	0.34	0.00	0.34	0.00
Volume/Cap:	0.14	0.00	1.31	0.00	0.00	0.00	0.00	1.02	0.61	0.00	1.31	0.00
Delay/Veh:	6.4	0.0	162.0	0.0	0.0	0.0	0.0	59.3	29.4	0.0	175	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	6.4	0.0	162.0	0.0	0.0	0.0	0.0	59.3	29.4	0.0	175	0.0
LOS by Move:	A	A	F	A	A	A	A	E	C	A	F	A
HCM2kAvgQ:	2	0	83	0	0	0	0	28	9	0	52	0

Note: Queue reported is the number of cars per lane.

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2000 HCM Operations Method (Future Volume Alternative)

Intersection #21 Antelope Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.493
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 5.1
Optimal Cycle: 45 Level Of Service: A

Street Name:	Antelope Road						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ignore			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0 0	0 0	2	0 0	0 2	2	0 3	0 0	0	0 2	1 0
Volume Module:												
Base Vol:	0	0	0	15	0	426	388	1869	0	0	1643	296
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	15	0	426	388	1869	0	0	1643	296
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	15	0	426	388	1869	0	0	1643	296
User Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	15	0	0	388	1869	0	0	1643	296
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	15	0	0	388	1869	0	0	1643	296
PCE Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	15	0	0	388	1869	0	0	1643	296
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.92	1.00	0.88	0.92	0.91	1.00	1.00	0.89	0.89
Lanes:	0.00	0.00	0.00	2.00	0.00	2.00	2.00	3.00	0.00	0.00	2.54	0.46
Final Sat.:	0	0	0	3502	0	3344	3502	5187	0	0	4294	774
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.36	0.00	0.00	0.38	0.38
Crit Moves:					****			****			****	
Green/Cycle:	0.00	0.00	0.00	0.00	0.00	0.00	0.22	1.00	0.00	0.00	0.78	0.78
Volume/Cap:	0.00	0.00	0.00	xxxx	0.00	0.00	0.49	0.36	0.00	0.00	0.49	0.49
Delay/Veh:	0.0	0.0	0.0	0.0	0.0	0.0	34.3	0.0	0.0	0.0	4.2	4.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	0.0	0.0	0.0	34.3	0.0	0.0	0.0	4.2	4.2
LOS by Move:	A	A	A	A	A	A	C	A	A	A	A	A
HCM2kAvgQ:	0	0	0	0	0	0	6	1	0	0	8	8

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #23 Liberty Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.638
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 7.4
Optimal Cycle: 63 Level Of Service: A

Street Name:	Liberty Road						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2 0	0	0 1	0	0 0	0 0	0	0 2	1 0	1	0 3	0 0
Volume Module:												
Base Vol:	65	0	217	0	0	0	0	1615	205	44	2610	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	65	0	217	0	0	0	0	1615	205	44	2610	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	65	0	217	0	0	0	0	1615	205	44	2610	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	65	0	217	0	0	0	0	1615	205	44	2610	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	65	0	217	0	0	0	0	1615	205	44	2610	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	65	0	217	0	0	0	0	1615	205	44	2610	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.85	1.00	1.00	1.00	1.00	0.89	0.89	0.95	0.91	1.00
Lanes:	2.00	0.00	1.00	0.00	0.00	0.00	0.00	2.66	0.34	1.00	3.00	0.00
Final Sat.:	3502	0	1615	0	0	0	0	4525	574	1805	5187	0
Capacity Analysis Module:												
Vol/Sat:	0.02	0.00	0.13	0.00	0.00	0.00	0.00	0.36	0.36	0.02	0.50	0.00
Crit Moves:			****				****				****	
Green/Cycle:	0.21	0.00	0.21	0.00	0.00	0.00	0.00	0.74	0.74	0.05	0.79	0.00
Volume/Cap:	0.09	0.00	0.64	0.00	0.00	0.00	0.00	0.48	0.48	0.48	0.64	0.00
Delay/Veh:	31.8	0.0	40.0	0.0	0.0	0.0	0.0	5.4	5.4	50.2	4.8	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	31.8	0.0	40.0	0.0	0.0	0.0	0.0	5.4	5.4	50.2	4.8	0.0
LOS by Move:	C	A	D	A	A	A	A	A	A	D	A	A
HCM2kAvgQ:	1	0	7	0	0	0	0	8	8	2	13	0

Note: Queue reported is the number of cars per lane.

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Intersection #24 Leon Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.888
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 26.0
Optimal Cycle: 180 Level Of Service: C

Street Name:	Leon Road						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ovl			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	0	0 0	1	0 0	0 2	2	0 3	0 0	0	0 3	0 1
Volume Module:												
Base Vol:	0	0	0	144	0	1537	396	1420	0	0	858	561
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	144	0	1537	396	1420	0	0	858	561
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	144	0	1537	396	1420	0	0	858	561
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	144	0	1537	396	1420	0	0	858	561
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	144	0	1537	396	1420	0	0	858	561
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	144	0	1537	396	1420	0	0	858	561
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.95	1.00	0.75	0.92	0.91	1.00	1.00	0.91	0.85
Lanes:	0.00	0.00	0.00	1.00	0.00	2.00	2.00	3.00	0.00	0.00	3.00	1.00
Final Sat.:	0	0	0	1805	0	2842	3502	5187	0	0	5187	1615
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.08	0.00	0.54	0.11	0.27	0.00	0.00	0.17	0.35
Crit Moves:						****	****					****
Green/Cycle:	0.00	0.00	0.00	0.48	0.00	0.61	0.13	0.52	0.00	0.00	0.39	0.39
Volume/Cap:	0.00	0.00	0.00	0.17	0.00	0.89	0.89	0.53	0.00	0.00	0.42	0.89
Delay/Veh:	0.0	0.0	0.0	14.7	0.0	22.7	62.0	16.2	0.0	0.0	22.4	42.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	14.7	0.0	22.7	62.0	16.2	0.0	0.0	22.4	42.8
LOS by Move:	A	A	A	B	A	C	E	B	A	A	C	D
HCM2kAvgQ:	0	0	0	2	0	26	9	11	0	0	7	20

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #25 Winchester Road - SR-79 & Benton Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.976
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 38.8
Optimal Cycle: 180 Level Of Service: D

Street Name:	Winchester Road - SR-79						Benton Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 3	0 1	2	0 3	0 1	2	0 2	0 2	2	0 2	0 1
Volume Module:												
Base Vol:	490	1366	368	96	2041	400	38	470	978	344	614	32
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	490	1366	368	96	2041	400	38	470	978	344	614	32
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	490	1366	368	96	2041	400	38	470	978	344	614	32
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	490	1366	368	96	2041	400	38	470	978	344	614	32
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	490	1366	368	96	2041	400	38	470	978	344	614	32
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	490	1366	368	96	2041	400	38	470	978	344	614	32
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.91	0.85	0.92	0.91	0.85	0.92	0.95	0.75	0.92	0.95	0.85
Lanes:	2.00	3.00	1.00	2.00	3.00	1.00	2.00	2.00	2.00	2.00	2.00	1.00
Final Sat.:	3502	5187	1615	3502	5187	1615	3502	3610	2842	3502	3610	1615
Capacity Analysis Module:												
Vol/Sat:	0.14	0.26	0.23	0.03	0.39	0.25	0.01	0.13	0.34	0.10	0.17	0.02
Crit Moves:	****				****				****	****		
Green/Cycle:	0.14	0.50	0.50	0.05	0.40	0.40	0.03	0.35	0.35	0.10	0.43	0.43
Volume/Cap:	0.98	0.53	0.46	0.53	0.98	0.61	0.40	0.37	0.98	0.98	0.40	0.05
Delay/Veh:	76.5	17.5	16.9	49.3	43.7	25.4	50.6	24.3	54.6	86.1	20.0	16.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	76.5	17.5	16.9	49.3	43.7	25.4	50.6	24.3	54.6	86.1	20.0	16.8
LOS by Move:	E	B	B	D	D	C	D	C	D	F	C	B
HCM2kAvgQ:	12	11	8	2	29	10	1	6	23	9	7	1

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #26 Winchester Road - SR-79 & Via Mira Mosa

Cycle (sec): 100 Critical Vol./Cap.(X): 0.889
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 24.1
Optimal Cycle: 180 Level Of Service: C

Street Name:	Winchester Road - SR-79						Via Mira Mosa					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 0	1 0	1	0 0	1 0
Volume Module:												
Base Vol:	28	1593	798	319	2788	234	358	49	95	177	19	29
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	28	1593	798	319	2788	234	358	49	95	177	19	29
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	28	1593	798	319	2788	234	358	49	95	177	19	29
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	28	1593	798	319	2788	234	358	49	95	177	19	29
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	28	1593	798	319	2788	234	358	49	95	177	19	29
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	28	1593	798	319	2788	234	358	49	95	177	19	29
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.86	0.86	0.95	0.90	0.90	0.95	0.90	0.90	0.95	0.91	0.91
Lanes:	1.00	2.00	1.00	1.00	2.77	0.23	1.00	0.34	0.66	1.00	0.40	0.60
Final Sat.:	1805	3285	1643	1805	4728	397	1805	583	1129	1805	684	1043
Capacity Analysis Module:												
Vol/Sat:	0.02	0.48	0.49	0.18	0.59	0.59	0.20	0.08	0.08	0.10	0.03	0.03
Crit Moves:			****	****			****				****	
Green/Cycle:	0.02	0.55	0.55	0.20	0.73	0.73	0.22	0.12	0.12	0.14	0.03	0.03
Volume/Cap:	0.81	0.89	0.89	0.89	0.81	0.81	0.89	0.72	0.72	0.72	0.89	0.89
Delay/Veh:	129.5	23.9	24.0	61.6	10.6	10.6	58.4	54.1	54.1	50.9	131	130.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	129.5	23.9	24.0	61.6	10.6	10.6	58.4	54.1	54.1	50.9	131	130.8
LOS by Move:	F	C	C	E	B	B	E	D	D	D	F	F
HCM2kAvgQ:	2	27	27	13	24	24	14	6	6	7	3	3

Note: Queue reported is the number of cars per lane.

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Intersection #27 Monroe Ave & Los Alamos

Cycle (sec): 100 Critical Vol./Cap.(X): 0.603
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 24.5
Optimal Cycle: 57 Level Of Service: C

Street Name:	Monroe Ave						Los Alamos					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	2	0 2	0 1	1	0 1	1 0	1	0 2	0 1
Volume Module:												
Base Vol:	28	223	188	569	475	208	46	351	134	63	994	473
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	28	223	188	569	475	208	46	351	134	63	994	473
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	28	223	188	569	475	208	46	351	134	63	994	473
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	28	223	188	569	475	208	46	351	134	63	994	473
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	28	223	188	569	475	208	46	351	134	63	994	473
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	28	223	188	569	475	208	46	351	134	63	994	473
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.88	0.88	0.92	0.95	0.85	0.95	0.91	0.91	0.95	0.95	0.85
Lanes:	1.00	1.09	0.91	2.00	2.00	1.00	1.00	1.45	0.55	1.00	2.00	1.00
Final Sat.:	1805	1824	1537	3502	3610	1615	1805	2505	957	1805	3610	1615
Capacity Analysis Module:												
Vol/Sat:	0.02	0.12	0.12	0.16	0.13	0.13	0.03	0.14	0.14	0.03	0.28	0.29
Crit Moves:		****		****			****					****
Green/Cycle:	0.05	0.20	0.20	0.27	0.42	0.42	0.04	0.42	0.42	0.11	0.49	0.49
Volume/Cap:	0.31	0.60	0.60	0.60	0.31	0.30	0.60	0.33	0.33	0.33	0.57	0.60
Delay/Veh:	47.8	37.7	37.7	33.0	19.3	19.4	59.9	19.5	19.5	42.5	18.7	20.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	47.8	37.7	37.7	33.0	19.3	19.4	59.9	19.5	19.5	42.5	18.7	20.0
LOS by Move:	D	D	D	C	B	B	E	B	B	D	B	C
HCM2kAvgQ:	1	7	7	9	5	4	2	5	5	2	12	11

Note: Queue reported is the number of cars per lane.

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Intersection #28 Jefferson Avenue & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.440
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 133.3
Optimal Cycle: 180 Level Of Service: F

Street Name:	Jefferson Avenue						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 3	0 1	1	0 2	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	10	1074	495	919	1236	77	15	76	21	876	93	921
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	10	1074	495	919	1236	77	15	76	21	876	93	921
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	10	1074	495	919	1236	77	15	76	21	876	93	921
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	10	1074	495	919	1236	77	15	76	21	876	93	921
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	10	1074	495	919	1236	77	15	76	21	876	93	921
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	10	1074	495	919	1236	77	15	76	21	876	93	921
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.85	0.95	0.90	0.90	0.95	0.88	0.88	0.95	0.79	0.79
Lanes:	1.00	3.00	1.00	1.00	2.82	0.18	1.00	2.35	0.65	1.00	2.00	1.00
Final Sat.:	1805	5187	1615	1805	4839	301	1805	3934	1087	1805	2988	1494
Capacity Analysis Module:												
Vol/Sat:	0.01	0.21	0.31	0.51	0.26	0.26	0.01	0.02	0.02	0.49	0.03	0.62
Crit Moves:			****	****			****					****
Green/Cycle:	0.01	0.21	0.21	0.35	0.55	0.55	0.01	0.02	0.02	0.42	0.43	0.43
Volume/Cap:	0.46	0.97	1.44	1.44	0.46	0.46	1.44	1.16	1.16	1.16	0.07	1.44
Delay/Veh:	63.8	59.9	253.4	239.4	13.5	13.5	497.9	198	198.4	116.9	16.9	234.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	63.8	59.9	253.4	239.4	13.5	13.5	497.9	198	198.4	116.9	16.9	234.9
LOS by Move:	E	E	F	F	B	B	F	F	F	F	B	F
HCM2kAvgQ:	1	17	36	64	9	9	2	3	3	45	1	70

Note: Queue reported is the number of cars per lane.

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Intersection #29 Madison Avenue & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.678
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 26.6
Optimal Cycle: 71 Level Of Service: C

Street Name:	Madison Avenue						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	2	0	1	2	0	1	1	0	2	0	3	0	1
Volume Module:												
Base Vol:	127	67	324	183	184	156	117	1137	271	754	1769	74
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	127	67	324	183	184	156	117	1137	271	754	1769	74
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	127	67	324	183	184	156	117	1137	271	754	1769	74
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	127	67	324	183	184	156	117	1137	271	754	1769	74
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	127	67	324	183	184	156	117	1137	271	754	1769	74
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	127	67	324	183	184	156	117	1137	271	754	1769	74
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.95	0.85	0.92	0.88	0.88	0.92	0.88	0.88	0.92	0.91	0.85
Lanes:	2.00	2.00	1.00	2.00	1.08	0.92	2.00	3.23	0.77	2.00	3.00	1.00
Final Sat.:	3502	3610	1615	3502	1819	1542	3502	5423	1293	3502	5187	1615
Capacity Analysis Module:												
Vol/Sat:	0.04	0.02	0.20	0.05	0.10	0.10	0.03	0.21	0.21	0.22	0.34	0.05
Crit Moves:			****	****				****		****		
Green/Cycle:	0.10	0.30	0.30	0.08	0.27	0.27	0.06	0.31	0.31	0.32	0.57	0.57
Volume/Cap:	0.37	0.06	0.68	0.68	0.37	0.37	0.60	0.68	0.68	0.68	0.60	0.08
Delay/Veh:	42.8	25.3	34.9	51.7	29.5	29.5	51.1	31.1	31.1	31.4	14.3	9.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	42.8	25.3	34.9	51.7	29.5	29.5	51.1	31.1	31.1	31.4	14.3	9.7
LOS by Move:	D	C	C	D	C	C	D	C	C	C	B	A
HCM2kAvgQ:	2	1	10	4	5	5	3	11	11	11	13	1

Note: Queue reported is the number of cars per lane.

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Intersection #30 I-15 SB Off-Ramp & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.723
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 16.1
Optimal Cycle: 82 Level Of Service: B

Street Name:	I-15 SB Off-Ramp						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	1	0	1!	0	1	0	0	3	0	1	0	0	3	0	1
Volume Module:												
Base Vol:	0	0	0	808	0	421	0	1385	215	0	2301	47
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	808	0	421	0	1385	215	0	2301	47
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	808	0	421	0	1385	215	0	2301	47
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	0	0	0	808	0	421	0	1385	0	0	2301	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	808	0	421	0	1385	0	0	2301	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	0	0	0	808	0	421	0	1385	0	0	2301	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.91	1.00	1.00	0.91	1.00
Lanes:	0.00	0.00	0.00	1.66	0.00	1.34	0.00	3.00	1.00	0.00	3.00	1.00
Final Sat.:	0	0	0	2893	0	2343	0	5187	1900	0	5187	1900
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.28	0.00	0.18	0.00	0.27	0.00	0.00	0.44	0.00
Crit Moves:				****			****				****	
Green/Cycle:	0.00	0.00	0.00	0.39	0.00	0.39	0.00	0.61	0.00	0.00	0.61	0.00
Volume/Cap:	0.00	0.00	0.00	0.72	0.00	0.47	0.00	0.44	0.00	0.00	0.72	0.00
Delay/Veh:	0.0	0.0	0.0	27.7	0.0	23.1	0.0	10.3	0.0	0.0	14.3	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	27.7	0.0	23.1	0.0	10.3	0.0	0.0	14.3	0.0
LOS by Move:	A	A	A	C	A	C	A	B	A	A	B	A
HCM2kAvgQ:	0	0	0	14	0	7	0	8	0	0	19	0

Note: Queue reported is the number of cars per lane.

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Intersection #31 I-15 NB Off-Ramp & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.402
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 5.7
Optimal Cycle: 38 Level Of Service: A

Street Name:	I-15 NB Off-Ramp						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	0	0	1	0	0	0	0	0	0	4	0	1	0	0	4	0	1
Volume Module:																			
Base Vol:	292	0	60	0	0	0	0	2202	210	0	1546	598
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	292	0	60	0	0	0	0	2202	210	0	1546	598
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	292	0	60	0	0	0	0	2202	210	0	1546	598
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	292	0	60	0	0	0	0	2202	0	0	1546	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	292	0	60	0	0	0	0	2202	0	0	1546	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	292	0	60	0	0	0	0	2202	0	0	1546	0
Saturation Flow Module:																			
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.85	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Lanes:	2.00	0.00	1.00	0.00	0.00	0.00	0.00	4.00	1.00	0.00	4.00	1.00
Final Sat.:	3502	0	1615	0	0	0	0	6916	1900	0	6916	1900
Capacity Analysis Module:																			
Vol/Sat:	0.08	0.00	0.04	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.22	0.00
Crit Moves:	****							****		****		
Green/Cycle:	0.21	0.00	0.21	0.00	0.00	0.00	0.00	0.79	0.00	0.00	0.79	0.00
Volume/Cap:	0.40	0.00	0.18	0.00	0.00	0.00	0.00	0.40	0.00	0.00	0.28	0.00
Delay/Veh:	34.6	0.0	32.9	0.0	0.0	0.0	0.0	3.2	0.0	0.0	2.8	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	34.6	0.0	32.9	0.0	0.0	0.0	0.0	3.2	0.0	0.0	2.8	0.0
LOS by Move:	C	A	C	A	A	A	A	A	A	A	A	A
HCM2kAvgQ:	4	0	2	0	0	0	0	6	0	0	4	0

Note: Queue reported is the number of cars per lane.

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Intersection #32 I-215 SB Off-Ramp & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.702
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 12.5
Optimal Cycle: 63 Level Of Service: B

Street Name:	I-215 SB Off-Ramp						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	1	0	1!	0	1	0	0	3	0	1	0	0	3	0	1
Volume Module:																			
Base Vol:	0	0	0	483	0	524	0	1838	53	0	2599	378
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	483	0	524	0	1838	53	0	2599	378
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	483	0	524	0	1838	53	0	2599	378
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	0	0	0	483	0	524	0	1838	0	0	2599	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	483	0	524	0	1838	0	0	2599	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	0	0	0	483	0	524	0	1838	0	0	2599	0
Saturation Flow Module:																			
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.90	1.00	0.90	1.00	0.91	1.00	1.00	0.91	1.00
Lanes:	0.00	0.00	0.00	1.48	0.00	1.52	0.00	3.00	1.00	0.00	3.00	1.00
Final Sat.:	0	0	0	2532	0	2602	0	5187	1900	0	5187	1900
Capacity Analysis Module:																			
Vol/Sat:	0.00	0.00	0.00	0.19	0.00	0.20	0.00	0.35	0.00	0.00	0.50	0.00
Crit Moves:						****					****	
Green/Cycle:	0.00	0.00	0.00	0.29	0.00	0.29	0.00	0.71	0.00	0.00	0.71	0.00
Volume/Cap:	0.00	0.00	0.00	0.67	0.00	0.70	0.00	0.50	0.00	0.00	0.70	0.00
Delay/Veh:	0.0	0.0	0.0	32.6	0.0	33.4	0.0	6.5	0.0	0.0	8.9	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	32.6	0.0	33.4	0.0	6.5	0.0	0.0	8.9	0.0
LOS by Move:	A	A	A	C	A	C	A	A	A	A	A	A
HCM2kAvgQ:	0	0	0	10	0	11	0	9	0	0	17	0

Note: Queue reported is the number of cars per lane.

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Intersection #33 I-215 NB Off-Ramp & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.604
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 5.6
Optimal Cycle: 47 Level Of Service: A

Street Name:	I-215 NB Off-Ramp						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 0	0 2		0 0 0 0	0	0	0 3	0 1		0 0 3	0 1
Volume Module:												
Base Vol:	343	0	24	0	0	0	0	1583	115	0	2623	663
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	343	0	24	0	0	0	0	1583	115	0	2623	663
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	343	0	24	0	0	0	0	1583	115	0	2623	663
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	343	0	24	0	0	0	0	1583	0	0	2623	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	343	0	24	0	0	0	0	1583	0	0	2623	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	343	0	24	0	0	0	0	1583	0	0	2623	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.75	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Lanes:	2.00	0.00	2.00	0.00	0.00	0.00	0.00	3.00	1.00	0.00	3.00	1.00
Final Sat.:	3502	0	2842	0	0	0	0	5187	1900	0	5187	1900
Capacity Analysis Module:												
Vol/Sat:	0.10	0.00	0.01	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.51	0.00
Crit Moves:	****										****	
Green/Cycle:	0.16	0.00	0.16	0.00	0.00	0.00	0.00	0.84	0.00	0.00	0.84	0.00
Volume/Cap:	0.60	0.00	0.05	0.00	0.00	0.00	0.00	0.36	0.00	0.00	0.60	0.00
Delay/Veh:	40.7	0.0	35.4	0.0	0.0	0.0	0.0	1.9	0.0	0.0	2.9	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	40.7	0.0	35.4	0.0	0.0	0.0	0.0	1.9	0.0	0.0	2.9	0.0
LOS by Move:	D	A	D	A	A	A	A	A	A	A	A	A
HCM2kAvgQ:	6	0	0	0	0	0	0	4	0	0	10	0

Note: Queue reported is the number of cars per lane.

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Intersection #34 Jackson Avenue & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.410
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 5.1
Optimal Cycle: 39 Level Of Service: A

Street Name:	Jackson Avenue						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 0	0 2		0 0 0 0	0	0	0 3	0 1		1 0 3	0 0
Volume Module:												
Base Vol:	68	0	52	0	0	0	0	1217	38	149	2024	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	68	0	52	0	0	0	0	1217	38	149	2024	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	68	0	52	0	0	0	0	1217	38	149	2024	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	68	0	52	0	0	0	0	1217	38	149	2024	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	68	0	52	0	0	0	0	1217	38	149	2024	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	68	0	52	0	0	0	0	1217	38	149	2024	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.75	1.00	1.00	1.00	1.00	0.91	0.85	0.95	0.91	1.00
Lanes:	2.00	0.00	2.00	0.00	0.00	0.00	0.00	3.00	1.00	1.00	3.00	0.00
Final Sat.:	3502	0	2842	0	0	0	0	5187	1615	1805	5187	0
Capacity Analysis Module:												
Vol/Sat:	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.23	0.02	0.08	0.39	0.00
Crit Moves:	****						****				****	
Green/Cycle:	0.05	0.00	0.05	0.00	0.00	0.00	0.00	0.70	0.70	0.25	0.95	0.00
Volume/Cap:	0.41	0.00	0.39	0.00	0.00	0.00	0.00	0.33	0.03	0.33	0.41	0.00
Delay/Veh:	47.9	0.0	48.1	0.0	0.0	0.0	0.0	5.8	4.5	31.3	0.2	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	47.9	0.0	48.1	0.0	0.0	0.0	0.0	5.8	4.5	31.3	0.2	0.0
LOS by Move:	D	A	D	A	A	A	A	A	A	C	A	A
HCM2kAvgQ:	2	0	1	0	0	0	0	5	0	4	2	0

Note: Queue reported is the number of cars per lane.

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Intersection #35 Margarita Road & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.665
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 24.6
Optimal Cycle: 68 Level Of Service: C

Street Name:	Margarita Road						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 1	0 1	0	1 0	0 1	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	640	60	128	41	17	7	161	750	462	302	1793	71
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	640	60	128	41	17	7	161	750	462	302	1793	71
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	640	60	128	41	17	7	161	750	462	302	1793	71
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	640	60	128	41	17	7	161	750	462	302	1793	71
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	640	60	128	41	17	7	161	750	462	302	1793	71
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	640	60	128	41	17	7	161	750	462	302	1793	71
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.85	0.97	0.97	0.85	0.95	0.86	0.86	0.95	0.90	0.90
Lanes:	2.00	1.00	1.00	0.71	0.29	1.00	1.00	2.00	1.00	1.00	2.89	0.11
Final Sat.:	3502	1900	1615	1297	538	1615	1805	3261	1630	1805	4959	196
Capacity Analysis Module:												
Vol/Sat:	0.18	0.03	0.08	0.03	0.03	0.00	0.09	0.23	0.28	0.17	0.36	0.36
Crit Moves:	****			****					****	****		
Green/Cycle:	0.27	0.27	0.27	0.05	0.05	0.05	0.13	0.43	0.43	0.25	0.54	0.54
Volume/Cap:	0.67	0.11	0.29	0.67	0.67	0.09	0.67	0.54	0.67	0.67	0.67	0.67
Delay/Veh:	34.0	27.2	28.9	64.6	64.6	46.1	48.0	21.7	23.9	37.4	16.9	16.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	34.0	27.2	28.9	64.6	64.6	46.1	48.0	21.7	23.9	37.4	16.9	16.9
LOS by Move:	C	C	C	E	E	D	D	C	C	D	B	B
HCM2kAvgQ:	10	1	3	3	3	0	6	10	13	9	15	15

Note: Queue reported is the number of cars per lane.

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Intersection #36 French Valley Parkway & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.744
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 12.9
Optimal Cycle: 89 Level Of Service: B

Street Name:	French Valley Parkway						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 0	0 2	0	0 0	0 0	0	0 2	1 0	1	0 3	0 0
Volume Module:												
Base Vol:	19	0	829	0	0	0	0	1182	269	805	2004	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	19	0	829	0	0	0	0	1182	269	805	2004	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	19	0	829	0	0	0	0	1182	269	805	2004	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	19	0	829	0	0	0	0	1182	269	805	2004	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	19	0	829	0	0	0	0	1182	269	805	2004	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	19	0	829	0	0	0	0	1182	269	805	2004	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.75	1.00	1.00	1.00	1.00	0.88	0.88	0.95	0.91	1.00
Lanes:	1.00	0.00	2.00	0.00	0.00	0.00	0.00	2.44	0.56	1.00	3.00	0.00
Final Sat.:	1805	0	2842	0	0	0	0	4107	935	1805	5187	0
Capacity Analysis Module:												
Vol/Sat:	0.01	0.00	0.29	0.00	0.00	0.00	0.00	0.29	0.29	0.45	0.39	0.00
Crit Moves:	****							****		****		
Green/Cycle:	0.01	0.00	0.61	0.00	0.00	0.00	0.00	0.39	0.39	0.60	0.99	0.00
Volume/Cap:	0.74	0.00	0.48	0.00	0.00	0.00	0.00	0.74	0.74	0.74	0.39	0.00
Delay/Veh:	124.0	0.0	10.8	0.0	0.0	0.0	0.0	28.0	28.0	17.3	0.1	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	124.0	0.0	10.8	0.0	0.0	0.0	0.0	28.0	28.0	17.3	0.1	0.0
LOS by Move:	F	A	B	A	A	A	A	C	C	B	A	A
HCM2kAvgQ:	2	0	8	0	0	0	0	15	15	19	1	0

Note: Queue reported is the number of cars per lane.

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Intersection #37 Jefferson Avenue & Guava Street

Cycle (sec): 100 Critical Vol./Cap.(X): 0.485
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 9.4
Optimal Cycle: 36 Level Of Service: A

Street Name:	Jefferson Avenue						Guava Street					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 0	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	22	1363	3	7	1420	306	176	108	89	2	32	10
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	22	1363	3	7	1420	306	176	108	89	2	32	10
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	22	1363	3	7	1420	306	176	108	89	2	32	10
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	22	1363	3	7	1420	306	176	108	89	2	32	10
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	22	1363	3	7	1420	306	176	108	89	2	32	10
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	22	1363	3	7	1420	306	176	108	89	2	32	10
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.89	0.89	0.71	0.93	0.93	0.40	0.92	0.92
Lanes:	1.00	2.99	0.01	1.00	2.47	0.53	1.00	0.55	0.45	1.00	1.52	0.48
Final Sat.:	1805	5176	11	1805	4152	895	1349	971	800	762	2651	829
Capacity Analysis Module:												
Vol/Sat:	0.01	0.26	0.26	0.00	0.34	0.34	0.13	0.11	0.11	0.00	0.01	0.01
Crit Moves:	****				****		****					
Green/Cycle:	0.03	0.72	0.72	0.01	0.71	0.71	0.27	0.27	0.27	0.27	0.27	0.27
Volume/Cap:	0.48	0.37	0.37	0.37	0.48	0.48	0.48	0.41	0.41	0.01	0.04	0.04
Delay/Veh:	56.0	5.4	5.4	60.6	6.7	6.7	31.7	30.6	30.6	26.8	27.0	27.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	56.0	5.4	5.4	60.6	6.7	6.7	31.7	30.6	30.6	26.8	27.0	27.0
LOS by Move:	E	A	A	E	A	A	C	C	C	C	C	C
HCM2kAvgQ:	1	6	6	1	9	9	5	5	5	0	1	1

Note: Queue reported is the number of cars per lane.

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Intersection #39 Washington Ave & Calle Del Oso Oro/Nutmeg

Cycle (sec): 100 Critical Vol./Cap.(X): 0.739
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 27.6
Optimal Cycle: 87 Level Of Service: C

Street Name:	Washington Ave						Calle Del Oso Oro/Nutmeg					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	262	164	126	88	218	88	64	602	742	151	189	38
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	262	164	126	88	218	88	64	602	742	151	189	38
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	262	164	126	88	218	88	64	602	742	151	189	38
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	262	164	126	88	218	88	64	602	742	151	189	38
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	262	164	126	88	218	88	64	602	742	151	189	38
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	262	164	126	88	218	88	64	602	742	151	189	38
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.85	0.85	0.95	0.87	0.87	0.95	0.87	0.87	0.95	0.93	0.93
Lanes:	1.00	2.00	1.00	1.00	2.14	0.86	1.00	1.00	1.00	1.00	1.67	0.33
Final Sat.:	1805	3233	1617	1805	3536	1428	1805	1655	1655	1805	2931	589
Capacity Analysis Module:												
Vol/Sat:	0.15	0.05	0.08	0.05	0.06	0.06	0.04	0.36	0.45	0.08	0.06	0.06
Crit Moves:	****				****				****	****		
Green/Cycle:	0.20	0.17	0.17	0.11	0.08	0.08	0.26	0.61	0.61	0.11	0.46	0.46
Volume/Cap:	0.74	0.29	0.45	0.45	0.74	0.74	0.14	0.60	0.74	0.74	0.14	0.14
Delay/Veh:	45.7	36.3	37.7	43.5	51.7	51.7	28.9	12.6	15.6	56.2	15.4	15.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	45.7	36.3	37.7	43.5	51.7	51.7	28.9	12.6	15.6	56.2	15.4	15.4
LOS by Move:	D	D	D	D	D	D	C	B	B	E	B	B
HCM2kAvgQ:	9	3	4	3	5	5	2	12	18	6	2	2

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #40 Clinton Keith Rd & Calle de Oso Oro/Bear Creek Dr

Cycle (sec): 100 Critical Vol./Cap.(X): 0.944
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 23.7
Optimal Cycle: 180 Level Of Service: C

Street Name:	Clinton Keith Rd						Calle de Oso Oro/Bear Creek Dr					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 0	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	63	107	268	4	115	192	269	613	172	420	598	19
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	63	107	268	4	115	192	269	613	172	420	598	19
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	63	107	268	4	115	192	269	613	172	420	598	19
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	63	107	268	4	115	192	269	613	172	420	598	19
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	63	107	268	4	115	192	269	613	172	420	598	19
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	63	107	268	4	115	192	269	613	172	420	598	19
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.85	0.85	0.95	0.86	0.86	0.41	0.97	0.97	0.28	0.95	0.95
Lanes:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.78	0.22	1.00	1.94	0.06
Final Sat.:	1805	1612	1612	1805	1635	1635	775	1435	403	542	3481	111
Capacity Analysis Module:												
Vol/Sat:	0.03	0.07	0.17	0.00	0.07	0.12	0.35	0.43	0.43	0.78	0.17	0.17
Crit Moves:			****	****						****		
Green/Cycle:	0.04	0.18	0.18	0.00	0.14	0.14	0.82	0.82	0.82	0.82	0.82	0.82
Volume/Cap:	0.85	0.38	0.94	0.94	0.51	0.85	0.42	0.52	0.52	0.94	0.21	0.21
Delay/Veh:	105.6	36.6	71.9	442.9	40.7	59.7	2.9	3.1	3.1	36.0	2.0	2.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	105.6	36.6	71.9	442.9	40.7	59.7	2.9	3.1	3.1	36.0	2.0	2.0
LOS by Move:	F	D	E	F	D	E	A	A	A	D	A	A
HCM2kAvgQ:	4	3	13	1	4	9	3	8	8	15	2	2

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #43 Jefferson Ave & Lemon St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.924
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 28.2
Optimal Cycle: 180 Level Of Service: C

Street Name:	Jefferson Ave						Lemon St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	0 1	1	0 0	1 0
Volume Module:												
Base Vol:	320	733	28	4	2585	166	31	3	334	8	13	6
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	320	733	28	4	2585	166	31	3	334	8	13	6
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	320	733	28	4	2585	166	31	3	334	8	13	6
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	320	733	28	4	2585	166	31	3	334	8	13	6
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	320	733	28	4	2585	166	31	3	334	8	13	6
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	320	733	28	4	2585	166	31	3	334	8	13	6
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.90	0.90	0.95	0.90	0.90	0.95	1.00	0.85	0.95	0.95	0.95
Lanes:	1.00	2.89	0.11	1.00	2.82	0.18	1.00	1.00	1.00	1.00	0.68	0.32
Final Sat.:	1805	4966	190	1805	4830	310	1805	1900	1615	1805	1239	572
Capacity Analysis Module:												
Vol/Sat:	0.18	0.15	0.15	0.00	0.54	0.54	0.02	0.00	0.21	0.00	0.01	0.01
Crit Moves:	****				****				****	****		
Green/Cycle:	0.19	0.76	0.76	0.01	0.58	0.58	0.14	0.22	0.22	0.00	0.09	0.09
Volume/Cap:	0.92	0.19	0.19	0.19	0.92	0.92	0.12	0.01	0.92	0.92	0.12	0.12
Delay/Veh:	69.3	3.4	3.4	53.6	24.6	24.6	37.7	30.2	66.8	308.5	42.5	42.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	69.3	3.4	3.4	53.6	24.6	24.6	37.7	30.2	66.8	308.5	42.5	42.5
LOS by Move:	E	A	A	D	C	C	D	C	E	F	D	D
HCM2kAvgQ:	14	2	2	0	32	32	1	0	14	1	1	1

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #44 Jefferson Ave & Kalmia St

Cycle (sec): 100 Critical Vol./Cap.(X): 1.090
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 59.3
Optimal Cycle: 180 Level Of Service: E

Street Name:	Jefferson Ave									Kalmia St								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected				Protected				Protected				Protected					
Rights:	Include				Include				Include				Include					
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0			
Lanes:	2	0	3	0	1	1	0	2	1	0	1	0	2	1	0	1	0	1	1	0
Volume Module:																				
Base Vol:	261	957	246		967 1732	170		55	502	349		223	355	556						
Growth Adj:	1.00	1.00	1.00		1.00 1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00						
Initial Bse:	261	957	246		967 1732	170		55	502	349		223	355	556						
Added Vol:	0	0	0		0 0	0		0	0	0		0	0	0						
PasserByVol:	0	0	0		0 0	0		0	0	0		0	0	0						
Initial Fut:	261	957	246		967 1732	170		55	502	349		223	355	556						
User Adj:	1.00	1.00	1.00		1.00 1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00						
PHF Adj:	1.00	1.00	1.00		1.00 1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00						
PHF Volume:	261	957	246		967 1732	170		55	502	349		223	355	556						
Reduct Vol:	0	0	0		0 0	0		0	0	0		0	0	0						
Reduced Vol:	261	957	246		967 1732	170		55	502	349		223	355	556						
PCE Adj:	1.00	1.00	1.00		1.00 1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00						
MLF Adj:	1.00	1.00	1.00		1.00 1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00						
FinalVolume:	261	957	246		967 1732	170		55	502	349		223	355	556						
Saturation Flow Module:																				
Sat/Lane:	1900	1900	1900		1900 1900	1900		1900	1900	1900		1900	1900	1900						
Adjustment:	0.92	0.91	0.85		0.95 0.90	0.90		0.95	0.85	0.85		0.95	0.86	0.86						
Lanes:	2.00	3.00	1.00		1.00 2.73	0.27		1.00	2.00	1.00		1.00	1.00	1.00						
Final Sat.:	3502	5187	1615		1805 4662	458		1805	3247	1624		1805	1641	1641						
Capacity Analysis Module:																				
Vol/Sat:	0.07	0.18	0.15		0.54 0.37	0.37		0.03	0.15	0.21		0.12	0.22	0.34						
Crit Moves:		****			****			****						****						
Green/Cycle:	0.11	0.17	0.17		0.49 0.55	0.55		0.03	0.22	0.22		0.12	0.31	0.31						
Volume/Cap:	0.67	1.09	0.90		1.09 0.67	0.67		1.09	0.72	1.00		1.00	0.70	1.09						
Delay/Veh:	47.4	99.3	70.5		83.0 16.7	16.7		202.5	38.6	69.7		103.6	31.9	92.8						
User DelAdj:	1.00	1.00	1.00		1.00 1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00						
AdjDel/Veh:	47.4	99.3	70.5		83.0 16.7	16.7		202.5	38.6	69.7		103.6	31.9	92.8						
LOS by Move:	D	F	E		F B	B		F	D	E		F	C	F						
HCM2kAvgQ:	5	18	11		44 16	16		4	9	18		11	11	28						

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #45 Jefferson Ave & Juniper St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.801
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 23.4
Optimal Cycle: 115 Level Of Service: C

Street Name:	Jefferson Ave									Juniper St								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected				Protected				Protected				Protected					
Rights:	Include				Include				Include				Include					
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0			
Lanes:	1	0	2	1	0	1	0	2	1	0	1	0	1	1	0	1	0	1	1	0
Volume Module:																				
Base Vol:	471	1298	35		71 2027	173		137	99	188		7	101	22						
Growth Adj:	1.00	1.00	1.00		1.00 1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00						
Initial Bse:	471	1298	35		71 2027	173		137	99	188		7	101	22						
Added Vol:	0	0	0		0 0	0		0	0	0		0	0	0						
PasserByVol:	0	0	0		0 0	0		0	0	0		0	0	0						
Initial Fut:	471	1298	35		71 2027	173		137	99	188		7	101	22						
User Adj:	1.00	1.00	1.00		1.00 1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00						
PHF Adj:	1.00	1.00	1.00		1.00 1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00						
PHF Volume:	471	1298	35		71 2027	173		137	99	188		7	101	22						
Reduct Vol:	0	0	0		0 0	0		0	0	0		0	0	0						
Reduced Vol:	471	1298	35		71 2027	173		137	99	188		7	101	22						
PCE Adj:	1.00	1.00	1.00		1.00 1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00						
MLF Adj:	1.00	1.00	1.00		1.00 1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00						
FinalVolume:	471	1298	35		71 2027	173		137	99	188		7	101	22						
Saturation Flow Module:																				
Sat/Lane:	1900	1900	1900		1900 1900	1900		1900	1900	1900		1900	1900	1900						
Adjustment:	0.95	0.91	0.91		0.95 0.90	0.90		0.95	0.86	0.86		0.95	0.92	0.92						
Lanes:	1.00	2.92	0.08		1.00 2.76	0.24		1.00	1.00	1.00		1.00	1.64	0.36						
Final Sat.:	1805	5031	136		1805 4722	403		1805	1628	1628		1805	2884	628						
Capacity Analysis Module:																				
Vol/Sat:	0.26	0.26	0.26		0.04 0.43	0.43		0.08	0.06	0.12		0.00	0.04	0.04						
Crit Moves:	****				****			****						****						
Green/Cycle:	0.33	0.75	0.75		0.11 0.54	0.54		0.09	0.13	0.13		0.00	0.04	0.04						
Volume/Cap:	0.80	0.35	0.35		0.35 0.80	0.80		0.80	0.45	0.86		0.86	0.80	0.80						
Delay/Veh:	38.5	4.3	4.3		41.9 20.6	20.6		67.3	40.4	62.3		279.4	72.5	72.5						
User DelAdj:	1.00	1.00	1.00		1.00 1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00						
AdjDel/Veh:	38.5	4.3	4.3		41.9 20.6	20.6		67.3	40.4	62.3		279.4	72.5	72.5						
LOS by Move:	D	A	A		D C	C		E	D	E		F	E	E						
HCM2kAvgQ:	15	5	5		2 22	22		6	3	9		1	4	4						

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #46 Jefferson Ave & Ivy St/Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.705
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 26.8
Optimal Cycle: 77 Level Of Service: C

Street Name:	Jefferson Ave									Ivy St/Los Alamos Rd								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected				Protected				Protected				Protected					
Rights:	Include				Include				Include				Include					
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0			
Lanes:	2	0	3	0	1	2	0	3	0	1	1	0	1	1	0	1	0	1	1	0
Volume Module:																				
Base Vol:	259	1336		111		327	1823		72		49		95		129		363		121	400
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00		1.00	1.00
Initial Bse:	259	1336		111		327	1823		72		49		95		129		363		121	400
Added Vol:	0	0		0		0	0		0		0		0		0		0		0	0
PasserByVol:	0	0		0		0	0		0		0		0		0		0		0	0
Initial Fut:	259	1336		111		327	1823		72		49		95		129		363		121	400
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00		1.00	1.00
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00		1.00	1.00
PHF Volume:	259	1336		111		327	1823		72		49		95		129		363		121	400
Reduct Vol:	0	0		0		0	0		0		0		0		0		0		0	0
Reduced Vol:	259	1336		111		327	1823		72		49		95		129		363		121	400
PCE Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00		1.00	1.00
MLF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00		1.00	1.00
FinalVolume:	259	1336		111		327	1823		72		49		95		129		363		121	400
Saturation Flow Module:																				
Sat/Lane:	1900	1900		1900		1900	1900		1900		1900		1900		1900		1900		1900	1900
Adjustment:	0.92	0.91		0.85		0.92	0.91		0.85		0.95		0.87		0.87		0.95		0.84	0.84
Lanes:	2.00	3.00		1.00		2.00	3.00		1.00		1.00		1.00		1.00		1.00		1.00	1.00
Final Sat.:	3502	5187		1615		3502	5187		1615		1805		1650		1650		1805		1597	1597
Capacity Analysis Module:																				
Vol/Sat:	0.07	0.26		0.07		0.09	0.35		0.04		0.03		0.06		0.08		0.20		0.08	0.25
Crit Moves:	****						****								****		****			
Green/Cycle:	0.10	0.44		0.44		0.16	0.50		0.50		0.04		0.11		0.11		0.29		0.36	0.36
Volume/Cap:	0.70	0.58		0.16		0.58	0.70		0.09		0.70		0.52		0.70		0.70		0.21	0.70
Delay/Veh:	49.4	21.3		16.8		40.4	20.3		13.2		74.5		43.1		49.9		36.4		22.4	30.5
User DelAdj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00		1.00	1.00
AdjDel/Veh:	49.4	21.3		16.8		40.4	20.3		13.2		74.5		43.1		49.9		36.4		22.4	30.5
LOS by Move:	D	C		B		D	C		B		E		D		D		D		C	C
HCM2kAvgQ:	5	12		2		6	17		1		3		4		6		11		3	12

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #48 Madison Ave/I-15 SB Ramps & Kalmia St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.569
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 29.4
Optimal Cycle: 53 Level Of Service: C

Street Name:	Madison Ave/I-15 SB Ramps									Kalmia St								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected				Protected				Protected				Protected					
Rights:	Include				Include				Include				Include					
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0			
Lanes:	2	0	0	0	2	2	0	1	1	0	0	0	3	1	0	2	0	2	1	1
Volume Module:																				
Base Vol:	119		0		219	250		51		272	0	1459		245		386	1139			505
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00			1.00
Initial Bse:	119		0		219	250		51		272	0	1459		245		386	1139			505
Added Vol:	0		0		0	0		0		0	0	0		0		0	0			0
PasserByVol:	0		0		0	0		0		0	0	0		0		0	0			0
Initial Fut:	119		0		219	250		51		272	0	1459		245		386	1139			505
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00			1.00
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00			1.00
PHF Volume:	119		0		219	250		51		272	0	1459		245		386	1139			505
Reduct Vol:	0		0		0	0		0		0	0	0		0		0	0			0
Reduced Vol:	119		0		219	250		51		272	0	1459		245		386	1139			505
PCE Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00			1.00
MLF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00			1.00
FinalVolume:	119		0		219	250		51		272	0	1459		245		386	1139			505
Saturation Flow Module:																				
Sat/Lane:	1900	1900		1900		1900	1900		1900		1900	1900		1900		1900	1900			1900
Adjustment:	0.92	1.00		0.75		0.92	0.83		0.83		1.00	0.89		0.89		0.92	0.87			0.87
Lanes:	2.00	0.00		2.00		2.00	1.00		1.00		0.00	3.42		0.58		2.00	2.77			1.23
Final Sat.:	3502		0		2842	3502	1578		1578		0	5791		973		3502	4571			2027
Capacity Analysis Module:																				
Vol/Sat:	0.03	0.00		0.08		0.07	0.03		0.17		0.00	0.25		0.25		0.11	0.25			0.25
Crit Moves:	****								****			****				****				
Green/Cycle:	0.06	0.00		0.06		0.17	0.30		0.30		0.00	0.44		0.44		0.19	0.64			0.64
Volume/Cap:	0.57	0.00		1.29		0.41	0.11		0.57		0.00	0.57		0.57		0.57	0.39			0.39
Delay/Veh:	49.4	0.0		213.9		37.1	25.1		30.7		0.0	21.0		21.0		37.7	8.8			8.8
User DelAdj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00			1.00
AdjDel/Veh:	49.4	0.0		213.9		37.1	25.1		30.7		0.0	21.0		21.0		37.7	8.8			8.8
LOS by Move:	D	A		F		D	C		C		A	C		C		D	A			A
HCM2kAvgQ:	3	0		10		4	1		8		0	11		11		6	7			7

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #50 Hancock Ave & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.778
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 17.6
Optimal Cycle: 103 Level Of Service: B

Street Name:	Hancock Ave						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ovl			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	2	0	0	2	0	4	0	3	1
Volume Module:												
Base Vol:	0	0	0	379	0	598	697	1520	0	0	2602	566
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	379	0	598	697	1520	0	0	2602	566
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	379	0	598	697	1520	0	0	2602	566
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	379	0	598	697	1520	0	0	2602	566
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	379	0	598	697	1520	0	0	2602	566
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	379	0	598	697	1520	0	0	2602	566
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.92	1.00	0.75	0.92	0.91	1.00	1.00	0.89	0.89
Lanes:	0.00	0.00	0.00	2.00	0.00	2.00	2.00	4.00	0.00	0.00	3.29	0.71
Final Sat.:	0	0	0	3502	0	2842	3502	6916	0	0	5527	1202
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.11	0.00	0.21	0.20	0.22	0.00	0.00	0.47	0.47
Crit Moves:				****			****				****	
Green/Cycle:	0.00	0.00	0.00	0.14	0.00	0.39	0.26	0.86	0.00	0.00	0.61	0.61
Volume/Cap:	0.00	0.00	0.00	0.78	0.00	0.53	0.78	0.26	0.00	0.00	0.78	0.78
Delay/Veh:	0.0	0.0	0.0	49.4	0.0	23.7	39.0	1.3	0.0	0.0	15.7	15.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	49.4	0.0	23.7	39.0	1.3	0.0	0.0	15.7	15.7
LOS by Move:	A	A	A	D	A	C	D	A	A	A	B	B
HCM2kAvgQ:	0	0	0	8	0	8	12	2	0	0	21	21

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #51 Alta Murrieta Dr & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.601
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 23.8
Optimal Cycle: 57 Level Of Service: C

Street Name:	Alta Murrieta Dr						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Ovl		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	1	0	1	2	0	1	1	0	2	0
Volume Module:												
Base Vol:	221	82	19	69	130	313	258	982	282	131	1871	169
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	221	82	19	69	130	313	258	982	282	131	1871	169
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	221	82	19	69	130	313	258	982	282	131	1871	169
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	221	82	19	69	130	313	258	982	282	131	1871	169
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	221	82	19	69	130	313	258	982	282	131	1871	169
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	221	82	19	69	130	313	258	982	282	131	1871	169
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.85	0.92	0.85	0.85	0.92	0.88	0.88	0.92	0.91	0.85
Lanes:	2.00	1.00	1.00	2.00	1.00	1.00	2.00	2.33	0.67	2.00	4.00	1.00
Final Sat.:	3502	1900	1615	3502	1614	1614	3502	3897	1119	3502	6916	1615
Capacity Analysis Module:												
Vol/Sat:	0.06	0.04	0.01	0.02	0.08	0.19	0.07	0.25	0.25	0.04	0.27	0.10
Crit Moves:	****					****	****				****	
Green/Cycle:	0.10	0.29	0.29	0.13	0.32	0.32	0.12	0.50	0.50	0.07	0.45	0.58
Volume/Cap:	0.60	0.15	0.04	0.15	0.25	0.60	0.60	0.51	0.51	0.51	0.60	0.18
Delay/Veh:	45.5	26.2	25.3	38.4	25.0	29.9	43.9	17.0	17.0	46.2	21.1	9.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	45.5	26.2	25.3	38.4	25.0	29.9	43.9	17.0	17.0	46.2	21.1	9.8
LOS by Move:	D	C	C	D	C	C	D	B	B	D	C	A
HCM2kAvgQ:	4	2	0	1	3	9	5	10	10	3	12	2

Note: Queue reported is the number of cars per lane.

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Intersection #52 Winchester Road - SR-79 & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.376
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 107.8
Optimal Cycle: 180 Level Of Service: F

Street Name:	Winchester Road - SR-79						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 3	0 1	2	0 3	0 1	2	0 3	0 1	2	0 2	1 0
Volume Module:												
Base Vol:	288	1507	155	161	1461	1426	768	265	95	276	897	83
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	288	1507	155	161	1461	1426	768	265	95	276	897	83
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	288	1507	155	161	1461	1426	768	265	95	276	897	83
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	288	1507	155	161	1461	1426	768	265	95	276	897	83
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	288	1507	155	161	1461	1426	768	265	95	276	897	83
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	288	1507	155	161	1461	1426	768	265	95	276	897	83
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.91	0.85	0.92	0.91	0.85	0.92	0.91	0.85	0.92	0.90	0.90
Lanes:	2.00	3.00	1.00	2.00	3.00	1.00	2.00	3.00	1.00	2.00	2.75	0.25
Final Sat.:	3502	5187	1615	3502	5187	1615	3502	5187	1615	3502	4686	434
Capacity Analysis Module:												
Vol/Sat:	0.08	0.29	0.10	0.05	0.28	0.88	0.22	0.05	0.06	0.08	0.19	0.19
Crit Moves:	****					****	****				****	
Green/Cycle:	0.06	0.61	0.78	0.10	0.64	0.64	0.16	0.13	0.13	0.17	0.14	0.14
Volume/Cap:	1.38	0.48	0.12	0.48	0.44	1.38	1.38	0.40	0.46	0.46	1.38	1.38
Delay/Veh:	243.3	11.1	2.8	43.9	9.0	193.2	222.3	40.5	42.1	37.9	221	221.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	243.3	11.1	2.8	43.9	9.0	193.2	222.3	40.5	42.1	37.9	221	221.0
LOS by Move:	F	B	A	D	A	F	F	D	D	D	F	F
HCM2kAvgQ:	12	9	1	3	8	92	28	3	3	4	25	25

Note: Queue reported is the number of cars per lane.

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Intersection #53 Hancock Ave & Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.161
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 84.6
Optimal Cycle: 180 Level Of Service: F

Street Name:	Hancock Ave						Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	2	0 0	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	48	120	221	793	252	93	71	969	72	916	1682	614
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	48	120	221	793	252	93	71	969	72	916	1682	614
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	48	120	221	793	252	93	71	969	72	916	1682	614
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	48	120	221	793	252	93	71	969	72	916	1682	614
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	48	120	221	793	252	93	71	969	72	916	1682	614
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	48	120	221	793	252	93	71	969	72	916	1682	614
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.86	0.86	0.92	0.96	0.96	0.95	0.94	0.94	0.95	0.91	0.91
Lanes:	1.00	1.00	1.00	2.00	0.73	0.27	1.00	1.86	0.14	1.00	1.47	0.53
Final Sat.:	1805	1630	1630	3502	1332	492	1805	3327	247	1805	2539	927
Capacity Analysis Module:												
Vol/Sat:	0.03	0.07	0.14	0.23	0.19	0.19	0.04	0.29	0.29	0.51	0.66	0.66
Crit Moves:			****	****				****		****		
Green/Cycle:	0.04	0.12	0.12	0.20	0.27	0.27	0.04	0.25	0.25	0.44	0.65	0.65
Volume/Cap:	0.69	0.63	1.16	1.16	0.69	0.69	1.02	1.16	1.16	1.16	1.02	1.02
Delay/Veh:	73.3	44.5	147.5	128.2	36.7	36.7	161.6	122	122.2	114.3	41.7	41.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	73.3	44.5	147.5	128.2	36.7	36.7	161.6	122	122.2	114.3	41.7	41.7
LOS by Move:	E	D	F	F	D	D	F	F	F	F	D	D
HCM2kAvgQ:	3	5	14	23	11	11	5	30	30	47	47	47

Note: Queue reported is the number of cars per lane.

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2000 HCM Operations Method (Future Volume Alternative)

Intersection #54 I-215 SB Ramps & Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.129
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 77.2
Optimal Cycle: 180 Level Of Service: E

Street Name:	I-215 SB Ramps						Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	1	0	1! 0 1	0	0	2 0 1	2	0	2 0 0
Volume Module:												
Base Vol:	0	0	0	405	0	2037	0	1419	478	220	1506	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	405	0	2037	0	1419	478	220	1506	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	405	0	2037	0	1419	478	220	1506	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	405	0	2037	0	1419	478	220	1506	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	405	0	2037	0	1419	478	220	1506	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	405	0	2037	0	1419	478	220	1506	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.87	1.00	0.87	1.00	0.95	0.85	0.92	0.95	1.00
Lanes:	0.00	0.00	0.00	1.17	0.00	1.83	0.00	2.00	1.00	2.00	2.00	0.00
Final Sat.:	0	0	0	1923	0	3025	0	3610	1615	3502	3610	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.21	0.00	0.67	0.00	0.39	0.30	0.06	0.42	0.00
Crit Moves:						****		****		****		
Green/Cycle:	0.00	0.00	0.00	0.60	0.00	0.60	0.00	0.35	0.35	0.06	0.40	0.00
Volume/Cap:	0.00	0.00	0.00	0.35	0.00	1.13	0.00	1.13	0.85	1.13	1.03	0.00
Delay/Veh:	0.0	0.0	0.0	10.4	0.0	84.9	0.0	101	42.0	150.8	62.4	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	10.4	0.0	84.9	0.0	101	42.0	150.8	62.4	0.0
LOS by Move:	A	A	A	B	A	F	A	F	D	F	E	A
HCM2kAvgQ:	0	0	0	5	0	53	0	37	16	8	34	0

Note: Queue reported is the number of cars per lane.

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Intersection #55 I-215 NB Ramps & Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.802
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 25.5
Optimal Cycle: 115 Level Of Service: C

Street Name:	I-215 NB Ramps						Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	0 1	0	0	0 0 0	2	0	3 0 0	0	0	2 0 1
Volume Module:												
Base Vol:	550	0	377	0	0	0	591	1233	0	0	1185	160
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	550	0	377	0	0	0	591	1233	0	0	1185	160
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	550	0	377	0	0	0	591	1233	0	0	1185	160
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	550	0	377	0	0	0	591	1233	0	0	1185	160
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	550	0	377	0	0	0	591	1233	0	0	1185	160
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	550	0	377	0	0	0	591	1233	0	0	1185	160
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	1.00	1.00	1.00	0.92	0.91	1.00	1.00	0.95	0.85
Lanes:	1.00	0.00	1.00	0.00	0.00	0.00	2.00	3.00	0.00	0.00	2.00	1.00
Final Sat.:	1805	0	1615	0	0	0	3502	5187	0	0	3610	1615
Capacity Analysis Module:												
Vol/Sat:	0.30	0.00	0.23	0.00	0.00	0.00	0.17	0.24	0.00	0.00	0.33	0.10
Crit Moves:	****						****				****	
Green/Cycle:	0.38	0.00	0.38	0.00	0.00	0.00	0.21	0.62	0.00	0.00	0.41	0.41
Volume/Cap:	0.80	0.00	0.61	0.00	0.00	0.00	0.80	0.38	0.00	0.00	0.80	0.24
Delay/Veh:	34.4	0.0	26.9	0.0	0.0	0.0	43.8	9.6	0.0	0.0	29.2	19.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	34.4	0.0	26.9	0.0	0.0	0.0	43.8	9.6	0.0	0.0	29.2	19.5
LOS by Move:	C	A	C	A	A	A	D	A	A	A	C	B
HCM2kAvgQ:	17	0	10	0	0	0	11	7	0	0	19	3

Note: Queue reported is the number of cars per lane.

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Intersection #56 Whitewood Rd & Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.962
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 44.4
Optimal Cycle: 180 Level Of Service: D

Street Name:	Whitewood Rd						Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 2	0 1	1	0 2	0 1	1	0 1	1 0
Volume Module:												
Base Vol:	83	372	38	26	432	617	823	232	109	48	241	34
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	83	372	38	26	432	617	823	232	109	48	241	34
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	83	372	38	26	432	617	823	232	109	48	241	34
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	83	372	38	26	432	617	823	232	109	48	241	34
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	83	372	38	26	432	617	823	232	109	48	241	34
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	83	372	38	26	432	617	823	232	109	48	241	34
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.94	0.94	0.95	0.95	0.85	0.95	0.95	0.85	0.95	0.93	0.93
Lanes:	1.00	1.81	0.19	1.00	2.00	1.00	1.00	2.00	1.00	1.00	1.75	0.25
Final Sat.:	1805	3230	330	1805	3610	1615	1805	3610	1615	1805	3104	438
Capacity Analysis Module:												
Vol/Sat:	0.05	0.12	0.12	0.01	0.12	0.38	0.46	0.06	0.07	0.03	0.08	0.08
Crit Moves:	****					****	****				****	
Green/Cycle:	0.05	0.40	0.40	0.05	0.40	0.40	0.47	0.40	0.40	0.16	0.08	0.08
Volume/Cap:	0.96	0.29	0.29	0.29	0.30	0.96	0.96	0.16	0.17	0.17	0.96	0.96
Delay/Veh:	131.3	20.8	20.8	47.6	20.8	55.6	47.3	19.4	19.6	36.8	88.5	88.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	131.3	20.8	20.8	47.6	20.8	55.6	47.3	19.4	19.6	36.8	88.5	88.5
LOS by Move:	F	C	C	D	C	E	D	B	B	D	F	F
HCM2kAvgQ:	5	5	5	1	5	24	30	2	2	1	8	8

Note: Queue reported is the number of cars per lane.

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Intersection #57 Whitewood Rd & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.795
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 28.3
Optimal Cycle: 111 Level Of Service: C

Street Name:	Whitewood Rd						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	50	240	241	260	536	102	32	1001	132	514	2105	166
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	50	240	241	260	536	102	32	1001	132	514	2105	166
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	50	240	241	260	536	102	32	1001	132	514	2105	166
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	50	240	241	260	536	102	32	1001	132	514	2105	166
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	50	240	241	260	536	102	32	1001	132	514	2105	166
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	50	240	241	260	536	102	32	1001	132	514	2105	166
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.88	0.88	0.95	0.93	0.93	0.95	0.89	0.89	0.95	0.90	0.90
Lanes:	1.00	1.00	1.00	1.00	1.68	0.32	1.00	2.65	0.35	1.00	2.78	0.22
Final Sat.:	1805	1670	1670	1805	2960	563	1805	4500	593	1805	4755	375
Capacity Analysis Module:												
Vol/Sat:	0.03	0.14	0.14	0.14	0.18	0.18	0.02	0.22	0.22	0.28	0.44	0.44
Crit Moves:		****		****				****		****		
Green/Cycle:	0.05	0.18	0.18	0.18	0.31	0.31	0.02	0.28	0.28	0.36	0.61	0.61
Volume/Cap:	0.58	0.79	0.80	0.79	0.58	0.58	0.72	0.79	0.79	0.79	0.72	0.72
Delay/Veh:	55.9	46.4	46.6	51.8	29.5	29.5	92.8	36.5	36.5	35.6	14.2	14.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	55.9	46.4	46.6	51.8	29.5	29.5	92.8	36.5	36.5	35.6	14.2	14.2
LOS by Move:	E	D	D	D	C	C	F	D	D	D	B	B
HCM2kAvgQ:	2	10	10	10	9	9	2	14	14	16	18	18

Note: Queue reported is the number of cars per lane.

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Intersection #59 Nutmeg St & Clinton Keith Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.194
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 96.5
Optimal Cycle: 180 Level Of Service: F

Street Name:	Nutmeg St						Clinton Keith Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	67	41	484	425	54	67	50	2123	110	386	1317	156
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	67	41	484	425	54	67	50	2123	110	386	1317	156
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	67	41	484	425	54	67	50	2123	110	386	1317	156
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	67	41	484	425	54	67	50	2123	110	386	1317	156
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	67	41	484	425	54	67	50	2123	110	386	1317	156
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	67	41	484	425	54	67	50	2123	110	386	1317	156
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.82	0.82	0.95	0.87	0.87	0.95	0.90	0.90	0.95	0.90	0.90
Lanes:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.85	0.15	1.00	2.68	0.32
Final Sat.:	1805	1556	1556	1805	1655	1655	1805	4897	254	1805	4563	541
Capacity Analysis Module:												
Vol/Sat:	0.04	0.03	0.31	0.24	0.03	0.04	0.03	0.43	0.43	0.21	0.29	0.29
Crit Moves:			****	****				****		****		
Green/Cycle:	0.22	0.26	0.26	0.20	0.24	0.24	0.05	0.36	0.36	0.18	0.49	0.49
Volume/Cap:	0.17	0.10	1.19	1.19	0.14	0.17	0.58	1.19	1.19	1.19	0.58	0.58
Delay/Veh:	31.9	28.1	144.7	151.7	30.0	30.3	56.5	125	124.7	154.6	18.3	18.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	31.9	28.1	144.7	151.7	30.0	30.3	56.5	125	124.7	154.6	18.3	18.3
LOS by Move:	C	C	F	F	C	C	E	F	F	F	B	B
HCM2kAvgQ:	2	1	29	25	1	2	2	44	44	23	12	12

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #60 Murrieta Oaks Ave-Mitchell Rd & Clinton Keith Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.862
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 20.4
Optimal Cycle: 165 Level Of Service: C

Street Name:	Murrieta Oaks Ave-Mitchell Rd						Clinton Keith Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 0	1 0	1	0 1	0 1	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	101	241	85	19	69	196	203	2903	312	78	2088	405
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	101	241	85	19	69	196	203	2903	312	78	2088	405
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	101	241	85	19	69	196	203	2903	312	78	2088	405
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	101	241	85	19	69	196	203	2903	312	78	2088	405
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	101	241	85	19	69	196	203	2903	312	78	2088	405
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	101	241	85	19	69	196	203	2903	312	78	2088	405
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.96	0.96	0.95	1.00	0.85	0.95	0.90	0.90	0.95	0.89	0.89
Lanes:	1.00	0.74	0.26	1.00	1.00	1.00	1.00	2.71	0.29	1.00	2.51	0.49
Final Sat.:	1805	1350	476	1805	1900	1615	1805	4613	496	1805	4240	822
Capacity Analysis Module:												
Vol/Sat:	0.06	0.18	0.18	0.01	0.04	0.12	0.11	0.63	0.63	0.04	0.49	0.49
Crit Moves:		****		****				****		****		
Green/Cycle:	0.07	0.21	0.21	0.01	0.15	0.15	0.15	0.73	0.73	0.05	0.64	0.64
Volume/Cap:	0.81	0.86	0.86	0.86	0.24	0.81	0.77	0.86	0.86	0.86	0.77	0.77
Delay/Veh:	76.8	56.2	56.2	178.2	37.9	59.0	54.6	12.1	12.1	99.5	14.3	14.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	76.8	56.2	56.2	178.2	37.9	59.0	54.6	12.1	12.1	99.5	14.3	14.3
LOS by Move:	E	E	E	F	D	E	D	B	B	F	B	B
HCM2kAvgQ:	5	13	13	2	2	8	8	29	29	5	21	21

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #61 I-215 SB Ramps & Scott Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.237
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 8.5
Optimal Cycle: 30 Level Of Service: A

Street Name:	I-215 SB Ramps						Scott Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	2	0	0	4	0	1	0	0	3	0	2
Volume Module:																
Base Vol:	0	0	0	246	0	104	0	1052	385	0	866	384
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	246	0	104	0	1052	385	0	866	384
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	246	0	104	0	1052	385	0	866	384
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	0	0	0	246	0	104	0	1052	0	0	866	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	246	0	104	0	1052	0	0	866	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	0	0	0	246	0	104	0	1052	0	0	866	0
Saturation Flow Module:																
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.92	1.00	0.75	1.00	0.91	1.00	1.00	0.91	0.88
Lanes:	0.00	0.00	0.00	2.00	0.00	2.00	0.00	4.00	1.00	0.00	3.00	2.00
Final Sat.:	0	0	0	3502	0	2842	0	6916	1900	0	5187	3344
Capacity Analysis Module:																
Vol/Sat:	0.00	0.00	0.00	0.07	0.00	0.04	0.00	0.15	0.00	0.00	0.17	0.00
Crit Moves:				****			****				****	
Green/Cycle:	0.00	0.00	0.00	0.30	0.00	0.30	0.00	0.70	0.00	0.00	0.70	0.00
Volume/Cap:	0.00	0.00	0.00	0.24	0.00	0.12	0.00	0.22	0.00	0.00	0.24	0.00
Delay/Veh:	0.0	0.0	0.0	26.8	0.0	25.8	0.0	5.2	0.0	0.0	5.3	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	26.8	0.0	25.8	0.0	5.2	0.0	0.0	5.3	0.0
LOS by Move:	A	A	A	C	A	C	A	A	A	A	A	A
HCM2kAvgQ:	0	0	0	3	0	1	0	3	0	0	3	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #62 I-215 NB Ramps & Scott Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.376
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 15.9
Optimal Cycle: 37 Level Of Service: B

Street Name:	I-215 NB Ramps						Scott Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Ovl		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	1	2	0	0	0	0	0	2	2	0	4	0	0	0	0	3	0	2
Volume Module:																
Base Vol:	0	15	600	0	0	259	156	1199	0	0	978	329
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	15	600	0	0	259	156	1199	0	0	978	329
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	15	600	0	0	259	156	1199	0	0	978	329
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	15	600	0	0	259	156	1199	0	0	978	329
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	15	600	0	0	259	156	1199	0	0	978	329
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	15	600	0	0	259	156	1199	0	0	978	329
Saturation Flow Module:																
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.85	0.75	1.00	1.00	0.75	0.92	0.91	1.00	1.00	0.91	0.75
Lanes:	0.00	0.06	2.94	0.00	0.00	2.00	2.00	4.00	0.00	0.00	3.00	2.00
Final Sat.:	0	105	4191	0	0	2842	3502	6916	0	0	5187	2842
Capacity Analysis Module:																
Vol/Sat:	0.00	0.14	0.14	0.00	0.00	0.09	0.04	0.17	0.00	0.00	0.19	0.12
Crit Moves:		****		****			****				****	
Green/Cycle:	0.00	0.38	0.38	0.00	0.00	0.38	0.12	0.62	0.00	0.00	0.50	0.50
Volume/Cap:	0.00	0.38	0.38	0.00	0.00	0.24	0.38	0.28	0.00	0.00	0.38	0.23
Delay/Veh:	0.0	22.5	22.5	0.0	0.0	21.2	41.2	8.8	0.0	0.0	15.4	14.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	22.5	22.5	0.0	0.0	21.2	41.2	8.8	0.0	0.0	15.4	14.2
LOS by Move:	A	C	C	A	A	C	D	A	A	A	B	B
HCM2kAvgQ:	0	5	5	0	0	3	3	5	0	0	7	3

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #102 Leon Road & Scott Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.673
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 27.9
Optimal Cycle: 70 Level Of Service: C

Street Name:	Leon Road						Scott Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	104	198	2	101	444	489	353	438	498	14	360	157
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	104	198	2	101	444	489	353	438	498	14	360	157
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	104	198	2	101	444	489	353	438	498	14	360	157
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	104	198	2	101	444	489	353	438	498	14	360	157
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	104	198	2	101	444	489	353	438	498	14	360	157
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	104	198	2	101	444	489	353	438	498	14	360	157
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.95	0.95	0.87	0.87	0.95	0.84	0.84	0.95	0.87	0.87
Lanes:	1.00	1.98	0.02	1.00	1.00	1.00	1.00	2.00	1.00	1.00	2.09	0.91
Final Sat.:	1805	3570	36	1805	1662	1662	1805	3181	1591	1805	3446	1503
Capacity Analysis Module:												
Vol/Sat:	0.06	0.06	0.06	0.06	0.27	0.29	0.20	0.14	0.31	0.01	0.10	0.10
Crit Moves:	****					****			****	****		
Green/Cycle:	0.09	0.26	0.26	0.26	0.44	0.44	0.31	0.47	0.47	0.01	0.17	0.17
Volume/Cap:	0.67	0.21	0.21	0.21	0.61	0.67	0.63	0.30	0.67	0.67	0.63	0.63
Delay/Veh:	55.4	29.1	29.1	29.0	22.3	23.7	31.8	16.6	22.1	111.3	40.4	40.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	55.4	29.1	29.1	29.0	22.3	23.7	31.8	16.6	22.1	111.3	40.4	40.4
LOS by Move:	E	C	C	C	C	C	C	B	C	F	D	D
HCM2kAvgQ:	4	3	3	2	11	13	10	5	14	1	6	6

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #104 Antelope Road & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.501
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 158.6
Optimal Cycle: 180 Level Of Service: F

Street Name:	Antelope Road						Keller Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 2	0 1	1	0 2	0 1	2	0 3	0 1	1	0 3	0 1
Volume Module:												
Base Vol:	66	43	328	241	584	447	405	791	1203	758	467	27
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	66	43	328	241	584	447	405	791	1203	758	467	27
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	66	43	328	241	584	447	405	791	1203	758	467	27
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	66	43	328	241	584	447	405	791	1203	758	467	27
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	66	43	328	241	584	447	405	791	1203	758	467	27
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	66	43	328	241	584	447	405	791	1203	758	467	27
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.95	0.85	0.95	0.95	0.85	0.92	0.91	0.85	0.95	0.91	0.85
Lanes:	2.00	2.00	1.00	1.00	2.00	1.00	2.00	3.00	1.00	1.00	3.00	1.00
Final Sat.:	3502	3610	1615	1805	3610	1615	3502	5187	1615	1805	5187	1615
Capacity Analysis Module:												
Vol/Sat:	0.02	0.01	0.20	0.13	0.16	0.28	0.12	0.15	0.74	0.42	0.09	0.02
Crit Moves:			****	****					****	****		
Green/Cycle:	0.01	0.14	0.14	0.09	0.21	0.21	0.44	0.50	0.50	0.28	0.34	0.34
Volume/Cap:	1.32	0.09	1.50	1.50	0.77	1.32	0.27	0.31	1.50	1.50	0.27	0.05
Delay/Veh:	283.7	37.9	291.3	300.9	42.1	202.3	18.1	15.0	257.4	271.9	24.0	22.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	283.7	37.9	291.3	300.9	42.1	202.3	18.1	15.0	257.4	271.9	24.0	22.2
LOS by Move:	F	D	F	F	D	F	B	B	F	F	C	C
HCM2kAvgQ:	4	1	25	19	11	29	4	5	86	55	4	1

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #105 Menifee Road - Meadowlark Road & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.109
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 68.8
Optimal Cycle: 180 Level Of Service: E

Street Name:	Menifee Road - Meadowlark Road						Keller Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	2	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	23	226	251	133	1301	680	495	199	565	299	400	125
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	23	226	251	133	1301	680	495	199	565	299	400	125
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	23	226	251	133	1301	680	495	199	565	299	400	125
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	23	226	251	133	1301	680	495	199	565	299	400	125
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	23	226	251	133	1301	680	495	199	565	299	400	125
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	23	226	251	133	1301	680	495	199	565	299	400	125
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.87	0.87	0.95	0.90	0.90	0.92	0.84	0.84	0.95	0.92	0.92
Lanes:	1.00	1.00	1.00	1.00	1.31	0.69	2.00	1.00	1.00	1.00	1.52	0.48
Final Sat.:	1805	1662	1662	1805	2250	1176	3502	1605	1605	1805	2651	829
Capacity Analysis Module:												
Vol/Sat:	0.01	0.14	0.15	0.07	0.58	0.58	0.14	0.12	0.35	0.17	0.15	0.15
Crit Moves:	****				****				****	****		
Green/Cycle:	0.01	0.36	0.36	0.17	0.52	0.52	0.23	0.32	0.32	0.15	0.24	0.24
Volume/Cap:	1.11	0.38	0.42	0.42	1.11	1.11	0.63	0.39	1.11	1.11	0.63	0.63
Delay/Veh:	283.4	24.0	24.5	37.7	81.6	81.6	36.5	26.7	102.2	129.7	35.4	35.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	283.4	24.0	24.5	37.7	81.6	81.6	36.5	26.7	102.2	129.7	35.4	35.4
LOS by Move:	F	C	C	D	F	F	D	C	F	F	D	D
HCM2kAvgQ:	2	6	6	4	48	48	8	5	30	17	8	8

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #107 Leon Road & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.389
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 12.3
Optimal Cycle: 31 Level Of Service: B

Street Name:	Leon Road						Keller Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Permitted			Protected			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	111	330	18	4	868	156	2	60	106	7	65	5
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	111	330	18	4	868	156	2	60	106	7	65	5
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	111	330	18	4	868	156	2	60	106	7	65	5
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	111	330	18	4	868	156	2	60	106	7	65	5
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	111	330	18	4	868	156	2	60	106	7	65	5
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	111	330	18	4	868	156	2	60	106	7	65	5
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.94	0.94	0.53	0.93	0.93	0.95	0.86	0.86	0.83	0.94	0.94
Lanes:	1.00	1.90	0.10	1.00	1.70	0.30	1.00	1.00	1.00	1.00	1.86	0.14
Final Sat.:	1805	3396	185	1005	2990	537	1805	1632	1632	1583	3315	255
Capacity Analysis Module:												
Vol/Sat:	0.06	0.10	0.10	0.00	0.29	0.29	0.00	0.04	0.06	0.00	0.02	0.02
Crit Moves:	****				****			****				
Green/Cycle:	0.15	0.86	0.86	0.71	0.71	0.71	0.09	0.14	0.14	0.05	0.05	0.05
Volume/Cap:	0.41	0.11	0.11	0.01	0.41	0.41	0.01	0.27	0.47	0.09	0.41	0.41
Delay/Veh:	39.4	1.1	1.1	4.2	6.0	6.0	41.5	38.8	40.7	46.0	47.8	47.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	39.4	1.1	1.1	4.2	6.0	6.0	41.5	38.8	40.7	46.0	47.8	47.8
LOS by Move:	D	A	A	A	A	A	D	D	D	D	D	D
HCM2kAvgQ:	3	1	1	0	7	7	0	2	4	0	2	2

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #108 Winchester Road - SR-79 & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.567
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 1.6
Optimal Cycle: 43 Level Of Service: A

Street Name:	Winchester Road - SR-79						Keller Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	1	1512	25	5	2774	3	1	10	1	13	20	50
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	1	1512	25	5	2774	3	1	10	1	13	20	50
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	1	1512	25	5	2774	3	1	10	1	13	20	50
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	1	1512	25	5	2774	3	1	10	1	13	20	50
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	1	1512	25	5	2774	3	1	10	1	13	20	50
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	1	1512	25	5	2774	3	1	10	1	13	20	50
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.91	0.91	0.73	0.94	0.94	0.73	0.85	0.85
Lanes:	1.00	2.95	0.05	1.00	2.99	0.01	1.00	1.82	0.18	1.00	1.00	1.00
Final Sat.:	1805	5092	84	1805	5181	6	1389	3236	324	1389	1612	1612
Capacity Analysis Module:												
Vol/Sat:	0.00	0.30	0.30	0.00	0.54	0.54	0.00	0.00	0.00	0.01	0.01	0.03
Crit Moves:	****				****							****
Green/Cycle:	0.00	0.94	0.94	0.01	0.94	0.94	0.05	0.05	0.05	0.05	0.05	0.05
Volume/Cap:	0.57	0.32	0.32	0.32	0.57	0.57	0.01	0.06	0.06	0.17	0.23	0.57
Delay/Veh:	260.2	0.3	0.3	60.5	0.5	0.5	44.8	44.9	44.9	46.2	45.6	52.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	260.2	0.3	0.3	60.5	0.5	0.5	44.8	44.9	44.9	46.2	45.6	52.2
LOS by Move:	F	A	A	E	A	A	D	D	D	D	D	D
HCM2kAvgQ:	0	2	2	1	5	5	0	0	0	1	1	3

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #112 Leon Road & Jean Nicholas

Cycle (sec): 100 Critical Vol./Cap.(X): 0.397
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 22.1
Optimal Cycle: 38 Level Of Service: C

Street Name:	Leon Road						Jean Nicholas					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	5	183	126	261	649	53	2	145	13	157	22	249
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	5	183	126	261	649	53	2	145	13	157	22	249
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	5	183	126	261	649	53	2	145	13	157	22	249
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	5	183	126	261	649	53	2	145	13	157	22	249
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	5	183	126	261	649	53	2	145	13	157	22	249
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	5	183	126	261	649	53	2	145	13	157	22	249
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.89	0.89	0.95	0.94	0.94	0.95	0.94	0.94	0.95	0.82	0.82
Lanes:	1.00	1.18	0.82	1.00	1.85	0.15	1.00	1.84	0.16	1.00	1.00	1.00
Final Sat.:	1805	2008	1382	1805	3301	270	1805	3273	293	1805	1556	1556
Capacity Analysis Module:												
Vol/Sat:	0.00	0.09	0.09	0.14	0.20	0.20	0.00	0.04	0.04	0.09	0.01	0.16
Crit Moves:		****		****			****					****
Green/Cycle:	0.01	0.23	0.23	0.36	0.59	0.59	0.00	0.14	0.14	0.27	0.40	0.40
Volume/Cap:	0.34	0.40	0.40	0.40	0.34	0.34	0.40	0.32	0.32	0.32	0.04	0.40
Delay/Veh:	62.2	33.0	33.0	24.0	10.8	10.8	94.2	39.4	39.4	29.7	18.1	21.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	62.2	33.0	33.0	24.0	10.8	10.8	94.2	39.4	39.4	29.7	18.1	21.6
LOS by Move:	E	C	C	C	B	B	F	D	D	C	B	C
HCM2kAvgQ:	1	4	4	6	6	6	0	3	3	4	0	6

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #122 Meadowlark Lane - Whitewood Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.495
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 145.9
Optimal Cycle: 180 Level Of Service: F

Street Name:	Meadowlark Lane - Whitewood Road						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 2	0 1	2	0 1	1 0	2	0 3	0 1	2	0 3	0 1
Volume Module:												
Base Vol:	133	230	1083	212	134	715	1386	486	82	943	1187	594
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	133	230	1083	212	134	715	1386	486	82	943	1187	594
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	133	230	1083	212	134	715	1386	486	82	943	1187	594
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	133	230	1083	212	134	715	1386	486	82	943	1187	594
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	133	230	1083	212	134	715	1386	486	82	943	1187	594
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	133	230	1083	212	134	715	1386	486	82	943	1187	594
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.95	0.85	0.92	0.83	0.83	0.92	0.91	0.85	0.92	0.91	0.85
Lanes:	2.00	2.00	1.00	2.00	1.00	1.00	2.00	3.00	1.00	2.00	3.00	1.00
Final Sat.:	3502	3610	1615	3502	1578	1578	3502	5187	1615	3502	5187	1615
Capacity Analysis Module:												
Vol/Sat:	0.04	0.06	0.67	0.06	0.08	0.45	0.40	0.09	0.05	0.27	0.23	0.37
Crit Moves:			****	****			****					****
Green/Cycle:	0.04	0.45	0.45	0.04	0.45	0.45	0.26	0.13	0.13	0.38	0.25	0.25
Volume/Cap:	1.00	0.14	1.49	1.49	0.19	1.00	1.49	0.71	0.39	0.71	0.93	1.49
Delay/Veh:	127.4	16.3	257.5	304.0	16.5	59.4	265.1	45.1	40.9	28.2	48.9	273.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	127.4	16.3	257.5	304.0	16.5	59.4	265.1	45.1	40.9	28.2	48.9	273.3
LOS by Move:	F	B	F	F	B	E	F	D	D	C	D	F
HCM2kAvgQ:	5	2	78	10	3	31	52	7	3	14	17	44

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
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Intersection #138 Jefferson Avenue & Cherry Street

Cycle (sec): 100 Critical Vol./Cap.(X): 0.783
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 21.8
Optimal Cycle: 105 Level Of Service: C

Street Name:	Jefferson Avenue						Cherry Street					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	0 1	1	0 1	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	86	620	196	37	640	22	1	48	6	147	1311	893
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	86	620	196	37	640	22	1	48	6	147	1311	893
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	86	620	196	37	640	22	1	48	6	147	1311	893
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	86	620	196	37	640	22	1	48	6	147	1311	893
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	86	620	196	37	640	22	1	48	6	147	1311	893
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	86	620	196	37	640	22	1	48	6	147	1311	893
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.85	0.95	0.95	0.95	0.95	0.89	0.89	0.95	0.85	0.85
Lanes:	1.00	2.00	1.00	1.00	1.93	0.07	1.00	2.67	0.33	1.00	2.00	1.00
Final Sat.:	1805	3610	1615	1805	3473	119	1805	4532	567	1805	3247	1624
Capacity Analysis Module:												
Vol/Sat:	0.05	0.17	0.12	0.02	0.18	0.18	0.00	0.01	0.01	0.08	0.40	0.55
Crit Moves:	****				****		****					****
Green/Cycle:	0.06	0.26	0.26	0.03	0.24	0.24	0.00	0.08	0.08	0.62	0.70	0.70
Volume/Cap:	0.78	0.65	0.46	0.65	0.78	0.78	0.78	0.13	0.13	0.13	0.57	0.78
Delay/Veh:	76.0	34.2	31.5	71.1	40.6	40.6	573.4	42.8	42.8	7.8	7.6	11.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	76.0	34.2	31.5	71.1	40.6	40.6	573.4	42.8	42.8	7.8	7.6	11.3
LOS by Move:	E	C	C	E	D	D	F	D	D	A	A	B
HCM2kAvgQ:	4	10	5	2	12	12	0	1	1	2	11	21

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #141 Jefferson Ave & Nutmeg St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.997
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 51.1
Optimal Cycle: 180 Level Of Service: D

Street Name:	Jefferson Ave						Nutmeg St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	181	321	272	96	1887	69	93	223	509	366	171	67
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	181	321	272	96	1887	69	93	223	509	366	171	67
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	181	321	272	96	1887	69	93	223	509	366	171	67
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	181	321	272	96	1887	69	93	223	509	366	171	67
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	181	321	272	96	1887	69	93	223	509	366	171	67
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	181	321	272	96	1887	69	93	223	509	366	171	67
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.85	0.85	0.95	0.91	0.91	0.95	0.85	0.85	0.95	0.91	0.91
Lanes:	1.00	2.00	1.00	1.00	2.89	0.11	1.00	1.00	1.00	1.00	1.44	0.56
Final Sat.:	1805	3219	1610	1805	4979	182	1805	1617	1617	1805	2485	974
Capacity Analysis Module:												
Vol/Sat:	0.10	0.10	0.17	0.05	0.38	0.38	0.05	0.14	0.31	0.20	0.07	0.07
Crit Moves:	****				****				****	****		
Green/Cycle:	0.10	0.37	0.37	0.12	0.38	0.38	0.22	0.32	0.32	0.20	0.30	0.30
Volume/Cap:	1.00	0.27	0.46	0.46	1.00	1.00	0.23	0.44	1.00	1.00	0.23	0.23
Delay/Veh:	110.7	22.4	24.5	43.0	50.4	50.4	32.2	27.3	66.5	85.8	26.7	26.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	110.7	22.4	24.5	43.0	50.4	50.4	32.2	27.3	66.5	85.8	26.7	26.7
LOS by Move:	F	C	C	D	D	D	C	C	E	F	C	C
HCM2kAvgQ:	10	4	7	3	29	29	2	6	23	17	3	3

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #142 Jefferson Ave & Magnolia St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.701
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 10.7
Optimal Cycle: 76 Level Of Service: B

Street Name:	Jefferson Ave						Magnolia St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 0	1 0	1	0 0	1 0
Volume Module:												
Base Vol:	81	637	8	8	2543	247	158	1	155	27	3	1
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	81	637	8	8	2543	247	158	1	155	27	3	1
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	81	637	8	8	2543	247	158	1	155	27	3	1
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	81	637	8	8	2543	247	158	1	155	27	3	1
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	81	637	8	8	2543	247	158	1	155	27	3	1
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	81	637	8	8	2543	247	158	1	155	27	3	1
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.90	0.90	0.95	0.85	0.85	0.95	0.96	0.96
Lanes:	1.00	2.96	0.04	1.00	2.73	0.27	1.00	0.01	0.99	1.00	0.75	0.25
Final Sat.:	1805	5112	64	1805	4666	453	1805	10	1607	1805	1372	457
Capacity Analysis Module:												
Vol/Sat:	0.04	0.12	0.12	0.00	0.54	0.54	0.09	0.10	0.10	0.01	0.00	0.00
Crit Moves:	****				****			****		****		
Green/Cycle:	0.06	0.81	0.81	0.03	0.78	0.78	0.16	0.14	0.14	0.02	0.00	0.00
Volume/Cap:	0.70	0.15	0.15	0.15	0.70	0.70	0.56	0.70	0.70	0.70	0.56	0.56
Delay/Veh:	63.4	2.0	2.0	48.7	6.0	6.0	41.8	50.8	50.8	93.3	126	126.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	63.4	2.0	2.0	48.7	6.0	6.0	41.8	50.8	50.8	93.3	126	126.3
LOS by Move:	E	A	A	D	A	A	D	D	D	F	F	F
HCM2kAvgQ:	4	2	2	0	16	16	5	6	6	2	1	1

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #149 Monroe Ave & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.322
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 8.0
Optimal Cycle: 34 Level Of Service: A

Street Name:	Monroe Ave						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ovl			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0	2 0	1	1 0	2 0	1	1 0	4 0	1	1 0	3 1	0
Volume Module:												
Base Vol:	46	73	48	1	47	50	101	1156	34	7	1552	21
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	46	73	48	1	47	50	101	1156	34	7	1552	21
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	46	73	48	1	47	50	101	1156	34	7	1552	21
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	46	73	48	1	47	50	101	1156	34	7	1552	21
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	46	73	48	1	47	50	101	1156	34	7	1552	21
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	46	73	48	1	47	50	101	1156	34	7	1552	21
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.85	0.95	0.95	0.85	0.95	0.91	0.85	0.95	0.91	0.91
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	4.00	1.00	1.00	3.95	0.05
Final Sat.:	1805	3610	1615	1805	3610	1615	1805	6916	1615	1805	6810	92
Capacity Analysis Module:												
Vol/Sat:	0.03	0.02	0.03	0.00	0.01	0.03	0.06	0.17	0.02	0.00	0.23	0.23
Crit Moves:	****				****		****				****	
Green/Cycle:	0.08	0.12	0.12	0.00	0.04	0.21	0.17	0.86	0.94	0.02	0.71	0.71
Volume/Cap:	0.32	0.17	0.25	0.25	0.32	0.14	0.32	0.19	0.02	0.19	0.32	0.32
Delay/Veh:	44.8	40.0	40.9	81.0	47.9	32.1	36.8	1.2	0.2	50.8	5.6	5.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	44.8	40.0	40.9	81.0	47.9	32.1	36.8	1.2	0.2	50.8	5.6	5.6
LOS by Move:	D	D	D	F	D	C	D	A	A	D	A	A
HCM2kAvgQ:	2	1	2	0	1	1	3	2	0	0	5	5

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #158 Adams Ave & Guava St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.287
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 12.2
Optimal Cycle: 20 Level Of Service: B

Street Name:	Adams Ave									Guava St		
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0	1 1	0	1 0	1 1	0	1 0	0 1	0	1 0	0 1	0
Volume Module:												
Base Vol:	78	97	21	101	21	40	23	324	46	3	256	108
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	78	97	21	101	21	40	23	324	46	3	256	108
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	78	97	21	101	21	40	23	324	46	3	256	108
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	78	97	21	101	21	40	23	324	46	3	256	108
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	78	97	21	101	21	40	23	324	46	3	256	108
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	78	97	21	101	21	40	23	324	46	3	256	108
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.69	0.92	0.92	0.62	0.86	0.86	0.48	0.98	0.98	0.48	0.96	0.96
Lanes:	1.00	1.64	0.36	1.00	1.00	1.00	1.00	0.88	0.12	1.00	0.70	0.30
Final Sat.:	1303	2887	625	1172	1628	1628	918	1632	232	910	1276	538
Capacity Analysis Module:												
Vol/Sat:	0.06	0.03	0.03	0.09	0.01	0.02	0.03	0.20	0.20	0.00	0.20	0.20
Crit Moves:				****							****	
Green/Cycle:	0.30	0.30	0.30	0.30	0.30	0.30	0.70	0.70	0.70	0.70	0.70	0.70
Volume/Cap:	0.20	0.11	0.11	0.29	0.04	0.08	0.04	0.28	0.28	0.00	0.29	0.29
Delay/Veh:	26.3	25.4	25.4	27.2	24.8	25.1	4.7	5.8	5.8	4.5	5.8	5.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	26.3	25.4	25.4	27.2	24.8	25.1	4.7	5.8	5.8	4.5	5.8	5.8
LOS by Move:	C	C	C	C	C	C	A	A	A	A	A	A
HCM2kAvgQ:	2	1	1	3	0	1	0	4	4	0	4	4

Note: Queue reported is the number of cars per lane.

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Scenario Report

Scenario:	Future Proposed GP PM
Command:	Future Proposed GP PM
Volume:	Future Proposed GP PM
Geometry:	Future
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	Default Trip Distribution
Paths:	Default Path
Routes:	Default Route
Configuration:	Future Proposed GP PM

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Turning Movement Report

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#1 Menifee Road & Scott Road													
Base	291	672	860	196	284	99	272	967	458	408	546	566	5619
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	291	672	860	196	284	99	272	967	458	408	546	566	5619
#2 Leon Road & Scott Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#3 Winchester Road/SR-79 & Scott Road													
Base	126	2492	29	1119	1872	128	113	286	119	0	222	1066	7572
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	126	2492	29	1119	1872	128	113	286	119	0	222	1066	7572
#4 Antelope Road & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#5 Menifee Road - Meadowlark Road & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#6 Briggs Road & Keller Road													
Base	300	122	105	1	50	81	20	347	765	9	295	6	2101
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	300	122	105	1	50	81	20	347	765	9	295	6	2101
#7 Leon Road & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#8 Winchester Road - SR-79 & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#9 Antelope Road & Golden City Drive - Baxter Road													
Base	4	428	941	216	974	25	5	202	46	354	178	896	4269
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	4	428	941	216	974	25	5	202	46	354	178	896	4269

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#10 Whitewood Roa - /Meadowlark Road & Golden City Drive - Baxter Road													
Base	280	1410	3	0	596	978	319	12	967	0	7	2	4574
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	280	1410	3	0	596	978	319	12	967	0	7	2	4574
#11 Briggs Road & Baxter Road - Jean Nicholas													
Base	0	430	89	46	659	0	0	0	0	10	0	87	1321
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	430	89	46	659	0	0	0	0	10	0	87	1321
#12 Leon Road & Jean Nicholas													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#13 Winchester Road - SR-79 & Nicholas - Skyview													
Base	196	2680	209	79	2052	17	37	650	118	150	439	125	6752
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	196	2680	209	79	2052	17	37	650	118	150	439	125	6752
#14 Antelope Road & Linnel Lane Extension													
Base	42	637	99	49	1075	525	117	363	394	58	562	426	4347
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	42	637	99	49	1075	525	117	363	394	58	562	426	4347
#15 Whitewood Road - Meadowlark Road & Linnel Lane Extension													
Base	41	819	636	143	1315	229	22	335	154	223	775	779	5471
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	41	819	636	143	1315	229	22	335	154	223	775	779	5471
#16 Leon Road & Max Gillis Road													
Base	546	437	605	355	259	127	100	199	465	565	344	365	4367
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	546	437	605	355	259	127	100	199	465	565	344	365	4367
#17 Winchester Road - SR-79 & Max Gillis - Thompson													
Base	226	2443	80	294	1319	649	759	310	140	32	242	87	6581
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	226	2443	80	294	1319	649	759	310	140	32	242	87	6581
#18 California Oaks Road & Clinton Keith Road													
Base	312	0	1024	0	0	0	0	2396	112	439	2820	0	7103
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	312	0	1024	0	0	0	0	2396	112	439	2820	0	7103

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#19 I-215 SB Off-Ramp & Clinton Keith Road													
Base	0	0	0	47	0	608	0	2930	784	0	2369	219	6957
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	47	0	608	0	2930	784	0	2369	219	6957
#20 I-215 NB Off Ramp & Clinton Keith Road													
Base	409	0	492	0	0	0	0	1562	280	0	2836	314	5893
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	409	0	492	0	0	0	0	1562	280	0	2836	314	5893
#21 Antelope Road & Clinton Keith Road													
Base	0	0	0	174	0	916	117	2128	0	0	1645	427	5407
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	174	0	916	117	2128	0	0	1645	427	5407
#22 Meadowlark Lane - Whitewood Road & Clinton Keith Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#23 Liberty Road & Clinton Keith Road													
Base	81	0	286	0	0	0	0	2323	323	41	2078	0	5132
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	81	0	286	0	0	0	0	2323	323	41	2078	0	5132
#24 Leon Road & Clinton Keith Road													
Base	0	0	0	143	0	1218	638	1950	0	0	913	877	5739
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	143	0	1218	638	1950	0	0	913	877	5739
#25 Winchester Road - SR-79 & Benton Road													
Base	462	2486	738	75	1004	485	83	704	1387	241	720	92	8477
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	462	2486	738	75	1004	485	83	704	1387	241	720	92	8477
#26 Winchester Road - SR-79 & Via Mira Mosa													
Base	69	3255	228	107	2094	356	229	28	54	229	40	129	6818
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	69	3255	228	107	2094	356	229	28	54	229	40	129	6818
#27 Monroe Ave & Los Alamos													
Base	29	469	264	235	281	61	229	1460	165	84	975	467	4719
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	29	469	264	235	281	61	229	1460	165	84	975	467	4719

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#28 Jefferson Avenue & Murrieta Hot Springs Road													
Base	6	2300	1226	814	1025	70	40	210	111	581	90	891	7364
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	6	2300	1226	814	1025	70	40	210	111	581	90	891	7364
#29 Madison Avenue & Murrieta Hot Springs Road													
Base	316	600	1218	342	247	116	346	1505	279	791	1185	189	7134
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	316	600	1218	342	247	116	346	1505	279	791	1185	189	7134
#30 I-15 SB Off-Ramp & Murrieta Hot Springs Road													
Base	0	0	0	674	0	422	0	2533	487	0	2188	112	6416
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	674	0	422	0	2533	487	0	2188	112	6416
#31 I-15 NB Off-Ramp & Murrieta Hot Springs Road													
Base	213	0	239	0	0	0	0	2848	370	0	1582	1637	6889
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	213	0	239	0	0	0	0	2848	370	0	1582	1637	6889
#32 I-215 SB Off-Ramp & Murrieta Hot Springs Road													
Base	0	0	0	470	0	362	0	3377	139	0	2338	238	6924
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	470	0	362	0	3377	139	0	2338	238	6924
#33 I-215 NB Off-Ramp & Murrieta Hot Springs Road													
Base	84	0	465	0	0	0	0	2331	104	0	2361	1383	6728
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	84	0	465	0	0	0	0	2331	104	0	2361	1383	6728
#34 Jackson Avenue & Murrieta Hot Springs Road													
Base	201	0	169	0	0	0	0	1910	59	213	2568	0	5120
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	201	0	169	0	0	0	0	1910	59	213	2568	0	5120
#35 Margarita Road & Murrieta Hot Springs Road													
Base	933	69	383	185	77	150	51	1752	538	273	1609	38	6058
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	933	69	383	185	77	150	51	1752	538	273	1609	38	6058
#36 French Valley Parkway & Murrieta Hot Springs Road													
Base	32	0	1110	0	0	0	0	1808	343	453	1697	0	5443
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	32	0	1110	0	0	0	0	1808	343	453	1697	0	5443

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#37 Jefferson Avenue & Guava Street													
Base	14	3281	10	11	1174	349	103	86	133	2	71	16	5250
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	14	3281	10	11	1174	349	103	86	133	2	71	16	5250
#38 Jefferson Avenue & Cherry Street													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#39 Washington Ave & Calle Del Oso Oro/Nutmeg													
Base	421	306	134	93	236	55	28	209	276	164	635	163	2720
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	421	306	134	93	236	55	28	209	276	164	635	163	2720
#40 Clinton Keith Rd & Calle de Oso Oro/Bear Creek Dr													
Base	80	179	208	16	90	271	187	520	142	226	747	9	2675
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	80	179	208	16	90	271	187	520	142	226	747	9	2675
#41 Jefferson Ave & Nutmeg St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#42 Jefferson Ave & Magnolia St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#43 Jefferson Ave & Lemon St													
Base	418	2124	2	5	1607	38	42	39	270	16	21	13	4595
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	418	2124	2	5	1607	38	42	39	270	16	21	13	4595
#44 Jefferson Ave & Kalmia St													
Base	412	1763	951	978	1203	34	34	658	281	313	533	869	8029
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	412	1763	951	978	1203	34	34	658	281	313	533	869	8029
#45 Jefferson Ave & Juniper St													
Base	192	2787	67	48	1603	98	338	90	378	18	72	82	5773
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	192	2787	67	48	1603	98	338	90	378	18	72	82	5773

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#46 Jefferson Ave & Ivy St/Los Alamos Rd													
Base	312	2389	685	457	1448	113	90	224	187	259	274	494	6932
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	312	2389	685	457	1448	113	90	224	187	259	274	494	6932
#47 Madison Ave & Kalmia St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#48 Madison Ave/I-15 SB Ramps & Kalmia St													
Base	392	0	898	306	27	379	0	2534	265	265	1505	614	7185
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	392	0	898	306	27	379	0	2534	265	265	1505	614	7185
#49 Monroe Ave & Murrieta Hot Springs Rd													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#50 Hancock Ave & Murrieta Hot Springs Rd													
Base	0	0	0	598	0	820	755	3291	0	0	2482	311	8257
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	598	0	820	755	3291	0	0	2482	311	8257
#51 Alta Murrieta Dr & Murrieta Hot Springs Rd													
Base	587	221	53	195	128	493	698	1702	518	173	2320	153	7241
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	587	221	53	195	128	493	698	1702	518	173	2320	153	7241
#52 Winchester Road - SR-79 & Murrieta Hot Springs Rd													
Base	334	1970	195	195	1162	1115	1478	1036	280	244	754	99	8862
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	334	1970	195	195	1162	1115	1478	1036	280	244	754	99	8862
#53 Hancock Ave & Los Alamos Rd													
Base	124	438	871	657	115	26	105	1967	46	538	1361	703	6951
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	124	438	871	657	115	26	105	1967	46	538	1361	703	6951
#54 I-215 SB Ramps & Los Alamos Rd													
Base	0	0	0	537	0	1534	0	3121	446	146	1263	0	7047
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	537	0	1534	0	3121	446	146	1263	0	7047

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#55 I-215 NB Ramps & Los Alamos Rd													
Base	229	0	171	0	0	0	1589	1996	0	0	1182	331	5498
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	229	0	171	0	0	0	1589	1996	0	0	1182	331	5498
#56 Whitewood Rd & Los Alamos Rd													
Base	139	582	34	35	578	567	867	361	298	65	228	48	3802
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	139	582	34	35	578	567	867	361	298	65	228	48	3802
#57 Whitewood Rd & Murrieta Hot Springs Rd													
Base	434	314	529	362	266	233	166	1645	172	401	2240	457	7219
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	434	314	529	362	266	233	166	1645	172	401	2240	457	7219
#58 Adams Ave & Guava St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#59 Nutmeg St & Clinton Keith Rd													
Base	65	83	494	318	32	58	92	1775	61	552	2056	380	5966
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	65	83	494	318	32	58	92	1775	61	552	2056	380	5966
#60 Murrieta Oaks Ave-Mitchell Rd & Clinton Keith Rd													
Base	16	134	19	103	180	900	135	3159	18	27	2766	395	7852
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	16	134	19	103	180	900	135	3159	18	27	2766	395	7852
#61 I-215 SB Ramps & Scott Rd													
Base	0	0	0	160	0	261	0	756	392	0	1529	445	3543
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	160	0	261	0	756	392	0	1529	445	3543
#62 I-215 NB Ramps & Scott Rd													
Base	0	7	963	0	0	368	80	1012	0	0	1761	395	4586
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	7	963	0	0	368	80	1012	0	0	1761	395	4586
#102 Leon Road & Scott Road													
Base	563	411	18	63	209	373	580	525	505	4	374	155	3780
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	563	411	18	63	209	373	580	525	505	4	374	155	3780

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Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#104 Antelope Road & Keller Road													
Base	923	556	870	74	72	563	828	753	209	228	658	167	5901
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	923	556	870	74	72	563	828	753	209	228	658	167	5901
#105 Menifee Road - Meadowlark Road & Keller Road													
Base	174	1077	822	86	680	363	765	314	468	176	392	121	5438
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	174	1077	822	86	680	363	765	314	468	176	392	121	5438
#107 Leon Road & Keller Road													
Base	62	926	1	1	688	78	88	81	281	17	190	3	2416
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	62	926	1	1	688	78	88	81	281	17	190	3	2416
#108 Winchester Road - SR-79 & Keller Road													
Base	1	2693	28	9	2103	1	2	59	2	10	16	25	4949
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	2693	28	9	2103	1	2	59	2	10	16	25	4949
#112 Leon Road & Jean Nicholas													
Base	2	530	263	327	553	11	2	128	12	114	123	446	2511
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	530	263	327	553	11	2	128	12	114	123	446	2511
#122 Meadowlark Lane - Whitewood Road & Clinton Keith Road													
Base	748	337	589	767	412	730	352	1452	506	314	701	1031	7939
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	748	337	589	767	412	730	352	1452	506	314	701	1031	7939
#138 Jefferson Avenue & Cherry Street													
Base	29	1226	823	196	861	6	2	1060	40	122	793	666	5824
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	29	1226	823	196	861	6	2	1060	40	122	793	666	5824
#141 Jefferson Ave & Nutmeg St													
Base	624	1208	377	103	1155	97	61	133	249	300	223	145	4675
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	624	1208	377	103	1155	97	61	133	249	300	223	145	4675
#142 Jefferson Ave & Magnolia St													
Base	137	2070	11	10	1578	106	159	5	56	7	5	14	4158
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	137	2070	11	10	1578	106	159	5	56	7	5	14	4158

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Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#149 Monroe Ave & Murrieta Hot Springs Rd													
Base	178	236	199	1	239	110	164	2579	154	37	2043	26	5966
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	178	236	199	1	239	110	164	2579	154	37	2043	26	5966
#158 Adams Ave & Guava St													
Base	37	222	27	91	39	205	59	243	181	8	261	165	1538
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	37	222	27	91	39	205	59	243	181	8	261	165	1538

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Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
# 1 Menifee Road & Scott Road	F	86.3	1.143	F	86.3	1.143	+ 0.000 D/V
# 3 Winchester Road/SR-79 & Scott	F	284.5	1.873	F	284.5	1.873	+ 0.000 D/V
# 6 Briggs Road & Keller Road	B	19.0	0.693	B	19.0	0.693	+ 0.000 D/V
# 9 Antelope Road & Golden City Dr	F	89.2	1.523	F	89.2	1.523	+ 0.000 D/V
# 10 Whitewood Roa - /Meadowlark Ro	F	113.6	1.381	F	113.6	1.381	+ 0.000 D/V
# 11 Briggs Road & Baxter Road - Je	A	8.3	0.227	A	8.3	0.227	+ 0.000 D/V
# 13 Winchester Road - SR-79 & Nich	C	28.5	0.908	C	28.5	0.908	+ 0.000 D/V
# 14 Antelope Road & Linnel Lane Ex	C	28.5	0.847	C	28.5	0.847	+ 0.000 D/V
# 15 Whitewood Road - Meadowlark Ro	D	43.7	0.990	D	43.7	0.990	+ 0.000 D/V
# 16 Leon Road & Max Gillis Road	D	40.3	0.925	D	40.3	0.925	+ 0.000 D/V
# 17 Winchester Road - SR-79 & Max	D	37.8	0.963	D	37.8	0.963	+ 0.000 D/V
# 18 California Oaks Road & Clinton	C	20.7	0.903	C	20.7	0.903	+ 0.000 D/V
# 19 I-215 SB Off-Ramp & Clinton Ke	B	11.5	0.779	B	11.5	0.779	+ 0.000 D/V
# 20 I-215 NB Off Ramp & Clinton Ke	B	17.1	0.851	B	17.1	0.851	+ 0.000 D/V
# 21 Antelope Road & Clinton Keith	A	4.5	0.495	A	4.5	0.495	+ 0.000 D/V
# 23 Liberty Road & Clinton Keith R	B	10.0	0.719	B	10.0	0.719	+ 0.000 D/V
# 24 Leon Road & Clinton Keith Road	C	28.6	0.972	C	28.6	0.972	+ 0.000 D/V
# 25 Winchester Road - SR-79 & Bent	D	53.7	1.057	D	53.7	1.057	+ 0.000 D/V
# 26 Winchester Road - SR-79 & Via	C	25.1	0.965	C	25.1	0.965	+ 0.000 D/V
# 27 Monroe Ave & Los Alamos	C	27.5	0.785	C	27.5	0.785	+ 0.000 D/V
# 28 Jefferson Avenue & Murrieta Ho	F	206.4	1.829	F	206.4	1.829	+ 0.000 D/V
# 29 Madison Avenue & Murrieta Hot	F	129.6	1.342	F	129.6	1.342	+ 0.000 D/V
# 30 I-15 SB Off-Ramp & Murrieta Ho	B	14.3	0.729	B	14.3	0.729	+ 0.000 D/V

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Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
# 31 I-15 NB Off-Ramp & Murrieta Ho	A	7.9	0.560	A	7.9	0.560	+ 0.000 D/V
# 32 I-215 SB Off-Ramp & Murrieta H	B	10.8	0.825	B	10.8	0.825	+ 0.000 D/V
# 33 I-215 NB Off-Ramp & Murrieta H	A	9.4	0.619	A	9.4	0.619	+ 0.000 D/V
# 34 Jackson Avenue & Murrieta Hot	A	8.5	0.552	A	8.5	0.552	+ 0.000 D/V
# 35 Margarita Road & Murrieta Hot	D	49.2	1.018	D	49.2	1.018	+ 0.000 D/V
# 36 French Valley Parkway & Murrie	B	18.4	0.815	B	18.4	0.815	+ 0.000 D/V
# 37 Jefferson Avenue & Guava Stree	A	7.9	0.767	A	7.9	0.767	+ 0.000 D/V
# 39 Washington Ave & Calle Del Oso	C	27.5	0.549	C	27.5	0.549	+ 0.000 D/V
# 40 Clinton Keith Rd & Calle de Os	B	16.5	0.651	B	16.5	0.651	+ 0.000 D/V
# 43 Jefferson Ave & Lemon St	B	18.3	0.726	B	18.3	0.726	+ 0.000 D/V
# 44 Jefferson Ave & Kalmia St	F	159.9	1.680	F	159.9	1.680	+ 0.000 D/V
# 45 Jefferson Ave & Juniper St	C	22.3	0.827	C	22.3	0.827	+ 0.000 D/V
# 46 Jefferson Ave & Ivy St/Los Ala	D	35.8	0.944	D	35.8	0.944	+ 0.000 D/V
# 48 Madison Ave/I-15 SB Ramps & Ka	C	30.9	0.889	C	30.9	0.889	+ 0.000 D/V
# 50 Hancock Ave & Murrieta Hot Spr	B	17.6	0.797	B	17.6	0.797	+ 0.000 D/V
# 51 Alta Murrieta Dr & Murrieta Ho	D	51.9	1.012	D	51.9	1.012	+ 0.000 D/V
# 52 Winchester Road - SR-79 & Murr	F	104.8	1.375	F	104.8	1.375	+ 0.000 D/V
# 53 Hancock Ave & Los Alamos Rd	F	223.1	1.581	F	223.1	1.581	+ 0.000 D/V
# 54 I-215 SB Ramps & Los Alamos Rd	F	157.8	1.435	F	157.8	1.435	+ 0.000 D/V
# 55 I-215 NB Ramps & Los Alamos Rd	C	24.4	0.908	C	24.4	0.908	+ 0.000 D/V
# 56 Whitewood Rd & Los Alamos Rd	D	44.6	0.987	D	44.6	0.987	+ 0.000 D/V
# 57 Whitewood Rd & Murrieta Hot Sp	F	88.7	1.149	F	88.7	1.149	+ 0.000 D/V
# 59 Nutmeg St & Clinton Keith Rd	E	78.4	1.152	E	78.4	1.152	+ 0.000 D/V
# 60 Murrieta Oaks Ave-Mitchell Rd	F	120.7	1.262	F	120.7	1.262	+ 0.000 D/V
# 61 I-215 SB Ramps & Scott Rd	A	8.1	0.387	A	8.1	0.387	+ 0.000 D/V

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Intersection	Base LOS	Del/ Veh	V/ C	Future LOS	Del/ Veh	V/ C	Change in
# 62 I-215 NB Ramps & Scott Rd	B	16.2	0.589	B	16.2	0.589	+ 0.000 D/V
#102 Leon Road & Scott Road	D	46.7	0.969	D	46.7	0.969	+ 0.000 D/V
#104 Antelope Road & Keller Road	D	49.9	0.976	D	49.9	0.976	+ 0.000 D/V
#105 Menifee Road - Meadowlark Road	D	47.6	0.993	D	47.6	0.993	+ 0.000 D/V
#107 Leon Road & Keller Road	C	26.2	0.359	C	26.2	0.359	+ 0.000 D/V
#108 Winchester Road - SR-79 & Kell	A	1.6	0.547	A	1.6	0.547	+ 0.000 D/V
#112 Leon Road & Jean Nicholas	C	26.4	0.694	C	26.4	0.694	+ 0.000 D/V
#122 Meadowlark Lane - Whitewood Ro	F	121.7	1.400	F	121.7	1.400	+ 0.000 D/V
#138 Jefferson Avenue & Cherry Stre	D	37.8	1.033	D	37.8	1.033	+ 0.000 D/V
#141 Jefferson Ave & Nutmeg St	D	36.0	0.909	D	36.0	0.909	+ 0.000 D/V
#142 Jefferson Ave & Magnolia St	A	9.4	0.503	A	9.4	0.503	+ 0.000 D/V
#149 Monroe Ave & Murrieta Hot Spri	B	16.2	0.555	B	16.2	0.555	+ 0.000 D/V
#158 Adams Ave & Guava St	B	14.3	0.368	B	14.3	0.368	+ 0.000 D/V

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #1 Menifee Road & Scott Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.143
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 86.3
Optimal Cycle: 180 Level Of Service: F

Street Name:	Menifee Rd						Scott Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	291	672	860	196	284	99	272	967	458	408	546	566
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	291	672	860	196	284	99	272	967	458	408	546	566
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	291	672	860	196	284	99	272	967	458	408	546	566
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	291	672	860	196	284	99	272	967	458	408	546	566
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	291	672	860	196	284	99	272	967	458	408	546	566
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	291	672	860	196	284	99	272	967	458	408	546	566
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.87	0.87	0.95	0.91	0.91	0.95	0.87	0.87	0.95	0.84	0.84
Lanes:	1.00	1.00	1.00	1.00	1.48	0.52	1.00	2.04	0.96	1.00	2.00	1.00
Final Sat.:	1805	1653	1653	1805	2572	897	1805	3351	1587	1805	3195	1598
Capacity Analysis Module:												
Vol/Sat:	0.16	0.41	0.52	0.11	0.11	0.11	0.15	0.29	0.29	0.23	0.17	0.35
Crit Moves:			****	****				****		****		
Green/Cycle:	0.33	0.45	0.45	0.09	0.22	0.22	0.13	0.25	0.25	0.20	0.32	0.32
Volume/Cap:	0.49	0.89	1.14	1.14	0.49	0.49	1.12	1.14	1.14	1.14	0.54	1.12
Delay/Veh:	27.7	31.5	101.1	157.8	34.4	34.4	137.8	112	111.9	132.7	28.5	102.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	27.7	31.5	101.1	157.8	34.4	34.4	137.8	112	111.9	132.7	28.5	102.5
LOS by Move:	C	C	F	F	C	C	F	F	F	F	C	F
HCM2kAvgQ:	7	24	45	12	6	6	16	28	28	22	8	31

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
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Intersection #3 Winchester Road/SR-79 & Scott Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.873
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 284.5
Optimal Cycle: 180 Level Of Service: F

Street Name:	Winchester Road/SR-79											
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	126	2492	29	1119	1872	128	113	286	119	0	222	1066
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	126	2492	29	1119	1872	128	113	286	119	0	222	1066
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	126	2492	29	1119	1872	128	113	286	119	0	222	1066
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	126	2492	29	1119	1872	128	113	286	119	0	222	1066
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	126	2492	29	1119	1872	128	113	286	119	0	222	1066
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	126	2492	29	1119	1872	128	113	286	119	0	222	1066
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.90	0.90	0.95	0.87	0.87	1.00	0.80	0.80
Lanes:	1.00	2.97	0.03	1.00	2.81	0.19	1.00	2.12	0.88	1.00	2.00	1.00
Final Sat.:	1805	5117	60	1805	4806	329	1805	3502	1457	1900	3029	1515
Capacity Analysis Module:												
Vol/Sat:	0.07	0.49	0.49	0.62	0.39	0.39	0.06	0.08	0.08	0.00	0.07	0.70
Crit Moves:		****		****			****					****
Green/Cycle:	0.09	0.26	0.26	0.33	0.50	0.50	0.03	0.41	0.41	0.00	0.38	0.38
Volume/Cap:	0.78	1.87	1.87	1.87	0.78	0.78	1.87	0.20	0.20	0.00	0.20	1.87
Delay/Veh:	65.3	433	432.9	432.8	21.9	21.9	497.4	19.1	19.1	0.0	21.0	429.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	65.3	433	432.9	432.8	21.9	21.9	497.4	19.1	19.1	0.0	21.0	429.8
LOS by Move:	E	F	F	F	C	C	F	B	B	A	C	F
HCM2kAvgQ:	6	82	82	98	20	20	11	3	3	0	3	103

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #6 Briggs Road & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.693
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 19.0
Optimal Cycle: 74 Level Of Service: B

Street Name:	Briggs Road									Keller Road		
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	300	122	105	1	50	81	20	347	765	9	295	6
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	300	122	105	1	50	81	20	347	765	9	295	6
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	300	122	105	1	50	81	20	347	765	9	295	6
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	300	122	105	1	50	81	20	347	765	9	295	6
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	300	122	105	1	50	81	20	347	765	9	295	6
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	300	122	105	1	50	81	20	347	765	9	295	6
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.88	0.88	0.95	0.86	0.86	0.95	0.85	0.85	0.95	0.95	0.95
Lanes:	1.00	1.07	0.93	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.96	0.04
Final Sat.:	1805	1806	1555	1805	1637	1637	1805	1619	1619	1805	3527	72
Capacity Analysis Module:												
Vol/Sat:	0.17	0.07	0.07	0.00	0.03	0.05	0.01	0.21	0.47	0.00	0.08	0.08
Crit Moves:	****					****			****	****		
Green/Cycle:	0.24	0.31	0.31	0.00	0.07	0.07	0.08	0.68	0.68	0.01	0.61	0.61
Volume/Cap:	0.69	0.22	0.22	0.22	0.43	0.69	0.14	0.31	0.69	0.69	0.14	0.14
Delay/Veh:	39.5	25.7	25.7	72.6	45.4	55.9	43.2	6.5	10.9	146.8	8.4	8.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	39.5	25.7	25.7	72.6	45.4	55.9	43.2	6.5	10.9	146.8	8.4	8.4
LOS by Move:	D	C	C	E	D	E	D	A	B	F	A	A
HCM2kAvgQ:	10	3	3	0	2	4	1	5	16	1	2	2

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #9 Antelope Road & Golden City Drive - Baxter Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.523
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 89.2
Optimal Cycle: 180 Level Of Service: F

Street Name:	Antelope Road						Golden City Drive - Baxter Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	4	428	941	216	974	25	5	202	46	354	178	896
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	4	428	941	216	974	25	5	202	46	354	178	896
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	4	428	941	216	974	25	5	202	46	354	178	896
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	4	428	941	216	974	25	5	202	46	354	178	896
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	4	428	941	216	974	25	5	202	46	354	178	896
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	4	428	941	216	974	25	5	202	46	354	178	896
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.22	0.85	0.85	0.12	0.95	0.95	0.11	0.92	0.92	0.51	0.83	0.83
Lanes:	1.00	1.00	1.00	1.00	1.95	0.05	1.00	1.63	0.37	1.00	1.00	1.00
Final Sat.:	412	1619	1619	226	3506	90	203	2858	651	977	1579	1579
Capacity Analysis Module:												
Vol/Sat:	0.01	0.26	0.58	0.96	0.28	0.28	0.02	0.07	0.07	0.36	0.11	0.57
Crit Moves:				****								****
Green/Cycle:	0.63	0.63	0.63	0.63	0.63	0.63	0.37	0.37	0.37	0.37	0.37	0.37
Volume/Cap:	0.02	0.42	0.93	1.52	0.44	0.44	0.07	0.19	0.19	0.97	0.30	1.52
Delay/Veh:	7.0	9.5	26.9	286.3	9.8	9.8	20.5	21.3	21.3	70.7	22.2	273.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	7.0	9.5	26.9	286.3	9.8	9.8	20.5	21.3	21.3	70.7	22.2	273.8
LOS by Move:	A	A	C	F	A	A	C	C	C	E	C	F
HCM2kAvgQ:	0	7	32	18	8	8	0	3	3	16	4	69

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
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Intersection #10 Whitewood Roa - /Meadowlark Road & Golden City Drive - Baxter R

Cycle (sec): 100 Critical Vol./Cap.(X): 1.381
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 113.6
Optimal Cycle: 180 Level Of Service: F

Street Name:	Whitewood Road - Meadowlark Road						Golden City Drive - Baxter Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	280	1410	3	0	596	978	319	12	967	0	7	2
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	280	1410	3	0	596	978	319	12	967	0	7	2
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	280	1410	3	0	596	978	319	12	967	0	7	2
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	280	1410	3	0	596	978	319	12	967	0	7	2
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	280	1410	3	0	596	978	319	12	967	0	7	2
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	280	1410	3	0	596	978	319	12	967	0	7	2
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.95	1.00	0.86	0.86	0.95	0.81	0.81	1.00	0.92	0.92
Lanes:	1.00	1.99	0.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.56	0.44
Final Sat.:	1805	3602	8	1900	1637	1637	1805	1538	1538	1900	2715	776
Capacity Analysis Module:												
Vol/Sat:	0.16	0.39	0.39	0.00	0.36	0.60	0.18	0.01	0.63	0.00	0.00	0.00
Crit Moves:	****					****			****	****		
Green/Cycle:	0.11	0.54	0.54	0.00	0.43	0.43	0.45	0.46	0.46	0.00	0.01	0.01
Volume/Cap:	1.38	0.72	0.72	0.00	0.84	1.38	0.39	0.02	1.38	0.00	0.39	0.39
Delay/Veh:	243.7	18.3	18.3	0.0	29.0	205.5	18.8	15.0	207.6	0.0	60.3	60.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	243.7	18.3	18.3	0.0	29.0	205.5	18.8	15.0	207.6	0.0	60.3	60.3
LOS by Move:	F	B	B	A	C	F	B	B	F	A	E	E
HCM2kAvgQ:	20	18	18	0	20	67	7	0	67	0	1	1

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #11 Briggs Road & Baxter Road - Jean Nicholas

Cycle (sec): 100 Critical Vol./Cap.(X): 0.227
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 8.3
Optimal Cycle: 29 Level Of Service: A

Street Name:	Briggs Road						Baxter Road - Jean Nicholas					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0 1	1 0	1	0 2	0 0	0	0 0	0 0	1	0 0	0 1
Volume Module:												
Base Vol:	0	430	89	46	659	0	0	0	0	10	0	87
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	430	89	46	659	0	0	0	0	10	0	87
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	430	89	46	659	0	0	0	0	10	0	87
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	430	89	46	659	0	0	0	0	10	0	87
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	430	89	46	659	0	0	0	0	10	0	87
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	430	89	46	659	0	0	0	0	10	0	87
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.93	0.93	0.95	0.95	1.00	1.00	1.00	1.00	0.95	1.00	0.85
Lanes:	0.00	1.66	0.34	1.00	2.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00
Final Sat.:	0	2913	603	1805	3610	0	0	0	0	1805	0	1615
Capacity Analysis Module:												
Vol/Sat:	0.00	0.15	0.15	0.03	0.18	0.00	0.00	0.00	0.00	0.01	0.00	0.05
Crit Moves:		****		****								****
Green/Cycle:	0.00	0.65	0.65	0.11	0.76	0.00	0.00	0.00	0.00	0.24	0.00	0.24
Volume/Cap:	0.00	0.23	0.23	0.23	0.24	0.00	0.00	0.00	0.00	0.02	0.00	0.23
Delay/Veh:	0.0	7.2	7.2	41.0	3.5	0.0	0.0	0.0	0.0	29.3	0.0	31.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	7.2	7.2	41.0	3.5	0.0	0.0	0.0	0.0	29.3	0.0	31.0
LOS by Move:	A	A	A	D	A	A	A	A	A	C	A	C
HCM2kAvgQ:	0	3	3	1	3	0	0	0	0	0	0	2

Note: Queue reported is the number of cars per lane.

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2000 HCM Operations Method (Future Volume Alternative)

Intersection #13 Winchester Road - SR-79 & Nicholas - Skyview

Cycle (sec): 100 Critical Vol./Cap.(X): 0.908
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 28.5
Optimal Cycle: 180 Level Of Service: C

Street Name:	Winchester Road - SR-79						Nicholas - Skyview					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	196	2680	209	79	2052	17	37	650	118	150	439	125
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	196	2680	209	79	2052	17	37	650	118	150	439	125
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	196	2680	209	79	2052	17	37	650	118	150	439	125
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	196	2680	209	79	2052	17	37	650	118	150	439	125
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	196	2680	209	79	2052	17	37	650	118	150	439	125
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	196	2680	209	79	2052	17	37	650	118	150	439	125
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.90	0.90	0.95	0.91	0.91	0.95	0.93	0.93	0.95	0.92	0.92
Lanes:	1.00	2.78	0.22	1.00	2.98	0.02	1.00	1.69	0.31	1.00	1.56	0.44
Final Sat.:	1805	4759	371	1805	5139	43	1805	2985	542	1805	2717	774
Capacity Analysis Module:												
Vol/Sat:	0.11	0.56	0.56	0.04	0.40	0.40	0.02	0.22	0.22	0.08	0.16	0.16
Crit Moves:		****		****				****		****		
Green/Cycle:	0.14	0.62	0.62	0.05	0.53	0.53	0.04	0.24	0.24	0.09	0.29	0.29
Volume/Cap:	0.76	0.91	0.91	0.91	0.76	0.76	0.55	0.91	0.91	0.91	0.55	0.55
Delay/Veh:	53.5	20.8	20.8	114.0	20.0	20.0	56.6	50.4	50.4	89.2	30.4	30.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	53.5	20.8	20.8	114.0	20.0	20.0	56.6	50.4	50.4	89.2	30.4	30.4
LOS by Move:	D	C	C	F	C	C	E	D	D	F	C	C
HCM2kAvgQ:	8	32	32	5	20	20	2	16	16	8	8	8

Note: Queue reported is the number of cars per lane.

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2000 HCM Operations Method (Future Volume Alternative)

Intersection #14 Antelope Road & Linnel Lane Extension

Cycle (sec): 100 Critical Vol./Cap.(X): 0.847
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 28.5
Optimal Cycle: 149 Level Of Service: C

Street Name:	Antelope Road						Linnel Lane Extension					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	42	637	99	49	1075	525	117	363	394	58	562	426
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	42	637	99	49	1075	525	117	363	394	58	562	426
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	42	637	99	49	1075	525	117	363	394	58	562	426
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	42	637	99	49	1075	525	117	363	394	58	562	426
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	42	637	99	49	1075	525	117	363	394	58	562	426
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	42	637	99	49	1075	525	117	363	394	58	562	426
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.93	0.93	0.95	0.90	0.90	0.95	0.88	0.88	0.95	0.89	0.89
Lanes:	1.00	1.73	0.27	1.00	1.34	0.66	1.00	1.00	1.00	1.00	1.14	0.86
Final Sat.:	1805	3062	476	1805	2307	1126	1805	1664	1664	1805	1920	1455
Capacity Analysis Module:												
Vol/Sat:	0.02	0.21	0.21	0.03	0.47	0.47	0.06	0.22	0.24	0.03	0.29	0.29
Crit Moves:	****			****			****			****		
Green/Cycle:	0.03	0.51	0.51	0.07	0.55	0.55	0.08	0.37	0.37	0.05	0.35	0.35
Volume/Cap:	0.85	0.41	0.41	0.41	0.85	0.85	0.85	0.59	0.64	0.64	0.85	0.85
Delay/Veh:	121.8	15.2	15.2	47.0	22.7	22.7	81.4	25.9	27.0	60.6	36.2	36.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	121.8	15.2	15.2	47.0	22.7	22.7	81.4	25.9	27.0	60.6	36.2	36.2
LOS by Move:	F	B	B	D	C	C	F	C	C	E	D	D
HCM2kAvgQ:	3	7	7	2	24	24	6	10	11	3	17	17

Note: Queue reported is the number of cars per lane.

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Intersection #15 Whitewood Road - Meadowlark Road & Linnel Lane Extension

Cycle (sec): 100 Critical Vol./Cap.(X): 0.990
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 43.7
Optimal Cycle: 180 Level Of Service: D

Street Name:	Whitewood Road - Meadowlark Road						Linnel Lane Extension (Future)					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	41	819	636	143	1315	229	22	335	154	223	775	779
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	41	819	636	143	1315	229	22	335	154	223	775	779
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	41	819	636	143	1315	229	22	335	154	223	775	779
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	41	819	636	143	1315	229	22	335	154	223	775	779
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	41	819	636	143	1315	229	22	335	154	223	775	779
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	41	819	636	143	1315	229	22	335	154	223	775	779
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.89	0.89	0.95	0.93	0.93	0.95	0.91	0.91	0.95	0.88	0.88
Lanes:	1.00	1.13	0.87	1.00	1.70	0.30	1.00	1.37	0.63	1.00	1.00	1.00
Final Sat.:	1805	1898	1474	1805	3007	524	1805	2357	1083	1805	1670	1670
Capacity Analysis Module:												
Vol/Sat:	0.02	0.43	0.43	0.08	0.44	0.44	0.01	0.14	0.14	0.12	0.46	0.47
Crit Moves:		****		****			****					****
Green/Cycle:	0.03	0.44	0.44	0.08	0.49	0.49	0.01	0.26	0.26	0.22	0.47	0.47
Volume/Cap:	0.89	0.99	0.99	0.99	0.89	0.89	0.99	0.55	0.55	0.55	0.98	0.99
Delay/Veh:	140.6	48.9	48.9	117.5	29.3	29.3	235.3	32.7	32.7	35.9	45.0	46.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	140.6	48.9	48.9	117.5	29.3	29.3	235.3	32.7	32.7	35.9	45.0	46.3
LOS by Move:	F	D	D	F	C	C	F	C	C	D	D	D
HCM2kAvgQ:	3	30	30	8	26	26	2	7	7	7	32	32

Note: Queue reported is the number of cars per lane.

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Intersection #16 Leon Road & Max Gillis Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.925
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 40.3
Optimal Cycle: 180 Level Of Service: D

Street Name:	Leon Road						Max Gillis Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	2	0	1	2	0	1	1	0	2	0	1	0	1
Volume Module:												
Base Vol:	546	437	605	355	259	127	100	199	465	565	344	365
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	546	437	605	355	259	127	100	199	465	565	344	365
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	546	437	605	355	259	127	100	199	465	565	344	365
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	546	437	605	355	259	127	100	199	465	565	344	365
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	546	437	605	355	259	127	100	199	465	565	344	365
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	546	437	605	355	259	127	100	199	465	565	344	365
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.95	0.85	0.92	0.90	0.90	0.92	0.85	0.85	0.92	1.00	0.85
Lanes:	2.00	2.00	1.00	2.00	1.34	0.66	2.00	1.00	1.00	2.00	1.00	1.00
Final Sat.:	3502	3610	1615	3502	2304	1130	3502	1615	1615	3502	1900	1615
Capacity Analysis Module:												
Vol/Sat:	0.16	0.12	0.37	0.10	0.11	0.11	0.03	0.12	0.29	0.16	0.18	0.23
Crit Moves:			****	****					****	****		
Green/Cycle:	0.30	0.40	0.40	0.11	0.22	0.22	0.05	0.31	0.31	0.17	0.43	0.43
Volume/Cap:	0.52	0.30	0.93	0.93	0.52	0.52	0.52	0.40	0.93	0.93	0.42	0.52
Delay/Veh:	29.6	20.3	47.4	72.0	35.3	35.3	48.7	27.2	51.2	60.7	20.1	21.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	29.6	20.3	47.4	72.0	35.3	35.3	48.7	27.2	51.2	60.7	20.1	21.6
LOS by Move:	C	C	D	E	D	D	D	C	D	E	C	C
HCM2kAvgQ:	8	5	22	9	6	6	2	5	19	13	7	9

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #17 Winchester Road - SR-79 & Max Gillis - Thompson

Cycle (sec): 100 Critical Vol./Cap.(X): 0.963
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 37.8
Optimal Cycle: 180 Level Of Service: D

Street Name:	Winchester Road - SR-79						Max Gillis - Thompson					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	2	1	0	1	0	3	0	1	2	0	2	0	1	1	0	1	1	0
Volume Module:												
Base Vol:	226	2443	80	294	1319	649	759	310	140	32	242	87
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	226	2443	80	294	1319	649	759	310	140	32	242	87
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	226	2443	80	294	1319	649	759	310	140	32	242	87
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	226	2443	80	294	1319	649	759	310	140	32	242	87
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	226	2443	80	294	1319	649	759	310	140	32	242	87
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	226	2443	80	294	1319	649	759	310	140	32	242	87
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.91	0.85	0.92	0.95	0.85	0.95	0.91	0.91
Lanes:	1.00	2.90	0.10	1.00	3.00	1.00	2.00	2.00	1.00	1.00	1.47	0.53
Final Sat.:	1805	4997	164	1805	5187	1615	3502	3610	1615	1805	2549	916
Capacity Analysis Module:												
Vol/Sat:	0.13	0.49	0.49	0.16	0.25	0.40	0.22	0.09	0.09	0.02	0.09	0.09
Crit Moves:		****		****			****				****	
Green/Cycle:	0.16	0.51	0.51	0.17	0.52	0.52	0.22	0.27	0.27	0.05	0.10	0.10
Volume/Cap:	0.78	0.96	0.96	0.96	0.49	0.78	0.96	0.32	0.32	0.32	0.96	0.96
Delay/Veh:	52.9	34.2	34.2	82.8	15.9	24.3	61.7	29.5	29.7	47.4	83.8	83.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	52.9	34.2	34.2	82.8	15.9	24.3	61.7	29.5	29.7	47.4	83.8	83.8
LOS by Move:	D	C	C	F	B	C	E	C	C	D	F	F
HCM2kAvgQ:	9	34	34	14	10	18	17	4	4	1	9	9

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #18 California Oaks Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.903
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 20.7
Optimal Cycle: 180 Level Of Service: C

Street Name:	California Oaks Road									Clinton Keith Road								
Approach:	North Bound				South Bound					East Bound					West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected					Protected				
Rights:	Ovl					Include					Include					Include				
Min. Green:	0	0	0			0	0	0			0	0	0			0	0	0		
Lanes:	1	0	0	0	2	0	0	0	0	0	0	0	2	1	0	1	0	3	0	0
Volume Module:																				
Base Vol:	312	0	1024			0	0	0			0	2396		112		439	2820			0
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00		1.00		1.00	1.00			1.00
Initial Bse:	312	0	1024			0	0	0			0	2396		112		439	2820			0
Added Vol:	0	0	0			0	0	0			0	0		0		0	0			0
PasserByVol:	0	0	0			0	0	0			0	0		0		0	0			0
Initial Fut:	312	0	1024			0	0	0			0	2396		112		439	2820			0
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00		1.00		1.00	1.00			1.00
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00		1.00		1.00	1.00			1.00
PHF Volume:	312	0	1024			0	0	0			0	2396		112		439	2820			0
Reduct Vol:	0	0	0			0	0	0			0	0		0		0	0			0
Reduced Vol:	312	0	1024			0	0	0			0	2396		112		439	2820			0
PCE Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00		1.00		1.00	1.00			1.00
MLF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00		1.00		1.00	1.00			1.00
FinalVolume:	312	0	1024			0	0	0			0	2396		112		439	2820			0
Saturation Flow Module:																				
Sat/Lane:	1900	1900	1900			1900	1900	1900			1900	1900		1900		1900	1900			1900
Adjustment:	0.95	1.00	0.75			1.00	1.00	1.00			1.00	0.90		0.90		0.95	0.91			1.00
Lanes:	1.00	0.00	2.00			0.00	0.00	0.00			0.00	2.87		0.13		1.00	3.00			0.00
Final Sat.:	1805	0	2842			0	0	0			0	4921		230		1805	5187			0
Capacity Analysis Module:																				
Vol/Sat:	0.17	0.00	0.36			0.00	0.00	0.00			0.00	0.49		0.49		0.24	0.54			0.00
Crit Moves:	****											****				****				
Green/Cycle:	0.19	0.00	0.46			0.00	0.00	0.00			0.00	0.54		0.54		0.27	0.81			0.00
Volume/Cap:	0.90	0.00	0.78			0.00	0.00	0.00			0.00	0.90		0.90		0.90	0.67			0.00
Delay/Veh:	65.3	0.0	25.9			0.0	0.0	0.0			0.0	25.3		25.3		55.2	4.5			0.0
User DelAdj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00		1.00		1.00	1.00			1.00
AdjDel/Veh:	65.3	0.0	25.9			0.0	0.0	0.0			0.0	25.3		25.3		55.2	4.5			0.0
LOS by Move:	E		A			C		A			A			C		E		A		A
HCM2kAvgQ:	13		0			17		0			0			29		17		14		0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #19 I-215 SB Off-Ramp & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.779
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 11.5
Optimal Cycle: 103 Level Of Service: B

Street Name:	I-215 SB Off-Ramp									Clinton Keith Road								
Approach:	North Bound				South Bound					East Bound					West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Split Phase					Split Phase					Protected					Protected				
Rights:	Include					Include					Include					Ignore				
Min. Green:	0	0	0			0	0	0			0	0	0			0	0	0		
Lanes:	0	0	0	0	0	0	1	0	0	2	0	0	3	0	1	0	0	3	0	1
Volume Module:																				
Base Vol:	0	0	0			47	0	608			0	2930		784		0	2369			219
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00		1.00		1.00	1.00			1.00
Initial Bse:	0	0	0			47	0	608			0	2930		784		0	2369			219
Added Vol:	0	0	0			0	0	0			0	0		0		0	0			0
PasserByVol:	0	0	0			0	0	0			0	0		0		0	0			0
Initial Fut:	0	0	0			47	0	608			0	2930		784		0	2369			219
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00		1.00		1.00	1.00			0.00
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00		1.00		1.00	1.00			0.00
PHF Volume:	0	0	0			47	0	608			0	2930		784		0	2369			0
Reduct Vol:	0	0	0			0	0	0			0	0		0		0	0			0
Reduced Vol:	0	0	0			47	0	608			0	2930		784		0	2369			0
PCE Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00		1.00		1.00	1.00			0.00
MLF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00		1.00		1.00	1.00			0.00
FinalVolume:	0	0	0			47	0	608			0	2930		784		0	2369			0
Saturation Flow Module:																				
Sat/Lane:	1900	1900	1900			1900	1900	1900			1900	1900		1900		1900	1900			1900
Adjustment:	1.00	1.00	1.00			0.95	1.00	0.75			1.00	0.91		0.85		1.00	0.91			1.00
Lanes:	0.00	0.00	0.00			1.00	0.00	2.00			0.00	3.00		1.00		0.00	3.00			1.00
Final Sat.:	0	0	0			1809	0	2842			0	5187		1615		0	5187			1900
Capacity Analysis Module:																				
Vol/Sat:	0.00	0.00	0.00			0.03	0.00	0.21			0.00	0.56		0.49		0.00	0.46			0.00
Crit Moves:								****				****				****				
Green/Cycle:	0.00	0.00	0.00			0.27	0.00	0.27			0.00	0.73		0.73		0.00	0.73			0.00
Volume/Cap:	0.00	0.00	0.00			0.09	0.00	0.78			0.00	0.78		0.67		0.00	0.63			0.00
Delay/Veh:	0.0	0.0	0.0			27.1	0.0	38.5			0.0	9.8		8.8		0.0	7.3			0.0
User DelAdj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00		1.00		1.00	1.00			1.00
AdjDel/Veh:	0.0	0.0	0.0			27.1	0.0	38.5			0.0	9.8		8.8		0.0	7.3			0.0
LOS by Move:	A		A			C		A			D			A		A		A		A
HCM2kAvgQ:	0		0			1		0			12			0		22		14		0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #20 I-215 NB Off Ramp & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.851
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 17.1
Optimal Cycle: 153 Level Of Service: B

Street Name:	I-215 NB Off Ramp						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 0	0 1	0	0 0	0 0	0	0 3	0 1	0	0 3	0 1
Volume Module:												
Base Vol:	409	0	492	0	0	0	0	1562	280	0	2836	314
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	409	0	492	0	0	0	0	1562	280	0	2836	314
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	409	0	492	0	0	0	0	1562	280	0	2836	314
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
PHF Volume:	409	0	492	0	0	0	0	1562	280	0	2836	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	409	0	492	0	0	0	0	1562	280	0	2836	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
FinalVolume:	409	0	492	0	0	0	0	1562	280	0	2836	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	1.00	1.00	1.00	1.00	0.91	0.85	1.00	0.91	1.00
Lanes:	1.00	0.00	1.00	0.00	0.00	0.00	0.00	3.00	1.00	0.00	3.00	1.00
Final Sat.:	1805	0	1615	0	0	0	0	5187	1615	0	5187	1900
Capacity Analysis Module:												
Vol/Sat:	0.23	0.00	0.30	0.00	0.00	0.00	0.00	0.30	0.17	0.00	0.55	0.00
Crit Moves:			****				****				****	
Green/Cycle:	0.36	0.00	0.36	0.00	0.00	0.00	0.00	0.64	0.64	0.00	0.64	0.00
Volume/Cap:	0.63	0.00	0.85	0.00	0.00	0.00	0.00	0.47	0.27	0.00	0.85	0.00
Delay/Veh:	28.7	0.0	41.2	0.0	0.0	0.0	0.0	9.3	7.9	0.0	16.4	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	28.7	0.0	41.2	0.0	0.0	0.0	0.0	9.3	7.9	0.0	16.4	0.0
LOS by Move:	C	A	D	A	A	A	A	A	A	A	B	A
HCM2kAvgQ:	11	0	17	0	0	0	0	9	4	0	28	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #21 Antelope Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.495
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 4.5
Optimal Cycle: 45 Level Of Service: A

Street Name:	Antelope Road						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ignore			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0 0	0 0	2	0 0	0 2	2	0 3	0 0	0	0 2	1 0
Volume Module:												
Base Vol:	0	0	0	174	0	916	117	2128	0	0	1645	427
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	174	0	916	117	2128	0	0	1645	427
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	174	0	916	117	2128	0	0	1645	427
User Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	174	0	0	117	2128	0	0	1645	427
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	174	0	0	117	2128	0	0	1645	427
PCE Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	174	0	0	117	2128	0	0	1645	427
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.92	1.00	0.88	0.92	0.91	1.00	1.00	0.88	0.88
Lanes:	0.00	0.00	0.00	2.00	0.00	2.00	2.00	3.00	0.00	0.00	2.38	0.62
Final Sat.:	0	0	0	3502	0	3344	3502	5187	0	0	3990	1036
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.05	0.00	0.00	0.03	0.41	0.00	0.00	0.41	0.41
Crit Moves:				****			****				****	
Green/Cycle:	0.00	0.00	0.00	0.10	0.00	0.00	0.07	0.90	0.00	0.00	0.83	0.83
Volume/Cap:	0.00	0.00	0.00	0.50	0.00	0.00	0.50	0.46	0.00	0.00	0.50	0.50
Delay/Veh:	0.0	0.0	0.0	43.7	0.0	0.0	46.6	0.9	0.0	0.0	2.5	2.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	43.7	0.0	0.0	46.6	0.9	0.0	0.0	2.5	2.5
LOS by Move:	A	A	A	D	A	A	D	A	A	A	A	A
HCM2kAvgQ:	0	0	0	3	0	0	2	5	0	0	7	7

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #23 Liberty Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.719
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 10.0
Optimal Cycle: 81 Level Of Service: B

Street Name:	Liberty Road						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	0	0	1	0	0	0	0	0	0	2	1	0	1	0	3	0	0
Volume Module:												
Base Vol:	81	0	286	0	0	0	0	2323	323	41	2078	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	81	0	286	0	0	0	0	2323	323	41	2078	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	81	0	286	0	0	0	0	2323	323	41	2078	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	81	0	286	0	0	0	0	2323	323	41	2078	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	81	0	286	0	0	0	0	2323	323	41	2078	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	81	0	286	0	0	0	0	2323	323	41	2078	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.85	1.00	1.00	1.00	1.00	0.89	0.89	0.95	0.91	1.00
Lanes:	2.00	0.00	1.00	0.00	0.00	0.00	0.00	2.63	0.37	1.00	3.00	0.00
Final Sat.:	3502	0	1615	0	0	0	0	4472	622	1805	5187	0
Capacity Analysis Module:												
Vol/Sat:	0.02	0.00	0.18	0.00	0.00	0.00	0.00	0.52	0.52	0.02	0.40	0.00
Crit Moves:			****					****		****		
Green/Cycle:	0.25	0.00	0.25	0.00	0.00	0.00	0.00	0.72	0.72	0.03	0.75	0.00
Volume/Cap:	0.09	0.00	0.72	0.00	0.00	0.00	0.00	0.72	0.72	0.72	0.53	0.00
Delay/Veh:	29.1	0.0	40.8	0.0	0.0	0.0	0.0	8.7	8.7	83.7	5.2	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	29.1	0.0	40.8	0.0	0.0	0.0	0.0	8.7	8.7	83.7	5.2	0.0
LOS by Move:	C	A	D	A	A	A	A	A	A	F	A	A
HCM2kAvgQ:	1	0	9	0	0	0	0	18	18	3	10	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #24 Leon Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.972
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 28.6
Optimal Cycle: 180 Level Of Service: C

Street Name:	Leon Road						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ovl			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	1	0	0	0	2	2	0	3	0	0	0	0	3	0	1
Volume Module:												
Base Vol:	0	0	0	143	0	1218	638	1950	0	0	913	877
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	143	0	1218	638	1950	0	0	913	877
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	143	0	1218	638	1950	0	0	913	877
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	143	0	1218	638	1950	0	0	913	877
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	143	0	1218	638	1950	0	0	913	877
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	143	0	1218	638	1950	0	0	913	877
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.95	1.00	0.75	0.92	0.91	1.00	1.00	0.91	0.85
Lanes:	0.00	0.00	0.00	1.00	0.00	2.00	2.00	3.00	0.00	0.00	3.00	1.00
Final Sat.:	0	0	0	1805	0	2842	3502	5187	0	0	5187	1615
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.08	0.00	0.43	0.18	0.38	0.00	0.00	0.18	0.54
Crit Moves:						****	****					****
Green/Cycle:	0.00	0.00	0.00	0.25	0.00	0.44	0.19	0.75	0.00	0.00	0.56	0.56
Volume/Cap:	0.00	0.00	0.00	0.31	0.00	0.97	0.97	0.50	0.00	0.00	0.31	0.97
Delay/Veh:	0.0	0.0	0.0	30.7	0.0	46.2	68.4	5.3	0.0	0.0	11.9	44.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	30.7	0.0	46.2	68.4	5.3	0.0	0.0	11.9	44.4
LOS by Move:	A	A	A	C	A	D	E	A	A	A	B	D
HCM2kAvgQ:	0	0	0	4	0	27	15	9	0	0	5	33

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #25 Winchester Road - SR-79 & Benton Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.057
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 53.7
Optimal Cycle: 180 Level Of Service: D

Street Name:	Winchester Road - SR-79						Benton Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 3	0 1	2	0 3	0 1	2	0 2	0 2	2	0 2	0 1
Volume Module:												
Base Vol:	462	2486	738	75	1004	485	83	704	1387	241	720	92
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	462	2486	738	75	1004	485	83	704	1387	241	720	92
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	462	2486	738	75	1004	485	83	704	1387	241	720	92
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	462	2486	738	75	1004	485	83	704	1387	241	720	92
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	462	2486	738	75	1004	485	83	704	1387	241	720	92
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	462	2486	738	75	1004	485	83	704	1387	241	720	92
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.91	0.85	0.92	0.91	0.85	0.92	0.95	0.75	0.92	0.95	0.85
Lanes:	2.00	3.00	1.00	2.00	3.00	1.00	2.00	2.00	2.00	2.00	2.00	1.00
Final Sat.:	3502	5187	1615	3502	5187	1615	3502	3610	2842	3502	3610	1615
Capacity Analysis Module:												
Vol/Sat:	0.13	0.48	0.46	0.02	0.19	0.30	0.02	0.20	0.49	0.07	0.20	0.06
Crit Moves:		****		****					****	****		
Green/Cycle:	0.14	0.45	0.45	0.02	0.33	0.33	0.06	0.46	0.46	0.07	0.47	0.47
Volume/Cap:	0.91	1.06	1.01	1.06	0.59	0.91	0.42	0.42	1.06	1.06	0.42	0.12
Delay/Veh:	63.1	63.3	62.7	172.6	28.5	52.4	47.1	18.2	68.5	122.3	17.7	14.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	63.1	63.3	62.7	172.6	28.5	52.4	47.1	18.2	68.5	122.3	17.7	14.9
LOS by Move:	E	E	E	F	C	D	D	B	E	F	B	B
HCM2kAvgQ:	11	39	30	3	10	18	2	8	35	8	8	2

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #26 Winchester Road - SR-79 & Via Mira Mosa

Cycle (sec): 100 Critical Vol./Cap.(X): 0.965
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 25.1
Optimal Cycle: 180 Level Of Service: C

Street Name:	Winchester Road - SR-79						Via Mira Mosa					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 0	1 0	1	0 0	1 0
Volume Module:												
Base Vol:	69	3255	228	107	2094	356	229	28	54	229	40	129
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	69	3255	228	107	2094	356	229	28	54	229	40	129
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	69	3255	228	107	2094	356	229	28	54	229	40	129
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	69	3255	228	107	2094	356	229	28	54	229	40	129
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	69	3255	228	107	2094	356	229	28	54	229	40	129
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	69	3255	228	107	2094	356	229	28	54	229	40	129
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.90	0.90	0.95	0.89	0.89	0.95	0.90	0.90	0.95	0.89	0.89
Lanes:	1.00	2.80	0.20	1.00	2.56	0.44	1.00	0.34	0.66	1.00	0.24	0.76
Final Sat.:	1805	4799	336	1805	4336	737	1805	585	1127	1805	398	1285
Capacity Analysis Module:												
Vol/Sat:	0.04	0.68	0.68	0.06	0.48	0.48	0.13	0.05	0.05	0.13	0.10	0.10
Crit Moves:		****		****			****				****	
Green/Cycle:	0.06	0.70	0.70	0.06	0.71	0.71	0.13	0.06	0.06	0.17	0.10	0.10
Volume/Cap:	0.68	0.96	0.96	0.96	0.68	0.68	0.96	0.74	0.74	0.74	0.96	0.96
Delay/Veh:	63.7	22.1	22.1	120.8	8.8	8.8	91.6	69.3	69.3	48.7	102	102.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	63.7	22.1	22.1	120.8	8.8	8.8	91.6	69.3	69.3	48.7	102	102.1
LOS by Move:	E	C	C	F	A	A	F	E	E	D	F	F
HCM2kAvgQ:	3	43	43	6	16	16	11	4	4	8	9	9

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #27 Monroe Ave & Los Alamos

Cycle (sec): 100 Critical Vol./Cap.(X): 0.785
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 27.5
Optimal Cycle: 106 Level Of Service: C

Street Name:	Monroe Ave						Los Alamos					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	2	0 2	0 1	1	0 1	1 0	1	0 2	0 1
Volume Module:												
Base Vol:	29	469	264	235	281	61	229	1460	165	84	975	467
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	29	469	264	235	281	61	229	1460	165	84	975	467
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	29	469	264	235	281	61	229	1460	165	84	975	467
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	29	469	264	235	281	61	229	1460	165	84	975	467
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	29	469	264	235	281	61	229	1460	165	84	975	467
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	29	469	264	235	281	61	229	1460	165	84	975	467
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.90	0.90	0.92	0.95	0.85	0.95	0.94	0.94	0.95	0.95	0.85
Lanes:	1.00	1.28	0.72	2.00	2.00	1.00	1.00	1.80	0.20	1.00	2.00	1.00
Final Sat.:	1805	2185	1230	3502	3610	1615	1805	3195	361	1805	3610	1615
Capacity Analysis Module:												
Vol/Sat:	0.02	0.21	0.21	0.07	0.08	0.04	0.13	0.46	0.46	0.05	0.27	0.29
Crit Moves:		****		****				****		****		
Green/Cycle:	0.06	0.27	0.27	0.09	0.30	0.30	0.20	0.58	0.58	0.06	0.45	0.45
Volume/Cap:	0.26	0.79	0.79	0.79	0.26	0.13	0.65	0.79	0.79	0.79	0.61	0.65
Delay/Veh:	46.0	38.1	38.1	57.6	26.9	25.8	41.3	18.1	18.1	77.2	21.7	23.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	46.0	38.1	38.1	57.6	26.9	25.8	41.3	18.1	18.1	77.2	21.7	23.7
LOS by Move:	D	D	D	E	C	C	D	B	B	E	C	C
HCM2kAvgQ:	1	13	13	6	3	1	8	22	22	4	12	12

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #28 Jefferson Avenue & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.829
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 206.4
Optimal Cycle: 180 Level Of Service: F

Street Name:	Jefferson Avenue						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 3	0 1	1	0 2	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	6	2300	1226	814	1025	70	40	210	111	581	90	891
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	6	2300	1226	814	1025	70	40	210	111	581	90	891
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	6	2300	1226	814	1025	70	40	210	111	581	90	891
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	6	2300	1226	814	1025	70	40	210	111	581	90	891
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	6	2300	1226	814	1025	70	40	210	111	581	90	891
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	6	2300	1226	814	1025	70	40	210	111	581	90	891
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.85	0.95	0.90	0.90	0.95	0.86	0.86	0.95	0.79	0.79
Lanes:	1.00	3.00	1.00	1.00	2.81	0.19	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1805	5187	1615	1805	4807	328	1805	3278	1639	1805	2988	1494
Capacity Analysis Module:												
Vol/Sat:	0.00	0.44	0.76	0.45	0.21	0.21	0.02	0.06	0.07	0.32	0.03	0.60
Crit Moves:			****	****			****					****
Green/Cycle:	0.01	0.42	0.42	0.25	0.65	0.65	0.01	0.06	0.06	0.28	0.33	0.33
Volume/Cap:	0.33	1.07	1.83	1.83	0.33	0.33	1.83	1.09	1.15	1.15	0.09	1.83
Delay/Veh:	59.3	69.8	408.0	419.3	7.8	7.8	556.0	126	148.4	125.1	23.4	413.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	59.3	69.8	408.0	419.3	7.8	7.8	556.0	126	148.4	125.1	23.4	413.9
LOS by Move:	E	E	F	F	A	A	F	F	F	F	C	F
HCM2kAvgQ:	1	38	106	71	5	5	5	8	8	31	1	85

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #29 Madison Avenue & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.342
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 129.6
Optimal Cycle: 180 Level Of Service: F

Street Name:	Madison Avenue						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	2	0	1	2	0	1	1	0	2	0	3	0	1
Volume Module:												
Base Vol:	316	600	1218	342	247	116	346	1505	279	791	1185	189
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	316	600	1218	342	247	116	346	1505	279	791	1185	189
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	316	600	1218	342	247	116	346	1505	279	791	1185	189
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	316	600	1218	342	247	116	346	1505	279	791	1185	189
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	316	600	1218	342	247	116	346	1505	279	791	1185	189
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	316	600	1218	342	247	116	346	1505	279	791	1185	189
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.95	0.85	0.92	0.90	0.90	0.92	0.89	0.89	0.92	0.91	0.85
Lanes:	2.00	2.00	1.00	2.00	1.36	0.64	2.00	3.37	0.63	2.00	3.00	1.00
Final Sat.:	3502	3610	1615	3502	2338	1098	3502	5700	1057	3502	5187	1615
Capacity Analysis Module:												
Vol/Sat:	0.09	0.17	0.75	0.10	0.11	0.11	0.10	0.26	0.26	0.23	0.23	0.12
Crit Moves:			****	****				****		****		
Green/Cycle:	0.29	0.56	0.56	0.07	0.34	0.34	0.11	0.20	0.20	0.17	0.25	0.25
Volume/Cap:	0.31	0.30	1.34	1.34	0.31	0.31	0.90	1.34	1.34	1.34	0.90	0.46
Delay/Veh:	27.7	11.6	183.1	224.1	24.3	24.3	66.6	199	199.1	206.6	44.3	32.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	27.7	11.6	183.1	224.1	24.3	24.3	66.6	199	199.1	206.6	44.3	32.3
LOS by Move:	C	B	F	F	C	C	E	F	F	F	D	C
HCM2kAvgQ:	4	5	76	13	4	4	8	32	32	27	17	5

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #30 I-15 SB Off-Ramp & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.729
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 14.3
Optimal Cycle: 84 Level Of Service: B

Street Name:	I-15 SB Off-Ramp						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	1	0	1!	0	1	0	0	3	0	1	0	0	3	0	1
Volume Module:												
Base Vol:	0	0	0	674	0	422	0	2533	487	0	2188	112
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	674	0	422	0	2533	487	0	2188	112
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	674	0	422	0	2533	487	0	2188	112
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	0	0	0	674	0	422	0	2533	0	0	2188	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	674	0	422	0	2533	0	0	2188	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	0	0	0	674	0	422	0	2533	0	0	2188	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.91	1.00	0.91	1.00	0.91	1.00	1.00	0.91	1.00
Lanes:	0.00	0.00	0.00	1.61	0.00	1.39	0.00	3.00	1.00	0.00	3.00	1.00
Final Sat.:	0	0	0	2804	0	2405	0	5187	1900	0	5187	1900
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.24	0.00	0.18	0.00	0.49	0.00	0.00	0.42	0.00
Crit Moves:				****				****		****		
Green/Cycle:	0.00	0.00	0.00	0.33	0.00	0.33	0.00	0.67	0.00	0.00	0.67	0.00
Volume/Cap:	0.00	0.00	0.00	0.73	0.00	0.53	0.00	0.73	0.00	0.00	0.63	0.00
Delay/Veh:	0.0	0.0	0.0	31.4	0.0	27.5	0.0	11.4	0.0	0.0	9.8	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	31.4	0.0	27.5	0.0	11.4	0.0	0.0	9.8	0.0
LOS by Move:	A	A	A	C	A	C	A	B	A	A	A	A
HCM2kAvgQ:	0	0	0	13	0	8	0	19	0	0	14	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #31 I-15 NB Off-Ramp & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.560
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 7.9
Optimal Cycle: 52 Level Of Service: A

Street Name:	I-15 NB Off-Ramp						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	0	0	1	0	0	0	0	0	0	1
Volume Module:												
Base Vol:	213	0	239	0	0	0	0	2848	370	0	1582	1637
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	213	0	239	0	0	0	0	2848	370	0	1582	1637
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	213	0	239	0	0	0	0	2848	370	0	1582	1637
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	213	0	239	0	0	0	0	2848	0	0	1582	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	213	0	239	0	0	0	0	2848	0	0	1582	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	213	0	239	0	0	0	0	2848	0	0	1582	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.85	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Lanes:	2.00	0.00	1.00	0.00	0.00	0.00	0.00	4.00	1.00	0.00	4.00	1.00
Final Sat.:	3502	0	1615	0	0	0	0	6916	1900	0	6916	1900
Capacity Analysis Module:												
Vol/Sat:	0.06	0.00	0.15	0.00	0.00	0.00	0.00	0.41	0.00	0.00	0.23	0.00
Crit Moves:			****					****		****		
Green/Cycle:	0.26	0.00	0.26	0.00	0.00	0.00	0.00	0.74	0.00	0.00	0.74	0.00
Volume/Cap:	0.23	0.00	0.56	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.31	0.00
Delay/Veh:	28.9	0.0	33.4	0.0	0.0	0.0	0.0	6.1	0.0	0.0	4.6	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	28.9	0.0	33.4	0.0	0.0	0.0	0.0	6.1	0.0	0.0	4.6	0.0
LOS by Move:	C	A	C	A	A	A	A	A	A	A	A	A
HCM2kAvgQ:	3	0	7	0	0	0	0	11	0	0	5	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #32 I-215 SB Off-Ramp & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.825
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 10.8
Optimal Cycle: 106 Level Of Service: B

Street Name:	I-215 SB Off-Ramp						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	1	0	1!	0	1	0	0	3	0	1	0	0	3	0	1
Volume Module:												
Base Vol:	0	0	0	470	0	362	0	3377	139	0	2338	238
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	470	0	362	0	3377	139	0	2338	238
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	470	0	362	0	3377	139	0	2338	238
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	0	0	0	470	0	362	0	3377	0	0	2338	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	470	0	362	0	3377	0	0	2338	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	0	0	0	470	0	362	0	3377	0	0	2338	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.91	1.00	0.91	1.00	0.91	1.00	1.00	0.91	1.00
Lanes:	0.00	0.00	0.00	1.56	0.00	1.44	0.00	3.00	1.00	0.00	3.00	1.00
Final Sat.:	0	0	0	2705	0	2481	0	5187	1900	0	5187	1900
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.17	0.00	0.15	0.00	0.65	0.00	0.00	0.45	0.00
Crit Moves:				****				****				
Green/Cycle:	0.00	0.00	0.00	0.21	0.00	0.21	0.00	0.79	0.00	0.00	0.79	0.00
Volume/Cap:	0.00	0.00	0.00	0.82	0.00	0.69	0.00	0.82	0.00	0.00	0.57	0.00
Delay/Veh:	0.0	0.0	0.0	43.3	0.0	38.2	0.0	7.8	0.0	0.0	4.2	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	43.3	0.0	38.2	0.0	7.8	0.0	0.0	4.2	0.0
LOS by Move:	A	A	A	D	A	D	A	A	A	A	A	A
HCM2kAvgQ:	0	0	0	11	0	8	0	25	0	0	10	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #33 I-215 NB Off-Ramp & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.619
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 9.4
Optimal Cycle: 49 Level Of Service: A

Street Name:	I-215 NB Off-Ramp						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	0	0	2	0	0	0	0	0	3	0	1	0	0	3	0	1
Volume Module:																		
Base Vol:	84	0	465	0	0	0	0	2331	104	0	2361	1383
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	84	0	465	0	0	0	0	2331	104	0	2361	1383
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	84	0	465	0	0	0	0	2331	104	0	2361	1383
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	84	0	465	0	0	0	0	2331	0	0	2361	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	84	0	465	0	0	0	0	2331	0	0	2361	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	84	0	465	0	0	0	0	2331	0	0	2361	0
Saturation Flow Module:																		
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.75	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Lanes:	2.00	0.00	2.00	0.00	0.00	0.00	0.00	3.00	1.00	0.00	3.00	1.00
Final Sat.:	3502	0	2842	0	0	0	0	5187	1900	0	5187	1900
Capacity Analysis Module:																		
Vol/Sat:	0.02	0.00	0.16	0.00	0.00	0.00	0.00	0.45	0.00	0.00	0.46	0.00
Crit Moves:			****								****	
Green/Cycle:	0.26	0.00	0.26	0.00	0.00	0.00	0.00	0.74	0.00	0.00	0.74	0.00
Volume/Cap:	0.09	0.00	0.62	0.00	0.00	0.00	0.00	0.61	0.00	0.00	0.62	0.00
Delay/Veh:	27.8	0.0	33.9	0.0	0.0	0.0	0.0	6.6	0.0	0.0	6.7	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	27.8	0.0	33.9	0.0	0.0	0.0	0.0	6.6	0.0	0.0	6.7	0.0
LOS by Move:	C	A	C	A	A	A	A	A	A	A	A	A
HCM2kAvgQ:	1	0	8	0	0	0	0	13	0	0	13	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #34 Jackson Avenue & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.552
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 8.5
Optimal Cycle: 51 Level Of Service: A

Street Name:	Jackson Avenue						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	0	0	2	0	0	0	0	0	3	0	1	1	0	3	0	0
Volume Module:																		
Base Vol:	201	0	169	0	0	0	0	1910	59	213	2568	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	201	0	169	0	0	0	0	1910	59	213	2568	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	201	0	169	0	0	0	0	1910	59	213	2568	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	201	0	169	0	0	0	0	1910	59	213	2568	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	201	0	169	0	0	0	0	1910	59	213	2568	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	201	0	169	0	0	0	0	1910	59	213	2568	0
Saturation Flow Module:																		
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.75	1.00	1.00	1.00	1.00	0.91	0.85	0.95	0.91	1.00
Lanes:	2.00	0.00	2.00	0.00	0.00	0.00	0.00	3.00	1.00	1.00	3.00	0.00
Final Sat.:	3502	0	2842	0	0	0	0	5187	1615	1805	5187	0
Capacity Analysis Module:																		
Vol/Sat:	0.06	0.00	0.06	0.00	0.00	0.00	0.00	0.37	0.04	0.12	0.50	0.00
Crit Moves:	****							****			****	
Green/Cycle:	0.10	0.00	0.10	0.00	0.00	0.00	0.00	0.68	0.68	0.22	0.90	0.00
Volume/Cap:	0.55	0.00	0.57	0.00	0.00	0.00	0.00	0.54	0.05	0.54	0.55	0.00
Delay/Veh:	44.4	0.0	45.4	0.0	0.0	0.0	0.0	8.3	5.4	36.3	1.2	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	44.4	0.0	45.4	0.0	0.0	0.0	0.0	8.3	5.4	36.3	1.2	0.0
LOS by Move:	D	A	D	A	A	A	A	A	A	D	A	A
HCM2kAvgQ:	4	0	4	0	0	0	0	11	1	6	7	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #35 Margarita Road & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.018
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 49.2
Optimal Cycle: 180 Level Of Service: D

Street Name:	Margarita Road							Murrieta Hot Springs Road							
Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Split Phase				Split Phase				Protected				Protected			
Rights:	Include				Include				Include				Include			
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0	
Lanes:	2	0	1	0	1	0	1	0	0	1	1	0	2	1	0	1	0	2	1	0
Volume Module:																
Base Vol:	933	69	383		185	77	150		51	1752	538		273	1609	38	
Growth Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
Initial Bse:	933	69	383		185	77	150		51	1752	538		273	1609	38	
Added Vol:	0	0	0		0	0	0		0	0	0		0	0	0	
PasserByVol:	0	0	0		0	0	0		0	0	0		0	0	0	
Initial Fut:	933	69	383		185	77	150		51	1752	538		273	1609	38	
User Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Volume:	933	69	383		185	77	150		51	1752	538		273	1609	38	
Reduct Vol:	0	0	0		0	0	0		0	0	0		0	0	0	
Reduced Vol:	933	69	383		185	77	150		51	1752	538		273	1609	38	
PCE Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
MLF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
FinalVolume:	933	69	383		185	77	150		51	1752	538		273	1609	38	
Saturation Flow Module:																
Sat/Lane:	1900	1900	1900		1900	1900	1900		1900	1900	1900		1900	1900	1900	
Adjustment:	0.92	1.00	0.85		0.97	0.97	0.85		0.95	0.88	0.88		0.95	0.91	0.91	
Lanes:	2.00	1.00	1.00		0.71	0.29	1.00		1.00	2.30	0.70		1.00	2.93	0.07	
Final Sat.:	3502	1900	1615		1296	539	1615		1805	3830	1176		1805	5052	119	
Capacity Analysis Module:																
Vol/Sat:	0.27	0.04	0.24		0.14	0.14	0.09		0.03	0.46	0.46		0.15	0.32	0.32	
Crit Moves:	****					****					****			****		
Green/Cycle:	0.26	0.26	0.26		0.14	0.14	0.14		0.05	0.45	0.45		0.15	0.55	0.55	
Volume/Cap:	1.02	0.14	0.91		1.02	1.02	0.66		0.58	1.02	1.02		1.02	0.58	0.58	
Delay/Veh:	71.2	28.4	58.4		103.8	104	47.9		55.9	51.1	51.1		102.2	15.2	15.2	
User DelAdj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
AdjDel/Veh:	71.2	28.4	58.4		103.8	104	47.9		55.9	51.1	51.1		102.2	15.2	15.2	
LOS by Move:	E	C	E		F	F	D		E	D	D		F	B	B	
HCM2kAvgQ:	22	2	15		13	13	6		2	35	35		14	12	12	

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #36 French Valley Parkway & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.815
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 18.4
Optimal Cycle: 124 Level Of Service: B

Street Name:	French Valley Parkway							Murrieta Hot Springs Road							
Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected				Protected				Protected				Protected			
Rights:	Ovl				Include				Include				Include			
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0	
Lanes:	1	0	0	0	2	0	0	0	0	0	0	0	2	1	0	1	0	3	0	0
Volume Module:																
Base Vol:	32	0	1110		0	0	0		0	1808	343		453	1697	0	
Growth Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
Initial Bse:	32	0	1110		0	0	0		0	1808	343		453	1697	0	
Added Vol:	0	0	0		0	0	0		0	0	0		0	0	0	
PasserByVol:	0	0	0		0	0	0		0	0	0		0	0	0	
Initial Fut:	32	0	1110		0	0	0		0	1808	343		453	1697	0	
User Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
PHF Volume:	32	0	1110		0	0	0		0	1808	343		453	1697	0	
Reduct Vol:	0	0	0		0	0	0		0	0	0		0	0	0	
Reduced Vol:	32	0	1110		0	0	0		0	1808	343		453	1697	0	
PCE Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
MLF Adj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
FinalVolume:	32	0	1110		0	0	0		0	1808	343		453	1697	0	
Saturation Flow Module:																
Sat/Lane:	1900	1900	1900		1900	1900	1900		1900	1900	1900		1900	1900	1900	
Adjustment:	0.95	1.00	0.75		1.00	1.00	1.00		1.00	0.89	0.89		0.95	0.91	1.00	
Lanes:	1.00	0.00	2.00		0.00	0.00	0.00		0.00	2.52	0.48		1.00	3.00	0.00	
Final Sat.:	1805	0	2842		0	0	0		0	4255	807		1805	5187	0	
Capacity Analysis Module:																
Vol/Sat:	0.02	0.00	0.39		0.00	0.00	0.00		0.00	0.42	0.42		0.25	0.33	0.00	
Crit Moves:			****							****			****			
Green/Cycle:	0.17	0.00	0.48		0.00	0.00	0.00		0.00	0.52	0.52		0.31	0.83	0.00	
Volume/Cap:	0.10	0.00	0.82		0.00	0.00	0.00		0.00	0.82	0.82		0.82	0.39	0.00	
Delay/Veh:	35.1	0.0	26.2		0.0	0.0	0.0		0.0	22.0	22.0		41.1	2.2	0.0	
User DelAdj:	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	
AdjDel/Veh:	35.1	0.0	26.2		0.0	0.0	0.0		0.0	22.0	22.0		41.1	2.2	0.0	
LOS by Move:	D	A	C		A	A	A		A	C	C		D	A	A	
HCM2kAvgQ:	1	0	19		0	0	0		0	22	22		15	5	0	

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #37 Jefferson Avenue & Guava Street

Cycle (sec): 100 Critical Vol./Cap.(X): 0.767
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 7.9
Optimal Cycle: 80 Level Of Service: A

Street Name:	Jefferson Avenue						Guava Street					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 0	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	14	3281	10	11	1174	349	103	86	133	2	71	16
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	14	3281	10	11	1174	349	103	86	133	2	71	16
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	14	3281	10	11	1174	349	103	86	133	2	71	16
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	14	3281	10	11	1174	349	103	86	133	2	71	16
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	14	3281	10	11	1174	349	103	86	133	2	71	16
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	14	3281	10	11	1174	349	103	86	133	2	71	16
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.88	0.88	0.61	0.91	0.91	0.24	0.92	0.92
Lanes:	1.00	2.99	0.01	1.00	2.31	0.69	1.00	0.39	0.61	1.00	1.63	0.37
Final Sat.:	1805	5171	16	1805	3862	1148	1161	678	1049	460	2864	645
Capacity Analysis Module:												
Vol/Sat:	0.01	0.63	0.63	0.01	0.30	0.30	0.09	0.13	0.13	0.00	0.02	0.02
Crit Moves:		****		****				****				
Green/Cycle:	0.02	0.83	0.83	0.01	0.81	0.81	0.17	0.17	0.17	0.17	0.17	0.17
Volume/Cap:	0.37	0.77	0.77	0.77	0.37	0.37	0.54	0.77	0.77	0.03	0.15	0.15
Delay/Veh:	54.5	5.0	5.0	171.1	2.5	2.5	41.2	51.8	51.8	35.1	35.8	35.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	54.5	5.0	5.0	171.1	2.5	2.5	41.2	51.8	51.8	35.1	35.8	35.8
LOS by Move:	D	A	A	F	A	A	D	D	D	D	D	D
HCM2kAvgQ:	1	19	19	1	5	5	4	8	8	0	1	1

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #39 Washington Ave & Calle Del Oso Oro/Nutmeg

Cycle (sec): 100 Critical Vol./Cap.(X): 0.549
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 27.5
Optimal Cycle: 51 Level Of Service: C

Street Name:	Washington Ave						Calle Del Oso Oro/Nutmeg					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	421	306	134	93	236	55	28	209	276	164	635	163
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	421	306	134	93	236	55	28	209	276	164	635	163
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	421	306	134	93	236	55	28	209	276	164	635	163
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	421	306	134	93	236	55	28	209	276	164	635	163
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	421	306	134	93	236	55	28	209	276	164	635	163
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	421	306	134	93	236	55	28	209	276	164	635	163
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.87	0.87	0.95	0.88	0.88	0.95	0.87	0.87	0.95	0.92	0.92
Lanes:	1.00	2.09	0.91	1.00	2.43	0.57	1.00	1.00	1.00	1.00	1.59	0.41
Final Sat.:	1805	3441	1507	1805	4089	953	1805	1652	1652	1805	2784	715
Capacity Analysis Module:												
Vol/Sat:	0.23	0.09	0.09	0.05	0.06	0.06	0.02	0.13	0.17	0.09	0.23	0.23
Crit Moves:	****				****				****	****		
Green/Cycle:	0.42	0.34	0.34	0.19	0.11	0.11	0.03	0.30	0.30	0.17	0.44	0.44
Volume/Cap:	0.55	0.26	0.26	0.26	0.55	0.55	0.52	0.42	0.55	0.55	0.52	0.52
Delay/Veh:	22.4	24.3	24.3	34.6	43.7	43.7	56.4	27.9	29.8	40.5	20.6	20.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	22.4	24.3	24.3	34.6	43.7	43.7	56.4	27.9	29.8	40.5	20.6	20.6
LOS by Move:	C	C	C	C	D	D	E	C	C	D	C	C
HCM2kAvgQ:	10	4	4	3	4	4	2	6	8	5	10	10

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #40 Clinton Keith Rd & Calle de Oso Oro/Bear Creek Dr

Cycle (sec): 100 Critical Vol./Cap.(X): 0.651
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 16.5
Optimal Cycle: 53 Level Of Service: B

Street Name:	Clinton Keith Rd						Calle de Oso Oro/Bear Creek Dr					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 0 1	0	1	0 1	1 0
Volume Module:												
Base Vol:	80	179	208	16	90	271	187	520	142	226	747	9
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	80	179	208	16	90	271	187	520	142	226	747	9
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	80	179	208	16	90	271	187	520	142	226	747	9
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	80	179	208	16	90	271	187	520	142	226	747	9
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	80	179	208	16	90	271	187	520	142	226	747	9
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	80	179	208	16	90	271	187	520	142	226	747	9
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.87	0.87	0.95	0.84	0.84	0.32	0.97	0.97	0.27	0.95	0.95
Lanes:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.79	0.21	1.00	1.98	0.02
Final Sat.:	1805	1659	1659	1805	1601	1601	614	1445	395	517	3560	43
Capacity Analysis Module:												
Vol/Sat:	0.04	0.11	0.13	0.01	0.06	0.17	0.30	0.36	0.36	0.44	0.21	0.21
Crit Moves:	****					****				****		
Green/Cycle:	0.07	0.31	0.31	0.02	0.26	0.26	0.67	0.67	0.67	0.67	0.67	0.67
Volume/Cap:	0.65	0.35	0.41	0.41	0.22	0.65	0.45	0.54	0.54	0.65	0.31	0.31
Delay/Veh:	57.2	27.2	27.8	55.1	29.1	35.7	8.5	8.9	8.9	13.9	6.9	6.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	57.2	27.2	27.8	55.1	29.1	35.7	8.5	8.9	8.9	13.9	6.9	6.9
LOS by Move:	E	C	C	E	C	D	A	A	A	B	A	A
HCM2kAvgQ:	4	5	6	1	2	9	3	11	11	5	5	5

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #43 Jefferson Ave & Lemon St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.726
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 18.3
Optimal Cycle: 83 Level Of Service: B

Street Name:	Jefferson Ave						Lemon St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	0 1	1	0 0	1 0
Volume Module:												
Base Vol:	418	2124	2	5	1607	38	42	39	270	16	21	13
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	418	2124	2	5	1607	38	42	39	270	16	21	13
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	418	2124	2	5	1607	38	42	39	270	16	21	13
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	418	2124	2	5	1607	38	42	39	270	16	21	13
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	418	2124	2	5	1607	38	42	39	270	16	21	13
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	418	2124	2	5	1607	38	42	39	270	16	21	13
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.91	0.91	0.95	1.00	0.85	0.95	0.94	0.94
Lanes:	1.00	2.99	0.01	1.00	2.93	0.07	1.00	1.00	1.00	1.00	0.62	0.38
Final Sat.:	1805	5182	5	1805	5052	119	1805	1900	1615	1805	1107	685
Capacity Analysis Module:												
Vol/Sat:	0.23	0.41	0.41	0.00	0.32	0.32	0.02	0.02	0.17	0.01	0.02	0.02
Crit Moves:	****				****				****	****		
Green/Cycle:	0.32	0.75	0.75	0.01	0.44	0.44	0.13	0.23	0.23	0.01	0.11	0.11
Volume/Cap:	0.73	0.54	0.54	0.54	0.73	0.73	0.17	0.09	0.73	0.73	0.17	0.17
Delay/Veh:	34.8	5.4	5.4	103.8	24.3	24.3	38.8	30.3	42.5	126.0	40.9	40.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	34.8	5.4	5.4	103.8	24.3	24.3	38.8	30.3	42.5	126.0	40.9	40.9
LOS by Move:	C	A	A	F	C	C	D	C	D	F	D	D
HCM2kAvgQ:	13	10	10	1	16	16	1	1	9	2	1	1

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #44 Jefferson Ave & Kalmia St

Cycle (sec): 100 Critical Vol./Cap.(X): 1.680
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 159.9
Optimal Cycle: 180 Level Of Service: F

Street Name:	Jefferson Ave						Kalmia St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 3	0 1	1	0 2	1 0	1	0 2	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	412	1763	951	978	1203	34	34	658	281	313	533	869
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	412	1763	951	978	1203	34	34	658	281	313	533	869
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	412	1763	951	978	1203	34	34	658	281	313	533	869
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	412	1763	951	978	1203	34	34	658	281	313	533	869
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	412	1763	951	978	1203	34	34	658	281	313	533	869
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	412	1763	951	978	1203	34	34	658	281	313	533	869
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.91	0.85	0.95	0.91	0.91	0.95	0.87	0.87	0.95	0.86	0.86
Lanes:	2.00	3.00	1.00	1.00	2.92	0.08	1.00	2.10	0.90	1.00	1.00	1.00
Final Sat.:	3502	5187	1615	1805	5024	142	1805	3471	1482	1805	1637	1637
Capacity Analysis Module:												
Vol/Sat:	0.12	0.34	0.59	0.54	0.24	0.24	0.02	0.19	0.19	0.17	0.33	0.53
Crit Moves:			****	****			****					****
Green/Cycle:	0.22	0.35	0.35	0.32	0.45	0.45	0.01	0.17	0.17	0.16	0.32	0.32
Volume/Cap:	0.53	0.97	1.68	1.68	0.53	0.53	1.68	1.11	1.11	1.11	1.03	1.68
Delay/Veh:	35.0	46.6	346.3	347.5	20.0	20.0	503.7	107	107.0	128.5	66.8	345.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	35.0	46.6	346.3	347.5	20.0	20.0	503.7	107	107.0	128.5	66.8	345.6
LOS by Move:	D	D	F	F	C	C	F	F	F	F	E	F
HCM2kAvgQ:	6	25	77	79	10	10	4	19	19	17	25	74

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #45 Jefferson Ave & Juniper St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.827
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 22.3
Optimal Cycle: 132 Level Of Service: C

Street Name:	Jefferson Ave						Juniper St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	192	2787	67	48	1603	98	338	90	378	18	72	82
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	192	2787	67	48	1603	98	338	90	378	18	72	82
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	192	2787	67	48	1603	98	338	90	378	18	72	82
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	192	2787	67	48	1603	98	338	90	378	18	72	82
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	192	2787	67	48	1603	98	338	90	378	18	72	82
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	192	2787	67	48	1603	98	338	90	378	18	72	82
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.90	0.90	0.95	0.84	0.84	0.95	0.87	0.87
Lanes:	1.00	2.93	0.07	1.00	2.83	0.17	1.00	1.00	1.00	1.00	1.00	1.00
Final Sat.:	1805	5050	121	1805	4844	296	1805	1587	1587	1805	1661	1661
Capacity Analysis Module:												
Vol/Sat:	0.11	0.55	0.55	0.03	0.33	0.33	0.19	0.06	0.24	0.01	0.04	0.05
Crit Moves:		****		****					****	****		
Green/Cycle:	0.17	0.67	0.67	0.03	0.53	0.53	0.24	0.29	0.29	0.01	0.06	0.06
Volume/Cap:	0.62	0.83	0.83	0.83	0.62	0.62	0.79	0.20	0.83	0.83	0.69	0.79
Delay/Veh:	42.5	14.1	14.1	108.4	17.0	17.0	45.2	26.9	43.0	164.4	54.9	65.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	42.5	14.1	14.1	108.4	17.0	17.0	45.2	26.9	43.0	164.4	54.9	65.2
LOS by Move:	D	B	B	F	B	B	D	C	D	F	D	E
HCM2kAvgQ:	6	26	26	3	14	14	12	2	14	2	4	5

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #46 Jefferson Ave & Ivy St/Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.944
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 35.8
Optimal Cycle: 180 Level Of Service: D

Street Name:	Jefferson Ave									Ivy St/Los Alamos Rd								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected				Protected				Protected				Protected					
Rights:	Include				Include				Include				Include					
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0			
Lanes:	2	0	3	0	1	2	0	3	0	1	1	0	1	1	0	1	0	1	1	0
Volume Module:																				
Base Vol:	312	2389		685		457	1448		113		90	224		187		259	274		494	
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
Initial Bse:	312	2389		685		457	1448		113		90	224		187		259	274		494	
Added Vol:	0	0		0		0	0		0		0	0		0		0	0		0	
PasserByVol:	0	0		0		0	0		0		0	0		0		0	0		0	
Initial Fut:	312	2389		685		457	1448		113		90	224		187		259	274		494	
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Volume:	312	2389		685		457	1448		113		90	224		187		259	274		494	
Reduct Vol:	0	0		0		0	0		0		0	0		0		0	0		0	
Reduced Vol:	312	2389		685		457	1448		113		90	224		187		259	274		494	
PCE Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
MLF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
FinalVolume:	312	2389		685		457	1448		113		90	224		187		259	274		494	
Saturation Flow Module:																				
Sat/Lane:	1900	1900		1900		1900	1900		1900		1900	1900		1900		1900	1900		1900	
Adjustment:	0.92	0.91		0.85		0.92	0.91		0.85		0.95	0.89		0.89		0.95	0.86		0.86	
Lanes:	2.00	3.00		1.00		2.00	3.00		1.00		1.00	1.09		0.91		1.00	1.00		1.00	
Final Sat.:	3502	5187		1615		3502	5187		1615		1805	1834		1531		1805	1632		1632	
Capacity Analysis Module:																				
Vol/Sat:	0.09	0.46		0.42		0.13	0.28		0.07		0.05	0.12		0.12		0.14	0.17		0.30	
Crit Moves:		****				****					****								****	
Green/Cycle:	0.15	0.49		0.49		0.14	0.47		0.47		0.05	0.17		0.17		0.20	0.32		0.32	
Volume/Cap:	0.59	0.94		0.87		0.94	0.59		0.15		0.94	0.71		0.71		0.71	0.52		0.94	
Delay/Veh:	41.2	32.5		33.0		70.0	19.5		14.9		120.9	43.2		43.2		43.6	28.1		52.3	
User DelAdj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
AdjDel/Veh:	41.2	32.5		33.0		70.0	19.5		14.9		120.9	43.2		43.2		43.6	28.1		52.3	
LOS by Move:	D	C		C		E	B		B		F	D		D		D	C		D	
HCM2kAvgQ:	5	31		22		11	12		2		6	8		8		9	8		20	

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #48 Madison Ave/I-15 SB Ramps & Kalmia St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.889
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 30.9
Optimal Cycle: 180 Level Of Service: C

Street Name:	Madison Ave/I-15 SB Ramps									Kalmia St								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected				Protected				Protected				Protected					
Rights:	Include				Include				Include				Include					
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0			
Lanes:	2	0	0	0	2	2	0	1	1	0	0	0	3	1	0	2	0	2	1	1
Volume Module:																				
Base Vol:	392	0		898		306	27		379		0	2534		265		265	1505		614	
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
Initial Bse:	392	0		898		306	27		379		0	2534		265		265	1505		614	
Added Vol:	0	0		0		0	0		0		0	0		0		0	0		0	
PasserByVol:	0	0		0		0	0		0		0	0		0		0	0		0	
Initial Fut:	392	0		898		306	27		379		0	2534		265		265	1505		614	
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Volume:	392	0		898		306	27		379		0	2534		265		265	1505		614	
Reduct Vol:	0	0		0		0	0		0		0	0		0		0	0		0	
Reduced Vol:	392	0		898		306	27		379		0	2534		265		265	1505		614	
PCE Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
MLF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
FinalVolume:	392	0		898		306	27		379		0	2534		265		265	1505		614	
Saturation Flow Module:																				
Sat/Lane:	1900	1900		1900		1900	1900		1900		1900	1900		1900		1900	1900		1900	
Adjustment:	0.92	1.00		0.75		0.92	0.82		0.82		1.00	0.90		0.90		0.92	0.87		0.87	
Lanes:	2.00	0.00		2.00		2.00	1.00		1.00		0.00	3.62		0.38		2.00	2.84		1.16	
Final Sat.:	3502	0		2842		3502	1552		1552		0	6174		646		3502	4701		1918	
Capacity Analysis Module:																				
Vol/Sat:	0.11	0.00		0.32		0.09	0.02		0.24		0.00	0.41		0.41		0.08	0.32		0.32	
Crit Moves:				****		****						****				****				
Green/Cycle:	0.14	0.00		0.36		0.10	0.31		0.31		0.00	0.46		0.46		0.09	0.55		0.55	
Volume/Cap:	0.79	0.00		0.89		0.89	0.06		0.79		0.00	0.89		0.89		0.89	0.59		0.59	
Delay/Veh:	49.4	0.0		40.2		68.1	24.2		39.2		0.0	28.1		28.1		71.5	15.4		15.4	
User DelAdj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
AdjDel/Veh:	49.4	0.0		40.2		68.1	24.2		39.2		0.0	28.1		28.1		71.5	15.4		15.4	
LOS by Move:	D	A		D		E	C		D		A	C		C		E	B		B	
HCM2kAvgQ:	8	0		18		8	1		13		0	25		25		7	12		12	

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #50 Hancock Ave & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.797
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 17.6
Optimal Cycle: 112 Level Of Service: B

Street Name:	Hancock Ave						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ovl			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	2	0	0	2	0	4	0	3	1
Volume Module:												
Base Vol:	0	0	0	598	0	820	755	3291	0	0	2482	311
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	598	0	820	755	3291	0	0	2482	311
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	598	0	820	755	3291	0	0	2482	311
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	598	0	820	755	3291	0	0	2482	311
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	598	0	820	755	3291	0	0	2482	311
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	598	0	820	755	3291	0	0	2482	311
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.92	1.00	0.75	0.92	0.91	1.00	1.00	0.89	0.89
Lanes:	0.00	0.00	0.00	2.00	0.00	2.00	2.00	4.00	0.00	0.00	3.55	0.45
Final Sat.:	0	0	0	3502	0	2842	3502	6916	0	0	6041	757
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.17	0.00	0.29	0.22	0.48	0.00	0.00	0.41	0.41
Crit Moves:				****			****				****	
Green/Cycle:	0.00	0.00	0.00	0.21	0.00	0.48	0.27	0.79	0.00	0.00	0.52	0.52
Volume/Cap:	0.00	0.00	0.00	0.80	0.00	0.60	0.80	0.61	0.00	0.00	0.80	0.80
Delay/Veh:	0.0	0.0	0.0	43.2	0.0	19.4	38.7	4.6	0.0	0.0	21.3	21.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	43.2	0.0	19.4	38.7	4.6	0.0	0.0	21.3	21.3
LOS by Move:	A	A	A	D	A	B	D	A	A	A	C	C
HCM2kAvgQ:	0	0	0	11	0	11	13	12	0	0	21	21

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #51 Alta Murrieta Dr & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.012
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 51.9
Optimal Cycle: 180 Level Of Service: D

Street Name:	Alta Murrieta Dr						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Ovl		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	1	0	1	2	0	1	1	0	2	0
Volume Module:												
Base Vol:	587	221	53	195	128	493	698	1702	518	173	2320	153
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	587	221	53	195	128	493	698	1702	518	173	2320	153
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	587	221	53	195	128	493	698	1702	518	173	2320	153
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	587	221	53	195	128	493	698	1702	518	173	2320	153
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	587	221	53	195	128	493	698	1702	518	173	2320	153
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	587	221	53	195	128	493	698	1702	518	173	2320	153
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.85	0.92	0.84	0.84	0.92	0.88	0.88	0.92	0.91	0.85
Lanes:	2.00	1.00	1.00	2.00	1.00	1.00	2.00	2.30	0.70	2.00	4.00	1.00
Final Sat.:	3502	1900	1615	3502	1590	1590	3502	3838	1168	3502	6916	1615
Capacity Analysis Module:												
Vol/Sat:	0.17	0.12	0.03	0.06	0.08	0.31	0.20	0.44	0.44	0.05	0.34	0.09
Crit Moves:	****					****	****				****	
Green/Cycle:	0.17	0.32	0.32	0.15	0.31	0.31	0.20	0.48	0.48	0.05	0.33	0.48
Volume/Cap:	1.01	0.36	0.10	0.36	0.26	1.01	1.01	0.93	0.93	0.93	1.01	0.20
Delay/Veh:	82.2	26.6	24.1	38.4	26.2	74.2	77.6	32.3	32.3	94.3	55.4	14.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	82.2	26.6	24.1	38.4	26.2	74.2	77.6	32.3	32.3	94.3	55.4	14.8
LOS by Move:	F	C	C	D	C	E	E	C	C	F	E	B
HCM2kAvgQ:	15	5	1	3	3	23	17	28	28	5	27	3

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #52 Winchester Road - SR-79 & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.375
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 104.8
Optimal Cycle: 180 Level Of Service: F

Street Name:	Winchester Road - SR-79						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 3	0 1	2	0 3	0 1	2	0 3	0 1	2	0 2	1 0
Volume Module:												
Base Vol:	334	1970	195	195	1162	1115	1478	1036	280	244	754	99
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	334	1970	195	195	1162	1115	1478	1036	280	244	754	99
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	334	1970	195	195	1162	1115	1478	1036	280	244	754	99
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	334	1970	195	195	1162	1115	1478	1036	280	244	754	99
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	334	1970	195	195	1162	1115	1478	1036	280	244	754	99
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	334	1970	195	195	1162	1115	1478	1036	280	244	754	99
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.91	0.85	0.92	0.91	0.85	0.92	0.91	0.85	0.92	0.89	0.89
Lanes:	2.00	3.00	1.00	2.00	3.00	1.00	2.00	3.00	1.00	2.00	2.65	0.35
Final Sat.:	3502	5187	1615	3502	5187	1615	3502	5187	1615	3502	4507	592
Capacity Analysis Module:												
Vol/Sat:	0.10	0.38	0.12	0.06	0.22	0.69	0.42	0.20	0.17	0.07	0.17	0.17
Crit Moves:	****					****	****				****	
Green/Cycle:	0.07	0.50	0.61	0.07	0.50	0.50	0.31	0.32	0.32	0.11	0.12	0.12
Volume/Cap:	1.38	0.76	0.20	0.76	0.45	1.38	1.38	0.63	0.55	0.63	1.38	1.38
Delay/Veh:	239.2	21.7	8.8	58.1	16.1	201.5	209.4	29.9	29.4	45.8	223	222.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	239.2	21.7	8.8	58.1	16.1	201.5	209.4	29.9	29.4	45.8	223	222.8
LOS by Move:	F	C	A	E	B	F	F	C	C	D	F	F
HCM2kAvgQ:	13	19	3	5	8	72	50	11	8	5	22	22

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #53 Hancock Ave & Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.581
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 223.1
Optimal Cycle: 180 Level Of Service: F

Street Name:	Hancock Ave						Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	2	0 0	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	124	438	871	657	115	26	105	1967	46	538	1361	703
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	124	438	871	657	115	26	105	1967	46	538	1361	703
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	124	438	871	657	115	26	105	1967	46	538	1361	703
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	124	438	871	657	115	26	105	1967	46	538	1361	703
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	124	438	871	657	115	26	105	1967	46	538	1361	703
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	124	438	871	657	115	26	105	1967	46	538	1361	703
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.86	0.86	0.92	0.97	0.97	0.95	0.95	0.95	0.95	0.90	0.90
Lanes:	1.00	1.00	1.00	2.00	0.82	0.18	1.00	1.95	0.05	1.00	1.32	0.68
Final Sat.:	1805	1625	1625	3502	1506	341	1805	3517	82	1805	2259	1167
Capacity Analysis Module:												
Vol/Sat:	0.07	0.27	0.54	0.19	0.08	0.08	0.06	0.56	0.56	0.30	0.60	0.60
Crit Moves:			****	****				****		****		
Green/Cycle:	0.22	0.34	0.34	0.12	0.24	0.24	0.05	0.35	0.35	0.19	0.49	0.49
Volume/Cap:	0.32	0.80	1.58	1.58	0.32	0.32	1.22	1.58	1.58	1.58	1.22	1.22
Delay/Veh:	33.4	32.7	300.3	316.9	31.6	31.6	214.5	298	297.6	315.8	129	129.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	33.4	32.7	300.3	316.9	31.6	31.6	214.5	298	297.6	315.8	129	129.1
LOS by Move:	C	C	F	F	C	C	F	F	F	F	F	F
HCM2kAvgQ:	3	15	70	27	4	4	8	81	81	42	59	59

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #54 I-215 SB Ramps & Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.435
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 157.8
Optimal Cycle: 180 Level Of Service: F

Street Name:	I-215 SB Ramps						Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	1	0	1! 0 1	0	0	2 0 1	2	0	2 0 0
Volume Module:												
Base Vol:	0	0	0	537	0	1534	0	3121	446	146	1263	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	537	0	1534	0	3121	446	146	1263	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	537	0	1534	0	3121	446	146	1263	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	537	0	1534	0	3121	446	146	1263	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	537	0	1534	0	3121	446	146	1263	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	537	0	1534	0	3121	446	146	1263	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.88	1.00	0.88	1.00	0.95	0.85	0.92	0.95	1.00
Lanes:	0.00	0.00	0.00	1.26	0.00	1.74	0.00	2.00	1.00	2.00	2.00	0.00
Final Sat.:	0	0	0	2099	0	2902	0	3610	1615	3502	3610	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.26	0.00	0.53	0.00	0.86	0.28	0.04	0.35	0.00
Crit Moves:						****		****		****		
Green/Cycle:	0.00	0.00	0.00	0.37	0.00	0.37	0.00	0.60	0.60	0.03	0.63	0.00
Volume/Cap:	0.00	0.00	0.00	0.69	0.00	1.43	0.00	1.43	0.46	1.43	0.55	0.00
Delay/Veh:	0.0	0.0	0.0	27.5	0.0	231.3	0.0	218	11.3	291.3	10.7	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	27.5	0.0	231.3	0.0	218	11.3	291.3	10.7	0.0
LOS by Move:	A	A	A	C	A	F	A	F	B	F	B	A
HCM2kAvgQ:	0	0	0	12	0	61	0	111	8	7	12	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #55 I-215 NB Ramps & Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.908
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 24.4
Optimal Cycle: 180 Level Of Service: C

Street Name:	I-215 NB Ramps						Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	0 1	0	0	0 0 0	2	0	3 0 0	0	0	2 0 1
Volume Module:												
Base Vol:	229	0	171	0	0	0	1589	1996	0	0	1182	331
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	229	0	171	0	0	0	1589	1996	0	0	1182	331
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	229	0	171	0	0	0	1589	1996	0	0	1182	331
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	229	0	171	0	0	0	1589	1996	0	0	1182	331
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	229	0	171	0	0	0	1589	1996	0	0	1182	331
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	229	0	171	0	0	0	1589	1996	0	0	1182	331
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	1.00	1.00	1.00	0.92	0.91	1.00	1.00	0.95	0.85
Lanes:	1.00	0.00	1.00	0.00	0.00	0.00	2.00	3.00	0.00	0.00	2.00	1.00
Final Sat.:	1805	0	1615	0	0	0	3502	5187	0	0	3610	1615
Capacity Analysis Module:												
Vol/Sat:	0.13	0.00	0.11	0.00	0.00	0.00	0.45	0.38	0.00	0.00	0.33	0.20
Crit Moves:	****						****				****	
Green/Cycle:	0.14	0.00	0.14	0.00	0.00	0.00	0.50	0.86	0.00	0.00	0.36	0.36
Volume/Cap:	0.91	0.00	0.76	0.00	0.00	0.00	0.91	0.45	0.00	0.00	0.91	0.57
Delay/Veh:	75.7	0.0	55.2	0.0	0.0	0.0	30.3	1.7	0.0	0.0	39.9	27.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	75.7	0.0	55.2	0.0	0.0	0.0	30.3	1.7	0.0	0.0	39.9	27.0
LOS by Move:	E	A	E	A	A	A	C	A	A	A	D	C
HCM2kAvgQ:	10	0	7	0	0	0	27	5	0	0	22	9

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #56 Whitewood Rd & Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.987
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 44.6
Optimal Cycle: 180 Level Of Service: D

Street Name:	Whitewood Rd						Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 2	0 1	1	0 2	0 1	1	0 1	1 0
Volume Module:												
Base Vol:	139	582	34	35	578	567	867	361	298	65	228	48
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	139	582	34	35	578	567	867	361	298	65	228	48
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	139	582	34	35	578	567	867	361	298	65	228	48
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	139	582	34	35	578	567	867	361	298	65	228	48
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	139	582	34	35	578	567	867	361	298	65	228	48
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	139	582	34	35	578	567	867	361	298	65	228	48
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.94	0.94	0.95	0.95	0.85	0.95	0.95	0.85	0.95	0.93	0.93
Lanes:	1.00	1.89	0.11	1.00	2.00	1.00	1.00	2.00	1.00	1.00	1.65	0.35
Final Sat.:	1805	3383	198	1805	3610	1615	1805	3610	1615	1805	2905	612
Capacity Analysis Module:												
Vol/Sat:	0.08	0.17	0.17	0.02	0.16	0.35	0.48	0.10	0.18	0.04	0.08	0.08
Crit Moves:	****					****	****				****	
Green/Cycle:	0.08	0.39	0.39	0.04	0.36	0.36	0.49	0.47	0.47	0.09	0.08	0.08
Volume/Cap:	0.99	0.44	0.44	0.44	0.45	0.99	0.99	0.21	0.39	0.39	0.99	0.99
Delay/Veh:	117.7	22.7	22.7	50.5	25.0	66.1	52.4	15.4	17.3	44.2	96.0	96.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	117.7	22.7	22.7	50.5	25.0	66.1	52.4	15.4	17.3	44.2	96.0	96.0
LOS by Move:	F	C	C	D	C	E	D	B	B	D	F	F
HCM2kAvgQ:	8	7	7	2	7	24	34	3	6	2	8	8

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #57 Whitewood Rd & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.149
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 88.7
Optimal Cycle: 180 Level Of Service: F

Street Name:	Whitewood Rd						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	434	314	529	362	266	233	166	1645	172	401	2240	457
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	434	314	529	362	266	233	166	1645	172	401	2240	457
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	434	314	529	362	266	233	166	1645	172	401	2240	457
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	434	314	529	362	266	233	166	1645	172	401	2240	457
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	434	314	529	362	266	233	166	1645	172	401	2240	457
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	434	314	529	362	266	233	166	1645	172	401	2240	457
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.86	0.86	0.95	0.88	0.88	0.95	0.90	0.90	0.95	0.89	0.89
Lanes:	1.00	1.00	1.00	1.00	1.07	0.93	1.00	2.72	0.28	1.00	2.49	0.51
Final Sat.:	1805	1635	1635	1805	1790	1568	1805	4630	484	1805	4200	857
Capacity Analysis Module:												
Vol/Sat:	0.24	0.19	0.32	0.20	0.15	0.15	0.09	0.36	0.36	0.22	0.53	0.53
Crit Moves:			****	****			****				****	
Green/Cycle:	0.28	0.28	0.28	0.17	0.17	0.17	0.08	0.33	0.33	0.21	0.46	0.46
Volume/Cap:	0.85	0.68	1.15	1.15	0.85	0.85	1.15	1.06	1.06	1.06	1.15	1.15
Delay/Veh:	47.1	33.5	118.5	138.8	51.7	51.7	166.6	73.4	73.4	103.0	99.4	99.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	47.1	33.5	118.5	138.8	51.7	51.7	166.6	73.4	73.4	103.0	99.4	99.4
LOS by Move:	D	C	F	F	D	D	F	E	E	F	F	F
HCM2kAvgQ:	15	10	29	20	11	11	11	30	30	20	49	49

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #59 Nutmeg St & Clinton Keith Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.152
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 78.4
Optimal Cycle: 180 Level Of Service: E

Street Name:	Nutmeg St						Clinton Keith Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	65	83	494	318	32	58	92	1775	61	552	2056	380
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	65	83	494	318	32	58	92	1775	61	552	2056	380
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	65	83	494	318	32	58	92	1775	61	552	2056	380
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	65	83	494	318	32	58	92	1775	61	552	2056	380
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	65	83	494	318	32	58	92	1775	61	552	2056	380
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	65	83	494	318	32	58	92	1775	61	552	2056	380
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.83	0.83	0.95	0.86	0.86	0.95	0.91	0.91	0.95	0.89	0.89
Lanes:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.90	0.10	1.00	2.53	0.47
Final Sat.:	1805	1574	1574	1805	1630	1630	1805	4990	171	1805	4277	791
Capacity Analysis Module:												
Vol/Sat:	0.04	0.05	0.31	0.18	0.02	0.04	0.05	0.36	0.36	0.31	0.48	0.48
Crit Moves:			****	****				****		****		
Green/Cycle:	0.21	0.27	0.27	0.15	0.21	0.21	0.06	0.31	0.31	0.27	0.52	0.52
Volume/Cap:	0.17	0.19	1.15	1.15	0.09	0.17	0.93	1.15	1.15	1.15	0.93	0.93
Delay/Veh:	32.2	28.0	125.5	143.8	31.8	32.4	113.5	110	110.5	126.6	28.5	28.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	32.2	28.0	125.5	143.8	31.8	32.4	113.5	110	110.5	126.6	28.5	28.5
LOS by Move:	C	C	F	F	C	C	F	F	F	F	C	C
HCM2kAvgQ:	2	2	28	18	1	2	6	35	35	29	30	30

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #60 Murrieta Oaks Ave-Mitchell Rd & Clinton Keith Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.262
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 120.7
Optimal Cycle: 180 Level Of Service: F

Street Name:	Murrieta Oaks Ave-Mitchell Rd						Clinton Keith Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 0	1 0	1	0 1	0 1	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	16	134	19	103	180	900	135	3159	18	27	2766	395
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	16	134	19	103	180	900	135	3159	18	27	2766	395
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	16	134	19	103	180	900	135	3159	18	27	2766	395
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	16	134	19	103	180	900	135	3159	18	27	2766	395
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	16	134	19	103	180	900	135	3159	18	27	2766	395
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	16	134	19	103	180	900	135	3159	18	27	2766	395
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.98	0.98	0.95	1.00	0.85	0.95	0.91	0.91	0.95	0.89	0.89
Lanes:	1.00	0.88	0.12	1.00	1.00	1.00	1.00	2.98	0.02	1.00	2.63	0.37
Final Sat.:	1805	1632	231	1805	1900	1615	1805	5152	29	1805	4453	636
Capacity Analysis Module:												
Vol/Sat:	0.01	0.08	0.08	0.06	0.09	0.56	0.07	0.61	0.61	0.01	0.62	0.62
Crit Moves:	****					****	****				****	
Green/Cycle:	0.01	0.26	0.26	0.18	0.44	0.44	0.06	0.54	0.54	0.01	0.49	0.49
Volume/Cap:	1.26	0.31	0.31	0.31	0.21	1.26	1.26	1.14	1.14	1.14	1.26	1.26
Delay/Veh:	398.7	29.8	29.8	35.8	17.4	157.0	220.2	90.5	90.5	280.3	147	146.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	398.7	29.8	29.8	35.8	17.4	157.0	220.2	90.5	90.5	280.3	147	146.7
LOS by Move:	F	C	C	D	B	F	F	F	F	F	F	F
HCM2kAvgQ:	2	4	4	3	3	52	10	56	56	3	66	66

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
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Intersection #61 I-215 SB Ramps & Scott Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.387
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 8.1
Optimal Cycle: 37 Level Of Service: A

Street Name:	I-215 SB Ramps						Scott Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	2	0	0	4	0	1	0	0	3	0	2
Volume Module:												
Base Vol:	0	0	0	160	0	261	0	756	392	0	1529	445
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	160	0	261	0	756	392	0	1529	445
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	160	0	261	0	756	392	0	1529	445
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	0	0	0	160	0	261	0	756	0	0	1529	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	160	0	261	0	756	0	0	1529	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	0	0	0	160	0	261	0	756	0	0	1529	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.92	1.00	0.75	1.00	0.91	1.00	1.00	0.91	0.88
Lanes:	0.00	0.00	0.00	2.00	0.00	2.00	0.00	4.00	1.00	0.00	3.00	2.00
Final Sat.:	0	0	0	3502	0	2842	0	6916	1900	0	5187	3344
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.05	0.00	0.09	0.00	0.11	0.00	0.00	0.29	0.00
Crit Moves:						****	****				****	
Green/Cycle:	0.00	0.00	0.00	0.24	0.00	0.24	0.00	0.76	0.00	0.00	0.76	0.00
Volume/Cap:	0.00	0.00	0.00	0.19	0.00	0.39	0.00	0.14	0.00	0.00	0.39	0.00
Delay/Veh:	0.0	0.0	0.0	30.6	0.0	32.4	0.0	3.2	0.0	0.0	4.1	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	30.6	0.0	32.4	0.0	3.2	0.0	0.0	4.1	0.0
LOS by Move:	A	A	A	C	A	C	A	A	A	A	A	A
HCM2kAvgQ:	0	0	0	2	0	4	0	2	0	0	6	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #62 I-215 NB Ramps & Scott Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.589
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 16.2
Optimal Cycle: 56 Level Of Service: B

Street Name:	I-215 NB Ramps						Scott Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Ovl		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	1	2	0	0	0	0	0	2	2	0	4	0	0	0	0	3	0	2
Volume Module:												
Base Vol:	0	7	963	0	0	368	80	1012	0	0	1761	395
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	7	963	0	0	368	80	1012	0	0	1761	395
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	7	963	0	0	368	80	1012	0	0	1761	395
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	7	963	0	0	368	80	1012	0	0	1761	395
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	7	963	0	0	368	80	1012	0	0	1761	395
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	7	963	0	0	368	80	1012	0	0	1761	395
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.85	0.75	1.00	1.00	0.75	0.92	0.91	1.00	1.00	0.91	0.75
Lanes:	0.00	0.02	2.98	0.00	0.00	2.00	2.00	4.00	0.00	0.00	3.00	2.00
Final Sat.:	0	31	4241	0	0	2842	3502	6916	0	0	5187	2842
Capacity Analysis Module:												
Vol/Sat:	0.00	0.23	0.23	0.00	0.00	0.13	0.02	0.15	0.00	0.00	0.34	0.14
Crit Moves:		****		****			****				****	
Green/Cycle:	0.00	0.39	0.39	0.00	0.00	0.39	0.04	0.61	0.00	0.00	0.58	0.58
Volume/Cap:	0.00	0.59	0.59	0.00	0.00	0.34	0.59	0.24	0.00	0.00	0.59	0.24
Delay/Veh:	0.0	25.0	25.0	0.0	0.0	21.9	53.9	8.7	0.0	0.0	13.9	10.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	25.0	25.0	0.0	0.0	21.9	53.9	8.7	0.0	0.0	13.9	10.5
LOS by Move:	A	C	C	A	A	C	D	A	A	A	B	B
HCM2kAvgQ:	0	9	9	0	0	5	2	4	0	0	13	3

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #102 Leon Road & Scott Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.969
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 46.7
Optimal Cycle: 180 Level Of Service: D

Street Name:	Leon Road						Scott Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	563	411	18	63	209	373	580	525	505	4	374	155
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	563	411	18	63	209	373	580	525	505	4	374	155
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	563	411	18	63	209	373	580	525	505	4	374	155
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	563	411	18	63	209	373	580	525	505	4	374	155
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	563	411	18	63	209	373	580	525	505	4	374	155
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	563	411	18	63	209	373	580	525	505	4	374	155
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.94	0.94	0.95	0.86	0.86	0.95	0.84	0.84	0.95	0.87	0.87
Lanes:	1.00	1.92	0.08	1.00	1.00	1.00	1.00	2.00	1.00	1.00	2.12	0.88
Final Sat.:	1805	3438	151	1805	1632	1632	1805	3206	1603	1805	3506	1453
Capacity Analysis Module:												
Vol/Sat:	0.31	0.12	0.12	0.03	0.13	0.23	0.32	0.16	0.32	0.00	0.11	0.11
Crit Moves:	****					****	****				****	
Green/Cycle:	0.32	0.43	0.43	0.13	0.24	0.24	0.33	0.44	0.44	0.00	0.11	0.11
Volume/Cap:	0.97	0.28	0.28	0.28	0.54	0.97	0.97	0.37	0.72	0.72	0.97	0.97
Delay/Veh:	62.8	18.4	18.4	40.2	34.0	66.7	61.8	18.9	24.8	237.4	74.8	74.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	62.8	18.4	18.4	40.2	34.0	66.7	61.8	18.9	24.8	237.4	74.8	74.8
LOS by Move:	E	B	B	D	C	E	E	B	C	F	E	E
HCM2kAvgQ:	23	4	4	2	6	17	23	6	15	1	10	10

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #104 Antelope Road & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.976
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 49.9
Optimal Cycle: 180 Level Of Service: D

Street Name:	Antelope Road						Keller Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 2	0 1	1	0 2	0 1	2	0 3	0 1	1	0 3	0 1
Volume Module:												
Base Vol:	923	556	870	74	72	563	828	753	209	228	658	167
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	923	556	870	74	72	563	828	753	209	228	658	167
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	923	556	870	74	72	563	828	753	209	228	658	167
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	923	556	870	74	72	563	828	753	209	228	658	167
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	923	556	870	74	72	563	828	753	209	228	658	167
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	923	556	870	74	72	563	828	753	209	228	658	167
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.95	0.85	0.95	0.95	0.85	0.92	0.91	0.85	0.95	0.91	0.85
Lanes:	2.00	2.00	1.00	1.00	2.00	1.00	2.00	3.00	1.00	1.00	3.00	1.00
Final Sat.:	3502	3610	1615	1805	3610	1615	3502	5187	1615	1805	5187	1615
Capacity Analysis Module:												
Vol/Sat:	0.26	0.15	0.54	0.04	0.02	0.35	0.24	0.15	0.13	0.13	0.13	0.10
Crit Moves:	****					****	****				****	
Green/Cycle:	0.27	0.58	0.58	0.04	0.36	0.36	0.24	0.20	0.20	0.17	0.13	0.13
Volume/Cap:	0.98	0.26	0.92	0.92	0.06	0.98	0.98	0.73	0.65	0.73	0.98	0.80
Delay/Veh:	59.5	10.3	33.2	122.6	21.1	62.9	62.5	40.2	41.5	47.5	71.8	60.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	59.5	10.3	33.2	122.6	21.1	62.9	62.5	40.2	41.5	47.5	71.8	60.8
LOS by Move:	E	B	C	F	C	E	E	D	D	D	E	E
HCM2kAvgQ:	20	4	29	5	1	23	18	9	7	8	12	7

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #105 Menifee Road - Meadowlark Road & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.993
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 47.6
Optimal Cycle: 180 Level Of Service: D

Street Name:	Menifee Road - Meadowlark Road						Keller Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	2	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	174	1077	822	86	680	363	765	314	468	176	392	121
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	174	1077	822	86	680	363	765	314	468	176	392	121
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	174	1077	822	86	680	363	765	314	468	176	392	121
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	174	1077	822	86	680	363	765	314	468	176	392	121
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	174	1077	822	86	680	363	765	314	468	176	392	121
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	174	1077	822	86	680	363	765	314	468	176	392	121
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.89	0.89	0.95	0.90	0.90	0.92	0.86	0.86	0.95	0.92	0.92
Lanes:	1.00	1.13	0.87	1.00	1.30	0.70	2.00	1.00	1.00	1.00	1.53	0.47
Final Sat.:	1805	1914	1461	1805	2231	1191	3502	1643	1643	1805	2662	822
Capacity Analysis Module:												
Vol/Sat:	0.10	0.56	0.56	0.05	0.30	0.30	0.22	0.19	0.28	0.10	0.15	0.15
Crit Moves:		****		****					****	****		
Green/Cycle:	0.15	0.57	0.57	0.05	0.47	0.47	0.23	0.29	0.29	0.10	0.16	0.16
Volume/Cap:	0.65	0.99	0.99	0.99	0.65	0.65	0.95	0.67	0.99	0.99	0.95	0.95
Delay/Veh:	45.9	40.3	40.3	141.7	21.4	21.4	58.2	32.9	65.7	110.4	68.4	68.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	45.9	40.3	40.3	141.7	21.4	21.4	58.2	32.9	65.7	110.4	68.4	68.4
LOS by Move:	D	D	D	F	C	C	E	C	E	F	E	E
HCM2kAvgQ:	6	38	38	6	13	13	17	10	21	9	12	12

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #107 Leon Road & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.359
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 26.2
Optimal Cycle: 44 Level Of Service: C

Street Name:	Leon Road						Keller Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Permitted			Protected			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	62	926	1	1	688	78	88	81	281	17	190	3
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	62	926	1	1	688	78	88	81	281	17	190	3
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	62	926	1	1	688	78	88	81	281	17	190	3
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	62	926	1	1	688	78	88	81	281	17	190	3
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	62	926	1	1	688	78	88	81	281	17	190	3
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	62	926	1	1	688	78	88	81	281	17	190	3
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.95	0.25	0.94	0.94	0.95	0.84	0.84	0.43	0.95	0.95
Lanes:	1.00	1.99	0.01	1.00	1.80	0.20	1.00	1.00	1.00	1.00	1.97	0.03
Final Sat.:	1805	3606	4	483	3194	362	1805	1596	1596	815	3547	56
Capacity Analysis Module:												
Vol/Sat:	0.03	0.26	0.26	0.00	0.22	0.22	0.05	0.05	0.18	0.02	0.05	0.05
Crit Moves:		****					****				****	
Green/Cycle:	0.45	0.82	0.82	0.37	0.37	0.37	0.08	0.18	0.18	0.09	0.09	0.09
Volume/Cap:	0.08	0.31	0.31	0.01	0.57	0.57	0.57	0.29	0.99	0.22	0.57	0.57
Delay/Veh:	15.9	2.2	2.2	19.6	25.5	25.5	49.2	35.7	84.9	43.5	45.9	45.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	15.9	2.2	2.2	19.6	25.5	25.5	49.2	35.7	84.9	43.5	45.9	45.9
LOS by Move:	B	A	A	B	C	C	D	D	F	D	D	D
HCM2kAvgQ:	1	4	4	0	10	10	4	2	14	1	4	4

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #108 Winchester Road - SR-79 & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.547
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 1.6
Optimal Cycle: 41 Level Of Service: A

Street Name:	Winchester Road - SR-79						Keller Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	1	2693	28	9	2103	1	2	59	2	10	16	25
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	1	2693	28	9	2103	1	2	59	2	10	16	25
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	1	2693	28	9	2103	1	2	59	2	10	16	25
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	1	2693	28	9	2103	1	2	59	2	10	16	25
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	1	2693	28	9	2103	1	2	59	2	10	16	25
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	1	2693	28	9	2103	1	2	59	2	10	16	25
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.91	0.91	1.00	0.95	0.95	1.00	0.86	0.86
Lanes:	1.00	2.97	0.03	1.00	2.99	0.01	1.00	1.93	0.07	1.00	1.00	1.00
Final Sat.:	1805	5128	53	1805	5185	2	1900	3474	118	1900	1641	1641
Capacity Analysis Module:												
Vol/Sat:	0.00	0.53	0.53	0.00	0.41	0.41	0.00	0.02	0.02	0.01	0.01	0.02
Crit Moves:		****			****			****				
Green/Cycle:	0.00	0.96	0.96	0.01	0.97	0.97	0.03	0.03	0.03	0.03	0.03	0.03
Volume/Cap:	0.42	0.55	0.55	0.55	0.42	0.42	0.03	0.55	0.55	0.14	0.31	0.49
Delay/Veh:	139.2	0.3	0.3	82.9	0.1	0.1	47.1	53.4	53.4	48.0	48.8	52.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	139.2	0.3	0.3	82.9	0.1	0.1	47.1	53.4	53.4	48.0	48.8	52.2
LOS by Move:	F	A	A	F	A	A	D	D	D	D	D	D
HCM2kAvgQ:	0	4	4	1	2	2	0	2	2	0	1	2

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #112 Leon Road & Jean Nicholas

Cycle (sec): 100 Critical Vol./Cap.(X): 0.694
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 26.4
Optimal Cycle: 74 Level Of Service: C

Street Name:	Leon Road						Jean Nicholas					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	2	530	263	327	553	11	2	128	12	114	123	446
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	2	530	263	327	553	11	2	128	12	114	123	446
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	2	530	263	327	553	11	2	128	12	114	123	446
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	2	530	263	327	553	11	2	128	12	114	123	446
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	2	530	263	327	553	11	2	128	12	114	123	446
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	2	530	263	327	553	11	2	128	12	114	123	446
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.90	0.90	0.95	0.95	0.95	0.95	0.94	0.94	0.95	0.84	0.84
Lanes:	1.00	1.34	0.66	1.00	1.96	0.04	1.00	1.83	0.17	1.00	1.00	1.00
Final Sat.:	1805	2292	1137	1805	3529	70	1805	3258	305	1805	1592	1592
Capacity Analysis Module:												
Vol/Sat:	0.00	0.23	0.23	0.18	0.16	0.16	0.00	0.04	0.04	0.06	0.08	0.28
Crit Moves:		****			****			****				****
Green/Cycle:	0.00	0.33	0.33	0.26	0.59	0.59	0.00	0.16	0.16	0.25	0.40	0.40
Volume/Cap:	0.27	0.69	0.69	0.69	0.27	0.27	0.69	0.25	0.25	0.25	0.19	0.69
Delay/Veh:	67.6	30.8	30.8	37.8	10.0	10.0	309.6	37.4	37.4	30.3	19.3	27.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	67.6	30.8	30.8	37.8	10.0	10.0	309.6	37.4	37.4	30.3	19.3	27.3
LOS by Move:	E	C	C	D	B	B	F	D	D	C	B	C
HCM2kAvgQ:	0	12	12	10	4	4	1	2	2	3	3	13

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #122 Meadowlark Lane - Whitewood Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.400
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 121.7
Optimal Cycle: 180 Level Of Service: F

Street Name:	Meadowlark Lane - Whitewood Road									Clinton Keith Road								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected					Protected				
Rights:	Include					Include					Include					Include				
Min. Green:	0	0	0			0	0	0			0	0	0			0	0	0		
Lanes:	2	0	2	0	1	2	0	1	1	0	2	0	3	0	1	2	0	3	0	1
Volume Module:																				
Base Vol:	748	337		589		767	412		730		352	1452		506		314	701		1031	
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
Initial Bse:	748	337		589		767	412		730		352	1452		506		314	701		1031	
Added Vol:	0	0		0		0	0		0		0	0		0		0	0		0	
PasserByVol:	0	0		0		0	0		0		0	0		0		0	0		0	
Initial Fut:	748	337		589		767	412		730		352	1452		506		314	701		1031	
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Volume:	748	337		589		767	412		730		352	1452		506		314	701		1031	
Reduct Vol:	0	0		0		0	0		0		0	0		0		0	0		0	
Reduced Vol:	748	337		589		767	412		730		352	1452		506		314	701		1031	
PCE Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
MLF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
FinalVolume:	748	337		589		767	412		730		352	1452		506		314	701		1031	
Saturation Flow Module:																				
Sat/Lane:	1900	1900		1900		1900	1900		1900		1900	1900		1900		1900	1900		1900	
Adjustment:	0.92	0.95		0.85		0.92	0.86		0.86		0.92	0.91		0.85		0.92	0.91		0.85	
Lanes:	2.00	2.00		1.00		2.00	1.00		1.00		2.00	3.00		1.00		2.00	3.00		1.00	
Final Sat.:	3502	3610		1615		3502	1632		1632		3502	5187		1615		3502	5187		1615	
Capacity Analysis Module:																				
Vol/Sat:	0.21	0.09		0.36		0.22	0.25		0.45		0.10	0.28		0.31		0.09	0.14		0.64	
Crit Moves:	****								****		****								****	
Green/Cycle:	0.15	0.29		0.29		0.18	0.32		0.32		0.07	0.41		0.41		0.12	0.46		0.46	
Volume/Cap:	1.40	0.32		1.24		1.24	0.79		1.40		1.40	0.68		0.76		0.76	0.30		1.40	
Delay/Veh:	233.4	27.6		158.6		160.9	34.0		221.4		248.7	25.1		30.6		51.0	17.2		215.3	
User DelAdj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
AdjDel/Veh:	233.4	27.6		158.6		160.9	34.0		221.4		248.7	25.1		30.6		51.0	17.2		215.3	
LOS by Move:	F	C		F		F	C		F		F	C		C		D	B		F	
HCM2kAvgQ:	27	4		34		24	14		52		14	14		15		7	5		69	

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #138 Jefferson Avenue & Cherry Street

Cycle (sec): 100 Critical Vol./Cap.(X): 1.033
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 37.8
Optimal Cycle: 180 Level Of Service: D

Street Name:	Jefferson Avenue									Cherry Street								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected					Protected				
Rights:	Include					Include					Include					Include				
Min. Green:	0	0	0			0	0	0			0	0	0			0	0	0		
Lanes:	1	0	2	0	1	1	0	1	1	0	1	0	2	1	0	1	0	2	1	0
Volume Module:																				
Base Vol:	29	1226		823		196	861		6		2	1060		40		122	793		666	
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
Initial Bse:	29	1226		823		196	861		6		2	1060		40		122	793		666	
Added Vol:	0	0		0		0	0		0		0	0		0		0	0		0	
PasserByVol:	0	0		0		0	0		0		0	0		0		0	0		0	
Initial Fut:	29	1226		823		196	861		6		2	1060		40		122	793		666	
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Volume:	29	1226		823		196	861		6		2	1060		40		122	793		666	
Reduct Vol:	0	0		0		0	0		0		0	0		0		0	0		0	
Reduced Vol:	29	1226		823		196	861		6		2	1060		40		122	793		666	
PCE Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
MLF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
FinalVolume:	29	1226		823		196	861		6		2	1060		40		122	793		666	
Saturation Flow Module:																				
Sat/Lane:	1900	1900		1900		1900	1900		1900		1900	1900		1900		1900	1900		1900	
Adjustment:	0.95	0.95		0.85		0.95	0.95		0.95		0.95	0.91		0.91		0.95	0.85		0.85	
Lanes:	1.00	2.00		1.00		1.00	1.99		0.01		1.00	2.89		0.11		1.00	2.00		1.00	
Final Sat.:	1805	3610		1615		1805	3581		25		1805	4973		188		1805	3223		1611	
Capacity Analysis Module:																				
Vol/Sat:	0.02	0.34		0.51		0.11	0.24		0.24		0.00	0.21		0.21		0.07	0.25		0.41	
Crit Moves:						****	****							****					****	
Green/Cycle:	0.04	0.49		0.49		0.11	0.56		0.56		0.00	0.30		0.30		0.10	0.40		0.40	
Volume/Cap:	0.43	0.69		1.03		1.03	0.43		0.43		1.03	0.70		0.70		0.70	0.61		1.03	
Delay/Veh:	51.4	20.6		65.9		118.9	12.8		12.8		714.5	32.1		32.1		55.7	24.3		62.7	
User DelAdj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
AdjDel/Veh:	51.4	20.6		65.9		118.9	12.8		12.8		714.5	32.1		32.1		55.7	24.3		62.7	
LOS by Move:	D	C		E		F	B		B		F	C		C		E	C		E	
HCM2kAvgQ:	1	16		35		11	8		8		1	12		12		5	11		31	

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #141 Jefferson Ave & Nutmeg St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.909
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 36.0
Optimal Cycle: 180 Level Of Service: D

Street Name:	Jefferson Ave						Nutmeg St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	624	1208	377	103	1155	97	61	133	249	300	223	145
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	624	1208	377	103	1155	97	61	133	249	300	223	145
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	624	1208	377	103	1155	97	61	133	249	300	223	145
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	624	1208	377	103	1155	97	61	133	249	300	223	145
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	624	1208	377	103	1155	97	61	133	249	300	223	145
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	624	1208	377	103	1155	97	61	133	249	300	223	145
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.88	0.88	0.95	0.90	0.90	0.95	0.86	0.86	0.95	0.89	0.89
Lanes:	1.00	2.29	0.71	1.00	2.77	0.23	1.00	1.00	1.00	1.00	1.21	0.79
Final Sat.:	1805	3811	1189	1805	4728	397	1805	1628	1628	1805	2059	1338
Capacity Analysis Module:												
Vol/Sat:	0.35	0.32	0.32	0.06	0.24	0.24	0.03	0.08	0.15	0.17	0.11	0.11
Crit Moves:	****				****				****	****		
Green/Cycle:	0.38	0.55	0.55	0.10	0.27	0.27	0.08	0.17	0.17	0.18	0.27	0.27
Volume/Cap:	0.91	0.58	0.58	0.58	0.91	0.91	0.40	0.49	0.91	0.91	0.40	0.40
Delay/Veh:	45.4	15.1	15.1	47.6	44.5	44.5	45.2	38.1	64.2	67.8	30.4	30.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	45.4	15.1	15.1	47.6	44.5	44.5	45.2	38.1	64.2	67.8	30.4	30.4
LOS by Move:	D	B	B	D	D	D	D	D	E	E	C	C
HCM2kAvgQ:	22	12	12	4	18	18	2	4	11	13	5	5

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #142 Jefferson Ave & Magnolia St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.503
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 9.4
Optimal Cycle: 46 Level Of Service: A

Street Name:	Jefferson Ave						Magnolia St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 0	1 0	1	0 0	1 0
Volume Module:												
Base Vol:	137	2070	11	10	1578	106	159	5	56	7	5	14
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	137	2070	11	10	1578	106	159	5	56	7	5	14
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	137	2070	11	10	1578	106	159	5	56	7	5	14
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	137	2070	11	10	1578	106	159	5	56	7	5	14
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	137	2070	11	10	1578	106	159	5	56	7	5	14
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	137	2070	11	10	1578	106	159	5	56	7	5	14
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.90	0.90	0.95	0.86	0.86	0.95	0.89	0.89
Lanes:	1.00	2.98	0.02	1.00	2.81	0.19	1.00	0.08	0.92	1.00	0.26	0.74
Final Sat.:	1805	5154	27	1805	4817	324	1805	134	1504	1805	445	1245
Capacity Analysis Module:												
Vol/Sat:	0.08	0.40	0.40	0.01	0.33	0.33	0.09	0.04	0.04	0.00	0.01	0.01
Crit Moves:	****				****		****				****	
Green/Cycle:	0.15	0.79	0.79	0.01	0.65	0.65	0.18	0.18	0.18	0.02	0.02	0.02
Volume/Cap:	0.50	0.51	0.51	0.51	0.50	0.50	0.50	0.21	0.21	0.21	0.50	0.50
Delay/Veh:	40.5	3.7	3.7	69.2	9.2	9.2	38.6	35.4	35.4	51.4	58.7	58.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	40.5	3.7	3.7	69.2	9.2	9.2	38.6	35.4	35.4	51.4	58.7	58.7
LOS by Move:	D	A	A	E	A	A	D	D	D	D	E	E
HCM2kAvgQ:	4	8	8	1	10	10	5	2	2	0	1	1

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #149 Monroe Ave & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.555
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 16.2
Optimal Cycle: 51 Level Of Service: B

Street Name:	Monroe Ave						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ovl			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	0 1	1	0 2	0 1	1	0 4	0 1	1	0 3	1 0
Volume Module:												
Base Vol:	178	236	199	1	239	110	164	2579	154	37	2043	26
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	178	236	199	1	239	110	164	2579	154	37	2043	26
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	178	236	199	1	239	110	164	2579	154	37	2043	26
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	178	236	199	1	239	110	164	2579	154	37	2043	26
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	178	236	199	1	239	110	164	2579	154	37	2043	26
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	178	236	199	1	239	110	164	2579	154	37	2043	26
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.85	0.95	0.95	0.85	0.95	0.91	0.85	0.95	0.91	0.91
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	4.00	1.00	1.00	3.95	0.05
Final Sat.:	1805	3610	1615	1805	3610	1615	1805	6916	1615	1805	6815	87
Capacity Analysis Module:												
Vol/Sat:	0.10	0.07	0.12	0.00	0.07	0.07	0.09	0.37	0.10	0.02	0.30	0.30
Crit Moves:	****				****		****				****	
Green/Cycle:	0.18	0.30	0.30	0.00	0.12	0.28	0.16	0.67	0.84	0.04	0.54	0.54
Volume/Cap:	0.56	0.22	0.42	0.42	0.56	0.24	0.56	0.56	0.11	0.56	0.56	0.56
Delay/Veh:	39.7	26.7	28.9	138.3	43.1	27.9	40.8	9.0	1.4	57.7	15.3	15.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	39.7	26.7	28.9	138.3	43.1	27.9	40.8	9.0	1.4	57.7	15.3	15.3
LOS by Move:	D	C	C	F	D	C	D	A	A	E	B	B
HCM2kAvgQ:	6	3	5	0	4	3	5	12	1	2	12	12

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #158 Adams Ave & Guava St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.368
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 14.3
Optimal Cycle: 23 Level Of Service: B

Street Name:	Adams Ave						Guava St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 0	1 0	1	0 0	1 0
Volume Module:												
Base Vol:	37	222	27	91	39	205	59	243	181	8	261	165
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	37	222	27	91	39	205	59	243	181	8	261	165
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	37	222	27	91	39	205	59	243	181	8	261	165
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	37	222	27	91	39	205	59	243	181	8	261	165
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	37	222	27	91	39	205	59	243	181	8	261	165
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	37	222	27	91	39	205	59	243	181	8	261	165
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.51	0.93	0.93	0.51	0.83	0.83	0.43	0.94	0.94	0.43	0.94	0.94
Lanes:	1.00	1.78	0.22	1.00	1.00	1.00	1.00	0.57	0.43	1.00	0.61	0.39
Final Sat.:	969	3167	385	961	1578	1578	809	1019	759	811	1097	693
Capacity Analysis Module:												
Vol/Sat:	0.04	0.07	0.07	0.09	0.02	0.13	0.07	0.24	0.24	0.01	0.24	0.24
Crit Moves:						****		****				
Green/Cycle:	0.35	0.35	0.35	0.35	0.35	0.35	0.65	0.65	0.65	0.65	0.65	0.65
Volume/Cap:	0.11	0.20	0.20	0.27	0.07	0.37	0.11	0.37	0.37	0.02	0.37	0.37
Delay/Veh:	21.9	22.6	22.6	23.6	21.5	24.4	6.8	8.4	8.4	6.3	8.4	8.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	21.9	22.6	22.6	23.6	21.5	24.4	6.8	8.4	8.4	6.3	8.4	8.4
LOS by Move:	C	C	C	C	C	C	A	A	A	A	A	A
HCM2kAvgQ:	1	3	3	2	1	5	1	6	6	0	6	6

Note: Queue reported is the number of cars per lane.

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SCENARIO B

City of Murrieta General Plan
Future General Plan (Scenario B)
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Scenario Report

Scenario:	Future GP Scenario B AM
Command:	Future GP Scenario B AM
Volume:	Future GP Scenario B AM
Geometry:	Future
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	Default Trip Distribution
Paths:	Default Path
Routes:	Default Route
Configuration:	Future GP Scenario B AM

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City of Murrieta General Plan
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Turning Movement Report

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#1 Menifee Road & Scott Road													
Base	256	394	414	250	735	89	111	557	303	799	488	262	4658
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	256	394	414	250	735	89	111	557	303	799	488	262	4658
#2 Leon Road & Scott Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#3 Winchester Road/SR-79 & Scott Road													
Base	114	1419	52	946	2576	75	115	175	65	16	153	971	6677
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	114	1419	52	946	2576	75	115	175	65	16	153	971	6677
#4 Antelope Road & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#5 Menifee Road - Meadowlark Road & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#6 Briggs Road & Keller Road													
Base	304	19	53	0	33	42	2	90	498	13	328	1	1383
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	304	19	53	0	33	42	2	90	498	13	328	1	1383
#7 Leon Road & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#8 Winchester Road - SR-79 & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#9 Antelope Road & Golden City Drive - Baxter Road													
Base	3	178	593	261	881	30	1	51	9	308	209	684	3208
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	3	178	593	261	881	30	1	51	9	308	209	684	3208

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City of Murrieta General Plan
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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#10 Whitewood Roa - /Meadowlark Road & Golden City Drive - Baxter Road													
Base	343	813	2	0	778	798	66	4	677	1	15	2	3499
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	343	813	2	0	778	798	66	4	677	1	15	2	3499
#11 Briggs Road & Baxter Road - Jean Nicholas													
Base	0	182	27	57	505	0	0	0	0	3	0	50	824
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	182	27	57	505	0	0	0	0	3	0	50	824
#12 Leon Road & Jean Nicholas													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#13 Winchester Road - SR-79 & Nicholas - Skyview													
Base	136	1408	350	20	2816	29	36	331	139	119	333	174	5891
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	136	1408	350	20	2816	29	36	331	139	119	333	174	5891
#14 Antelope Road & Linnel Lane Extension													
Base	18	731	77	58	525	341	239	504	230	14	177	355	3269
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	18	731	77	58	525	341	239	504	230	14	177	355	3269
#15 Whitewood Road - Meadowlark Road & Linnel Lane Extension													
Base	34	1000	736	271	754	313	36	530	74	24	197	290	4259
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	34	1000	736	271	754	313	36	530	74	24	197	290	4259
#16 Leon Road & Max Gillis Road													
Base	418	119	422	345	302	130	107	477	716	561	293	184	4074
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	418	119	422	345	302	130	107	477	716	561	293	184	4074
#17 Winchester Road - SR-79 & Max Gillis - Thompson													
Base	176	1324	43	136	2163	666	624	155	266	32	287	44	5916
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	176	1324	43	136	2163	666	624	155	266	32	287	44	5916
#18 California Oaks Road & Clinton Keith Road													
Base	184	0	611	0	0	0	0	2451	297	934	1886	0	6363
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	184	0	611	0	0	0	0	2451	297	934	1886	0	6363

City of Murrieta General Plan
Future General Plan (Scenario B)
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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#19 I-215 SB Off-Ramp & Clinton Keith Road													
Base	0	0	0	54	0	424	0	2554	631	0	1998	240	5901
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	54	0	424	0	2554	631	0	1998	240	5901
#20 I-215 NB Off Ramp & Clinton Keith Road													
Base	127	0	1354	0	0	0	0	1756	300	0	2320	267	6124
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	127	0	1354	0	0	0	0	1756	300	0	2320	267	6124
#21 Antelope Road & Clinton Keith Road													
Base	0	0	0	17	0	550	402	1797	0	0	1587	274	4627
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	17	0	550	402	1797	0	0	1587	274	4627
#22 Meadowlark Lane - Whitewood Road & Clinton Keith Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#23 Liberty Road & Clinton Keith Road													
Base	12	0	59	0	0	0	0	1960	151	34	2224	0	4440
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	12	0	59	0	0	0	0	1960	151	34	2224	0	4440
#24 Leon Road & Clinton Keith Road													
Base	0	0	0	162	0	1329	415	1595	0	0	727	578	4806
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	162	0	1329	415	1595	0	0	727	578	4806
#25 Winchester Road - SR-79 & Benton Road													
Base	458	1368	362	95	2018	376	44	533	1108	338	572	32	7304
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	458	1368	362	95	2018	376	44	533	1108	338	572	32	7304
#26 Winchester Road - SR-79 & Via Mira Mosa													
Base	27	1638	783	317	2745	234	362	47	91	176	19	31	6470
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	27	1638	783	317	2745	234	362	47	91	176	19	31	6470
#27 Monroe Ave & Los Alamos													
Base	29	223	187	562	483	213	45	337	132	64	1008	465	3748
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	29	223	187	562	483	213	45	337	132	64	1008	465	3748

City of Murrieta General Plan
Future General Plan (Scenario B)
AM Peak Hour

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#28 Jefferson Avenue & Murrieta Hot Springs Road													
Base	11	1065	524	914	1272	81	14	77	22	852	92	812	5736
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	11	1065	524	914	1272	81	14	77	22	852	92	812	5736
#29 Madison Avenue & Murrieta Hot Springs Road													
Base	151	73	355	188	216	174	118	1155	314	789	1764	67	5364
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	151	73	355	188	216	174	118	1155	314	789	1764	67	5364
#30 I-15 SB Off-Ramp & Murrieta Hot Springs Road													
Base	0	0	0	810	0	413	0	1436	218	0	2353	47	5277
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	810	0	413	0	1436	218	0	2353	47	5277
#31 I-15 NB Off-Ramp & Murrieta Hot Springs Road													
Base	286	0	61	0	0	0	0	2251	200	0	1621	608	5027
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	286	0	61	0	0	0	0	2251	200	0	1621	608	5027
#32 I-215 SB Off-Ramp & Murrieta Hot Springs Road													
Base	0	0	0	476	0	515	0	1880	53	0	2605	378	5907
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	476	0	515	0	1880	53	0	2605	378	5907
#33 I-215 NB Off-Ramp & Murrieta Hot Springs Road													
Base	338	0	24	0	0	0	0	1583	115	0	2633	668	5361
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	338	0	24	0	0	0	0	1583	115	0	2633	668	5361
#34 Jackson Avenue & Murrieta Hot Springs Road													
Base	68	0	52	0	0	0	0	1217	41	163	2045	0	3586
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	68	0	52	0	0	0	0	1217	41	163	2045	0	3586
#35 Margarita Road & Murrieta Hot Springs Road													
Base	628	60	127	41	17	7	162	751	460	304	1795	72	4424
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	628	60	127	41	17	7	162	751	460	304	1795	72	4424
#36 French Valley Parkway & Murrieta Hot Springs Road													
Base	20	0	832	0	0	0	0	1242	291	771	2012	0	5168
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	20	0	832	0	0	0	0	1242	291	771	2012	0	5168

City of Murrieta General Plan
Future General Plan (Scenario B)
AM Peak Hour

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#37 Jefferson Avenue & Guava Street													
Base	23	1420	3	8	1468	305	169	115	86	2	32	10	3641
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	23	1420	3	8	1468	305	169	115	86	2	32	10	3641
#38 Jefferson Avenue & Cherry Street													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#39 Washington Ave & Calle Del Oso Oro/Nutmeg													
Base	264	162	123	86	197	89	64	592	675	142	200	40	2634
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	264	162	123	86	197	89	64	592	675	142	200	40	2634
#40 Clinton Keith Rd & Calle de Oso Oro/Bear Creek Dr													
Base	60	107	273	5	114	195	267	618	160	422	615	20	2856
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	60	107	273	5	114	195	267	618	160	422	615	20	2856
#41 Jefferson Ave & Nutmeg St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#42 Jefferson Ave & Magnolia St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#43 Jefferson Ave & Lemon St													
Base	282	758	28	4	2549	155	35	3	344	8	12	6	4184
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	282	758	28	4	2549	155	35	3	344	8	12	6	4184
#44 Jefferson Ave & Kalmia St													
Base	258	930	266	954	1732	153	49	496	349	236	341	524	6288
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	258	930	266	954	1732	153	49	496	349	236	341	524	6288
#45 Jefferson Ave & Juniper St													
Base	485	1291	36	69	2046	172	135	100	195	7	100	21	4657
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	485	1291	36	69	2046	172	135	100	195	7	100	21	4657

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#46 Jefferson Ave & Ivy St/Los Alamos Rd													
Base	166	1321	95	310	1866	52	53	88	129	354	82	421	4937
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	166	1321	95	310	1866	52	53	88	129	354	82	421	4937
#47 Madison Ave & Kalmia St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#48 Madison Ave/I-15 SB Ramps & Kalmia St													
Base	114	0	226	259	56	260	0	1453	258	437	1127	512	4702
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	114	0	226	259	56	260	0	1453	258	437	1127	512	4702
#49 Monroe Ave & Murrieta Hot Springs Rd													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#50 Hancock Ave & Murrieta Hot Springs Rd													
Base	0	0	0	398	0	652	708	1542	0	0	2617	548	6465
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	398	0	652	708	1542	0	0	2617	548	6465
#51 Alta Murrieta Dr & Murrieta Hot Springs Rd													
Base	224	80	19	69	129	325	260	982	280	127	1900	166	4561
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	224	80	19	69	129	325	260	982	280	127	1900	166	4561
#52 Winchester Road - SR-79 & Murrieta Hot Springs Rd													
Base	287	1481	151	154	1467	1400	809	276	103	281	894	81	7384
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	287	1481	151	154	1467	1400	809	276	103	281	894	81	7384
#53 Hancock Ave & Los Alamos Rd													
Base	49	120	214	740	266	92	71	943	80	981	1687	600	5843
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	49	120	214	740	266	92	71	943	80	981	1687	600	5843
#54 I-215 SB Ramps & Los Alamos Rd													
Base	0	0	0	397	0	2007	0	1348	464	236	1591	0	6043
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	397	0	2007	0	1348	464	236	1591	0	6043

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#55 I-215 NB Ramps & Los Alamos Rd													
Base	510	0	269	0	0	0	571	1169	0	0	1326	140	3985
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	510	0	269	0	0	0	571	1169	0	0	1326	140	3985
#56 Whitewood Rd & Los Alamos Rd													
Base	86	322	40	31	540	725	656	225	111	52	247	29	3064
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	86	322	40	31	540	725	656	225	111	52	247	29	3064
#57 Whitewood Rd & Murrieta Hot Springs Rd													
Base	54	227	239	277	594	121	30	986	135	483	2115	144	5405
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	54	227	239	277	594	121	30	986	135	483	2115	144	5405
#58 Adams Ave & Guava St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#59 Nutmeg St & Clinton Keith Rd													
Base	75	44	497	424	57	72	46	1869	103	421	1467	167	5242
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	75	44	497	424	57	72	46	1869	103	421	1467	167	5242
#60 Murrieta Oaks Ave-Mitchell Rd & Clinton Keith Rd													
Base	105	208	106	40	121	339	140	2911	262	82	2191	351	6856
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	105	208	106	40	121	339	140	2911	262	82	2191	351	6856
#61 I-215 SB Ramps & Scott Rd													
Base	0	0	0	210	0	123	0	1031	430	0	929	338	3061
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	210	0	123	0	1031	430	0	929	338	3061
#62 I-215 NB Ramps & Scott Rd													
Base	0	15	615	0	0	281	155	1192	0	0	1036	329	3623
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	15	615	0	0	281	155	1192	0	0	1036	329	3623
#102 Leon Road & Scott Road													
Base	119	204	2	98	340	516	382	482	434	10	372	146	3105
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	119	204	2	98	340	516	382	482	434	10	372	146	3105

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AM Peak Hour

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#104 Antelope Road & Keller Road													
Base	110	75	445	197	479	447	453	687	1048	677	509	31	5158
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	110	75	445	197	479	447	453	687	1048	677	509	31	5158
#105 Menifee Road - Meadowlark Road & Keller Road													
Base	28	289	292	126	1138	656	527	192	502	255	377	128	4510
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	28	289	292	126	1138	656	527	192	502	255	377	128	4510
#107 Leon Road & Keller Road													
Base	112	351	16	3	709	138	3	64	121	7	65	5	1594
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	112	351	16	3	709	138	3	64	121	7	65	5	1594
#108 Winchester Road - SR-79 & Keller Road													
Base	1	1563	26	5	2680	3	1	12	1	12	19	47	4370
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	1563	26	5	2680	3	1	12	1	12	19	47	4370
#112 Leon Road & Jean Nicholas													
Base	6	194	132	228	539	50	2	176	14	148	23	250	1762
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	6	194	132	228	539	50	2	176	14	148	23	250	1762
#122 Meadowlark Lane - Whitewood Road & Clinton Keith Road													
Base	101	121	1015	337	232	923	1090	682	126	1007	943	326	6903
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	101	121	1015	337	232	923	1090	682	126	1007	943	326	6903
#138 Jefferson Avenue & Cherry Street													
Base	87	628	194	36	640	21	1	47	6	146	1294	882	3982
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	87	628	194	36	640	21	1	47	6	146	1294	882	3982
#141 Jefferson Ave & Nutmeg St													
Base	193	357	265	84	1819	66	96	202	511	382	176	72	4223
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	193	357	265	84	1819	66	96	202	511	382	176	72	4223
#142 Jefferson Ave & Magnolia St													
Base	81	668	8	8	2498	242	166	1	155	28	3	1	3859
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	81	668	8	8	2498	242	166	1	155	28	3	1	3859

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#149 Monroe Ave & Murrieta Hot Springs Rd													
Base	44	79	49	1	56	53	109	1196	37	8	1601	24	3257
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	44	79	49	1	56	53	109	1196	37	8	1601	24	3257
#158 Adams Ave & Guava St													
Base	70	76	18	100	20	42	21	326	47	3	267	99	1089
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	70	76	18	100	20	42	21	326	47	3	267	99	1089

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Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
# 1 Menifee Road & Scott Road	E	60.0	1.015	E	60.0	1.015	+ 0.000 D/V
# 3 Winchester Road/SR-79 & Scott	F	177.3	1.518	F	177.3	1.518	+ 0.000 D/V
# 6 Briggs Road & Keller Road	B	17.2	0.517	B	17.2	0.517	+ 0.000 D/V
# 9 Antelope Road & Golden City Dr	C	25.3	0.941	C	25.3	0.941	+ 0.000 D/V
# 10 Whitewood Roa - /Meadowlark Ro	E	72.5	1.110	E	72.5	1.110	+ 0.000 D/V
# 11 Briggs Road & Baxter Road - Je	A	8.2	0.171	A	8.2	0.171	+ 0.000 D/V
# 13 Winchester Road - SR-79 & Nich	B	19.8	0.826	B	19.8	0.826	+ 0.000 D/V
# 14 Antelope Road & Linnel Lane Ex	C	24.6	0.610	C	24.6	0.610	+ 0.000 D/V
# 15 Whitewood Road - Meadowlark Ro	C	27.4	0.860	C	27.4	0.860	+ 0.000 D/V
# 16 Leon Road & Max Gillis Road	D	44.9	0.956	D	44.9	0.956	+ 0.000 D/V
# 17 Winchester Road - SR-79 & Max	C	26.2	0.786	C	26.2	0.786	+ 0.000 D/V
# 18 California Oaks Road & Clinton	E	67.3	1.158	E	67.3	1.158	+ 0.000 D/V
# 19 I-215 SB Off-Ramp & Clinton Ke	A	7.7	0.642	A	7.7	0.642	+ 0.000 D/V
# 20 I-215 NB Off Ramp & Clinton Ke	F	116.7	1.286	F	116.7	1.286	+ 0.000 D/V
# 21 Antelope Road & Clinton Keith	A	5.4	0.482	A	5.4	0.482	+ 0.000 D/V
# 23 Liberty Road & Clinton Keith R	A	2.0	0.467	A	2.0	0.467	+ 0.000 D/V
# 24 Leon Road & Clinton Keith Road	C	22.2	0.825	C	22.2	0.825	+ 0.000 D/V
# 25 Winchester Road - SR-79 & Bent	D	43.3	1.006	D	43.3	1.006	+ 0.000 D/V
# 26 Winchester Road - SR-79 & Via	C	24.3	0.895	C	24.3	0.895	+ 0.000 D/V
# 27 Monroe Ave & Los Alamos	C	24.5	0.595	C	24.5	0.595	+ 0.000 D/V
# 28 Jefferson Avenue & Murrieta Ho	F	122.9	1.382	F	122.9	1.382	+ 0.000 D/V
# 29 Madison Avenue & Murrieta Hot	C	27.7	0.718	C	27.7	0.718	+ 0.000 D/V
# 30 I-15 SB Off-Ramp & Murrieta Ho	B	16.1	0.733	B	16.1	0.733	+ 0.000 D/V

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Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
# 31 I-15 NB Off-Ramp & Murrieta Ho	A	5.5	0.407	A	5.5	0.407	+ 0.000 D/V
# 32 I-215 SB Off-Ramp & Murrieta H	B	12.3	0.700	B	12.3	0.700	+ 0.000 D/V
# 33 I-215 NB Off-Ramp & Murrieta H	A	5.5	0.604	A	5.5	0.604	+ 0.000 D/V
# 34 Jackson Avenue & Murrieta Hot	A	5.3	0.414	A	5.3	0.414	+ 0.000 D/V
# 35 Margarita Road & Murrieta Hot	C	24.5	0.661	C	24.5	0.661	+ 0.000 D/V
# 36 French Valley Parkway & Murrie	B	13.1	0.742	B	13.1	0.742	+ 0.000 D/V
# 37 Jefferson Avenue & Guava Stree	A	9.1	0.489	A	9.1	0.489	+ 0.000 D/V
# 39 Washington Ave & Calle Del Oso	C	26.7	0.689	C	26.7	0.689	+ 0.000 D/V
# 40 Clinton Keith Rd & Calle de Os	C	23.8	0.949	C	23.8	0.949	+ 0.000 D/V
# 43 Jefferson Ave & Lemon St	C	25.8	0.900	C	25.8	0.900	+ 0.000 D/V
# 44 Jefferson Ave & Kalmia St	E	56.4	1.054	E	56.4	1.054	+ 0.000 D/V
# 45 Jefferson Ave & Juniper St	C	23.5	0.825	C	23.5	0.825	+ 0.000 D/V
# 46 Jefferson Ave & Ivy St/Los Ala	C	26.2	0.703	C	26.2	0.703	+ 0.000 D/V
# 48 Madison Ave/I-15 SB Ramps & Ka	C	31.8	0.575	C	31.8	0.575	+ 0.000 D/V
# 50 Hancock Ave & Murrieta Hot Spr	B	18.0	0.786	B	18.0	0.786	+ 0.000 D/V
# 51 Alta Murrieta Dr & Murrieta Ho	C	24.1	0.615	C	24.1	0.615	+ 0.000 D/V
# 52 Winchester Road - SR-79 & Murr	F	107.1	1.370	F	107.1	1.370	+ 0.000 D/V
# 53 Hancock Ave & Los Alamos Rd	F	83.2	1.173	F	83.2	1.173	+ 0.000 D/V
# 54 I-215 SB Ramps & Los Alamos Rd	E	77.7	1.104	E	77.7	1.104	+ 0.000 D/V
# 55 I-215 NB Ramps & Los Alamos Rd	C	25.0	0.813	C	25.0	0.813	+ 0.000 D/V
# 56 Whitewood Rd & Los Alamos Rd	D	40.2	0.938	D	40.2	0.938	+ 0.000 D/V
# 57 Whitewood Rd & Murrieta Hot Sp	C	28.4	0.777	C	28.4	0.777	+ 0.000 D/V
# 59 Nutmeg St & Clinton Keith Rd	F	88.0	1.171	F	88.0	1.171	+ 0.000 D/V
# 60 Murrieta Oaks Ave-Mitchell Rd	C	26.2	0.933	C	26.2	0.933	+ 0.000 D/V
# 61 I-215 SB Ramps & Scott Rd	A	7.6	0.239	A	7.6	0.239	+ 0.000 D/V

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City of Murrieta General Plan
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AM Peak Hour

Intersection	Base LOS	Del/ Veh	V/ C	Future LOS	Del/ Veh	V/ C	Change in
# 62 I-215 NB Ramps & Scott Rd	B	15.8	0.391	B	15.8	0.391	+ 0.000 D/V
#102 Leon Road & Scott Road	C	28.6	0.696	C	28.6	0.696	+ 0.000 D/V
#104 Antelope Road & Keller Road	F	130.8	1.409	F	130.8	1.409	+ 0.000 D/V
#105 Menifee Road - Meadowlark Road	D	45.1	0.994	D	45.1	0.994	+ 0.000 D/V
#107 Leon Road & Keller Road	B	13.7	0.342	B	13.7	0.342	+ 0.000 D/V
#108 Winchester Road - SR-79 & Kell	A	1.5	0.547	A	1.5	0.547	+ 0.000 D/V
#112 Leon Road & Jean Nicholas	C	23.0	0.384	C	23.0	0.384	+ 0.000 D/V
#122 Meadowlark Lane - Whitewood Ro	F	106.9	1.238	F	106.9	1.238	+ 0.000 D/V
#138 Jefferson Avenue & Cherry Stre	C	21.8	0.776	C	21.8	0.776	+ 0.000 D/V
#141 Jefferson Ave & Nutmeg St	D	52.4	1.001	D	52.4	1.001	+ 0.000 D/V
#142 Jefferson Ave & Magnolia St	B	10.7	0.692	B	10.7	0.692	+ 0.000 D/V
#149 Monroe Ave & Murrieta Hot Spri	A	8.3	0.336	A	8.3	0.336	+ 0.000 D/V
#158 Adams Ave & Guava St	B	11.7	0.283	B	11.7	0.283	+ 0.000 D/V

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City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #1 Menifee Road & Scott Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.015
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 60.0
Optimal Cycle: 180 Level Of Service: E

Street Name:	Menifee Rd						Scott Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	256	394	414	250	735	89	111	557	303	799	488	262
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	256	394	414	250	735	89	111	557	303	799	488	262
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	256	394	414	250	735	89	111	557	303	799	488	262
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	256	394	414	250	735	89	111	557	303	799	488	262
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	256	394	414	250	735	89	111	557	303	799	488	262
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	256	394	414	250	735	89	111	557	303	799	488	262
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.88	0.88	0.95	0.93	0.93	0.95	0.86	0.86	0.95	0.86	0.86
Lanes:	1.00	1.00	1.00	1.00	1.78	0.22	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1805	1666	1666	1805	3169	384	1805	3275	1637	1805	3278	1639
Capacity Analysis Module:												
Vol/Sat:	0.14	0.24	0.25	0.14	0.23	0.23	0.06	0.17	0.19	0.44	0.15	0.16
Crit Moves:			****	****					****	****		
Green/Cycle:	0.14	0.24	0.24	0.14	0.24	0.24	0.17	0.18	0.18	0.44	0.45	0.45
Volume/Cap:	0.98	0.97	1.01	1.01	0.98	0.98	0.36	0.93	1.01	1.01	0.33	0.36
Delay/Veh:	92.6	60.3	73.4	104.3	64.0	64.0	37.2	56.1	75.5	64.0	18.1	18.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	92.6	60.3	73.4	104.3	64.0	64.0	37.2	56.1	75.5	64.0	18.1	18.3
LOS by Move:	F	E	E	F	E	E	D	E	E	E	B	B
HCM2kAvgQ:	12	18	20	13	19	19	3	13	16	33	5	6

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #3 Winchester Road/SR-79 & Scott Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.518
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 177.3
Optimal Cycle: 180 Level Of Service: F

Street Name:	Winchester Road/SR-79									Scott Road								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected					Protected				
Rights:	Include					Include					Include					Include				
Min. Green:	0	0	0			0	0	0			0	0	0			0	0	0		
Lanes:	1	0	2	1	0	1	0	2	1	0	1	0	2	1	0	1	0	2	1	0
Volume Module:																				
Base Vol:	114	1419		52		946	2576		75		115	175		65		16	153		971	
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
Initial Bse:	114	1419		52		946	2576		75		115	175		65		16	153		971	
Added Vol:	0	0		0		0	0		0		0	0		0		0	0		0	
PasserByVol:	0	0		0		0	0		0		0	0		0		0	0		0	
Initial Fut:	114	1419		52		946	2576		75		115	175		65		16	153		971	
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Volume:	114	1419		52		946	2576		75		115	175		65		16	153		971	
Reduct Vol:	0	0		0		0	0		0		0	0		0		0	0		0	
Reduced Vol:	114	1419		52		946	2576		75		115	175		65		16	153		971	
PCE Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
MLF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
FinalVolume:	114	1419		52		946	2576		75		115	175		65		16	153		971	
Saturation Flow Module:																				
Sat/Lane:	1900	1900		1900		1900	1900		1900		1900	1900		1900		1900	1900		1900	
Adjustment:	0.95	0.91		0.91		0.95	0.91		0.91		0.95	0.87		0.87		0.95	0.79		0.79	
Lanes:	1.00	2.89		0.11		1.00	2.92		0.08		1.00	2.19		0.81		1.00	2.00		1.00	
Final Sat.:	1805	4979		182		1805	5020		146		1805	3627		1347		1805	3008		1504	
Capacity Analysis Module:																				
Vol/Sat:	0.06	0.29		0.29		0.52	0.51		0.51		0.06	0.05		0.05		0.01	0.05		0.65	
Crit Moves:		****				****					****								****	
Green/Cycle:	0.06	0.19		0.19		0.35	0.47		0.47		0.04	0.39		0.39		0.07	0.43		0.43	
Volume/Cap:	1.08	1.52		1.52		1.52	1.08		1.08		1.52	0.12		0.12		0.12	0.12		1.52	
Delay/Veh:	158.4	279		279.2		274.2	70.9		70.9		337.3	19.3		19.3		43.8	17.4		268.9	
User DelAdj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
AdjDel/Veh:	158.4	279		279.2		274.2	70.9		70.9		337.3	19.3		19.3		43.8	17.4		268.9	
LOS by Move:	F	F		F		F	E		E		F	B		B		D	B		F	
HCM2kAvgQ:	8	41		41		69	43		43		10	2		2		1	2		78	

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #6 Briggs Road & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.517
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 17.2
Optimal Cycle: 47 Level Of Service: B

Street Name:	Briggs Road									Keller Road								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected					Protected				
Rights:	Include					Include					Include					Include				
Min. Green:	0	0	0			0	0	0			0	0	0			0	0	0		
Lanes:	1	0	1	1	0	1	0	1	1	0	1	0	1	1	0	1	0	1	1	0
Volume Module:																				
Base Vol:	304	19		53		0	33		42		2	90		498		13	328		1	
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
Initial Bse:	304	19		53		0	33		42		2	90		498		13	328		1	
Added Vol:	0	0		0		0	0		0		0	0		0		0	0		0	
PasserByVol:	0	0		0		0	0		0		0	0		0		0	0		0	
Initial Fut:	304	19		53		0	33		42		2	90		498		13	328		1	
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Volume:	304	19		53		0	33		42		2	90		498		13	328		1	
Reduct Vol:	0	0		0		0	0		0		0	0		0		0	0		0	
Reduced Vol:	304	19		53		0	33		42		2	90		498		13	328		1	
PCE Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
MLF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
FinalVolume:	304	19		53		0	33		42		2	90		498		13	328		1	
Saturation Flow Module:																				
Sat/Lane:	1900	1900		1900		1900	1900		1900		1900	1900		1900		1900	1900		1900	
Adjustment:	0.95	0.85		0.85		1.00	0.87		0.87		0.95	0.83		0.83		0.95	0.95		0.95	
Lanes:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.99		0.01	
Final Sat.:	1805	1606		1606		1900	1653		1653		1805	1576		1576		1805	3599		11	
Capacity Analysis Module:																				
Vol/Sat:	0.17	0.01		0.03		0.00	0.02		0.03		0.00	0.06		0.32		0.01	0.09		0.09	
Crit Moves:	****								****					****		****				
Green/Cycle:	0.33	0.37		0.37		0.00	0.05		0.05		0.01	0.61		0.61		0.01	0.62		0.62	
Volume/Cap:	0.52	0.03		0.09		0.00	0.41		0.52		0.15	0.09		0.52		0.52	0.15		0.15	
Delay/Veh:	28.1	19.8		20.3		0.0	47.6		49.6		54.3	8.0		11.5		66.5	8.1		8.1	
User DelAdj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
AdjDel/Veh:	28.1	19.8		20.3		0.0	47.6		49.6		54.3	8.0		11.5		66.5	8.1		8.1	
LOS by Move:	C	B		C		A	D		D		D	A		B		E	A		A	
HCM2kAvgQ:	8	0		1		0	2		2		0	1		9		1	2		2	

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #9 Antelope Road & Golden City Drive - Baxter Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.941
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 25.3
Optimal Cycle: 180 Level Of Service: C

Street Name:	Antelope Road						Golden City Drive - Baxter Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	3	178	593	261	881	30	1	51	9	308	209	684
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	3	178	593	261	881	30	1	51	9	308	209	684
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	3	178	593	261	881	30	1	51	9	308	209	684
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	3	178	593	261	881	30	1	51	9	308	209	684
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	3	178	593	261	881	30	1	51	9	308	209	684
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	3	178	593	261	881	30	1	51	9	308	209	684
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.22	0.84	0.84	0.27	0.95	0.95	0.18	0.93	0.93	0.70	0.84	0.84
Lanes:	1.00	1.00	1.00	1.00	1.93	0.07	1.00	1.70	0.30	1.00	1.00	1.00
Final Sat.:	414	1597	1597	509	3474	118	348	3001	530	1334	1597	1597
Capacity Analysis Module:												
Vol/Sat:	0.01	0.11	0.37	0.51	0.25	0.25	0.00	0.02	0.02	0.23	0.13	0.43
Crit Moves:				****								****
Green/Cycle:	0.54	0.54	0.54	0.54	0.54	0.54	0.46	0.46	0.46	0.46	0.46	0.46
Volume/Cap:	0.01	0.20	0.68	0.94	0.47	0.47	0.01	0.04	0.04	0.51	0.29	0.94
Delay/Veh:	10.5	11.7	18.2	59.5	14.1	14.1	14.9	15.1	15.1	20.0	17.1	42.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	10.5	11.7	18.2	59.5	14.1	14.1	14.9	15.1	15.1	20.0	17.1	42.7
LOS by Move:	B	B	B	E	B	B	B	B	B	C	B	D
HCM2kAvgQ:	0	3	15	12	9	9	0	1	1	7	4	26

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #10 Whitewood Roa - /Meadowlark Road & Golden City Drive - Baxter R

Cycle (sec): 100 Critical Vol./Cap.(X): 1.110
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 72.5
Optimal Cycle: 180 Level Of Service: E

Street Name:	Whitewood Road - Meadowlark Road						Golden City Drive - Baxter Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	343	813	2	0	778	798	66	4	677	1	15	2
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	343	813	2	0	778	798	66	4	677	1	15	2
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	343	813	2	0	778	798	66	4	677	1	15	2
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	343	813	2	0	778	798	66	4	677	1	15	2
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	343	813	2	0	778	798	66	4	677	1	15	2
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	343	813	2	0	778	798	66	4	677	1	15	2
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.95	1.00	0.88	0.88	0.95	0.81	0.81	0.95	0.93	0.93
Lanes:	1.00	1.99	0.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.76	0.24
Final Sat.:	1805	3601	9	1900	1668	1668	1805	1536	1536	1805	3128	417
Capacity Analysis Module:												
Vol/Sat:	0.19	0.23	0.23	0.00	0.47	0.48	0.04	0.00	0.44	0.00	0.00	0.00
Crit Moves:	****					****			****	****		
Green/Cycle:	0.17	0.60	0.60	0.00	0.43	0.43	0.35	0.40	0.40	0.00	0.05	0.05
Volume/Cap:	1.11	0.37	0.37	0.00	1.08	1.11	0.10	0.01	1.11	1.11	0.10	0.10
Delay/Veh:	125.5	10.3	10.3	0.0	77.6	88.4	21.9	18.2	100.4	1074	46.0	46.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	125.5	10.3	10.3	0.0	77.6	88.4	21.9	18.2	100.4	1074	46.0	46.0
LOS by Move:	F	B	B	A	E	F	C	B	F	F	D	D
HCM2kAvgQ:	19	7	7	0	37	40	1	0	35	0	0	0

Note: Queue reported is the number of cars per lane.

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Intersection #11 Briggs Road & Baxter Road - Jean Nicholas

Cycle (sec): 100 Critical Vol./Cap.(X): 0.171
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 8.2
Optimal Cycle: 27 Level Of Service: A

Street Name:	Briggs Road									Baxter Road - Jean Nicholas					
Approach:	North Bound			South Bound			East Bound			West Bound					
Movement:	L	- T	- R	L	- T	- R	L	- T	- R	L	- T	- R			
Control:	Protected			Protected			Protected			Protected					
Rights:	Include			Include			Include			Include					
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0			
Lanes:	0	0 1	1 0	1	0 2	0 0	0	0 0	0 0	1	0 0	0 1			
Volume Module:															
Base Vol:	0	182	27	57	505	0	0	0	0	3	0	50			
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Initial Bse:	0	182	27	57	505	0	0	0	0	3	0	50			
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0			
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0			
Initial Fut:	0	182	27	57	505	0	0	0	0	3	0	50			
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
PHF Volume:	0	182	27	57	505	0	0	0	0	3	0	50			
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0			
Reduced Vol:	0	182	27	57	505	0	0	0	0	3	0	50			
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
FinalVolume:	0	182	27	57	505	0	0	0	0	3	0	50			
Saturation Flow Module:															
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900			
Adjustment:	1.00	0.93	0.93	0.95	0.95	1.00	1.00	1.00	1.00	0.95	1.00	0.85			
Lanes:	0.00	1.74	0.26	1.00	2.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00			
Final Sat.:	0	3084	458	1805	3610	0	0	0	0	1805	0	1615			
Capacity Analysis Module:															
Vol/Sat:	0.00	0.06	0.06	0.03	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.03			
Crit Moves:	****				****							****			
Green/Cycle:	0.00	0.53	0.53	0.29	0.82	0.00	0.00	0.00	0.00	0.18	0.00	0.18			
Volume/Cap:	0.00	0.11	0.11	0.11	0.17	0.00	0.00	0.00	0.00	0.01	0.00	0.17			
Delay/Veh:	0.0	11.6	11.6	26.5	1.9	0.0	0.0	0.0	0.0	33.6	0.0	34.9			
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
AdjDel/Veh:	0.0	11.6	11.6	26.5	1.9	0.0	0.0	0.0	0.0	33.6	0.0	34.9			
LOS by Move:	A	B	B	C	A	A	A	A	A	C	A	C			
HCM2kAvgQ:	0	2	2	1	2	0	0	0	0	0	0	1			

Note: Queue reported is the number of cars per lane.

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Intersection #13 Winchester Road - SR-79 & Nicholas - Skyview

Cycle (sec): 100 Critical Vol./Cap.(X): 0.826
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 19.8
Optimal Cycle: 131 Level Of Service: B

Street Name:	Winchester Road - SR-79									Nicholas - Skyview					
Approach:	North Bound			South Bound			East Bound			West Bound					
Movement:	L	- T	- R	L	- T	- R	L	- T	- R	L	- T	- R			
Control:	Protected			Protected			Protected			Protected					
Rights:	Include			Include			Include			Include					
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0			
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	1 0	1	0 1	1 0			
Volume Module:															
Base Vol:	136	1408	350	20	2816	29	36	331	139	119	333	174			
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Initial Bse:	136	1408	350	20	2816	29	36	331	139	119	333	174			
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0			
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0			
Initial Fut:	136	1408	350	20	2816	29	36	331	139	119	333	174			
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
PHF Volume:	136	1408	350	20	2816	29	36	331	139	119	333	174			
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0			
Reduced Vol:	136	1408	350	20	2816	29	36	331	139	119	333	174			
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
FinalVolume:	136	1408	350	20	2816	29	36	331	139	119	333	174			
Saturation Flow Module:															
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900			
Adjustment:	0.95	0.88	0.88	0.95	0.91	0.91	0.95	0.91	0.91	0.95	0.90	0.90			
Lanes:	1.00	2.40	0.60	1.00	2.97	0.03	1.00	1.41	0.59	1.00	1.31	0.69			
Final Sat.:	1805	4030	1002	1805	5129	53	1805	2430	1021	1805	2250	1176			
Capacity Analysis Module:															
Vol/Sat:	0.08	0.35	0.35	0.01	0.55	0.55	0.02	0.14	0.14	0.07	0.15	0.15			
Crit Moves:	****				****			****		****					
Green/Cycle:	0.09	0.73	0.73	0.02	0.66	0.66	0.03	0.16	0.16	0.08	0.22	0.22			
Volume/Cap:	0.83	0.48	0.48	0.48	0.83	0.83	0.69	0.83	0.83	0.83	0.69	0.69			
Delay/Veh:	72.4	5.6	5.6	56.6	14.3	14.3	79.9	50.1	50.1	76.2	38.8	38.8			
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
AdjDel/Veh:	72.4	5.6	5.6	56.6	14.3	14.3	79.9	50.1	50.1	76.2	38.8	38.8			
LOS by Move:	E	A	A	E	B	B	E	D	D	E	D	D			
HCM2kAvgQ:	6	8	8	1	26	26	2	10	10	6	9	9			

Note: Queue reported is the number of cars per lane.

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Intersection #14 Antelope Road & Linnel Lane Extension

Cycle (sec): 100 Critical Vol./Cap.(X): 0.610
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 24.6
Optimal Cycle: 58 Level Of Service: C

Street Name:	Antelope Road						Linnel Lane Extension					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	18	731	77	58	525	341	239	504	230	14	177	355
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	18	731	77	58	525	341	239	504	230	14	177	355
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	18	731	77	58	525	341	239	504	230	14	177	355
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	18	731	77	58	525	341	239	504	230	14	177	355
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	18	731	77	58	525	341	239	504	230	14	177	355
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	18	731	77	58	525	341	239	504	230	14	177	355
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.94	0.94	0.95	0.89	0.89	0.95	0.91	0.91	0.95	0.86	0.86
Lanes:	1.00	1.81	0.19	1.00	1.21	0.79	1.00	1.37	0.63	1.00	1.00	1.00
Final Sat.:	1805	3220	339	1805	2059	1338	1805	2362	1078	1805	1625	1625
Capacity Analysis Module:												
Vol/Sat:	0.01	0.23	0.23	0.03	0.25	0.25	0.13	0.21	0.21	0.01	0.11	0.22
Crit Moves:		****			****			****				****
Green/Cycle:	0.02	0.37	0.37	0.05	0.41	0.41	0.22	0.56	0.56	0.02	0.36	0.36
Volume/Cap:	0.62	0.61	0.61	0.61	0.62	0.62	0.61	0.38	0.38	0.38	0.30	0.61
Delay/Veh:	84.6	26.3	26.3	57.4	24.4	24.4	38.1	12.7	12.7	55.0	23.2	27.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	84.6	26.3	26.3	57.4	24.4	24.4	38.1	12.7	12.7	55.0	23.2	27.6
LOS by Move:	F	C	C	E	C	C	D	B	B	E	C	C
HCM2kAvgQ:	1	11	11	3	12	12	7	7	7	1	4	10

Note: Queue reported is the number of cars per lane.

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Intersection #15 Whitewood Road - Meadowlark Road & Linnel Lane Extension

Cycle (sec): 100 Critical Vol./Cap.(X): 0.860
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 27.4
Optimal Cycle: 163 Level Of Service: C

Street Name:	Whitewood Road - Meadowlark Road						Linnel Lane Extension (Future)					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	34	1000	736	271	754	313	36	530	74	24	197	290
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	34	1000	736	271	754	313	36	530	74	24	197	290
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	34	1000	736	271	754	313	36	530	74	24	197	290
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	34	1000	736	271	754	313	36	530	74	24	197	290
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	34	1000	736	271	754	313	36	530	74	24	197	290
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	34	1000	736	271	754	313	36	530	74	24	197	290
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.89	0.89	0.95	0.91	0.91	0.95	0.93	0.93	0.95	0.87	0.87
Lanes:	1.00	1.15	0.85	1.00	1.41	0.59	1.00	1.75	0.25	1.00	1.00	1.00
Final Sat.:	1805	1946	1433	1805	2439	1012	1805	3111	434	1805	1644	1644
Capacity Analysis Module:												
Vol/Sat:	0.02	0.51	0.51	0.15	0.31	0.31	0.02	0.17	0.17	0.01	0.12	0.18
Crit Moves:		****			****			****				****
Green/Cycle:	0.04	0.60	0.60	0.17	0.73	0.73	0.02	0.21	0.21	0.02	0.21	0.21
Volume/Cap:	0.42	0.86	0.86	0.86	0.42	0.42	0.86	0.80	0.80	0.80	0.58	0.86
Delay/Veh:	50.2	20.7	20.7	60.7	5.5	5.5	135.2	43.8	43.8	135.4	37.0	51.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	50.2	20.7	20.7	60.7	5.5	5.5	135.2	43.8	43.8	135.4	37.0	51.0
LOS by Move:	D	C	C	E	A	A	F	D	D	F	D	D
HCM2kAvgQ:	2	26	26	11	7	7	3	12	12	2	7	12

Note: Queue reported is the number of cars per lane.

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Intersection #16 Leon Road & Max Gillis Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.956
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 44.9
Optimal Cycle: 180 Level Of Service: D

Street Name:	Leon Road						Max Gillis Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	2	0	1	2	0	1	1	0	2	0	1	0	1
Volume Module:															
Base Vol:	418	119	422	345	302	130	107	477	716	561	293	184
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	418	119	422	345	302	130	107	477	716	561	293	184
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	418	119	422	345	302	130	107	477	716	561	293	184
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	418	119	422	345	302	130	107	477	716	561	293	184
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	418	119	422	345	302	130	107	477	716	561	293	184
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	418	119	422	345	302	130	107	477	716	561	293	184
Saturation Flow Module:															
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.95	0.85	0.92	0.91	0.91	0.92	0.86	0.86	0.92	1.00	0.85
Lanes:	2.00	2.00	1.00	2.00	1.40	0.60	2.00	1.00	1.00	2.00	1.00	1.00
Final Sat.:	3502	3610	1615	3502	2410	1037	3502	1643	1643	3502	1900	1615
Capacity Analysis Module:															
Vol/Sat:	0.12	0.03	0.26	0.10	0.13	0.13	0.03	0.29	0.44	0.16	0.15	0.11
Crit Moves:			****	****					****	****		
Green/Cycle:	0.18	0.27	0.27	0.10	0.19	0.19	0.10	0.46	0.46	0.17	0.52	0.52
Volume/Cap:	0.65	0.12	0.96	0.96	0.65	0.65	0.30	0.64	0.96	0.96	0.30	0.22
Delay/Veh:	40.2	27.4	67.4	80.5	39.5	39.5	41.9	21.6	42.3	67.7	13.8	13.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	40.2	27.4	67.4	80.5	39.5	39.5	41.9	21.6	42.3	67.7	13.8	13.1
LOS by Move:	D	C	E	F	D	D	D	C	D	E	B	B
HCM2kAvgQ:	7	1	18	9	8	8	2	12	28	13	5	3

Note: Queue reported is the number of cars per lane.

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Intersection #17 Winchester Road - SR-79 & Max Gillis - Thompson

Cycle (sec): 100 Critical Vol./Cap.(X): 0.786
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 26.2
Optimal Cycle: 107 Level Of Service: C

Street Name:	Winchester Road - SR-79						Max Gillis - Thompson					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	2	1	0	1	0	3	0	1	2	0	2	0	1	1	0	1	1	0
Volume Module:																				
Base Vol:	176	1324	43	136	2163	666	624	155	266	32	287	44
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	176	1324	43	136	2163	666	624	155	266	32	287	44
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	176	1324	43	136	2163	666	624	155	266	32	287	44
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	176	1324	43	136	2163	666	624	155	266	32	287	44
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	176	1324	43	136	2163	666	624	155	266	32	287	44
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	176	1324	43	136	2163	666	624	155	266	32	287	44
Saturation Flow Module:																				
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.91	0.85	0.92	0.95	0.85	0.95	0.93	0.93
Lanes:	1.00	2.91	0.09	1.00	3.00	1.00	2.00	2.00	1.00	1.00	1.73	0.27
Final Sat.:	1805	4999	162	1805	5187	1615	3502	3610	1615	1805	3068	470
Capacity Analysis Module:																				
Vol/Sat:	0.10	0.26	0.26	0.08	0.42	0.41	0.18	0.04	0.16	0.02	0.09	0.09
Crit Moves:	****				****		****				****	
Green/Cycle:	0.12	0.51	0.51	0.14	0.53	0.53	0.23	0.31	0.31	0.03	0.12	0.12
Volume/Cap:	0.79	0.52	0.52	0.52	0.79	0.78	0.79	0.14	0.53	0.53	0.79	0.79
Delay/Veh:	59.2	16.6	16.6	41.4	20.5	23.3	41.6	24.8	29.4	56.0	52.3	52.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	59.2	16.6	16.6	41.4	20.5	23.3	41.6	24.8	29.4	56.0	52.3	52.3
LOS by Move:	E	B	B	D	C	C	D	C	C	E	D	D
HCM2kAvgQ:	7	10	10	5	21	18	11	2	7	2	7	7

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #18 California Oaks Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.158
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 67.3
Optimal Cycle: 180 Level Of Service: E

Street Name:	California Oaks Road						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 0	0 2	0	0 0	0 0	0	0 2	1 0	1	0 3	0 0
Volume Module:												
Base Vol:	184	0	611	0	0	0	0	2451	297	934	1886	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	184	0	611	0	0	0	0	2451	297	934	1886	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	184	0	611	0	0	0	0	2451	297	934	1886	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	184	0	611	0	0	0	0	2451	297	934	1886	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	184	0	611	0	0	0	0	2451	297	934	1886	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	184	0	611	0	0	0	0	2451	297	934	1886	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.75	1.00	1.00	1.00	1.00	0.90	0.90	0.95	0.91	1.00
Lanes:	1.00	0.00	2.00	0.00	0.00	0.00	0.00	2.68	0.32	1.00	3.00	0.00
Final Sat.:	1805	0	2842	0	0	0	0	4552	552	1805	5187	0
Capacity Analysis Module:												
Vol/Sat:	0.10	0.00	0.21	0.00	0.00	0.00	0.00	0.54	0.54	0.52	0.36	0.00
Crit Moves:	****							****		****		
Green/Cycle:	0.09	0.00	0.53	0.00	0.00	0.00	0.00	0.47	0.47	0.45	0.91	0.00
Volume/Cap:	1.16	0.00	0.40	0.00	0.00	0.00	0.00	1.16	1.16	1.16	0.40	0.00
Delay/Veh:	165.7	0.0	13.9	0.0	0.0	0.0	0.0	103	102.9	112.4	0.7	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	165.7	0.0	13.9	0.0	0.0	0.0	0.0	103	102.9	112.4	0.7	0.0
LOS by Move:	F	A	B	A	A	A	A	F	F	F	A	A
HCM2kAvgQ:	12	0	6	0	0	0	0	51	51	47	3	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #19 I-215 SB Off-Ramp & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.642
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 7.7
Optimal Cycle: 64 Level Of Service: A

Street Name:	I-215 SB Off-Ramp						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0 0	0 0	0	1 0	0 2	0	0 3	0 1	0	0 3	0 1
Volume Module:												
Base Vol:	0	0	0	54	0	424	0	2554	631	0	1998	240
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	54	0	424	0	2554	631	0	1998	240
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	54	0	424	0	2554	631	0	1998	240
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
PHF Volume:	0	0	0	54	0	424	0	2554	631	0	1998	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	54	0	424	0	2554	631	0	1998	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
FinalVolume:	0	0	0	54	0	424	0	2554	631	0	1998	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.95	1.00	0.75	1.00	0.91	0.85	1.00	0.91	1.00
Lanes:	0.00	0.00	0.00	1.00	0.00	2.00	0.00	3.00	1.00	0.00	3.00	1.00
Final Sat.:	0	0	0	1809	0	2842	0	5187	1615	0	5187	1900
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.03	0.00	0.15	0.00	0.49	0.39	0.00	0.39	0.00
Crit Moves:						****		****		****		
Green/Cycle:	0.00	0.00	0.00	0.23	0.00	0.23	0.00	0.77	0.77	0.00	0.77	0.00
Volume/Cap:	0.00	0.00	0.00	0.13	0.00	0.64	0.00	0.64	0.51	0.00	0.50	0.00
Delay/Veh:	0.0	0.0	0.0	30.5	0.0	36.8	0.0	5.7	4.8	0.0	4.5	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	30.5	0.0	36.8	0.0	5.7	4.8	0.0	4.5	0.0
LOS by Move:	A	A	A	C	A	D	A	A	A	A	A	A
HCM2kAvgQ:	0	0	0	1	0	8	0	14	8	0	9	0

Note: Queue reported is the number of cars per lane.

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2000 HCM Operations Method (Future Volume Alternative)

Intersection #20 I-215 NB Off Ramp & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.286
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 116.7
Optimal Cycle: 180 Level Of Service: F

Street Name:	I-215 NB Off Ramp						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 0	0 1	0	0 0	0 0	0	0 3	0 1	0	0 3	0 1
Volume Module:												
Base Vol:	127	0	1354	0	0	0	0	1756	300	0	2320	267
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	127	0	1354	0	0	0	0	1756	300	0	2320	267
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	127	0	1354	0	0	0	0	1756	300	0	2320	267
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
PHF Volume:	127	0	1354	0	0	0	0	1756	300	0	2320	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	127	0	1354	0	0	0	0	1756	300	0	2320	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
FinalVolume:	127	0	1354	0	0	0	0	1756	300	0	2320	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	1.00	1.00	1.00	1.00	0.91	0.85	1.00	0.91	1.00
Lanes:	1.00	0.00	1.00	0.00	0.00	0.00	0.00	3.00	1.00	0.00	3.00	1.00
Final Sat.:	1805	0	1615	0	0	0	0	5187	1615	0	5187	1900
Capacity Analysis Module:												
Vol/Sat:	0.07	0.00	0.84	0.00	0.00	0.00	0.00	0.34	0.19	0.00	0.45	0.00
Crit Moves:			****				****				****	
Green/Cycle:	0.65	0.00	0.65	0.00	0.00	0.00	0.00	0.35	0.35	0.00	0.35	0.00
Volume/Cap:	0.11	0.00	1.29	0.00	0.00	0.00	0.00	0.97	0.53	0.00	1.29	0.00
Delay/Veh:	6.6	0.0	153.2	0.0	0.0	0.0	0.0	47.4	27.1	0.0	165	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	6.6	0.0	153.2	0.0	0.0	0.0	0.0	47.4	27.1	0.0	165	0.0
LOS by Move:	A	A	F	A	A	A	A	D	C	A	F	A
HCM2kAvgQ:	1	0	79	0	0	0	0	26	8	0	51	0

Note: Queue reported is the number of cars per lane.

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2000 HCM Operations Method (Future Volume Alternative)

Intersection #21 Antelope Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.482
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 5.4
Optimal Cycle: 44 Level Of Service: A

Street Name:	Antelope Road						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ignore			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0 0	0 0	2	0 0	0 2	2	0 3	0 0	0	0 2	1 0
Volume Module:												
Base Vol:	0	0	0	17	0	550	402	1797	0	0	1587	274
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	17	0	550	402	1797	0	0	1587	274
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	17	0	550	402	1797	0	0	1587	274
User Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	17	0	0	402	1797	0	0	1587	274
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	17	0	0	402	1797	0	0	1587	274
PCE Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	17	0	0	402	1797	0	0	1587	274
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.92	1.00	0.88	0.92	0.91	1.00	1.00	0.89	0.89
Lanes:	0.00	0.00	0.00	2.00	0.00	2.00	2.00	3.00	0.00	0.00	2.56	0.44
Final Sat.:	0	0	0	3502	0	3344	3502	5187	0	0	4326	747
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.35	0.00	0.00	0.37	0.37
Crit Moves:					****			****			****	
Green/Cycle:	0.00	0.00	0.00	0.00	0.00	0.00	0.24	1.00	0.00	0.00	0.76	0.76
Volume/Cap:	0.00	0.00	0.00	xxxx	0.00	0.00	0.48	0.35	0.00	0.00	0.48	0.48
Delay/Veh:	0.0	0.0	0.0	0.0	0.0	0.0	33.2	0.0	0.0	0.0	4.6	4.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	0.0	0.0	0.0	33.2	0.0	0.0	0.0	4.6	4.6
LOS by Move:	A	A	A	A	A	A	C	A	A	A	A	A
HCM2kAvgQ:	0	0	0	0	0	0	6	1	0	0	8	8

Note: Queue reported is the number of cars per lane.

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Intersection #23 Liberty Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.467
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 2.0
Optimal Cycle: 43 Level Of Service: A

Street Name:	Liberty Road						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	0	0	1	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	12	0	59	0	0	0	0	1960	151	34	2224	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	12	0	59	0	0	0	0	1960	151	34	2224	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	12	0	59	0	0	0	0	1960	151	34	2224	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	12	0	59	0	0	0	0	1960	151	34	2224	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	12	0	59	0	0	0	0	1960	151	34	2224	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	12	0	59	0	0	0	0	1960	151	34	2224	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.85	1.00	1.00	1.00	1.00	0.90	0.90	0.95	0.91	1.00
Lanes:	2.00	0.00	1.00	0.00	0.00	0.00	0.00	2.79	0.21	1.00	3.00	0.00
Final Sat.:	3502	0	1615	0	0	0	0	4763	367	1805	5187	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.41	0.41	0.02	0.43	0.00
Crit Moves:			****					****		****		
Green/Cycle:	0.08	0.00	0.08	0.00	0.00	0.00	0.00	0.88	0.88	0.04	0.92	0.00
Volume/Cap:	0.04	0.00	0.47	0.00	0.00	0.00	0.00	0.47	0.47	0.47	0.47	0.00
Delay/Veh:	42.7	0.0	46.8	0.0	0.0	0.0	0.0	1.3	1.3	51.6	0.6	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	42.7	0.0	46.8	0.0	0.0	0.0	0.0	1.3	1.3	51.6	0.6	0.0
LOS by Move:	D	A	D	A	A	A	A	A	A	D	A	A
HCM2kAvgQ:	0	0	2	0	0	0	0	5	5	2	4	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #24 Leon Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.825
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 22.2
Optimal Cycle: 131 Level Of Service: C

Street Name:	Leon Road						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ovl			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	1	0	0	0	2	2	0
Volume Module:												
Base Vol:	0	0	0	162	0	1329	415	1595	0	0	727	578
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	162	0	1329	415	1595	0	0	727	578
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	162	0	1329	415	1595	0	0	727	578
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	162	0	1329	415	1595	0	0	727	578
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	162	0	1329	415	1595	0	0	727	578
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	162	0	1329	415	1595	0	0	727	578
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.95	1.00	0.75	0.92	0.91	1.00	1.00	0.91	0.85
Lanes:	0.00	0.00	0.00	1.00	0.00	2.00	2.00	3.00	0.00	0.00	3.00	1.00
Final Sat.:	0	0	0	1805	0	2842	3502	5187	0	0	5187	1615
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.09	0.00	0.47	0.12	0.31	0.00	0.00	0.14	0.36
Crit Moves:						****	****					****
Green/Cycle:	0.00	0.00	0.00	0.42	0.00	0.57	0.14	0.58	0.00	0.00	0.43	0.43
Volume/Cap:	0.00	0.00	0.00	0.21	0.00	0.83	0.83	0.53	0.00	0.00	0.32	0.83
Delay/Veh:	0.0	0.0	0.0	18.4	0.0	21.3	52.3	13.1	0.0	0.0	18.7	32.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	18.4	0.0	21.3	52.3	13.1	0.0	0.0	18.7	32.9
LOS by Move:	A	A	A	B	A	C	D	B	A	A	B	C
HCM2kAvgQ:	0	0	0	3	0	21	9	11	0	0	5	18

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #25 Winchester Road - SR-79 & Benton Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.006
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 43.3
Optimal Cycle: 180 Level Of Service: D

Street Name:	Winchester Road - SR-79						Benton Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 3	0 1	2	0 3	0 1	2	0 2	0 2	2	0 2	0 1
Volume Module:												
Base Vol:	458	1368	362	95	2018	376	44	533	1108	338	572	32
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	458	1368	362	95	2018	376	44	533	1108	338	572	32
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	458	1368	362	95	2018	376	44	533	1108	338	572	32
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	458	1368	362	95	2018	376	44	533	1108	338	572	32
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	458	1368	362	95	2018	376	44	533	1108	338	572	32
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	458	1368	362	95	2018	376	44	533	1108	338	572	32
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.91	0.85	0.92	0.91	0.85	0.92	0.95	0.75	0.92	0.95	0.85
Lanes:	2.00	3.00	1.00	2.00	3.00	1.00	2.00	2.00	2.00	2.00	2.00	1.00
Final Sat.:	3502	5187	1615	3502	5187	1615	3502	3610	2842	3502	3610	1615
Capacity Analysis Module:												
Vol/Sat:	0.13	0.26	0.22	0.03	0.39	0.23	0.01	0.15	0.39	0.10	0.16	0.02
Crit Moves:	****				****				****	****		
Green/Cycle:	0.13	0.47	0.47	0.05	0.39	0.39	0.04	0.39	0.39	0.10	0.45	0.45
Volume/Cap:	1.01	0.56	0.48	0.56	1.01	0.60	0.35	0.38	1.01	1.01	0.35	0.04
Delay/Veh:	87.2	19.5	18.7	50.9	52.3	26.2	48.8	22.2	59.3	95.9	18.2	15.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	87.2	19.5	18.7	50.9	52.3	26.2	48.8	22.2	59.3	95.9	18.2	15.6
LOS by Move:	F	B	B	D	D	C	D	C	E	F	B	B
HCM2kAvgQ:	12	11	8	2	30	10	1	6	27	10	6	1

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #26 Winchester Road - SR-79 & Via Mira Mosa

Cycle (sec): 100 Critical Vol./Cap.(X): 0.895
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 24.3
Optimal Cycle: 180 Level Of Service: C

Street Name:	Winchester Road - SR-79						Via Mira Mosa					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 0	1 0	1	0 0	1 0
Volume Module:												
Base Vol:	27	1638	783	317	2745	234	362	47	91	176	19	31
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	27	1638	783	317	2745	234	362	47	91	176	19	31
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	27	1638	783	317	2745	234	362	47	91	176	19	31
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	27	1638	783	317	2745	234	362	47	91	176	19	31
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	27	1638	783	317	2745	234	362	47	91	176	19	31
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	27	1638	783	317	2745	234	362	47	91	176	19	31
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.87	0.87	0.95	0.90	0.90	0.95	0.90	0.90	0.95	0.91	0.91
Lanes:	1.00	2.03	0.97	1.00	2.76	0.24	1.00	0.34	0.66	1.00	0.38	0.62
Final Sat.:	1805	3341	1597	1805	4722	403	1805	583	1129	1805	655	1068
Capacity Analysis Module:												
Vol/Sat:	0.01	0.49	0.49	0.18	0.58	0.58	0.20	0.08	0.08	0.10	0.03	0.03
Crit Moves:		****		****			****				****	
Green/Cycle:	0.02	0.55	0.55	0.20	0.72	0.72	0.22	0.12	0.12	0.14	0.03	0.03
Volume/Cap:	0.80	0.90	0.90	0.90	0.80	0.80	0.90	0.69	0.69	0.69	0.90	0.90
Delay/Veh:	127.4	24.4	24.4	63.2	10.4	10.4	59.4	52.7	52.7	49.1	131	131.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	127.4	24.4	24.4	63.2	10.4	10.4	59.4	52.7	52.7	49.1	131	131.3
LOS by Move:	F	C	C	E	B	B	E	D	D	D	F	F
HCM2kAvgQ:	2	28	28	13	24	24	14	6	6	7	4	4

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #27 Monroe Ave & Los Alamos

Cycle (sec): 100 Critical Vol./Cap.(X): 0.595
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 24.5
Optimal Cycle: 56 Level Of Service: C

Street Name:	Monroe Ave						Los Alamos					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	2	0 2	0 1	1	0 1	1 0	1	0 2	0 1
Volume Module:												
Base Vol:	29	223	187	562	483	213	45	337	132	64	1008	465
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	29	223	187	562	483	213	45	337	132	64	1008	465
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	29	223	187	562	483	213	45	337	132	64	1008	465
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	29	223	187	562	483	213	45	337	132	64	1008	465
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	29	223	187	562	483	213	45	337	132	64	1008	465
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	29	223	187	562	483	213	45	337	132	64	1008	465
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.89	0.89	0.92	0.95	0.85	0.95	0.91	0.91	0.95	0.95	0.85
Lanes:	1.00	1.09	0.91	2.00	2.00	1.00	1.00	1.44	0.56	1.00	2.00	1.00
Final Sat.:	1805	1830	1535	3502	3610	1615	1805	2485	973	1805	3610	1615
Capacity Analysis Module:												
Vol/Sat:	0.02	0.12	0.12	0.16	0.13	0.13	0.02	0.14	0.14	0.04	0.28	0.29
Crit Moves:		****		****			****					****
Green/Cycle:	0.05	0.20	0.20	0.27	0.42	0.42	0.04	0.42	0.42	0.11	0.48	0.48
Volume/Cap:	0.32	0.60	0.60	0.60	0.32	0.31	0.60	0.33	0.33	0.33	0.58	0.60
Delay/Veh:	47.8	37.4	37.4	32.8	19.3	19.4	59.3	19.8	19.8	42.1	19.0	20.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	47.8	37.4	37.4	32.8	19.3	19.4	59.3	19.8	19.8	42.1	19.0	20.0
LOS by Move:	D	D	D	C	B	B	E	B	B	D	B	B
HCM2kAvgQ:	1	7	7	8	5	4	2	5	5	2	12	11

Note: Queue reported is the number of cars per lane.

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2000 HCM Operations Method (Future Volume Alternative)

Intersection #28 Jefferson Avenue & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.382
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 122.9
Optimal Cycle: 180 Level Of Service: F

Street Name:	Jefferson Avenue						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 3	0 1	1	0 2	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	11	1065	524	914	1272	81	14	77	22	852	92	812
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	11	1065	524	914	1272	81	14	77	22	852	92	812
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	11	1065	524	914	1272	81	14	77	22	852	92	812
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	11	1065	524	914	1272	81	14	77	22	852	92	812
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	11	1065	524	914	1272	81	14	77	22	852	92	812
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	11	1065	524	914	1272	81	14	77	22	852	92	812
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.85	0.95	0.90	0.90	0.95	0.88	0.88	0.95	0.79	0.79
Lanes:	1.00	3.00	1.00	1.00	2.82	0.18	1.00	2.33	0.67	1.00	2.00	1.00
Final Sat.:	1805	5187	1615	1805	4833	308	1805	3901	1115	1805	2991	1496
Capacity Analysis Module:												
Vol/Sat:	0.01	0.21	0.32	0.51	0.26	0.26	0.01	0.02	0.02	0.47	0.03	0.54
Crit Moves:			****	****			****					****
Green/Cycle:	0.01	0.23	0.23	0.37	0.59	0.59	0.01	0.02	0.02	0.38	0.39	0.39
Volume/Cap:	0.45	0.87	1.38	1.38	0.45	0.45	1.38	1.23	1.23	1.23	0.08	1.38
Delay/Veh:	61.4	44.1	225.7	212.7	11.6	11.6	478.8	225	225.1	148.3	19.0	211.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	61.4	44.1	225.7	212.7	11.6	11.6	478.8	225	225.1	148.3	19.0	211.5
LOS by Move:	E	D	F	F	B	B	F	F	F	F	B	F
HCM2kAvgQ:	1	15	36	60	9	9	2	4	4	48	1	59

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #29 Madison Avenue & Murrieta Hot Springs Road

Cycle (sec):	100	Critical Vol./Cap.(X):	0.718	
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	27.7	
Optimal Cycle:	81	Level Of Service:	C	

Street Name:	Madison Avenue						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	2	0	1	2	0	1	1	0	2	0	3	0	1
Volume Module:												
Base Vol:	151	73	355	188	216	174	118	1155	314	789	1764	67
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	151	73	355	188	216	174	118	1155	314	789	1764	67
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	151	73	355	188	216	174	118	1155	314	789	1764	67
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	151	73	355	188	216	174	118	1155	314	789	1764	67
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	151	73	355	188	216	174	118	1155	314	789	1764	67
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	151	73	355	188	216	174	118	1155	314	789	1764	67
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.95	0.85	0.92	0.89	0.89	0.92	0.88	0.88	0.92	0.91	0.85
Lanes:	2.00	2.00	1.00	2.00	1.11	0.89	2.00	3.14	0.86	2.00	3.00	1.00
Final Sat.:	3502	3610	1615	3502	1865	1503	3502	5264	1431	3502	5187	1615
Capacity Analysis Module:												
Vol/Sat:	0.04	0.02	0.22	0.05	0.12	0.12	0.03	0.22	0.22	0.23	0.34	0.04
Crit Moves:			****	****				****		****		
Green/Cycle:	0.10	0.31	0.31	0.07	0.28	0.28	0.06	0.31	0.31	0.31	0.56	0.56
Volume/Cap:	0.42	0.07	0.72	0.72	0.42	0.42	0.60	0.72	0.72	0.72	0.60	0.07
Delay/Veh:	42.8	24.6	35.9	54.5	29.8	29.8	51.4	32.2	32.2	32.7	14.8	10.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	42.8	24.6	35.9	54.5	29.8	29.8	51.4	32.2	32.2	32.7	14.8	10.0
LOS by Move:	D	C	D	D	C	C	D	C	C	C	B	A
HCM2kAvgQ:	3	1	11	4	5	5	3	12	12	12	13	1

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #30 I-15 SB Off-Ramp & Murrieta Hot Springs Road

Cycle (sec):	100	Critical Vol./Cap.(X):	0.733	
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	16.1	
Optimal Cycle:	85	Level Of Service:	B	

Street Name:	I-15 SB Off-Ramp						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	1	0	1!	0	1	0	0	3	0	1	0	0	3	0	1
Volume Module:												
Base Vol:	0	0	0	810	0	413	0	1436	218	0	2353	47
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	810	0	413	0	1436	218	0	2353	47
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	810	0	413	0	1436	218	0	2353	47
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	0	0	0	810	0	413	0	1436	0	0	2353	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	810	0	413	0	1436	0	0	2353	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	0	0	0	810	0	413	0	1436	0	0	2353	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.92	1.00	0.92	1.00	0.91	1.00	1.00	0.91	1.00
Lanes:	0.00	0.00	0.00	1.66	0.00	1.34	0.00	3.00	1.00	0.00	3.00	1.00
Final Sat.:	0	0	0	2901	0	2335	0	5187	1900	0	5187	1900
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.28	0.00	0.18	0.00	0.28	0.00	0.00	0.45	0.00
Crit Moves:				****			****				****	
Green/Cycle:	0.00	0.00	0.00	0.38	0.00	0.38	0.00	0.62	0.00	0.00	0.62	0.00
Volume/Cap:	0.00	0.00	0.00	0.73	0.00	0.46	0.00	0.45	0.00	0.00	0.73	0.00
Delay/Veh:	0.0	0.0	0.0	28.3	0.0	23.4	0.0	10.1	0.0	0.0	14.2	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	28.3	0.0	23.4	0.0	10.1	0.0	0.0	14.2	0.0
LOS by Move:	A	A	A	C	A	C	A	B	A	A	B	A
HCM2kAvgQ:	0	0	0	14	0	7	0	8	0	0	19	0

Note: Queue reported is the number of cars per lane.

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2000 HCM Operations Method (Future Volume Alternative)

Intersection #31 I-15 NB Off-Ramp & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.407
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 5.5
Optimal Cycle: 38 Level Of Service: A

Street Name:	I-15 NB Off-Ramp						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	0	0	1	0	0	0	0	0	0	4	0	1	0	0	4	0	1	0	0	4	0	1
Volume Module:																								
Base Vol:	286	0	61	0	0	0	0	2251	200	0	1621	608
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	286	0	61	0	0	0	0	2251	200	0	1621	608
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	286	0	61	0	0	0	0	2251	200	0	1621	608
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	286	0	61	0	0	0	0	2251	0	0	1621	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	286	0	61	0	0	0	0	2251	0	0	1621	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	286	0	61	0	0	0	0	2251	0	0	1621	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.85	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Lanes:	2.00	0.00	1.00	0.00	0.00	0.00	0.00	4.00	1.00	0.00	4.00	1.00
Final Sat.:	3502	0	1615	0	0	0	0	6916	1900	0	6916	1900
Capacity Analysis Module:												
Vol/Sat:	0.08	0.00	0.04	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.23	0.00
Crit Moves:	****							****		****		
Green/Cycle:	0.20	0.00	0.20	0.00	0.00	0.00	0.00	0.80	0.00	0.00	0.80	0.00
Volume/Cap:	0.41	0.00	0.19	0.00	0.00	0.00	0.00	0.41	0.00	0.00	0.29	0.00
Delay/Veh:	35.2	0.0	33.5	0.0	0.0	0.0	0.0	3.0	0.0	0.0	2.7	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	35.2	0.0	33.5	0.0	0.0	0.0	0.0	3.0	0.0	0.0	2.7	0.0
LOS by Move:	D	A	C	A	A	A	A	A	A	A	A	A
HCM2kAvgQ:	4	0	2	0	0	0	0	6	0	0	4	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #32 I-215 SB Off-Ramp & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.700
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 12.3
Optimal Cycle: 62 Level Of Service: B

Street Name:	I-215 SB Off-Ramp						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	1	0	1!	0	1	0	0	3	0	1	0	0	3	0	1
Volume Module:																								
Base Vol:	0	0	0	476	0	515	0	1880	53	0	2605	378
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	476	0	515	0	1880	53	0	2605	378
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	476	0	515	0	1880	53	0	2605	378
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	0	0	0	476	0	515	0	1880	0	0	2605	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	476	0	515	0	1880	0	0	2605	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	0	0	0	476	0	515	0	1880	0	0	2605	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.90	1.00	0.90	1.00	0.91	1.00	1.00	0.91	1.00
Lanes:	0.00	0.00	0.00	1.48	0.00	1.52	0.00	3.00	1.00	0.00	3.00	1.00
Final Sat.:	0	0	0	2534	0	2601	0	5187	1900	0	5187	1900
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.19	0.00	0.20	0.00	0.36	0.00	0.00	0.50	0.00
Crit Moves:						****					****	
Green/Cycle:	0.00	0.00	0.00	0.28	0.00	0.28	0.00	0.72	0.00	0.00	0.72	0.00
Volume/Cap:	0.00	0.00	0.00	0.66	0.00	0.70	0.00	0.51	0.00	0.00	0.70	0.00
Delay/Veh:	0.0	0.0	0.0	32.8	0.0	33.7	0.0	6.4	0.0	0.0	8.6	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	32.8	0.0	33.7	0.0	6.4	0.0	0.0	8.6	0.0
LOS by Move:	A	A	A	C	A	C	A	A	A	A	A	A
HCM2kAvgQ:	0	0	0	10	0	11	0	9	0	0	17	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #33 I-215 NB Off-Ramp & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.604
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 5.5
Optimal Cycle: 47 Level Of Service: A

Street Name:	I-215 NB Off-Ramp			Murrieta Hot Springs Road								
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 0	2	0	0 0	0	0	0 3	0 1	0	0 3	0 1
Volume Module:												
Base Vol:	338	0	24	0	0	0	0	1583	115	0	2633	668
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	338	0	24	0	0	0	0	1583	115	0	2633	668
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	338	0	24	0	0	0	0	1583	115	0	2633	668
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	338	0	24	0	0	0	0	1583	0	0	2633	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	338	0	24	0	0	0	0	1583	0	0	2633	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	338	0	24	0	0	0	0	1583	0	0	2633	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.75	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Lanes:	2.00	0.00	2.00	0.00	0.00	0.00	0.00	3.00	1.00	0.00	3.00	1.00
Final Sat.:	3502	0	2842	0	0	0	0	5187	1900	0	5187	1900
Capacity Analysis Module:												
Vol/Sat:	0.10	0.00	0.01	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.51	0.00
Crit Moves:	****										****	
Green/Cycle:	0.16	0.00	0.16	0.00	0.00	0.00	0.00	0.84	0.00	0.00	0.84	0.00
Volume/Cap:	0.60	0.00	0.05	0.00	0.00	0.00	0.00	0.36	0.00	0.00	0.60	0.00
Delay/Veh:	40.9	0.0	35.6	0.0	0.0	0.0	0.0	1.9	0.0	0.0	2.8	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	40.9	0.0	35.6	0.0	0.0	0.0	0.0	1.9	0.0	0.0	2.8	0.0
LOS by Move:	D	A	D	A	A	A	A	A	A	A	A	A
HCM2kAvgQ:	6	0	0	0	0	0	0	4	0	0	10	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #34 Jackson Avenue & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.414
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 5.3
Optimal Cycle: 39 Level Of Service: A

Street Name:	Jackson Avenue			Murrieta Hot Springs Road								
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 0	2	0	0 0	0	0	0 3	0 1	1	0 3	0 0
Volume Module:												
Base Vol:	68	0	52	0	0	0	0	1217	41	163	2045	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	68	0	52	0	0	0	0	1217	41	163	2045	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	68	0	52	0	0	0	0	1217	41	163	2045	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	68	0	52	0	0	0	0	1217	41	163	2045	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	68	0	52	0	0	0	0	1217	41	163	2045	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	68	0	52	0	0	0	0	1217	41	163	2045	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.75	1.00	1.00	1.00	1.00	0.91	0.85	0.95	0.91	1.00
Lanes:	2.00	0.00	2.00	0.00	0.00	0.00	0.00	3.00	1.00	1.00	3.00	0.00
Final Sat.:	3502	0	2842	0	0	0	0	5187	1615	1805	5187	0
Capacity Analysis Module:												
Vol/Sat:	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.23	0.03	0.09	0.39	0.00
Crit Moves:	****						****				****	
Green/Cycle:	0.05	0.00	0.05	0.00	0.00	0.00	0.00	0.69	0.69	0.26	0.95	0.00
Volume/Cap:	0.41	0.00	0.39	0.00	0.00	0.00	0.00	0.34	0.04	0.34	0.41	0.00
Delay/Veh:	48.0	0.0	48.1	0.0	0.0	0.0	0.0	6.4	5.0	30.1	0.2	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	48.0	0.0	48.1	0.0	0.0	0.0	0.0	6.4	5.0	30.1	0.2	0.0
LOS by Move:	D	A	D	A	A	A	A	A	A	C	A	A
HCM2kAvgQ:	2	0	1	0	0	0	0	6	0	4	2	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #35 Margarita Road & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.661
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 24.5
Optimal Cycle: 67 Level Of Service: C

Street Name:	Margarita Road									Murrieta Hot Springs Road								
Approach:	North Bound				South Bound					East Bound					West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Split Phase				Split Phase					Protected					Protected			
Rights:	Include				Include					Include					Include			
Min. Green:	0	0	0		0	0	0			0	0	0			0	0	0	
Lanes:	2	0	1	0	1	0	1	0	0	1	1	0	2	1	0	1	0	2	1	0
Volume Module:																				
Base Vol:	628	60	127		41	17	7			162	751	460			304	1795	72			
Growth Adj:	1.00	1.00	1.00		1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			
Initial Bse:	628	60	127		41	17	7			162	751	460			304	1795	72			
Added Vol:	0	0	0		0	0	0			0	0	0			0	0	0			
PasserByVol:	0	0	0		0	0	0			0	0	0			0	0	0			
Initial Fut:	628	60	127		41	17	7			162	751	460			304	1795	72			
User Adj:	1.00	1.00	1.00		1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			
PHF Adj:	1.00	1.00	1.00		1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			
PHF Volume:	628	60	127		41	17	7			162	751	460			304	1795	72			
Reduct Vol:	0	0	0		0	0	0			0	0	0			0	0	0			
Reduced Vol:	628	60	127		41	17	7			162	751	460			304	1795	72			
PCE Adj:	1.00	1.00	1.00		1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			
MLF Adj:	1.00	1.00	1.00		1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			
FinalVolume:	628	60	127		41	17	7			162	751	460			304	1795	72			
Saturation Flow Module:																				
Sat/Lane:	1900	1900	1900		1900	1900	1900			1900	1900	1900			1900	1900	1900			
Adjustment:	0.92	1.00	0.85		0.97	0.97	0.85			0.95	0.86	0.86			0.95	0.90	0.90			
Lanes:	2.00	1.00	1.00		0.71	0.29	1.00			1.00	2.00	1.00			1.00	2.88	0.12			
Final Sat.:	3502	1900	1615		1297	538	1615			1805	3261	1630			1805	4957	199			
Capacity Analysis Module:																				
Vol/Sat:	0.18	0.03	0.08		0.03	0.03	0.00			0.09	0.23	0.28			0.17	0.36	0.36			
Crit Moves:	****				****							****	****							
Green/Cycle:	0.27	0.27	0.27		0.05	0.05	0.05			0.14	0.43	0.43			0.25	0.55	0.55			
Volume/Cap:	0.66	0.12	0.29		0.66	0.66	0.09			0.66	0.54	0.66			0.66	0.66	0.66			
Delay/Veh:	34.1	27.5	29.2		64.1	64.1	46.0			47.8	21.6	23.8			37.0	16.8	16.8			
User DelAdj:	1.00	1.00	1.00		1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			
AdjDel/Veh:	34.1	27.5	29.2		64.1	64.1	46.0			47.8	21.6	23.8			37.0	16.8	16.8			
LOS by Move:	C	C	C		E	E	D			D	C	C			D	B	B			
HCM2kAvgQ:	10	1	3		3	3	0			6	10	13			9	15	15			

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #36 French Valley Parkway & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.742
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 13.1
Optimal Cycle: 88 Level Of Service: B

Street Name:	French Valley Parkway									Murrieta Hot Springs Road								
Approach:	North Bound				South Bound					East Bound					West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected				Protected					Protected					Protected			
Rights:	Ovl				Include					Include					Include			
Min. Green:	0	0	0		0	0	0			0	0	0			0	0	0			
Lanes:	1	0	0	0	2	0	0	0	0	0	0	0	2	1	0	1	0	3	0	0
Volume Module:																				
Base Vol:	20	0	832		0	0	0			0	1242	291			771	2012	0			
Growth Adj:	1.00	1.00	1.00		1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			
Initial Bse:	20	0	832		0	0	0			0	1242	291			771	2012	0			
Added Vol:	0	0	0		0	0	0			0	0	0			0	0	0			
PasserByVol:	0	0	0		0	0	0			0	0	0			0	0	0			
Initial Fut:	20	0	832		0	0	0			0	1242	291			771	2012	0			
User Adj:	1.00	1.00	1.00		1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			
PHF Adj:	1.00	1.00	1.00		1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			
PHF Volume:	20	0	832		0	0	0			0	1242	291			771	2012	0			
Reduct Vol:	0	0	0		0	0	0			0	0	0			0	0	0			
Reduced Vol:	20	0	832		0	0	0			0	1242	291			771	2012	0			
PCE Adj:	1.00	1.00	1.00		1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			
MLF Adj:	1.00	1.00	1.00		1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			
FinalVolume:	20	0	832		0	0	0			0	1242	291			771	2012	0			
Saturation Flow Module:																				
Sat/Lane:	1900	1900	1900		1900	1900	1900			1900	1900	1900			1900	1900	1900			
Adjustment:	0.95	1.00	0.75		1.00	1.00	1.00			1.00	0.88	0.88			0.95	0.91	1.00			
Lanes:	1.00	0.00	2.00		0.00	0.00	0.00			0.00	2.43	0.57			1.00	3.00	0.00			
Final Sat.:	1805	0	2842		0	0	0			0	4085	957			1805	5187	0			
Capacity Analysis Module:																				
Vol/Sat:	0.01	0.00	0.29		0.00	0.00	0.00			0.00	0.30	0.30			0.43	0.39	0.00			
Crit Moves:	****										****				****					
Green/Cycle:	0.01	0.00	0.59		0.00	0.00	0.00			0.00	0.41	0.41			0.58	0.99	0.00			
Volume/Cap:	0.74	0.00	0.50		0.00	0.00	0.00			0.00	0.74	0.74			0.74	0.39	0.00			
Delay/Veh:	120.4	0.0	12.1		0.0	0.0	0.0			0.0	26.5	26.5			18.6	0.1	0.0			
User DelAdj:	1.00	1.00	1.00		1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			
AdjDel/Veh:	120.4	0.0	12.1		0.0	0.0	0.0			0.0	26.5	26.5			18.6	0.1	0.0			
LOS by Move:	F	A	B		A	A	A			A	C	C			B	A	A			
HCM2kAvgQ:	2	0	9		0	0	0			0	16	16			19	1	0			

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #37 Jefferson Avenue & Guava Street

Cycle (sec): 100 Critical Vol./Cap.(X): 0.489
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 9.1
Optimal Cycle: 36 Level Of Service: A

Street Name:	Jefferson Avenue						Guava Street					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 0	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	23	1420	3	8	1468	305	169	115	86	2	32	10
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	23	1420	3	8	1468	305	169	115	86	2	32	10
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	23	1420	3	8	1468	305	169	115	86	2	32	10
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	23	1420	3	8	1468	305	169	115	86	2	32	10
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	23	1420	3	8	1468	305	169	115	86	2	32	10
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	23	1420	3	8	1468	305	169	115	86	2	32	10
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.89	0.89	0.71	0.94	0.94	0.38	0.92	0.92
Lanes:	1.00	2.99	0.01	1.00	2.48	0.52	1.00	0.57	0.43	1.00	1.52	0.48
Final Sat.:	1805	5176	11	1805	4183	869	1347	1017	761	722	2651	829
Capacity Analysis Module:												
Vol/Sat:	0.01	0.27	0.27	0.00	0.35	0.35	0.13	0.11	0.11	0.00	0.01	0.01
Crit Moves:	****				****		****					
Green/Cycle:	0.03	0.73	0.73	0.01	0.72	0.72	0.26	0.26	0.26	0.26	0.26	0.26
Volume/Cap:	0.49	0.37	0.37	0.37	0.49	0.49	0.49	0.44	0.44	0.01	0.05	0.05
Delay/Veh:	55.8	5.0	5.0	59.8	6.3	6.3	32.7	31.8	31.8	27.7	28.0	28.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	55.8	5.0	5.0	59.8	6.3	6.3	32.7	31.8	31.8	27.7	28.0	28.0
LOS by Move:	E	A	A	E	A	A	C	C	C	C	C	C
HCM2kAvgQ:	1	6	6	1	9	9	5	5	5	0	1	1

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #39 Washington Ave & Calle Del Oso Oro/Nutmeg

Cycle (sec): 100 Critical Vol./Cap.(X): 0.689
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 26.7
Optimal Cycle: 73 Level Of Service: C

Street Name:	Washington Ave						Calle Del Oso Oro/Nutmeg					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	264	162	123	86	197	89	64	592	675	142	200	40
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	264	162	123	86	197	89	64	592	675	142	200	40
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	264	162	123	86	197	89	64	592	675	142	200	40
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	264	162	123	86	197	89	64	592	675	142	200	40
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	264	162	123	86	197	89	64	592	675	142	200	40
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	264	162	123	86	197	89	64	592	675	142	200	40
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.85	0.85	0.95	0.87	0.87	0.95	0.87	0.87	0.95	0.93	0.93
Lanes:	1.00	2.00	1.00	1.00	2.07	0.93	1.00	1.00	1.00	1.00	1.67	0.33
Final Sat.:	1805	3233	1617	1805	3405	1538	1805	1661	1661	1805	2933	587
Capacity Analysis Module:												
Vol/Sat:	0.15	0.05	0.08	0.05	0.06	0.06	0.04	0.36	0.41	0.08	0.07	0.07
Crit Moves:	****				****				****	****		
Green/Cycle:	0.21	0.18	0.18	0.11	0.08	0.08	0.24	0.59	0.59	0.11	0.46	0.46
Volume/Cap:	0.69	0.28	0.42	0.42	0.69	0.69	0.15	0.60	0.69	0.69	0.15	0.15
Delay/Veh:	41.6	35.4	36.6	42.6	49.4	49.4	30.0	13.6	15.3	52.1	15.5	15.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	41.6	35.4	36.6	42.6	49.4	49.4	30.0	13.6	15.3	52.1	15.5	15.5
LOS by Move:	D	D	D	D	D	D	C	B	B	D	B	B
HCM2kAvgQ:	9	3	4	3	5	5	2	13	16	6	2	2

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #40 Clinton Keith Rd & Calle de Oso Oro/Bear Creek Dr

Cycle (sec): 100 Critical Vol./Cap.(X): 0.949
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 23.8
Optimal Cycle: 180 Level Of Service: C

Street Name:	Clinton Keith Rd						Calle de Oso Oro/Bear Creek Dr					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 0 1	0	1	0 1	1 0
Volume Module:												
Base Vol:	60	107	273	5	114	195	267	618	160	422	615	20
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	60	107	273	5	114	195	267	618	160	422	615	20
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	60	107	273	5	114	195	267	618	160	422	615	20
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	60	107	273	5	114	195	267	618	160	422	615	20
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	60	107	273	5	114	195	267	618	160	422	615	20
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	60	107	273	5	114	195	267	618	160	422	615	20
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.85	0.85	0.95	0.86	0.86	0.40	0.97	0.97	0.29	0.95	0.95
Lanes:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.79	0.21	1.00	1.94	0.06
Final Sat.:	1805	1610	1610	1805	1634	1634	758	1462	379	543	3479	113
Capacity Analysis Module:												
Vol/Sat:	0.03	0.07	0.17	0.00	0.07	0.12	0.35	0.42	0.42	0.78	0.18	0.18
Crit Moves:			****	****						****		
Green/Cycle:	0.04	0.18	0.18	0.00	0.14	0.14	0.82	0.82	0.82	0.82	0.82	0.82
Volume/Cap:	0.84	0.37	0.95	0.95	0.49	0.84	0.43	0.52	0.52	0.95	0.22	0.22
Delay/Veh:	103.4	36.4	72.6	404.5	40.2	57.5	3.0	3.2	3.2	37.4	2.0	2.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	103.4	36.4	72.6	404.5	40.2	57.5	3.0	3.2	3.2	37.4	2.0	2.0
LOS by Move:	F	D	E	F	D	E	A	A	A	D	A	A
HCM2kAvgQ:	4	3	13	1	4	9	3	8	8	16	2	2

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #43 Jefferson Ave & Lemon St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.900
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 25.8
Optimal Cycle: 180 Level Of Service: C

Street Name:	Jefferson Ave						Lemon St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	0 1	1	0 0	1 0
Volume Module:												
Base Vol:	282	758	28	4	2549	155	35	3	344	8	12	6
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	282	758	28	4	2549	155	35	3	344	8	12	6
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	282	758	28	4	2549	155	35	3	344	8	12	6
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	282	758	28	4	2549	155	35	3	344	8	12	6
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	282	758	28	4	2549	155	35	3	344	8	12	6
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	282	758	28	4	2549	155	35	3	344	8	12	6
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.90	0.90	0.95	1.00	0.85	0.95	0.95	0.95
Lanes:	1.00	2.89	0.11	1.00	2.83	0.17	1.00	1.00	1.00	1.00	0.67	0.33
Final Sat.:	1805	4977	184	1805	4846	295	1805	1900	1615	1805	1203	602
Capacity Analysis Module:												
Vol/Sat:	0.16	0.15	0.15	0.00	0.53	0.53	0.02	0.00	0.21	0.00	0.01	0.01
Crit Moves:	****				****				****	****		
Green/Cycle:	0.17	0.75	0.75	0.01	0.58	0.58	0.16	0.24	0.24	0.00	0.08	0.08
Volume/Cap:	0.90	0.20	0.20	0.20	0.90	0.90	0.12	0.01	0.90	0.90	0.12	0.12
Delay/Veh:	67.5	3.8	3.8	54.1	22.3	22.3	36.2	29.2	60.4	290.4	42.9	42.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	67.5	3.8	3.8	54.1	22.3	22.3	36.2	29.2	60.4	290.4	42.9	42.9
LOS by Move:	E	A	A	D	C	C	D	C	E	F	D	D
HCM2kAvgQ:	12	3	3	0	30	30	1	0	14	1	1	1

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #44 Jefferson Ave & Kalmia St

Cycle (sec): 100 Critical Vol./Cap.(X): 1.054
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 56.4
Optimal Cycle: 180 Level Of Service: E

Street Name:	Jefferson Ave						Kalmia St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 3	0 1	1	0 2	1 0	1	0 2	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	258	930	266	954	1732	153	49	496	349	236	341	524
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	258	930	266	954	1732	153	49	496	349	236	341	524
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	258	930	266	954	1732	153	49	496	349	236	341	524
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	258	930	266	954	1732	153	49	496	349	236	341	524
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	258	930	266	954	1732	153	49	496	349	236	341	524
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	258	930	266	954	1732	153	49	496	349	236	341	524
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.91	0.85	0.95	0.90	0.90	0.95	0.85	0.85	0.95	0.86	0.86
Lanes:	2.00	3.00	1.00	1.00	2.76	0.24	1.00	2.00	1.00	1.00	1.00	1.00
Final Sat.:	3502	5187	1615	1805	4709	416	1805	3244	1622	1805	1641	1641
Capacity Analysis Module:												
Vol/Sat:	0.07	0.18	0.16	0.53	0.37	0.37	0.03	0.15	0.22	0.13	0.21	0.32
Crit Moves:		****		****					****	****		
Green/Cycle:	0.11	0.17	0.17	0.50	0.56	0.56	0.03	0.20	0.20	0.12	0.30	0.30
Volume/Cap:	0.66	1.05	0.97	1.05	0.66	0.66	1.06	0.75	1.05	1.05	0.69	1.06
Delay/Veh:	46.6	87.0	86.6	70.0	15.9	15.9	197.5	40.2	86.7	118.8	32.3	82.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	46.6	87.0	86.6	70.0	15.9	15.9	197.5	40.2	86.7	118.8	32.3	82.0
LOS by Move:	D	F	F	E	B	B	F	D	F	F	C	F
HCM2kAvgQ:	5	17	13	41	15	15	4	10	19	13	11	26

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #45 Jefferson Ave & Juniper St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.825
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 23.5
Optimal Cycle: 130 Level Of Service: C

Street Name:	Jefferson Ave						Juniper St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	485	1291	36	69	2046	172	135	100	195	7	100	21
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	485	1291	36	69	2046	172	135	100	195	7	100	21
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	485	1291	36	69	2046	172	135	100	195	7	100	21
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	485	1291	36	69	2046	172	135	100	195	7	100	21
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	485	1291	36	69	2046	172	135	100	195	7	100	21
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	485	1291	36	69	2046	172	135	100	195	7	100	21
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.90	0.90	0.95	0.86	0.86	0.95	0.93	0.93
Lanes:	1.00	2.92	0.08	1.00	2.77	0.23	1.00	1.00	1.00	1.00	1.65	0.35
Final Sat.:	1805	5026	140	1805	4727	397	1805	1626	1626	1805	2906	610
Capacity Analysis Module:												
Vol/Sat:	0.27	0.26	0.26	0.04	0.43	0.43	0.07	0.06	0.12	0.00	0.03	0.03
Crit Moves:	****				****					****	****	
Green/Cycle:	0.33	0.74	0.74	0.11	0.52	0.52	0.10	0.15	0.15	0.00	0.05	0.05
Volume/Cap:	0.83	0.35	0.35	0.35	0.83	0.83	0.73	0.42	0.83	0.83	0.73	0.73
Delay/Veh:	40.4	4.6	4.6	42.2	22.2	22.2	57.1	39.3	56.0	251.9	62.0	62.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	40.4	4.6	4.6	42.2	22.2	22.2	57.1	39.3	56.0	251.9	62.0	62.0
LOS by Move:	D	A	A	D	C	C	E	D	E	F	E	E
HCM2kAvgQ:	16	5	5	2	23	23	6	3	9	1	3	3

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #46 Jefferson Ave & Ivy St/Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.703
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 26.2
Optimal Cycle: 77 Level Of Service: C

Street Name:	Jefferson Ave									Ivy St/Los Alamos Rd								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected				Protected				Protected				Protected					
Rights:	Include				Include				Include				Include					
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0			
Lanes:	2	0	3	0	1	2	0	3	0	1	1	0	1	1	0	1	0	1	1	0
Volume Module:																				
Base Vol:	166	1321		95		310	1866		52		53		88		129		354		82	421
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00		1.00	1.00
Initial Bse:	166	1321		95		310	1866		52		53		88		129		354		82	421
Added Vol:	0	0		0		0	0		0		0		0		0		0		0	0
PasserByVol:	0	0		0		0	0		0		0		0		0		0		0	0
Initial Fut:	166	1321		95		310	1866		52		53		88		129		354		82	421
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00		1.00	1.00
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00		1.00	1.00
PHF Volume:	166	1321		95		310	1866		52		53		88		129		354		82	421
Reduct Vol:	0	0		0		0	0		0		0		0		0		0		0	0
Reduced Vol:	166	1321		95		310	1866		52		53		88		129		354		82	421
PCE Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00		1.00	1.00
MLF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00		1.00	1.00
FinalVolume:	166	1321		95		310	1866		52		53		88		129		354		82	421
Saturation Flow Module:																				
Sat/Lane:	1900	1900		1900		1900	1900		1900		1900		1900		1900		1900		1900	1900
Adjustment:	0.92	0.91		0.85		0.92	0.91		0.85		0.95		0.87		0.87		0.95		0.83	0.83
Lanes:	2.00	3.00		1.00		2.00	3.00		1.00		1.00		1.00		1.00		1.00		1.00	1.00
Final Sat.:	3502	5187		1615		3502	5187		1615		1805		1644		1644		1805		1578	1578
Capacity Analysis Module:																				
Vol/Sat:	0.05	0.25		0.06		0.09	0.36		0.03		0.03		0.05		0.08		0.20		0.05	0.27
Crit Moves:	****						****				****									****
Green/Cycle:	0.07	0.43		0.43		0.15	0.51		0.51		0.04		0.12		0.12		0.30		0.38	0.38
Volume/Cap:	0.70	0.59		0.14		0.59	0.70		0.06		0.70		0.44		0.65		0.65		0.14	0.70
Delay/Veh:	54.9	22.3		17.4		41.5	19.5		12.4		73.2		41.5		46.5		33.2		20.3	29.4
User DelAdj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00		1.00	1.00
AdjDel/Veh:	54.9	22.3		17.4		41.5	19.5		12.4		73.2		41.5		46.5		33.2		20.3	29.4
LOS by Move:	D	C		B		D	B		B		E		D		D		C		C	C
HCM2kAvgQ:	4	12		2		5	17		1		3		3		5		10		2	13

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #48 Madison Ave/I-15 SB Ramps & Kalmia St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.575
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 31.8
Optimal Cycle: 54 Level Of Service: C

Street Name:	Madison Ave/I-15 SB Ramps									Kalmia St								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected				Protected				Protected				Protected					
Rights:	Include				Include				Include				Include					
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0			
Lanes:	2	0	0	0	2	2	0	1	1	0	0	0	3	1	0	2	0	2	1	1
Volume Module:																				
Base Vol:	114		0		226	259		56		260		0	1453		258	437	1127			512
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00
Initial Bse:	114		0		226	259		56		260		0	1453		258	437	1127			512
Added Vol:	0		0		0	0		0		0		0	0		0	0	0			0
PasserByVol:	0		0		0	0		0		0		0	0		0	0	0			0
Initial Fut:	114		0		226	259		56		260		0	1453		258	437	1127			512
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00
PHF Volume:	114		0		226	259		56		260		0	1453		258	437	1127			512
Reduct Vol:	0		0		0	0		0		0		0	0		0	0	0			0
Reduced Vol:	114		0		226	259		56		260		0	1453		258	437	1127			512
PCE Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00
MLF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00
FinalVolume:	114		0		226	259		56		260		0	1453		258	437	1127			512
Saturation Flow Module:																				
Sat/Lane:	1900	1900		1900		1900	1900		1900		1900	1900		1900		1900		1900		1900
Adjustment:	0.92	1.00		0.75		0.92	0.83		0.83		1.00	0.89		0.89		0.92	0.87			0.87
Lanes:	2.00	0.00		2.00		2.00	1.00		1.00		0.00	3.40		0.60		2.00	2.75			1.25
Final Sat.:	3502		0		2842	3502	1583		1583		0	5738		1019		3502	4532			2059
Capacity Analysis Module:																				
Vol/Sat:	0.03	0.00		0.08		0.07	0.04		0.16		0.00	0.25		0.25		0.12	0.25			0.25
Crit Moves:	****								****			****				****				
Green/Cycle:	0.06	0.00		0.06		0.16	0.29		0.29		0.00	0.44		0.44		0.22	0.66			0.66
Volume/Cap:	0.57	0.00		1.40		0.45	0.12		0.57		0.00	0.57		0.57		0.57	0.38			0.38
Delay/Veh:	50.1	0.0		261.8		38.2	26.5		32.0		0.0	21.2		21.2		36.1	7.9			7.9
User DelAdj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00			1.00
AdjDel/Veh:	50.1	0.0		261.8		38.2	26.5		32.0		0.0	21.2		21.2		36.1	7.9			7.9
LOS by Move:	D	A		F		D	C		C		A	C		C		D	A			A
HCM2kAvgQ:	3	0		10		4	1		8		0	11		11		7	6			6

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #50 Hancock Ave & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.786
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 18.0
Optimal Cycle: 106 Level Of Service: B

Street Name:	Hancock Ave						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ovl			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	2	0	0	2	0	4	0	3	1
Volume Module:												
Base Vol:	0	0	0	398	0	652	708	1542	0	0	2617	548
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	398	0	652	708	1542	0	0	2617	548
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	398	0	652	708	1542	0	0	2617	548
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	398	0	652	708	1542	0	0	2617	548
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	398	0	652	708	1542	0	0	2617	548
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	398	0	652	708	1542	0	0	2617	548
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.92	1.00	0.75	0.92	0.91	1.00	1.00	0.89	0.89
Lanes:	0.00	0.00	0.00	2.00	0.00	2.00	2.00	4.00	0.00	0.00	3.31	0.69
Final Sat.:	0	0	0	3502	0	2842	3502	6916	0	0	5570	1166
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.11	0.00	0.23	0.20	0.22	0.00	0.00	0.47	0.47
Crit Moves:				****			****				****	
Green/Cycle:	0.00	0.00	0.00	0.14	0.00	0.40	0.26	0.86	0.00	0.00	0.60	0.60
Volume/Cap:	0.00	0.00	0.00	0.79	0.00	0.57	0.79	0.26	0.00	0.00	0.79	0.79
Delay/Veh:	0.0	0.0	0.0	49.2	0.0	23.9	39.2	1.4	0.0	0.0	16.3	16.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	49.2	0.0	23.9	39.2	1.4	0.0	0.0	16.3	16.3
LOS by Move:	A	A	A	D	A	C	D	A	A	A	B	B
HCM2kAvgQ:	0	0	0	8	0	9	12	3	0	0	22	22

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #51 Alta Murrieta Dr & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.615
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 24.1
Optimal Cycle: 59 Level Of Service: C

Street Name:	Alta Murrieta Dr						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Ovl		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	1	0	1	2	0	1	1	0	2	0
Volume Module:												
Base Vol:	224	80	19	69	129	325	260	982	280	127	1900	166
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	224	80	19	69	129	325	260	982	280	127	1900	166
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	224	80	19	69	129	325	260	982	280	127	1900	166
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	224	80	19	69	129	325	260	982	280	127	1900	166
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	224	80	19	69	129	325	260	982	280	127	1900	166
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	224	80	19	69	129	325	260	982	280	127	1900	166
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.85	0.92	0.85	0.85	0.92	0.88	0.88	0.92	0.91	0.85
Lanes:	2.00	1.00	1.00	2.00	1.00	1.00	2.00	2.33	0.67	2.00	4.00	1.00
Final Sat.:	3502	1900	1615	3502	1612	1612	3502	3903	1113	3502	6916	1615
Capacity Analysis Module:												
Vol/Sat:	0.06	0.04	0.01	0.02	0.08	0.20	0.07	0.25	0.25	0.04	0.27	0.10
Crit Moves:	****						****	****			****	
Green/Cycle:	0.10	0.29	0.29	0.14	0.33	0.33	0.12	0.50	0.50	0.07	0.45	0.58
Volume/Cap:	0.61	0.14	0.04	0.14	0.24	0.61	0.61	0.51	0.51	0.51	0.61	0.18
Delay/Veh:	46.0	26.1	25.2	38.1	24.6	29.8	44.4	17.1	17.1	46.4	21.5	9.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	46.0	26.1	25.2	38.1	24.6	29.8	44.4	17.1	17.1	46.4	21.5	9.7
LOS by Move:	D	C	C	D	C	C	D	B	B	D	C	A
HCM2kAvgQ:	4	2	0	1	3	10	5	10	10	3	13	2

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #52 Winchester Road - SR-79 & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.370
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 107.1
Optimal Cycle: 180 Level Of Service: F

Street Name:	Winchester Road - SR-79						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 3	0 1	2	0 3	0 1	2	0 3	0 1	2	0 2	1 0
Volume Module:												
Base Vol:	287	1481	151	154	1467	1400	809	276	103	281	894	81
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	287	1481	151	154	1467	1400	809	276	103	281	894	81
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	287	1481	151	154	1467	1400	809	276	103	281	894	81
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	287	1481	151	154	1467	1400	809	276	103	281	894	81
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	287	1481	151	154	1467	1400	809	276	103	281	894	81
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	287	1481	151	154	1467	1400	809	276	103	281	894	81
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.91	0.85	0.92	0.91	0.85	0.92	0.91	0.85	0.92	0.90	0.90
Lanes:	2.00	3.00	1.00	2.00	3.00	1.00	2.00	3.00	1.00	2.00	2.75	0.25
Final Sat.:	3502	5187	1615	3502	5187	1615	3502	5187	1615	3502	4699	426
Capacity Analysis Module:												
Vol/Sat:	0.08	0.29	0.09	0.04	0.28	0.87	0.23	0.05	0.06	0.08	0.19	0.19
Crit Moves:	****					****	****				****	
Green/Cycle:	0.06	0.60	0.77	0.09	0.63	0.63	0.17	0.14	0.14	0.17	0.14	0.14
Volume/Cap:	1.37	0.48	0.12	0.48	0.45	1.37	1.37	0.39	0.47	0.47	1.37	1.37
Delay/Veh:	240.9	11.3	2.9	44.2	9.5	191.2	218.7	39.8	41.4	37.9	218	218.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	240.9	11.3	2.9	44.2	9.5	191.2	218.7	39.8	41.4	37.9	218	218.5
LOS by Move:	F	B	A	D	A	F	F	D	D	D	F	F
HCM2kAvgQ:	12	9	1	3	8	90	29	3	3	4	25	25

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #53 Hancock Ave & Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.173
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 83.2
Optimal Cycle: 180 Level Of Service: F

Street Name:	Hancock Ave						Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	2	0 0	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	49	120	214	740	266	92	71	943	80	981	1687	600
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	49	120	214	740	266	92	71	943	80	981	1687	600
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	49	120	214	740	266	92	71	943	80	981	1687	600
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	49	120	214	740	266	92	71	943	80	981	1687	600
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	49	120	214	740	266	92	71	943	80	981	1687	600
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	49	120	214	740	266	92	71	943	80	981	1687	600
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.86	0.86	0.92	0.96	0.96	0.95	0.94	0.94	0.95	0.91	0.91
Lanes:	1.00	1.00	1.00	2.00	0.74	0.26	1.00	1.84	0.16	1.00	1.48	0.52
Final Sat.:	1805	1632	1632	3502	1357	469	1805	3288	279	1805	2559	910
Capacity Analysis Module:												
Vol/Sat:	0.03	0.07	0.13	0.21	0.20	0.20	0.04	0.29	0.29	0.54	0.66	0.66
Crit Moves:			****	****				****		****		
Green/Cycle:	0.04	0.11	0.11	0.18	0.26	0.26	0.04	0.24	0.24	0.46	0.67	0.67
Volume/Cap:	0.76	0.66	1.17	1.17	0.76	0.76	0.99	1.17	1.17	1.17	0.99	0.99
Delay/Veh:	89.1	45.7	152.9	134.8	41.7	41.7	149.3	128	127.6	117.2	31.8	31.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	89.1	45.7	152.9	134.8	41.7	41.7	149.3	128	127.6	117.2	31.8	31.8
LOS by Move:	F	D	F	F	D	D	F	F	F	F	C	C
HCM2kAvgQ:	3	5	14	22	12	12	5	29	29	51	44	44

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #54 I-215 SB Ramps & Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.104
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 77.7
Optimal Cycle: 180 Level Of Service: E

Street Name:	I-215 SB Ramps						Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	1	0	1!	0	1	0	2	0	1
Volume Module:												
Base Vol:	0	0	0	397	0	2007	0	1348	464	236	1591	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	397	0	2007	0	1348	464	236	1591	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	397	0	2007	0	1348	464	236	1591	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	397	0	2007	0	1348	464	236	1591	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	397	0	2007	0	1348	464	236	1591	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	397	0	2007	0	1348	464	236	1591	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.87	1.00	0.87	1.00	0.95	0.85	0.92	0.95	1.00
Lanes:	0.00	0.00	0.00	1.17	0.00	1.83	0.00	2.00	1.00	2.00	2.00	0.00
Final Sat.:	0	0	0	1922	0	3026	0	3610	1615	3502	3610	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.21	0.00	0.66	0.00	0.37	0.29	0.07	0.44	0.00
Crit Moves:						****		****		****		
Green/Cycle:	0.00	0.00	0.00	0.60	0.00	0.60	0.00	0.34	0.34	0.06	0.40	0.00
Volume/Cap:	0.00	0.00	0.00	0.34	0.00	1.10	0.00	1.10	0.85	1.10	1.10	0.00
Delay/Veh:	0.0	0.0	0.0	10.1	0.0	74.3	0.0	92.3	42.7	139.1	87.5	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	10.1	0.0	74.3	0.0	92.3	42.7	139.1	87.5	0.0
LOS by Move:	A	A	A	B	A	E	A	F	D	F	F	A
HCM2kAvgQ:	0	0	0	5	0	50	0	34	16	8	40	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #55 I-215 NB Ramps & Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.813
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 25.0
Optimal Cycle: 122 Level Of Service: C

Street Name:	I-215 NB Ramps						Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	0	1	0	0	0	0	0	2	0	3
Volume Module:												
Base Vol:	510	0	269	0	0	0	571	1169	0	0	1326	140
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	510	0	269	0	0	0	571	1169	0	0	1326	140
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	510	0	269	0	0	0	571	1169	0	0	1326	140
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	510	0	269	0	0	0	571	1169	0	0	1326	140
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	510	0	269	0	0	0	571	1169	0	0	1326	140
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	510	0	269	0	0	0	571	1169	0	0	1326	140
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	1.00	1.00	1.00	0.92	0.91	1.00	1.00	0.95	0.85
Lanes:	1.00	0.00	1.00	0.00	0.00	0.00	2.00	3.00	0.00	0.00	2.00	1.00
Final Sat.:	1805	0	1615	0	0	0	3502	5187	0	0	3610	1615
Capacity Analysis Module:												
Vol/Sat:	0.28	0.00	0.17	0.00	0.00	0.00	0.16	0.23	0.00	0.00	0.37	0.09
Crit Moves:	****						****				****	
Green/Cycle:	0.35	0.00	0.35	0.00	0.00	0.00	0.20	0.65	0.00	0.00	0.45	0.45
Volume/Cap:	0.81	0.00	0.48	0.00	0.00	0.00	0.81	0.35	0.00	0.00	0.81	0.19
Delay/Veh:	37.6	0.0	26.2	0.0	0.0	0.0	45.4	7.9	0.0	0.0	27.0	16.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	37.6	0.0	26.2	0.0	0.0	0.0	45.4	7.9	0.0	0.0	27.0	16.6
LOS by Move:	D	A	C	A	A	A	D	A	A	A	C	B
HCM2kAvgQ:	16	0	7	0	0	0	11	6	0	0	20	3

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #56 Whitewood Rd & Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.938
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 40.2
Optimal Cycle: 180 Level Of Service: D

Street Name:	Whitewood Rd						Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 2	0 1	1	0 2	0 1	1	0 1	1 0
Volume Module:												
Base Vol:	86	322	40	31	540	725	656	225	111	52	247	29
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	86	322	40	31	540	725	656	225	111	52	247	29
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	86	322	40	31	540	725	656	225	111	52	247	29
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	86	322	40	31	540	725	656	225	111	52	247	29
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	86	322	40	31	540	725	656	225	111	52	247	29
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	86	322	40	31	540	725	656	225	111	52	247	29
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.93	0.93	0.95	0.95	0.85	0.95	0.95	0.85	0.95	0.93	0.93
Lanes:	1.00	1.78	0.22	1.00	2.00	1.00	1.00	2.00	1.00	1.00	1.79	0.21
Final Sat.:	1805	3160	393	1805	3610	1615	1805	3610	1615	1805	3179	373
Capacity Analysis Module:												
Vol/Sat:	0.05	0.10	0.10	0.02	0.15	0.45	0.36	0.06	0.07	0.03	0.08	0.08
Crit Moves:	****					****	****				****	
Green/Cycle:	0.05	0.45	0.45	0.08	0.48	0.48	0.39	0.33	0.33	0.14	0.08	0.08
Volume/Cap:	0.94	0.22	0.22	0.22	0.31	0.94	0.94	0.19	0.21	0.21	0.94	0.94
Delay/Veh:	120.8	16.7	16.7	44.2	16.1	43.5	49.7	23.9	24.2	38.6	81.8	81.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	120.8	16.7	16.7	44.2	16.1	43.5	49.7	23.9	24.2	38.6	81.8	81.8
LOS by Move:	F	B	B	D	B	D	D	C	C	D	F	F
HCM2kAvgQ:	5	4	4	1	5	26	24	3	2	2	8	8

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #57 Whitewood Rd & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.777
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 28.4
Optimal Cycle: 102 Level Of Service: C

Street Name:	Whitewood Rd						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	54	227	239	277	594	121	30	986	135	483	2115	144
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	54	227	239	277	594	121	30	986	135	483	2115	144
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	54	227	239	277	594	121	30	986	135	483	2115	144
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	54	227	239	277	594	121	30	986	135	483	2115	144
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	54	227	239	277	594	121	30	986	135	483	2115	144
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	54	227	239	277	594	121	30	986	135	483	2115	144
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.88	0.88	0.95	0.93	0.93	0.95	0.89	0.89	0.95	0.90	0.90
Lanes:	1.00	1.00	1.00	1.00	1.66	0.34	1.00	2.64	0.36	1.00	2.81	0.19
Final Sat.:	1805	1666	1666	1805	2924	596	1805	4480	613	1805	4808	327
Capacity Analysis Module:												
Vol/Sat:	0.03	0.14	0.14	0.15	0.20	0.20	0.02	0.22	0.22	0.27	0.44	0.44
Crit Moves:		****		****				****		****		
Green/Cycle:	0.05	0.18	0.18	0.20	0.32	0.32	0.02	0.28	0.28	0.34	0.60	0.60
Volume/Cap:	0.63	0.78	0.82	0.78	0.63	0.63	0.73	0.78	0.78	0.78	0.73	0.73
Delay/Veh:	60.3	45.8	48.8	48.4	29.7	29.7	97.0	35.7	35.7	35.5	14.9	14.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	60.3	45.8	48.8	48.4	29.7	29.7	97.0	35.7	35.7	35.5	14.9	14.9
LOS by Move:	E	D	D	D	C	C	F	D	D	D	B	B
HCM2kAvgQ:	3	9	10	10	10	10	2	13	13	15	19	19

Note: Queue reported is the number of cars per lane.

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2000 HCM Operations Method (Future Volume Alternative)

Intersection #59 Nutmeg St & Clinton Keith Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.171
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 88.0
Optimal Cycle: 180 Level Of Service: F

Street Name:	Nutmeg St						Clinton Keith Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	75	44	497	424	57	72	46	1869	103	421	1467	167
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	75	44	497	424	57	72	46	1869	103	421	1467	167
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	75	44	497	424	57	72	46	1869	103	421	1467	167
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	75	44	497	424	57	72	46	1869	103	421	1467	167
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	75	44	497	424	57	72	46	1869	103	421	1467	167
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	75	44	497	424	57	72	46	1869	103	421	1467	167
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.82	0.82	0.95	0.87	0.87	0.95	0.90	0.90	0.95	0.90	0.90
Lanes:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.84	0.16	1.00	2.69	0.31
Final Sat.:	1805	1556	1556	1805	1653	1653	1805	4877	269	1805	4587	522
Capacity Analysis Module:												
Vol/Sat:	0.04	0.03	0.32	0.23	0.03	0.04	0.03	0.38	0.38	0.23	0.32	0.32
Crit Moves:			****	****				****		****		
Green/Cycle:	0.23	0.27	0.27	0.20	0.24	0.24	0.04	0.33	0.33	0.20	0.49	0.49
Volume/Cap:	0.18	0.10	1.17	1.17	0.14	0.18	0.66	1.17	1.17	1.17	0.66	0.66
Delay/Veh:	31.0	27.2	134.2	142.4	29.8	30.1	67.7	117	117.2	142.6	19.9	19.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	31.0	27.2	134.2	142.4	29.8	30.1	67.7	117	117.2	142.6	19.9	19.9
LOS by Move:	C	C	F	F	C	C	E	F	F	F	B	B
HCM2kAvgQ:	2	1	29	24	1	2	3	38	38	24	14	14

Note: Queue reported is the number of cars per lane.

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2000 HCM Operations Method (Future Volume Alternative)

Intersection #60 Murrieta Oaks Ave-Mitchell Rd & Clinton Keith Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.933
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 26.2
Optimal Cycle: 180 Level Of Service: C

Street Name:	Murrieta Oaks Ave-Mitchell Rd						Clinton Keith Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 0	1 0	1	0 1	0 1	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	105	208	106	40	121	339	140	2911	262	82	2191	351
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	105	208	106	40	121	339	140	2911	262	82	2191	351
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	105	208	106	40	121	339	140	2911	262	82	2191	351
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	105	208	106	40	121	339	140	2911	262	82	2191	351
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	105	208	106	40	121	339	140	2911	262	82	2191	351
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	105	208	106	40	121	339	140	2911	262	82	2191	351
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.95	0.95	1.00	0.85	0.95	0.90	0.90	0.95	0.89	0.89
Lanes:	1.00	0.66	0.34	1.00	1.00	1.00	1.00	2.75	0.25	1.00	2.59	0.41
Final Sat.:	1805	1194	609	1805	1900	1615	1805	4702	423	1805	4377	701
Capacity Analysis Module:												
Vol/Sat:	0.06	0.17	0.17	0.02	0.06	0.21	0.08	0.62	0.62	0.05	0.50	0.50
Crit Moves:	****					****		****		****		
Green/Cycle:	0.06	0.25	0.25	0.03	0.23	0.23	0.10	0.66	0.66	0.05	0.62	0.62
Volume/Cap:	0.93	0.68	0.68	0.68	0.28	0.93	0.81	0.93	0.93	0.93	0.81	0.81
Delay/Veh:	110.4	37.8	37.8	76.2	32.4	68.5	68.7	20.4	20.4	121.1	16.4	16.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	110.4	37.8	37.8	76.2	32.4	68.5	68.7	20.4	20.4	121.1	16.4	16.4
LOS by Move:	F	D	D	E	C	E	E	C	C	F	B	B
HCM2kAvgQ:	6	10	10	2	3	14	6	36	36	5	24	24

Note: Queue reported is the number of cars per lane.

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Intersection #61 I-215 SB Ramps & Scott Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.239
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 7.6
Optimal Cycle: 30 Level Of Service: A

Street Name:	I-215 SB Ramps						Scott Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	2	0	0	0	4	0	1	0	3	0	2
Volume Module:														
Base Vol:	0	0	0	210	0	123	0	1031	430	0	929	338
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	210	0	123	0	1031	430	0	929	338
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	210	0	123	0	1031	430	0	929	338
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	0	0	0	210	0	123	0	1031	0	0	929	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	210	0	123	0	1031	0	0	929	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	0	0	0	210	0	123	0	1031	0	0	929	0
Saturation Flow Module:														
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.92	1.00	0.75	1.00	0.91	1.00	1.00	0.91	0.88
Lanes:	0.00	0.00	0.00	2.00	0.00	2.00	0.00	4.00	1.00	0.00	3.00	2.00
Final Sat.:	0	0	0	3502	0	2842	0	6916	1900	0	5187	3344
Capacity Analysis Module:														
Vol/Sat:	0.00	0.00	0.00	0.06	0.00	0.04	0.00	0.15	0.00	0.00	0.18	0.00
Crit Moves:				****			****				****	
Green/Cycle:	0.00	0.00	0.00	0.25	0.00	0.25	0.00	0.75	0.00	0.00	0.75	0.00
Volume/Cap:	0.00	0.00	0.00	0.24	0.00	0.17	0.00	0.20	0.00	0.00	0.24	0.00
Delay/Veh:	0.0	0.0	0.0	30.0	0.0	29.4	0.0	3.7	0.0	0.0	3.9	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	30.0	0.0	29.4	0.0	3.7	0.0	0.0	3.9	0.0
LOS by Move:	A	A	A	C	A	C	A	A	A	A	A	A
HCM2kAvgQ:	0	0	0	3	0	2	0	3	0	0	3	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #62 I-215 NB Ramps & Scott Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.391
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 15.8
Optimal Cycle: 37 Level Of Service: B

Street Name:	I-215 NB Ramps						Scott Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Ovl		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	1	2	0	0	0	0	2	2	0	4	0	0	0	0	3	0	2
Volume Module:														
Base Vol:	0	15	615	0	0	281	155	1192	0	0	1036	329
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	15	615	0	0	281	155	1192	0	0	1036	329
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	15	615	0	0	281	155	1192	0	0	1036	329
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	15	615	0	0	281	155	1192	0	0	1036	329
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	15	615	0	0	281	155	1192	0	0	1036	329
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	15	615	0	0	281	155	1192	0	0	1036	329
Saturation Flow Module:														
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.85	0.75	1.00	1.00	0.75	0.92	0.91	1.00	1.00	0.91	0.75
Lanes:	0.00	0.06	2.94	0.00	0.00	2.00	2.00	4.00	0.00	0.00	3.00	2.00
Final Sat.:	0	102	4194	0	0	2842	3502	6916	0	0	5187	2842
Capacity Analysis Module:														
Vol/Sat:	0.00	0.15	0.15	0.00	0.00	0.10	0.04	0.17	0.00	0.00	0.20	0.12
Crit Moves:		****		****			****				****	
Green/Cycle:	0.00	0.38	0.38	0.00	0.00	0.38	0.11	0.62	0.00	0.00	0.51	0.51
Volume/Cap:	0.00	0.39	0.39	0.00	0.00	0.26	0.39	0.28	0.00	0.00	0.39	0.23
Delay/Veh:	0.0	23.0	23.0	0.0	0.0	21.8	41.8	8.5	0.0	0.0	15.0	13.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	23.0	23.0	0.0	0.0	21.8	41.8	8.5	0.0	0.0	15.0	13.6
LOS by Move:	A	C	C	A	A	C	D	A	A	A	B	B
HCM2kAvgQ:	0	5	5	0	0	3	3	5	0	0	7	3

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #102 Leon Road & Scott Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.696
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 28.6
Optimal Cycle: 75 Level Of Service: C

Street Name:	Leon Road						Scott Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	119	204	2	98	340	516	382	482	434	10	372	146
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	119	204	2	98	340	516	382	482	434	10	372	146
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	119	204	2	98	340	516	382	482	434	10	372	146
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	119	204	2	98	340	516	382	482	434	10	372	146
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	119	204	2	98	340	516	382	482	434	10	372	146
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	119	204	2	98	340	516	382	482	434	10	372	146
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.95	0.95	0.86	0.86	0.95	0.85	0.85	0.95	0.87	0.87
Lanes:	1.00	1.98	0.02	1.00	1.00	1.00	1.00	2.00	1.00	1.00	2.15	0.85
Final Sat.:	1805	3571	35	1805	1643	1643	1805	3212	1606	1805	3569	1401
Capacity Analysis Module:												
Vol/Sat:	0.07	0.06	0.06	0.05	0.21	0.31	0.21	0.15	0.27	0.01	0.10	0.10
Crit Moves:	****					****	****				****	
Green/Cycle:	0.09	0.28	0.28	0.27	0.45	0.45	0.30	0.44	0.44	0.01	0.15	0.15
Volume/Cap:	0.70	0.20	0.20	0.20	0.46	0.70	0.70	0.34	0.61	0.61	0.70	0.70
Delay/Veh:	55.7	27.6	27.6	28.7	19.2	23.7	34.6	18.2	21.8	100.8	43.2	43.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	55.7	27.6	27.6	28.7	19.2	23.7	34.6	18.2	21.8	100.8	43.2	43.2
LOS by Move:	E	C	C	C	B	C	C	B	C	F	D	D
HCM2kAvgQ:	5	3	3	2	8	14	11	5	12	1	7	7

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #104 Antelope Road & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.409
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 130.8
Optimal Cycle: 180 Level Of Service: F

Street Name:	Antelope Road						Keller Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 2	0 1	1	0 2	0 1	2	0 3	0 1	1	0 3	0 1
Volume Module:												
Base Vol:	110	75	445	197	479	447	453	687	1048	677	509	31
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	110	75	445	197	479	447	453	687	1048	677	509	31
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	110	75	445	197	479	447	453	687	1048	677	509	31
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	110	75	445	197	479	447	453	687	1048	677	509	31
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	110	75	445	197	479	447	453	687	1048	677	509	31
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	110	75	445	197	479	447	453	687	1048	677	509	31
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.95	0.85	0.95	0.95	0.85	0.92	0.91	0.85	0.95	0.91	0.85
Lanes:	2.00	2.00	1.00	1.00	2.00	1.00	2.00	3.00	1.00	1.00	3.00	1.00
Final Sat.:	3502	3610	1615	1805	3610	1615	3502	5187	1615	1805	5187	1615
Capacity Analysis Module:												
Vol/Sat:	0.03	0.02	0.28	0.11	0.13	0.28	0.13	0.13	0.65	0.38	0.10	0.02
Crit Moves:			****	****					****	****		
Green/Cycle:	0.03	0.20	0.20	0.08	0.25	0.25	0.41	0.46	0.46	0.27	0.31	0.31
Volume/Cap:	1.13	0.11	1.41	1.41	0.54	1.13	0.31	0.29	1.41	1.41	0.31	0.06
Delay/Veh:	178.6	33.1	242.0	267.0	33.5	122.7	19.9	16.8	218.9	232.7	26.2	24.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	178.6	33.1	242.0	267.0	33.5	122.7	19.9	16.8	218.9	232.7	26.2	24.1
LOS by Move:	F	C	F	F	C	F	B	B	F	F	C	C
HCM2kAvgQ:	5	1	31	15	7	24	5	5	70	46	4	1

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #105 Menifee Road - Meadowlark Road & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.994
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 45.1
Optimal Cycle: 180 Level Of Service: D

Street Name:	Menifee Road - Meadowlark Road						Keller Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	2	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	28	289	292	126	1138	656	527	192	502	255	377	128
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	28	289	292	126	1138	656	527	192	502	255	377	128
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	28	289	292	126	1138	656	527	192	502	255	377	128
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	28	289	292	126	1138	656	527	192	502	255	377	128
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	28	289	292	126	1138	656	527	192	502	255	377	128
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	28	289	292	126	1138	656	527	192	502	255	377	128
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.88	0.88	0.95	0.90	0.90	0.92	0.85	0.85	0.95	0.91	0.91
Lanes:	1.00	1.00	1.00	1.00	1.27	0.73	2.00	1.00	1.00	1.00	1.49	0.51
Final Sat.:	1805	1670	1670	1805	2164	1247	3502	1610	1610	1805	2593	880
Capacity Analysis Module:												
Vol/Sat:	0.02	0.17	0.17	0.07	0.53	0.53	0.15	0.12	0.31	0.14	0.15	0.15
Crit Moves:	****				****				****	****		
Green/Cycle:	0.02	0.39	0.39	0.16	0.53	0.53	0.23	0.31	0.31	0.14	0.22	0.22
Volume/Cap:	0.99	0.44	0.45	0.45	0.99	0.99	0.65	0.38	0.99	0.99	0.65	0.65
Delay/Veh:	216.4	22.8	22.9	39.5	43.2	43.2	36.6	26.9	66.8	97.4	37.2	37.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	216.4	22.8	22.9	39.5	43.2	43.2	36.6	26.9	66.8	97.4	37.2	37.2
LOS by Move:	F	C	C	D	D	D	D	C	E	F	D	D
HCM2kAvgQ:	3	7	7	4	37	37	9	5	23	13	8	8

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #107 Leon Road & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.342
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 13.7
Optimal Cycle: 29 Level Of Service: B

Street Name:	Leon Road						Keller Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Permitted			Protected			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	112	351	16	3	709	138	3	64	121	7	65	5
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	112	351	16	3	709	138	3	64	121	7	65	5
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	112	351	16	3	709	138	3	64	121	7	65	5
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	112	351	16	3	709	138	3	64	121	7	65	5
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	112	351	16	3	709	138	3	64	121	7	65	5
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	112	351	16	3	709	138	3	64	121	7	65	5
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.94	0.94	0.52	0.93	0.93	0.95	0.86	0.86	0.74	0.94	0.94
Lanes:	1.00	1.91	0.09	1.00	1.67	0.33	1.00	1.00	1.00	1.00	1.86	0.14
Final Sat.:	1805	3428	156	982	2949	574	1805	1628	1628	1400	3315	255
Capacity Analysis Module:												
Vol/Sat:	0.06	0.10	0.10	0.00	0.24	0.24	0.00	0.04	0.07	0.00	0.02	0.02
Crit Moves:	****				****			****				
Green/Cycle:	0.17	0.84	0.84	0.67	0.67	0.67	0.11	0.16	0.16	0.05	0.05	0.05
Volume/Cap:	0.36	0.12	0.12	0.00	0.36	0.36	0.02	0.24	0.46	0.09	0.36	0.36
Delay/Veh:	37.3	1.5	1.5	5.6	7.5	7.5	39.8	36.6	38.7	45.5	46.8	46.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	37.3	1.5	1.5	5.6	7.5	7.5	39.8	36.6	38.7	45.5	46.8	46.8
LOS by Move:	D	A	A	A	A	A	D	D	D	D	D	D
HCM2kAvgQ:	3	1	1	0	6	6	0	2	4	0	2	2

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #108 Winchester Road - SR-79 & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.547
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 1.5
Optimal Cycle: 41 Level Of Service: A

Street Name:	Winchester Road - SR-79						Keller Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	1	1563	26	5	2680	3	1	12	1	12	19	47
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	1	1563	26	5	2680	3	1	12	1	12	19	47
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	1	1563	26	5	2680	3	1	12	1	12	19	47
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	1	1563	26	5	2680	3	1	12	1	12	19	47
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	1	1563	26	5	2680	3	1	12	1	12	19	47
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	1	1563	26	5	2680	3	1	12	1	12	19	47
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.91	0.91	0.75	0.94	0.94	0.75	0.85	0.85
Lanes:	1.00	2.95	0.05	1.00	2.99	0.01	1.00	1.85	0.15	1.00	1.00	1.00
Final Sat.:	1805	5092	85	1805	5181	6	1425	3292	274	1425	1612	1612
Capacity Analysis Module:												
Vol/Sat:	0.00	0.31	0.31	0.00	0.52	0.52	0.00	0.00	0.00	0.01	0.01	0.03
Crit Moves:	****				****							****
Green/Cycle:	0.00	0.94	0.94	0.01	0.95	0.95	0.05	0.05	0.05	0.05	0.05	0.05
Volume/Cap:	0.55	0.33	0.33	0.33	0.55	0.55	0.01	0.07	0.07	0.16	0.22	0.55
Delay/Veh:	234.2	0.3	0.3	61.4	0.4	0.4	44.9	45.1	45.1	46.2	45.7	51.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	234.2	0.3	0.3	61.4	0.4	0.4	44.9	45.1	45.1	46.2	45.7	51.3
LOS by Move:	F	A	A	E	A	A	D	D	D	D	D	D
HCM2kAvgQ:	0	2	2	1	4	4	0	0	0	1	1	2

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #112 Leon Road & Jean Nicholas

Cycle (sec): 100 Critical Vol./Cap.(X): 0.384
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 23.0
Optimal Cycle: 37 Level Of Service: C

Street Name:	Leon Road						Jean Nicholas					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	6	194	132	228	539	50	2	176	14	148	23	250
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	6	194	132	228	539	50	2	176	14	148	23	250
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	6	194	132	228	539	50	2	176	14	148	23	250
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	6	194	132	228	539	50	2	176	14	148	23	250
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	6	194	132	228	539	50	2	176	14	148	23	250
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	6	194	132	228	539	50	2	176	14	148	23	250
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.89	0.89	0.95	0.94	0.94	0.95	0.94	0.94	0.95	0.82	0.82
Lanes:	1.00	1.19	0.81	1.00	1.83	0.17	1.00	1.85	0.15	1.00	1.00	1.00
Final Sat.:	1805	2017	1373	1805	3261	302	1805	3307	263	1805	1558	1558
Capacity Analysis Module:												
Vol/Sat:	0.00	0.10	0.10	0.13	0.17	0.17	0.00	0.05	0.05	0.08	0.01	0.16
Crit Moves:		****		****			****					****
Green/Cycle:	0.01	0.25	0.25	0.33	0.57	0.57	0.00	0.17	0.17	0.26	0.42	0.42
Volume/Cap:	0.29	0.38	0.38	0.38	0.29	0.29	0.38	0.32	0.32	0.32	0.04	0.38
Delay/Veh:	56.7	31.4	31.4	26.2	11.3	11.3	91.0	37.1	37.1	30.6	17.2	20.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	56.7	31.4	31.4	26.2	11.3	11.3	91.0	37.1	37.1	30.6	17.2	20.5
LOS by Move:	E	C	C	C	B	B	F	D	D	C	B	C
HCM2kAvgQ:	1	5	5	5	5	5	0	3	3	4	0	6

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #122 Meadowlark Lane - Whitewood Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.238
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 106.9
Optimal Cycle: 180 Level Of Service: F

Street Name:	Meadowlark Lane - Whitewood Road						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 2	0 1	2	0 1	1 0	2	0 3	0 1	2	0 3	0 1
Volume Module:												
Base Vol:	101	121	1015	337	232	923	1090	682	126	1007	943	326
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	101	121	1015	337	232	923	1090	682	126	1007	943	326
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	101	121	1015	337	232	923	1090	682	126	1007	943	326
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	101	121	1015	337	232	923	1090	682	126	1007	943	326
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	101	121	1015	337	232	923	1090	682	126	1007	943	326
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	101	121	1015	337	232	923	1090	682	126	1007	943	326
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.95	0.85	0.92	0.84	0.84	0.92	0.91	0.85	0.92	0.91	0.85
Lanes:	2.00	2.00	1.00	2.00	1.00	1.00	2.00	3.00	1.00	2.00	3.00	1.00
Final Sat.:	3502	3610	1615	3502	1588	1588	3502	5187	1615	3502	5187	1615
Capacity Analysis Module:												
Vol/Sat:	0.03	0.03	0.63	0.10	0.15	0.58	0.31	0.13	0.08	0.29	0.18	0.20
Crit Moves:			****	****			****					****
Green/Cycle:	0.03	0.51	0.51	0.08	0.56	0.56	0.25	0.13	0.13	0.28	0.16	0.16
Volume/Cap:	1.04	0.07	1.24	1.24	0.26	1.04	1.24	1.01	0.60	1.01	1.11	1.24
Delay/Veh:	151.8	12.6	142.1	180.5	11.5	60.7	154.2	80.9	45.8	67.0	109	177.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	151.8	12.6	142.1	180.5	11.5	60.7	154.2	80.9	45.8	67.0	109	177.0
LOS by Move:	F	B	F	F	B	E	F	F	D	E	F	F
HCM2kAvgQ:	4	1	57	12	4	41	33	13	5	23	19	20

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #138 Jefferson Avenue & Cherry Street

Cycle (sec): 100 Critical Vol./Cap.(X): 0.776
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 21.8
Optimal Cycle: 102 Level Of Service: C

Street Name:	Jefferson Avenue						Cherry Street					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	0 1	1	0 1	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	87	628	194	36	640	21	1	47	6	146	1294	882
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	87	628	194	36	640	21	1	47	6	146	1294	882
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	87	628	194	36	640	21	1	47	6	146	1294	882
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	87	628	194	36	640	21	1	47	6	146	1294	882
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	87	628	194	36	640	21	1	47	6	146	1294	882
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	87	628	194	36	640	21	1	47	6	146	1294	882
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.85	0.95	0.95	0.95	0.95	0.89	0.89	0.95	0.85	0.85
Lanes:	1.00	2.00	1.00	1.00	1.94	0.06	1.00	2.66	0.34	1.00	2.00	1.00
Final Sat.:	1805	3610	1615	1805	3478	114	1805	4522	577	1805	3247	1624
Capacity Analysis Module:												
Vol/Sat:	0.05	0.17	0.12	0.02	0.18	0.18	0.00	0.01	0.01	0.08	0.40	0.54
Crit Moves:	****				****		****					****
Green/Cycle:	0.06	0.27	0.27	0.03	0.24	0.24	0.00	0.08	0.08	0.62	0.70	0.70
Volume/Cap:	0.78	0.65	0.45	0.65	0.78	0.78	0.78	0.13	0.13	0.13	0.57	0.78
Delay/Veh:	74.3	33.9	31.1	71.6	40.2	40.2	563.4	42.9	42.9	7.9	7.7	11.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	74.3	33.9	31.1	71.6	40.2	40.2	563.4	42.9	42.9	7.9	7.7	11.3
LOS by Move:	E	C	C	E	D	D	F	D	D	A	A	B
HCM2kAvgQ:	4	10	5	2	12	12	0	1	1	2	11	21

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #141 Jefferson Ave & Nutmeg St

Cycle (sec): 100 Critical Vol./Cap.(X): 1.001
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 52.4
Optimal Cycle: 180 Level Of Service: D

Street Name:	Jefferson Ave						Nutmeg St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	193	357	265	84	1819	66	96	202	511	382	176	72
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	193	357	265	84	1819	66	96	202	511	382	176	72
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	193	357	265	84	1819	66	96	202	511	382	176	72
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	193	357	265	84	1819	66	96	202	511	382	176	72
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	193	357	265	84	1819	66	96	202	511	382	176	72
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	193	357	265	84	1819	66	96	202	511	382	176	72
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.85	0.85	0.95	0.91	0.91	0.95	0.85	0.85	0.95	0.91	0.91
Lanes:	1.00	2.00	1.00	1.00	2.89	0.11	1.00	1.00	1.00	1.00	1.42	0.58
Final Sat.:	1805	3237	1618	1805	4980	181	1805	1610	1610	1805	2452	1003
Capacity Analysis Module:												
Vol/Sat:	0.11	0.11	0.16	0.05	0.37	0.37	0.05	0.13	0.32	0.21	0.07	0.07
Crit Moves:	****				****				****	****		
Green/Cycle:	0.11	0.37	0.37	0.10	0.36	0.36	0.22	0.32	0.32	0.21	0.30	0.30
Volume/Cap:	1.00	0.30	0.45	0.45	1.00	1.00	0.24	0.40	1.00	1.00	0.24	0.24
Delay/Veh:	109.8	22.6	24.2	43.7	52.8	52.8	32.0	26.8	68.2	85.8	26.2	26.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	109.8	22.6	24.2	43.7	52.8	52.8	32.0	26.8	68.2	85.8	26.2	26.2
LOS by Move:	F	C	C	D	D	D	C	C	E	F	C	C
HCM2kAvgQ:	10	4	7	3	29	29	2	5	23	18	3	3

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #142 Jefferson Ave & Magnolia St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.692
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 10.7
Optimal Cycle: 74 Level Of Service: B

Street Name:	Jefferson Ave						Magnolia St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 0	1 0	1	0 0	1 0
Volume Module:												
Base Vol:	81	668	8	8	2498	242	166	1	155	28	3	1
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	81	668	8	8	2498	242	166	1	155	28	3	1
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	81	668	8	8	2498	242	166	1	155	28	3	1
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	81	668	8	8	2498	242	166	1	155	28	3	1
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	81	668	8	8	2498	242	166	1	155	28	3	1
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	81	668	8	8	2498	242	166	1	155	28	3	1
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.90	0.90	0.95	0.85	0.85	0.95	0.96	0.96
Lanes:	1.00	2.96	0.04	1.00	2.74	0.26	1.00	0.01	0.99	1.00	0.75	0.25
Final Sat.:	1805	5115	61	1805	4667	452	1805	10	1607	1805	1372	457
Capacity Analysis Module:												
Vol/Sat:	0.04	0.13	0.13	0.00	0.54	0.54	0.09	0.10	0.10	0.02	0.00	0.00
Crit Moves:	****				****			****		****		
Green/Cycle:	0.06	0.81	0.81	0.03	0.77	0.77	0.16	0.14	0.14	0.02	0.00	0.00
Volume/Cap:	0.69	0.16	0.16	0.16	0.69	0.69	0.58	0.69	0.69	0.69	0.58	0.58
Delay/Veh:	62.1	2.1	2.1	49.0	6.1	6.1	42.1	49.9	49.9	89.3	137	137.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	62.1	2.1	2.1	49.0	6.1	6.1	42.1	49.9	49.9	89.3	137	137.1
LOS by Move:	E	A	A	D	A	A	D	D	D	F	F	F
HCM2kAvgQ:	4	2	2	0	16	16	6	6	6	2	1	1

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #149 Monroe Ave & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.336
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 8.3
Optimal Cycle: 34 Level Of Service: A

Street Name:	Monroe Ave						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ovl			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	0 1	1	0 2	0 1	1	0 4	0 1	1	0 3	1 0
Volume Module:												
Base Vol:	44	79	49	1	56	53	109	1196	37	8	1601	24
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	44	79	49	1	56	53	109	1196	37	8	1601	24
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	44	79	49	1	56	53	109	1196	37	8	1601	24
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	44	79	49	1	56	53	109	1196	37	8	1601	24
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	44	79	49	1	56	53	109	1196	37	8	1601	24
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	44	79	49	1	56	53	109	1196	37	8	1601	24
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.85	0.95	0.95	0.85	0.95	0.91	0.85	0.95	0.91	0.91
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	4.00	1.00	1.00	3.94	0.06
Final Sat.:	1805	3610	1615	1805	3610	1615	1805	6916	1615	1805	6800	102
Capacity Analysis Module:												
Vol/Sat:	0.02	0.02	0.03	0.00	0.02	0.03	0.06	0.17	0.02	0.00	0.24	0.24
Crit Moves:	****				****		****				****	
Green/Cycle:	0.07	0.12	0.12	0.00	0.05	0.23	0.18	0.86	0.93	0.02	0.70	0.70
Volume/Cap:	0.34	0.19	0.26	0.26	0.34	0.15	0.34	0.20	0.02	0.20	0.34	0.34
Delay/Veh:	45.6	40.1	41.0	82.7	47.4	31.1	36.4	1.2	0.2	50.5	5.9	5.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	45.6	40.1	41.0	82.7	47.4	31.1	36.4	1.2	0.2	50.5	5.9	5.9
LOS by Move:	D	D	D	F	D	C	D	A	A	D	A	A
HCM2kAvgQ:	2	1	2	0	1	1	3	2	0	0	5	5

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #158 Adams Ave & Guava St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.283
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 11.7
Optimal Cycle: 20 Level Of Service: B

Street Name:	Adams Ave						Guava St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	0 1	1	0 0	1 0
Volume Module:												
Base Vol:	70	76	18	100	20	42	21	326	47	3	267	99
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	70	76	18	100	20	42	21	326	47	3	267	99
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	70	76	18	100	20	42	21	326	47	3	267	99
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	70	76	18	100	20	42	21	326	47	3	267	99
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	70	76	18	100	20	42	21	326	47	3	267	99
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	70	76	18	100	20	42	21	326	47	3	267	99
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.68	0.92	0.92	0.64	0.85	0.85	0.85	0.98	0.98	0.48	0.96	0.96
Lanes:	1.00	1.62	0.38	1.00	1.00	1.00	1.00	0.87	0.13	1.00	0.73	0.27
Final Sat.:	1298	2834	671	1222	1621	1621	920	1629	235	912	1331	493
Capacity Analysis Module:												
Vol/Sat:	0.05	0.03	0.03	0.08	0.01	0.03	0.02	0.20	0.20	0.00	0.20	0.20
Crit Moves:				****							****	
Green/Cycle:	0.29	0.29	0.29	0.29	0.29	0.29	0.71	0.71	0.71	0.71	0.71	0.71
Volume/Cap:	0.19	0.09	0.09	0.28	0.04	0.09	0.03	0.28	0.28	0.00	0.28	0.28
Delay/Veh:	26.9	26.0	26.0	27.9	25.6	26.0	4.3	5.4	5.4	4.2	5.4	5.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	26.9	26.0	26.0	27.9	25.6	26.0	4.3	5.4	5.4	4.2	5.4	5.4
LOS by Move:	C	C	C	C	C	C	A	A	A	A	A	A
HCM2kAvgQ:	2	1	1	3	0	1	0	4	4	0	4	4

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
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Scenario Report

Scenario:	Future GP Scenario B PM
Command:	Future GP Scenario B PM
Volume:	Future GP Scenario B PM
Geometry:	Future
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	Default Trip Distribution
Paths:	Default Path
Routes:	Default Route
Configuration:	Future GP Scenario B PM

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Turning Movement Report

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#1 Menifee Road & Scott Road													
Base	277	619	816	203	319	103	254	930	476	442	549	550	5538
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	277	619	816	203	319	103	254	930	476	442	549	550	5538
#2 Leon Road & Scott Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#3 Winchester Road/SR-79 & Scott Road													
Base	126	2471	28	1112	1886	129	117	292	123	0	222	1064	7570
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	126	2471	28	1112	1886	129	117	292	123	0	222	1064	7570
#4 Antelope Road & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#5 Menifee Road - Meadowlark Road & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#6 Briggs Road & Keller Road													
Base	349	92	106	1	53	87	13	310	785	9	303	4	2112
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	349	92	106	1	53	87	13	310	785	9	303	4	2112
#7 Leon Road & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#8 Winchester Road - SR-79 & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#9 Antelope Road & Golden City Drive - Baxter Road													
Base	2	300	837	264	1068	16	4	215	44	405	121	895	4171
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	300	837	264	1068	16	4	215	44	405	121	895	4171

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#10 Whitewood Roa - /Meadowlark Road & Golden City Drive - Baxter Road													
Base	271	1188	3	0	697	984	243	12	981	0	8	2	4389
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	271	1188	3	0	697	984	243	12	981	0	8	2	4389
#11 Briggs Road & Baxter Road - Jean Nicholas													
Base	0	449	72	41	681	0	0	0	0	10	0	91	1344
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	449	72	41	681	0	0	0	0	10	0	91	1344
#12 Leon Road & Jean Nicholas													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#13 Winchester Road - SR-79 & Nicholas - Skyview													
Base	201	2651	200	77	2065	18	40	683	128	148	447	123	6781
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	201	2651	200	77	2065	18	40	683	128	148	447	123	6781
#14 Antelope Road & Linnel Lane Extension													
Base	48	594	162	82	1105	613	85	463	310	51	563	348	4424
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	48	594	162	82	1105	613	85	463	310	51	563	348	4424
#15 Whitewood Road - Meadowlark Road & Linnel Lane Extension													
Base	27	581	514	153	1498	200	26	458	224	274	734	792	5481
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	27	581	514	153	1498	200	26	458	224	274	734	792	5481
#16 Leon Road & Max Gillis Road													
Base	517	405	579	371	254	131	104	213	467	570	366	382	4359
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	517	405	579	371	254	131	104	213	467	570	366	382	4359
#17 Winchester Road - SR-79 & Max Gillis - Thompson													
Base	244	2443	86	297	1330	662	732	322	145	32	248	82	6623
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	244	2443	86	297	1330	662	732	322	145	32	248	82	6623
#18 California Oaks Road & Clinton Keith Road													
Base	312	0	1105	0	0	0	0	2509	123	456	2578	0	7083
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	312	0	1105	0	0	0	0	2509	123	456	2578	0	7083

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#19 I-215 SB Off-Ramp & Clinton Keith Road													
Base	0	0	0	36	0	628	0	2693	826	0	2635	207	7025
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	36	0	628	0	2693	826	0	2635	207	7025
#20 I-215 NB Off Ramp & Clinton Keith Road													
Base	517	0	464	0	0	0	0	1524	283	0	2960	253	6001
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	517	0	464	0	0	0	0	1524	283	0	2960	253	6001
#21 Antelope Road & Clinton Keith Road													
Base	0	0	0	111	0	926	147	2057	0	0	1746	375	5362
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	111	0	926	147	2057	0	0	1746	375	5362
#22 Meadowlark Lane - Whitewood Road & Clinton Keith Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#23 Liberty Road & Clinton Keith Road													
Base	47	0	157	0	0	0	0	2305	86	11	2266	0	4872
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	47	0	157	0	0	0	0	2305	86	11	2266	0	4872
#24 Leon Road & Clinton Keith Road													
Base	0	0	0	145	0	1216	539	1900	0	0	1048	888	5736
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	145	0	1216	539	1900	0	0	1048	888	5736
#25 Winchester Road - SR-79 & Benton Road													
Base	575	2536	756	65	1007	510	75	634	1450	240	749	79	8676
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	575	2536	756	65	1007	510	75	634	1450	240	749	79	8676
#26 Winchester Road - SR-79 & Via Mira Mosa													
Base	65	3235	238	122	2123	370	238	31	52	223	40	135	6872
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	65	3235	238	122	2123	370	238	31	52	223	40	135	6872
#27 Monroe Ave & Los Alamos													
Base	27	457	249	250	318	64	240	1480	178	88	948	475	4774
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	27	457	249	250	318	64	240	1480	178	88	948	475	4774

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#28 Jefferson Avenue & Murrieta Hot Springs Road													
Base	6	2312	1191	792	1042	69	39	196	108	594	90	903	7342
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	6	2312	1191	792	1042	69	39	196	108	594	90	903	7342
#29 Madison Avenue & Murrieta Hot Springs Road													
Base	383	646	1270	323	260	127	389	1638	338	843	1322	187	7726
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	383	646	1270	323	260	127	389	1638	338	843	1322	187	7726
#30 I-15 SB Off-Ramp & Murrieta Hot Springs Road													
Base	0	0	0	675	0	423	0	2672	511	0	2361	112	6754
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	675	0	423	0	2672	511	0	2361	112	6754
#31 I-15 NB Off-Ramp & Murrieta Hot Springs Road													
Base	214	0	239	0	0	0	0	3013	363	0	1731	1644	7204
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	214	0	239	0	0	0	0	3013	363	0	1731	1644	7204
#32 I-215 SB Off-Ramp & Murrieta Hot Springs Road													
Base	0	0	0	474	0	359	0	3438	139	0	2361	238	7009
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	474	0	359	0	3438	139	0	2361	238	7009
#33 I-215 NB Off-Ramp & Murrieta Hot Springs Road													
Base	85	0	463	0	0	0	0	2333	104	0	2380	1413	6778
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	85	0	463	0	0	0	0	2333	104	0	2380	1413	6778
#34 Jackson Avenue & Murrieta Hot Springs Road													
Base	202	0	169	0	0	0	0	1910	58	211	2597	0	5147
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	202	0	169	0	0	0	0	1910	58	211	2597	0	5147
#35 Margarita Road & Murrieta Hot Springs Road													
Base	949	70	388	187	77	152	51	1745	535	276	1634	38	6102
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	949	70	388	187	77	152	51	1745	535	276	1634	38	6102
#36 French Valley Parkway & Murrieta Hot Springs Road													
Base	34	0	1093	0	0	0	0	1789	362	445	1723	0	5446
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	34	0	1093	0	0	0	0	1789	362	445	1723	0	5446

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City of Murrieta General Plan
Future General Plan (Scenario B)
PM Peak Hour

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#37 Jefferson Avenue & Guava Street													
Base	15	3304	21	20	1223	332	80	134	117	2	77	16	5341
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	15	3304	21	20	1223	332	80	134	117	2	77	16	5341
#38 Jefferson Avenue & Cherry Street													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#39 Washington Ave & Calle Del Oso Oro/Nutmeg													
Base	395	266	126	93	235	55	26	212	281	160	621	148	2618
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	395	266	126	93	235	55	26	212	281	160	621	148	2618
#40 Clinton Keith Rd & Calle de Oso Oro/Bear Creek Dr													
Base	77	177	207	17	90	271	188	528	140	228	753	10	2686
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	77	177	207	17	90	271	188	528	140	228	753	10	2686
#41 Jefferson Ave & Nutmeg St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#42 Jefferson Ave & Magnolia St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#43 Jefferson Ave & Lemon St													
Base	424	2136	2	6	1607	40	41	38	251	16	21	14	4596
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	424	2136	2	6	1607	40	41	38	251	16	21	14	4596
#44 Jefferson Ave & Kalmia St													
Base	391	1782	1026	905	1210	28	29	604	281	353	486	844	7939
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	391	1782	1026	905	1210	28	29	604	281	353	486	844	7939
#45 Jefferson Ave & Juniper St													
Base	150	2837	60	46	1660	84	358	83	371	18	58	88	5813
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	150	2837	60	46	1660	84	358	83	371	18	58	88	5813

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City of Murrieta General Plan
Future General Plan (Scenario B)
PM Peak Hour

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#46 Jefferson Ave & Ivy St/Los Alamos Rd													
Base	294	2396	687	474	1480	110	75	188	154	257	258	496	6869
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	294	2396	687	474	1480	110	75	188	154	257	258	496	6869
#47 Madison Ave & Kalmia St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#48 Madison Ave/I-15 SB Ramps & Kalmia St													
Base	379	0	968	322	28	357	0	2478	248	281	1499	606	7166
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	379	0	968	322	28	357	0	2478	248	281	1499	606	7166
#49 Monroe Ave & Murrieta Hot Springs Rd													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#50 Hancock Ave & Murrieta Hot Springs Rd													
Base	0	0	0	583	0	894	827	3365	0	0	2518	303	8490
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	583	0	894	827	3365	0	0	2518	303	8490
#51 Alta Murrieta Dr & Murrieta Hot Springs Rd													
Base	597	223	53	194	128	496	701	1703	520	174	2354	154	7297
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	597	223	53	194	128	496	701	1703	520	174	2354	154	7297
#52 Winchester Road - SR-79 & Murrieta Hot Springs Rd													
Base	340	1979	203	201	1167	1117	1437	1044	276	245	756	98	8863
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	340	1979	203	201	1167	1117	1437	1044	276	245	756	98	8863
#53 Hancock Ave & Los Alamos Rd													
Base	124	453	916	658	124	25	106	2012	51	585	1301	694	7049
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	124	453	916	658	124	25	106	2012	51	585	1301	694	7049
#54 I-215 SB Ramps & Los Alamos Rd													
Base	0	0	0	532	0	1542	0	3236	443	136	1247	0	7136
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	532	0	1542	0	3236	443	136	1247	0	7136

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City of Murrieta General Plan
Future General Plan (Scenario B)
PM Peak Hour

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#55 I-215 NB Ramps & Los Alamos Rd													
Base	246	0	159	0	0	0	1617	2080	0	0	1139	329	5570
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	246	0	159	0	0	0	1617	2080	0	0	1139	329	5570
#56 Whitewood Rd & Los Alamos Rd													
Base	147	646	41	38	562	538	911	412	307	62	211	46	3921
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	147	646	41	38	562	538	911	412	307	62	211	46	3921
#57 Whitewood Rd & Murrieta Hot Springs Rd													
Base	445	344	533	360	263	236	179	1631	170	395	2251	490	7297
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	445	344	533	360	263	236	179	1631	170	395	2251	490	7297
#58 Adams Ave & Guava St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#59 Nutmeg St & Clinton Keith Rd													
Base	64	87	510	315	31	54	99	1885	64	515	1860	369	5853
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	64	87	510	315	31	54	99	1885	64	515	1860	369	5853
#60 Murrieta Oaks Ave-Mitchell Rd & Clinton Keith Rd													
Base	14	148	13	74	172	826	220	3209	25	28	2770	496	7995
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	14	148	13	74	172	826	220	3209	25	28	2770	496	7995
#61 I-215 SB Ramps & Scott Rd													
Base	0	0	0	160	0	259	0	756	412	0	1482	458	3527
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	160	0	259	0	756	412	0	1482	458	3527
#62 I-215 NB Ramps & Scott Rd													
Base	0	7	896	0	0	400	93	1001	0	0	1708	382	4487
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	7	896	0	0	400	93	1001	0	0	1708	382	4487
#102 Leon Road & Scott Road													
Base	547	394	18	64	226	357	545	528	541	5	402	164	3791
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	547	394	18	64	226	357	545	528	541	5	402	164	3791

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City of Murrieta General Plan
Future General Plan (Scenario B)
PM Peak Hour

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#104 Antelope Road & Keller Road													
Base	780	471	867	89	99	573	804	859	273	283	605	154	5857
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	780	471	867	89	99	573	804	859	273	283	605	154	5857
#105 Menifee Road - Meadowlark Road & Keller Road													
Base	130	887	732	104	735	369	819	364	482	198	414	141	5375
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	130	887	732	104	735	369	819	364	482	198	414	141	5375
#107 Leon Road & Keller Road													
Base	64	899	1	0	740	83	83	56	279	18	190	3	2416
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	64	899	1	0	740	83	83	56	279	18	190	3	2416
#108 Winchester Road - SR-79 & Keller Road													
Base	1	2651	38	12	2124	1	1	33	1	11	17	26	4916
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	2651	38	12	2124	1	1	33	1	11	17	26	4916
#112 Leon Road & Jean Nicholas													
Base	3	519	263	354	572	13	2	129	11	108	143	435	2552
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	3	519	263	354	572	13	2	129	11	108	143	435	2552
#122 Meadowlark Lane - Whitewood Road & Clinton Keith Road													
Base	811	401	576	638	377	673	385	1305	501	324	727	1175	7893
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	811	401	576	638	377	673	385	1305	501	324	727	1175	7893
#138 Jefferson Avenue & Cherry Street													
Base	32	1267	821	210	888	7	2	1073	39	111	816	651	5917
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	32	1267	821	210	888	7	2	1073	39	111	816	651	5917
#141 Jefferson Ave & Nutmeg St													
Base	612	1204	389	108	1190	97	59	133	245	286	206	136	4665
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	612	1204	389	108	1190	97	59	133	245	286	206	136	4665
#142 Jefferson Ave & Magnolia St													
Base	141	2078	12	10	1589	109	148	5	52	7	5	14	4170
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	141	2078	12	10	1589	109	148	5	52	7	5	14	4170

City of Murrieta General Plan
Future General Plan (Scenario B)
PM Peak Hour

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#149 Monroe Ave & Murrieta Hot Springs Rd													
Base	178	240	200	1	250	117	170	2625	154	37	2083	27	6082
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	178	240	200	1	250	117	170	2625	154	37	2083	27	6082
#158 Adams Ave & Guava St													
Base	39	241	31	95	42	208	58	243	188	8	253	162	1568
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	39	241	31	95	42	208	58	243	188	8	253	162	1568

City of Murrieta General Plan
Future General Plan (Scenario B)
PM Peak Hour

Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
# 1 Menifee Road & Scott Road	E	79.7	1.142	E	79.7	1.142	+ 0.000 D/V
# 3 Winchester Road/SR-79 & Scott	F	281.2	1.866	F	281.2	1.866	+ 0.000 D/V
# 6 Briggs Road & Keller Road	C	20.7	0.739	C	20.7	0.739	+ 0.000 D/V
# 9 Antelope Road & Golden City Dr	F	83.1	1.429	F	83.1	1.429	+ 0.000 D/V
# 10 Whitewood Roa - /Meadowlark Ro	F	121.3	1.386	F	121.3	1.386	+ 0.000 D/V
# 11 Briggs Road & Baxter Road - Je	A	7.9	0.245	A	7.9	0.245	+ 0.000 D/V
# 13 Winchester Road - SR-79 & Nich	C	29.3	0.910	C	29.3	0.910	+ 0.000 D/V
# 14 Antelope Road & Linnel Lane Ex	C	28.1	0.844	C	28.1	0.844	+ 0.000 D/V
# 15 Whitewood Road - Meadowlark Ro	D	40.7	0.984	D	40.7	0.984	+ 0.000 D/V
# 16 Leon Road & Max Gillis Road	D	39.7	0.916	D	39.7	0.916	+ 0.000 D/V
# 17 Winchester Road - SR-79 & Max	D	37.3	0.959	D	37.3	0.959	+ 0.000 D/V
# 18 California Oaks Road & Clinton	C	23.6	0.936	C	23.6	0.936	+ 0.000 D/V
# 19 I-215 SB Off-Ramp & Clinton Ke	B	12.5	0.740	B	12.5	0.740	+ 0.000 D/V
# 20 I-215 NB Off Ramp & Clinton Ke	B	17.8	0.858	B	17.8	0.858	+ 0.000 D/V
# 21 Antelope Road & Clinton Keith	A	3.8	0.494	A	3.8	0.494	+ 0.000 D/V
# 23 Liberty Road & Clinton Keith R	A	4.7	0.567	A	4.7	0.567	+ 0.000 D/V
# 24 Leon Road & Clinton Keith Road	C	29.2	0.978	C	29.2	0.978	+ 0.000 D/V
# 25 Winchester Road - SR-79 & Bent	E	63.5	1.086	E	63.5	1.086	+ 0.000 D/V
# 26 Winchester Road - SR-79 & Via	C	27.3	0.980	C	27.3	0.980	+ 0.000 D/V
# 27 Monroe Ave & Los Alamos	C	27.6	0.793	C	27.6	0.793	+ 0.000 D/V
# 28 Jefferson Avenue & Murrieta Ho	F	201.4	1.802	F	201.4	1.802	+ 0.000 D/V
# 29 Madison Avenue & Murrieta Hot	F	148.3	1.413	F	148.3	1.413	+ 0.000 D/V
# 30 I-15 SB Off-Ramp & Murrieta Ho	B	14.3	0.756	B	14.3	0.756	+ 0.000 D/V

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City of Murrieta General Plan
Future General Plan (Scenario B)
PM Peak Hour

Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
# 31 I-15 NB Off-Ramp & Murrieta Ho	A	7.7	0.584	A	7.7	0.584	+ 0.000 D/V
# 32 I-215 SB Off-Ramp & Murrieta H	B	10.9	0.838	B	10.9	0.838	+ 0.000 D/V
# 33 I-215 NB Off-Ramp & Murrieta H	A	9.4	0.622	A	9.4	0.622	+ 0.000 D/V
# 34 Jackson Avenue & Murrieta Hot	A	8.5	0.558	A	8.5	0.558	+ 0.000 D/V
# 35 Margarita Road & Murrieta Hot	D	50.2	1.023	D	50.2	1.023	+ 0.000 D/V
# 36 French Valley Parkway & Murrie	B	18.0	0.810	B	18.0	0.810	+ 0.000 D/V
# 37 Jefferson Avenue & Guava Stree	A	9.1	0.795	A	9.1	0.795	+ 0.000 D/V
# 39 Washington Ave & Calle Del Oso	C	27.3	0.535	C	27.3	0.535	+ 0.000 D/V
# 40 Clinton Keith Rd & Calle de Os	B	16.4	0.655	B	16.4	0.655	+ 0.000 D/V
# 43 Jefferson Ave & Lemon St	B	17.8	0.718	B	17.8	0.718	+ 0.000 D/V
# 44 Jefferson Ave & Kalmia St	F	158.6	1.669	F	158.6	1.669	+ 0.000 D/V
# 45 Jefferson Ave & Juniper St	C	21.9	0.838	C	21.9	0.838	+ 0.000 D/V
# 46 Jefferson Ave & Ivy St/Los Ala	D	35.3	0.944	D	35.3	0.944	+ 0.000 D/V
# 48 Madison Ave/I-15 SB Ramps & Ka	C	32.7	0.913	C	32.7	0.913	+ 0.000 D/V
# 50 Hancock Ave & Murrieta Hot Spr	B	18.0	0.817	B	18.0	0.817	+ 0.000 D/V
# 51 Alta Murrieta Dr & Murrieta Ho	D	53.6	1.023	D	53.6	1.023	+ 0.000 D/V
# 52 Winchester Road - SR-79 & Murr	F	102.6	1.367	F	102.6	1.367	+ 0.000 D/V
# 53 Hancock Ave & Los Alamos Rd	F	238.4	1.650	F	238.4	1.650	+ 0.000 D/V
# 54 I-215 SB Ramps & Los Alamos Rd	F	168.4	1.466	F	168.4	1.466	+ 0.000 D/V
# 55 I-215 NB Ramps & Los Alamos Rd	C	24.4	0.914	C	24.4	0.914	+ 0.000 D/V
# 56 Whitewood Rd & Los Alamos Rd	D	44.7	0.992	D	44.7	0.992	+ 0.000 D/V
# 57 Whitewood Rd & Murrieta Hot Sp	F	90.3	1.167	F	90.3	1.167	+ 0.000 D/V
# 59 Nutmeg St & Clinton Keith Rd	F	81.0	1.161	F	81.0	1.161	+ 0.000 D/V
# 60 Murrieta Oaks Ave-Mitchell Rd	F	115.0	1.286	F	115.0	1.286	+ 0.000 D/V
# 61 I-215 SB Ramps & Scott Rd	A	8.2	0.377	A	8.2	0.377	+ 0.000 D/V

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City of Murrieta General Plan
Future General Plan (Scenario B)
PM Peak Hour

Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
# 62 I-215 NB Ramps & Scott Rd	B	16.0	0.567	B	16.0	0.567	+ 0.000 D/V
#102 Leon Road & Scott Road	D	43.0	0.937	D	43.0	0.937	+ 0.000 D/V
#104 Antelope Road & Keller Road	D	48.0	0.932	D	48.0	0.932	+ 0.000 D/V
#105 Menifee Road - Meadowlark Road	D	42.2	0.940	D	42.2	0.940	+ 0.000 D/V
#107 Leon Road & Keller Road	B	15.6	0.366	B	15.6	0.366	+ 0.000 D/V
#108 Winchester Road - SR-79 & Kell	A	1.4	0.542	A	1.4	0.542	+ 0.000 D/V
#112 Leon Road & Jean Nicholas	C	26.4	0.697	C	26.4	0.697	+ 0.000 D/V
#122 Meadowlark Lane - Whitewood Ro	F	137.7	1.482	F	137.7	1.482	+ 0.000 D/V
#138 Jefferson Avenue & Cherry Stre	D	37.5	1.029	D	37.5	1.029	+ 0.000 D/V
#141 Jefferson Ave & Nutmeg St	D	35.1	0.899	D	35.1	0.899	+ 0.000 D/V
#142 Jefferson Ave & Magnolia St	A	9.0	0.502	A	9.0	0.502	+ 0.000 D/V
#149 Monroe Ave & Murrieta Hot Spri	B	16.4	0.568	B	16.4	0.568	+ 0.000 D/V
#158 Adams Ave & Guava St	B	14.6	0.374	B	14.6	0.374	+ 0.000 D/V

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City of Murrieta General Plan
Future General Plan (Scenario B)
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #1 Menifee Road & Scott Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.142
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 79.7
Optimal Cycle: 180 Level Of Service: E

Street Name:	Menifee Rd						Scott Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	277	619	816	203	319	103	254	930	476	442	549	550
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	277	619	816	203	319	103	254	930	476	442	549	550
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	277	619	816	203	319	103	254	930	476	442	549	550
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	277	619	816	203	319	103	254	930	476	442	549	550
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	277	619	816	203	319	103	254	930	476	442	549	550
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	277	619	816	203	319	103	254	930	476	442	549	550
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.87	0.87	0.95	0.91	0.91	0.95	0.86	0.86	0.95	0.84	0.84
Lanes:	1.00	1.00	1.00	1.00	1.51	0.49	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1805	1652	1652	1805	2628	849	1805	3282	1641	1805	3199	1599
Capacity Analysis Module:												
Vol/Sat:	0.15	0.37	0.49	0.11	0.12	0.12	0.14	0.28	0.29	0.24	0.17	0.34
Crit Moves:			****	****					****	****		
Green/Cycle:	0.30	0.43	0.43	0.10	0.23	0.23	0.14	0.25	0.25	0.21	0.33	0.33
Volume/Cap:	0.52	0.87	1.14	1.14	0.52	0.52	1.03	1.12	1.14	1.14	0.52	1.03
Delay/Veh:	30.1	30.8	102.0	155.7	33.9	33.9	109.8	100	111.1	129.4	27.1	70.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	30.1	30.8	102.0	155.7	33.9	33.9	109.8	100	111.1	129.4	27.1	70.1
LOS by Move:	C	C	F	F	C	C	F	F	F	F	C	E
HCM2kAvgQ:	7	21	43	12	6	6	13	26	28	24	8	27

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
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PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #3 Winchester Road/SR-79 & Scott Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.866
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 281.2
Optimal Cycle: 180 Level Of Service: F

Street Name:	Winchester Road/SR-79									Scott Road								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected				Protected				Protected				Protected					
Rights:	Include				Include				Include				Include					
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0			
Lanes:	1	0	2	1	0	1	0	2	1	0	1	0	2	1	0	1	0	2	1	0
Volume Module:																				
Base Vol:	126	2471		28		1112	1886		129		117		292		123		0	222		1064
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00	1.00		1.00
Initial Bse:	126	2471		28		1112	1886		129		117		292		123		0	222		1064
Added Vol:	0	0		0		0	0		0		0		0		0		0	0		0
PasserByVol:	0	0		0		0	0		0		0		0		0		0	0		0
Initial Fut:	126	2471		28		1112	1886		129		117		292		123		0	222		1064
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00	1.00		1.00
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00	1.00		1.00
PHF Volume:	126	2471		28		1112	1886		129		117		292		123		0	222		1064
Reduct Vol:	0	0		0		0	0		0		0		0		0		0	0		0
Reduced Vol:	126	2471		28		1112	1886		129		117		292		123		0	222		1064
PCE Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00	1.00		1.00
MLF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00	1.00		1.00
FinalVolume:	126	2471		28		1112	1886		129		117		292		123		0	222		1064
Saturation Flow Module:																				
Sat/Lane:	1900	1900		1900		1900	1900		1900		1900		1900		1900		1900	1900		1900
Adjustment:	0.95	0.91		0.91		0.95	0.90		0.90		0.95		0.87		0.87		1.00	0.80		0.80
Lanes:	1.00	2.97		0.03		1.00	2.81		0.19		1.00		2.11		0.89		1.00	2.00		1.00
Final Sat.:	1805	5119		58		1805	4806		329		1805		3489		1470		1900	3029		1515
Capacity Analysis Module:																				
Vol/Sat:	0.07	0.48		0.48		0.62	0.39		0.39		0.06		0.08		0.08		0.00	0.07		0.70
Crit Moves:		****				****					****									****
Green/Cycle:	0.09	0.26		0.26		0.33	0.50		0.50		0.03		0.41		0.41		0.00	0.38		0.38
Volume/Cap:	0.78	1.87		1.87		1.87	0.78		0.78		1.87		0.20		0.20		0.00	0.19		1.87
Delay/Veh:	66.6	430		429.7		429.7	22.2		22.2		492.3		19.0		19.0		0.0	21.0		426.5
User DelAdj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00		1.00		1.00		1.00	1.00		1.00
AdjDel/Veh:	66.6	430		429.7		429.7	22.2		22.2		492.3		19.0		19.0		0.0	21.0		426.5
LOS by Move:	E	F		F		F	C		C		F		B		B		A	C		F
HCM2kAvgQ:	6	81		81		97	20		20		12		3		3		0	3		102

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #6 Briggs Road & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.739
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 20.7
Optimal Cycle: 87 Level Of Service: C

Street Name:	Briggs Road									Keller Road								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected				Protected				Protected				Protected					
Rights:	Include				Include				Include				Include					
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0			
Lanes:	1	0	1	1	0	1	0	1	1	0	1	0	1	1	0	1	0	1	1	0
Volume Module:																				
Base Vol:	349		92		106	1		53		87	13		310		785	9		303		4
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
Initial Bse:	349		92		106	1		53		87	13		310		785	9		303		4
Added Vol:	0		0		0	0		0		0	0		0		0	0		0		0
PasserByVol:	0		0		0	0		0		0	0		0		0	0		0		0
Initial Fut:	349		92		106	1		53		87	13		310		785	9		303		4
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Volume:	349		92		106	1		53		87	13		310		785	9		303		4
Reduct Vol:	0		0		0	0		0		0	0		0		0	0		0		0
Reduced Vol:	349		92		106	1		53		87	13		310		785	9		303		4
PCE Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
MLF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
FinalVolume:	349		92		106	1		53		87	13		310		785	9		303		4
Saturation Flow Module:																				
Sat/Lane:	1900	1900		1900		1900	1900		1900		1900	1900		1900		1900	1900		1900	
Adjustment:	0.95	0.87		0.87		0.95	0.86		0.86		0.95	0.85		0.85		0.95	0.95		0.95	
Lanes:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.97		0.03	
Final Sat.:	1805	1661		1661		1805	1637		1637		1805	1610		1610		1805	3556		47	
Capacity Analysis Module:																				
Vol/Sat:	0.19	0.06		0.06		0.00	0.03		0.05		0.01	0.19		0.49		0.00	0.09		0.09	
Crit Moves:	****								****					****	****					
Green/Cycle:	0.26	0.33		0.33		0.00	0.07		0.07		0.05	0.66		0.66		0.01	0.61		0.61	
Volume/Cap:	0.74	0.17		0.19		0.19	0.45		0.74		0.14	0.29		0.74		0.74	0.14		0.14	
Delay/Veh:	39.9	23.8		24.0		67.2	45.5		59.8		45.9	7.2		13.3		171.6	8.2		8.2	
User DelAdj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
AdjDel/Veh:	39.9	23.8		24.0		67.2	45.5		59.8		45.9	7.2		13.3		171.6	8.2		8.2	
LOS by Move:	D	C		C		E	D		E		D	A		B		F	A		A	
HCM2kAvgQ:	11	2		2		0	2		4		1	4		18		1	2		2	

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #9 Antelope Road & Golden City Drive - Baxter Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.429
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 83.1
Optimal Cycle: 180 Level Of Service: F

Street Name:	Antelope Road						Golden City Drive - Baxter Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	2	300	837	264	1068	16	4	215	44	405	121	895
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	2	300	837	264	1068	16	4	215	44	405	121	895
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	2	300	837	264	1068	16	4	215	44	405	121	895
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	2	300	837	264	1068	16	4	215	44	405	121	895
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	2	300	837	264	1068	16	4	215	44	405	121	895
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	2	300	837	264	1068	16	4	215	44	405	121	895
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.18	0.85	0.85	0.16	0.95	0.95	0.11	0.93	0.93	0.52	0.82	0.82
Lanes:	1.00	1.00	1.00	1.00	1.97	0.03	1.00	1.66	0.34	1.00	1.00	1.00
Final Sat.:	336	1606	1606	308	3550	53	217	2922	598	983	1567	1567
Capacity Analysis Module:												
Vol/Sat:	0.01	0.19	0.52	0.86	0.30	0.30	0.02	0.07	0.07	0.41	0.08	0.57
Crit Moves:				****								****
Green/Cycle:	0.60	0.60	0.60	0.60	0.60	0.60	0.40	0.40	0.40	0.40	0.40	0.40
Volume/Cap:	0.01	0.31	0.87	1.43	0.50	0.50	0.05	0.18	0.18	1.03	0.19	1.43
Delay/Veh:	8.1	9.9	23.1	241.3	11.6	11.6	18.6	19.5	19.5	83.4	19.5	231.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	8.1	9.9	23.1	241.3	11.6	11.6	18.6	19.5	19.5	83.4	19.5	231.1
LOS by Move:	A	A	C	F	B	B	B	B	B	F	B	F
HCM2kAvgQ:	0	5	25	20	10	10	0	3	3	19	3	65

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #10 Whitewood Roa - /Meadowlark Road & Golden City Drive - Baxter R

Cycle (sec): 100 Critical Vol./Cap.(X): 1.386
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 121.3
Optimal Cycle: 180 Level Of Service: F

Street Name:	Whitewood Road - Meadowlark Road						Golden City Drive - Baxter Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	271	1188	3	0	697	984	243	12	981	0	8	2
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	271	1188	3	0	697	984	243	12	981	0	8	2
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	271	1188	3	0	697	984	243	12	981	0	8	2
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	271	1188	3	0	697	984	243	12	981	0	8	2
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	271	1188	3	0	697	984	243	12	981	0	8	2
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	271	1188	3	0	697	984	243	12	981	0	8	2
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.95	1.00	0.87	0.87	0.95	0.81	0.81	1.00	0.92	0.92
Lanes:	1.00	1.99	0.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.60	0.40
Final Sat.:	1805	3601	9	1900	1646	1646	1805	1538	1538	1900	2801	700
Capacity Analysis Module:												
Vol/Sat:	0.15	0.33	0.33	0.00	0.42	0.60	0.13	0.01	0.64	0.00	0.00	0.00
Crit Moves:	****					****			****	****		
Green/Cycle:	0.11	0.54	0.54	0.00	0.43	0.43	0.45	0.46	0.46	0.00	0.01	0.01
Volume/Cap:	1.39	0.61	0.61	0.00	0.98	1.39	0.30	0.02	1.39	0.00	0.30	0.30
Delay/Veh:	246.6	16.4	16.4	0.0	45.5	207.2	17.6	14.7	209.2	0.0	54.1	54.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	246.6	16.4	16.4	0.0	45.5	207.2	17.6	14.7	209.2	0.0	54.1	54.1
LOS by Move:	F	B	B	A	D	F	B	B	F	A	D	D
HCM2kAvgQ:	20	13	13	0	29	68	5	0	68	0	0	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #11 Briggs Road & Baxter Road - Jean Nicholas

Cycle (sec): 100 Critical Vol./Cap.(X): 0.245
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 7.9
Optimal Cycle: 30 Level Of Service: A

Street Name:	Briggs Road						Baxter Road - Jean Nicholas					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	1 1 0	1	0	2 0 0	0	0	0 0 0	1	0	0 0 1
Volume Module:												
Base Vol:	0	449	72	41	681	0	0	0	0	10	0	91
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	449	72	41	681	0	0	0	0	10	0	91
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	449	72	41	681	0	0	0	0	10	0	91
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	449	72	41	681	0	0	0	0	10	0	91
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	449	72	41	681	0	0	0	0	10	0	91
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	449	72	41	681	0	0	0	0	10	0	91
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.93	0.93	0.95	0.95	1.00	1.00	1.00	1.00	0.95	1.00	0.85
Lanes:	0.00	1.72	0.28	1.00	2.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00
Final Sat.:	0	3046	488	1805	3610	0	0	0	0	1805	0	1615
Capacity Analysis Module:												
Vol/Sat:	0.00	0.15	0.15	0.02	0.19	0.00	0.00	0.00	0.00	0.01	0.00	0.06
Crit Moves:	****				****							****
Green/Cycle:	0.00	0.67	0.67	0.10	0.77	0.00	0.00	0.00	0.00	0.23	0.00	0.23
Volume/Cap:	0.00	0.22	0.22	0.22	0.24	0.00	0.00	0.00	0.00	0.02	0.00	0.24
Delay/Veh:	0.0	6.5	6.5	41.8	3.3	0.0	0.0	0.0	0.0	29.8	0.0	31.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	6.5	6.5	41.8	3.3	0.0	0.0	0.0	0.0	29.8	0.0	31.8
LOS by Move:	A	A	A	D	A	A	A	A	A	C	A	C
HCM2kAvgQ:	0	3	3	1	3	0	0	0	0	0	0	2

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #13 Winchester Road - SR-79 & Nicholas - Skyview

Cycle (sec): 100 Critical Vol./Cap.(X): 0.910
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 29.3
Optimal Cycle: 180 Level Of Service: C

Street Name:	Winchester Road - SR-79						Nicholas - Skyview					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	2 1 0	1	0	2 1 0	1	0	1 1 0	1	0	1 1 0
Volume Module:												
Base Vol:	201	2651	200	77	2065	18	40	683	128	148	447	123
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	201	2651	200	77	2065	18	40	683	128	148	447	123
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	201	2651	200	77	2065	18	40	683	128	148	447	123
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	201	2651	200	77	2065	18	40	683	128	148	447	123
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	201	2651	200	77	2065	18	40	683	128	148	447	123
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	201	2651	200	77	2065	18	40	683	128	148	447	123
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.90	0.90	0.95	0.91	0.91	0.95	0.93	0.93	0.95	0.92	0.92
Lanes:	1.00	2.79	0.21	1.00	2.97	0.03	1.00	1.68	0.32	1.00	1.57	0.43
Final Sat.:	1805	4775	360	1805	5137	45	1805	2967	556	1805	2740	754
Capacity Analysis Module:												
Vol/Sat:	0.11	0.56	0.56	0.04	0.40	0.40	0.02	0.23	0.23	0.08	0.16	0.16
Crit Moves:		****		****				****		****		
Green/Cycle:	0.14	0.61	0.61	0.05	0.51	0.51	0.04	0.25	0.25	0.09	0.30	0.30
Volume/Cap:	0.78	0.91	0.91	0.91	0.78	0.78	0.54	0.91	0.91	0.91	0.54	0.54
Delay/Veh:	55.7	21.6	21.6	115.9	21.3	21.3	54.8	49.4	49.4	90.3	29.7	29.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	55.7	21.6	21.6	115.9	21.3	21.3	54.8	49.4	49.4	90.3	29.7	29.7
LOS by Move:	E	C	C	F	C	C	D	D	D	F	C	C
HCM2kAvgQ:	8	32	32	5	20	20	2	17	17	8	8	8

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #14 Antelope Road & Linnel Lane Extension

Cycle (sec): 100 Critical Vol./Cap.(X): 0.844
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 28.1
Optimal Cycle: 146 Level Of Service: C

Street Name:	Antelope Road						Linnel Lane Extension					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	48	594	162	82	1105	613	85	463	310	51	563	348
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	48	594	162	82	1105	613	85	463	310	51	563	348
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	48	594	162	82	1105	613	85	463	310	51	563	348
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	48	594	162	82	1105	613	85	463	310	51	563	348
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	48	594	162	82	1105	613	85	463	310	51	563	348
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	48	594	162	82	1105	613	85	463	310	51	563	348
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.92	0.92	0.95	0.90	0.90	0.95	0.89	0.89	0.95	0.90	0.90
Lanes:	1.00	1.57	0.43	1.00	1.29	0.71	1.00	1.20	0.80	1.00	1.24	0.76
Final Sat.:	1805	2746	749	1805	2197	1219	1805	2033	1361	1805	2104	1300
Capacity Analysis Module:												
Vol/Sat:	0.03	0.22	0.22	0.05	0.50	0.50	0.05	0.23	0.23	0.03	0.27	0.27
Crit Moves:	****			****			****				****	
Green/Cycle:	0.03	0.52	0.52	0.11	0.60	0.60	0.06	0.33	0.33	0.04	0.32	0.32
Volume/Cap:	0.84	0.42	0.42	0.42	0.84	0.84	0.84	0.69	0.69	0.69	0.84	0.84
Delay/Veh:	114.5	15.0	15.0	43.0	19.9	19.9	91.3	30.7	30.7	71.0	38.1	38.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	114.5	15.0	15.0	43.0	19.9	19.9	91.3	30.7	30.7	71.0	38.1	38.1
LOS by Move:	F	B	B	D	B	B	F	C	C	E	D	D
HCM2kAvgQ:	3	8	8	3	25	25	5	12	12	3	16	16

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #15 Whitewood Road - Meadowlark Road & Linnel Lane Extension

Cycle (sec): 100 Critical Vol./Cap.(X): 0.984
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 40.7
Optimal Cycle: 180 Level Of Service: D

Street Name:	Whitewood Road - Meadowlark Road						Linnel Lane Extension (Future)					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	27	581	514	153	1498	200	26	458	224	274	734	792
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	27	581	514	153	1498	200	26	458	224	274	734	792
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	27	581	514	153	1498	200	26	458	224	274	734	792
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	27	581	514	153	1498	200	26	458	224	274	734	792
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	27	581	514	153	1498	200	26	458	224	274	734	792
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	27	581	514	153	1498	200	26	458	224	274	734	792
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.88	0.88	0.95	0.93	0.93	0.95	0.90	0.90	0.95	0.88	0.88
Lanes:	1.00	1.06	0.94	1.00	1.76	0.24	1.00	1.34	0.66	1.00	1.00	1.00
Final Sat.:	1805	1781	1576	1805	3127	418	1805	2306	1128	1805	1664	1664
Capacity Analysis Module:												
Vol/Sat:	0.01	0.33	0.33	0.08	0.48	0.48	0.01	0.20	0.20	0.15	0.44	0.48
Crit Moves:	****				****		****					****
Green/Cycle:	0.02	0.40	0.40	0.10	0.49	0.49	0.01	0.28	0.28	0.22	0.48	0.48
Volume/Cap:	0.98	0.82	0.82	0.82	0.98	0.98	0.98	0.70	0.70	0.70	0.91	0.98
Delay/Veh:	214.0	31.0	31.0	67.8	43.3	43.3	217.3	34.5	34.5	42.0	31.9	44.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	214.0	31.0	31.0	67.8	43.3	43.3	217.3	34.5	34.5	42.0	31.9	44.6
LOS by Move:	F	C	C	E	D	D	F	C	C	D	C	D
HCM2kAvgQ:	3	18	18	7	34	34	2	11	11	9	26	32

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #16 Leon Road & Max Gillis Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.916
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 39.7
Optimal Cycle: 180 Level Of Service: D

Street Name:	Leon Road						Max Gillis Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	2	0	1	2	0	1	1	0	2	0	1	0	1
Volume Module:												
Base Vol:	517	405	579	371	254	131	104	213	467	570	366	382
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	517	405	579	371	254	131	104	213	467	570	366	382
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	517	405	579	371	254	131	104	213	467	570	366	382
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	517	405	579	371	254	131	104	213	467	570	366	382
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	517	405	579	371	254	131	104	213	467	570	366	382
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	517	405	579	371	254	131	104	213	467	570	366	382
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.95	0.85	0.92	0.90	0.90	0.92	0.85	0.85	0.92	1.00	0.85
Lanes:	2.00	2.00	1.00	2.00	1.32	0.68	2.00	1.00	1.00	2.00	1.00	1.00
Final Sat.:	3502	3610	1615	3502	2260	1166	3502	1619	1619	3502	1900	1615
Capacity Analysis Module:												
Vol/Sat:	0.15	0.11	0.36	0.11	0.11	0.11	0.03	0.13	0.29	0.16	0.19	0.24
Crit Moves:			****	****					****	****		
Green/Cycle:	0.29	0.39	0.39	0.12	0.22	0.22	0.05	0.31	0.31	0.18	0.44	0.44
Volume/Cap:	0.51	0.29	0.92	0.92	0.51	0.51	0.54	0.42	0.92	0.92	0.44	0.54
Delay/Veh:	30.2	21.0	47.0	68.8	34.9	34.9	49.1	27.2	49.0	58.7	19.9	21.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	30.2	21.0	47.0	68.8	34.9	34.9	49.1	27.2	49.0	58.7	19.9	21.5
LOS by Move:	C	C	D	E	C	C	D	C	D	E	B	C
HCM2kAvgQ:	7	4	21	9	6	6	2	6	19	13	8	9

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #17 Winchester Road - SR-79 & Max Gillis - Thompson

Cycle (sec): 100 Critical Vol./Cap.(X): 0.959
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 37.3
Optimal Cycle: 180 Level Of Service: D

Street Name:	Winchester Road - SR-79						Max Gillis - Thompson					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	2	1	0	1	0	3	0	1	2	0	2	0	1	1	0	1	1	0
Volume Module:												
Base Vol:	244	2443	86	297	1330	662	732	322	145	32	248	82
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	244	2443	86	297	1330	662	732	322	145	32	248	82
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	244	2443	86	297	1330	662	732	322	145	32	248	82
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	244	2443	86	297	1330	662	732	322	145	32	248	82
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	244	2443	86	297	1330	662	732	322	145	32	248	82
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	244	2443	86	297	1330	662	732	322	145	32	248	82
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.91	0.85	0.92	0.95	0.85	0.95	0.91	0.91
Lanes:	1.00	2.90	0.10	1.00	3.00	1.00	2.00	2.00	1.00	1.00	1.50	0.50
Final Sat.:	1805	4986	176	1805	5187	1615	3502	3610	1615	1805	2613	864
Capacity Analysis Module:												
Vol/Sat:	0.14	0.49	0.49	0.16	0.26	0.41	0.21	0.09	0.09	0.02	0.09	0.09
Crit Moves:		****		****			****				****	
Green/Cycle:	0.17	0.51	0.51	0.17	0.51	0.51	0.22	0.26	0.26	0.05	0.10	0.10
Volume/Cap:	0.80	0.96	0.96	0.96	0.50	0.80	0.96	0.34	0.34	0.96	0.96	0.96
Delay/Veh:	53.6	33.1	33.1	81.0	16.1	25.5	61.5	29.9	30.2	47.9	82.3	82.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	53.6	33.1	33.1	81.0	16.1	25.5	61.5	29.9	30.2	47.9	82.3	82.3
LOS by Move:	D	C	C	F	B	C	E	C	C	D	F	F
HCM2kAvgQ:	9	33	33	14	10	19	16	4	4	1	9	9

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #18 California Oaks Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.936
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 23.6
Optimal Cycle: 180 Level Of Service: C

Street Name:	California Oaks Road									Clinton Keith Road								
Approach:	North Bound				South Bound					East Bound					West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected					Protected				
Rights:	Ovl					Include					Include					Include				
Min. Green:	0	0	0			0	0	0			0	0	0			0	0	0		
Lanes:	1	0	0	0	2	0	0	0	0	0	0	0	2	1	0	1	0	3	0	0
Volume Module:																				
Base Vol:	312	0	1105			0	0	0			0	2509		123		456	2578			
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00		1.00		1.00	1.00			
Initial Bse:	312	0	1105			0	0	0			0	2509		123		456	2578			
Added Vol:	0	0	0			0	0	0			0	0		0		0	0			
PasserByVol:	0	0	0			0	0	0			0	0		0		0	0			
Initial Fut:	312	0	1105			0	0	0			0	2509		123		456	2578			
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00		1.00		1.00	1.00			
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00		1.00		1.00	1.00			
PHF Volume:	312	0	1105			0	0	0			0	2509		123		456	2578			
Reduct Vol:	0	0	0			0	0	0			0	0		0		0	0			
Reduced Vol:	312	0	1105			0	0	0			0	2509		123		456	2578			
PCE Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00		1.00		1.00	1.00			
MLF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00		1.00		1.00	1.00			
FinalVolume:	312	0	1105			0	0	0			0	2509		123		456	2578			
Saturation Flow Module:																				
Sat/Lane:	1900	1900	1900			1900	1900	1900			1900	1900		1900		1900	1900			
Adjustment:	0.95	1.00	0.75			1.00	1.00	1.00			1.00	0.90		0.90		0.95	0.91			
Lanes:	1.00	0.00	2.00			0.00	0.00	0.00			0.00	2.86		0.14		1.00	3.00			
Final Sat.:	1805	0	2842			0	0	0			0	4910		241		1805	5187			
Capacity Analysis Module:																				
Vol/Sat:	0.17	0.00	0.39			0.00	0.00	0.00			0.00	0.51		0.51		0.25	0.50			
Crit Moves:	****											****				****				
Green/Cycle:	0.18	0.00	0.45			0.00	0.00	0.00			0.00	0.55		0.55		0.27	0.82			
Volume/Cap:	0.94	0.00	0.86			0.00	0.00	0.00			0.00	0.94		0.94		0.94	0.61			
Delay/Veh:	73.3	0.0	30.2			0.0	0.0	0.0			0.0	28.0		28.0		61.4	3.6			
User DelAdj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00		1.00		1.00	1.00			
AdjDel/Veh:	73.3	0.0	30.2			0.0	0.0	0.0			0.0	28.0		28.0		61.4	3.6			
LOS by Move:	E		A			C		A			A			C		E		A		
HCM2kAvgQ:	14	0	20			0	0	0			0	33		33		18	11			

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #19 I-215 SB Off-Ramp & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.740
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 12.5
Optimal Cycle: 88 Level Of Service: B

Street Name:	I-215 SB Off-Ramp									Clinton Keith Road								
Approach:	North Bound				South Bound					East Bound					West Bound			
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Split Phase					Split Phase					Protected					Protected				
Rights:	Include					Include					Include					Ignore				
Min. Green:	0	0	0			0	0	0			0	0	0			0	0	0		
Lanes:	0	0	0	0	0	0	1	0	0	2	0	0	3	0	1	0	0	3	0	1
Volume Module:																				
Base Vol:	0	0	0			36	0	628			0	2693		826		0	2635			
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00		1.00		1.00	1.00			
Initial Bse:	0	0	0			36	0	628			0	2693		826		0	2635			
Added Vol:	0	0	0			0	0	0			0	0		0		0	0			
PasserByVol:	0	0	0			0	0	0			0	0		0		0	0			
Initial Fut:	0	0	0			36	0	628			0	2693		826		0	2635			
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00		1.00		1.00	1.00			
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00		1.00		1.00	1.00			
PHF Volume:	0	0	0			36	0	628			0	2693		826		0	2635			
Reduct Vol:	0	0	0			0	0	0			0	0		0		0	0			
Reduced Vol:	0	0	0			36	0	628			0	2693		826		0	2635			
PCE Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00		1.00		1.00	1.00			
MLF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00		1.00		1.00	1.00			
FinalVolume:	0	0	0			36	0	628			0	2693		826		0	2635			
Saturation Flow Module:																				
Sat/Lane:	1900	1900	1900			1900	1900	1900			1900	1900		1900		1900	1900			
Adjustment:	1.00	1.00	1.00			0.95	1.00	0.75			1.00	0.91		0.85		1.00	0.91			
Lanes:	0.00	0.00	0.00			1.00	0.00	2.00			0.00	3.00		1.00		0.00	3.00			
Final Sat.:	0	0	0			1809	0	2842			0	5187		1615		0	5187			
Capacity Analysis Module:																				
Vol/Sat:	0.00	0.00	0.00			0.02	0.00	0.22			0.00	0.52		0.51		0.00	0.51			
Crit Moves:								****				****				****				
Green/Cycle:	0.00	0.00	0.00			0.30	0.00	0.30			0.00	0.70		0.70		0.00	0.70			
Volume/Cap:	0.00	0.00	0.00			0.07	0.00	0.74			0.00	0.74		0.73		0.00	0.72			
Delay/Veh:	0.0	0.0	0.0			25.2	0.0	35.1			0.0	10.1		11.6		0.0	9.8			
User DelAdj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00		1.00		1.00	1.00			
AdjDel/Veh:	0.0	0.0	0.0			25.2	0.0	35.1			0.0	10.1		11.6		0.0	9.8			
LOS by Move:	A		A			C		A			D			A		B		B		
HCM2kAvgQ:	0	0	0			1	0	11			0	20		17		0	19			

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #20 I-215 NB Off Ramp & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.858
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 17.8
Optimal Cycle: 161 Level Of Service: B

Street Name:	I-215 NB Off Ramp						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0	0	0	1	0	0	0	0	0	0	3	0	1	0	0	3	0	1	0	0	3	0	1
Volume Module:																								
Base Vol:	517	0	464	0	0	0	0	1524	283	0	2960	253
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	517	0	464	0	0	0	0	1524	283	0	2960	253
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	517	0	464	0	0	0	0	1524	283	0	2960	253
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
PHF Volume:	517	0	464	0	0	0	0	1524	283	0	2960	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	517	0	464	0	0	0	0	1524	283	0	2960	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
FinalVolume:	517	0	464	0	0	0	0	1524	283	0	2960	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	1.00	1.00	1.00	1.00	0.91	0.85	1.00	0.91	1.00
Lanes:	1.00	0.00	1.00	0.00	0.00	0.00	0.00	3.00	1.00	0.00	3.00	1.00
Final Sat.:	1805	0	1615	0	0	0	0	5187	1615	0	5187	1900
Capacity Analysis Module:												
Vol/Sat:	0.29	0.00	0.29	0.00	0.00	0.00	0.00	0.29	0.18	0.00	0.57	0.00
Crit Moves:			****				****				****	
Green/Cycle:	0.33	0.00	0.33	0.00	0.00	0.00	0.00	0.67	0.67	0.00	0.67	0.00
Volume/Cap:	0.86	0.00	0.86	0.00	0.00	0.00	0.00	0.44	0.26	0.00	0.86	0.00
Delay/Veh:	42.5	0.0	44.0	0.0	0.0	0.0	0.0	8.0	6.9	0.0	15.4	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	42.5	0.0	44.0	0.0	0.0	0.0	0.0	8.0	6.9	0.0	15.4	0.0
LOS by Move:	D	A	D	A	A	A	A	A	A	A	B	A
HCM2kAvgQ:	18	0	16	0	0	0	0	8	4	0	28	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #21 Antelope Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.494
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 3.8
Optimal Cycle: 45 Level Of Service: A

Street Name:	Antelope Road						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ignore			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	2	0	0	0	2	2	0	3	0	0	0	0	2	1	0
Volume Module:																								
Base Vol:	0	0	0	111	0	926	147	2057	0	0	1746	375
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	111	0	926	147	2057	0	0	1746	375
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	111	0	926	147	2057	0	0	1746	375
User Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	111	0	0	147	2057	0	0	1746	375
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	111	0	0	147	2057	0	0	1746	375
PCE Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	111	0	0	147	2057	0	0	1746	375
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.92	1.00	0.88	0.92	0.91	1.00	1.00	0.89	0.89
Lanes:	0.00	0.00	0.00	2.00	0.00	2.00	2.00	3.00	0.00	0.00	2.47	0.53
Final Sat.:	0	0	0	3502	0	3344	3502	5187	0	0	4155	892
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.03	0.00	0.00	0.04	0.40	0.00	0.00	0.42	0.42
Crit Moves:				****			****				****	
Green/Cycle:	0.00	0.00	0.00	0.06	0.00	0.00	0.08	0.94	0.00	0.00	0.85	0.85
Volume/Cap:	0.00	0.00	0.00	0.49	0.00	0.00	0.49	0.42	0.00	0.00	0.49	0.49
Delay/Veh:	0.0	0.0	0.0	46.9	0.0	0.0	45.0	0.4	0.0	0.0	2.0	2.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	46.9	0.0	0.0	45.0	0.4	0.0	0.0	2.0	2.0
LOS by Move:	A	A	A	D	A	A	D	A	A	A	A	A
HCM2kAvgQ:	0	0	0	2	0	0	3	3	0	0	7	7

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #23 Liberty Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.567
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 4.7
Optimal Cycle: 53 Level Of Service: A

Street Name:	Liberty Road						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	0	0	1	0	0	0	0	0	2	1	0	1	0	3	0	0
Volume Module:												
Base Vol:	47	0	157	0	0	0	0	2305	86	11	2266	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	47	0	157	0	0	0	0	2305	86	11	2266	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	47	0	157	0	0	0	0	2305	86	11	2266	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	47	0	157	0	0	0	0	2305	86	11	2266	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	47	0	157	0	0	0	0	2305	86	11	2266	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	47	0	157	0	0	0	0	2305	86	11	2266	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.85	1.00	1.00	1.00	1.00	0.91	0.91	0.95	0.91	1.00
Lanes:	2.00	0.00	1.00	0.00	0.00	0.00	0.00	2.89	0.11	1.00	3.00	0.00
Final Sat.:	3502	0	1615	0	0	0	0	4975	186	1805	5187	0
Capacity Analysis Module:												
Vol/Sat:	0.01	0.00	0.10	0.00	0.00	0.00	0.00	0.46	0.46	0.01	0.44	0.00
Crit Moves:			****					****		****		
Green/Cycle:	0.17	0.00	0.17	0.00	0.00	0.00	0.00	0.82	0.82	0.01	0.83	0.00
Volume/Cap:	0.08	0.00	0.57	0.00	0.00	0.00	0.00	0.57	0.57	0.57	0.53	0.00
Delay/Veh:	34.8	0.0	40.7	0.0	0.0	0.0	0.0	3.3	3.3	83.0	2.7	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	34.8	0.0	40.7	0.0	0.0	0.0	0.0	3.3	3.3	83.0	2.7	0.0
LOS by Move:	C	A	D	A	A	A	A	A	A	F	A	A
HCM2kAvgQ:	1	0	5	0	0	0	0	10	10	1	8	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #24 Leon Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.978
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 29.2
Optimal Cycle: 180 Level Of Service: C

Street Name:	Leon Road						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ovl			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	1	0	0	0	2	2	0	3	0	0	0	0	3	0	1
Volume Module:												
Base Vol:	0	0	0	145	0	1216	539	1900	0	0	1048	888
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	145	0	1216	539	1900	0	0	1048	888
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	145	0	1216	539	1900	0	0	1048	888
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	145	0	1216	539	1900	0	0	1048	888
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	145	0	1216	539	1900	0	0	1048	888
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	145	0	1216	539	1900	0	0	1048	888
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.95	1.00	0.75	0.92	0.91	1.00	1.00	0.91	0.85
Lanes:	0.00	0.00	0.00	1.00	0.00	2.00	2.00	3.00	0.00	0.00	3.00	1.00
Final Sat.:	0	0	0	1805	0	2842	3502	5187	0	0	5187	1615
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.08	0.00	0.43	0.15	0.37	0.00	0.00	0.20	0.55
Crit Moves:						****	****					****
Green/Cycle:	0.00	0.00	0.00	0.28	0.00	0.44	0.16	0.72	0.00	0.00	0.56	0.56
Volume/Cap:	0.00	0.00	0.00	0.29	0.00	0.98	0.98	0.51	0.00	0.00	0.36	0.98
Delay/Veh:	0.0	0.0	0.0	28.5	0.0	47.9	74.5	6.3	0.0	0.0	12.1	45.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	28.5	0.0	47.9	74.5	6.3	0.0	0.0	12.1	45.7
LOS by Move:	A	A	A	C	A	D	E	A	A	A	B	D
HCM2kAvgQ:	0	0	0	4	0	27	13	10	0	0	6	33

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #25 Winchester Road - SR-79 & Benton Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.086
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 63.5
Optimal Cycle: 180 Level Of Service: E

Street Name:	Winchester Road - SR-79						Benton Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 3	0 1	2	0 3	0 1	2	0 2	0 2	2	0 2	0 1
Volume Module:												
Base Vol:	575	2536	756	65	1007	510	75	634	1450	240	749	79
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	575	2536	756	65	1007	510	75	634	1450	240	749	79
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	575	2536	756	65	1007	510	75	634	1450	240	749	79
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	575	2536	756	65	1007	510	75	634	1450	240	749	79
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	575	2536	756	65	1007	510	75	634	1450	240	749	79
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	575	2536	756	65	1007	510	75	634	1450	240	749	79
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.91	0.85	0.92	0.91	0.85	0.92	0.95	0.75	0.92	0.95	0.85
Lanes:	2.00	3.00	1.00	2.00	3.00	1.00	2.00	2.00	2.00	2.00	2.00	1.00
Final Sat.:	3502	5187	1615	3502	5187	1615	3502	3610	2842	3502	3610	1615
Capacity Analysis Module:												
Vol/Sat:	0.16	0.49	0.47	0.02	0.19	0.32	0.02	0.18	0.51	0.07	0.21	0.05
Crit Moves:		****			****				****	****		
Green/Cycle:	0.16	0.45	0.45	0.02	0.31	0.31	0.05	0.47	0.47	0.06	0.48	0.48
Volume/Cap:	1.03	1.09	1.04	1.09	0.63	1.03	0.43	0.37	1.09	1.09	0.43	0.10
Delay/Veh:	87.2	74.3	71.7	191.3	30.6	82.2	47.8	17.2	78.1	132.2	17.0	14.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	87.2	74.3	71.7	191.3	30.6	82.2	47.8	17.2	78.1	132.2	17.0	14.1
LOS by Move:	F	E	E	F	C	F	D	B	E	F	B	B
HCM2kAvgQ:	15	42	33	3	10	23	2	7	38	8	8	1

Note: Queue reported is the number of cars per lane.

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Intersection #26 Winchester Road - SR-79 & Via Mira Mosa

Cycle (sec): 100 Critical Vol./Cap.(X): 0.980
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 27.3
Optimal Cycle: 180 Level Of Service: C

Street Name:	Winchester Road - SR-79						Via Mira Mosa					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 0	1 0	1	0 0	1 0
Volume Module:												
Base Vol:	65	3235	238	122	2123	370	238	31	52	223	40	135
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	65	3235	238	122	2123	370	238	31	52	223	40	135
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	65	3235	238	122	2123	370	238	31	52	223	40	135
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	65	3235	238	122	2123	370	238	31	52	223	40	135
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	65	3235	238	122	2123	370	238	31	52	223	40	135
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	65	3235	238	122	2123	370	238	31	52	223	40	135
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.90	0.90	0.95	0.89	0.89	0.95	0.91	0.91	0.95	0.88	0.88
Lanes:	1.00	2.79	0.21	1.00	2.55	0.45	1.00	0.37	0.63	1.00	0.23	0.77
Final Sat.:	1805	4783	352	1805	4320	753	1805	643	1078	1805	384	1296
Capacity Analysis Module:												
Vol/Sat:	0.04	0.68	0.68	0.07	0.49	0.49	0.13	0.05	0.05	0.12	0.10	0.10
Crit Moves:		****			****			****			****	
Green/Cycle:	0.05	0.69	0.69	0.07	0.71	0.71	0.13	0.07	0.07	0.17	0.11	0.11
Volume/Cap:	0.69	0.98	0.98	0.98	0.69	0.69	0.98	0.71	0.71	0.71	0.98	0.98
Delay/Veh:	66.9	25.7	25.7	120.7	9.0	9.0	95.1	64.4	64.4	46.5	106	105.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	66.9	25.7	25.7	120.7	9.0	9.0	95.1	64.4	64.4	46.5	106	105.8
LOS by Move:	E	C	C	F	A	A	F	E	E	D	F	F
HCM2kAvgQ:	3	45	45	7	17	17	12	4	4	8	9	9

Note: Queue reported is the number of cars per lane.

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2000 HCM Operations Method (Future Volume Alternative)

Intersection #27 Monroe Ave & Los Alamos

Cycle (sec): 100 Critical Vol./Cap.(X): 0.793
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 27.6
Optimal Cycle: 110 Level Of Service: C

Street Name:	Monroe Ave						Los Alamos					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	2	0 2	0 1	1	0 1	1 0	1	0 2	0 1
Volume Module:												
Base Vol:	27	457	249	250	318	64	240	1480	178	88	948	475
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	27	457	249	250	318	64	240	1480	178	88	948	475
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	27	457	249	250	318	64	240	1480	178	88	948	475
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	27	457	249	250	318	64	240	1480	178	88	948	475
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	27	457	249	250	318	64	240	1480	178	88	948	475
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	27	457	249	250	318	64	240	1480	178	88	948	475
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.90	0.90	0.92	0.95	0.85	0.95	0.93	0.93	0.95	0.95	0.85
Lanes:	1.00	1.29	0.71	2.00	2.00	1.00	1.00	1.79	0.21	1.00	2.00	1.00
Final Sat.:	1805	2213	1206	3502	3610	1615	1805	3171	381	1805	3610	1615
Capacity Analysis Module:												
Vol/Sat:	0.01	0.21	0.21	0.07	0.09	0.04	0.13	0.47	0.47	0.05	0.26	0.29
Crit Moves:		****		****				****		****		
Green/Cycle:	0.05	0.26	0.26	0.09	0.30	0.30	0.20	0.59	0.59	0.06	0.45	0.45
Volume/Cap:	0.29	0.79	0.79	0.79	0.29	0.13	0.66	0.79	0.79	0.79	0.59	0.66
Delay/Veh:	47.5	39.4	39.4	57.5	27.1	25.7	41.0	18.1	18.1	77.6	21.3	23.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	47.5	39.4	39.4	57.5	27.1	25.7	41.0	18.1	18.1	77.6	21.3	23.8
LOS by Move:	D	D	D	E	C	C	D	B	B	E	C	C
HCM2kAvgQ:	1	13	13	6	4	1	8	22	22	5	12	12

Note: Queue reported is the number of cars per lane.

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2000 HCM Operations Method (Future Volume Alternative)

Intersection #28 Jefferson Avenue & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.802
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 201.4
Optimal Cycle: 180 Level Of Service: F

Street Name:	Jefferson Avenue						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 3	0 1	1	0 2	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	6	2312	1191	792	1042	69	39	196	108	594	90	903
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	6	2312	1191	792	1042	69	39	196	108	594	90	903
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	6	2312	1191	792	1042	69	39	196	108	594	90	903
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	6	2312	1191	792	1042	69	39	196	108	594	90	903
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	6	2312	1191	792	1042	69	39	196	108	594	90	903
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	6	2312	1191	792	1042	69	39	196	108	594	90	903
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.85	0.95	0.90	0.90	0.95	0.86	0.86	0.95	0.79	0.79
Lanes:	1.00	3.00	1.00	1.00	2.81	0.19	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1805	5187	1615	1805	4821	319	1805	3275	1637	1805	2988	1494
Capacity Analysis Module:												
Vol/Sat:	0.00	0.45	0.74	0.44	0.22	0.22	0.02	0.06	0.07	0.33	0.03	0.60
Crit Moves:			****	****			****					****
Green/Cycle:	0.01	0.41	0.41	0.24	0.64	0.64	0.01	0.06	0.06	0.29	0.34	0.34
Volume/Cap:	0.34	1.09	1.80	1.80	0.34	0.34	1.80	1.03	1.14	1.14	0.09	1.80
Delay/Veh:	60.0	78.3	396.6	407.9	8.2	8.2	546.2	108	144.3	118.5	22.8	401.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	60.0	78.3	396.6	407.9	8.2	8.2	546.2	108	144.3	118.5	22.8	401.5
LOS by Move:	E	E	F	F	A	A	F	F	F	F	C	F
HCM2kAvgQ:	1	39	102	68	6	6	5	7	8	31	1	85

Note: Queue reported is the number of cars per lane.

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Intersection #29 Madison Avenue & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.413
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 148.3
Optimal Cycle: 180 Level Of Service: F

Street Name:	Madison Avenue						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	2	0	1	2	0	1	1	0	2	0	3	0	1
Volume Module:												
Base Vol:	383	646	1270	323	260	127	389	1638	338	843	1322	187
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	383	646	1270	323	260	127	389	1638	338	843	1322	187
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	383	646	1270	323	260	127	389	1638	338	843	1322	187
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	383	646	1270	323	260	127	389	1638	338	843	1322	187
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	383	646	1270	323	260	127	389	1638	338	843	1322	187
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	383	646	1270	323	260	127	389	1638	338	843	1322	187
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.95	0.85	0.92	0.90	0.90	0.92	0.89	0.89	0.92	0.91	0.85
Lanes:	2.00	2.00	1.00	2.00	1.34	0.66	2.00	3.32	0.68	2.00	3.00	1.00
Final Sat.:	3502	3610	1615	3502	2306	1127	3502	5584	1152	3502	5187	1615
Capacity Analysis Module:												
Vol/Sat:	0.11	0.18	0.79	0.09	0.11	0.11	0.11	0.29	0.29	0.24	0.25	0.12
Crit Moves:			****	****				****		****		
Green/Cycle:	0.31	0.56	0.56	0.07	0.32	0.32	0.11	0.21	0.21	0.17	0.26	0.26
Volume/Cap:	0.36	0.32	1.41	1.41	0.36	0.36	0.97	1.41	1.41	1.41	0.97	0.44
Delay/Veh:	27.2	12.1	214.5	256.3	26.6	26.6	80.5	230	229.6	237.0	53.6	31.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	27.2	12.1	214.5	256.3	26.6	26.6	80.5	230	229.6	237.0	53.6	31.4
LOS by Move:	C	B	F	F	C	C	F	F	F	F	D	C
HCM2kAvgQ:	5	6	85	13	5	5	10	38	38	31	20	5

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #30 I-15 SB Off-Ramp & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.756
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 14.3
Optimal Cycle: 93 Level Of Service: B

Street Name:	I-15 SB Off-Ramp						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	1	0	1!	0	1	0	0	3	0	1	0	0	3	0	1
Volume Module:												
Base Vol:	0	0	0	675	0	423	0	2672	511	0	2361	112
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	675	0	423	0	2672	511	0	2361	112
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	675	0	423	0	2672	511	0	2361	112
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	0	0	0	675	0	423	0	2672	0	0	2361	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	675	0	423	0	2672	0	0	2361	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	0	0	0	675	0	423	0	2672	0	0	2361	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.91	1.00	0.91	1.00	0.91	1.00	1.00	0.91	1.00
Lanes:	0.00	0.00	0.00	1.61	0.00	1.39	0.00	3.00	1.00	0.00	3.00	1.00
Final Sat.:	0	0	0	2803	0	2405	0	5187	1900	0	5187	1900
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.24	0.00	0.18	0.00	0.52	0.00	0.00	0.46	0.00
Crit Moves:				****				****		****		
Green/Cycle:	0.00	0.00	0.00	0.32	0.00	0.32	0.00	0.68	0.00	0.00	0.68	0.00
Volume/Cap:	0.00	0.00	0.00	0.76	0.00	0.55	0.00	0.76	0.00	0.00	0.67	0.00
Delay/Veh:	0.0	0.0	0.0	32.9	0.0	28.5	0.0	11.4	0.0	0.0	9.8	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	32.9	0.0	28.5	0.0	11.4	0.0	0.0	9.8	0.0
LOS by Move:	A	A	A	C	A	C	A	B	A	A	A	A
HCM2kAvgQ:	0	0	0	13	0	8	0	21	0	0	16	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #31 I-15 NB Off-Ramp & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.584
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 7.7
Optimal Cycle: 55 Level Of Service: A

Street Name:	I-15 NB Off-Ramp						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	0	0	1	0	0	0	0	0	0	4	0	1	0	0	4	0	1
Volume Module:																			
Base Vol:	214	0	239	0	0	0	0	3013	363	0	1731	1644
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	214	0	239	0	0	0	0	3013	363	0	1731	1644
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	214	0	239	0	0	0	0	3013	363	0	1731	1644
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	214	0	239	0	0	0	0	3013	0	0	1731	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	214	0	239	0	0	0	0	3013	0	0	1731	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	214	0	239	0	0	0	0	3013	0	0	1731	0
Saturation Flow Module:																			
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.85	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Lanes:	2.00	0.00	1.00	0.00	0.00	0.00	0.00	4.00	1.00	0.00	4.00	1.00
Final Sat.:	3502	0	1615	0	0	0	0	6916	1900	0	6916	1900
Capacity Analysis Module:																			
Vol/Sat:	0.06	0.00	0.15	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.25	0.00
Crit Moves:			****					****		****		
Green/Cycle:	0.25	0.00	0.25	0.00	0.00	0.00	0.00	0.75	0.00	0.00	0.75	0.00
Volume/Cap:	0.24	0.00	0.58	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.34	0.00
Delay/Veh:	29.8	0.0	34.9	0.0	0.0	0.0	0.0	5.9	0.0	0.0	4.3	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	29.8	0.0	34.9	0.0	0.0	0.0	0.0	5.9	0.0	0.0	4.3	0.0
LOS by Move:	C	A	C	A	A	A	A	A	A	A	A	A
HCM2kAvgQ:	3	0	7	0	0	0	0	12	0	0	5	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #32 I-215 SB Off-Ramp & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.838
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 10.9
Optimal Cycle: 115 Level Of Service: B

Street Name:	I-215 SB Off-Ramp						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	0	0	1	0	1!	0	1	0	0	3	0	1	0	0	3	0	1
Volume Module:																			
Base Vol:	0	0	0	474	0	359	0	3438	139	0	2361	238
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	474	0	359	0	3438	139	0	2361	238
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	474	0	359	0	3438	139	0	2361	238
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	0	0	0	474	0	359	0	3438	0	0	2361	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	474	0	359	0	3438	0	0	2361	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	0	0	0	474	0	359	0	3438	0	0	2361	0
Saturation Flow Module:																			
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.91	1.00	0.91	1.00	0.91	1.00	1.00	0.91	1.00
Lanes:	0.00	0.00	0.00	1.57	0.00	1.43	0.00	3.00	1.00	0.00	3.00	1.00
Final Sat.:	0	0	0	2709	0	2471	0	5187	1900	0	5187	1900
Capacity Analysis Module:																			
Vol/Sat:	0.00	0.00	0.00	0.17	0.00	0.15	0.00	0.66	0.00	0.00	0.46	0.00
Crit Moves:				****				****				
Green/Cycle:	0.00	0.00	0.00	0.21	0.00	0.21	0.00	0.79	0.00	0.00	0.79	0.00
Volume/Cap:	0.00	0.00	0.00	0.84	0.00	0.70	0.00	0.84	0.00	0.00	0.58	0.00
Delay/Veh:	0.0	0.0	0.0	44.3	0.0	38.4	0.0	8.1	0.0	0.0	4.2	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	44.3	0.0	38.4	0.0	8.1	0.0	0.0	4.2	0.0
LOS by Move:	A	A	A	D	A	D	A	A	A	A	A	A
HCM2kAvgQ:	0	0	0	12	0	8	0	26	0	0	11	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #33 I-215 NB Off-Ramp & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.622
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 9.4
Optimal Cycle: 49 Level Of Service: A

Street Name:	I-215 NB Off-Ramp						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	0	0	2	0	0	0	0	0	0	3	0	1	0	0	3	0	1
Volume Module:																			
Base Vol:	85	0	463	0	0	0	0	2333	104	0	2380	1413
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	85	0	463	0	0	0	0	2333	104	0	2380	1413
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	85	0	463	0	0	0	0	2333	104	0	2380	1413
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	85	0	463	0	0	0	0	2333	0	0	2380	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	85	0	463	0	0	0	0	2333	0	0	2380	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	85	0	463	0	0	0	0	2333	0	0	2380	0
Saturation Flow Module:																			
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.75	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Lanes:	2.00	0.00	2.00	0.00	0.00	0.00	0.00	3.00	1.00	0.00	3.00	1.00
Final Sat.:	3502	0	2842	0	0	0	0	5187	1900	0	5187	1900
Capacity Analysis Module:																			
Vol/Sat:	0.02	0.00	0.16	0.00	0.00	0.00	0.00	0.45	0.00	0.00	0.46	0.00
Crit Moves:			****								****	
Green/Cycle:	0.26	0.00	0.26	0.00	0.00	0.00	0.00	0.74	0.00	0.00	0.74	0.00
Volume/Cap:	0.09	0.00	0.62	0.00	0.00	0.00	0.00	0.61	0.00	0.00	0.62	0.00
Delay/Veh:	28.0	0.0	34.2	0.0	0.0	0.0	0.0	6.5	0.0	0.0	6.7	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	28.0	0.0	34.2	0.0	0.0	0.0	0.0	6.5	0.0	0.0	6.7	0.0
LOS by Move:	C	A	C	A	A	A	A	A	A	A	A	A
HCM2kAvgQ:	1	0	8	0	0	0	0	13	0	0	13	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #34 Jackson Avenue & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.558
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 8.5
Optimal Cycle: 52 Level Of Service: A

Street Name:	Jackson Avenue						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	0	0	2	0	0	0	0	0	0	3	0	1	1	0	3	0	0
Volume Module:																			
Base Vol:	202	0	169	0	0	0	0	1910	58	211	2597	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	202	0	169	0	0	0	0	1910	58	211	2597	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	202	0	169	0	0	0	0	1910	58	211	2597	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	202	0	169	0	0	0	0	1910	58	211	2597	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	202	0	169	0	0	0	0	1910	58	211	2597	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	202	0	169	0	0	0	0	1910	58	211	2597	0
Saturation Flow Module:																			
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.75	1.00	1.00	1.00	1.00	0.91	0.85	0.95	0.91	1.00
Lanes:	2.00	0.00	2.00	0.00	0.00	0.00	0.00	3.00	1.00	1.00	3.00	0.00
Final Sat.:	3502	0	2842	0	0	0	0	5187	1615	1805	5187	0
Capacity Analysis Module:																			
Vol/Sat:	0.06	0.00	0.06	0.00	0.00	0.00	0.00	0.37	0.04	0.12	0.50	0.00
Crit Moves:	****							****			****	
Green/Cycle:	0.10	0.00	0.10	0.00	0.00	0.00	0.00	0.68	0.68	0.22	0.90	0.00
Volume/Cap:	0.56	0.00	0.58	0.00	0.00	0.00	0.00	0.54	0.05	0.54	0.56	0.00
Delay/Veh:	44.6	0.0	45.5	0.0	0.0	0.0	0.0	8.2	5.3	36.3	1.2	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	44.6	0.0	45.5	0.0	0.0	0.0	0.0	8.2	5.3	36.3	1.2	0.0
LOS by Move:	D	A	D	A	A	A	A	A	A	D	A	A
HCM2kAvgQ:	4	0	4	0	0	0	0	11	1	6	7	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #35 Margarita Road & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.023
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 50.2
Optimal Cycle: 180 Level Of Service: D

Street Name:	Margarita Road						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 1	0 1	0	1 0	0 1	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	949	70	388	187	77	152	51	1745	535	276	1634	38
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	949	70	388	187	77	152	51	1745	535	276	1634	38
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	949	70	388	187	77	152	51	1745	535	276	1634	38
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	949	70	388	187	77	152	51	1745	535	276	1634	38
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	949	70	388	187	77	152	51	1745	535	276	1634	38
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	949	70	388	187	77	152	51	1745	535	276	1634	38
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.85	0.97	0.97	0.85	0.95	0.88	0.88	0.95	0.91	0.91
Lanes:	2.00	1.00	1.00	0.71	0.29	1.00	1.00	2.30	0.70	1.00	2.93	0.07
Final Sat.:	3502	1900	1615	1300	535	1615	1805	3831	1175	1805	5054	118
Capacity Analysis Module:												
Vol/Sat:	0.27	0.04	0.24	0.14	0.14	0.09	0.03	0.46	0.46	0.15	0.32	0.32
Crit Moves:	****				****			****			****	
Green/Cycle:	0.26	0.26	0.26	0.14	0.14	0.14	0.05	0.45	0.45	0.15	0.55	0.55
Volume/Cap:	1.02	0.14	0.91	1.02	1.02	0.67	0.59	1.02	1.02	1.02	0.59	0.59
Delay/Veh:	72.3	28.2	58.2	105.1	105	48.3	57.1	53.0	53.0	103.4	15.5	15.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	72.3	28.2	58.2	105.1	105	48.3	57.1	53.0	53.0	103.4	15.5	15.5
LOS by Move:	E	C	E	F	F	D	E	D	D	F	B	B
HCM2kAvgQ:	22	2	15	13	13	6	3	35	35	14	13	13

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #36 French Valley Parkway & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.810
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 18.0
Optimal Cycle: 120 Level Of Service: B

Street Name:	French Valley Parkway						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 0	0 2	0	0 0	0 0	0	0 2	1 0	1	0 3	0 0
Volume Module:												
Base Vol:	34	0	1093	0	0	0	0	1789	362	445	1723	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	34	0	1093	0	0	0	0	1789	362	445	1723	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	34	0	1093	0	0	0	0	1789	362	445	1723	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	34	0	1093	0	0	0	0	1789	362	445	1723	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	34	0	1093	0	0	0	0	1789	362	445	1723	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	34	0	1093	0	0	0	0	1789	362	445	1723	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.75	1.00	1.00	1.00	1.00	0.89	0.89	0.95	0.91	1.00
Lanes:	1.00	0.00	2.00	0.00	0.00	0.00	0.00	2.50	0.50	1.00	3.00	0.00
Final Sat.:	1805	0	2842	0	0	0	0	4206	851	1805	5187	0
Capacity Analysis Module:												
Vol/Sat:	0.02	0.00	0.38	0.00	0.00	0.00	0.00	0.43	0.43	0.25	0.33	0.00
Crit Moves:			****					****			****	
Green/Cycle:	0.17	0.00	0.47	0.00	0.00	0.00	0.00	0.53	0.53	0.30	0.83	0.00
Volume/Cap:	0.11	0.00	0.81	0.00	0.00	0.00	0.00	0.81	0.81	0.81	0.40	0.00
Delay/Veh:	35.2	0.0	26.2	0.0	0.0	0.0	0.0	21.6	21.6	40.9	2.2	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	35.2	0.0	26.2	0.0	0.0	0.0	0.0	21.6	21.6	40.9	2.2	0.0
LOS by Move:	D	A	C	A	A	A	A	C	C	D	A	A
HCM2kAvgQ:	1	0	18	0	0	0	0	22	22	15	5	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #37 Jefferson Avenue & Guava Street

Cycle (sec): 100 Critical Vol./Cap.(X): 0.795
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 9.1
Optimal Cycle: 91 Level Of Service: A

Street Name:	Jefferson Avenue						Guava Street					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 0	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	15	3304	21	20	1223	332	80	134	117	2	77	16
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	15	3304	21	20	1223	332	80	134	117	2	77	16
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	15	3304	21	20	1223	332	80	134	117	2	77	16
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	15	3304	21	20	1223	332	80	134	117	2	77	16
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	15	3304	21	20	1223	332	80	134	117	2	77	16
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	15	3304	21	20	1223	332	80	134	117	2	77	16
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.88	0.88	0.61	0.93	0.93	0.22	0.93	0.93
Lanes:	1.00	2.98	0.02	1.00	2.36	0.64	1.00	0.53	0.47	1.00	1.66	0.34
Final Sat.:	1805	5149	33	1805	3949	1072	1159	943	824	426	2911	605
Capacity Analysis Module:												
Vol/Sat:	0.01	0.64	0.64	0.01	0.31	0.31	0.07	0.14	0.14	0.00	0.03	0.03
Crit Moves:		****		****				****				
Green/Cycle:	0.02	0.81	0.81	0.01	0.80	0.80	0.18	0.18	0.18	0.18	0.18	0.18
Volume/Cap:	0.39	0.79	0.79	0.79	0.39	0.39	0.39	0.79	0.79	0.03	0.15	0.15
Delay/Veh:	54.6	6.3	6.3	142.1	3.0	3.0	37.4	52.3	52.3	34.0	34.8	34.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	54.6	6.3	6.3	142.1	3.0	3.0	37.4	52.3	52.3	34.0	34.8	34.8
LOS by Move:	D	A	A	F	A	A	D	D	D	C	C	C
HCM2kAvgQ:	1	22	22	2	5	5	3	10	10	0	1	1

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #39 Washington Ave & Calle Del Oso Oro/Nutmeg

Cycle (sec): 100 Critical Vol./Cap.(X): 0.535
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 27.3
Optimal Cycle: 49 Level Of Service: C

Street Name:	Washington Ave						Calle Del Oso Oro/Nutmeg					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	395	266	126	93	235	55	26	212	281	160	621	148
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	395	266	126	93	235	55	26	212	281	160	621	148
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	395	266	126	93	235	55	26	212	281	160	621	148
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	395	266	126	93	235	55	26	212	281	160	621	148
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	395	266	126	93	235	55	26	212	281	160	621	148
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	395	266	126	93	235	55	26	212	281	160	621	148
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.87	0.87	0.95	0.88	0.88	0.95	0.87	0.87	0.95	0.92	0.92
Lanes:	1.00	2.04	0.96	1.00	2.43	0.57	1.00	1.00	1.00	1.00	1.62	0.38
Final Sat.:	1805	3351	1587	1805	4086	956	1805	1652	1652	1805	2831	675
Capacity Analysis Module:												
Vol/Sat:	0.22	0.08	0.08	0.05	0.06	0.06	0.01	0.13	0.17	0.09	0.22	0.22
Crit Moves:	****				****				****	****		
Green/Cycle:	0.41	0.31	0.31	0.20	0.11	0.11	0.03	0.32	0.32	0.17	0.45	0.45
Volume/Cap:	0.54	0.25	0.25	0.25	0.54	0.54	0.48	0.40	0.54	0.54	0.48	0.48
Delay/Veh:	23.1	25.7	25.7	33.8	43.3	43.3	54.5	26.9	28.6	40.1	19.3	19.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	23.1	25.7	25.7	33.8	43.3	43.3	54.5	26.9	28.6	40.1	19.3	19.3
LOS by Move:	C	C	C	C	D	D	D	C	C	D	B	B
HCM2kAvgQ:	9	3	3	3	4	4	1	6	8	5	9	9

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #40 Clinton Keith Rd & Calle de Oso Oro/Bear Creek Dr

Cycle (sec): 100 Critical Vol./Cap.(X): 0.655
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 16.4
Optimal Cycle: 54 Level Of Service: B

Street Name:	Clinton Keith Rd						Calle de Oso Oro/Bear Creek Dr					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 0	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	77	177	207	17	90	271	188	528	140	228	753	10
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	77	177	207	17	90	271	188	528	140	228	753	10
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	77	177	207	17	90	271	188	528	140	228	753	10
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	77	177	207	17	90	271	188	528	140	228	753	10
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	77	177	207	17	90	271	188	528	140	228	753	10
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	77	177	207	17	90	271	188	528	140	228	753	10
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.87	0.87	0.95	0.84	0.84	0.32	0.97	0.97	0.27	0.95	0.95
Lanes:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.79	0.21	1.00	1.97	0.03
Final Sat.:	1805	1659	1659	1805	1601	1601	612	1455	386	515	3556	47
Capacity Analysis Module:												
Vol/Sat:	0.04	0.11	0.12	0.01	0.06	0.17	0.31	0.36	0.36	0.44	0.21	0.21
Crit Moves:	****					****				****		
Green/Cycle:	0.07	0.30	0.30	0.02	0.26	0.26	0.68	0.68	0.68	0.68	0.68	0.68
Volume/Cap:	0.65	0.35	0.41	0.41	0.22	0.65	0.45	0.54	0.54	0.65	0.31	0.31
Delay/Veh:	58.2	27.6	28.2	54.9	29.2	35.9	8.4	8.7	8.7	13.9	6.7	6.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	58.2	27.6	28.2	54.9	29.2	35.9	8.4	8.7	8.7	13.9	6.7	6.7
LOS by Move:	E	C	C	D	C	D	A	A	A	B	A	A
HCM2kAvgQ:	4	5	6	1	2	9	3	11	11	5	5	5

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #43 Jefferson Ave & Lemon St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.718
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 17.8
Optimal Cycle: 81 Level Of Service: B

Street Name:	Jefferson Ave						Lemon St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	0 1	1	0 0	1 0
Volume Module:												
Base Vol:	424	2136	2	6	1607	40	41	38	251	16	21	14
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	424	2136	2	6	1607	40	41	38	251	16	21	14
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	424	2136	2	6	1607	40	41	38	251	16	21	14
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	424	2136	2	6	1607	40	41	38	251	16	21	14
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	424	2136	2	6	1607	40	41	38	251	16	21	14
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	424	2136	2	6	1607	40	41	38	251	16	21	14
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.91	0.91	0.95	1.00	0.85	0.95	0.94	0.94
Lanes:	1.00	2.99	0.01	1.00	2.93	0.07	1.00	1.00	1.00	1.00	0.60	0.40
Final Sat.:	1805	5182	5	1805	5041	125	1805	1900	1615	1805	1072	714
Capacity Analysis Module:												
Vol/Sat:	0.23	0.41	0.41	0.00	0.32	0.32	0.02	0.02	0.16	0.01	0.02	0.02
Crit Moves:	****				****				****	****		
Green/Cycle:	0.33	0.77	0.77	0.01	0.44	0.44	0.12	0.22	0.22	0.01	0.11	0.11
Volume/Cap:	0.72	0.54	0.54	0.54	0.72	0.72	0.18	0.09	0.72	0.72	0.18	0.18
Delay/Veh:	33.8	4.8	4.8	93.5	23.8	23.8	39.8	31.4	43.4	122.8	41.2	41.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	33.8	4.8	4.8	93.5	23.8	23.8	39.8	31.4	43.4	122.8	41.2	41.2
LOS by Move:	C	A	A	F	C	C	D	C	D	F	D	D
HCM2kAvgQ:	13	10	10	1	16	16	1	1	9	2	1	1

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
Future General Plan (Scenario B)
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #44 Jefferson Ave & Kalmia St

Cycle (sec): 100 Critical Vol./Cap.(X): 1.669
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 158.6
Optimal Cycle: 180 Level Of Service: F

Street Name:	Jefferson Ave						Kalmia St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 3	0 1	1	0 2	1 0	1	0 2	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	391	1782	1026	905	1210	28	29	604	281	353	486	844
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	391	1782	1026	905	1210	28	29	604	281	353	486	844
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	391	1782	1026	905	1210	28	29	604	281	353	486	844
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	391	1782	1026	905	1210	28	29	604	281	353	486	844
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	391	1782	1026	905	1210	28	29	604	281	353	486	844
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	391	1782	1026	905	1210	28	29	604	281	353	486	844
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.91	0.85	0.95	0.91	0.91	0.95	0.87	0.87	0.95	0.86	0.86
Lanes:	2.00	3.00	1.00	1.00	2.93	0.07	1.00	2.05	0.95	1.00	1.00	1.00
Final Sat.:	3502	5187	1615	1805	5054	117	1805	3370	1568	1805	1634	1634
Capacity Analysis Module:												
Vol/Sat:	0.11	0.34	0.64	0.50	0.24	0.24	0.02	0.18	0.18	0.20	0.30	0.52
Crit Moves:			****	****			****					****
Green/Cycle:	0.22	0.38	0.38	0.30	0.46	0.46	0.01	0.15	0.15	0.17	0.31	0.31
Volume/Cap:	0.52	0.90	1.67	1.67	0.52	0.52	1.67	1.17	1.17	1.17	0.96	1.67
Delay/Veh:	35.2	35.5	339.3	344.3	19.1	19.1	517.2	135	134.6	149.5	49.8	341.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	35.2	35.5	339.3	344.3	19.1	19.1	517.2	135	134.6	149.5	49.8	341.3
LOS by Move:	D	D	F	F	B	B	F	F	F	F	D	F
HCM2kAvgQ:	6	23	82	73	10	10	4	19	19	20	21	72

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
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PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #45 Jefferson Ave & Juniper St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.838
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 21.9
Optimal Cycle: 140 Level Of Service: C

Street Name:	Jefferson Ave						Juniper St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	150	2837	60	46	1660	84	358	83	371	18	58	88
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	150	2837	60	46	1660	84	358	83	371	18	58	88
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	150	2837	60	46	1660	84	358	83	371	18	58	88
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	150	2837	60	46	1660	84	358	83	371	18	58	88
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	150	2837	60	46	1660	84	358	83	371	18	58	88
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	150	2837	60	46	1660	84	358	83	371	18	58	88
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.90	0.90	0.95	0.83	0.83	0.95	0.86	0.86
Lanes:	1.00	2.94	0.06	1.00	2.86	0.14	1.00	1.00	1.00	1.00	1.00	1.00
Final Sat.:	1805	5064	107	1805	4903	248	1805	1583	1583	1805	1643	1643
Capacity Analysis Module:												
Vol/Sat:	0.08	0.56	0.56	0.03	0.34	0.34	0.20	0.05	0.23	0.01	0.04	0.05
Crit Moves:		****		****			****					****
Green/Cycle:	0.14	0.67	0.67	0.03	0.56	0.56	0.24	0.29	0.29	0.01	0.06	0.06
Volume/Cap:	0.60	0.84	0.84	0.84	0.60	0.60	0.84	0.18	0.81	0.81	0.55	0.84
Delay/Veh:	44.7	14.4	14.4	114.1	14.9	14.9	49.9	26.7	41.9	157.3	47.9	74.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	44.7	14.4	14.4	114.1	14.9	14.9	49.9	26.7	41.9	157.3	47.9	74.7
LOS by Move:	D	B	B	F	B	B	D	C	D	F	D	E
HCM2kAvgQ:	5	27	27	3	13	13	13	2	13	2	3	5

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
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PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #46 Jefferson Ave & Ivy St/Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.944
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 35.3
Optimal Cycle: 180 Level Of Service: D

Street Name:	Jefferson Ave									Ivy St/Los Alamos Rd								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected				Protected				Protected				Protected					
Rights:	Include				Include				Include				Include					
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0			
Lanes:	2	0	3	0	1	2	0	3	0	1	1	0	1	1	0	1	0	1	1	0
Volume Module:																				
Base Vol:	294	2396	687			474	1480	110			75	188	154			257	258	496		
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Initial Bse:	294	2396	687			474	1480	110			75	188	154			257	258	496		
Added Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
PasserByVol:	0	0	0			0	0	0			0	0	0			0	0	0		
Initial Fut:	294	2396	687			474	1480	110			75	188	154			257	258	496		
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Volume:	294	2396	687			474	1480	110			75	188	154			257	258	496		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
Reduced Vol:	294	2396	687			474	1480	110			75	188	154			257	258	496		
PCE Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
MLF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
FinalVolume:	294	2396	687			474	1480	110			75	188	154			257	258	496		
Saturation Flow Module:																				
Sat/Lane:	1900	1900	1900			1900	1900	1900			1900	1900	1900			1900	1900	1900		
Adjustment:	0.92	0.91	0.85			0.92	0.91	0.85			0.95	0.89	0.89			0.95	0.86	0.86		
Lanes:	2.00	3.00	1.00			2.00	3.00	1.00			1.00	1.10	0.90			1.00	1.00	1.00		
Final Sat.:	3502	5187	1615			3502	5187	1615			1805	1851	1517			1805	1626	1626		
Capacity Analysis Module:																				
Vol/Sat:	0.08	0.46	0.43			0.14	0.29	0.07			0.04	0.10	0.10			0.14	0.16	0.30		
Crit Moves:		****				****					****							****		
Green/Cycle:	0.14	0.49	0.49			0.14	0.49	0.49			0.04	0.15	0.15			0.21	0.32	0.32		
Volume/Cap:	0.58	0.94	0.87			0.94	0.58	0.14			0.94	0.66	0.66			0.66	0.49	0.94		
Delay/Veh:	41.8	32.4	32.9			69.1	18.6	14.1			129.5	43.2	43.2			40.3	27.5	52.4		
User DelAdj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
AdjDel/Veh:	41.8	32.4	32.9			69.1	18.6	14.1			129.5	43.2	43.2			40.3	27.5	52.4		
LOS by Move:	D	C	C			E	B	B			F	D	D			D	C	D		
HCM2kAvgQ:	5	31	22			11	12	2			5	6	6			8	7	20		

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
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PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #48 Madison Ave/I-15 SB Ramps & Kalmia St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.913
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 32.7
Optimal Cycle: 180 Level Of Service: C

Street Name:	Madison Ave/I-15 SB Ramps									Kalmia St								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected				Protected				Protected				Protected					
Rights:	Include				Include				Include				Include					
Min. Green:	0	0	0		0	0	0		0	0	0		0	0	0			
Lanes:	2	0	0	0	2	2	0	1	1	0	0	0	3	1	0	2	0	2	1	1
Volume Module:																				
Base Vol:	379	0	968			322	28	357			0	2478	248			281	1499	606		
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Initial Bse:	379	0	968			322	28	357			0	2478	248			281	1499	606		
Added Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
PasserByVol:	0	0	0			0	0	0			0	0	0			0	0	0		
Initial Fut:	379	0	968			322	28	357			0	2478	248			281	1499	606		
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Volume:	379	0	968			322	28	357			0	2478	248			281	1499	606		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
Reduced Vol:	379	0	968			322	28	357			0	2478	248			281	1499	606		
PCE Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
MLF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
FinalVolume:	379	0	968			322	28	357			0	2478	248			281	1499	606		
Saturation Flow Module:																				
Sat/Lane:	1900	1900	1900			1900	1900	1900			1900	1900	1900			1900	1900	1900		
Adjustment:	0.92	1.00	0.75			0.92	0.82	0.82			1.00	0.90	0.90			0.92	0.87	0.87		
Lanes:	2.00	0.00	2.00			2.00	1.00	1.00			0.00	3.64	0.36			2.00	2.85	1.15		
Final Sat.:	3502	0	2842			3502	1554	1554			0	6199	620			3502	4713	1905		
Capacity Analysis Module:																				
Vol/Sat:	0.11	0.00	0.34			0.09	0.02	0.23			0.00	0.40	0.40			0.08	0.32	0.32		
Crit Moves:			****			****						****				****				
Green/Cycle:	0.15	0.00	0.37			0.10	0.32	0.32			0.00	0.44	0.44			0.09	0.53	0.53		
Volume/Cap:	0.71	0.00	0.91			0.91	0.06	0.71			0.00	0.91	0.91			0.91	0.60	0.60		
Delay/Veh:	44.9	0.0	41.5			71.6	23.4	34.3			0.0	31.1	31.1			75.1	16.8	16.8		
User DelAdj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
AdjDel/Veh:	44.9	0.0	41.5			71.6	23.4	34.3			0.0	31.1	31.1			75.1	16.8	16.8		
LOS by Move:	D	A	D			E	C	C			A	C	C			E	B	B		
HCM2kAvgQ:	7	0	20			8	1	11			0	26	26			7	13	13		

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
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PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #50 Hancock Ave & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.817
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 18.0
Optimal Cycle: 125 Level Of Service: B

Street Name:	Hancock Ave						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ovl			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	2	0	0	2	0	4	0	3	1
Volume Module:												
Base Vol:	0	0	0	583	0	894	827	3365	0	0	2518	303
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	583	0	894	827	3365	0	0	2518	303
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	583	0	894	827	3365	0	0	2518	303
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	583	0	894	827	3365	0	0	2518	303
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	583	0	894	827	3365	0	0	2518	303
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	583	0	894	827	3365	0	0	2518	303
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.92	1.00	0.75	0.92	0.91	1.00	1.00	0.90	0.90
Lanes:	0.00	0.00	0.00	2.00	0.00	2.00	2.00	4.00	0.00	0.00	3.57	0.43
Final Sat.:	0	0	0	3502	0	2842	3502	6916	0	0	6074	731
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.17	0.00	0.31	0.24	0.49	0.00	0.00	0.41	0.41
Crit Moves:				****			****				****	
Green/Cycle:	0.00	0.00	0.00	0.20	0.00	0.49	0.29	0.80	0.00	0.00	0.51	0.51
Volume/Cap:	0.00	0.00	0.00	0.82	0.00	0.64	0.82	0.61	0.00	0.00	0.82	0.82
Delay/Veh:	0.0	0.0	0.0	45.4	0.0	19.8	38.4	4.2	0.0	0.0	22.4	22.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	45.4	0.0	19.8	38.4	4.2	0.0	0.0	22.4	22.4
LOS by Move:	A	A	A	D	A	B	D	A	A	A	C	C
HCM2kAvgQ:	0	0	0	11	0	12	14	12	0	0	22	22

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #51 Alta Murrieta Dr & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.023
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 53.6
Optimal Cycle: 180 Level Of Service: D

Street Name:	Alta Murrieta Dr						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Ovl		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	1	0	1	2	0	1	1	0	2	0
Volume Module:												
Base Vol:	597	223	53	194	128	496	701	1703	520	174	2354	154
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	597	223	53	194	128	496	701	1703	520	174	2354	154
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	597	223	53	194	128	496	701	1703	520	174	2354	154
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	597	223	53	194	128	496	701	1703	520	174	2354	154
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	597	223	53	194	128	496	701	1703	520	174	2354	154
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	597	223	53	194	128	496	701	1703	520	174	2354	154
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.85	0.92	0.84	0.84	0.92	0.88	0.88	0.92	0.91	0.85
Lanes:	2.00	1.00	1.00	2.00	1.00	1.00	2.00	2.30	0.70	2.00	4.00	1.00
Final Sat.:	3502	1900	1615	3502	1590	1590	3502	3835	1171	3502	6916	1615
Capacity Analysis Module:												
Vol/Sat:	0.17	0.12	0.03	0.06	0.08	0.31	0.20	0.44	0.44	0.05	0.34	0.10
Crit Moves:	****					****	****				****	
Green/Cycle:	0.17	0.32	0.32	0.15	0.30	0.30	0.20	0.48	0.48	0.05	0.33	0.48
Volume/Cap:	1.02	0.37	0.10	0.37	0.26	1.02	1.02	0.93	0.93	0.93	1.02	0.20
Delay/Veh:	84.9	26.5	24.0	38.6	26.3	77.1	80.5	32.4	32.4	94.5	58.2	14.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	84.9	26.5	24.0	38.6	26.3	77.1	80.5	32.4	32.4	94.5	58.2	14.8
LOS by Move:	F	C	C	D	C	E	F	C	C	F	E	B
HCM2kAvgQ:	15	5	1	3	3	23	17	28	28	5	28	3

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #52 Winchester Road - SR-79 & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.367
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 102.6
Optimal Cycle: 180 Level Of Service: F

Street Name:	Winchester Road - SR-79						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 3	0 1	2	0 3	0 1	2	0 3	0 1	2	0 2	1 0
Volume Module:												
Base Vol:	340	1979	203	201	1167	1117	1437	1044	276	245	756	98
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	340	1979	203	201	1167	1117	1437	1044	276	245	756	98
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	340	1979	203	201	1167	1117	1437	1044	276	245	756	98
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	340	1979	203	201	1167	1117	1437	1044	276	245	756	98
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	340	1979	203	201	1167	1117	1437	1044	276	245	756	98
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	340	1979	203	201	1167	1117	1437	1044	276	245	756	98
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.91	0.85	0.92	0.91	0.85	0.92	0.91	0.85	0.92	0.89	0.89
Lanes:	2.00	3.00	1.00	2.00	3.00	1.00	2.00	3.00	1.00	2.00	2.66	0.34
Final Sat.:	3502	5187	1615	3502	5187	1615	3502	5187	1615	3502	4514	585
Capacity Analysis Module:												
Vol/Sat:	0.10	0.38	0.13	0.06	0.22	0.69	0.41	0.20	0.17	0.07	0.17	0.17
Crit Moves:	****					****	****				****	
Green/Cycle:	0.07	0.50	0.61	0.08	0.51	0.51	0.30	0.31	0.31	0.11	0.12	0.12
Volume/Cap:	1.37	0.76	0.21	0.76	0.44	1.37	1.37	0.64	0.54	0.64	1.37	1.37
Delay/Veh:	235.0	21.4	8.8	57.5	15.9	197.5	206.1	30.4	29.6	46.4	219	219.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	235.0	21.4	8.8	57.5	15.9	197.5	206.1	30.4	29.6	46.4	219	219.0
LOS by Move:	F	C	A	E	B	F	F	C	C	D	F	F
HCM2kAvgQ:	13	19	3	5	8	72	49	11	7	5	22	22

Note: Queue reported is the number of cars per lane.

Traffix 7.9.0215 (c) 2008 Dowling Assoc. Licensed to MMA, LONG BEACH, CA

City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #53 Hancock Ave & Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.650
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 238.4
Optimal Cycle: 180 Level Of Service: F

Street Name:	Hancock Ave						Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	2	0 0	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	124	453	916	658	124	25	106	2012	51	585	1301	694
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	124	453	916	658	124	25	106	2012	51	585	1301	694
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	124	453	916	658	124	25	106	2012	51	585	1301	694
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	124	453	916	658	124	25	106	2012	51	585	1301	694
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	124	453	916	658	124	25	106	2012	51	585	1301	694
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	124	453	916	658	124	25	106	2012	51	585	1301	694
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.86	0.86	0.92	0.98	0.98	0.95	0.95	0.95	0.95	0.90	0.90
Lanes:	1.00	1.00	1.00	2.00	0.83	0.17	1.00	1.95	0.05	1.00	1.30	0.70
Final Sat.:	1805	1625	1625	3502	1542	311	1805	3507	89	1805	2232	1191
Capacity Analysis Module:												
Vol/Sat:	0.07	0.28	0.56	0.19	0.08	0.08	0.06	0.57	0.57	0.32	0.58	0.58
Crit Moves:			****	****				****		****		
Green/Cycle:	0.21	0.34	0.34	0.11	0.25	0.25	0.05	0.35	0.35	0.20	0.49	0.49
Volume/Cap:	0.33	0.82	1.65	1.65	0.33	0.33	1.18	1.65	1.65	1.65	1.18	1.18
Delay/Veh:	34.0	33.3	330.7	347.7	31.4	31.4	198.4	329	328.6	344.9	112	112.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	34.0	33.3	330.7	347.7	31.4	31.4	198.4	329	328.6	344.9	112	112.3
LOS by Move:	C	C	F	F	C	C	F	F	F	F	F	F
HCM2kAvgQ:	3	16	77	28	4	4	8	86	86	47	54	54

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #54 I-215 SB Ramps & Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.466
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 168.4
Optimal Cycle: 180 Level Of Service: F

Street Name:	I-215 SB Ramps						Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0	0	0 0	1	0	1! 0 1	0 0	2	0 1	2	0	2 0 0
Volume Module:												
Base Vol:	0	0	0	532	0	1542	0	3236	443	136	1247	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	532	0	1542	0	3236	443	136	1247	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	532	0	1542	0	3236	443	136	1247	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	0	0	532	0	1542	0	3236	443	136	1247	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	532	0	1542	0	3236	443	136	1247	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	532	0	1542	0	3236	443	136	1247	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.88	1.00	0.88	1.00	0.95	0.85	0.92	0.95	1.00
Lanes:	0.00	0.00	0.00	1.26	0.00	1.74	0.00	2.00	1.00	2.00	2.00	0.00
Final Sat.:	0	0	0	2095	0	2907	0	3610	1615	3502	3610	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.25	0.00	0.53	0.00	0.90	0.27	0.04	0.35	0.00
Crit Moves:						****		****		****		
Green/Cycle:	0.00	0.00	0.00	0.36	0.00	0.36	0.00	0.61	0.61	0.03	0.64	0.00
Volume/Cap:	0.00	0.00	0.00	0.70	0.00	1.47	0.00	1.47	0.45	1.47	0.54	0.00
Delay/Veh:	0.0	0.0	0.0	28.1	0.0	245.4	0.0	232	10.7	307.7	10.3	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	28.1	0.0	245.4	0.0	232	10.7	307.7	10.3	0.0
LOS by Move:	A	A	A	C	A	F	A	F	B	F	B	A
HCM2kAvgQ:	0	0	0	12	0	63	0	118	7	7	11	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #55 I-215 NB Ramps & Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.914
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 24.4
Optimal Cycle: 180 Level Of Service: C

Street Name:	I-215 NB Ramps						Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0	0	0 1	0	0	0 0 0	2	0	3 0 0	0	0	2 0 1
Volume Module:												
Base Vol:	246	0	159	0	0	0	1617	2080	0	0	1139	329
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	246	0	159	0	0	0	1617	2080	0	0	1139	329
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	246	0	159	0	0	0	1617	2080	0	0	1139	329
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	246	0	159	0	0	0	1617	2080	0	0	1139	329
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	246	0	159	0	0	0	1617	2080	0	0	1139	329
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	246	0	159	0	0	0	1617	2080	0	0	1139	329
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	1.00	0.85	1.00	1.00	1.00	0.92	0.91	1.00	1.00	0.95	0.85
Lanes:	1.00	0.00	1.00	0.00	0.00	0.00	2.00	3.00	0.00	0.00	2.00	1.00
Final Sat.:	1805	0	1615	0	0	0	3502	5187	0	0	3610	1615
Capacity Analysis Module:												
Vol/Sat:	0.14	0.00	0.10	0.00	0.00	0.00	0.46	0.40	0.00	0.00	0.32	0.20
Crit Moves:	****						****				****	
Green/Cycle:	0.15	0.00	0.15	0.00	0.00	0.00	0.51	0.85	0.00	0.00	0.35	0.35
Volume/Cap:	0.91	0.00	0.66	0.00	0.00	0.00	0.91	0.47	0.00	0.00	0.91	0.59
Delay/Veh:	74.9	0.0	46.8	0.0	0.0	0.0	30.4	1.9	0.0	0.0	41.7	28.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	74.9	0.0	46.8	0.0	0.0	0.0	30.4	1.9	0.0	0.0	41.7	28.6
LOS by Move:	E	A	D	A	A	A	C	A	A	A	D	C
HCM2kAvgQ:	11	0	6	0	0	0	28	6	0	0	22	9

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #56 Whitewood Rd & Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.992
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 44.7
Optimal Cycle: 180 Level Of Service: D

Street Name:	Whitewood Rd						Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 2	0 1	1	0 2	0 1	1	0 1	1 0
Volume Module:												
Base Vol:	147	646	41	38	562	538	911	412	307	62	211	46
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	147	646	41	38	562	538	911	412	307	62	211	46
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	147	646	41	38	562	538	911	412	307	62	211	46
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	147	646	41	38	562	538	911	412	307	62	211	46
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	147	646	41	38	562	538	911	412	307	62	211	46
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	147	646	41	38	562	538	911	412	307	62	211	46
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.94	0.94	0.95	0.95	0.85	0.95	0.95	0.85	0.95	0.92	0.92
Lanes:	1.00	1.88	0.12	1.00	2.00	1.00	1.00	2.00	1.00	1.00	1.64	0.36
Final Sat.:	1805	3364	214	1805	3610	1615	1805	3610	1615	1805	2884	629
Capacity Analysis Module:												
Vol/Sat:	0.08	0.19	0.19	0.02	0.16	0.33	0.50	0.11	0.19	0.03	0.07	0.07
Crit Moves:	****					****	****				****	
Green/Cycle:	0.08	0.38	0.38	0.04	0.34	0.34	0.51	0.49	0.49	0.09	0.07	0.07
Volume/Cap:	0.99	0.51	0.51	0.51	0.46	0.99	0.99	0.23	0.39	0.39	0.99	0.99
Delay/Veh:	117.4	24.4	24.4	52.7	26.4	69.7	52.1	14.6	16.2	44.5	xxxx	100.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	117.4	24.4	24.4	52.7	26.4	69.7	52.1	14.6	16.2	44.5	xxxx	100.0
LOS by Move:	F	C	C	D	C	E	D	B	B	D	F	F
HCM2kAvgQ:	8	9	9	2	7	23	35	4	6	2	8	8

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #57 Whitewood Rd & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.167
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 90.3
Optimal Cycle: 180 Level Of Service: F

Street Name:	Whitewood Rd						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	445	344	533	360	263	236	179	1631	170	395	2251	490
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	445	344	533	360	263	236	179	1631	170	395	2251	490
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	445	344	533	360	263	236	179	1631	170	395	2251	490
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	445	344	533	360	263	236	179	1631	170	395	2251	490
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	445	344	533	360	263	236	179	1631	170	395	2251	490
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	445	344	533	360	263	236	179	1631	170	395	2251	490
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.86	0.86	0.95	0.88	0.88	0.95	0.90	0.90	0.95	0.89	0.89
Lanes:	1.00	1.00	1.00	1.00	1.05	0.95	1.00	2.72	0.28	1.00	2.46	0.54
Final Sat.:	1805	1641	1641	1805	1768	1586	1805	4632	483	1805	4145	902
Capacity Analysis Module:												
Vol/Sat:	0.25	0.21	0.32	0.20	0.15	0.15	0.10	0.35	0.35	0.22	0.54	0.54
Crit Moves:			****	****			****				****	
Green/Cycle:	0.28	0.28	0.28	0.17	0.17	0.17	0.09	0.34	0.34	0.21	0.47	0.47
Volume/Cap:	0.88	0.75	1.17	1.17	0.88	0.88	1.17	1.04	1.04	1.04	1.17	1.17
Delay/Veh:	50.5	35.8	125.1	145.8	55.3	55.3	170.2	64.9	64.9	95.5	107	106.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	50.5	35.8	125.1	145.8	55.3	55.3	170.2	64.9	64.9	95.5	107	106.7
LOS by Move:	D	D	F	F	E	E	F	E	E	F	F	F
HCM2kAvgQ:	16	12	30	21	11	11	12	29	29	19	51	51

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #59 Nutmeg St & Clinton Keith Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.161
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 81.0
Optimal Cycle: 180 Level Of Service: F

Street Name:	Nutmeg St						Clinton Keith Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	64	87	510	315	31	54	99	1885	64	515	1860	369
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	64	87	510	315	31	54	99	1885	64	515	1860	369
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	64	87	510	315	31	54	99	1885	64	515	1860	369
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	64	87	510	315	31	54	99	1885	64	515	1860	369
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	64	87	510	315	31	54	99	1885	64	515	1860	369
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	64	87	510	315	31	54	99	1885	64	515	1860	369
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.83	0.83	0.95	0.86	0.86	0.95	0.91	0.91	0.95	0.89	0.89
Lanes:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.90	0.10	1.00	2.50	0.50
Final Sat.:	1805	1574	1574	1805	1634	1634	1805	4992	169	1805	4220	837
Capacity Analysis Module:												
Vol/Sat:	0.04	0.06	0.32	0.17	0.02	0.03	0.05	0.38	0.38	0.29	0.44	0.44
Crit Moves:			****	****				****		****		
Green/Cycle:	0.22	0.28	0.28	0.15	0.21	0.21	0.06	0.33	0.33	0.25	0.51	0.51
Volume/Cap:	0.16	0.20	1.16	1.16	0.09	0.16	0.87	1.16	1.16	1.16	0.87	0.87
Delay/Veh:	31.6	27.5	128.5	148.0	32.1	32.7	92.6	113	113.4	132.7	25.1	25.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	31.6	27.5	128.5	148.0	32.1	32.7	92.6	113	113.4	132.7	25.1	25.1
LOS by Move:	C	C	F	F	C	C	F	F	F	F	C	C
HCM2kAvgQ:	2	2	29	18	1	1	5	37	37	28	25	25

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #60 Murrieta Oaks Ave-Mitchell Rd & Clinton Keith Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.286
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 115.0
Optimal Cycle: 180 Level Of Service: F

Street Name:	Murrieta Oaks Ave-Mitchell Rd						Clinton Keith Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 0	1 0	1	0 1	0 1	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	14	148	13	74	172	826	220	3209	25	28	2770	496
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	14	148	13	74	172	826	220	3209	25	28	2770	496
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	14	148	13	74	172	826	220	3209	25	28	2770	496
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	14	148	13	74	172	826	220	3209	25	28	2770	496
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	14	148	13	74	172	826	220	3209	25	28	2770	496
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	14	148	13	74	172	826	220	3209	25	28	2770	496
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.99	0.99	0.95	1.00	0.85	0.95	0.91	0.91	0.95	0.89	0.89
Lanes:	1.00	0.92	0.08	1.00	1.00	1.00	1.00	2.98	0.02	1.00	2.54	0.46
Final Sat.:	1805	1726	152	1805	1900	1615	1805	5142	40	1805	4298	770
Capacity Analysis Module:												
Vol/Sat:	0.01	0.09	0.09	0.04	0.09	0.51	0.12	0.62	0.62	0.02	0.64	0.64
Crit Moves:	****					****	****				****	
Green/Cycle:	0.01	0.27	0.27	0.13	0.40	0.40	0.09	0.58	0.58	0.01	0.50	0.50
Volume/Cap:	1.29	0.31	0.31	0.31	0.23	1.29	1.29	1.07	1.07	1.07	1.29	1.29
Delay/Veh:	429.8	29.2	29.2	40.2	20.1	170.2	210.6	61.0	61.0	248.9	157	156.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	429.8	29.2	29.2	40.2	20.1	170.2	210.6	61.0	61.0	248.9	157	156.6
LOS by Move:	F	C	C	D	C	F	F	E	E	F	F	F
HCM2kAvgQ:	2	4	4	2	3	50	15	51	51	3	70	70

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #61 I-215 SB Ramps & Scott Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.377
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 8.2
Optimal Cycle: 37 Level Of Service: A

Street Name:	I-215 SB Ramps						Scott Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Ignore			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	2	0	0	0	4	0	1	0	0	3	0	2
Volume Module:															
Base Vol:	0	0	0	160	0	259	0	756	412	0	1482	458
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	160	0	259	0	756	412	0	1482	458
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	160	0	259	0	756	412	0	1482	458
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
PHF Volume:	0	0	0	160	0	259	0	756	0	0	1482	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	160	0	259	0	756	0	0	1482	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
FinalVolume:	0	0	0	160	0	259	0	756	0	0	1482	0
Saturation Flow Module:															
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	0.92	1.00	0.75	1.00	0.91	1.00	1.00	0.91	0.88
Lanes:	0.00	0.00	0.00	2.00	0.00	2.00	0.00	4.00	1.00	0.00	3.00	2.00
Final Sat.:	0	0	0	3502	0	2842	0	6916	1900	0	5187	3344
Capacity Analysis Module:															
Vol/Sat:	0.00	0.00	0.00	0.05	0.00	0.09	0.00	0.11	0.00	0.00	0.29	0.00
Crit Moves:						****	****				****	
Green/Cycle:	0.00	0.00	0.00	0.24	0.00	0.24	0.00	0.76	0.00	0.00	0.76	0.00
Volume/Cap:	0.00	0.00	0.00	0.19	0.00	0.38	0.00	0.14	0.00	0.00	0.38	0.00
Delay/Veh:	0.0	0.0	0.0	30.2	0.0	32.0	0.0	3.3	0.0	0.0	4.2	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	0.0	0.0	30.2	0.0	32.0	0.0	3.3	0.0	0.0	4.2	0.0
LOS by Move:	A	A	A	C	A	C	A	A	A	A	A	A
HCM2kAvgQ:	0	0	0	2	0	4	0	2	0	0	6	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #62 I-215 NB Ramps & Scott Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.567
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 16.0
Optimal Cycle: 53 Level Of Service: B

Street Name:	I-215 NB Ramps						Scott Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Ovl		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	0	0	1	2	0	0	0	0	2	2	0	4	0	0	0	0	3	0	2
Volume Module:															
Base Vol:	0	7	896	0	0	400	93	1001	0	0	1708	382
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	7	896	0	0	400	93	1001	0	0	1708	382
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	7	896	0	0	400	93	1001	0	0	1708	382
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	7	896	0	0	400	93	1001	0	0	1708	382
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	7	896	0	0	400	93	1001	0	0	1708	382
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	7	896	0	0	400	93	1001	0	0	1708	382
Saturation Flow Module:															
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.85	0.75	1.00	1.00	0.75	0.92	0.91	1.00	1.00	0.91	0.75
Lanes:	0.00	0.02	2.98	0.00	0.00	2.00	2.00	4.00	0.00	0.00	3.00	2.00
Final Sat.:	0	33	4239	0	0	2842	3502	6916	0	0	5187	2842
Capacity Analysis Module:															
Vol/Sat:	0.00	0.21	0.21	0.00	0.00	0.14	0.03	0.14	0.00	0.00	0.33	0.13
Crit Moves:		****		****			****				****	
Green/Cycle:	0.00	0.37	0.37	0.00	0.00	0.37	0.05	0.63	0.00	0.00	0.58	0.58
Volume/Cap:	0.00	0.57	0.57	0.00	0.00	0.38	0.57	0.23	0.00	0.00	0.57	0.23
Delay/Veh:	0.0	25.4	25.4	0.0	0.0	23.1	51.3	8.1	0.0	0.0	13.4	10.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	25.4	25.4	0.0	0.0	23.1	51.3	8.1	0.0	0.0	13.4	10.2
LOS by Move:	A	C	C	A	A	C	D	A	A	A	B	B
HCM2kAvgQ:	0	9	9	0	0	5	2	4	0	0	12	3

Note: Queue reported is the number of cars per lane.

Traffix 7.9.0215 (c) 2008 Dowling Assoc. Licensed to MMA, LONG BEACH, CA

City of Murrieta General Plan
Future General Plan (Scenario B)
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #102 Leon Road & Scott Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.937
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 43.0
Optimal Cycle: 180 Level Of Service: D

Street Name:	Leon Road						Scott Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	547	394	18	64	226	357	545	528	541	5	402	164
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	547	394	18	64	226	357	545	528	541	5	402	164
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	547	394	18	64	226	357	545	528	541	5	402	164
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	547	394	18	64	226	357	545	528	541	5	402	164
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	547	394	18	64	226	357	545	528	541	5	402	164
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	547	394	18	64	226	357	545	528	541	5	402	164
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.94	0.94	0.95	0.86	0.86	0.95	0.84	0.84	0.95	0.87	0.87
Lanes:	1.00	1.91	0.09	1.00	1.00	1.00	1.00	2.00	1.00	1.00	2.13	0.87
Final Sat.:	1805	3428	157	1805	1639	1639	1805	3195	1598	1805	3526	1438
Capacity Analysis Module:												
Vol/Sat:	0.30	0.11	0.11	0.04	0.14	0.22	0.30	0.17	0.34	0.00	0.11	0.11
Crit Moves:	****					****	****				****	
Green/Cycle:	0.32	0.42	0.42	0.13	0.23	0.23	0.32	0.44	0.44	0.00	0.12	0.12
Volume/Cap:	0.94	0.27	0.27	0.27	0.59	0.94	0.94	0.38	0.77	0.77	0.94	0.94
Delay/Veh:	55.6	18.8	18.8	39.8	35.1	59.5	55.8	18.8	26.3	250.1	65.8	65.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	55.6	18.8	18.8	39.8	35.1	59.5	55.8	18.8	26.3	250.1	65.8	65.8
LOS by Move:	E	B	B	D	D	E	E	B	C	F	E	E
HCM2kAvgQ:	21	4	4	2	7	16	21	6	17	1	10	10

Note: Queue reported is the number of cars per lane.

Traffix 7.9.0215 (c) 2008 Dowling Assoc. Licensed to MMA, LONG BEACH, CA

City of Murrieta General Plan
Future General Plan (Scenario B)
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #104 Antelope Road & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.932
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 48.0
Optimal Cycle: 180 Level Of Service: D

Street Name:	Antelope Road						Keller Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 2	0 1	1	0 2	0 1	2	0 3	0 1	1	0 3	0 1
Volume Module:												
Base Vol:	780	471	867	89	99	573	804	859	273	283	605	154
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	780	471	867	89	99	573	804	859	273	283	605	154
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	780	471	867	89	99	573	804	859	273	283	605	154
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	780	471	867	89	99	573	804	859	273	283	605	154
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	780	471	867	89	99	573	804	859	273	283	605	154
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	780	471	867	89	99	573	804	859	273	283	605	154
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.95	0.85	0.95	0.95	0.85	0.92	0.91	0.85	0.95	0.91	0.85
Lanes:	2.00	2.00	1.00	1.00	2.00	1.00	2.00	3.00	1.00	1.00	3.00	1.00
Final Sat.:	3502	3610	1615	1805	3610	1615	3502	5187	1615	1805	5187	1615
Capacity Analysis Module:												
Vol/Sat:	0.22	0.13	0.54	0.05	0.03	0.35	0.23	0.17	0.17	0.16	0.12	0.10
Crit Moves:			****	****			****				****	
Green/Cycle:	0.24	0.58	0.58	0.05	0.39	0.39	0.25	0.19	0.19	0.18	0.13	0.13
Volume/Cap:	0.92	0.23	0.93	0.93	0.07	0.92	0.93	0.86	0.88	0.88	0.93	0.76
Delay/Veh:	51.7	10.4	35.1	117.3	19.4	48.0	53.5	46.7	62.6	62.7	63.7	57.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	51.7	10.4	35.1	117.3	19.4	48.0	53.5	46.7	62.6	62.7	63.7	57.9
LOS by Move:	D	B	D	F	B	D	D	D	E	E	E	E
HCM2kAvgQ:	16	4	29	5	1	21	17	12	11	12	10	6

Note: Queue reported is the number of cars per lane.

Traffix 7.9.0215 (c) 2008 Dowling Assoc. Licensed to MMA, LONG BEACH, CA

City of Murrieta General Plan
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PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #105 Menifee Road - Meadowlark Road & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.940
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 42.2
Optimal Cycle: 180 Level Of Service: D

Street Name:	Menifee Road - Meadowlark Road						Keller Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	2	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	130	887	732	104	735	369	819	364	482	198	414	141
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	130	887	732	104	735	369	819	364	482	198	414	141
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	130	887	732	104	735	369	819	364	482	198	414	141
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	130	887	732	104	735	369	819	364	482	198	414	141
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	130	887	732	104	735	369	819	364	482	198	414	141
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	130	887	732	104	735	369	819	364	482	198	414	141
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.89	0.89	0.95	0.90	0.90	0.92	0.87	0.87	0.95	0.91	0.91
Lanes:	1.00	1.10	0.90	1.00	1.33	0.67	2.00	1.00	1.00	1.00	1.49	0.51
Final Sat.:	1805	1843	1521	1805	2283	1146	3502	1652	1652	1805	2591	882
Capacity Analysis Module:												
Vol/Sat:	0.07	0.48	0.48	0.06	0.32	0.32	0.23	0.22	0.29	0.11	0.16	0.16
Crit Moves:		****		****					****	****		
Green/Cycle:	0.10	0.51	0.51	0.06	0.47	0.47	0.25	0.31	0.31	0.12	0.17	0.17
Volume/Cap:	0.69	0.94	0.94	0.94	0.69	0.69	0.92	0.71	0.94	0.94	0.92	0.92
Delay/Veh:	53.3	33.6	33.6	113.4	22.1	22.1	51.1	32.5	50.9	89.2	60.5	60.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	53.3	33.6	33.6	113.4	22.1	22.1	51.1	32.5	50.9	89.2	60.5	60.5
LOS by Move:	D	C	C	F	C	C	D	C	D	F	E	E
HCM2kAvgQ:	5	30	30	6	15	15	17	12	20	10	13	13

Note: Queue reported is the number of cars per lane.

Traffix 7.9.0215 (c) 2008 Dowling Assoc. Licensed to MMA, LONG BEACH, CA

City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #107 Leon Road & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.366
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 15.6
Optimal Cycle: 29 Level Of Service: B

Street Name:	Leon Road						Keller Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Permitted			Protected			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	64	899	1	0	740	83	83	56	279	18	190	3
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	64	899	1	0	740	83	83	56	279	18	190	3
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	64	899	1	0	740	83	83	56	279	18	190	3
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	64	899	1	0	740	83	83	56	279	18	190	3
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	64	899	1	0	740	83	83	56	279	18	190	3
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	64	899	1	0	740	83	83	56	279	18	190	3
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.95	1.00	0.94	0.94	0.95	0.83	0.83	0.27	0.95	0.95
Lanes:	1.00	1.99	0.01	1.00	1.80	0.20	1.00	1.00	1.00	1.00	1.97	0.03
Final Sat.:	1805	3606	4	1900	3197	359	1805	1579	1579	521	3547	56
Capacity Analysis Module:												
Vol/Sat:	0.04	0.25	0.25	0.00	0.23	0.23	0.05	0.04	0.18	0.03	0.05	0.05
Crit Moves:	****				****		****				****	
Green/Cycle:	0.10	0.73	0.73	0.00	0.63	0.63	0.13	0.27	0.27	0.15	0.15	0.15
Volume/Cap:	0.37	0.34	0.34	0.00	0.37	0.37	0.37	0.13	0.65	0.24	0.37	0.37
Delay/Veh:	43.6	5.0	5.0	0.0	8.9	8.9	41.1	27.5	35.1	39.4	38.9	38.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	43.6	5.0	5.0	0.0	8.9	8.9	41.1	27.5	35.1	39.4	38.9	38.9
LOS by Move:	D	A	A	A	A	A	D	C	D	D	D	D
HCM2kAvgQ:	2	5	5	0	6	6	3	1	9	1	3	3

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
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PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #108 Winchester Road - SR-79 & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.542
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 1.4
Optimal Cycle: 41 Level Of Service: A

Street Name:	Winchester Road - SR-79						Keller Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	1	2651	38	12	2124	1	1	33	1	11	17	26
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	1	2651	38	12	2124	1	1	33	1	11	17	26
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	1	2651	38	12	2124	1	1	33	1	11	17	26
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	1	2651	38	12	2124	1	1	33	1	11	17	26
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	1	2651	38	12	2124	1	1	33	1	11	17	26
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	1	2651	38	12	2124	1	1	33	1	11	17	26
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.91	0.91	1.00	0.95	0.95	1.00	0.86	0.86
Lanes:	1.00	2.96	0.04	1.00	2.99	0.01	1.00	1.94	0.06	1.00	1.00	1.00
Final Sat.:	1805	5103	73	1805	5185	2	1900	3490	106	1900	1641	1641
Capacity Analysis Module:												
Vol/Sat:	0.00	0.52	0.52	0.01	0.41	0.41	0.00	0.01	0.01	0.01	0.01	0.02
Crit Moves:		****		****								****
Green/Cycle:	0.00	0.96	0.96	0.01	0.97	0.97	0.03	0.03	0.03	0.03	0.03	0.03
Volume/Cap:	0.42	0.54	0.54	0.54	0.42	0.42	0.01	0.32	0.32	0.15	0.35	0.54
Delay/Veh:	140.7	0.3	0.3	73.8	0.1	0.1	47.2	49.4	49.4	48.3	49.4	55.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	140.7	0.3	0.3	73.8	0.1	0.1	47.2	49.4	49.4	48.3	49.4	55.3
LOS by Move:	F	A	A	E	A	A	D	D	D	D	D	E
HCM2kAvgQ:	0	4	4	1	2	2	0	1	1	0	1	2

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
Future General Plan (Scenario B)
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #112 Leon Road & Jean Nicholas

Cycle (sec): 100 Critical Vol./Cap.(X): 0.697
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 26.4
Optimal Cycle: 75 Level Of Service: C

Street Name:	Leon Road						Jean Nicholas					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	3	519	263	354	572	13	2	129	11	108	143	435
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	3	519	263	354	572	13	2	129	11	108	143	435
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	3	519	263	354	572	13	2	129	11	108	143	435
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	3	519	263	354	572	13	2	129	11	108	143	435
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	3	519	263	354	572	13	2	129	11	108	143	435
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	3	519	263	354	572	13	2	129	11	108	143	435
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.90	0.90	0.95	0.95	0.95	0.95	0.94	0.94	0.95	0.84	0.84
Lanes:	1.00	1.33	0.67	1.00	1.96	0.04	1.00	1.84	0.16	1.00	1.00	1.00
Final Sat.:	1805	2276	1153	1805	3519	80	1805	3286	280	1805	1601	1601
Capacity Analysis Module:												
Vol/Sat:	0.00	0.23	0.23	0.20	0.16	0.16	0.00	0.04	0.04	0.06	0.09	0.27
Crit Moves:		****		****			****					****
Green/Cycle:	0.01	0.33	0.33	0.28	0.60	0.60	0.00	0.16	0.16	0.24	0.39	0.39
Volume/Cap:	0.27	0.70	0.70	0.70	0.27	0.27	0.70	0.25	0.25	0.25	0.23	0.70
Delay/Veh:	62.1	31.3	31.3	36.3	9.5	9.5	313.3	37.4	37.4	31.3	20.5	28.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	62.1	31.3	31.3	36.3	9.5	9.5	313.3	37.4	37.4	31.3	20.5	28.2
LOS by Move:	E	C	C	D	A	A	F	D	D	C	C	C
HCM2kAvgQ:	0	12	12	11	4	4	1	2	2	3	3	13

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
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PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #122 Meadowlark Lane - Whitewood Road & Clinton Keith Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.482
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 137.7
Optimal Cycle: 180 Level Of Service: F

Street Name:	Meadowlark Lane - Whitewood Road						Clinton Keith Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 2	0 1	2	0 1	1 0	2	0 3	0 1	2	0 3	0 1
Volume Module:												
Base Vol:	811	401	576	638	377	673	385	1305	501	324	727	1175
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	811	401	576	638	377	673	385	1305	501	324	727	1175
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	811	401	576	638	377	673	385	1305	501	324	727	1175
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	811	401	576	638	377	673	385	1305	501	324	727	1175
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	811	401	576	638	377	673	385	1305	501	324	727	1175
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	811	401	576	638	377	673	385	1305	501	324	727	1175
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.95	0.85	0.92	0.86	0.86	0.92	0.91	0.85	0.92	0.91	0.85
Lanes:	2.00	2.00	1.00	2.00	1.00	1.00	2.00	3.00	1.00	2.00	3.00	1.00
Final Sat.:	3502	3610	1615	3502	1632	1632	3502	5187	1615	3502	5187	1615
Capacity Analysis Module:												
Vol/Sat:	0.23	0.11	0.36	0.18	0.23	0.41	0.11	0.25	0.31	0.09	0.14	0.73
Crit Moves:	****					****	****					****
Green/Cycle:	0.16	0.29	0.29	0.15	0.28	0.28	0.07	0.44	0.44	0.13	0.49	0.49
Volume/Cap:	1.48	0.39	1.24	1.24	0.83	1.48	1.48	0.58	0.71	0.71	0.29	1.48
Delay/Veh:	268.6	28.8	160.7	166.2	38.6	260.3	282.5	21.7	26.5	47.0	15.1	248.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	268.6	28.8	160.7	166.2	38.6	260.3	282.5	21.7	26.5	47.0	15.1	248.9
LOS by Move:	F	C	F	F	D	F	F	C	C	D	B	F
HCM2kAvgQ:	31	5	34	21	14	51	16	11	14	6	5	83

Note: Queue reported is the number of cars per lane.

Traffix 7.9.0215 (c) 2008 Dowling Assoc. Licensed to MMA, LONG BEACH, CA

City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #138 Jefferson Avenue & Cherry Street

Cycle (sec): 100 Critical Vol./Cap.(X): 1.029
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 37.5
Optimal Cycle: 180 Level Of Service: D

Street Name:	Jefferson Avenue						Cherry Street					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	0 1	1	0 1	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	32	1267	821	210	888	7	2	1073	39	111	816	651
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	32	1267	821	210	888	7	2	1073	39	111	816	651
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	32	1267	821	210	888	7	2	1073	39	111	816	651
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	32	1267	821	210	888	7	2	1073	39	111	816	651
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	32	1267	821	210	888	7	2	1073	39	111	816	651
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	32	1267	821	210	888	7	2	1073	39	111	816	651
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.85	0.95	0.95	0.95	0.95	0.91	0.91	0.95	0.85	0.85
Lanes:	1.00	2.00	1.00	1.00	1.98	0.02	1.00	2.89	0.11	1.00	2.00	1.00
Final Sat.:	1805	3610	1615	1805	3578	28	1805	4980	181	1805	3226	1613
Capacity Analysis Module:												
Vol/Sat:	0.02	0.35	0.51	0.12	0.25	0.25	0.00	0.22	0.22	0.06	0.25	0.40
Crit Moves:			****	****			****					****
Green/Cycle:	0.04	0.49	0.49	0.11	0.57	0.57	0.00	0.31	0.31	0.09	0.39	0.39
Volume/Cap:	0.44	0.71	1.03	1.03	0.44	0.44	1.03	0.70	0.70	0.70	0.65	1.03
Delay/Veh:	51.0	21.1	64.9	115.2	12.7	12.7	711.7	32.2	32.2	57.9	25.4	62.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	51.0	21.1	64.9	115.2	12.7	12.7	711.7	32.2	32.2	57.9	25.4	62.1
LOS by Move:	D	C	E	F	B	B	F	C	C	E	C	E
HCM2kAvgQ:	2	17	35	11	8	8	1	12	12	5	12	31

Note: Queue reported is the number of cars per lane.

Traffix 7.9.0215 (c) 2008 Dowling Assoc. Licensed to MMA, LONG BEACH, CA

City of Murrieta General Plan
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PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #141 Jefferson Ave & Nutmeg St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.899
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 35.1
Optimal Cycle: 180 Level Of Service: D

Street Name:	Jefferson Ave						Nutmeg St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	612	1204	389	108	1190	97	59	133	245	286	206	136
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	612	1204	389	108	1190	97	59	133	245	286	206	136
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	612	1204	389	108	1190	97	59	133	245	286	206	136
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	612	1204	389	108	1190	97	59	133	245	286	206	136
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	612	1204	389	108	1190	97	59	133	245	286	206	136
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	612	1204	389	108	1190	97	59	133	245	286	206	136
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.88	0.88	0.95	0.90	0.90	0.95	0.86	0.86	0.95	0.89	0.89
Lanes:	1.00	2.27	0.73	1.00	2.77	0.23	1.00	1.00	1.00	1.00	1.20	0.80
Final Sat.:	1805	3775	1220	1805	4743	387	1805	1630	1630	1805	2044	1349
Capacity Analysis Module:												
Vol/Sat:	0.34	0.32	0.32	0.06	0.25	0.25	0.03	0.08	0.15	0.16	0.10	0.10
Crit Moves:	****				****				****	****		
Green/Cycle:	0.38	0.55	0.55	0.10	0.28	0.28	0.08	0.17	0.17	0.18	0.26	0.26
Volume/Cap:	0.90	0.58	0.58	0.58	0.90	0.90	0.39	0.49	0.90	0.90	0.39	0.39
Delay/Veh:	44.2	15.0	15.0	47.1	42.6	42.6	45.0	38.2	62.4	66.9	30.8	30.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	44.2	15.0	15.0	47.1	42.6	42.6	45.0	38.2	62.4	66.9	30.8	30.8
LOS by Move:	D	B	B	D	D	D	D	D	E	E	C	C
HCM2kAvgQ:	21	12	12	4	18	18	2	4	11	12	5	5

Note: Queue reported is the number of cars per lane.

Traffix 7.9.0215 (c) 2008 Dowling Assoc. Licensed to MMA, LONG BEACH, CA

City of Murrieta General Plan
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PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #142 Jefferson Ave & Magnolia St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.502
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 9.0
Optimal Cycle: 46 Level Of Service: A

Street Name:	Jefferson Ave						Magnolia St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	1 0	1	0 2	1 0	1	0 0	1 0	1	0 0	1 0
Volume Module:												
Base Vol:	141	2078	12	10	1589	109	148	5	52	7	5	14
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	141	2078	12	10	1589	109	148	5	52	7	5	14
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	141	2078	12	10	1589	109	148	5	52	7	5	14
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	141	2078	12	10	1589	109	148	5	52	7	5	14
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	141	2078	12	10	1589	109	148	5	52	7	5	14
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	141	2078	12	10	1589	109	148	5	52	7	5	14
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.91	0.95	0.90	0.90	0.95	0.86	0.86	0.95	0.89	0.89
Lanes:	1.00	2.98	0.02	1.00	2.81	0.19	1.00	0.09	0.91	1.00	0.26	0.74
Final Sat.:	1805	5152	30	1805	4805	330	1805	144	1496	1805	445	1245
Capacity Analysis Module:												
Vol/Sat:	0.08	0.40	0.40	0.01	0.33	0.33	0.08	0.03	0.03	0.00	0.01	0.01
Crit Moves:	****				****		****				****	
Green/Cycle:	0.16	0.80	0.80	0.01	0.66	0.66	0.16	0.17	0.17	0.02	0.02	0.02
Volume/Cap:	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.21	0.21	0.21	0.50	0.50
Delay/Veh:	40.1	3.3	3.3	68.0	8.8	8.8	39.5	36.3	36.3	51.4	58.6	58.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	40.1	3.3	3.3	68.0	8.8	8.8	39.5	36.3	36.3	51.4	58.6	58.6
LOS by Move:	D	A	A	E	A	A	D	D	D	D	E	E
HCM2kAvgQ:	5	8	8	1	10	10	5	2	2	0	1	1

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #149 Monroe Ave & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.568
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 16.4
Optimal Cycle: 53 Level Of Service: B

Street Name:	Monroe Ave						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ovl			Ovl			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	0 1	1	0 2	0 1	1	0 4	0 1	1	0 3	1 0
Volume Module:												
Base Vol:	178	240	200	1	250	117	170	2625	154	37	2083	27
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	178	240	200	1	250	117	170	2625	154	37	2083	27
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	178	240	200	1	250	117	170	2625	154	37	2083	27
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	178	240	200	1	250	117	170	2625	154	37	2083	27
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	178	240	200	1	250	117	170	2625	154	37	2083	27
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	178	240	200	1	250	117	170	2625	154	37	2083	27
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.85	0.95	0.95	0.85	0.95	0.91	0.85	0.95	0.91	0.91
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	4.00	1.00	1.00	3.95	0.05
Final Sat.:	1805	3610	1615	1805	3610	1615	1805	6916	1615	1805	6814	88
Capacity Analysis Module:												
Vol/Sat:	0.10	0.07	0.12	0.00	0.07	0.07	0.09	0.38	0.10	0.02	0.31	0.31
Crit Moves:	****				****		****				****	
Green/Cycle:	0.17	0.29	0.29	0.00	0.12	0.29	0.17	0.67	0.84	0.04	0.54	0.54
Volume/Cap:	0.57	0.23	0.42	0.42	0.57	0.25	0.57	0.57	0.11	0.57	0.57	0.57
Delay/Veh:	40.3	26.8	29.0	139.9	43.2	27.6	41.0	9.0	1.4	58.7	15.6	15.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	40.3	26.8	29.0	139.9	43.2	27.6	41.0	9.0	1.4	58.7	15.6	15.6
LOS by Move:	D	C	C	F	D	C	D	A	A	E	B	B
HCM2kAvgQ:	6	3	5	0	5	3	6	12	1	2	12	12

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
Future General Plan (Scenario B)
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #158 Adams Ave & Guava St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.374
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 14.6
Optimal Cycle: 23 Level Of Service: B

Street Name:	Adams Ave						Guava St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 1	1 0	1	0 1	0 1	1	0 1	0 1
Volume Module:												
Base Vol:	39	241	31	95	42	208	58	243	188	8	253	162
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	39	241	31	95	42	208	58	243	188	8	253	162
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	39	241	31	95	42	208	58	243	188	8	253	162
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	39	241	31	95	42	208	58	243	188	8	253	162
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	39	241	31	95	42	208	58	243	188	8	253	162
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	39	241	31	95	42	208	58	243	188	8	253	162
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.50	0.93	0.93	0.49	0.83	0.83	0.43	0.94	0.94	0.42	0.94	0.94
Lanes:	1.00	1.77	0.23	1.00	1.00	1.00	1.00	0.56	0.44	1.00	0.61	0.39
Final Sat.:	958	3144	404	923	1579	1579	825	1002	775	804	1091	699
Capacity Analysis Module:												
Vol/Sat:	0.04	0.08	0.08	0.10	0.03	0.13	0.07	0.24	0.24	0.01	0.23	0.23
Crit Moves:						****		****				
Green/Cycle:	0.35	0.35	0.35	0.35	0.35	0.35	0.65	0.65	0.65	0.65	0.65	0.65
Volume/Cap:	0.12	0.22	0.22	0.29	0.08	0.37	0.11	0.37	0.37	0.02	0.36	0.36
Delay/Veh:	22.1	22.8	22.8	23.9	21.6	24.5	6.7	8.4	8.4	6.3	8.2	8.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	22.1	22.8	22.8	23.9	21.6	24.5	6.7	8.4	8.4	6.3	8.2	8.2
LOS by Move:	C	C	C	C	C	C	A	A	A	A	A	A
HCM2kAvgQ:	1	3	3	2	1	5	1	6	6	0	6	6

Note: Queue reported is the number of cars per lane.

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ENHANCED GEOMETRICS

City of Murrieta General Plan
Future Proposed General Plan
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Scenario Report

Scenario:	Future Proposed GP AM
Command:	Future Proposed GP AM
Volume:	Future Proposed GP AM
Geometry:	Future
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	Default Trip Distribution
Paths:	Default Path
Routes:	Default Route
Configuration:	Future Proposed GP AM

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City of Murrieta General Plan
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Turning Movement Report

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#1 Menifee Road & Scott Road													
Base	238	358	374	253	845	93	102	510	316	864	479	251	4683
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	238	358	374	253	845	93	102	510	316	864	479	251	4683
#2 Leon Road & Scott Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#3 Winchester Road/SR-79 & Scott Road													
Base	110	1376	51	951	2658	75	117	178	68	17	151	963	6715
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	110	1376	51	951	2658	75	117	178	68	17	151	963	6715
#4 Antelope Road & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#5 Menifee Road - Meadowlark Road & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#6 Briggs Road & Keller Road													
Base	346	17	53	0	40	47	1	72	492	15	344	1	1428
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	346	17	53	0	40	47	1	72	492	15	344	1	1428
#7 Leon Road & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#8 Winchester Road - SR-79 & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#9 Antelope Road & Golden City Drive - Baxter Road													
Base	1	88	515	381	1070	27	1	75	11	397	203	604	3373
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	88	515	381	1070	27	1	75	11	397	203	604	3373

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Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#10 Whitewood Roa - /Meadowlark Road & Golden City Drive - Baxter Road													
Base	316	689	2	0	955	880	59	4	739	1	15	2	3662
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	316	689	2	0	955	880	59	4	739	1	15	2	3662
#11 Briggs Road & Baxter Road - Jean Nicholas													
Base	0	206	43	38	534	0	0	0	0	9	0	75	905
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	206	43	38	534	0	0	0	0	9	0	75	905
#12 Leon Road & Jean Nicholas													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#13 Winchester Road - SR-79 & Nicholas - Skyview													
Base	138	1381	338	22	2896	33	37	330	132	106	327	166	5906
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	138	1381	338	22	2896	33	37	330	132	106	327	166	5906
#14 Antelope Road & Linnel Lane Extension													
Base	21	757	96	99	487	530	199	507	125	6	120	220	3167
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	21	757	96	99	487	530	199	507	125	6	120	220	3167
#15 Whitewood Road - Meadowlark Road & Linnel Lane Extension													
Base	18	797	678	281	1152	183	33	556	114	45	144	324	4325
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	18	797	678	281	1152	183	33	556	114	45	144	324	4325
#16 Leon Road & Max Gillis Road													
Base	417	107	396	383	363	152	100	470	767	631	322	182	4290
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	417	107	396	383	363	152	100	470	767	631	322	182	4290
#17 Winchester Road - SR-79 & Max Gillis - Thompson													
Base	200	1300	46	140	2198	729	609	165	279	31	298	39	6034
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	200	1300	46	140	2198	729	609	165	279	31	298	39	6034
#18 California Oaks Road & Clinton Keith Road													
Base	204	0	669	0	0	0	0	2680	307	773	1675	0	6308
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	204	0	669	0	0	0	0	2680	307	773	1675	0	6308

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Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#19 I-215 SB Off-Ramp & Clinton Keith Road													
Base	0	0	0	58	0	420	0	2401	496	0	2089	227	5691
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	58	0	420	0	2401	496	0	2089	227	5691
#20 I-215 NB Off Ramp & Clinton Keith Road													
Base	162	0	1393	0	0	0	0	1797	334	0	2305	233	6224
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	162	0	1393	0	0	0	0	1797	334	0	2305	233	6224
#21 Antelope Road & Clinton Keith Road													
Base	0	0	0	15	0	426	388	1869	0	0	1643	296	4637
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	15	0	426	388	1869	0	0	1643	296	4637
#22 Meadowlark Lane - Whitewood Road & Clinton Keith Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#23 Liberty Road & Clinton Keith Road													
Base	65	0	217	0	0	0	0	1615	205	44	2610	0	4756
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	65	0	217	0	0	0	0	1615	205	44	2610	0	4756
#24 Leon Road & Clinton Keith Road													
Base	0	0	0	144	0	1537	396	1420	0	0	858	561	4916
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	144	0	1537	396	1420	0	0	858	561	4916
#25 Winchester Road - SR-79 & Benton Road													
Base	490	1366	368	96	2041	400	38	470	978	344	614	32	7237
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	490	1366	368	96	2041	400	38	470	978	344	614	32	7237
#26 Winchester Road - SR-79 & Via Mira Mosa													
Base	28	1593	798	319	2788	234	358	49	95	177	19	29	6487
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	28	1593	798	319	2788	234	358	49	95	177	19	29	6487
#27 Monroe Ave & Los Alamos													
Base	28	223	188	569	475	208	46	351	134	63	994	473	3752
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	28	223	188	569	475	208	46	351	134	63	994	473	3752

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#28 Jefferson Avenue & Murrieta Hot Springs Road													
Base	10	1074	495	919	1236	77	15	76	21	876	93	921	5813
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	10	1074	495	919	1236	77	15	76	21	876	93	921	5813
#29 Madison Avenue & Murrieta Hot Springs Road													
Base	127	67	324	183	184	156	117	1137	271	754	1769	74	5163
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	127	67	324	183	184	156	117	1137	271	754	1769	74	5163
#30 I-15 SB Off-Ramp & Murrieta Hot Springs Road													
Base	0	0	0	808	0	421	0	1385	215	0	2301	47	5177
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	808	0	421	0	1385	215	0	2301	47	5177
#31 I-15 NB Off-Ramp & Murrieta Hot Springs Road													
Base	292	0	60	0	0	0	0	2202	210	0	1546	598	4908
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	292	0	60	0	0	0	0	2202	210	0	1546	598	4908
#32 I-215 SB Off-Ramp & Murrieta Hot Springs Road													
Base	0	0	0	483	0	524	0	1838	53	0	2599	378	5875
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	483	0	524	0	1838	53	0	2599	378	5875
#33 I-215 NB Off-Ramp & Murrieta Hot Springs Road													
Base	343	0	24	0	0	0	0	1583	115	0	2623	663	5351
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	343	0	24	0	0	0	0	1583	115	0	2623	663	5351
#34 Jackson Avenue & Murrieta Hot Springs Road													
Base	68	0	52	0	0	0	0	1217	38	149	2024	0	3548
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	68	0	52	0	0	0	0	1217	38	149	2024	0	3548
#35 Margarita Road & Murrieta Hot Springs Road													
Base	640	60	128	41	17	7	161	750	462	302	1793	71	4432
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	640	60	128	41	17	7	161	750	462	302	1793	71	4432
#36 French Valley Parkway & Murrieta Hot Springs Road													
Base	19	0	829	0	0	0	0	1182	269	805	2004	0	5108
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	19	0	829	0	0	0	0	1182	269	805	2004	0	5108

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#37 Jefferson Avenue & Guava Street													
Base	22	1363	3	7	1420	306	176	108	89	2	32	10	3538
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	22	1363	3	7	1420	306	176	108	89	2	32	10	3538
#38 Jefferson Avenue & Cherry Street													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#39 Washington Ave & Calle Del Oso Oro/Nutmeg													
Base	262	164	126	88	218	88	64	602	742	151	189	38	2732
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	262	164	126	88	218	88	64	602	742	151	189	38	2732
#40 Clinton Keith Rd & Calle de Oso Oro/Bear Creek Dr													
Base	63	107	268	4	115	192	269	613	172	420	598	19	2840
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	63	107	268	4	115	192	269	613	172	420	598	19	2840
#41 Jefferson Ave & Nutmeg St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#42 Jefferson Ave & Magnolia St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#43 Jefferson Ave & Lemon St													
Base	320	733	28	4	2585	166	31	3	334	8	13	6	4231
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	320	733	28	4	2585	166	31	3	334	8	13	6	4231
#44 Jefferson Ave & Kalmia St													
Base	261	957	246	967	1732	170	55	502	349	223	355	556	6373
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	261	957	246	967	1732	170	55	502	349	223	355	556	6373
#45 Jefferson Ave & Juniper St													
Base	471	1298	35	71	2027	173	137	99	188	7	101	22	4629
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	471	1298	35	71	2027	173	137	99	188	7	101	22	4629

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#46 Jefferson Ave & Ivy St/Los Alamos Rd													
Base	259	1336	111	327	1823	72	49	95	129	363	121	400	5085
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	259	1336	111	327	1823	72	49	95	129	363	121	400	5085
#47 Madison Ave & Kalmia St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#48 Madison Ave/I-15 SB Ramps & Kalmia St													
Base	119	0	219	250	51	272	0	1459	245	386	1139	505	4645
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	119	0	219	250	51	272	0	1459	245	386	1139	505	4645
#49 Monroe Ave & Murrieta Hot Springs Rd													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#50 Hancock Ave & Murrieta Hot Springs Rd													
Base	0	0	0	379	0	598	697	1520	0	0	2602	566	6362
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	379	0	598	697	1520	0	0	2602	566	6362
#51 Alta Murrieta Dr & Murrieta Hot Springs Rd													
Base	221	82	19	69	130	313	258	982	282	131	1871	169	4527
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	221	82	19	69	130	313	258	982	282	131	1871	169	4527
#52 Winchester Road - SR-79 & Murrieta Hot Springs Rd													
Base	288	1507	155	161	1461	1426	768	265	95	276	897	83	7382
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	288	1507	155	161	1461	1426	768	265	95	276	897	83	7382
#53 Hancock Ave & Los Alamos Rd													
Base	48	120	221	793	252	93	71	969	72	916	1682	614	5851
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	48	120	221	793	252	93	71	969	72	916	1682	614	5851
#54 I-215 SB Ramps & Los Alamos Rd													
Base	0	0	0	405	0	2037	0	1419	478	220	1506	0	6065
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	405	0	2037	0	1419	478	220	1506	0	6065

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AM Peak Hour

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#55 I-215 NB Ramps & Los Alamos Rd													
Base	550	0	377	0	0	0	591	1233	0	0	1185	160	4096
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	550	0	377	0	0	0	591	1233	0	0	1185	160	4096
#56 Whitewood Rd & Los Alamos Rd													
Base	83	372	38	26	432	617	823	232	109	48	241	34	3055
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	83	372	38	26	432	617	823	232	109	48	241	34	3055
#57 Whitewood Rd & Murrieta Hot Springs Rd													
Base	50	240	241	260	536	102	32	1001	132	514	2105	166	5379
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	50	240	241	260	536	102	32	1001	132	514	2105	166	5379
#58 Adams Ave & Guava St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#59 Nutmeg St & Clinton Keith Rd													
Base	67	41	484	425	54	67	50	2123	110	386	1317	156	5280
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	67	41	484	425	54	67	50	2123	110	386	1317	156	5280
#60 Murrieta Oaks Ave-Mitchell Rd & Clinton Keith Rd													
Base	101	241	85	19	69	196	203	2903	312	78	2088	405	6700
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	101	241	85	19	69	196	203	2903	312	78	2088	405	6700
#61 I-215 SB Ramps & Scott Rd													
Base	0	0	0	246	0	104	0	1052	385	0	866	384	3037
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	246	0	104	0	1052	385	0	866	384	3037
#62 I-215 NB Ramps & Scott Rd													
Base	0	15	600	0	0	259	156	1199	0	0	978	329	3536
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	15	600	0	0	259	156	1199	0	0	978	329	3536
#102 Leon Road & Scott Road													
Base	104	198	2	101	444	489	353	438	498	14	360	157	3158
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	104	198	2	101	444	489	353	438	498	14	360	157	3158

City of Murrieta General Plan
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AM Peak Hour

Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#104 Antelope Road & Keller Road													
Base	66	43	328	241	584	447	405	791	1203	758	467	27	5360
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	66	43	328	241	584	447	405	791	1203	758	467	27	5360
#105 Menifee Road - Meadowlark Road & Keller Road													
Base	23	226	251	133	1301	680	495	199	565	299	400	125	4697
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	23	226	251	133	1301	680	495	199	565	299	400	125	4697
#107 Leon Road & Keller Road													
Base	111	330	18	4	868	156	2	60	106	7	65	5	1732
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	111	330	18	4	868	156	2	60	106	7	65	5	1732
#108 Winchester Road - SR-79 & Keller Road													
Base	1	1512	25	5	2774	3	1	10	1	13	20	50	4415
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	1512	25	5	2774	3	1	10	1	13	20	50	4415
#112 Leon Road & Jean Nicholas													
Base	5	183	126	261	649	53	2	145	13	157	22	249	1865
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	5	183	126	261	649	53	2	145	13	157	22	249	1865
#122 Meadowlark Lane - Whitewood Road & Clinton Keith Road													
Base	133	230	1083	212	134	715	1386	486	82	943	1187	594	7185
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	133	230	1083	212	134	715	1386	486	82	943	1187	594	7185
#138 Jefferson Avenue & Cherry Street													
Base	86	620	196	37	640	22	1	48	6	147	1311	893	4007
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	86	620	196	37	640	22	1	48	6	147	1311	893	4007
#141 Jefferson Ave & Nutmeg St													
Base	181	321	272	96	1887	69	93	223	509	366	171	67	4255
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	181	321	272	96	1887	69	93	223	509	366	171	67	4255
#142 Jefferson Ave & Magnolia St													
Base	81	637	8	8	2543	247	158	1	155	27	3	1	3869
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	81	637	8	8	2543	247	158	1	155	27	3	1	3869

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#149 Monroe Ave & Murrieta Hot Springs Rd													
Base	46	73	48	1	47	50	101	1156	34	7	1552	21	3136
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	46	73	48	1	47	50	101	1156	34	7	1552	21	3136
#158 Adams Ave & Guava St													
Base	78	97	21	101	21	40	23	324	46	3	256	108	1118
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	78	97	21	101	21	40	23	324	46	3	256	108	1118

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Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
# 1 Menifee Road & Scott Road	C	29.5	0.711	C	29.5	0.711	+ 0.000 D/V
# 3 Winchester Road/SR-79 & Scott	F	132.7	1.251	F	132.7	1.251	+ 0.000 D/V
# 6 Briggs Road & Keller Road	B	13.6	0.341	B	13.6	0.341	+ 0.000 D/V
# 9 Antelope Road & Golden City Dr	C	20.3	0.696	C	20.3	0.696	+ 0.000 D/V
# 10 Whitewood Roa - /Meadowlark Ro	E	75.8	1.178	E	75.8	1.178	+ 0.000 D/V
# 14 Antelope Road & Linnel Lane Ex	C	21.4	0.586	C	21.4	0.586	+ 0.000 D/V
# 15 Whitewood Road - Meadowlark Ro	C	24.6	0.794	C	24.6	0.794	+ 0.000 D/V
# 28 Jefferson Avenue & Murrieta Ho	E	56.1	1.048	E	56.1	1.048	+ 0.000 D/V
# 29 Madison Avenue & Murrieta Hot	C	23.5	0.591	C	23.5	0.591	+ 0.000 D/V
# 44 Jefferson Ave & Kalmia St	E	60.3	1.095	E	60.3	1.095	+ 0.000 D/V
# 46 Jefferson Ave & Ivy St/Los Ala	C	26.8	0.705	C	26.8	0.705	+ 0.000 D/V
# 57 Whitewood Rd & Murrieta Hot Sp	C	24.3	0.718	C	24.3	0.718	+ 0.000 D/V
#102 Leon Road & Scott Road	C	26.6	0.640	C	26.6	0.640	+ 0.000 D/V

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #1 Menifee Road & Scott Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.711
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 29.5
Optimal Cycle: 79 Level Of Service: C

Street Name:	Menifee Rd						Scott Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Ovl			Ovl			Ovl		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	0 1	1	0 2	0 1	2	0 3	0 1	2	0 3	0 1
Volume Module:												
Base Vol:	238	358	374	253	845	93	102	510	316	864	479	251
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	238	358	374	253	845	93	102	510	316	864	479	251
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	238	358	374	253	845	93	102	510	316	864	479	251
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	238	358	374	253	845	93	102	510	316	864	479	251
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	238	358	374	253	845	93	102	510	316	864	479	251
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	238	358	374	253	845	93	102	510	316	864	479	251
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.85	0.95	0.95	0.85	0.92	0.91	0.85	0.92	0.91	0.85
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	2.00	3.00	1.00	2.00	3.00	1.00
Final Sat.:	1805	3610	1615	1805	3610	1615	3502	5187	1615	3502	5187	1615
Capacity Analysis Module:												
Vol/Sat:	0.13	0.10	0.23	0.14	0.23	0.06	0.03	0.10	0.20	0.25	0.09	0.16
Crit Moves:	****				****			****		****		
Green/Cycle:	0.19	0.21	0.56	0.30	0.33	0.45	0.12	0.14	0.32	0.35	0.37	0.67
Volume/Cap:	0.71	0.47	0.41	0.47	0.71	0.13	0.25	0.71	0.60	0.71	0.25	0.23
Delay/Veh:	45.2	34.8	12.9	29.0	31.4	16.4	40.5	44.5	30.4	30.3	22.0	6.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	45.2	34.8	12.9	29.0	31.4	16.4	40.5	44.5	30.4	30.3	22.0	6.5
LOS by Move:	D	C	B	C	C	B	D	D	C	C	C	A
HCM2kAvgQ:	8	5	7	7	13	2	2	7	9	13	4	3

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #3 Winchester Road/SR-79 & Scott Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.251
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 132.7
Optimal Cycle: 180 Level Of Service: F

Street Name:	Winchester Road/SR-79									Scott Road								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected					Protected				
Rights:	Include					Include					Include					Include				
Min. Green:	0	0	0			0	0	0			0	0	0			0	0	0		
Lanes:	1	0	2	1	0	2	0	2	1	0	1	0	2	1	0	1	0	3	0	1
Volume Module:																				
Base Vol:	110	1376		51		951	2658		75		117	178		68		17	151		963	
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
Initial Bse:	110	1376		51		951	2658		75		117	178		68		17	151		963	
Added Vol:	0	0		0		0	0		0		0	0		0		0	0		0	
PasserByVol:	0	0		0		0	0		0		0	0		0		0	0		0	
Initial Fut:	110	1376		51		951	2658		75		117	178		68		17	151		963	
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Volume:	110	1376		51		951	2658		75		117	178		68		17	151		963	
Reduct Vol:	0	0		0		0	0		0		0	0		0		0	0		0	
Reduced Vol:	110	1376		51		951	2658		75		117	178		68		17	151		963	
PCE Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
MLF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
FinalVolume:	110	1376		51		951	2658		75		117	178		68		17	151		963	
Saturation Flow Module:																				
Sat/Lane:	1900	1900		1900		1900	1900		1900		1900	1900		1900		1900	1900		1900	
Adjustment:	0.95	0.91		0.91		0.92	0.91		0.91		0.95	0.87		0.87		0.95	0.91		0.85	
Lanes:	1.00	2.89		0.11		2.00	2.92		0.08		1.00	2.17		0.83		1.00	3.00		1.00	
Final Sat.:	1805	4977		184		3502	5024		142		1805	3599		1375		1805	5187		1615	
Capacity Analysis Module:																				
Vol/Sat:	0.06	0.28		0.28		0.27	0.53		0.53		0.06	0.05		0.05		0.01	0.03		0.60	
Crit Moves:	****						****				****								****	
Green/Cycle:	0.05	0.24		0.24		0.23	0.42		0.42		0.05	0.44		0.44		0.08	0.48		0.48	
Volume/Cap:	1.25	1.16		1.16		1.16	1.25		1.25		1.25	0.11		0.11		0.11	0.06		1.25	
Delay/Veh:	225.4	120		120.4		124.7	146		145.8		222.3	16.3		16.3		42.6	14.1		149.8	
User DelAdj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
AdjDel/Veh:	225.4	120		120.4		124.7	146		145.8		222.3	16.3		16.3		42.6	14.1		149.8	
LOS by Move:	F	F		F		F	F		F		F	B		B		D	B		F	
HCM2kAvgQ:	8	28		28		27	57		57		9	2		2		1	1		55	

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #6 Briggs Road & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.341
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 13.6
Optimal Cycle: 35 Level Of Service: B

Street Name:	Briggs Road									Keller Road								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected					Protected				
Rights:	Include					Include					Ovl					Include				
Min. Green:	0	0	0			0	0	0			0	0	0			0	0	0		
Lanes:	1	0	1	1	0	1	0	1	1	0	1	0	2	0	1	1	0	1	1	0
Volume Module:																				
Base Vol:	346	17		53		0	40		47		1	72		492		15	344		1	
Growth Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
Initial Bse:	346	17		53		0	40		47		1	72		492		15	344		1	
Added Vol:	0	0		0		0	0		0		0	0		0		0	0		0	
PasserByVol:	0	0		0		0	0		0		0	0		0		0	0		0	
Initial Fut:	346	17		53		0	40		47		1	72		492		15	344		1	
User Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
PHF Volume:	346	17		53		0	40		47		1	72		492		15	344		1	
Reduct Vol:	0	0		0		0	0		0		0	0		0		0	0		0	
Reduced Vol:	346	17		53		0	40		47		1	72		492		15	344		1	
PCE Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
MLF Adj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
FinalVolume:	346	17		53		0	40		47		1	72		492		15	344		1	
Saturation Flow Module:																				
Sat/Lane:	1900	1900		1900		1900	1900		1900		1900	1900		1900		1900	1900		1900	
Adjustment:	0.95	0.84		0.84		1.00	0.87		0.87		0.95	0.95		0.85		0.95	0.95		0.95	
Lanes:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	2.00		1.00		1.00	1.99		0.01	
Final Sat.:	1805	1599		1599		1900	1659		1659		1805	3610		1615		1805	3600		10	
Capacity Analysis Module:																				
Vol/Sat:	0.19	0.01		0.03		0.00	0.02		0.03		0.00	0.02		0.30		0.01	0.10		0.10	
Crit Moves:	****								****					****		****				
Green/Cycle:	0.56	0.64		0.64		0.00	0.08		0.08		0.00	0.33		0.89		0.02	0.35		0.35	
Volume/Cap:	0.34	0.02		0.05		0.00	0.29		0.34		0.27	0.06		0.34		0.34	0.27		0.27	
Delay/Veh:	12.1	6.4		6.5		0.0	43.6		44.1		85.6	22.9		1.0		52.6	23.2		23.2	
User DelAdj:	1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00		1.00	1.00		1.00	
AdjDel/Veh:	12.1	6.4		6.5		0.0	43.6		44.1		85.6	22.9		1.0		52.6	23.2		23.2	
LOS by Move:	B	A		A		A	D		D		F	C		A		D	C		C	
HCM2kAvgQ:	6	0		1		0	1		2		0	1		3		1	4		4	

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #9 Antelope Road & Golden City Drive - Baxter Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.696
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 20.3
Optimal Cycle: 47 Level Of Service: C

Street Name:	Antelope Road						Golden City Drive - Baxter Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	0 1	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	1	88	515	381	1070	27	1	75	11	397	203	604
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	1	88	515	381	1070	27	1	75	11	397	203	604
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	1	88	515	381	1070	27	1	75	11	397	203	604
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	1	88	515	381	1070	27	1	75	11	397	203	604
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	1	88	515	381	1070	27	1	75	11	397	203	604
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	1	88	515	381	1070	27	1	75	11	397	203	604
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.12	0.95	0.85	0.67	0.95	0.95	0.25	0.93	0.93	0.68	0.84	0.84
Lanes:	1.00	2.00	1.00	1.00	1.95	0.05	1.00	1.74	0.26	1.00	1.00	1.00
Final Sat.:	219	3610	1615	1279	3507	88	481	3088	453	1294	1603	1603
Capacity Analysis Module:												
Vol/Sat:	0.00	0.02	0.32	0.30	0.31	0.31	0.00	0.02	0.02	0.31	0.13	0.38
Crit Moves:			****									****
Green/Cycle:	0.46	0.46	0.46	0.46	0.46	0.46	0.54	0.54	0.54	0.54	0.54	0.54
Volume/Cap:	0.01	0.05	0.70	0.65	0.67	0.67	0.00	0.04	0.04	0.57	0.23	0.70
Delay/Veh:	14.8	15.0	24.4	23.5	22.2	22.2	10.5	10.8	10.8	16.2	12.1	18.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	14.8	15.0	24.4	23.5	22.2	22.2	10.5	10.8	10.8	16.2	12.1	18.7
LOS by Move:	B	B	C	C	C	C	B	B	B	B	B	B
HCM2kAvgQ:	0	1	14	10	14	14	0	1	1	9	3	15

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #10 Whitewood Roa - /Meadowlark Road & Golden City Drive - Baxter R

Cycle (sec): 100 Critical Vol./Cap.(X): 1.178
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 75.8
Optimal Cycle: 180 Level Of Service: E

Street Name:	Whitewood Road - Meadowlark Road						Golden City Drive - Baxter Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 2	0 1	1	0 1	0 1	1	0 1	1 0
Volume Module:												
Base Vol:	316	689	2	0	955	880	59	4	739	1	15	2
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	316	689	2	0	955	880	59	4	739	1	15	2
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	316	689	2	0	955	880	59	4	739	1	15	2
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	316	689	2	0	955	880	59	4	739	1	15	2
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	316	689	2	0	955	880	59	4	739	1	15	2
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	316	689	2	0	955	880	59	4	739	1	15	2
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.95	1.00	0.95	0.85	0.95	1.00	0.85	0.95	0.93	0.93
Lanes:	1.00	1.99	0.01	1.00	2.00	1.00	1.00	1.00	1.00	1.00	1.76	0.24
Final Sat.:	1805	3600	10	1900	3610	1615	1805	1900	1615	1805	3128	417
Capacity Analysis Module:												
Vol/Sat:	0.18	0.19	0.19	0.00	0.26	0.54	0.03	0.00	0.46	0.00	0.00	0.00
Crit Moves:	****					****			****	****		
Green/Cycle:	0.15	0.61	0.61	0.00	0.46	0.46	0.34	0.39	0.39	0.00	0.05	0.05
Volume/Cap:	1.18	0.31	0.31	0.00	0.57	1.18	0.10	0.01	1.18	1.18	0.10	0.10
Delay/Veh:	154.5	9.4	9.4	0.0	20.1	120.6	22.6	18.7	126.6	1151	45.6	45.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	154.5	9.4	9.4	0.0	20.1	120.6	22.6	18.7	126.6	1151	45.6	45.6
LOS by Move:	F	A	A	A	C	F	C	B	F	F	D	D
HCM2kAvgQ:	19	5	5	0	12	46	1	0	39	0	0	0

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
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Intersection #14 Antelope Road & Linnel Lane Extension

Cycle (sec): 100 Critical Vol./Cap.(X): 0.586
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 21.4
Optimal Cycle: 55 Level Of Service: C

Street Name:	Antelope Road						Linnel Lane Extension					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	0 1	1	0 2	0 1	1	0 2	0 1	1	0 2	0 1
Volume Module:												
Base Vol:	21	757	96	99	487	530	199	507	125	6	120	220
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	21	757	96	99	487	530	199	507	125	6	120	220
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	21	757	96	99	487	530	199	507	125	6	120	220
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	21	757	96	99	487	530	199	507	125	6	120	220
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	21	757	96	99	487	530	199	507	125	6	120	220
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	21	757	96	99	487	530	199	507	125	6	120	220
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.85	0.95	0.95	0.85	0.95	0.95	0.85	0.95	0.95	0.85
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1805	3610	1615	1805	3610	1615	1805	3610	1615	1805	3610	1615
Capacity Analysis Module:												
Vol/Sat:	0.01	0.21	0.06	0.05	0.13	0.33	0.11	0.14	0.08	0.00	0.03	0.14
Crit Moves:	****					****	****					****
Green/Cycle:	0.02	0.46	0.46	0.12	0.56	0.56	0.19	0.41	0.41	0.01	0.23	0.23
Volume/Cap:	0.59	0.46	0.13	0.46	0.24	0.59	0.59	0.34	0.19	0.34	0.14	0.59
Delay/Veh:	71.3	18.7	15.6	42.5	11.3	15.4	39.7	20.3	19.0	60.5	30.6	36.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	71.3	18.7	15.6	42.5	11.3	15.4	39.7	20.3	19.0	60.5	30.6	36.5
LOS by Move:	E	B	B	D	B	B	D	C	B	E	C	D
HCM2kAvgQ:	2	8	2	3	4	11	6	6	2	1	2	7

Note: Queue reported is the number of cars per lane.

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2000 HCM Operations Method (Future Volume Alternative)

Intersection #15 Whitewood Road - Meadowlark Road & Linnel Lane Extension

Cycle (sec): 100 Critical Vol./Cap.(X): 0.794
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 24.6
Optimal Cycle: 111 Level Of Service: C

Street Name:	Whitewood Road - Meadowlark Road						Linnel Lane Extension (Future)					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	0 1	1	0 1	1 0	1	0 1	1 0	1	0 2	0 1
Volume Module:												
Base Vol:	18	797	678	281	1152	183	33	556	114	45	144	324
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	18	797	678	281	1152	183	33	556	114	45	144	324
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	18	797	678	281	1152	183	33	556	114	45	144	324
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	18	797	678	281	1152	183	33	556	114	45	144	324
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	18	797	678	281	1152	183	33	556	114	45	144	324
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	18	797	678	281	1152	183	33	556	114	45	144	324
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.85	0.95	0.93	0.93	0.95	0.93	0.93	0.95	0.95	0.85
Lanes:	1.00	2.00	1.00	1.00	1.73	0.27	1.00	1.66	0.34	1.00	2.00	1.00
Final Sat.:	1805	3610	1615	1805	3050	484	1805	2921	599	1805	3610	1615
Capacity Analysis Module:												
Vol/Sat:	0.01	0.22	0.42	0.16	0.38	0.38	0.02	0.19	0.19	0.02	0.04	0.20
Crit Moves:			****	****			****					****
Green/Cycle:	0.02	0.53	0.53	0.20	0.71	0.71	0.02	0.24	0.24	0.03	0.25	0.25
Volume/Cap:	0.54	0.42	0.79	0.79	0.54	0.54	0.79	0.78	0.78	0.78	0.16	0.79
Delay/Veh:	64.5	14.4	24.3	50.0	7.2	7.2	114.4	40.0	40.0	96.8	29.2	45.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	64.5	14.4	24.3	50.0	7.2	7.2	114.4	40.0	40.0	96.8	29.2	45.3
LOS by Move:	E	B	C	D	A	A	F	D	D	F	C	D
HCM2kAvgQ:	1	8	19	10	10	10	2	12	12	3	2	11

Note: Queue reported is the number of cars per lane.

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Intersection #28 Jefferson Avenue & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.048
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 56.1
Optimal Cycle: 180 Level Of Service: E

Street Name:	Jefferson Avenue						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0	3 0	2	2 0	2 1	0	1 0	2 1	0	1 0	3 0	1
Volume Module:												
Base Vol:	10	1074	495	919	1236	77	15	76	21	876	93	921
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	10	1074	495	919	1236	77	15	76	21	876	93	921
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	10	1074	495	919	1236	77	15	76	21	876	93	921
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	10	1074	495	919	1236	77	15	76	21	876	93	921
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	10	1074	495	919	1236	77	15	76	21	876	93	921
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	10	1074	495	919	1236	77	15	76	21	876	93	921
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.75	0.92	0.90	0.90	0.95	0.88	0.88	0.95	0.91	0.85
Lanes:	1.00	3.00	2.00	2.00	2.82	0.18	1.00	2.35	0.65	1.00	3.00	1.00
Final Sat.:	1805	5187	2842	3502	4839	301	1805	3934	1087	1805	5187	1615
Capacity Analysis Module:												
Vol/Sat:	0.01	0.21	0.17	0.26	0.26	0.26	0.01	0.02	0.02	0.49	0.02	0.57
Crit Moves:		****		****			****					****
Green/Cycle:	0.01	0.20	0.20	0.25	0.44	0.44	0.01	0.02	0.02	0.53	0.54	0.54
Volume/Cap:	0.58	1.05	0.88	1.05	0.58	0.58	1.05	0.91	0.91	0.91	0.03	1.05
Delay/Veh:	91.4	81.7	54.1	81.2	21.6	21.6	304.2	109	109.5	34.3	10.6	66.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	91.4	81.7	54.1	81.2	21.6	21.6	304.2	109	109.5	34.3	10.6	66.5
LOS by Move:	F	F	D	F	C	C	F	F	F	C	B	E
HCM2kAvgQ:	1	19	12	22	11	11	2	3	3	29	0	39

Note: Queue reported is the number of cars per lane.

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Intersection #29 Madison Avenue & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.591
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 23.5
Optimal Cycle: 56 Level Of Service: C

Street Name:	Madison Avenue						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2 0	2 0	2	2 0	1 1	0	2 0	3 1	0	2 0	3 0	1
Volume Module:												
Base Vol:	127	67	324	183	184	156	117	1137	271	754	1769	74
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	127	67	324	183	184	156	117	1137	271	754	1769	74
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	127	67	324	183	184	156	117	1137	271	754	1769	74
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	127	67	324	183	184	156	117	1137	271	754	1769	74
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	127	67	324	183	184	156	117	1137	271	754	1769	74
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	127	67	324	183	184	156	117	1137	271	754	1769	74
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.95	0.75	0.92	0.88	0.88	0.92	0.88	0.88	0.92	0.91	0.85
Lanes:	2.00	2.00	2.00	2.00	1.08	0.92	2.00	3.23	0.77	2.00	3.00	1.00
Final Sat.:	3502	3610	2842	3502	1819	1542	3502	5423	1293	3502	5187	1615
Capacity Analysis Module:												
Vol/Sat:	0.04	0.02	0.11	0.05	0.10	0.10	0.03	0.21	0.21	0.22	0.34	0.05
Crit Moves:			****	****				****		****		
Green/Cycle:	0.07	0.19	0.19	0.09	0.21	0.21	0.06	0.35	0.35	0.36	0.65	0.65
Volume/Cap:	0.49	0.10	0.59	0.59	0.49	0.49	0.52	0.59	0.59	0.59	0.52	0.07
Delay/Veh:	45.9	33.3	38.5	46.9	35.5	35.5	47.5	26.7	26.7	26.5	9.2	6.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	45.9	33.3	38.5	46.9	35.5	35.5	47.5	26.7	26.7	26.5	9.2	6.3
LOS by Move:	D	C	D	D	D	D	D	C	C	C	A	A
HCM2kAvgQ:	3	1	6	4	5	5	3	10	10	10	11	1

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #44 Jefferson Ave & Kalmia St

Cycle (sec): 100 Critical Vol./Cap.(X): 1.095
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 60.3
Optimal Cycle: 180 Level Of Service: E

Street Name:	Jefferson Ave						Kalmia St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2 0 3	0 1		1 0 2	1 0		1 0 2	1 0		1 0 2	0 1	
Volume Module:												
Base Vol:	261	957	246	967	1732	170	55	502	349	223	355	556
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	261	957	246	967	1732	170	55	502	349	223	355	556
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	261	957	246	967	1732	170	55	502	349	223	355	556
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	261	957	246	967	1732	170	55	502	349	223	355	556
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	261	957	246	967	1732	170	55	502	349	223	355	556
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	261	957	246	967	1732	170	55	502	349	223	355	556
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.91	0.85	0.95	0.90	0.90	0.95	0.85	0.85	0.95	0.95	0.85
Lanes:	2.00	3.00	1.00	1.00	2.73	0.27	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	3502	5187	1615	1805	4662	458	1805	3247	1624	1805	3610	1615
Capacity Analysis Module:												
Vol/Sat:	0.07	0.18	0.15	0.54	0.37	0.37	0.03	0.15	0.21	0.12	0.10	0.34
Crit Moves:		****		****			****					****
Green/Cycle:	0.11	0.17	0.17	0.49	0.55	0.55	0.03	0.22	0.22	0.12	0.31	0.31
Volume/Cap:	0.68	1.09	0.90	1.09	0.68	0.68	1.09	0.71	0.99	0.99	0.31	1.09
Delay/Veh:	47.6	101	71.6	85.1	16.9	16.9	204.6	38.3	66.9	100.4	26.2	102.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	47.6	101	71.6	85.1	16.9	16.9	204.6	38.3	66.9	100.4	26.2	102.6
LOS by Move:	D	F	E	F	B	B	F	D	E	F	C	F
HCM2kAvgQ:	5	19	11	44	16	16	4	9	17	11	4	27

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #46 Jefferson Ave & Ivy St/Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.705
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 26.8
Optimal Cycle: 77 Level Of Service: C

Street Name:	Jefferson Ave						Ivy St/Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2 0 3	0 1		2 0 3	0 1		1 0 1	1 0		1 0 2	0 1	
Volume Module:												
Base Vol:	259	1336	111	327	1823	72	49	95	129	363	121	400
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	259	1336	111	327	1823	72	49	95	129	363	121	400
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	259	1336	111	327	1823	72	49	95	129	363	121	400
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	259	1336	111	327	1823	72	49	95	129	363	121	400
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	259	1336	111	327	1823	72	49	95	129	363	121	400
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	259	1336	111	327	1823	72	49	95	129	363	121	400
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.91	0.85	0.92	0.91	0.85	0.95	0.87	0.87	0.95	0.95	0.85
Lanes:	2.00	3.00	1.00	2.00	3.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00
Final Sat.:	3502	5187	1615	3502	5187	1615	1805	1650	1650	1805	3610	1615
Capacity Analysis Module:												
Vol/Sat:	0.07	0.26	0.07	0.09	0.35	0.04	0.03	0.06	0.08	0.20	0.03	0.25
Crit Moves:	****				****				****	****		
Green/Cycle:	0.10	0.44	0.44	0.16	0.50	0.50	0.04	0.11	0.11	0.29	0.36	0.36
Volume/Cap:	0.70	0.58	0.16	0.58	0.70	0.09	0.69	0.52	0.70	0.70	0.09	0.69
Delay/Veh:	49.4	21.3	16.8	40.4	20.3	13.2	73.2	43.1	49.9	36.4	21.4	31.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	49.4	21.3	16.8	40.4	20.3	13.2	73.2	43.1	49.9	36.4	21.4	31.1
LOS by Move:	D	C	B	D	C	B	E	D	D	D	C	C
HCM2kAvgQ:	5	12	2	6	17	1	3	4	6	11	1	12

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #57 Whitewood Rd & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.718
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 24.3
Optimal Cycle: 81 Level Of Service: C

Street Name:	Whitewood Rd						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	0 1	1	0 1	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	50	240	241	260	536	102	32	1001	132	514	2105	166
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	50	240	241	260	536	102	32	1001	132	514	2105	166
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	50	240	241	260	536	102	32	1001	132	514	2105	166
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	50	240	241	260	536	102	32	1001	132	514	2105	166
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	50	240	241	260	536	102	32	1001	132	514	2105	166
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	50	240	241	260	536	102	32	1001	132	514	2105	166
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.85	0.95	0.93	0.93	0.95	0.89	0.89	0.95	0.90	0.90
Lanes:	1.00	2.00	1.00	1.00	1.68	0.32	1.00	2.65	0.35	1.00	2.78	0.22
Final Sat.:	1805	3610	1615	1805	2960	563	1805	4500	593	1805	4755	375
Capacity Analysis Module:												
Vol/Sat:	0.03	0.07	0.15	0.14	0.18	0.18	0.02	0.22	0.22	0.28	0.44	0.44
Crit Moves:		****		****				****		****		
Green/Cycle:	0.04	0.09	0.49	0.20	0.25	0.25	0.03	0.31	0.31	0.40	0.68	0.68
Volume/Cap:	0.71	0.72	0.30	0.72	0.71	0.71	0.65	0.72	0.72	0.72	0.65	0.65
Delay/Veh:	76.3	51.4	15.5	44.1	36.6	36.6	75.2	32.2	32.2	29.0	9.7	9.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	76.3	51.4	15.5	44.1	36.6	36.6	75.2	32.2	32.2	29.0	9.7	9.7
LOS by Move:	E	D	B	D	D	D	E	C	C	C	A	A
HCM2kAvgQ:	3	5	4	9	11	11	2	13	13	14	15	15

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #102 Leon Road & Scott Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.640
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 26.6
Optimal Cycle: 63 Level Of Service: C

Street Name:	Leon Road						Scott Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 1	1 0	1	0 1	1 0	1	0 3	0 1	1	0 2	1 0
Volume Module:												
Base Vol:	104	198	2	101	444	489	353	438	498	14	360	157
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	104	198	2	101	444	489	353	438	498	14	360	157
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	104	198	2	101	444	489	353	438	498	14	360	157
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	104	198	2	101	444	489	353	438	498	14	360	157
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	104	198	2	101	444	489	353	438	498	14	360	157
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	104	198	2	101	444	489	353	438	498	14	360	157
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.95	0.95	0.95	0.87	0.87	0.95	0.91	0.85	0.95	0.87	0.87
Lanes:	2.00	1.98	0.02	1.00	1.00	1.00	1.00	3.00	1.00	1.00	2.09	0.91
Final Sat.:	3502	3570	36	1805	1662	1662	1805	5187	1615	1805	3446	1503
Capacity Analysis Module:												
Vol/Sat:	0.03	0.06	0.06	0.06	0.27	0.29	0.20	0.08	0.31	0.01	0.10	0.10
Crit Moves:	****					****			****	****		
Green/Cycle:	0.05	0.25	0.25	0.25	0.46	0.46	0.32	0.48	0.48	0.01	0.17	0.17
Volume/Cap:	0.64	0.22	0.22	0.22	0.58	0.64	0.61	0.18	0.64	0.64	0.61	0.61
Delay/Veh:	55.2	29.7	29.7	29.7	20.5	21.7	30.4	14.7	21.2	98.9	39.6	39.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	55.2	29.7	29.7	29.7	20.5	21.7	30.4	14.7	21.2	98.9	39.6	39.6
LOS by Move:	E	C	C	C	C	C	C	B	C	F	D	D
HCM2kAvgQ:	3	3	3	2	11	13	10	3	12	1	6	6

Note: Queue reported is the number of cars per lane.

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Scenario Report

Scenario:	Future Proposed GP PM
Command:	Future Proposed GP PM
Volume:	Future Proposed GP PM
Geometry:	Future
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	Default Trip Distribution
Paths:	Default Path
Routes:	Default Route
Configuration:	Future Proposed GP PM

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City of Murrieta General Plan
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Turning Movement Report

Volume	Northbound			Southbound			Eastbound			Westbound			Total
Type	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Volume
#1 Menifee Road & Scott Road													
Base	291	672	860	196	284	99	272	967	458	408	546	566	5619
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	291	672	860	196	284	99	272	967	458	408	546	566	5619
#2 Leon Road & Scott Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#3 Winchester Road/SR-79 & Scott Road													
Base	126	2492	29	1119	1872	128	113	286	119	0	222	1066	7572
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	126	2492	29	1119	1872	128	113	286	119	0	222	1066	7572
#4 Antelope Road & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#5 Menifee Road - Meadowlark Road & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#6 Briggs Road & Keller Road													
Base	300	122	105	1	50	81	20	347	765	9	295	6	2101
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	300	122	105	1	50	81	20	347	765	9	295	6	2101
#7 Leon Road & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#8 Winchester Road - SR-79 & Keller Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#9 Antelope Road & Golden City Drive - Baxter Road													
Base	4	428	941	216	974	25	5	202	46	354	178	896	4269
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	4	428	941	216	974	25	5	202	46	354	178	896	4269

Traffix 7.9.0215 (c) 2008 Dowling Assoc. Licensed to MMA, LONG BEACH, CA

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#10 Whitewood Roa - /Meadowlark Road & Golden City Drive - Baxter Road													
Base	280	1410	3	0	596	978	319	12	967	0	7	2	4574
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	280	1410	3	0	596	978	319	12	967	0	7	2	4574
#11 Briggs Road & Baxter Road - Jean Nicholas													
Base	0	430	89	46	659	0	0	0	0	10	0	87	1321
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	430	89	46	659	0	0	0	0	10	0	87	1321
#12 Leon Road & Jean Nicholas													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#13 Winchester Road - SR-79 & Nicholas - Skyview													
Base	196	2680	209	79	2052	17	37	650	118	150	439	125	6752
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	196	2680	209	79	2052	17	37	650	118	150	439	125	6752
#14 Antelope Road & Linnel Lane Extension													
Base	42	637	99	49	1075	525	117	363	394	58	562	426	4347
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	42	637	99	49	1075	525	117	363	394	58	562	426	4347
#15 Whitewood Road - Meadowlark Road & Linnel Lane Extension													
Base	41	819	636	143	1315	229	22	335	154	223	775	779	5471
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	41	819	636	143	1315	229	22	335	154	223	775	779	5471
#16 Leon Road & Max Gillis Road													
Base	546	437	605	355	259	127	100	199	465	565	344	365	4367
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	546	437	605	355	259	127	100	199	465	565	344	365	4367
#17 Winchester Road - SR-79 & Max Gillis - Thompson													
Base	226	2443	80	294	1319	649	759	310	140	32	242	87	6581
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	226	2443	80	294	1319	649	759	310	140	32	242	87	6581
#18 California Oaks Road & Clinton Keith Road													
Base	312	0	1024	0	0	0	0	2396	112	439	2820	0	7103
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	312	0	1024	0	0	0	0	2396	112	439	2820	0	7103

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#19 I-215 SB Off-Ramp & Clinton Keith Road													
Base	0	0	0	47	0	608	0	2930	784	0	2369	219	6957
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	47	0	608	0	2930	784	0	2369	219	6957
#20 I-215 NB Off Ramp & Clinton Keith Road													
Base	409	0	492	0	0	0	0	1562	280	0	2836	314	5893
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	409	0	492	0	0	0	0	1562	280	0	2836	314	5893
#21 Antelope Road & Clinton Keith Road													
Base	0	0	0	174	0	916	117	2128	0	0	1645	427	5407
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	174	0	916	117	2128	0	0	1645	427	5407
#22 Meadowlark Lane - Whitewood Road & Clinton Keith Road													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#23 Liberty Road & Clinton Keith Road													
Base	81	0	286	0	0	0	0	2323	323	41	2078	0	5132
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	81	0	286	0	0	0	0	2323	323	41	2078	0	5132
#24 Leon Road & Clinton Keith Road													
Base	0	0	0	143	0	1218	638	1950	0	0	913	877	5739
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	143	0	1218	638	1950	0	0	913	877	5739
#25 Winchester Road - SR-79 & Benton Road													
Base	462	2486	738	75	1004	485	83	704	1387	241	720	92	8477
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	462	2486	738	75	1004	485	83	704	1387	241	720	92	8477
#26 Winchester Road - SR-79 & Via Mira Mosa													
Base	69	3255	228	107	2094	356	229	28	54	229	40	129	6818
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	69	3255	228	107	2094	356	229	28	54	229	40	129	6818
#27 Monroe Ave & Los Alamos													
Base	29	469	264	235	281	61	229	1460	165	84	975	467	4719
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	29	469	264	235	281	61	229	1460	165	84	975	467	4719

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#28 Jefferson Avenue & Murrieta Hot Springs Road													
Base	6	2300	1226	814	1025	70	40	210	111	581	90	891	7364
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	6	2300	1226	814	1025	70	40	210	111	581	90	891	7364
#29 Madison Avenue & Murrieta Hot Springs Road													
Base	316	600	1218	342	247	116	346	1505	279	791	1185	189	7134
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	316	600	1218	342	247	116	346	1505	279	791	1185	189	7134
#30 I-15 SB Off-Ramp & Murrieta Hot Springs Road													
Base	0	0	0	674	0	422	0	2533	487	0	2188	112	6416
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	674	0	422	0	2533	487	0	2188	112	6416
#31 I-15 NB Off-Ramp & Murrieta Hot Springs Road													
Base	213	0	239	0	0	0	0	2848	370	0	1582	1637	6889
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	213	0	239	0	0	0	0	2848	370	0	1582	1637	6889
#32 I-215 SB Off-Ramp & Murrieta Hot Springs Road													
Base	0	0	0	470	0	362	0	3377	139	0	2338	238	6924
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	470	0	362	0	3377	139	0	2338	238	6924
#33 I-215 NB Off-Ramp & Murrieta Hot Springs Road													
Base	84	0	465	0	0	0	0	2331	104	0	2361	1383	6728
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	84	0	465	0	0	0	0	2331	104	0	2361	1383	6728
#34 Jackson Avenue & Murrieta Hot Springs Road													
Base	201	0	169	0	0	0	0	1910	59	213	2568	0	5120
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	201	0	169	0	0	0	0	1910	59	213	2568	0	5120
#35 Margarita Road & Murrieta Hot Springs Road													
Base	933	69	383	185	77	150	51	1752	538	273	1609	38	6058
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	933	69	383	185	77	150	51	1752	538	273	1609	38	6058
#36 French Valley Parkway & Murrieta Hot Springs Road													
Base	32	0	1110	0	0	0	0	1808	343	453	1697	0	5443
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	32	0	1110	0	0	0	0	1808	343	453	1697	0	5443

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#37 Jefferson Avenue & Guava Street													
Base	14	3281	10	11	1174	349	103	86	133	2	71	16	5250
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	14	3281	10	11	1174	349	103	86	133	2	71	16	5250
#38 Jefferson Avenue & Cherry Street													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#39 Washington Ave & Calle Del Oso Oro/Nutmeg													
Base	421	306	134	93	236	55	28	209	276	164	635	163	2720
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	421	306	134	93	236	55	28	209	276	164	635	163	2720
#40 Clinton Keith Rd & Calle de Oso Oro/Bear Creek Dr													
Base	80	179	208	16	90	271	187	520	142	226	747	9	2675
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	80	179	208	16	90	271	187	520	142	226	747	9	2675
#41 Jefferson Ave & Nutmeg St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#42 Jefferson Ave & Magnolia St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#43 Jefferson Ave & Lemon St													
Base	418	2124	2	5	1607	38	42	39	270	16	21	13	4595
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	418	2124	2	5	1607	38	42	39	270	16	21	13	4595
#44 Jefferson Ave & Kalmia St													
Base	412	1763	951	978	1203	34	34	658	281	313	533	869	8029
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	412	1763	951	978	1203	34	34	658	281	313	533	869	8029
#45 Jefferson Ave & Juniper St													
Base	192	2787	67	48	1603	98	338	90	378	18	72	82	5773
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	192	2787	67	48	1603	98	338	90	378	18	72	82	5773

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#46 Jefferson Ave & Ivy St/Los Alamos Rd													
Base	312	2389	685	457	1448	113	90	224	187	259	274	494	6932
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	312	2389	685	457	1448	113	90	224	187	259	274	494	6932
#47 Madison Ave & Kalmia St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#48 Madison Ave/I-15 SB Ramps & Kalmia St													
Base	392	0	898	306	27	379	0	2534	265	265	1505	614	7185
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	392	0	898	306	27	379	0	2534	265	265	1505	614	7185
#49 Monroe Ave & Murrieta Hot Springs Rd													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#50 Hancock Ave & Murrieta Hot Springs Rd													
Base	0	0	0	598	0	820	755	3291	0	0	2482	311	8257
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	598	0	820	755	3291	0	0	2482	311	8257
#51 Alta Murrieta Dr & Murrieta Hot Springs Rd													
Base	587	221	53	195	128	493	698	1702	518	173	2320	153	7241
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	587	221	53	195	128	493	698	1702	518	173	2320	153	7241
#52 Winchester Road - SR-79 & Murrieta Hot Springs Rd													
Base	334	1970	195	195	1162	1115	1478	1036	280	244	754	99	8862
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	334	1970	195	195	1162	1115	1478	1036	280	244	754	99	8862
#53 Hancock Ave & Los Alamos Rd													
Base	124	438	871	657	115	26	105	1967	46	538	1361	703	6951
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	124	438	871	657	115	26	105	1967	46	538	1361	703	6951
#54 I-215 SB Ramps & Los Alamos Rd													
Base	0	0	0	537	0	1534	0	3121	446	146	1263	0	7047
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	537	0	1534	0	3121	446	146	1263	0	7047

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#55 I-215 NB Ramps & Los Alamos Rd													
Base	229	0	171	0	0	0	1589	1996	0	0	1182	331	5498
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	229	0	171	0	0	0	1589	1996	0	0	1182	331	5498
#56 Whitewood Rd & Los Alamos Rd													
Base	139	582	34	35	578	567	867	361	298	65	228	48	3802
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	139	582	34	35	578	567	867	361	298	65	228	48	3802
#57 Whitewood Rd & Murrieta Hot Springs Rd													
Base	434	314	529	362	266	233	166	1645	172	401	2240	457	7219
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	434	314	529	362	266	233	166	1645	172	401	2240	457	7219
#58 Adams Ave & Guava St													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#59 Nutmeg St & Clinton Keith Rd													
Base	65	83	494	318	32	58	92	1775	61	552	2056	380	5966
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	65	83	494	318	32	58	92	1775	61	552	2056	380	5966
#60 Murrieta Oaks Ave-Mitchell Rd & Clinton Keith Rd													
Base	16	134	19	103	180	900	135	3159	18	27	2766	395	7852
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	16	134	19	103	180	900	135	3159	18	27	2766	395	7852
#61 I-215 SB Ramps & Scott Rd													
Base	0	0	0	160	0	261	0	756	392	0	1529	445	3543
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	160	0	261	0	756	392	0	1529	445	3543
#62 I-215 NB Ramps & Scott Rd													
Base	0	7	963	0	0	368	80	1012	0	0	1761	395	4586
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	7	963	0	0	368	80	1012	0	0	1761	395	4586
#102 Leon Road & Scott Road													
Base	563	411	18	63	209	373	580	525	505	4	374	155	3780
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	563	411	18	63	209	373	580	525	505	4	374	155	3780

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#104 Antelope Road & Keller Road													
Base	923	556	870	74	72	563	828	753	209	228	658	167	5901
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	923	556	870	74	72	563	828	753	209	228	658	167	5901
#105 Menifee Road - Meadowlark Road & Keller Road													
Base	174	1077	822	86	680	363	765	314	468	176	392	121	5438
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	174	1077	822	86	680	363	765	314	468	176	392	121	5438
#107 Leon Road & Keller Road													
Base	62	926	1	1	688	78	88	81	281	17	190	3	2416
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	62	926	1	1	688	78	88	81	281	17	190	3	2416
#108 Winchester Road - SR-79 & Keller Road													
Base	1	2693	28	9	2103	1	2	59	2	10	16	25	4949
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	2693	28	9	2103	1	2	59	2	10	16	25	4949
#112 Leon Road & Jean Nicholas													
Base	2	530	263	327	553	11	2	128	12	114	123	446	2511
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	530	263	327	553	11	2	128	12	114	123	446	2511
#122 Meadowlark Lane - Whitewood Road & Clinton Keith Road													
Base	748	337	589	767	412	730	352	1452	506	314	701	1031	7939
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	748	337	589	767	412	730	352	1452	506	314	701	1031	7939
#138 Jefferson Avenue & Cherry Street													
Base	29	1226	823	196	861	6	2	1060	40	122	793	666	5824
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	29	1226	823	196	861	6	2	1060	40	122	793	666	5824
#141 Jefferson Ave & Nutmeg St													
Base	624	1208	377	103	1155	97	61	133	249	300	223	145	4675
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	624	1208	377	103	1155	97	61	133	249	300	223	145	4675
#142 Jefferson Ave & Magnolia St													
Base	137	2070	11	10	1578	106	159	5	56	7	5	14	4158
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	137	2070	11	10	1578	106	159	5	56	7	5	14	4158

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Volume Type	Northbound Left	Thru	Right	Southbound Left	Thru	Right	Eastbound Left	Thru	Right	Westbound Left	Thru	Right	Total Volume
#149 Monroe Ave & Murrieta Hot Springs Rd													
Base	178	236	199	1	239	110	164	2579	154	37	2043	26	5966
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	178	236	199	1	239	110	164	2579	154	37	2043	26	5966
#158 Adams Ave & Guava St													
Base	37	222	27	91	39	205	59	243	181	8	261	165	1538
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	37	222	27	91	39	205	59	243	181	8	261	165	1538

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Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
# 1 Menifee Road & Scott Road	C	31.2	0.844	C	31.2	0.844	+ 0.000 D/V
# 3 Winchester Road/SR-79 & Scott	F	187.8	1.529	F	187.8	1.529	+ 0.000 D/V
# 6 Briggs Road & Keller Road	B	13.7	0.528	B	13.7	0.528	+ 0.000 D/V
# 9 Antelope Road & Golden City Dr	E	55.2	1.150	E	55.2	1.150	+ 0.000 D/V
# 10 Whitewood Roa - /Meadowlark Ro	F	108.0	1.359	F	108.0	1.359	+ 0.000 D/V
# 14 Antelope Road & Linnel Lane Ex	C	23.4	0.677	C	23.4	0.677	+ 0.000 D/V
# 15 Whitewood Road - Meadowlark Ro	D	38.7	0.968	D	38.7	0.968	+ 0.000 D/V
# 28 Jefferson Avenue & Murrieta Ho	F	115.8	1.250	F	115.8	1.250	+ 0.000 D/V
# 29 Madison Avenue & Murrieta Hot	D	51.1	1.016	D	51.1	1.016	+ 0.000 D/V
# 44 Jefferson Ave & Kalmia St	F	158.5	1.688	F	158.5	1.688	+ 0.000 D/V
# 46 Jefferson Ave & Ivy St/Los Ala	D	36.5	0.947	D	36.5	0.947	+ 0.000 D/V
# 57 Whitewood Rd & Murrieta Hot Sp	D	51.6	1.014	D	51.6	1.014	+ 0.000 D/V
#102 Leon Road & Scott Road	C	32.5	0.817	C	32.5	0.817	+ 0.000 D/V

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #1 Menifee Road & Scott Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.844
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 31.2
Optimal Cycle: 146 Level Of Service: C

Street Name:	Menifee Rd						Scott Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Ovl			Ovl			Ovl		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	0 1	1	0 2	0 1	2	0 3	0 1	2	0 3	0 1
Volume Module:												
Base Vol:	291	672	860	196	284	99	272	967	458	408	546	566
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	291	672	860	196	284	99	272	967	458	408	546	566
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	291	672	860	196	284	99	272	967	458	408	546	566
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	291	672	860	196	284	99	272	967	458	408	546	566
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	291	672	860	196	284	99	272	967	458	408	546	566
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	291	672	860	196	284	99	272	967	458	408	546	566
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.85	0.95	0.95	0.85	0.92	0.91	0.85	0.92	0.91	0.85
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	2.00	3.00	1.00	2.00	3.00	1.00
Final Sat.:	1805	3610	1615	1805	3610	1615	3502	5187	1615	3502	5187	1615
Capacity Analysis Module:												
Vol/Sat:	0.16	0.19	0.53	0.11	0.08	0.06	0.08	0.19	0.28	0.12	0.11	0.35
Crit Moves:			****	****			****					****
Green/Cycle:	0.42	0.49	0.64	0.13	0.20	0.30	0.09	0.23	0.65	0.15	0.29	0.42
Volume/Cap:	0.39	0.38	0.83	0.84	0.39	0.21	0.84	0.80	0.44	0.80	0.37	0.84
Delay/Veh:	20.5	15.9	20.0	66.2	34.7	26.6	62.8	40.1	8.8	50.1	28.6	35.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	20.5	15.9	20.0	66.2	34.7	26.6	62.8	40.1	8.8	50.1	28.6	35.9
LOS by Move:	C	B	B	E	C	C	E	D	A	D	C	D
HCM2kAvgQ:	6	7	23	9	4	2	7	12	7	8	5	18

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #3 Winchester Road/SR-79 & Scott Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.529
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 187.8
Optimal Cycle: 180 Level Of Service: F

Street Name:	Winchester Road/SR-79									Scott Road								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected					Protected				
Rights:	Include					Include					Include					Include				
Min. Green:	0	0	0			0	0	0			0	0	0			0	0	0		
Lanes:	1	0	2	1	0	2	0	2	1	0	1	0	2	1	0	1	0	3	0	1
Volume Module:																				
Base Vol:	126	2492	29			1119	1872	128			113	286	119			0	222	1066		
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Initial Bse:	126	2492	29			1119	1872	128			113	286	119			0	222	1066		
Added Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
PasserByVol:	0	0	0			0	0	0			0	0	0			0	0	0		
Initial Fut:	126	2492	29			1119	1872	128			113	286	119			0	222	1066		
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Volume:	126	2492	29			1119	1872	128			113	286	119			0	222	1066		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
Reduced Vol:	126	2492	29			1119	1872	128			113	286	119			0	222	1066		
PCE Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
MLF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
FinalVolume:	126	2492	29			1119	1872	128			113	286	119			0	222	1066		
Saturation Flow Module:																				
Sat/Lane:	1900	1900	1900			1900	1900	1900			1900	1900	1900			1900	1900	1900		
Adjustment:	0.95	0.91	0.91			0.92	0.90	0.90			0.95	0.87	0.87			1.00	0.91	0.85		
Lanes:	1.00	2.97	0.03			2.00	2.81	0.19			1.00	2.12	0.88			1.00	3.00	1.00		
Final Sat.:	1805	5117	60			3502	4806	329			1805	3502	1457			1900	5187	1615		
Capacity Analysis Module:																				
Vol/Sat:	0.07	0.49	0.49			0.32	0.39	0.39			0.06	0.08	0.08			0.00	0.04	0.66		
Crit Moves:		****				****					****							****		
Green/Cycle:	0.08	0.32	0.32			0.21	0.45	0.45			0.04	0.47	0.47			0.00	0.43	0.43		
Volume/Cap:	0.87	1.53	1.53			1.53	0.87	0.87			1.53	0.17	0.17			0.00	0.10	1.53		
Delay/Veh:	85.1	275	275.3			284.6	28.9	28.9			342.9	15.2	15.2			0.0	16.9	273.8		
User DelAdj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
AdjDel/Veh:	85.1	275	275.3			284.6	28.9	28.9			342.9	15.2	15.2			0.0	16.9	273.8		
LOS by Move:	F	F	F			F	C	C			F	B	B			A	B	F		
HCM2kAvgQ:	6	68	68			44	23	23			10	3	3			0	1	78		

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #6 Briggs Road & Keller Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.528
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 13.7
Optimal Cycle: 48 Level Of Service: B

Street Name:	Briggs Road									Keller Road								
Approach:	North Bound				South Bound				East Bound				West Bound					
Movement:	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R	L	-	T	-	R
Control:	Protected					Protected					Protected					Protected				
Rights:	Include					Include					Ovl					Include				
Min. Green:	0	0	0			0	0	0			0	0	0			0	0	0		
Lanes:	1	0	1	1	0	1	0	1	1	0	1	0	2	0	1	1	0	1	1	0
Volume Module:																				
Base Vol:	300	122	105			1	50	81			20	347	765			9	295	6		
Growth Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
Initial Bse:	300	122	105			1	50	81			20	347	765			9	295	6		
Added Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
PasserByVol:	0	0	0			0	0	0			0	0	0			0	0	0		
Initial Fut:	300	122	105			1	50	81			20	347	765			9	295	6		
User Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
PHF Volume:	300	122	105			1	50	81			20	347	765			9	295	6		
Reduct Vol:	0	0	0			0	0	0			0	0	0			0	0	0		
Reduced Vol:	300	122	105			1	50	81			20	347	765			9	295	6		
PCE Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
MLF Adj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
FinalVolume:	300	122	105			1	50	81			20	347	765			9	295	6		
Saturation Flow Module:																				
Sat/Lane:	1900	1900	1900			1900	1900	1900			1900	1900	1900			1900	1900	1900		
Adjustment:	0.95	0.88	0.88			0.95	0.86	0.86			0.95	0.95	0.85			0.95	0.95	0.95		
Lanes:	1.00	1.07	0.93			1.00	1.00	1.00			1.00	2.00	1.00			1.00	1.96	0.04		
Final Sat.:	1805	1806	1555			1805	1637	1637			1805	3610	1615			1805	3527	72		
Capacity Analysis Module:																				
Vol/Sat:	0.17	0.07	0.07			0.00	0.03	0.05			0.01	0.10	0.47			0.00	0.08	0.08		
Crit Moves:	****							****					****	****						
Green/Cycle:	0.31	0.41	0.41			0.00	0.09	0.09			0.07	0.58	0.90			0.01	0.52	0.52		
Volume/Cap:	0.53	0.17	0.17			0.17	0.33	0.53			0.16	0.17	0.53			0.53	0.16	0.16		
Delay/Veh:	29.1	19.0	19.0			62.5	42.8	45.3			44.4	9.7	1.4			77.0	12.5	12.5		
User DelAdj:	1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00			1.00	1.00	1.00		
AdjDel/Veh:	29.1	19.0	19.0			62.5	42.8	45.3			44.4	9.7	1.4			77.0	12.5	12.5		
LOS by Move:	C	B	B			E	D	D			D	A	A			E	B	B		
HCM2kAvgQ:	8	2	2			0	2	3			1	3	5			1	2	2		

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #9 Antelope Road & Golden City Drive - Baxter Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.150
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 55.2
Optimal Cycle: 180 Level Of Service: E

Street Name:	Antelope Road						Golden City Drive - Baxter Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	0 1	1	0 1	1 0	1	0 1	1 0	1	0 1	1 0
Volume Module:												
Base Vol:	4	428	941	216	974	25	5	202	46	354	178	896
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	4	428	941	216	974	25	5	202	46	354	178	896
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	4	428	941	216	974	25	5	202	46	354	178	896
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	4	428	941	216	974	25	5	202	46	354	178	896
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	4	428	941	216	974	25	5	202	46	354	178	896
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	4	428	941	216	974	25	5	202	46	354	178	896
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.17	0.95	0.85	0.43	0.95	0.95	0.14	0.92	0.92	0.54	0.83	0.83
Lanes:	1.00	2.00	1.00	1.00	1.95	0.05	1.00	1.63	0.37	1.00	1.00	1.00
Final Sat.:	327	3610	1615	817	3506	90	268	2858	651	1034	1579	1579
Capacity Analysis Module:												
Vol/Sat:	0.01	0.12	0.58	0.26	0.28	0.28	0.02	0.07	0.07	0.34	0.11	0.57
Crit Moves:			****									****
Green/Cycle:	0.51	0.51	0.51	0.51	0.51	0.51	0.49	0.49	0.49	0.49	0.49	0.49
Volume/Cap:	0.02	0.23	1.15	0.52	0.55	0.55	0.04	0.14	0.14	0.69	0.23	1.15
Delay/Veh:	12.4	13.9	106.1	17.7	17.2	17.2	13.2	13.9	13.9	23.7	14.5	105.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	12.4	13.9	106.1	17.7	17.2	17.2	13.2	13.9	13.9	23.7	14.5	105.3
LOS by Move:	B	B	F	B	B	B	B	B	B	C	B	F
HCM2kAvgQ:	0	4	47	5	11	11	0	2	2	10	3	47

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #10 Whitewood Roa - /Meadowlark Road & Golden City Drive - Baxter R

Cycle (sec): 100 Critical Vol./Cap.(X): 1.359
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 108.0
Optimal Cycle: 180 Level Of Service: F

Street Name:	Whitewood Road - Meadowlark Road						Golden City Drive - Baxter Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 1	1 0	1	0 2	0 1	1	0 1	0 1	1	0 1	1 0
Volume Module:												
Base Vol:	280	1410	3	0	596	978	319	12	967	0	7	2
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	280	1410	3	0	596	978	319	12	967	0	7	2
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	280	1410	3	0	596	978	319	12	967	0	7	2
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	280	1410	3	0	596	978	319	12	967	0	7	2
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	280	1410	3	0	596	978	319	12	967	0	7	2
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	280	1410	3	0	596	978	319	12	967	0	7	2
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.95	1.00	0.95	0.85	0.95	1.00	0.85	1.00	0.92	0.92
Lanes:	1.00	1.99	0.01	1.00	2.00	1.00	1.00	1.00	1.00	1.00	1.56	0.44
Final Sat.:	1805	3602	8	1900	3610	1615	1805	1900	1615	1900	2715	776
Capacity Analysis Module:												
Vol/Sat:	0.16	0.39	0.39	0.00	0.17	0.61	0.18	0.01	0.60	0.00	0.00	0.00
Crit Moves:	****					****			****	****		
Green/Cycle:	0.11	0.56	0.56	0.00	0.45	0.45	0.43	0.44	0.44	0.00	0.01	0.01
Volume/Cap:	1.36	0.70	0.70	0.00	0.37	1.36	0.41	0.01	1.36	0.00	0.41	0.41
Delay/Veh:	234.2	17.0	17.0	0.0	18.6	198.4	19.8	15.8	198.8	0.0	61.3	61.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	234.2	17.0	17.0	0.0	18.6	198.4	19.8	15.8	198.8	0.0	61.3	61.3
LOS by Move:	F	B	B	A	B	F	B	B	F	A	E	E
HCM2kAvgQ:	20	17	17	0	6	63	7	0	62	0	1	1

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #14 Antelope Road & Linnel Lane Extension

Cycle (sec): 100 Critical Vol./Cap.(X): 0.677
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 23.4
Optimal Cycle: 71 Level Of Service: C

Street Name:	Antelope Road						Linnel Lane Extension					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	0 1	1	0 2	0 1	1	0 2	0 1	1	0 2	0 1
Volume Module:												
Base Vol:	42	637	99	49	1075	525	117	363	394	58	562	426
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	42	637	99	49	1075	525	117	363	394	58	562	426
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	42	637	99	49	1075	525	117	363	394	58	562	426
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	42	637	99	49	1075	525	117	363	394	58	562	426
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	42	637	99	49	1075	525	117	363	394	58	562	426
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	42	637	99	49	1075	525	117	363	394	58	562	426
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.85	0.95	0.95	0.85	0.95	0.95	0.85	0.95	0.95	0.85
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1805	3610	1615	1805	3610	1615	1805	3610	1615	1805	3610	1615
Capacity Analysis Module:												
Vol/Sat:	0.02	0.18	0.06	0.03	0.30	0.33	0.06	0.10	0.24	0.03	0.16	0.26
Crit Moves:	****					****	****					****
Green/Cycle:	0.03	0.45	0.45	0.07	0.48	0.48	0.10	0.43	0.43	0.06	0.39	0.39
Volume/Cap:	0.68	0.40	0.14	0.40	0.62	0.68	0.68	0.23	0.57	0.57	0.40	0.68
Delay/Veh:	73.7	18.8	16.4	46.7	19.9	22.4	54.0	18.2	22.7	53.4	22.2	28.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	73.7	18.8	16.4	46.7	19.9	22.4	54.0	18.2	22.7	53.4	22.2	28.3
LOS by Move:	E	B	B	D	B	C	D	B	C	D	C	C
HCM2kAvgQ:	3	7	2	2	13	13	5	4	10	3	7	12

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #15 Whitewood Road - Meadowlark Road & Linnel Lane Extension

Cycle (sec): 100 Critical Vol./Cap.(X): 0.968
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 38.7
Optimal Cycle: 180 Level Of Service: D

Street Name:	Whitewood Road - Meadowlark Road						Linnel Lane Extension (Future)					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	0 1	1	0 1	1 0	1	0 1	1 0	1	0 2	0 1
Volume Module:												
Base Vol:	41	819	636	143	1315	229	22	335	154	223	775	779
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	41	819	636	143	1315	229	22	335	154	223	775	779
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	41	819	636	143	1315	229	22	335	154	223	775	779
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	41	819	636	143	1315	229	22	335	154	223	775	779
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	41	819	636	143	1315	229	22	335	154	223	775	779
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	41	819	636	143	1315	229	22	335	154	223	775	779
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.85	0.95	0.93	0.93	0.95	0.91	0.91	0.95	0.95	0.85
Lanes:	1.00	2.00	1.00	1.00	1.70	0.30	1.00	1.37	0.63	1.00	2.00	1.00
Final Sat.:	1805	3610	1615	1805	3007	524	1805	2357	1083	1805	3610	1615
Capacity Analysis Module:												
Vol/Sat:	0.02	0.23	0.39	0.08	0.44	0.44	0.01	0.14	0.14	0.12	0.21	0.48
Crit Moves:			****	****			****					****
Green/Cycle:	0.02	0.41	0.41	0.08	0.46	0.46	0.01	0.27	0.27	0.24	0.50	0.50
Volume/Cap:	0.94	0.56	0.97	0.97	0.94	0.94	0.97	0.52	0.52	0.52	0.43	0.97
Delay/Veh:	162.0	23.2	56.1	109.8	36.6	36.6	223.0	31.3	31.3	34.3	16.2	48.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	162.0	23.2	56.1	109.8	36.6	36.6	223.0	31.3	31.3	34.3	16.2	48.2
LOS by Move:	F	C	E	F	D	D	F	C	C	C	B	D
HCM2kAvgQ:	3	10	25	8	29	29	2	7	7	6	8	29

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #28 Jefferson Avenue & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.250
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 115.8
Optimal Cycle: 180 Level Of Service: F

Street Name:	Jefferson Avenue						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0	3 0	2	2 0	2 1	0	1 0	2 1	0	1 0	3 0	1
Volume Module:												
Base Vol:	6	2300	1226	814	1025	70	40	210	111	581	90	891
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	6	2300	1226	814	1025	70	40	210	111	581	90	891
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	6	2300	1226	814	1025	70	40	210	111	581	90	891
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	6	2300	1226	814	1025	70	40	210	111	581	90	891
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	6	2300	1226	814	1025	70	40	210	111	581	90	891
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	6	2300	1226	814	1025	70	40	210	111	581	90	891
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.91	0.75	0.92	0.90	0.90	0.95	0.86	0.86	0.95	0.91	0.85
Lanes:	1.00	3.00	2.00	2.00	2.81	0.19	1.00	2.00	1.00	1.00	3.00	1.00
Final Sat.:	1805	5187	2842	3502	4807	328	1805	3278	1639	1805	5187	1615
Capacity Analysis Module:												
Vol/Sat:	0.00	0.44	0.43	0.23	0.21	0.21	0.02	0.06	0.07	0.32	0.02	0.55
Crit Moves:		****		****			****					****
Green/Cycle:	0.01	0.35	0.35	0.19	0.53	0.53	0.02	0.08	0.08	0.38	0.44	0.44
Volume/Cap:	0.40	1.25	1.22	1.25	0.40	0.40	1.25	0.80	0.85	0.85	0.04	1.25
Delay/Veh:	66.0	149	138.5	165.5	14.0	14.0	291.8	56.4	61.7	38.2	15.9	151.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	66.0	149	138.5	165.5	14.0	14.0	291.8	56.4	61.7	38.2	15.9	151.8
LOS by Move:	E	F	F	F	B	B	F	E	E	D	B	F
HCM2kAvgQ:	1	49	39	26	7	7	4	6	6	19	1	51

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #29 Madison Avenue & Murrieta Hot Springs Road

Cycle (sec): 100 Critical Vol./Cap.(X): 1.016
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 51.1
Optimal Cycle: 180 Level Of Service: D

Street Name:	Madison Avenue						Murrieta Hot Springs Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2 0	2 0	2	2 0	1 1	0	2 0	3 1	0	2 0	3 0	1
Volume Module:												
Base Vol:	316	600	1218	342	247	116	346	1505	279	791	1185	189
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	316	600	1218	342	247	116	346	1505	279	791	1185	189
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	316	600	1218	342	247	116	346	1505	279	791	1185	189
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	316	600	1218	342	247	116	346	1505	279	791	1185	189
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	316	600	1218	342	247	116	346	1505	279	791	1185	189
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	316	600	1218	342	247	116	346	1505	279	791	1185	189
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.95	0.75	0.92	0.90	0.90	0.92	0.89	0.89	0.92	0.91	0.85
Lanes:	2.00	2.00	2.00	2.00	1.36	0.64	2.00	3.37	0.63	2.00	3.00	1.00
Final Sat.:	3502	3610	2842	3502	2338	1098	3502	5700	1057	3502	5187	1615
Capacity Analysis Module:												
Vol/Sat:	0.09	0.17	0.43	0.10	0.11	0.11	0.10	0.26	0.26	0.23	0.23	0.12
Crit Moves:			****	****				****		****		
Green/Cycle:	0.24	0.42	0.42	0.10	0.28	0.28	0.15	0.26	0.26	0.22	0.34	0.34
Volume/Cap:	0.38	0.39	1.02	1.02	0.38	0.38	0.68	1.02	1.02	1.02	0.68	0.35
Delay/Veh:	32.2	20.2	59.0	98.4	29.3	29.3	44.2	62.6	62.6	75.2	29.6	25.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	32.2	20.2	59.0	98.4	29.3	29.3	44.2	62.6	62.6	75.2	29.6	25.3
LOS by Move:	C	C	E	F	C	C	D	E	E	E	C	C
HCM2kAvgQ:	4	7	29	10	5	5	7	22	22	19	12	4

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #44 Jefferson Ave & Kalmia St

Cycle (sec): 100 Critical Vol./Cap.(X): 1.688
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 158.5
Optimal Cycle: 180 Level Of Service: F

Street Name:	Jefferson Ave						Kalmia St					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 3	0 1	1	0 2	1 0	1	0 2	1 0	1	0 2	0 1
Volume Module:												
Base Vol:	412	1763	951	978	1203	34	34	658	281	313	533	869
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	412	1763	951	978	1203	34	34	658	281	313	533	869
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	412	1763	951	978	1203	34	34	658	281	313	533	869
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	412	1763	951	978	1203	34	34	658	281	313	533	869
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	412	1763	951	978	1203	34	34	658	281	313	533	869
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	412	1763	951	978	1203	34	34	658	281	313	533	869
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.91	0.85	0.95	0.91	0.91	0.95	0.87	0.87	0.95	0.95	0.85
Lanes:	2.00	3.00	1.00	1.00	2.92	0.08	1.00	2.10	0.90	1.00	2.00	1.00
Final Sat.:	3502	5187	1615	1805	5024	142	1805	3471	1482	1805	3610	1615
Capacity Analysis Module:												
Vol/Sat:	0.12	0.34	0.59	0.54	0.24	0.24	0.02	0.19	0.19	0.17	0.15	0.54
Crit Moves:			****	****			****					****
Green/Cycle:	0.22	0.35	0.35	0.32	0.45	0.45	0.01	0.17	0.17	0.16	0.32	0.32
Volume/Cap:	0.53	0.97	1.69	1.69	0.53	0.53	1.69	1.10	1.10	1.10	0.46	1.69
Delay/Veh:	35.1	47.5	349.6	350.8	20.2	20.2	507.1	103	103.2	124.9	27.5	351.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	35.1	47.5	349.6	350.8	20.2	20.2	507.1	103	103.2	124.9	27.5	351.8
LOS by Move:	D	D	F	F	C	C	F	F	F	F	C	F
HCM2kAvgQ:	6	26	77	79	10	10	4	18	18	17	7	71

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #46 Jefferson Ave & Ivy St/Los Alamos Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 0.947
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 36.5
Optimal Cycle: 180 Level Of Service: D

Street Name:	Jefferson Ave						Ivy St/Los Alamos Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 3	0 1	2	0 3	0 1	1	0 1	1 0	1	0 2	0 1
Volume Module:												
Base Vol:	312	2389	685	457	1448	113	90	224	187	259	274	494
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	312	2389	685	457	1448	113	90	224	187	259	274	494
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	312	2389	685	457	1448	113	90	224	187	259	274	494
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	312	2389	685	457	1448	113	90	224	187	259	274	494
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	312	2389	685	457	1448	113	90	224	187	259	274	494
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	312	2389	685	457	1448	113	90	224	187	259	274	494
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.91	0.85	0.92	0.91	0.85	0.95	0.89	0.89	0.95	0.95	0.85
Lanes:	2.00	3.00	1.00	2.00	3.00	1.00	1.00	1.09	0.91	1.00	2.00	1.00
Final Sat.:	3502	5187	1615	3502	5187	1615	1805	1834	1531	1805	3610	1615
Capacity Analysis Module:												
Vol/Sat:	0.09	0.46	0.42	0.13	0.28	0.07	0.05	0.12	0.12	0.14	0.08	0.31
Crit Moves:		****		****			****					****
Green/Cycle:	0.15	0.49	0.49	0.14	0.47	0.47	0.05	0.17	0.17	0.20	0.32	0.32
Volume/Cap:	0.59	0.95	0.87	0.95	0.59	0.15	0.95	0.71	0.71	0.71	0.23	0.95
Delay/Veh:	41.3	33.0	33.4	70.7	19.6	15.0	122.0	43.0	43.0	43.3	24.9	59.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	41.3	33.0	33.4	70.7	19.6	15.0	122.0	43.0	43.0	43.3	24.9	59.6
LOS by Move:	D	C	C	E	B	B	F	D	D	D	C	E
HCM2kAvgQ:	5	31	22	11	12	2	6	8	8	9	3	20

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
Future Proposed General Plan
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #57 Whitewood Rd & Murrieta Hot Springs Rd

Cycle (sec): 100 Critical Vol./Cap.(X): 1.014
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 51.6
Optimal Cycle: 180 Level Of Service: D

Street Name:	Whitewood Rd						Murrieta Hot Springs Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1	0 2	0 1	1	0 1	1 0	1	0 2	1 0	1	0 2	1 0
Volume Module:												
Base Vol:	434	314	529	362	266	233	166	1645	172	401	2240	457
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	434	314	529	362	266	233	166	1645	172	401	2240	457
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	434	314	529	362	266	233	166	1645	172	401	2240	457
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	434	314	529	362	266	233	166	1645	172	401	2240	457
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	434	314	529	362	266	233	166	1645	172	401	2240	457
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	434	314	529	362	266	233	166	1645	172	401	2240	457
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.85	0.95	0.88	0.88	0.95	0.90	0.90	0.95	0.89	0.89
Lanes:	1.00	2.00	1.00	1.00	1.07	0.93	1.00	2.72	0.28	1.00	2.49	0.51
Final Sat.:	1805	3610	1615	1805	1790	1568	1805	4630	484	1805	4200	857
Capacity Analysis Module:												
Vol/Sat:	0.24	0.09	0.33	0.20	0.15	0.15	0.09	0.36	0.36	0.22	0.53	0.53
Crit Moves:	****				****		****				****	
Green/Cycle:	0.24	0.13	0.37	0.25	0.15	0.15	0.09	0.38	0.38	0.24	0.53	0.53
Volume/Cap:	1.01	0.66	0.89	0.80	1.01	1.01	1.01	0.94	0.94	0.94	1.01	1.01
Delay/Veh:	85.3	44.6	44.6	44.6	86.9	86.9	119.6	39.2	39.2	65.6	44.8	44.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	85.3	44.6	44.6	44.6	86.9	86.9	119.6	39.2	39.2	65.6	44.8	44.8
LOS by Move:	F	D	D	D	F	F	F	D	D	E	D	D
HCM2kAvgQ:	20	6	19	13	13	13	9	25	25	17	39	39

Note: Queue reported is the number of cars per lane.

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City of Murrieta General Plan
Future Proposed General Plan
PM Peak Hour

Level Of Service Computation Report
2000 HCM Operations Method (Future Volume Alternative)

Intersection #102 Leon Road & Scott Road

Cycle (sec): 100 Critical Vol./Cap.(X): 0.817
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 32.5
Optimal Cycle: 125 Level Of Service: C

Street Name:	Leon Road						Scott Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0 1	1 0	1	0 1	1 0	1	0 3	0 1	1	0 2	1 0
Volume Module:												
Base Vol:	563	411	18	63	209	373	580	525	505	4	374	155
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	563	411	18	63	209	373	580	525	505	4	374	155
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	563	411	18	63	209	373	580	525	505	4	374	155
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	563	411	18	63	209	373	580	525	505	4	374	155
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	563	411	18	63	209	373	580	525	505	4	374	155
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	563	411	18	63	209	373	580	525	505	4	374	155
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.94	0.94	0.95	0.86	0.86	0.95	0.91	0.85	0.95	0.87	0.87
Lanes:	2.00	1.92	0.08	1.00	1.00	1.00	1.00	3.00	1.00	1.00	2.12	0.88
Final Sat.:	3502	3438	151	1805	1632	1632	1805	5187	1615	1805	3506	1453
Capacity Analysis Module:												
Vol/Sat:	0.16	0.12	0.12	0.03	0.13	0.23	0.32	0.10	0.31	0.00	0.11	0.11
Crit Moves:	****					****	****				****	
Green/Cycle:	0.20	0.37	0.37	0.11	0.28	0.28	0.39	0.52	0.52	0.00	0.13	0.13
Volume/Cap:	0.82	0.32	0.32	0.32	0.46	0.82	0.82	0.19	0.60	0.60	0.82	0.82
Delay/Veh:	46.0	22.8	22.8	42.2	30.0	41.0	34.5	12.9	18.0	149.9	50.3	50.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	46.0	22.8	22.8	42.2	30.0	41.0	34.5	12.9	18.0	149.9	50.3	50.3
LOS by Move:	D	C	C	D	C	D	C	B	B	F	D	D
HCM2kAvgQ:	11	5	5	2	6	14	18	3	11	1	8	8

Note: Queue reported is the number of cars per lane.

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APPENDIX C:
SED DATA

TAZ_ID	Existing General Plan	Preferred LU for GPU 2035	Existing on the Ground Sq Ft (PTAX)	Existing on the Ground DU (PTAX)	GPU 2035 Growth	Acres	Focus Area	Existing Zoning	Modeled 2009 Sq Ft	Modeled 2009 DU	Existing GP Modeled 2035 Sq Ft	Existing GP Modeled 2035 DU	GPU 2035 Growth Sq FT	GPU 2035 Growth DU	GPU 2035 Sq Ft to be Modeled	GPU 2035 DU to be Modeled For EIR	GPU 2035 DU to be Modeled For Traffic & Fiscal	2009 Students	Existing GP 2035 Modeled Students	GPU 2035 Students	2009 Total Jobs	2009 Retail Jobs	2009 Non-Retail Jobs	Existing GP Modeled 2035 Total Jobs	Existing GP Modeled 2035 Retail Jobs	Existing GP Modeled 2035 Non-Retail Jobs	GPU 2035 Total Jobs	GPU 2035 Retail Jobs	GPU 2035 Non-Retail Jobs	2009 Population	Existing GP Modeled 2035 Population	GPU 2035 Population	Notes
401	Open Space	Parks and Open Space				181.07		OS																									
401	Private Recreation	Parks and Open Space		3		188.74		PR																									
401	Single-Family 1, Residential	Single Family Residential		317		194.69		SF-1		320		368				388	368													960	1,104	1,104	
401	Single-Family 2, Residential	Single Family Residential		320		56.31		SF-2		271		279				320	320													813	837	960	
402	Civic/Institutional	Civic and Institutional				9.93		SP-C/I													5	0	5	5	0	5	5	0	5				
402	Open Space	Parks and Open Space				6.20		OS																									
402	Single-Family 1, Residential	Single Family Residential		99		21.41		SF-1		100		100				100	100													300	300	300	
402	Specific Plan	Parks and Open Space	15,404			218.93									15,404																		
402	Specific Plan	Single Family Residential		465		128.96		SF1*		379		394				465	465													1,137	1,182	1,395	
402								SF2*		83		298				298	298													249	894	894	
403	Open Space	Parks and Open Space		1		26.80		OS																									
403	Parks & Recreation	Parks and Open Space				29.22		P&R																									
403	Single-Family 1, Residential	Single Family Residential		569		110.70		SF-1		559		559				559	559													1,677	1,677	1,677	
403	Specific Plan	Civic/Institutional				10.47		SP-C/I		1143 students								1,143	1,143	1,143													Elementary School (10.4 acres)
403	Specific Plan	Parks and Open Space				12.53																											
403	Specific Plan	Single Family Residential		151		31.36		SF1*		152		152				152	152													456	456	456	
404	Single-Family 1, Residential	Single Family Residential		40		9.43		SF-1		40		40				40	40													120	120	120	
404	Specific Plan	Parks and Open Space				2.20																											
404	Specific Plan	Single Family Residential		368		60.53		SF1*		368		368				368	368													1,104	1,104	1,104	
405	Specific Plan	Parks and Open Space				64.32																											
405	Specific Plan	Single Family Residential				77.26		SF1*		0		270				270	270													0	810	810	
406	Specific Plan	Parks and Open Space				55.32																											
406	Specific Plan	Single Family Residential				0.33		SP-C/I		0		0				0	0				5	0	5	5	0	5	5	0	5	0	0	0	Rancho Water & Sewer (jobs)
407	Open Space	Parks and Open Space				40.72																											
407	Single-Family 1, Residential	Single Family Residential		260		52.88		SF-1		260		260				260	260													780	780	780	
408	Specific Plan	Single Family Residential				89.74		SF1*		0		322				322	322													0	966	966	
409	Specific Plan	Parks and Open Space				36.53																											
409	Specific Plan	Single Family Residential				107.64		SF1*		0		378				378	378													0	1,134	1,134	
410	Specific Plan	Civic/Institutional				9.36		SP-S		1000 students								1,000	1,000	1,000													
410	Specific Plan	Commercial				3.53		SP-C	0		36,500				36,500						0	0	0	73	73	0	73	73	0				
410	Specific Plan	Parks and Open Space				8.64																											
410	Specific Plan	Single Family Residential				16.33		SF1*		0		59				59	59													0	177	177	
411	Community Commercial	Commercial	121,725			12.05		CC	121,725		147,500				147,500						219	219	0	266	266	0	295	295	0				
411	Estate Residential 3	Single Family Residential		161		62.45		ER-3		162		162				162	162													486	486	486	
411	Open Space	Parks and Open Space				75.58																											
411	Single-Family 1, Residential	Single Family Residential		182		39.53		SF-1		182		182				182	182													546	546	546	
412	Estate Residential 3	Single Family Residential		44		12.25		ER-3		44		44				44	44													132	132	132	
412	Multi-Family 1, Residential	Multiple Family Residential				14.27		MF-1		0		178				178	178													0	534	534	
412	Open Space	Parks and Open Space				0.96																											
412	Single-Family 1, Residential	Single Family Residential		212		43.80		SF-1		214		214				214	214													642	642	642	
413	Civic/Institutional	Civic and Institutional				2.51		CI																									
413	Specific Plan	Parks and Open Space				33.46																											
413	Specific Plan	Single Family Residential		108		21.26		SF1*		114		114				114	114													342	342	342	
414	Estate Residential 3	Single Family Residential		7		41.68		ER-3		9		13				13	13													27	39	39	
414	Open Space	Parks and Open Space				8.81		OS																									
414	Parks & Recreation	Parks and Open Space				0.45		P&R																									
414	Single-Family 1, Residential	Single Family Residential		85		21.88		SF-1		84		84				85	85													252	252	255	
415	Estate Residential 3	Single Family Residential		84		62.56		ER-3		85		97				97	97													255	291	291	
415	Open Space	Parks and Open Space				0.22		OS																									
416	Civic/Institutional	Civic and Institutional	827,572			76.34		C/I		5336 students								5,336	5,336	5,336													Middle & High Schools (76.3 acres)
416	Estate Residential 2	Single Family Residential		43		72.41		ER-2		42		72				72	72													126	216	216	
417	Estate Residential 3	Single Family Residential		1		19.69		ER-3		1		12				12	12													3	36	36	
417	Open Space	Parks and Open Space		1		17.67		OS																									
417	Parks & Recreation	Parks and Open Space				2.27		P&R																									
417	Single-Family 1, Residential	Single Family Residential		117		23.07		SF-1		108		108				117	117													324	324	351	
418	Rural Residential	Rural Residential		29		285.60		RR		31		61				61	61													93	183	183	
419	Open Space	Parks and Open Space		1		14.13		OS																									
419	Parks & Recreation	Parks and Open Space				2.66		P&R																									
419	Single-Family 1, Residential	Single Family Residential		221		48.01		SF-1		222		222				222	222													666	666	666	
420	Estate Residential 3	Single Family Residential		132		66.44		ER-3		132		132				132	132													396	396	396	
420	Open Space	Parks and Open Space				4.54		OS																									
421	Estate Residential 2	Single Family Residential		21		22.00		ER-2		20		20				21	21													60	60	63	
421	Multiple Use, Area 3	Commercial		6	Yes	10.63	E	MU-3	0	0	0	0	140,623		140,623	-6	0				0	0	0	0	0	0	281	281	0	0	0	0	
421	Multiple Use, Area 3	Multiple Family Residential		67	Yes	23.23	E	MU-3	75		75			697		764	764													225	225	2,291	
421	Neighborhood Commercial	Commercial				2.21		NC	0		19,100				19,100						0	0	0	35	35	0	35	35	0				
421	Single-Family 1, Residential	Single Family Residential		13		11.78		SF-1		13		42				42	42													39	126	126	
422	Open Space	Parks and Open Space				3.03		OS																									
422	Single-Family 2, Residential	Single Family Residential		490		74.14		SF-2		490		490				490	490													1,470	1,470	1,470	
423	Civic/Institutional	Civic and Institutional				3.88		CI																									
423	Open Space	Parks and Open Space				9.36		OS																									
423	Single-Family 1, Residential	Single Family Residential		523		123.76		SF-1		468		573				573	573													1,404	1,719	1,719	
424	Open Space	Parks and Open Space				1.64																											
424	Single-Family 1, Residential	Single Family Residential		254		51.57		SF-1		254		254				254	254													762	762	762	
424								ER-2		1		6				6	6													3	18	18	
425	Civic/Institutional	Civic and Institutional	107,346	1		15.53		C/I	0		158,500				158,500						10	0	10	10	0	10	10	0	10				Church
425	Estate Residential 2	Single Family Residential		1		3.64		ER-2								1	1																
425	Parks & Recreation	Parks and Open Space		1		0.76		P&R																									
425	Single-Family 1, Residential	Single Family Residential		216		42.72		SF-1		208		687				687	687													624	2,061	2,061	
426	Open Space	Parks and Open Space				7.59		OS																									
426	Rural Residential	Rural Residential		82		223.43		RR		80		106				106	106													240	318	318	
427	Community Commercial	Commercial		1		22.14		CC		0		0			0						0	0	0	0	0	0	0	0	0				
428	Open Space	Parks and Open Space				19.49		OS																									
428	Parks & Recreation	Parks and Open Space				9.65		P&R																									
428	Single-Family 2, Residential	Single Family Residential		365		57.81		SF-2		365		365				365	365													1,095	1,095	1,095	
429	Civic/Institutional	Civic and Institutional				3.04		C/I	0		0				0																		
429	Community Commercial	Commercial	1,087	1		14.54		CC	0		176,800				176,800						0	0	0	329	329	0	329	329	0				
429	Estate Residential 2	Single Family Residential		24		40.25		ER-2		24		32				32	32													72	96	96	
429	Multiple Use, Area 3	Commercial	30,651		Yes	2.31	E	MU-3	0		182,900		30,603		61,254						0	0	0	318	318	0	123	123	0				
429	Multiple Use, Area 3	Multiple Family Residential			Yes	4.50	E	MU-3		6		6		135		135	135													18	18	405	
429	Multiple Use, Area 3	Professional and Office		4	Yes	8.23	E	MU-3					95,871		95,871	-4	0				0	0	0	0	0	0	383	0	383	0	0	0	
430	Open Space	Parks and Open Space				48.11		OS																									
430	Parks & Recreation	Parks and Open Space				1.12		P&R																									
430	Single-Family 1, Residential	Single Family Residential		361		75.33		SF-1		361		362				362	362													1,083	1,086	1,086	
431	Specific Plan	Mixed Use	52,134	17		7.50		SP-VMU	0		63,500				63,500						0	0	0	115	0	115	115	0	115				
431	Specific Plan	Rural Residential	10,855	14		19.75		VRR*		15		17				17	17													45	51	51	
431	Specific Plan	Single Family Residential	128,021	217		99.69		VSF1*		117		253				253	253													351	759	759	
								VSF2*		112		123				123	123													336	369	369	
432	Specific Plan	Commercial		1		8.64		SP-PA4	0		63,500				63,500						0	0	0	115	115	0	115	115	0				
432	Specific Plan	Multiple Family Residential		2		6.05																											
432	Specific Plan	Parks and Open Space		1		3.53																											
432	Specific Plan	Single Family Residential		4		33.57				0		0				4	4													0	0	12	
433	Open Space	Parks and Open Space				0.78		OS																									
433	Parks & Recreation	Parks and Open Space				18.92		P&R																									
433	Single-Family 2, Residential	Single Family Residential		114		20.72		SF-2		114		114				114	114													342	342	342	

TAZ_ID	Existing General Plan	Preferred LU for GPU 2035	Existing on the Ground Sq Ft (PTAX)	Existing on the Ground DU (PTAX)	GPU 2035 Growth	Acres	Focus Area	Existing Zoning	Modeled 2009 Sq Ft	Modeled 2009 DU	Existing GP Modeled 2035 Sq Ft	Existing GP Modeled 2035 DU	GPU 2035 Growth Sq FT	GPU 2035 Growth DU	GPU 2035 Sq Ft to be Modeled	GPU 2035 DU to be Modeled For EIR	**GPU 2035 DU to be Modeled For Traffic & Fiscal**	2009 Students	Existing GP 2035 Modeled Students	GPU 2035 Students	**2009 Total Jobs**	2009 Retail Jobs	2009 Non-Retail Jobs	**Existing GP Modeled 2035 Total Jobs**	Existing GP Modeled 2035 Retail Jobs	Existing GP Modeled 2035 Non-Retail Jobs	**GPU 2035 Total Jobs**	GPU 2035 Retail Jobs	GPU 2035 Non-Retail Jobs	2009 Population	Existing GP Modeled 2035 Population	GPU 2035 Population	Notes
434	Civic/Institutional	Civic and Institutional				6.58		C/I	0		0				0						0	0	0	0	0	0	4	0	4				
434	Civic/Institutional	Civic and Institutional			Yes	0.21	E	C/I	0		0		2,028		2,028						0	0	0	0	0	0	4	0	4				
434	Community Commercial	Commercial	12,510	28		26.89		CC	0		319,500				319,500						0	0	0	575	575	0	575	575	0				
434	Estate Residential 2	Single Family Residential		13		21.75		ER-2		11						23	23													33	69	69	
434	Multiple Use, Area 3	Commercial	32,968	1	Yes	4.82	E	MU-3	0		150,000		63,733		96,701	-1	0				0	0	0	270	270	0	193	193	0	0	0	0	
434	Multiple Use, Area 3	Professional and Office		4	Yes	11.07	E	MU-3		6		6	128,932		128,932	-4	0				0	0	0	0	0	0	516	516	0	18	18	0	
435	Civic/Institutional	Civic and Institutional				15.05		C/I		651	students							651	651	651												Elementary School
435	Open Space	Parks and Open Space		1		2.45		OS																								
435	Single-Family 1, Residential	Single Family Residential		383		65.59		SF-1		384		384				384	384													1,152	1,152	1,152	
436	Open Space	Parks and Open Space				29.33		OS																								
436	Single-Family 1, Residential	Single Family Residential		293		54.80		SF-1		284		284				284	284													852	852	852	
437	Specific Plan	Civic/Institutional	60,106	1		20.59		SP-VP/C/I		956	students							956	956	956												Elementary School
437	Specific Plan	Commercial	18,979	10	Yes	7.91	HDTSP	SP-VNC	0		59,200		135,156		194,356						0	0	0	106	106	0	389	389	0	0	0	0	
437	Specific Plan	Mixed Use	151,452	29	Yes	21.91	HDTSP	SP-VMU	0		173,300		251,101	256	424,401	256	256				0	0	0	312	0	312	849	849	0	0	0	768	
437	Specific Plan	Single Family Residential	13,653	56		17.67	HDTSP	VSF2*		31		31				31	31													93	93	93	
437	Specific Plan	Professional and Office					HDTSP	VRO*	0	20	85,300	20			85,300	20	20				0	0	0	153	0	153	341	0	341	60	60	60	
437	Specific Plan	Mixed Use						VMU*		9		9				9	9													27	27	27	
437	Specific Plan	Commercial						VNC*		4		0				4	4													12	0	12	
438	Rural Residential	Rural Residential		18		166.88		RR		22		31				31	31													66	93	93	
439	Civic/Institutional	Civic and Institutional				6.56		C/I	0		80,500				80,500						0	0	0	145	0	145	145	0	145				City Hall
439	Estate Residential 1	Rural Residential		49		114.05		ER-1		45		58				58	58													135	174	174	
439	Rural Residential	Rural Residential		1		30.07		RR		3		3				3	3													9	9	9	
440	Civic/Institutional	Civic and Institutional			No	1.07	E																										
440	Civic/Institutional	Commercial	1,648		No	0.42	E																										
440	Multiple Use, Area 3	Commercial	46,590	5	No	11.77	E									-5	0													0	0	0	
440	Specific Plan	Commercial	383,815	7	No	48.28	E			465,400		764,700			764,700	-7	0				837	837	0	1,376	1,376	0	1,376	1,376	0	0	0	0	
440	Specific Plan	Multiple Family Residential		390	No	16.37	E			472		472				472	472													1,416	1,416	1,416	
441	Multi-Family 2, Residential	Multiple Family Residential	61,528			15.98		MF-2	49,400	71	100,000	71			100,000	71	71				149	0	149	270	0	270	270	0	270	213	213	213	Nursing Home (212 existing bed, 400 beds in future)
441	Open Space	Parks and Open Space				36.73		OS																									
442	Civic/Institutional	Civic and Institutional	159,252			14.62		C/I													10	0	10	10	0	10	10	0	10				Church
442	Community Commercial	Commercial	161,790			15.29		CC	198,300		186,611				186,611						356	356	0	336	336	0	336	336	0				
442	Open Space	Parks and Open Space				4.39		OS																									
443	Single-Family 1, Residential	Single Family Residential		125		26.53		SF-1		116		116				125	125													348	348	375	
444	Specific Plan	Civic/Institutional	164,095			31.60	HDTSP	VP/C/I	0		271,800				271,800						0	0	0	489	0	489	489	0	489				City of Murrieta
444	Specific Plan	Commercial	21,822		Yes	6.93	HDTSP	SP-VNC	0		59,200		135,156		194,356						0	0	0	106	106	0	389	389	0				
444	Specific Plan	Mixed Use	55,712	2	Yes	13.29	HDTSP	SP-VMU	0		115,000		251,012	256	366,012	258	258				0	0	0	207	207	0	732	732	0	0	0	774	
444	Specific Plan	Multiple Family Residential		118		14.97	HDTSP	MF1*		111		111				111	111													333	333	333	
445	Multi-Family 2, Residential	Multiple Family Residential		271		20.72		MF-2		270		387				387	387													810	1,161	1,161	
446	Civic/Institutional	Civic and Institutional				1.67		CI																									
446	Open Space	Parks and Open Space				31.62		OS																									
446	Single-Family 2, Residential	Single Family Residential		156		22.06		SF-2		156		156				156	156													468	468	468	
447	Open Space	Parks and Open Space		4		70.21		OS																									
447	Private Recreation	Parks and Open Space		1		97.35		PR																									
447	Single-Family 2, Residential	Single Family Residential		1599		187.61		SF-2		1,594		1,594				1,599	1,599													4,782	4,782	4,797	
448	Estate Residential 1	Rural Residential		25		35.61		RR		25		25				25	25													75	75	75	
448	Multi-Family 1, Residential	Multiple Family Residential		1		7.92		MF-1		55		55				55	55													165	165	165	
448	Multiple Use, Area 3	Professional and Office	39,736	3	Yes	8.97	E	MU-3	0	1	108,500	1	104,476		104,476	-3	0				0	0	0	196	196	0	418	0	418	3	3	0	
448	Neighborhood Commercial	Commercial		1		1.10		NC	0		9,500				9,500						0	0	0	17	17	0	17	17	0				
448	Single-Family 2, Residential	Single Family Residential		1		19.14		SF-2		1		144				144	144													3	432	432	
449	Multi-Family 2, Residential	Multiple Family Residential		448		25.84		MF-2		448		448				448	448													1,344	1,344	1,344	
450	Multi-Family 2, Residential	Multiple Family Residential		142		15.22		MF-1		284		284				284	284													852	852	852	
450	Multiple Use, Area 3	Commercial	270,908	3	No	26.34	E	MU-3	328,900		658,600				270,908	-3	0				591	591	0	1,185	1,185	0	542	542	0	0	0	0	
450	Multiple Use, Area 3	Commercial	11,726		Yes	5.61	E	MU-3	0		0		74,284		86,009						0	0	0	0	0	0	172	172	0				
450	Multiple Use, Area 3	Multiple Family Residential	0	188	No	22.45	E	MU-3		315		315				315	315													945	945	945	
451	Rural Residential	Rural Residential		16		138.25		RR		19		23				23	23													57	69	69	
452	Estate Residential 1	Rural Residential		2		67.99		ER-1		2		43				43	43													6	129	129	
452	Rural Residential	Rural Residential		9		86.23		RR		8		12				12	12													24	36	36	
453	Civic/Institutional	Civic and Institutional				3.60		CI																									
453	Parks & Recreation	Parks and Open Space				6.82		P&R																									
453	Single-Family 1, Residential	Single Family Residential		111		61.33		SF-1		111		351				351	351													333	1,053	1,053	
454	Regional Commercial	Commercial	372,111			39.93		RC	372,111		695,200				695,200						670	670	0	1,251	1,251	0	1,251	1,251	0				
455	Community Commercial	Commercial	156,448			18.62		CC	91,535		226,800				226,800						165	165	0	408	408	0	408	408	0				
455	Recreational/Resort Commercial	Commercial	13,865			7.73		RRC	17,545		134,100				134,100						32	32	0	241	241	0	241	0	241				
456	Open Space	Parks and Open Space				24.85		OS																									
456	Parks & Recreation	Parks and Open Space				6.50		P&R																									
456	Single-Family 2, Residential	Single Family Residential		617		75.34		SF-2		616		616				617	617													1,848	1,848	1,851	
457	Community Commercial	Commercial	243,173			21.34		CC	303,311		261,000				261,000						545	545	0	470	470	0	470	470	0				
458	Multi-Family 1, Residential	Multiple Family Residential		149		9.18		MF-1		140		140				149	149													420	420	447	
458	Multiple Use, Area 3	Commercial	16,003		No	0.96	E	MU-3	0		0				16,033						0	0	0	0	0	0	32	32	0				
458	Multiple Use, Area 3	Commercial	73,201	7	Yes	27.69	E	MU-3	75,500		752,500		366,326		441,826	-7	0				136	136	0	1,355	1,355	0	884	884	0	0	0	0	
458	Multiple Use, Area 3	Multiple Family Residential		98	No	7.40	E	MU-3		139		139				139	139													417	417	417	
458	Multiple Use, Area 3	Multiple Family Residential		7	Yes	9.11	E	MU-3		0		0		273		273	273													0	0	820	
458	Multiple Use, Area 3	Professional and Office	80,474	37	Yes	18.20	E	MU-3	0		0		211,930		292,404	-37	0				0	0	0	0	0	0	1,170	0	1,170	0	0	0	
459	Open Space	Parks and Open Space				3.09		OS																									
459	Single-Family 1, Residential	Single Family Residential		60		17.19		SF-1		60		60				60	60													180	180	180	
460	Civic/Institutional	Civic and Institutional				15.48		C/I		778	students							778	778	778												Elementary School
460	Open Space	Parks and Open Space				18.36		OS																									
460	Parks & Recreation	Parks and Open Space				4.90		P&R																									
460	Single-Family 1, Residential	Single Family Residential		112		24.04		SF-1		112		112				112	112													336	336	336	
461	Civic/Institutional	Civic and Institutional				14.90		C/I		1628	students							1,628	1,628	1,628												Middle School
461	Community Commercial	Commercial	91,211	18		14.30		CC	90,700		174,400				174,400						163	163	0	313	313	0	313	313	0				
461	Multi-Family 2, Residential	Multiple Family Residential		186		7.56		MF-2		154		154				186	186													462	462	558	
461	Neighborhood Commercial	Commercial	6,622			0.70		NC	6,600		6,600				6,622						11	11	0	11	11	0	11	11	0				
461	Parks & Recreation	Parks and Open Space				18.70		P&R																									Sports Park
461	Single-Family 1, Residential	Single Family Residential		189		37.82		SF-2		189		189				189	189													567	567	567	
462	Business Park	Business Park		1	No	29.31	D	BP	0		408,400				408,400	-1	0				0	0	0	734	0	734	734	0	734	0	0	0	
462	Estate Residential 1	Rural Residential		5		11.48		ER-1		5		5				5	5													15	15	15	
462	Estate Residential 2	Single Family Residential		26		20.95		ER-2		25		25				25	25													75	75	75	
462	General Industrial-A	Industrial	1,488			9.26		GI-1	0		129,600				129,600						0	0	0	117	0	117	117	0	117				
462	Rural Residential	Rural Residential				0.38		RR		0		0				0	0																
463	Community Commercial	Commercial	59,327			8.00		CC	85,800		97,500				97,500						154	154	0	175	175	0	195	195	0				
463	Multi-Family 2, Residential	Multiple Family Residential				9.04		MF-2		0		148				148	148													0	444	444	
463	Multiple Use, Area 3	Commercial	293,802	3	No	26.36	E	MU-3	398,100		634,300				293,802	-3	0				716	716	0	1,141	1,141	0	588	588	0	0	0	0	
463	Multiple Use, Area 3	Commercial			Yes	26.83	E	MU-3	0		0		354,993		354,993						0	0	0	0	0	0	710	710	0				
464	Rural Residential	Rural Residential		33		143.43		RR		33		50				50	50													99	150	150	
465	Rural Residential	Rural Residential		46		147.91		RR		47		62				62	62													141	186	186	
466	Regional Commercial	Commercial		1		39.94		RC		1200-2400	students							0	2,400	2,400												New High School
466	Single-Family 1, Residential	Single Family Residential				22.37		SF-1								0	0													0	0	0	

TAZ_ID	Existing General Plan	Preferred LU for GPU 2035	Existing on the Ground Sq Ft (PTAX)	Existing on the Ground DU (PTAX)	GPU 2035 Growth	Acres	Focus Area	Existing Zoning	Modeled 2009 Sq Ft	Modeled 2009 DU	Existing GP Modeled 2035 Sq Ft	Existing GP Modeled 2035 DU	GPU 2035 Growth Sq FT	GPU 2035 Growth DU	GPU 2035 Sq Ft to be Modeled	GPU 2035 DU to be Modeled For EIR	GPU 2035 DU to be Modeled for Traffic & Fiscal	2009 Students	Existing GP 2035 Modeled Students	GPU 2035 Students	2009 Total Jobs	2009 Retail Jobs	2009 Non-Retail Jobs	Existing GP Modeled 2035 Total Jobs	Existing GP Modeled 2035 Retail Jobs	Existing GP Modeled 2035 Non-Retail Jobs	GPU 2035 Total Jobs	GPU 2035 Retail Jobs	GPU 2035 Non-Retail Jobs	2009 Population	Existing GP Modeled 2035 Population	GPU 2035 Population	Notes
467	Specific Plan	Parks and Open Space		2		147.25																											
467	Specific Plan	Rural Residential		1		46.79		ER-2		0		29				29	29				5	0	5	5	0	5	5	0	5	0	87	87	Elsinore Valley Water
468	Business Park	Business Park			Yes	36.45	D	BP		0	508,700		357,294		357,294						0	0	0	915	0	915	715	0	715				
468	Multiple Use, Area 3	Business Park	62,410		No	9.29	E	MU-3		0		0			62,410						0	0	0	0	0	0	125	0	125				
468	Multiple Use, Area 3	Business Park		2	Yes	28.23	E	MU-3		0	457,300		276,694		276,694	-2	0				0	0	0	823	823	0	553	0	553	0	0	0	
469	Open Space	Parks and Open Space				9.97		OS																									
469	Single-Family 2, Residential	Single Family Residential		198		28.15		SF-2		188		188				198	198													564	564	594	
470	Civic/Institutional	Civic and Institutional	1			1.27																											
470	Community Commercial	Commercial	114,408	1		12.24		CC	114,407		148,800				148,800						205	205	0	267	267	0	267	267	0				
470	Regional Commercial	Commercial	353,967			24.43		RC	354,068		425,100				425,100						637	637	0	765	765	0	765	765	0				
471	Community Commercial	Commercial	138,984	1		13.34		CC	140,082		154,900				154,900						252	252	0	278	278	0	278	278	0				
471	Multi-Family 2, Residential	Multiple Family Residential	241,777	285		19.14		MF-2		396		396				396	396													1,188	1,188	1,188	
471	Single-Family 1, Residential	Single Family Residential		323		58.56		SF-1		323		323				323	323													969	969	969	
472	Single-Family 1, Residential	Single Family Residential		56		10.93		SF-2		56		56				56	56													168	168	168	
473	Open Space	Parks and Open Space				8.16																											
473	Single-Family 1, Residential	Single Family Residential		216		47.93		SF-2		198		198				216	216													594	594	648	
474	Specific Plan	Professional and Office	8,622	8	Yes	27.36	C	MU-1	127,600		540,100		318,528		318,528	-8	0				230	230	0	972	972	0	1,274	0	1,274	0	0	0	
475	Estate Residential 1	Rural Residential		4		106.17		ER-1		3		9				9	9													9	27	27	
475	Open Space	Parks and Open Space				14.50		OS																									
475	Single-Family 1, Residential	Single Family Residential		323		95.56		SF-2		324		390				390	390													972	1,170	1,170	
476	Business Park	Business Park			No	17.94	D	BP	0		256,400				256,400						0	0	0	460	0	460	460	0	460				
476	General Industrial-A	Industrial	15,808	7		47.64		GI-A	14,968		946,400				946,400						13	0	13	852	0	852	852	0	852				
476	General Industrial-A	Industrial				21.48		GI-A	0		0				0						0	0	0	0	0	0	0	0	0				
477	Community Commercial	Commercial	84,191			70.58		CC	88,577		861,000				861,000						159	159	0	1,550	1,550	0	1,550	0	1,550				
478	Rural Residential	Rural Residential	21,000	20		134.30		RR		20		26				26	26													60	78	78	
479	Civic/Institutional	Civic and Institutional	16,085			3.02		C/I							16,085						15	0	15	15	0	15	15	0	15				Fire Station, EMVWD
479	Open Space	Parks and Open Space				0.20		OA																									
479	Single-Family 1, Residential	Single Family Residential		347		56.62		SF-1		347		347				347	347													1,041	1,041	1,041	
480	Civic/Institutional	Civic and Institutional	0			18.83		C/I		614 students								614	614	614													Elementary School
480	Open Space	Parks and Open Space				41.17		OS																									
480	Single-Family 1, Residential	Single Family Residential		333		62.14		SF-1		333		333				333	333													999	999	999	
481	Regional Commercial	Commercial			Yes	18.51	C	RC	0		322,300		244,872		244,872						0	0	0	579	579	0	490	490	0				
481	Specific Plan	Professional and Office	4,032	7	Yes	32.05	C		0	5	562,700	5	373,223		373,223	-7	0				0	0	0	1,013	1,013	0	1,493	0	1,493	15	15	0	
482	Open Space	Parks and Open Space				45.25		OS																									
482	Single-Family 1, Residential	Single Family Residential		308		54.10		SF-1		300		300				308	308													900	900	924	
483	Community Commercial	Commercial	155,008			29.23		CC	155,008		356,100				356,100						279	279	0	641	641	0	641	641	0				
484	Single-Family 1, Residential	Single Family Residential		20		76.81		SF-1		27		132				132	132				10	0	10	10	0	10	10	0	10	81	396	396	Salvation Army/Church (jobs)
485	Business Park	Business Park	383,176		No	29.64	D	BP	0		924,100				383,176						0	0	0	1,663	0	1,663	766	0	766				
485	Business Park	Business Park	11,222		Yes	36.72	D	BP					359,897		371,120						0	0	0	0	0	0	742	0	742				
486	Specific Plan	Civic/Institutional				3.64		SP-CC													5	0	5	5	0	5	5	0	5				Community Center
486	Specific Plan	Parks and Open Space		2		31.93																											
486	Specific Plan	Rural Residential				3.87		ER*		0		63				63	63																
486	Specific Plan	Single Family Residential		683		212.38		SFR*		691		930				930	930													2,073	2,790	2,790	
487	Specific Plan	Professional and Office	6,827	18	Yes	77.28	C	MU-1	0	23	1,219,600	23	899,838		899,838	-23	0				0	0	0	2,195	2,195	0	3,599	0	3,599	69	69	0	
488	Open Space	Parks and Open Space				4.38		OS																									
488	Single-Family 1, Residential	Single Family Residential		379		51.30		SF-1		379		379				379	379													1,137	1,137	1,137	
489	Business Park	Business Park	126,290		No	25.79	D	BP	126,290		510,100				510,100						227	0	227	918	0	918	918	0	918				
489	Business Park	Business Park			Yes	10.58	D	BP					103,713		103,713						0	0	0	0	0	0	207	0	207				
490	Civic/Institutional	Civic and Institutional				263.49		C/I													10	0	10	10	0	10	10	0	10				Rancho Water
490	Open Space	Parks and Open Space				80.84		OS																									
491	Community Commercial	Commercial	5,868	5		37.27		CC	0		454,940				454,940						0	0	0	818	818	0	818	0	818				
492	Civic/Institutional	Civic and Institutional	68,829			61.97		C/I							68,829						50	0	50	50	0	50	50	0	50				Rancho Water
492	General Industrial	Industrial	1,342	1		15.51		BP	0		216,000				216,000						0	0	0	389	0	389	389	0	389				
493	Open Space	Parks and Open Space				20.31		OS																									
493	Parks & Recreation	Parks and Open Space				4.51		P&R																									
493	Single-Family 1, Residential	Single Family Residential		625		103.90		SF-1		624		624				625	625													1,872	1,872	1,875	
494	Open Space	Parks and Open Space		2		8.36		OS																									
494	Single-Family 1, Residential	Single Family Residential		112		25.37		SF-1		112		112				112	112													336	336	336	
495	Business Park	Business Park			Yes	32.37	D	BP	0		451,600		317,276		317,276						0	0	0	813	0	813	635	0	635				
496	Community Commercial	Professional and Office	896	1	Yes	6.51	C	CC	0		28,052		75,753		75,753	-1	0				0	0	0	50	50	0	303	0	303	0	0	0	
496	Open Space	Parks and Open Space				0.34		OS	0		0				0																		
496	Professional Commercial	Professional and Office				2.65		PC	0		47,000				47,000						0	0	0	159	0	159	159	0	159				
496	Specific Plan	Professional and Office	9,070	14	Yes	39.37	C	MU-1	0		419,918		458,415		458,415						0	0	0	756	756	0	1,834	0	1,834				
497	Multiple Use, Area 2	Professional and Office	71,492	4	Yes	38.22	D	MU-2	0	6	533,800	6	445,066		445,066	-6	0				0	0	0	960	0	960	1,780	0	1,780	18	18	0	
498	Civic/Institutional	Civic and Institutional				0.20		C/I													0	0	0	0	0	0							Eastern Water District
498	Multi-Family 2, Residential	Multiple Family Residential		145		7.97		MF-2		144		144				145	145													432	432	435	
498	Professional Commercial	Professional and Office	251,125			19.74		PC	175,900		339,700				339,700						597	0	597	1,154	0	1,154	1,154	0	1,154				
499	Rural Residential	Rural Residential		10	Yes	81.14	B	RR		11		64		41		52	52													33	192	156	
499	Single-Family 1, Residential	Single Family Residential				7.00		SF-1		0		24				24	24													0	72	72	
500	Multi-Family 2, Residential	Multiple Family Residential		177		9.96		MF-2		200		200				200	200													600	600	600	
500	Parks & Recreation	Parks and Open Space				4.29		OS	0		0				0																		
500	Single-Family 1, Residential	Single Family Residential		218		30.88		SF-1		218		218				218	218													654	654	654	
500	Specific Plan	Multiple Family Residential		497	No	22.42	C	MU-1	0	496	390,300	496			0	497	497				0	0	0	702	702	0	0	0	0	1,488	1,488	1,491	
501	General Industrial	Business Park	250,553	1	No	32.00	D	GI	393,059		971,500				393,059	-1	0				354	0	354	874	0	874	786	0	786	0	0	0	
501	General Industrial	Business Park	11,346		Yes	37.64	D	GI					368,892		368,802						0	0	0	0	0	0	738	0	738				
501	Multiple Use, Area 2	Business Park	344,455		No	24.47	D	MU-2	391,648		409,800				409,800						705	0	705	737	0	737	737	0	737				
501	Multiple Use, Area 2	Business Park			Yes	4.85	D	MU-2					47,505		47,505						0	0	0	0	0	0	95	0	95				
502	Multi-Family 2, Residential	Multiple Family Residential		421		22.65		MF-2		420		420				421	421													1,260	1,260	1,263	
502	Open Space	Parks and Open Space				9.48		OS																									
502	Single-Family 1, Residential	Single Family Residential		166		25.22		SF-1		166		166				166	166													498	498	498	
503	Civic/Institutional	Civic and Institutional		1		24.83		CI													10	0	10	10	0	10	10	0	10				Rancho Water
503	General Industrial	Industrial	94,807			14.81		GI	138,935		206,300				206,300						125	0	125	186	0	186	186	0	186				
504	Scenic Highway Comm	Commercial				0.19																											
504	Specific Plan	Commercial				51.08		SP 276	0		1,780,700				1,780,700						0	0	0	4,406	2,003	2,403	4,406	2,003	2,403				
505	Rural Residential	Multiple Family Residential		1	Yes	9.35	B	RR						280		280	280													0	0	841	
505	Rural Residential	Rural Residential		11	Yes	35.69	B	RR		14		18		18		18	18													42	54	54	
505	Specific Plan	Parks and Open Space				2.22			0		0				0																		
505	Specific Plan	Single Family Residential		27		5.74		SF1*		27		27				27	27													81	81	81	

TAZ_ID	Existing General Plan	Preferred LU for GPU 2035	Existing on the Ground Sq Ft (PTAX)	Existing on the Ground DU (PTAX)	GPU 2035 Growth	Acres	Focus Area	Existing Zoning	Modeled 2009 Sq Ft	Modeled 2009 DU	Existing GP Modeled 2035 Sq Ft	Existing GP Modeled 2035 DU	GPU 2035 Growth Sq FT	GPU 2035 Growth DU	GPU 2035 Sq Ft to be Modeled	GPU 2035 DU to be Modeled For EIR	**GPU 2035 DU to be Modeled For Traffic & Fiscal**	2009 Students	Existing GP 2035 Modeled Students	GPU 2035 Students	**2009 Total Jobs**	2009 Retail Jobs	2009 Non-Retail Jobs	**Existing GP Modeled 2035 Total Jobs**	Existing GP Modeled 2035 Retail Jobs	Existing GP Modeled 2035 Non-Retail Jobs	**GPU 2035 Total Jobs**	GPU 2035 Retail Jobs	GPU 2035 Non-Retail Jobs	2009 Population	Existing GP Modeled 2035 Population	GPU 2035 Population	Notes
506	Multiple Use, Area 2	Professional and Office	7,534	7	Yes	39.69	D	MU-2	0	7	553,300	7	462,079		462,079	-7	0				0	0	0	996	0	996	1,848	0	1,848	21	21	0	
507	Community Commercial	Commercial				5.17		CC	0		63,400				63,400						0	0	0	114	114	0	114	114	0				
507	Multiple Use, Area 2	Professional and Office			Yes	29.27	D	MU-2	0		408,400		340,795		340,795						0	0	0	735	0	735	1,363	0	1,363				
508	Civic/Institutional	Civic and Institutional				4.07		SP-C/I			873 students							873	873	873												Elementary School
508	Community Commercial	Commercial				4.13																										
508	Regional Commercial	Commercial				0.82																										
508	Specific Plan	Civic/Institutional				9.62																										
508	Specific Plan	Parks and Open Space				106.13																										
508	Specific Plan	Single Family Residential		511		97.13		SF1*		512		512				512	512													1,536	1,536	1,536	
509	Professional Commercial	Professional and Office	49,499			3.33		PC	261,012		374,600				374,600						888	0	888	1,273	0	1,273	1,273	0	1,273				
509	Regional Commercial	Professional and Office	99,115		No	9.36	C	RC							99,115						0	0	0	0	0	0	396	0	396				
509	Regional Commercial	Professional and Office	18,231		Yes	3.23	C	RC	46,600		426,800		37,638		55,869						84	84	0	768	768	0	223	0	223				
509	Specific Plan	Professional and Office	212,862			18.37		SP							212,862						0	0	0	0	0	0	851	0	851				
509	Specific Plan	Professional and Office			No	11.93	C	SP							0						0	0	0	0	0	0	0	0	0				
510	Business Park	Business Park	5,719	5	Yes	48.40	D	BP	0	4	674,600	0	474,331		474,331	-5	0				0	0	0	1,214	0	1,214	949	0	949	12	0	0	
511	Open Space	Parks and Open Space				2.23		OS																								
511	Single-Family 1, Residential	Single Family Residential		137		22.11		SF-1		137		137				137	137													411	411	411	
512	Civic/Institutional	Civic and Institutional	30,755	1		4.78		BP	30,755		66,900				66,900						10	0	10	120	0	120	120	0	120				Church
512	Community Commercial	Commercial	58,333			7.07		CC	62,052		86,600				86,600						112	112	0	156	156	0	156	156	0				
512	Neighborhood Commercial	Commercial	167,623			11.21		NC	139,617		139,617				139,617						176	176	0	176	176	0	176	176	0				
513	Community Commercial	Commercial	197,279			13.38		CC	191,704		331,700				331,700						345	345	0	597	597	0	597	597	0				
513	Community Commercial	Professional and Office	57,396		Yes	13.85	C	CC	0		0		161,302		218,698						0	0	0	0	0	0	875	0	875				
514	Civic/Institutional	Civic and Institutional				108.64		C/I													10	0	10	10	0	10	10	0	10				Rancho Water District
515	Business Park	Business Park	355,015		No	20.68	D	BP	347,241		334,500				347,241						625	0	625	602	0	602	625	0	625				
515	Business Park	Business Park	2,715		Yes	3.28	D	BP					32,175		34,890						0	0	0	0	0	0	70	0	70				
515	General Industrial	Business Park			No	7.87	D	GI	0		110,100				110,100						0	0	0	99	0	99	99	0	99				
515	Multiple Use, Area 2	Business Park	17,969		No	13.25	D	MU-2	154,248		185,400				185,400						277	0	277	333	0	333	333	0	333				
516	Rural Residential	Multiple Family Residential		2	Yes	14.74	B	RR		2		4		442		442	442													6	12	1,326	
516	Rural Residential	Rural Residential		1	Yes	4.84	B	RR		1		1		2		2	2													3	3	6	
516	Rural Residential	Single Family Residential			Yes	4.74	B	RR		0		0		47		47	47													0	0	141	
517	Multiple Use, Area 2	Professional and Office	22,774	17	Yes	46.89	D	MU-2	0	16	621,600	16	545,930		545,930	-17	0				0	0	0	1,119	0	1,119	2,184	0	2,184	48	48	0	
518	Open Space	Parks and Open Space				0.28		OS																								
518	Single-Family 2, Residential	Single Family Residential		87		14.49		SF-2		88		88				88	88													264	264	264	
519		Commercial				0.39																										
519	Community Commercial	Commercial	300,765			24.04		CC	288,074		292,700				300,765						519	519	0	527	527	0	527	527	0				
520	Community Commercial	Commercial	499,020			29.26		CC	285,223		357,300				357,300						465	465	0	643	643	0	643	643	0				
520	Open Space	Parks and Open Space				6.89		OS																								
521	Business Park	Business Park	366,854	2	No	25.14	D	BP	446,583		503,200				366,854	-2	0				804	0	804	906	0	906	804	0	804	0	0	0	
521	Business Park	Business Park	73,631		Yes	10.92	D	BP					107,032		180,663						0	0	0	0	0	0	361	0	361				
521	Open Space	Business Park			Yes	4.32	D	OS					42,386		42,386						0	0	0	0	0	0	85	0	85				
522	Community Commercial	Commercial	371,926			38.94		CC	386,858		474,400				474,400						696	696	0	853	853	0	853	853	0				
522	Neighborhood Commercial	Commercial	43,549			12.64		NC	43,547		109,700				109,700						78	78	0	197	197	0	197	197	0				
522	Parks & Recreation	Parks and Open Space				9.76		P&R																								
523	Business Park	Single Family Residential		2	Yes	14.48	B	BP	0		202,100			145		147	147				0	0	0	364	0	364	0	0	0	0	0	441	
523	Multi-Family 2, Residential	Multiple Family Residential		123	No	13.21		MF-2		214		214				214	214													642	642	642	
523	Open Space	Parks and Open Space			No	1.85		OS	0		0				0																		
523	Regional Commercial	Commercial	1,400	1	No	6.61		RC	0		113,200				113,200						0	0	0	204	204	0	204	204	0				
523	Rural Residential	Commercial			Yes	5.03	B	RR		0		2	66,546		66,546						0	0	0	0	0	0	133	133	0				
523	Single-Family 2, Residential	Single Family Residential		118	No	11.07		SF-2		118		118				118	118													354	354	354	
524	Regional Commercial	Commercial	461,245			50.01		RC	461,144		871,200				871,200						830	830	0	1,568	1,568	0	1,568	1,568	0				
525	Single-Family 2, Residential	Single Family Residential		140		19.34		SF-2		140		140				140	140													420	420	420	
526	Multiple Use, Area 2	Business Park	113,924	2	Yes	22.53	D	MU-2	114,198	2	313,600	0	220,834		334,758	-2	0				205	0	205	564	0	564	670	0	670	6	0	0	
527	Multiple Use, Area 2	Professional and Office	9,768	11	Yes	44.64	D	MU-2	0	8	592,400	0	519,795		519,795	-11	0				0	0	0	1,066	0	1,066	2,079	0	2,079	24	0	0	
528	Business Park	Professional and Office	1,920	3	Yes	94.54	B	BP	0		1,317,200		1,100,732		1,100,732	-3	0				0	0	0	2,371	0	2,371	4,403	0	4,403	0	0	0	
528	Specific Plan	Parks and Open Space				77.79			0		0				0						0	0	0	0	0	0	0	0	0				
529	Open Space	Parks and Open Space				33.90		OS																								
529	Single-Family 1, Residential	Single Family Residential		479		136.57		SF-1		480		617				617	617													1,440	1,851	1,851	
530	Business Park	Business Park	800,117	13	No	35.23	D	BP	659,271		473,900				800,117	-13	0				1,186	0	1,186	853	0	853	1,600	0	1,600				
530	Multiple Use, Area 2	Business Park	65,942		No	2.21	D	MU-2	30,715		95,832				95,832						18	0	18	55	0	55	55	0	55				
531	Open Space	Parks and Open Space				6.36		OS																								
531	Parks & Recreation	Parks and Open Space				1.58		P&R																								
531	Single-Family 1, Residential	Single Family Residential		430		67.73		SF-1		430		430				430	430													1,290	1,290	1,290	
532	Civic/Institutional	Civic and Institutional	46,366	3		25.98		C/I			748 students							748	748	748												Church, Elementary School
532	Open Space	Parks and Open Space				10.08		OS																								
532	Single-Family 1, Residential	Single Family Residential		280		54.00		SF-1		280		280				280	280													840	840	840	
533	Multiple Use, Area 2	Business Park	121,957		No	15.00	D	MU-2	113,079		309,400				200,236						204	0	204	557	0	557	400	0	400				
533	Multiple Use, Area 2	Business Park			Yes	7.22	D	MU-2					70,800		70,800						0	0	0	0	0	0	142	0	142				
533	Open Space	Business Park			Yes	3.91	D	OS					38,364		38,364						0	0	0	0	0	0	77	0	77				
534	Multiple Use, Area 2	Business Park	156,859		No	15.11	D	MU-2	291,459		322,000				156,859						525	0	525	580	0	580	314	0	314				
534	Multiple Use, Area 2	Business Park	199,016		Yes	8.00	D	MU-2					78,406		277,422						0	0	0	0	0	0	555	0	555				
534	Open Space	Business Park			Yes	1.58	D	OS					15,491		15,491						0	0	0	0	0	0	31	0	31				
535	Professional Commercial	Professional and Office	2,358	4	Yes	60.61	D	PC	0	73	1,055,900	0	705,713		705,713	-4	0				0	0	0	3,589	0	3,589	2,823	0	2,823	219	0	0	
536	Community Commercial	Commercial	23,289			3.40		CC	0		69,500				69,500						0	0	0	125	125	0	139	139	0				
536	Community Commercial	Commercial				2.32		CC	0		0				0																		
536	Professional Commercial	Professional and Office	1			2.17		PC	0		0				0																		
536	Professional Commercial	Professional and Office	5,128			10.84		PC	0		0				0																		
536	Professional Commercial	Professional and Office			Yes	28.64	D	PC	0		726,500		333,485		333,485						0	0	0	2,469	0	2,469	1,334	0	1,334				
536	Single-Family 2, Residential	Single Family Residential				13.75		SF-2		0		0					0																
537	Business Park	Business Park	20,363			0.62		BP							0																		
537	Business Park	Commercial			Yes	15.01	B	BP	179,600		199,300		198,609		198,609						323	0	323	358	0	358	397	397	0				
537	Regional Commercial	Commercial	43,295			31.41		RC	61,049		569,700				569,700						110	110	0	1,025	1,025	0	1,139	1,139	0				
537	Regional Commercial	Commercial	20,363			0.00		RC	0		0																						
538	Open Space	Parks and Open Space				4.79		OS																								
538	Single-Family 1, Residential	Single Family Residential		241		42.29		SF-1		240		240				241	241													720	720	723	
539	Open Space	Parks and Open Space				13.69		OS																								
539	Parks & Recreation	Parks and Open Space				8.53		P&R																								
539	Single-Family 1, Residential	Single Family Residential		266		55.78		SF-1		256		256				266	266													768	768	798	
540	Regional Commercial	Commercial				2.18		RC	0		34,800				34,800						0	0	0	62	62	0	62	62	0				
540	Specific Plan	Single Family Residential		289		50.74		SF2*		289		289				289	289													867	867	867	
541	Multiple Use, Area 2	Business Park	367,912	1	No	23.75	D	MU-2	344,356		381,900				381,900	-1	0				619	0	619	687	0	687	687	0	687	0	0	0	
541	Multiple Use, Area 2	Business Park			Yes	3.61	D	MU-2					35,425		35,425						0	0	0	0	0	0	71	0	71				
542	Civic/Institutional	Civic and Institutional				13.55		C/I			693 students							693	693	693												Elementary School
542	Single-Family 1, Residential	Single Family Residential		260		51.26		SF-1		261		261				261	261													783	783	783	

TAZ_ID	Existing General Plan	Preferred LU for GPU 2035	Existing on the Ground Sq Ft (PTAX)	Existing on the Ground DU (PTAX)	GPU 2035 Growth	Acres	Focus Area	Existing Zoning	Modeled 2009 Sq Ft	Modeled 2009 DU	Existing GP Modeled 2035 Sq Ft	Existing GP Modeled 2035 DU	GPU 2035 Growth Sq FT	GPU 2035 Growth DU	GPU 2035 Sq Ft to be Modeled	GPU 2035 DU to be Modeled For EIR	**GPU 2035 DU to be Modeled For Traffic & Fiscal**	2009 Students	Existing GP 2035 Modeled Students	GPU 2035 Students	**2009 Total Jobs**	2009 Retail Jobs	2009 Non-Retail Jobs	**Existing GP Modeled 2035 Total Jobs**	Existing GP Modeled 2035 Retail Jobs	Existing GP Modeled 2035 Non-Retail Jobs	**GPU 2035 Total Jobs**	GPU 2035 Retail Jobs	GPU 2035 Non-Retail Jobs	2009 Population	Existing GP Modeled 2035 Population	GPU 2035 Population	Notes
543	Open Space	Parks and Open Space				5.25		OS																						0	0	0	
543	Single-Family 1, Residential	Single Family Residential		169		30.40		SF-1		169		169										169	169							507	507	507	
544	Business Park	Commercial			Yes	36.53	A	BP	0		508,700		483,335		483,335						0	0	0	916	0	916	967	967	0	0	0	0	
544	Community Commercial	Commercial				30.95		CC	0		635,400				635,400						0	0	0	1,143	1,143	0	1,143	1,143	0	0	0	0	
544	Community Commercial	Commercial			Yes	19.09	A	CC	0		0		252,617		252,617						0	0	0	0	0	0	505	505	0	0	0	0	
544	Multi-Family 2, Residential	Multiple Family Residential				12.00		MF-2		0		166				166	166													0	498	498	
545	Multiple Use, Area 2	Business Park	226,219		No	20.66	D	MU-2	299,503		497,600				299,503						539	0	539	896	0	896	539	0	539	0	0	0	
545	Multiple Use, Area 2	Business Park	73,305		Yes	20.13	D	MU-2					197,252		270,557						0	0	0	0	0	0	541	0	541	0	0	0	
546	Open Space	Parks and Open Space				5.15		OS																						0	0	0	
546	Single-Family 1, Residential	Single Family Residential		306		54.30		SF-1		297		297				306	306													891	891	918	
547	Civic/Institutional	Civic and Institutional				0.49		C/I													15	0	15	15	0	15	15	0	15	0	0	0	Fire Station
547	Neighborhood Commercial	Commercial	87,343	1		9.61		NC	56,267		76,600				87,343						101	101	0	138	138	0	175	175	0	0	0	0	
547	Parks & Recreation	Parks and Open Space				3.32		P&R																						0	0	0	
548	Specific Plan	Civic/Institutional				10.15		C/I		650 students								650	650	650												School Site
548	Specific Plan	Multiple Family Residential				19.06		MF2*		0		313				313	313													0	939	939	
548	Specific Plan	Parks and Open Space				43.21																											
549	Business Park	Commercial	2,417	3	Yes	20.42	A	BP					270,160		270,160	-3	0				0	0	0	0	0	0	540	540	0	0	0	0	
549	Business Park	Professional and Office	11,012	1	Yes	43.46	A	BP	0	0	676,000	0	505,983		505,983	-1	0				0	0	0	1,217	0	1,217	2,024	0	2,024	0	0	0	
550	Specific Plan	Business Park				37.12		MU-2	0	0	517,100	0			517,100						0	0	0	931	0	931	931	0	931				
551	Multiple Use, Area 2	Professional and Office	2,320	4	Yes	37.14	A	MU-2	0		503,200		432,410		432,410						0	0	0	906	0	906	1,730	0	1,730				
552	Multi-Family 2, Residential	Multiple Family Residential		394		35.03		MF-2		512		602				602	602													1,536	1,806	1,806	
553	Specific Plan	Business Park				5.95		MU-2	0		82,241				82,241						0	0	0	148	0	148	148	0	148				
553	Specific Plan	Multiple Family Residential		351		14.06		MF2*		353		353				353	353				0	0	0	148	0	148	148	0	148	1,059	1,059	1,059	
554	Business Park	Professional and Office	1,281	3	Yes	23.78	A	BP	0		685,800		276,845		276,845	-3	0				0	0	0	1,234	0	1,234	1,107	0	1,107				
554	Specific Plan	Civic/Institutional				4.16		SP-C/I	0		0										15	0	15	15	0	15	15	0	15				
554	Specific Plan	Professional and Office			Yes	1.14	A	SP	0		43,500		13,320		13,320						0	0	0	118	0	118	53	0	53				
555	Multiple Use, Area 2	Parks and Open Space			No	25.25	A	MU-2																									
555	Multiple Use, Area 2	Professional and Office	6,360	8	Yes	56.99	A	MU-2	0	10	1,109,500	30	663,559		663,559	-8	0				0	0	0	1,997	0	1,997	2,654	0	2,654	30	90	0	
556	Multiple Use, Area 2	Business Park		1		2.28		MU-2	0		0				0																		
556	Multiple Use, Area 2	Commercial		1	Yes	48.39	A	MU-2	0		705,300		640,217		640,217	-1	0				0	0	0	1,269	0	1,269	1,280	1,280	0	0	0	0	
556	Regional Commercial	Commercial	231,467			21.66		RC	253,702		393,700				393,700						456	456	0	708	708	0	708	0	708				
557	Specific Plan	Business Park				28.46		ORP?	0	0	930,400	0			930,400						0	0	0	3,163	0	3,163	3,163	0	3,163				
557	Multiple Use, Area 2	Business Park						MU-2	0	0	6,969	0			6,959						0	0	0	12	0	12	12	0	12				
558	Civic/Institutional	Civic and Institutional				0.71																											
558	Open Space	Parks and Open Space				9.15																											
558	Rural Residential	Rural Residential		2		36.69		RR		2		20				20	20													6	60	60	
558	Single-Family 1, Residential	Single Family Residential		1		18.69		SF-1		0		65				65	65													0	195	195	
558	Specific Plan	Parks and Open Space				104.56		P & R /C/I													35	0	35	35	0	35	35	0	35				Sports Park
559	Civic/Institutional	Civic and Institutional				67.65		C/I		3592 students								3,592	3,592	3,592													Murrieta Mesa High School
560	Rural Residential	Rural Residential		37		114.33		RR		35		35				37	37													105	105	111	
561	Single-Family 1, Residential	Single Family Residential		215		44.80		SF-1		215		215				215	215													645	645	645	
562	Specific Plan	Parks and Open Space				88.44		P & R													26	0	26	26	0	26	26	0	26				Sports Park
563	Single-Family 1, Residential	Single Family Residential		500		127.13		SF-1		502		615				615	615													1,506	1,845	1,845	
564	Open Space	Parks and Open Space			Yes	6.00		OS																									
564	Parks & Recreation	Parks and Open Space			Yes	25.60		P&R																									
564	Single-Family 1, Residential	Single Family Residential		305	Yes	59.43		SF-1		268		268				305	305													804	804	915	
565	Business Park	Commercial			Yes	2.19	A	BP	0		50,100		28,931		28,931						0	0	0	90	0	90	58	58	0				
565	Multiple Use, Area 3	Multiple Family Residential		484	No	64.67	E	MU-2	0	451	811,000	451				484	484				0	0	0	1,460	1,460	0	0	0	0	1,353	1,353	1,452	
566	Multi-Family 2, Residential	Multiple Family Residential		161		11.23		MF-2		180		180				180	180													540	540	540	
566	Parks & Recreation	Parks and Open Space				14.60		P&R																									
566	Professional Commercial	Professional and Office	140,097			4.85		PC	53,431		83,600				83,600						181	0	181	284	0	284	284	0	284				
567	Business Park	Professional and Office	600	1	Yes	17.00	A	BP	0		419,500		197,948		197,948	-1	0				0	0	0	755	0	755	792	0	792	0	0	0	
568	Single-Family 1, Residential	Professional and Office		5	Yes	63.70	A	SF-1		5		120	741,687		741,687	-5	0				0	0	0	0	0	0	2,967	0	2,967	15	360	0	
568	Multiple Use 2	Professional and Office			Yes		A	MU-2	0		30,900										0	0	0	45	0	45	0	0	0				
569	Specific Plan	Parks and Open Space				17.70																											
569	Specific Plan	Single Family Residential		238		49.32		SF2*		238		238				238	238													714	714	714	
570	Business Park	Professional and Office			Yes	55.89	A	BP	0		433,500		650,708		650,708						0	0	0	780	0	780	2,603	0	2,603				
571	Specific Plan	Business Park				4.74		BP	0		9,757				9,757						0	0	0	17	0	17	17	0	17				
571	Multiple Use 2	Business Park						MU-2	0		58,500				58,500						0	0	0	105	0	105	105	0	105				
571	Specific Plan	Parks and Open Space				1.17																											
571	Specific Plan	Single Family Residential				22.01		RS6*		0		76				76	76													0	228	228	
572	Multiple Use, Area 2	Professional and Office	1,568	1	Yes	5.50	A	MU-2	0		86,400		64,001		64,001	-1	0				0	0	0	155	0	153	256	0	256	0	0	0	
572	Single-Family 1, Residential	Professional and Office		1	Yes	9.63	A	SF-1	0	0	0	0	112,112		112,112	-1	0				0	0	0	0	0	0	448	0	448	0	0	0	
572	Single-Family 1, Residential	Single Family Residential		114		22.18		SF-1		112		132				132	132													336	396	396	
573	Open Space	Parks and Open Space				8.62		OS																									
573	Single-Family 1, Residential	Single Family Residential		202		32.44		SF-1		202		202				202	202													606	606	606	
574	Rural Residential	Rural Residential		21		203.34		RR		23		45				45	45													69	135	135	
575	Community Commercial	Commercial	92,790			12.37		CC	89,806		151,240				151,240						161	161	0	272	272	0	272	272	0				
575	Single-Family 2, Residential	Single Family Residential		332		39.98		SF-2		332		332				332	332													996	996	996	
576	Single-Family 1, Residential	Single Family Residential		301		59.45		SF-1		317		317				317	317													951	951	951	
578	Civic/Institutional	Civic and Institutional				10.69		C/I		1075 students								1,075	1,075	1,075													Elementary School
578	Open Space	Parks and Open Space				0.07		OS																									
578	Parks & Recreation	Parks and Open Space				3.79		P&R																									
578	Single-Family 1, Residential	Single Family Residential		287		49.32		SF-1		292		292				292	292													876	876	876	
579	Specific Plan	Civic/Institutional	145,737			13.38		C/I		600 students								600	600	600													Elementary School
579	Specific Plan	Parks and Open Space				14.22																											
579	Specific Plan	Single Family Residential		288		58.54		*SF1		288		288				288	288													864	864	864	
580	Estate Residential 1	Professional and Office			Yes	18.83	A	ER-1					219,299		219,299						0	0	0	0	0	0	877	0	877				
580	Rural Residential	Professional and Office	28,325	24	Yes	123.24	A	RR		24		31	1,434,930		1,434,930	-24	0				0	0	0	0	0	0	5,740	0	5,740	72	93	0	
581	Rural Residential	Rural Residential		7		149.40		RR		7		14				14	14													21	42	42	
582	Estate Residential 1	Professional and Office			Yes	19.38	A			0		13	225,686		225,686						0	0	0	0	0	0	903	0	903				
582	Rural Residential	Professional and Office	24,798	19	Yes	130.18	A			18		29	1,515,710		1,515,710	-19	0				0	0	0	0	0	0	6,063	0	6,063	54	87	0	
583	Specific Plan	Parks and Open Space	552			5.96									552																		
583	Specific Plan	Civic/Institutional				3.03		C/I*	0		0										5	0	5	5	0	5	5	0	5				
583	Specific Plan	Parks and Open Space	552			2.48									552																		

TAZ_ID	Existing General Plan	Preferred LU for GPU 2035	Existing on the Ground Sq Ft (PTAX)	Existing on the Ground DU (PTAX)	GPU 2035 Growth	Acres	Focus Area	Existing Zoning	Modeled 2009 Sq Ft	Modeled 2009 DU	Existing GP Modeled 2035 Sq Ft	Existing GP Modeled 2035 DU	GPU 2035 Growth Sq FT	GPU 2035 Growth DU	GPU 2035 Sq Ft to be Modeled	GPU 2035 DU to be Modeled For EIR	**GPU 2035 DU to be Modeled For Traffic & Fiscal**	2009 Students	Existing GP 2035 Modeled Students	GPU 2035 Students	**2009 Total Jobs**	2009 Retail Jobs	2009 Non-Retail Jobs	**Existing GP Modeled 2035 Total Jobs**	Existing GP Modeled 2035 Retail Jobs	Existing GP Modeled 2035 Non-Retail Jobs	**GPU 2035 Total Jobs**	GPU 2035 Retail Jobs	GPU 2035 Non-Retail Jobs	2009 Population	Existing GP Modeled 2035 Population	GPU 2035 Population	Notes
583	Specific Plan	Single Family Residential	552			62.87		RS8*		0		115				115	115													0	345	345	
583	Specific Plan	Single Family Residential						RS7*		0		105				105	105													0	315	315	
584	Single-Family 1, Residential	Professional and Office		2	Yes	58.50	A	SF-1	0	0	0	59	681,195		681,195	-2	0				0	0	0	0	0	0	2,725	0	2,725	0	177	0	
584	Specific Plan	Parks and Open Space				48.89		SP	0		0				0																		
584	Specific Plan	Single Family Residential				52.06		SP-RS6*		0		15				15	15													0	45	45	
584	Specific Plan							SP-RS7.5*	0	0		7				7	7													0	21	21	
584	Specific Plan							SP-RS8*		0		30				30	30													0	90	90	
585	Rural Residential	Rural Residential		28		194.34		RR		24		41				41	41													72	123	123	
586	Civic/Institutional	Civic and Institutional				41.35		C/I			550 students							550	550	550													Calvary Chapel Bible College
586	Civic/Institutional	Civic and Institutional						C/I	503,727		503,727				503,727						100	0	100	906	0	906	906	0	906				and Conference Center
586	Multi-Family 1, Residential	Multiple Family Residential		73		17.90		MF-1		140		140				140	140													420	420	420	
587	Single-Family 1, Residential	Single Family Residential				0.01																											
587	Single-Family 1, Residential	Single Family Residential		96		26.44		SF-1		96		126				126	126													288	378	378	
587	Specific Plan	Single Family Residential		98		24.82		SF2*		0		186				186	186													0	558	558	
588	Estate Residential 1	Rural Residential		1		12.08		ER-1		0		8				8	8													0	24	24	
588	Estate Residential 3	Single Family Residential		3		29.72		ER-3		0		73				73	73													0	219	219	
588	Open Space	Parks and Open Space				108.95		OS																									
588	Open Space	Parks and Open Space				31.66		OS																									
589	Private Recreation	Parks and Open Space				9.66		PR																									
589	Single-Family 1, Residential	Single Family Residential		1101		135.80		SF-1		1,112		1,112				1,112	1,112													3,336	3,336	3,336	
590	Community Commercial	Commercial	94,367			12.68		CC	94,457		153,600				153,600						170	170	0	276	276	0	276	0	276				
590	Single-Family 2, Residential	Single Family Residential		134		13.40		SF-2		140		140				140	140													420	420	420	
591	Neighborhood Commercial	Commercial	85,167			11.23		NC	89,837		94,900				94,900						161	161	0	171	171	0	171	0	171				
591	Open Space	Parks and Open Space				0.19		OS																									
591	Single-Family 1, Residential	Single Family Residential		272		46.41		SF-1		272		272				272	272													816	816	816	
591	Single-Family 2, Residential	Single Family Residential		44		9.26		SF-2		62		65				65	65													186	195	195	
592	Specific Plan	Single Family Residential		417		84.31		SF2*		418		418				418	418													1,254	1,254	1,254	
593	Multi-Family 1, Residential	Multiple Family Residential		455		24.84		MF-1		0		439				455	455													0	1,317	1,365	
593	Multi-Family 2, Residential	Multiple Family Residential				10.13		MF-2		0		166				166	166													0	498	498	
593	Professional Commercial	Professional and Office	2,040			0.71		PC	0		12,200				12,200						0	0	0	42	0	42	42	0	42				
594	Civic/Institutional	Civic and Institutional				2.33		C/I													5	0	5	5	0	5	5	0	5				Eastern Water District
594	Open Space	Parks and Open Space				13.52		OS																									
594	Single-Family 1, Residential	Single Family Residential		350		67.49		SF-1		350		350				350	350													1,050	1,050	1,050	
598	Civic/Institutional	Civic and Institutional				23.21		C/I			1387 students							1,387	1,387	1,387													Warm Springs Middle School
598	Community Commercial	Commercial				19.72		CC	0		240,200				240,200						0	0	0	432	432	0	432	432	0				
598	Neighborhood Commercial	Commercial				2.65		NC	0		23,500				23,500						0	0	0	42	42	0	42	42	0				
598	Parks & Recreation	Parks and Open Space				8.73		P&R																									
599	Open Space	Parks and Open Space				0.15																											
599	Single-Family 1, Residential	Single Family Residential		356		61.83		SF-1		356		364				364	364													1,068	1,092	1,092	
600	Rural Residential	Rural Residential		14		227.61		RR		10		52				52	52													30	156	156	
600	Civic/Institutional	Civic and Institutional				2.79																											
601	Multi-Family 1, Residential	Multiple Family Residential		85		19.95		MF-1		160		160				160	160													480	480	480	
601	Multi-Family 2, Residential	Multiple Family Residential		346		21.39		MF-2		328		328				346	346													984	984	1,038	
601	Open Space	Parks and Open Space				3.56		OS																									
601	Private Recreation	Parks and Open Space				104.70		P&R																									
601	Single-Family 2, Residential	Single Family Residential		340		64.90		SF-2		340		340				340	340													1,020	1,020	1,020	
602	Specific Plan	Parks and Open Space				8.67																											
602	Specific Plan	Civic/Institutional				12.30		C/I			835 students							835	835	835													
602	Specific Plan	Commercial				9.71		CC	0		118,300				118,300						0	0	0	213	213	0	213	213	0				
602	Specific Plan	Parks and Open Space				236.82																											
602	Specific Plan	Single Family Residential		766		375.36		SF1		768		1,630				1,630	1,630													2,304	4,890	4,890	
603	Open Space	Parks and Open Space				0.04		OS																									
603	Private Recreation	Parks and Open Space		1		14.76		PR																									
603	Single-Family 1, Residential	Single Family Residential		275		165.61		SF-1		276		276				275	275													828	828	825	
603	Single-Family 2, Residential	Single Family Residential		243		34.68		SF-2		243		243				243	243													729	729	729	
604	Community Commercial	Commercial	9,474			6.88		CC	14,600		84,100				84,100						26	26	0	151	151	0	151	151	0				
604	Multiple Use, Area 3	Multiple Family Residential		178	Yes	11.70	E	MU-3	0	176	137,800	176		351		351	351				0	0	0	248	248	0	0	0	0				
604	Neighborhood Commercial	Commercial	7,625			10.30		NC	9,583		88,800				88,800						17	17	0	159	159	0	159	159	0				
605	Specific Plan	Single Family Residential				0.07																											
606	Open Space	Parks and Open Space				2.48		OS																									
606	Parks & Recreation	Parks and Open Space				12.97		P&R																									
606	Single-Family 1, Residential	Single Family Residential		499		93.99		SF-1		501		501				501	501													1,503	1,503	1,503	
608	Neighborhood Commercial	Commercial	58,738			4.86		NC	57,384		42,700				58,738						104	104	0	77	77	0	117	117	0				
608	Open Space	Parks and Open Space				1.54																											
608	Parks & Recreation	Parks and Open Space				0.70																											
608	Single-Family 2, Residential	Single Family Residential		408		55.43		SF-2		408		408				408	408													1,224	1,224	1,224	
610	Business Park	Business Park			Yes - HE	8.59		BP	0		400,000				120,000						0	0	0	720	0	720	240	0	240				
610	Business Park	Multiple Family Residential			Yes - HE	15.02		BP	0	0	0	0		451		451	451				0	0	0	128	128	0	128	0	128				
610	Regional Commercial	Commercial				4.03		RC	0		71,400				71,400						0	0	0	128	128	0	128	0	128				
610	Rural Residential	Commercial				11.90		RR	0	0	0	0	157,453		157,453						0	0	0	0	0	0	315	315	0				
610	Rural Residential	Rural Residential		26		215.53		RR		27		51				51	51													81	153	153	
611	Business Park	Business Park			Yes-HE	52.51		BP	0	1	913,000	0			693,880						0	0	0	1,738	0	1,738	1,388	0	1,388				
611	Business Park	Multiple Family Residential			Yes-HE	16.74		BP						502		502	502													0	0	1,506	
611	Rural Residential	Rural Residential				47.75		RR		0		11				11	11													0	33	33	
611	Single-Family 1, Residential	Single Family Residential				12.91		SF-1		0		45				45	45													0	135	135	
618	Regional Commercial	Commercial				68.09		RC	0		965,900				965,900						0	0	0	2,052	2,052	0	2,052	2,052	0				
618	Rural Residential	Rural Residential				14.03		RR		0		3				3	3													0	9	9	
			13,978,895	**33,750**				**TOTALS**	**11,286,151**	**33,752**	**49,073,504**	**40,845**	**22,346,411**	**3,897**	**50,189,652**	**44,241**	**44,484**	**23,109**	**25,509**	**25,509**	**19,888**	**10,968**	**8,920**	**93,390**	**38,972**	**54,418**	**130,153**	**31,633**	**98,521**	**101,253**	**122,301**	**133,261**	
																					19,888			93,390			130,154						

is Area Codes
A - NORTH MURRIETA BUSINESS CORRIDOR
B - CLINTON KEITH/MITCHELL
C - GOLDEN TRIANGLE NORTH
D - SOUTH MURRIETA BUSINESS CORRIDOR
E - MULITPLE USE AREA 3 (MU-3)

Appendix D:

Air Quality Data

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name:

Project Name: Murrieta-Existing

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	2,145.43	635.88	1,600.17	0.07	4.59	4.55	786,413.75

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	4,687.86	6,583.96	59,820.22	71.69	11,730.16	2,281.97	7,004,001.09

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	6,833.29	7,219.84	61,420.39	71.76	11,734.75	2,286.52	7,790,414.84

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	47.45	621.35	312.43	0.01	1.18	1.16	784,343.77
Hearth							
Landscape	231.65	14.53	1,287.74	0.06	3.41	3.39	2,069.98
Consumer Products	1,674.28						
Architectural Coatings	192.05						
TOTALS (lbs/day, unmitigated)	2,145.43	635.88	1,600.17	0.07	4.59	4.55	786,413.75

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	1,995.06	2,678.51	24,897.22	29.36	4,778.39	930.38	2,865,347.21
Apartments low rise	210.12	272.21	2,530.27	2.98	485.62	94.55	291,201.09
High school	130.08	182.67	1,632.62	1.98	325.34	63.25	193,650.59
City park	28.80	25.69	228.63	0.28	45.70	8.88	27,185.83
Strip mall	1,981.36	2,953.25	26,205.57	31.92	5,248.66	1,020.22	3,120,833.18
General office building	107.11	148.33	1,352.05	1.62	265.72	51.69	158,628.84
Office park	182.19	252.98	2,326.37	2.78	454.38	88.41	271,611.39
General light industry	53.14	70.32	647.49	0.77	126.35	24.59	75,542.96
TOTALS (lbs/day, unmitigated)	4,687.86	6,583.96	59,820.22	71.69	11,730.16	2,281.97	7,004,001.09

12/22/2010 11:57:37 AM

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2012 Temperature (F): 80 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	9,535.00	9.57	dwelling units	28,605.00	273,749.84	2,765,639.89
Apartments low rise	252.00	6.90	dwelling units	4,032.00	27,820.80	281,067.98
High school		12.89	1000 sq ft	1,577.34	20,331.91	188,375.17
City park		1.59	acres	1,832.50	2,913.68	26,463.45
Strip mall		42.94	1000 sq ft	7,887.88	338,705.55	3,039,204.79
General office building		11.01	1000 sq ft	1,372.86	15,115.19	153,834.83
Office park		11.42	1000 sq ft	2,162.33	24,693.81	263,038.46
General light industry		6.97	1000 sq ft	978.47	6,819.94	73,143.81
					710,150.72	6,790,768.38

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	51.5	0.6	99.2	0.2
Light Truck < 3750 lbs	7.3	1.4	95.9	2.7
Light Truck 3751-5750 lbs	23.0	0.4	99.6	0.0
Med Truck 5751-8500 lbs	10.7	0.9	99.1	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Lite-Heavy Truck 8501-10,000 lbs	1.6	0.0	81.2	18.8
Lite-Heavy Truck 10,001-14,000 lbs	0.5	0.0	60.0	40.0
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	0.5	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.8	60.7	39.3	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.9	0.0	88.9	11.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
High school				10.0	5.0	85.0
City park				5.0	2.5	92.5
Strip mall				2.0	1.0	97.0

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
General office building				35.0	17.5	47.5
Office park				48.0	24.0	28.0
General light industry				50.0	25.0	25.0

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Urbemis 2007 Version 9.2.4

Combined Winter Emissions Reports (Pounds/Day)

File Name:

Project Name: Murrieta-Existing

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	1,913.78	621.35	312.43	0.01	1.18	1.16	784,343.77

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	5,159.14	7,928.54	57,212.94	59.65	11,730.16	2,281.97	6,340,547.21

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	7,072.92	8,549.89	57,525.37	59.66	11,731.34	2,283.13	7,124,890.98

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	47.45	621.35	312.43	0.01	1.18	1.16	784,343.77
Hearth							
Landscaping - No Winter Emissions							
Consumer Products	1,674.28						
Architectural Coatings	192.05						
TOTALS (lbs/day, unmitigated)	1,913.78	621.35	312.43	0.01	1.18	1.16	784,343.77

Area Source Changes to Defaults

12/22/2010 11:58:16 AM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name:

Project Name: Murrieta-Existing

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	391.55	116.05	292.03	0.01	0.83	0.83	143,520.51

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	884.21	1,283.36	10,758.58	12.35	2,140.75	416.46	1,237,870.10

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	1,275.76	1,399.41	11,050.61	12.36	2,141.58	417.29	1,381,390.61

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	8.66	113.40	57.02	0.00	0.21	0.21	143,142.74
Hearth							
Landscape	42.28	2.65	235.01	0.01	0.62	0.62	377.77
Consumer Products	305.56						
Architectural Coatings	35.05						
TOTALS (tons/year, unmitigated)	391.55	116.05	292.03	0.01	0.83	0.83	143,520.51

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	373.75	522.19	4,472.77	5.06	872.06	169.80	506,488.62
Apartments low rise	39.08	53.07	454.56	0.51	88.63	17.26	51,473.71
High school	24.49	35.60	293.82	0.34	59.37	11.54	34,221.65
City park	5.01	5.01	41.17	0.05	8.34	1.62	4,804.13
Strip mall	377.53	575.54	4,720.04	5.50	957.88	186.19	551,488.91
General office building	20.14	28.92	242.78	0.28	48.49	9.43	28,035.47
Office park	34.30	49.32	417.31	0.48	82.92	16.13	48,005.74
General light industry	9.91	13.71	116.13	0.13	23.06	4.49	13,351.87
TOTALS (tons/year, unmitigated)	884.21	1,283.36	10,758.58	12.35	2,140.75	416.46	1,237,870.10

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Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2012 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	9,535.00	9.57	dwelling units	28,605.00	273,749.84	2,765,639.89
Apartments low rise	252.00	6.90	dwelling units	4,032.00	27,820.80	281,067.98
High school		12.89	1000 sq ft	1,577.34	20,331.91	188,375.17
City park		1.59	acres	1,832.50	2,913.68	26,463.45
Strip mall		42.94	1000 sq ft	7,887.88	338,705.55	3,039,204.79
General office building		11.01	1000 sq ft	1,372.86	15,115.19	153,834.83
Office park		11.42	1000 sq ft	2,162.33	24,693.81	263,038.46
General light industry		6.97	1000 sq ft	978.47	6,819.94	73,143.81
					710,150.72	6,790,768.38

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	51.5	0.6	99.2	0.2
Light Truck < 3750 lbs	7.3	1.4	95.9	2.7
Light Truck 3751-5750 lbs	23.0	0.4	99.6	0.0
Med Truck 5751-8500 lbs	10.7	0.9	99.1	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Lite-Heavy Truck 8501-10,000 lbs	1.6	0.0	81.2	18.8
Lite-Heavy Truck 10,001-14,000 lbs	0.5	0.0	60.0	40.0
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	0.5	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.8	60.7	39.3	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.9	0.0	88.9	11.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
High school				10.0	5.0	85.0
City park				5.0	2.5	92.5
Strip mall				2.0	1.0	97.0

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
General office building				35.0	17.5	47.5
Office park				48.0	24.0	28.0
General light industry				50.0	25.0	25.0

Emissions From Electricity Consumed By Land Uses

Land Use	*Amount*	kilowatt-hours per year[1]	*CO* 2.00E-04	*ROG* 1.00E-05	*NO_X* 1.15E-03	*SO_X* 1.20E-04	*PM_{10}* 4.00E-05	*CO_2* 0.772	*N_2O* 6.59E-06	*CH_4* 4.04E-05
Residential (Dwelling Units)	32,637	5626.5	100.62	5.03	578.57	60.37	20.12	388,394.43	3.32	20.31
Food Store (SF)		53.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Restaurant (SF)		47.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hospitals (SF)		21.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Retail (SF)	7,887,887	13.55	58.56	2.93	336.75	35.14	11.71	226,060.36	1.93	11.82
College/University (SF)		11.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High School (SF)	1,577,344	10.5	9.08	0.45	52.18	5.45	1.82	35,030.00	0.30	1.83
Elementary School (SF)		5.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Office (SF)	3,535,196	12.95	25.09	1.25	144.24	15.05	5.02	96,829.50	0.83	5.06
Hotel/Motel (SF)		9.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Warehouse (SF)	978,469	4.35	2.33	0.12	13.41	1.40	0.47	9,002.45	0.08	0.47
Miscellaneous (SF)		10.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blank			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL - pounds per day	**--**	**--**	**1.96E-01**	**9.78E+00**	**1.13E+03**	**1.17E+02**	**3.91E+01**	**755,316.74**	**6.45**	**39.50**
TOTAL - tons per year	**--**	**--**	**3.57E-02**	**1.79E+00**	**2.05E+02**	**2.14E+01**	**7.14E+00**	**137,845.31**	**1.18**	**7.21**
TOTAL - metric tons per year	**--**	**--**	**3.24E-02**	**1.62E+00**	**1.86E+02**	**1.94E+01**	**6.48E+00**	**125051.15**	**1.07**	**6.54**

	CO_2	N_2O	CH_4	
metric tons per year	125,051.15	1.07	6.54	
metric tons CO_2eq per year	125,051.15	330.92	137.32	125,519.39

Notes:

1. Usage rate; average for SCE and LADWP.

Source:

South Coast Air Quality Management District, *CEQA Air Quality Handbook* , November 1993, Table A9-11.

Source for greenhouse gas emissions rates:

U.S. Energy Information Administration, *Domestic Electricity Emissions Factors 1999-2002* , October 2007. http://www.eia.doe.gov/oiaf/1605/techassist.html

Water Consumption Indirect Emissions

	Acre Feet per year	Electricity Usage kWh/year	Units	CO	ROG	NO_X	SO_X	PM_{10}	CO_2	N_2O	CH_4
				2.00E-04	1.00E-05	1.15E-03	1.20E-04	4.00E-05	0.772	6.59E-06	4.04E-05
Project Demand	39179	17,160,402	pounds/yr	3.43E+03	1.72E+02	1.97E+04	2.06E+03	6.86E+02	1.32E+07	1.13E+02	6.93E+02
			tons/yr	1.72E+00	8.58E-02	9.87E+00	1.03E+00	3.43E-01	6.62E+03	5.65E-02	3.46E-01
			mt/yr	1.56E+00	7.78E-02	8.95E+00	9.34E-01	3.11E-01	6.01E+03	5.13E-02	3.14E-01
								$MTCO_2EQ$	6009.11	17.53	7.27

Energy Factor 438 kWh/acre-foot

Based on energy usage factors for water conveyance from the California Energy Commission, Water Energy Use in California, Accessed May 2009.
http://www.energy.ca.gov/research/iaw/industry/water.html

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name:

Project Name: Murrieta-2035

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	3,054.63	1,049.52	2,063.66	0.08	5.81	5.76	1,291,531.13

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	10,214.49	14,479.04	131,018.97	157.63	25,812.33	5,020.57	15,398,749.46

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	13,269.12	15,528.56	133,082.63	157.71	25,818.14	5,026.33	16,690,280.59

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	78.00	1,033.00	599.45	0.01	1.93	1.91	1,289,177.81
Hearth							
Landscape	263.54	16.52	1,464.21	0.07	3.88	3.85	2,353.32
Consumer Products	2,282.03						
Architectural Coatings	431.06						
TOTALS (lbs/day, unmitigated)	3,054.63	1,049.52	2,063.66	0.08	5.81	5.76	1,291,531.13

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	2,270.77	3,048.66	28,337.83	33.42	5,438.72	1,058.96	3,261,317.06
Apartments low rise	621.49	805.16	7,484.12	8.83	1,436.39	279.67	861,325.45
High school	96.35	135.31	1,209.31	1.47	240.99	46.85	143,441.20
City park	50.61	45.15	401.74	0.49	80.31	15.61	47,769.91
Strip mall	4,821.80	7,186.98	63,773.49	77.69	12,773.06	2,482.79	7,594,814.37
General office building	1,311.27	1,815.94	16,552.18	19.88	3,253.05	632.79	1,941,979.07
Office park	960.83	1,334.16	12,268.82	14.67	2,396.33	466.25	1,432,425.86
General light industry	81.37	107.68	991.48	1.18	193.48	37.65	115,676.54
TOTALS (lbs/day, unmitigated)	10,214.49	14,479.04	131,018.97	157.63	25,812.33	5,020.57	15,398,749.46

12/22/2010 12:30:26 PM

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2012 Temperature (F): 80 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	10,852.67	9.57	dwelling units	32,558.00	311,580.05	3,147,830.93
Apartments low rise	745.38	6.90	dwelling units	11,926.00	82,289.40	831,353.36
High school		12.89	1000 sq ft	1,168.37	15,060.29	139,533.58
City park		1.59	acres	3,220.00	5,119.80	46,500.58
Strip mall		42.94	1000 sq ft	19,195.83	824,268.92	7,396,164.69
General office building		11.01	1000 sq ft	16,806.94	185,044.41	1,883,289.44
Office park		11.42	1000 sq ft	11,403.71	130,230.37	1,387,213.89
General light industry		6.97	1000 sq ft	1,498.30	10,443.15	112,002.80
					1,564,036.39	14,943,889.27

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	51.5	0.6	99.2	0.2
Light Truck < 3750 lbs	7.3	1.4	95.9	2.7
Light Truck 3751-5750 lbs	23.0	0.4	99.6	0.0
Med Truck 5751-8500 lbs	10.7	0.9	99.1	0.0

12/22/2010 12:30:26 PM

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Lite-Heavy Truck 8501-10,000 lbs	1.6	0.0	81.2	18.8
Lite-Heavy Truck 10,001-14,000 lbs	0.5	0.0	60.0	40.0
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	0.5	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.8	60.7	39.3	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.9	0.0	88.9	11.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
High school				10.0	5.0	85.0
City park				5.0	2.5	92.5
Strip mall				2.0	1.0	97.0

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
General office building				35.0	17.5	47.5
Office park				48.0	24.0	28.0
General light industry				50.0	25.0	25.0

12/22/2010 12:30:38 PM

Urbemis 2007 Version 9.2.4

Combined Winter Emissions Reports (Pounds/Day)

File Name:

Project Name: Murrieta-2035

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	2,791.09	1,033.00	599.45	0.01	1.93	1.91	1,289,177.81

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	11,284.97	17,435.44	125,295.37	131.12	25,812.33	5,020.57	13,938,740.73

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	14,076.06	18,468.44	125,894.82	131.13	25,814.26	5,022.48	15,227,918.54

12/22/2010 12:30:38 PM

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	78.00	1,033.00	599.45	0.01	1.93	1.91	1,289,177.81
Hearth							
Landscaping - No Winter Emissions							
Consumer Products	2,282.03						
Architectural Coatings	431.06						
TOTALS (lbs/day, unmitigated)	2,791.09	1,033.00	599.45	0.01	1.93	1.91	1,289,177.81

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	2,451.30	3,672.96	27,010.03	27.83	5,438.72	1,058.96	2,953,775.93
Apartments low rise	657.35	970.04	7,133.45	7.35	1,436.39	279.67	780,102.74
High school	105.49	162.89	1,158.95	1.22	240.99	46.85	129,808.85
City park	43.61	54.35	385.62	0.41	80.31	15.61	43,226.83
Strip mall	5,459.06	8,649.98	61,274.27	64.57	12,773.06	2,482.79	6,872,213.66
General office building	1,430.03	2,187.67	15,752.72	16.54	3,253.05	632.79	1,757,982.86
Office park	1,051.49	1,607.78	11,640.08	12.21	2,396.33	466.25	1,296,895.92
General light industry	86.64	129.77	940.25	0.99	193.48	37.65	104,733.94
TOTALS (lbs/day, unmitigated)	11,284.97	17,435.44	125,295.37	131.12	25,812.33	5,020.57	13,938,740.73

12/22/2010 12:30:38 PM

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2012 Temperature (F): 60 Season: Winter

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	10,852.67	9.57	dwelling units	32,558.00	311,580.05	3,147,830.93
Apartments low rise	745.38	6.90	dwelling units	11,926.00	82,289.40	831,353.36
High school		12.89	1000 sq ft	1,168.37	15,060.29	139,533.58
City park		1.59	acres	3,220.00	5,119.80	46,500.58
Strip mall		42.94	1000 sq ft	19,195.83	824,268.92	7,396,164.69
General office building		11.01	1000 sq ft	16,806.94	185,044.41	1,883,289.44
Office park		11.42	1000 sq ft	11,403.71	130,230.37	1,387,213.89
General light industry		6.97	1000 sq ft	1,498.30	10,443.15	112,002.80
					1,564,036.39	14,943,889.27

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	51.5	0.6	99.2	0.2
Light Truck < 3750 lbs	7.3	1.4	95.9	2.7
Light Truck 3751-5750 lbs	23.0	0.4	99.6	0.0
Med Truck 5751-8500 lbs	10.7	0.9	99.1	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Lite-Heavy Truck 8501-10,000 lbs	1.6	0.0	81.2	18.8
Lite-Heavy Truck 10,001-14,000 lbs	0.5	0.0	60.0	40.0
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	0.5	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.8	60.7	39.3	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.9	0.0	88.9	11.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
High school				10.0	5.0	85.0
City park				5.0	2.5	92.5
Strip mall				2.0	1.0	97.0

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
General office building				35.0	17.5	47.5
Office park				48.0	24.0	28.0
General light industry				50.0	25.0	25.0

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name:

Project Name: Murrieta-2035

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	557.47	191.54	376.62	0.01	1.06	1.05	235,704.43

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	1,929.27	2,822.27	23,562.79	27.15	4,710.75	916.25	2,721,454.58

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	2,486.74	3,013.81	23,939.41	27.16	4,711.81	917.30	2,957,159.01

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	14.23	188.52	109.40	0.00	0.35	0.35	235,274.95
Hearth							
Landscape	48.10	3.02	267.22	0.01	0.71	0.70	429.48
Consumer Products	416.47						
Architectural Coatings	78.67						
TOTALS (tons/year, unmitigated)	557.47	191.54	376.62	0.01	1.06	1.05	235,704.43

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	425.40	594.36	5,090.88	5.76	992.57	193.26	576,481.61
Apartments low rise	115.60	156.97	1,344.52	1.52	262.14	51.04	152,250.85
High school	18.14	26.37	217.64	0.25	43.98	8.55	25,348.72
City park	8.81	8.80	72.34	0.08	14.66	2.85	8,441.64
Strip mall	918.75	1,400.62	11,486.63	13.38	2,331.08	453.11	1,342,095.41
General office building	246.53	354.02	2,972.14	3.43	593.68	115.48	343,218.08
Office park	180.87	260.13	2,200.81	2.53	437.33	85.09	253,172.98
General light industry	15.17	21.00	177.83	0.20	35.31	6.87	20,445.29
TOTALS (tons/year, unmitigated)	1,929.27	2,822.27	23,562.79	27.15	4,710.75	916.25	2,721,454.58

12/22/2010 12:30:45 PM

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2012 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	10,852.67	9.57	dwelling units	32,558.00	311,580.05	3,147,830.93
Apartments low rise	745.38	6.90	dwelling units	11,926.00	82,289.40	831,353.36
High school		12.89	1000 sq ft	1,168.37	15,060.29	139,533.58
City park		1.59	acres	3,220.00	5,119.80	46,500.58
Strip mall		42.94	1000 sq ft	19,195.83	824,268.92	7,396,164.69
General office building		11.01	1000 sq ft	16,806.94	185,044.41	1,883,289.44
Office park		11.42	1000 sq ft	11,403.71	130,230.37	1,387,213.89
General light industry		6.97	1000 sq ft	1,498.30	10,443.15	112,002.80
					1,564,036.39	14,943,889.27

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	51.5	0.6	99.2	0.2
Light Truck < 3750 lbs	7.3	1.4	95.9	2.7
Light Truck 3751-5750 lbs	23.0	0.4	99.6	0.0
Med Truck 5751-8500 lbs	10.7	0.9	99.1	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Lite-Heavy Truck 8501-10,000 lbs	1.6	0.0	81.2	18.8
Lite-Heavy Truck 10,001-14,000 lbs	0.5	0.0	60.0	40.0
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	0.5	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.8	60.7	39.3	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.9	0.0	88.9	11.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
High school				10.0	5.0	85.0
City park				5.0	2.5	92.5
Strip mall				2.0	1.0	97.0

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
General office building				35.0	17.5	47.5
Office park				48.0	24.0	28.0
General light industry				50.0	25.0	25.0

Emissions From Electricity Consumed By Land Uses

Land Use	*Amount*	kilowatt-hours per year[1]	*CO* 2.00E-04	*ROG* 1.00E-05	*NO_X* 1.15E-03	*SO_X* 1.20E-04	*PM_{10}* 4.00E-05	*CO_2* 0.772	*N_2O* 6.59E-06	*CH_4* 4.04E-05
Residential (Dwelling Units)	44,484	5626.5	137.14	6.86	788.58	82.29	27.43	529,378.86	4.52	27.68
Food Store (SF)		53.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Restaurant (SF)		47.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hospitals (SF)		21.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Retail (SF)	19,195,825	13.55	142.52	7.13	819.50	85.51	28.50	550,136.57	4.70	28.77
College/University (SF)		11.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High School (SF)	1,168,369	10.5	6.72	0.34	38.65	4.03	1.34	25,947.39	0.22	1.36
Elementary School (SF)		5.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Office (SF)	28,210,650	12.95	200.18	10.01	1,151.03	120.11	40.04	772,693.57	6.60	40.41
Hotel/Motel (SF)		9.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Warehouse (SF)	1,498,300	4.35	3.57	0.18	20.53	2.14	0.71	13,785.18	0.12	0.72
Miscellaneous (SF)		10.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blank			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL - pounds per day	**--**	**--**	**4.90E-01**	**2.45E+01**	**2.82E+03**	**2.94E+02**	**9.80E+01**	**1,891,941.57**	**16.15**	**98.93**
TOTAL - tons per year	**--**	**--**	**8.95E-02**	**4.47E+00**	**5.14E+02**	**5.37E+01**	**1.79E+01**	**345,279.34**	**2.95**	**18.06**
TOTAL - metric tons per year	**--**	**--**	**8.11E-02**	**4.06E+00**	**4.67E+02**	**4.87E+01**	**1.62E+01**	**313232.13**	**2.67**	**16.38**

	CO_2	N_2O	CH_4	
metric tons per year	313,232.13	2.67	16.38	
metric tons CO_2eq per year	313,232.13	828.89	343.98	314,404.99

Notes:

1. Usage rate; average for SCE and LADWP.

Source:

South Coast Air Quality Management District, *CEQA Air Quality Handbook* , November 1993, Table A9-11.

Source for greenhouse gas emissions rates:

U.S. Energy Information Administration, *Domestic Electricity Emissions Factors 1999-2002* , October 2007. http://www.eia.doe.gov/oiaf/1605/techassist.html

Water Consumption Indirect Emissions

	Acre Feet per year	Electricity Usage kWh/year	Units	*CO* 2.00E-04	*ROG* 1.00E-05	*NO_X* 1.15E-03	*SO_X* 1.20E-04	*PM_{10}* 4.00E-05	*CO_2* 0.772	*N_2O* 6.59E-06	*CH_4* 4.04E-05
Project Demand	50207	21,990,666	pounds/yr	4.40E+03	2.20E+02	2.53E+04	2.64E+03	8.80E+02	1.70E+07	1.45E+02	8.88E+02
			tons/yr	2.20E+00	1.10E-01	1.26E+01	1.32E+00	4.40E-01	8.49E+03	7.25E-02	4.44E-01
			mt/yr	1.99E+00	9.97E-02	1.15E+01	1.20E+00	3.99E-01	7.70E+03	6.57E-02	4.03E-01
								$MTCO_2EQ$	7700.54	22.46	9.32

Energy Factor 438 kWh/acre-foot

Based on energy usage factors for water conveyance from the California Energy Commission, Water Energy Use in California, Accessed May 2009.
http://www.energy.ca.gov/research/iaw/industry/water.html

Appendix E:

Noise Data

Site Number: City of Murrieta (MUR001)
Recorded By: Brian Allee
Job Number: 10106976
Date: November 4, 2010
Time: 10:48 AM
Location: Corner of Elm Street and Madison Avenue.
Source of Peak Noise: Vehicular noise from Elm Street and Madison Avenue (small vehicles, medium trucks, large trucks) – vehicular noise from Interstate 15 and Interstate 215 – plane flew over – large truck horn – car radio – birds chirping – insect noises.

Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
52.7	41.8	68.5	91.8

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Brüel & Kjær**	**2250**	**2548189**	**9/10/2009**	
	Microphone	**Brüel & Kjær**	**4189**	**2543364**	**9/10/2009**	
	Preamp	**Brüel & Kjær**	**ZC 0032**	**4265**	**9/10/2009**	
	Calibrator	**Brüel & Kjær**	**4231**	**2545667**	**9/10/2009**	

Weather Data			
Est.	**Duration:** 10 minutes		**Sky:** ☼
	Note: dBA Offset = 0.02		**Sensor Height (ft):** 5 ft
	Wind Ave Speed (mph / m/s)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	1.0	89.0	978.1

Photo of Measurement Location

2250

Instrument:		2250
Application:		BZ7225 Version 2.0.2
Start Time:		11/04/2010 10:47:29
End Time:		11/04/2010 10:57:29
Elapsed Time:		00:10:00
Bandwidth:		1/3-octave
Max Input Level:		140.13

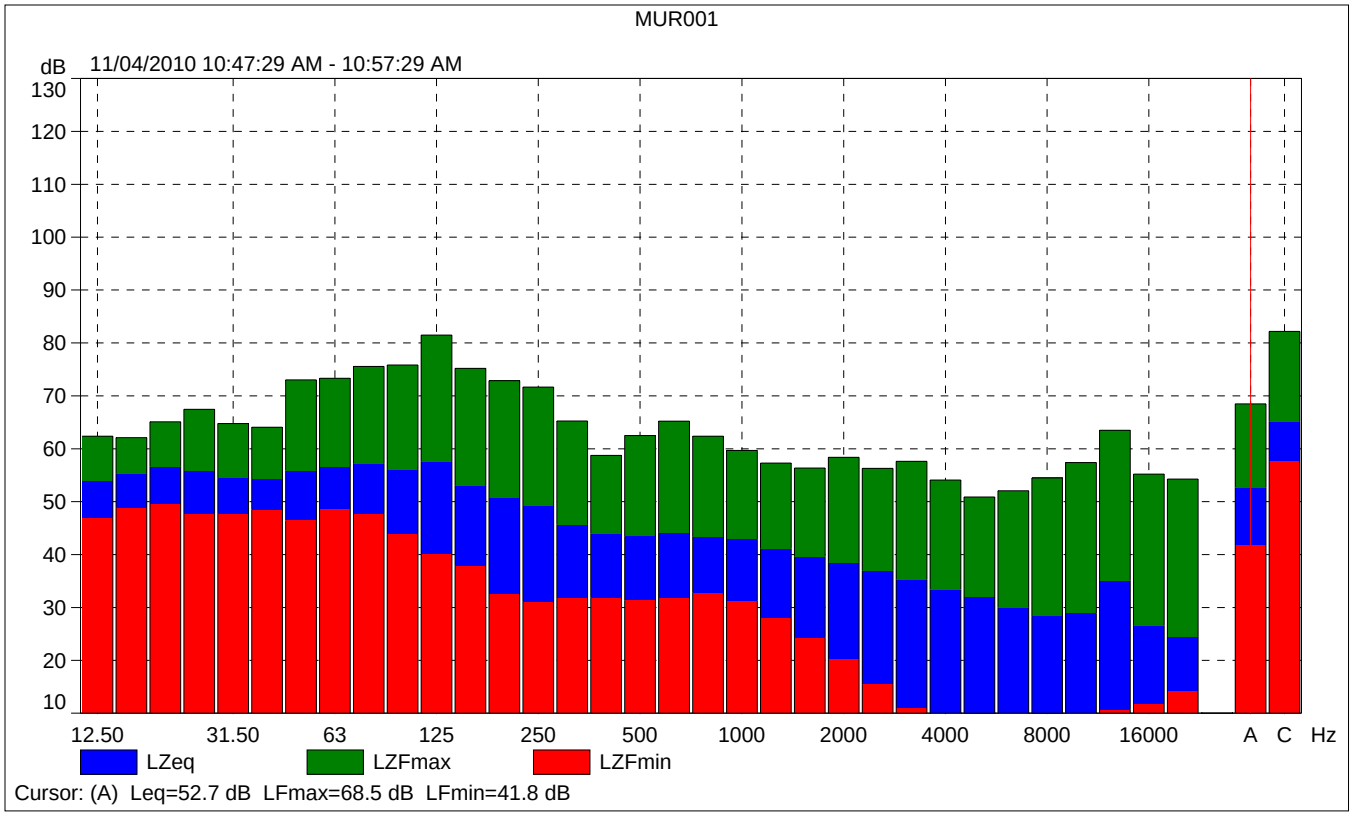
	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	Z

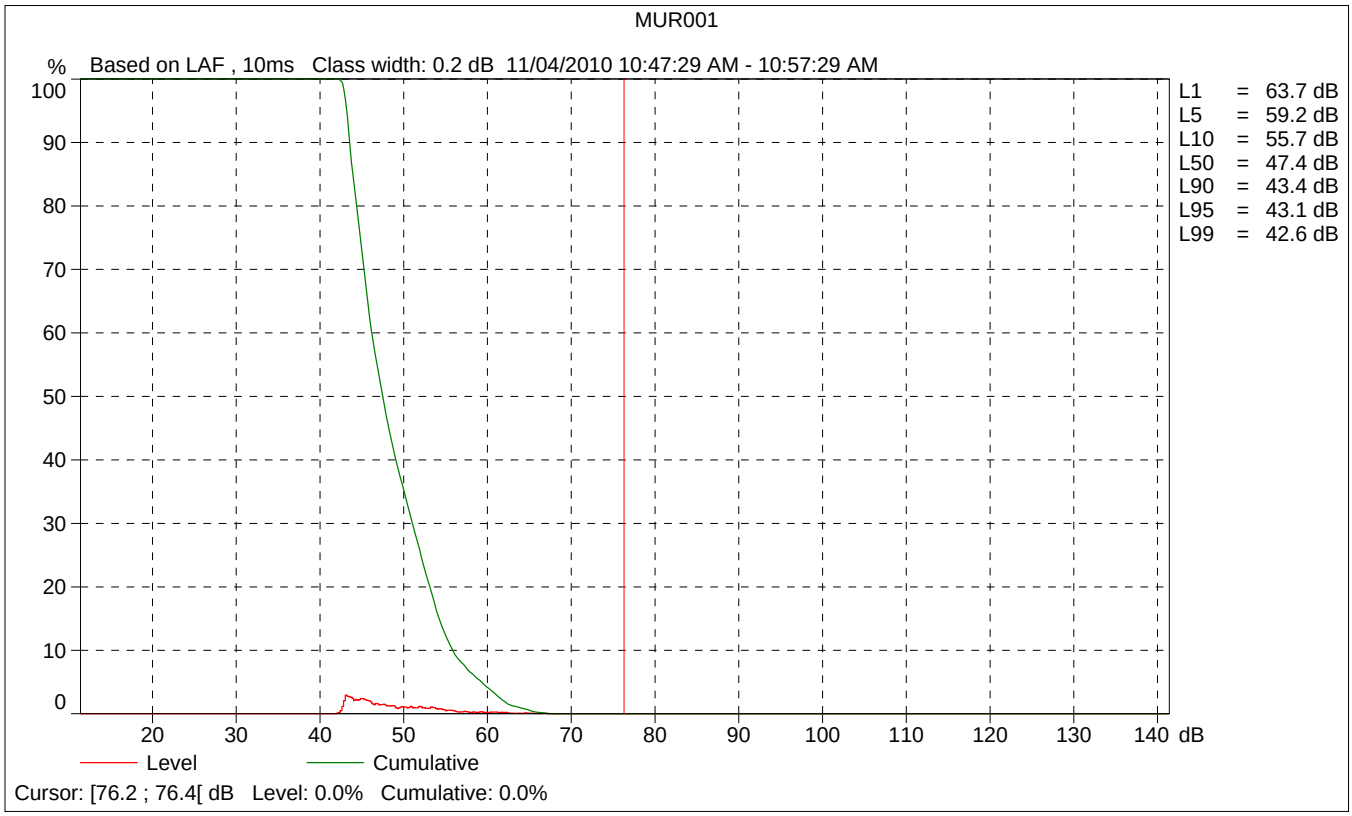
Instrument Serial Number:		2548189
Microphone Serial Number:		2543364
Input:		Top Socket
Windscreen Correction:		None
Sound Field Correction:		Diffuse-field

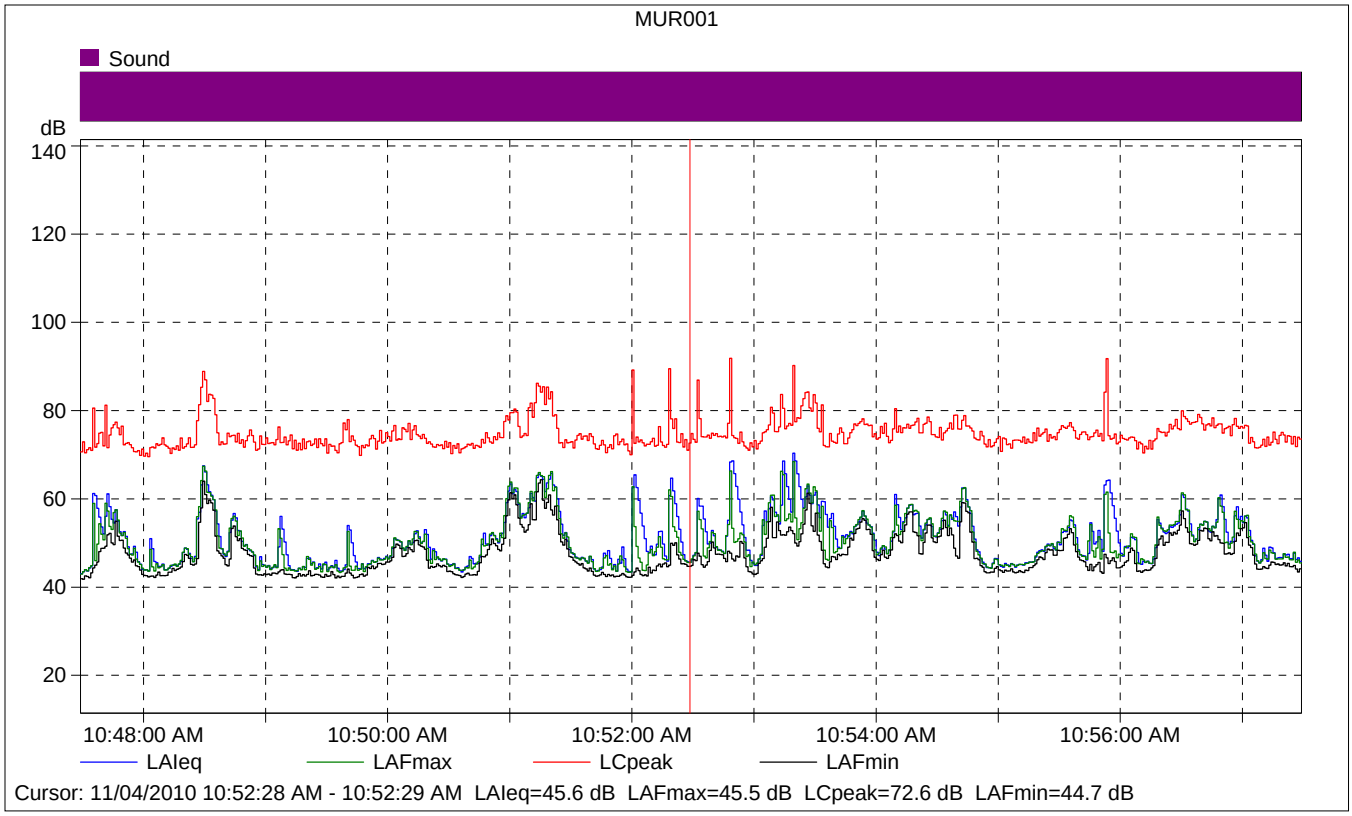
Calibration Time:		11/04/2010 08:39:06
Calibration Type:		External reference
Sensitivity:		54.83 mV/Pa

MUR001

	Start time	End time	Elapsed time	Overload [%]	LAeq [dB]	LAFmax [dB]	LAFmin [dB]
Value				0.00	52.7	68.5	41.8
Time	10:47:29 AM	10:57:29 AM	0:10:00				
Date	11/04/2010	11/04/2010					

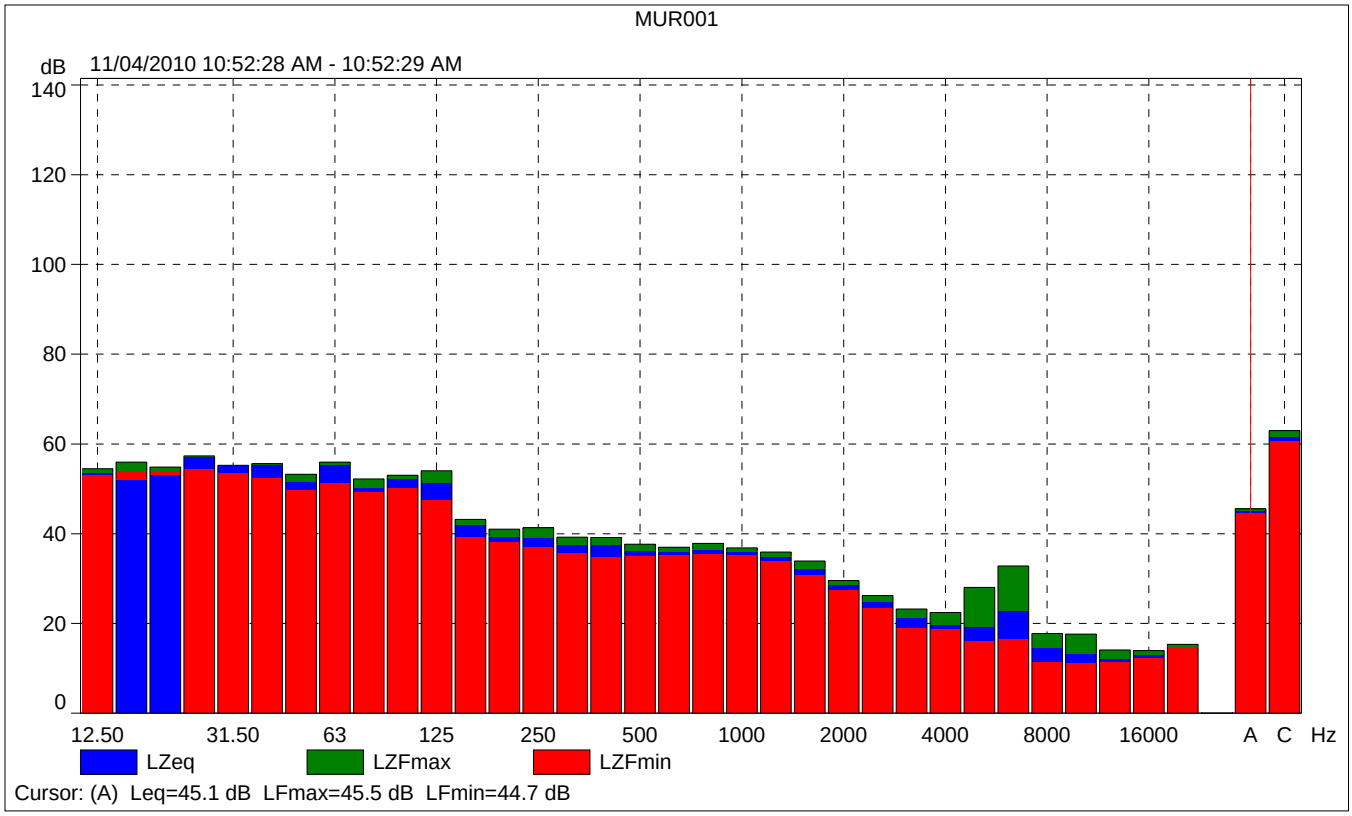

MUR001
dB
11/04/2010 10:47:29 AM - 10:57:29 AM
130
120
110
100
90
80
70
60
50
40
30
20
10
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=52.7 dB LFmax=68.5 dB LFmin=41.8 dB

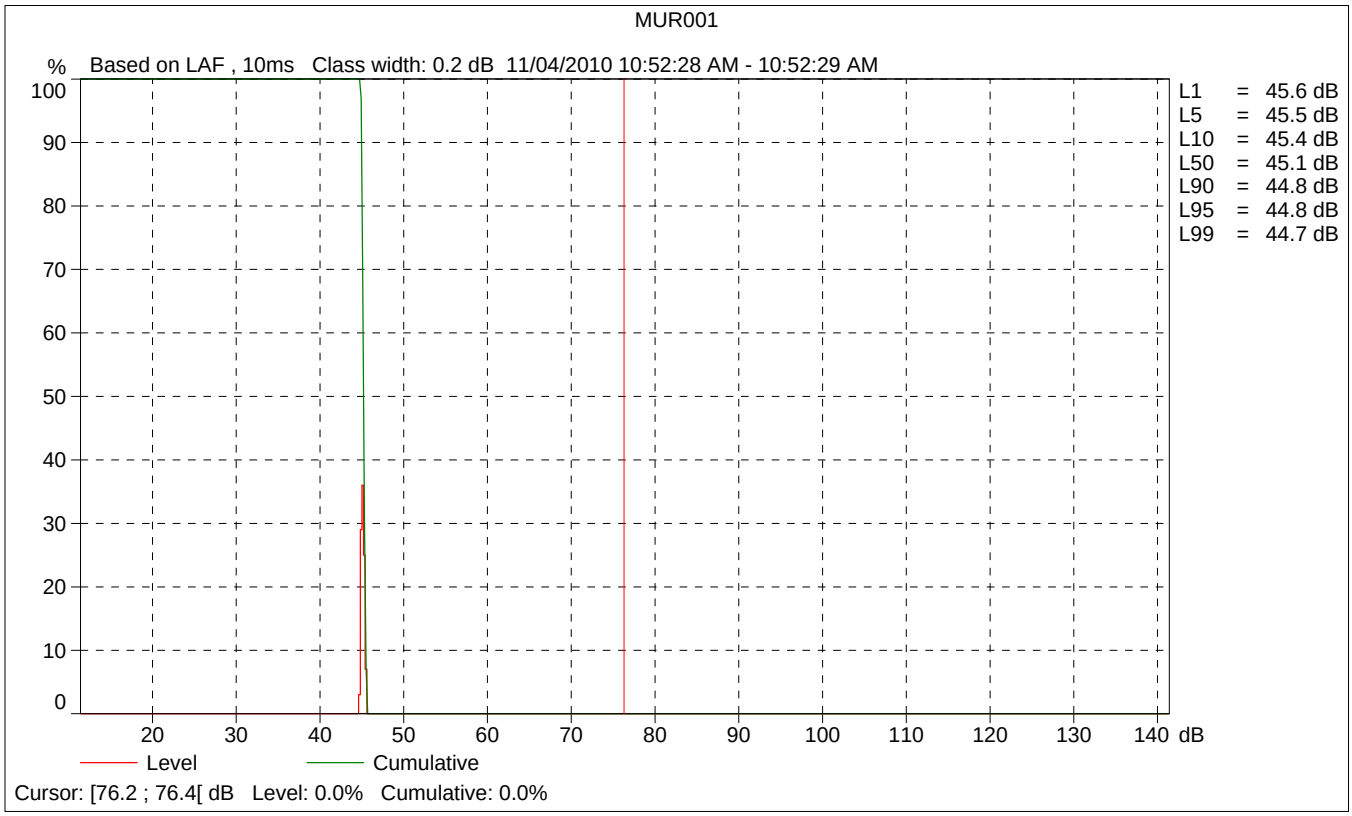

MUR001
%
Based on LAF , 10ms Class width: 0.2 dB 11/04/2010 10:47:29 AM - 10:57:29 AM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 63.7 dB
L5 = 59.2 dB
L10 = 55.7 dB
L50 = 47.4 dB
L90 = 43.4 dB
L95 = 43.1 dB
L99 = 42.6 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%

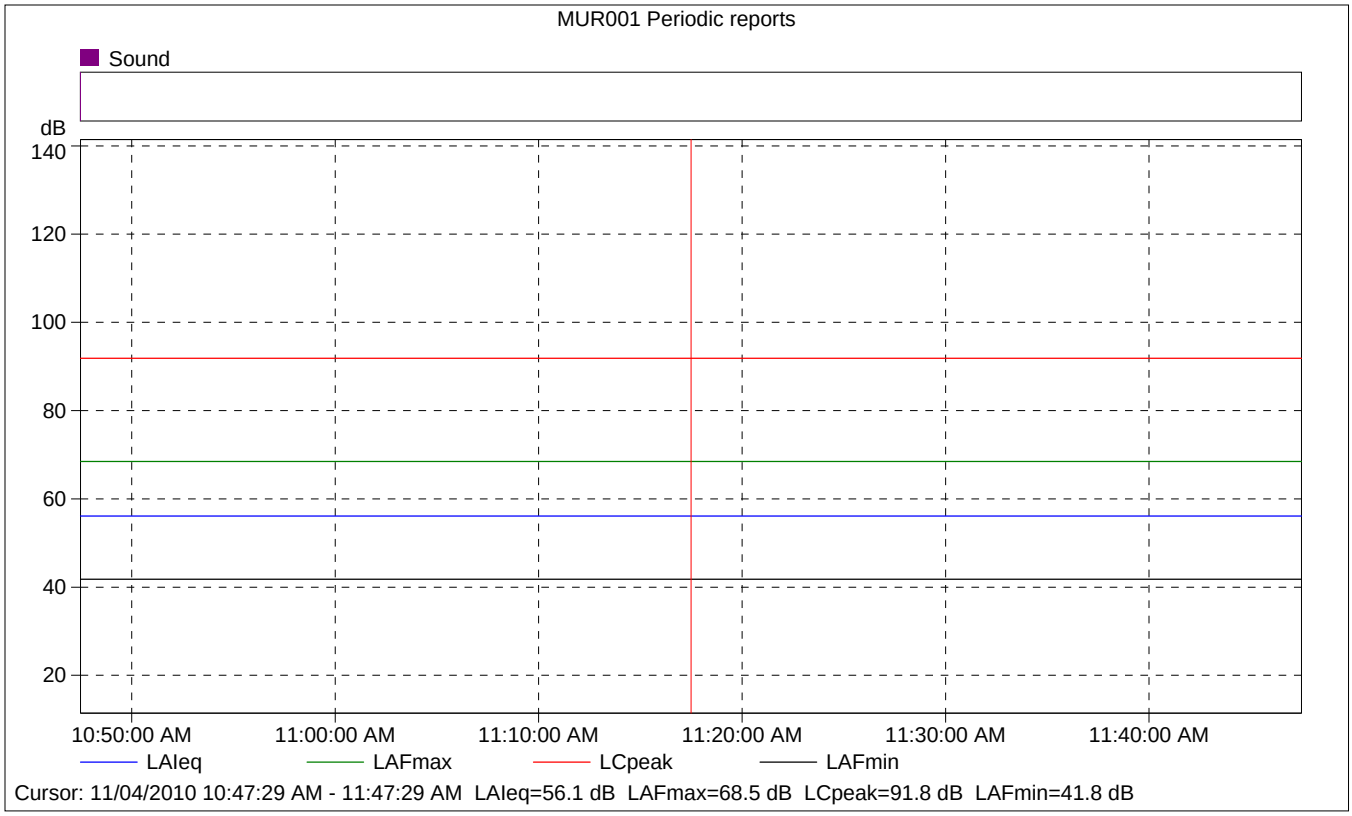


MUR001

	Start time	Elapsed time	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			45.6	45.5	44.7
Time	10:52:28 AM	0:00:01			
Date	11/04/2010				

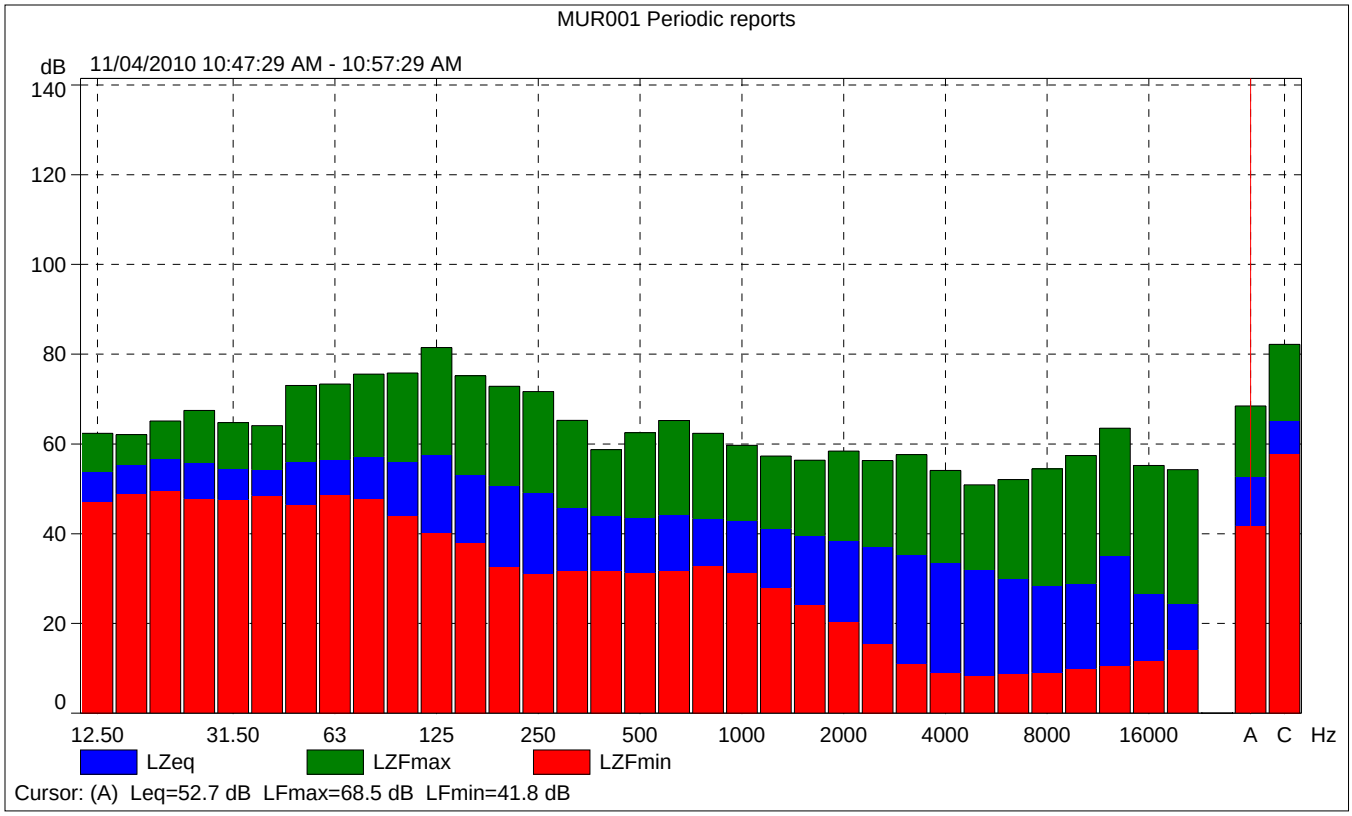

MUR001
dB
11/04/2010 10:52:28 AM - 10:52:29 AM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=45.1 dB LFmax=45.5 dB LFmin=44.7 dB

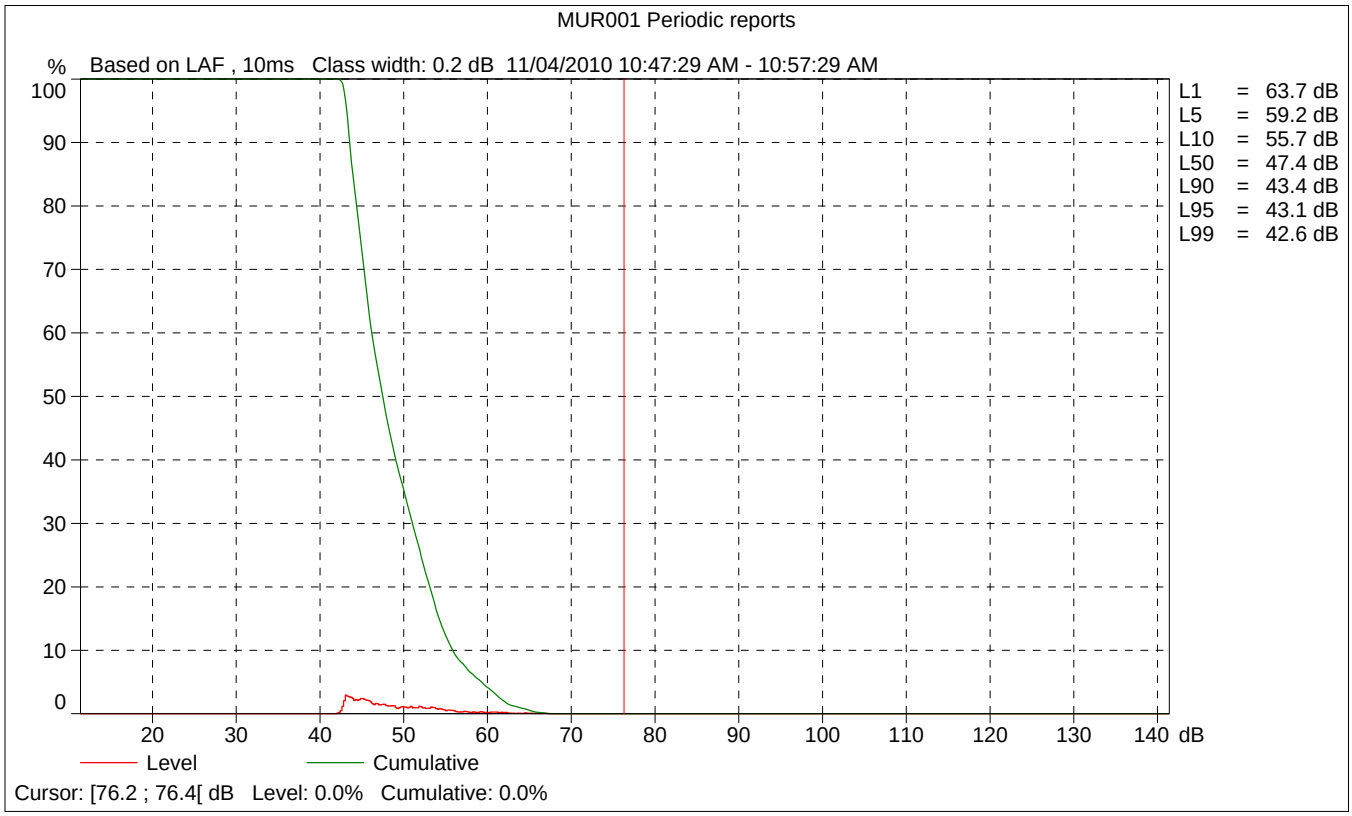

MUR001
%
Based on LAF , 10ms Class width: 0.2 dB 11/04/2010 10:52:28 AM - 10:52:29 AM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140 dB
L1 = 45.6 dB
L5 = 45.5 dB
L10 = 45.4 dB
L50 = 45.1 dB
L90 = 44.8 dB
L95 = 44.8 dB
L99 = 44.7 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%

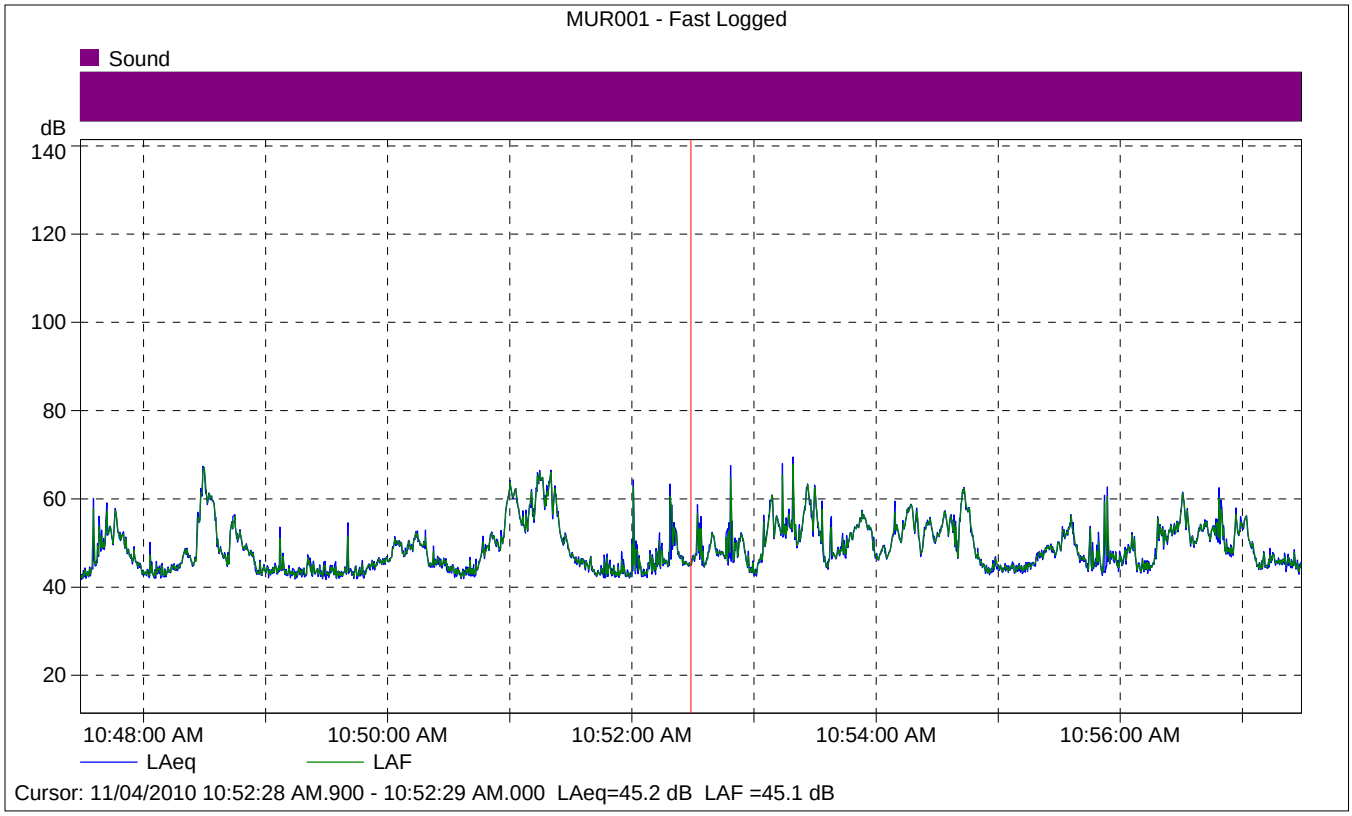


MUR001 Periodic reports

	Start time	Elapsed time	Overload [%]	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			0.00	56.1	68.5	41.8
Time	10:47:29 AM	0:10:00				
Date	11/04/2010					


MUR001 Periodic reports
dB
11/04/2010 10:47:29 AM - 10:57:29 AM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=52.7 dB LFmax=68.5 dB LFmin=41.8 dB


MUR001 Periodic reports
%
Based on LAF , 10ms Class width: 0.2 dB 11/04/2010 10:47:29 AM - 10:57:29 AM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 63.7 dB
L5 = 59.2 dB
L10 = 55.7 dB
L50 = 47.4 dB
L90 = 43.4 dB
L95 = 43.1 dB
L99 = 42.6 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%



MUR001 - Fast Logged

	Start time	Elapsed time	LAeq [dB]
Value			45.2
Time	10:52:28 AM.900	0:00:00.100	
Date	11/04/2010		

Site Number: City of Murrieta (MUR002)
Recorded By: Brian Allee
Job Number: 10106976
Date: November 4, 2010
Time: 11:22 AM
Location: Intersection of Arjay Drive and Estate Hill Way.
Source of Peak Noise: Vehicular noise from Hayes Avenue – two planes flew over – siren in background – pedestrians talking nearby – roosters in background – birds chirping.

Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
41.9	33.1	57.8	79.0

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Brüel & Kjær**	**2250**	**2548189**	**9/10/2009**	
	Microphone	**Brüel & Kjær**	**4189**	**2543364**	**9/10/2009**	
	Preamp	**Brüel & Kjær**	**ZC 0032**	**4265**	**9/10/2009**	
	Calibrator	**Brüel & Kjær**	**4231**	**2545667**	**9/10/2009**	

Weather Data			
Est.	**Duration:** 10 minutes		**Sky:** ☼
	Note: dBA Offset = 0.02		**Sensor Height (ft):** 5 ft
	Wind Ave Speed (mph / m/s)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	0.4	89.0	977.0

Photo of Measurement Location

2250

Instrument:		2250
Application:		BZ7225 Version 2.0.2
Start Time:		11/04/2010 11:21:53
End Time:		11/04/2010 11:31:53
Elapsed Time:		00:10:00
Bandwidth:		1/3-octave
Max Input Level:		140.13

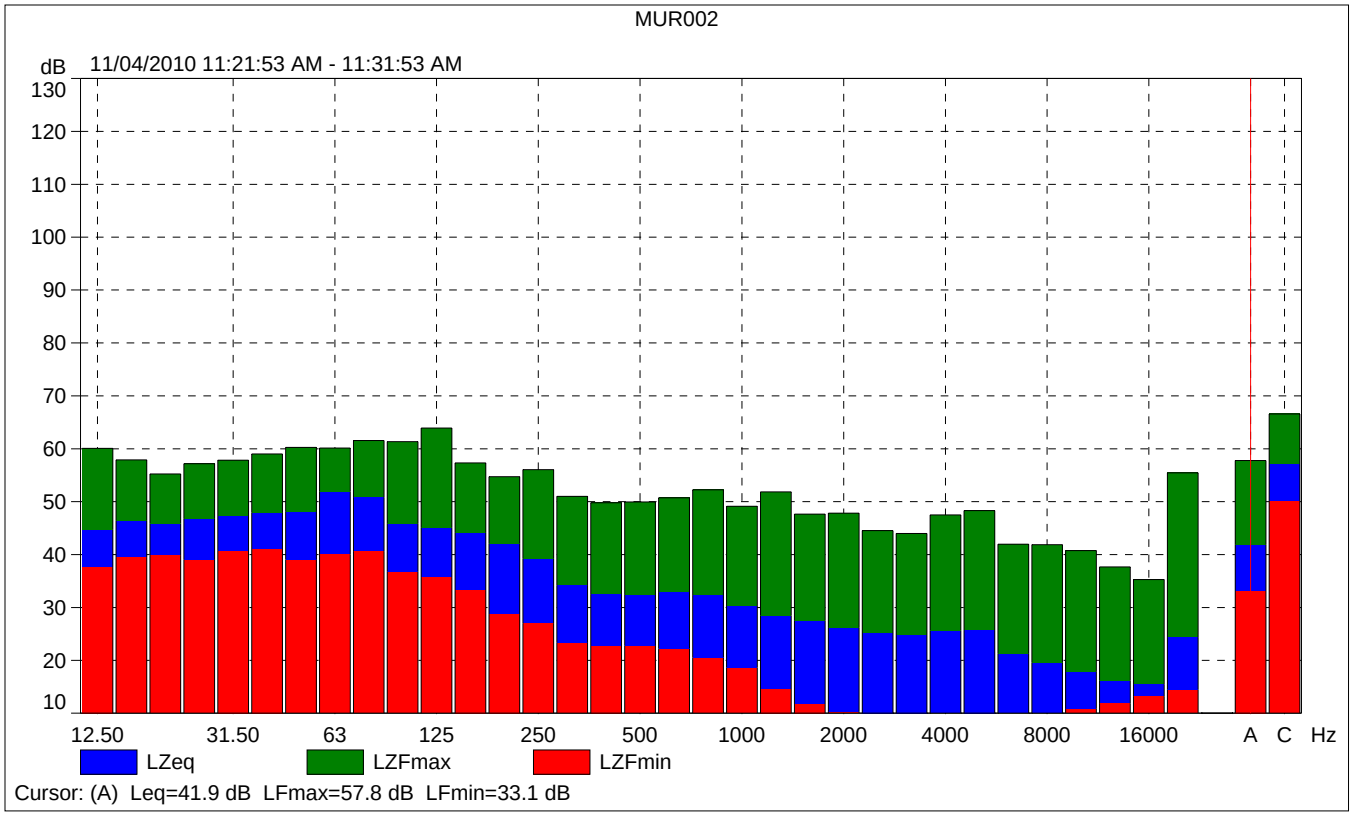
	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	Z

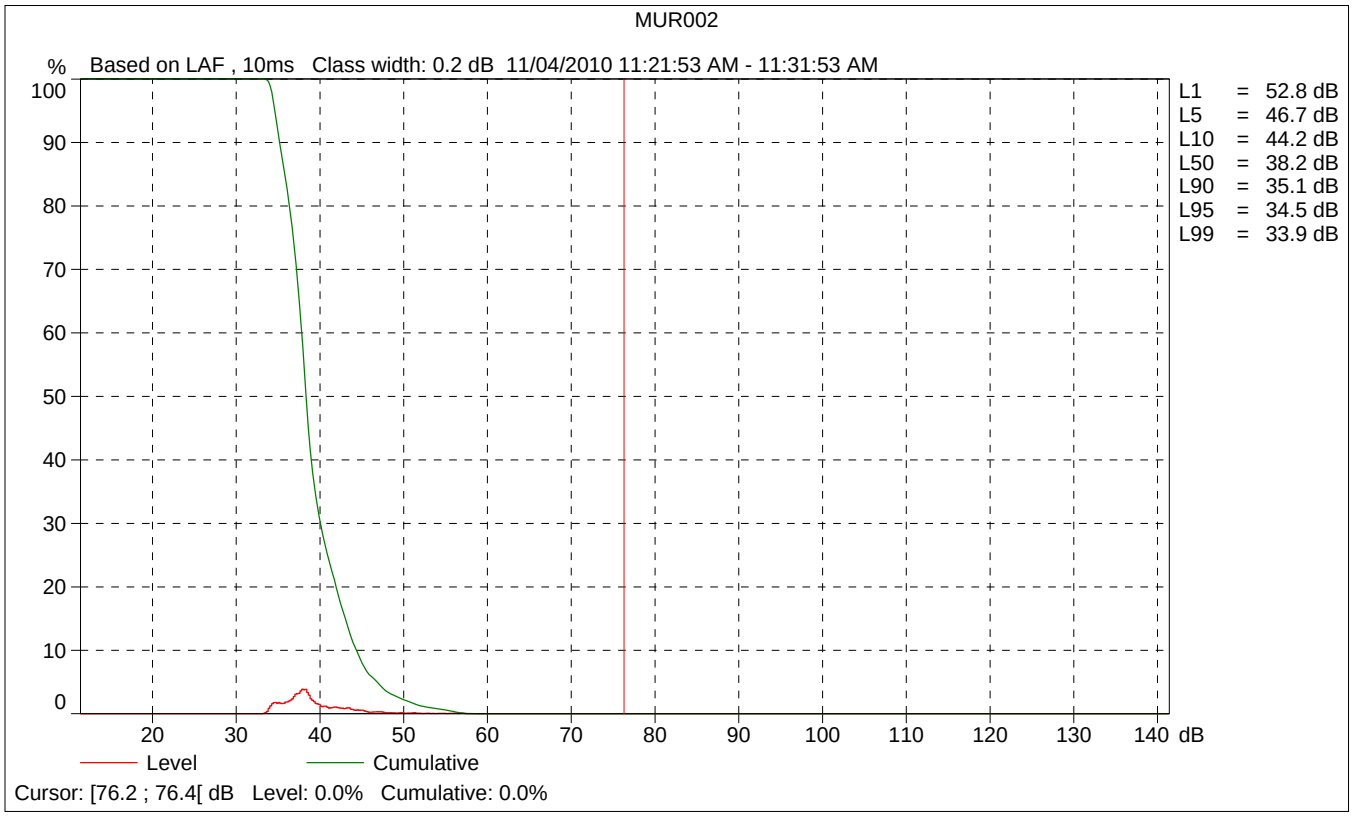
Instrument Serial Number:		2548189
Microphone Serial Number:		2543364
Input:		Top Socket
Windscreen Correction:		UA-1650
Sound Field Correction:		Diffuse-field

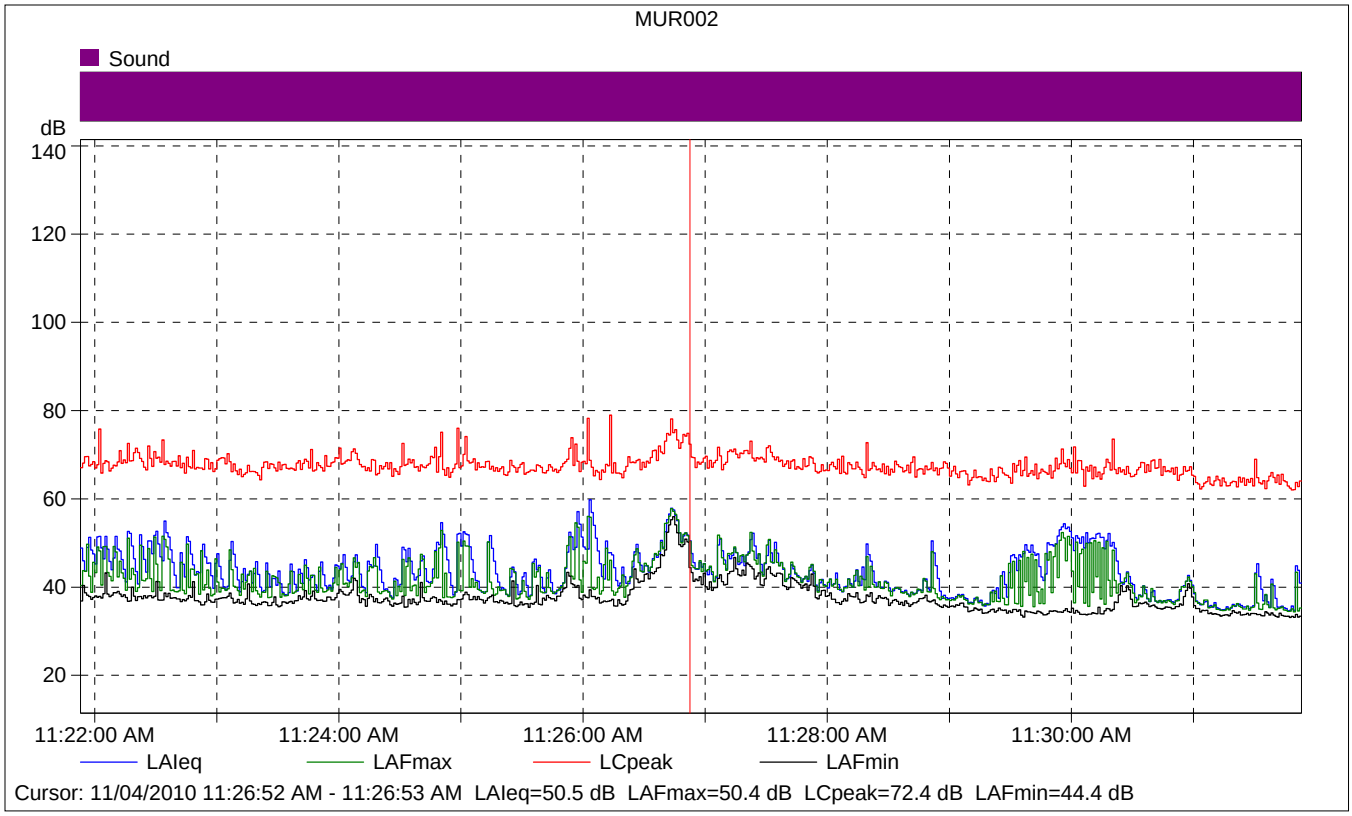
Calibration Time:		11/04/2010 08:39:06
Calibration Type:		External reference
Sensitivity:		54.83 mV/Pa

MUR002

	Start time	End time	Elapsed time	Overload [%]	LAeq [dB]	LAFmax [dB]	LAFmin [dB]
Value				0.00	41.9	57.8	33.1
Time	11:21:53 AM	11:31:53 AM	0:10:00				
Date	11/04/2010	11/04/2010					

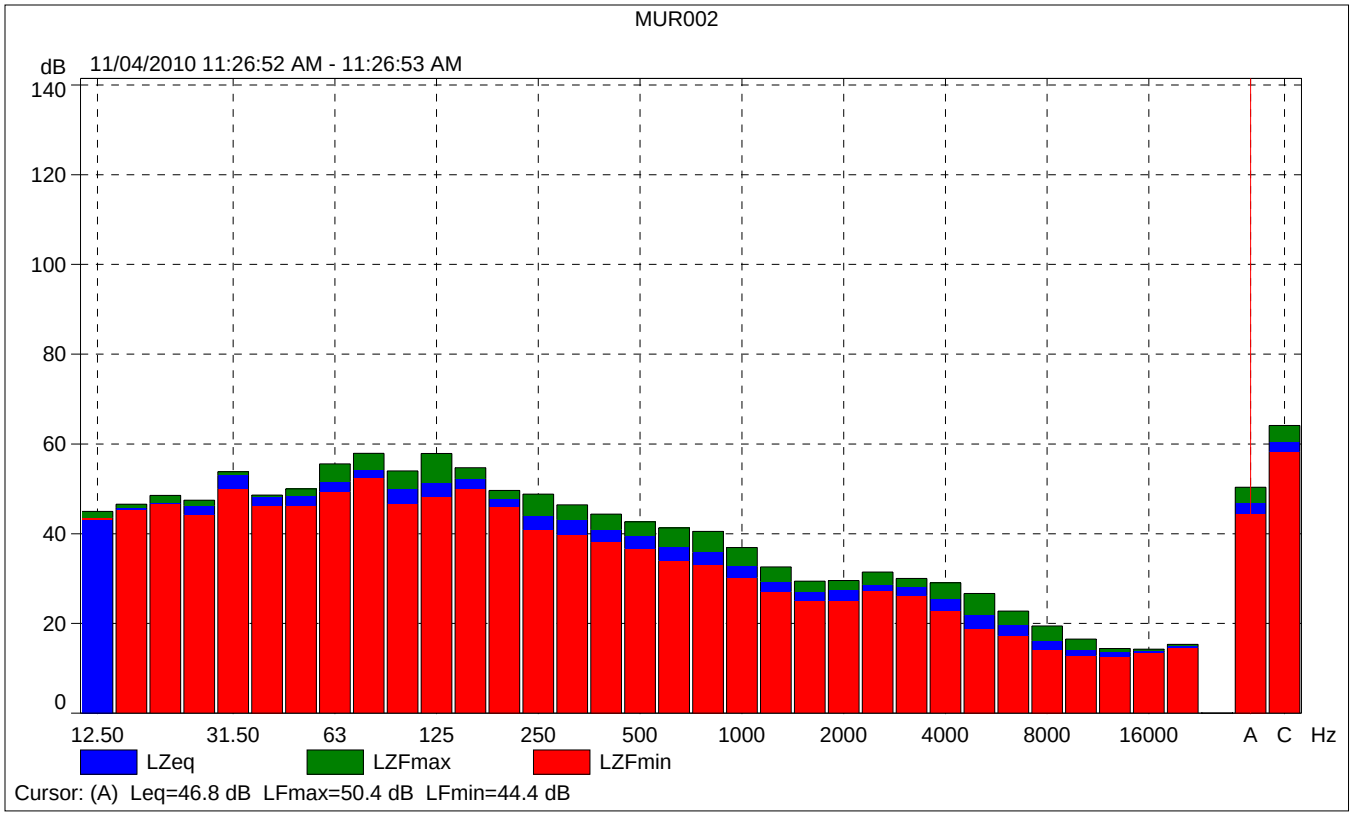

MUR002
dB
11/04/2010 11:21:53 AM - 11:31:53 AM
130
120
110
100
90
80
70
60
50
40
30
20
10
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=41.9 dB LFmax=57.8 dB LFmin=33.1 dB

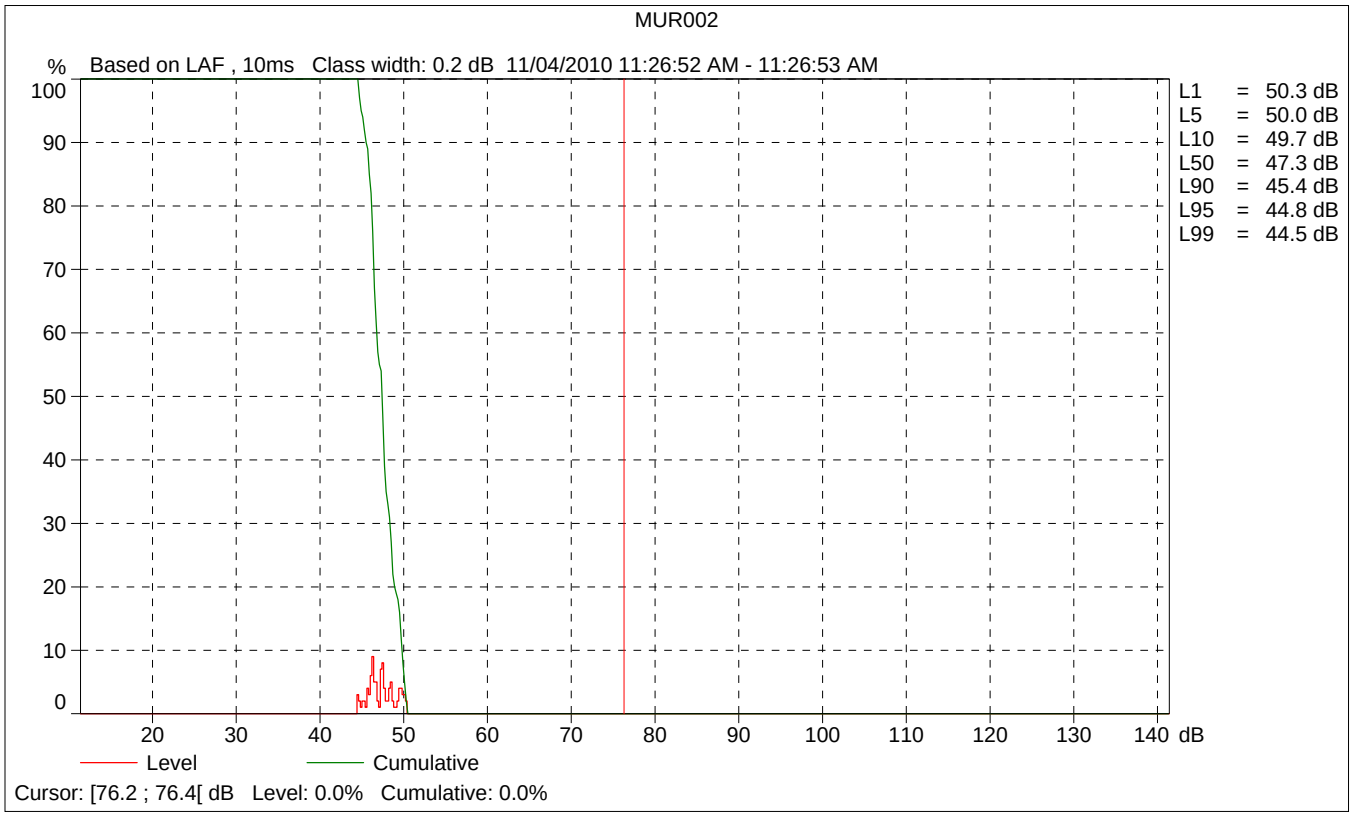

MUR002
%
Based on LAF , 10ms Class width: 0.2 dB 11/04/2010 11:21:53 AM - 11:31:53 AM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 52.8 dB
L5 = 46.7 dB
L10 = 44.2 dB
L50 = 38.2 dB
L90 = 35.1 dB
L95 = 34.5 dB
L99 = 33.9 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%

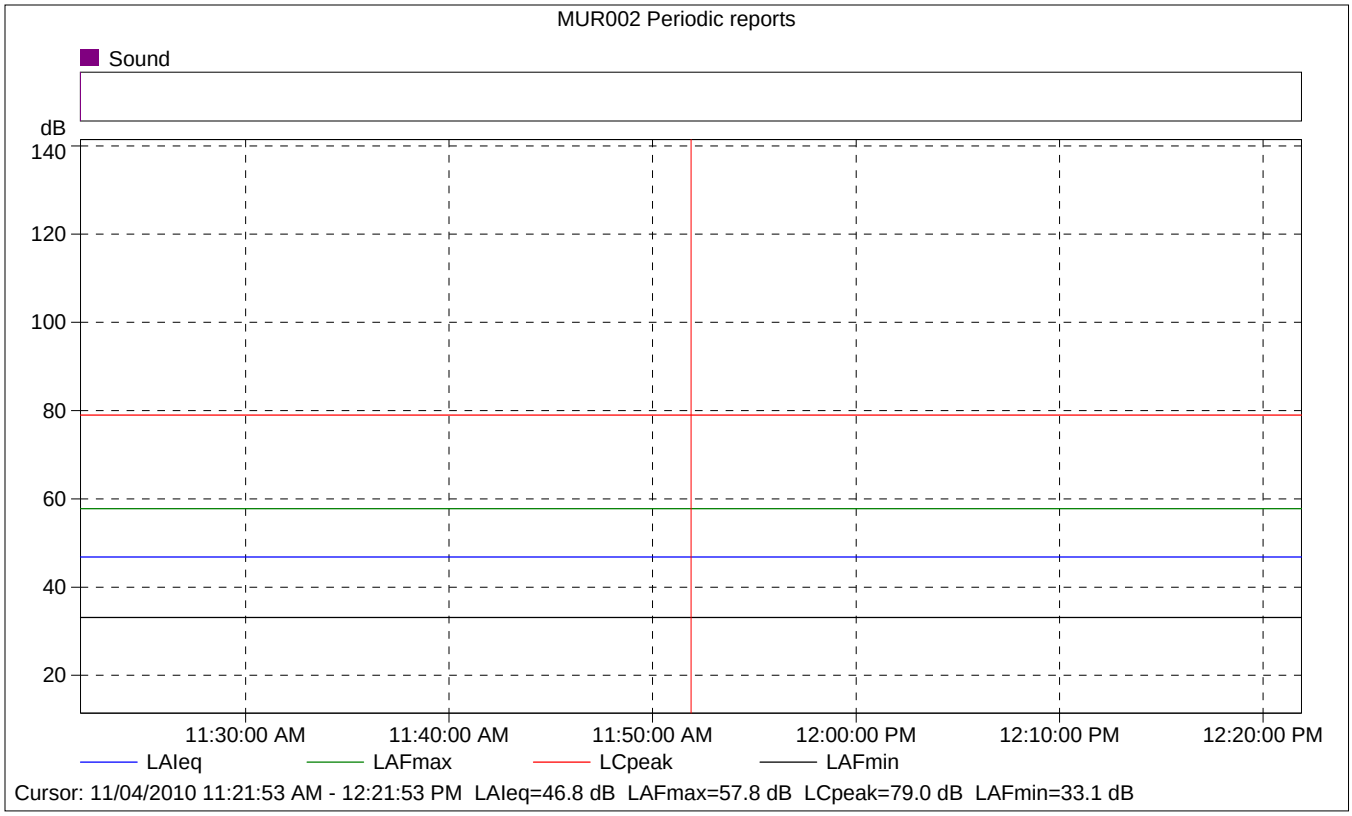


MUR002

	Start time	Elapsed time	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			50.5	50.4	44.4
Time	11:26:52 AM	0:00:01			
Date	11/04/2010				

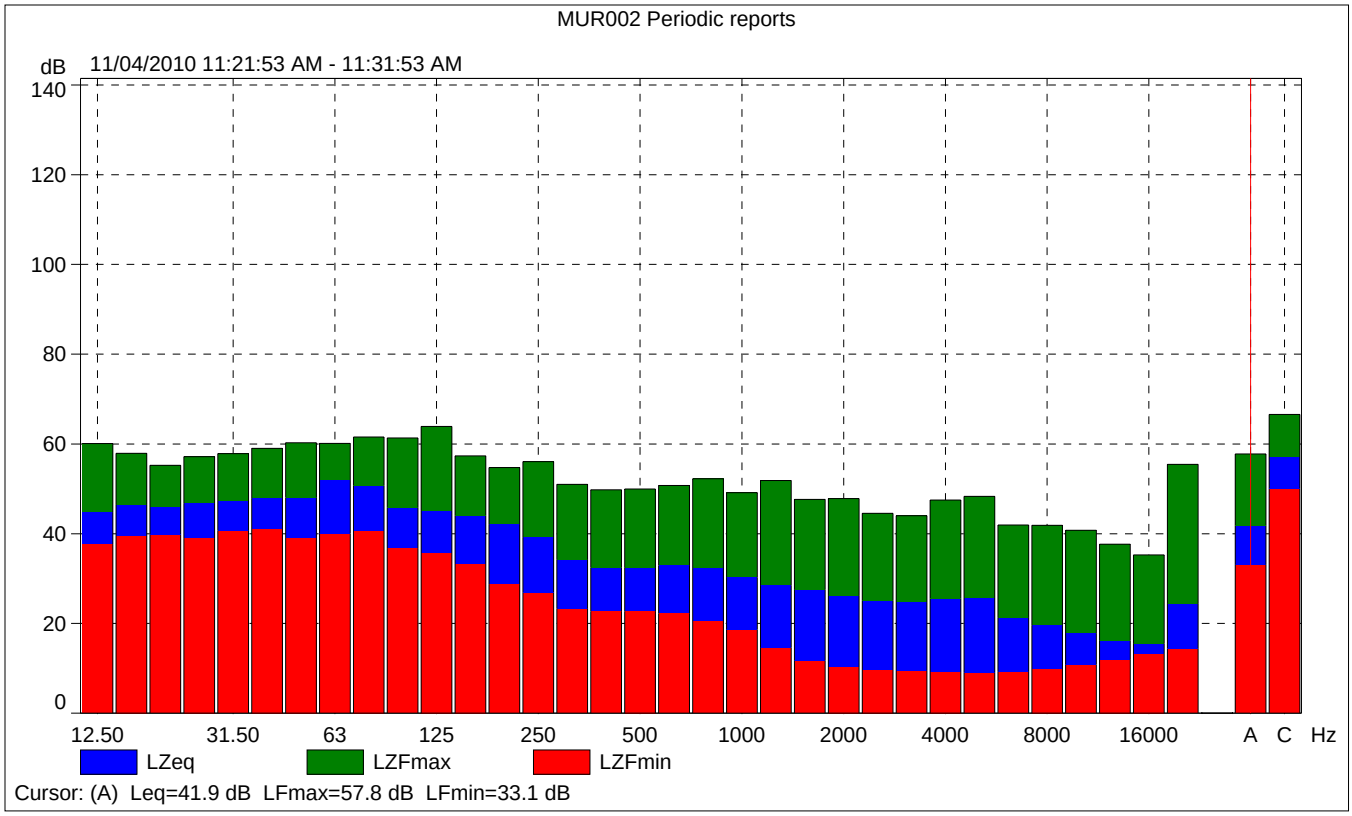

MUR002
dB
11/04/2010 11:26:52 AM - 11:26:53 AM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=46.8 dB LFmax=50.4 dB LFmin=44.4 dB

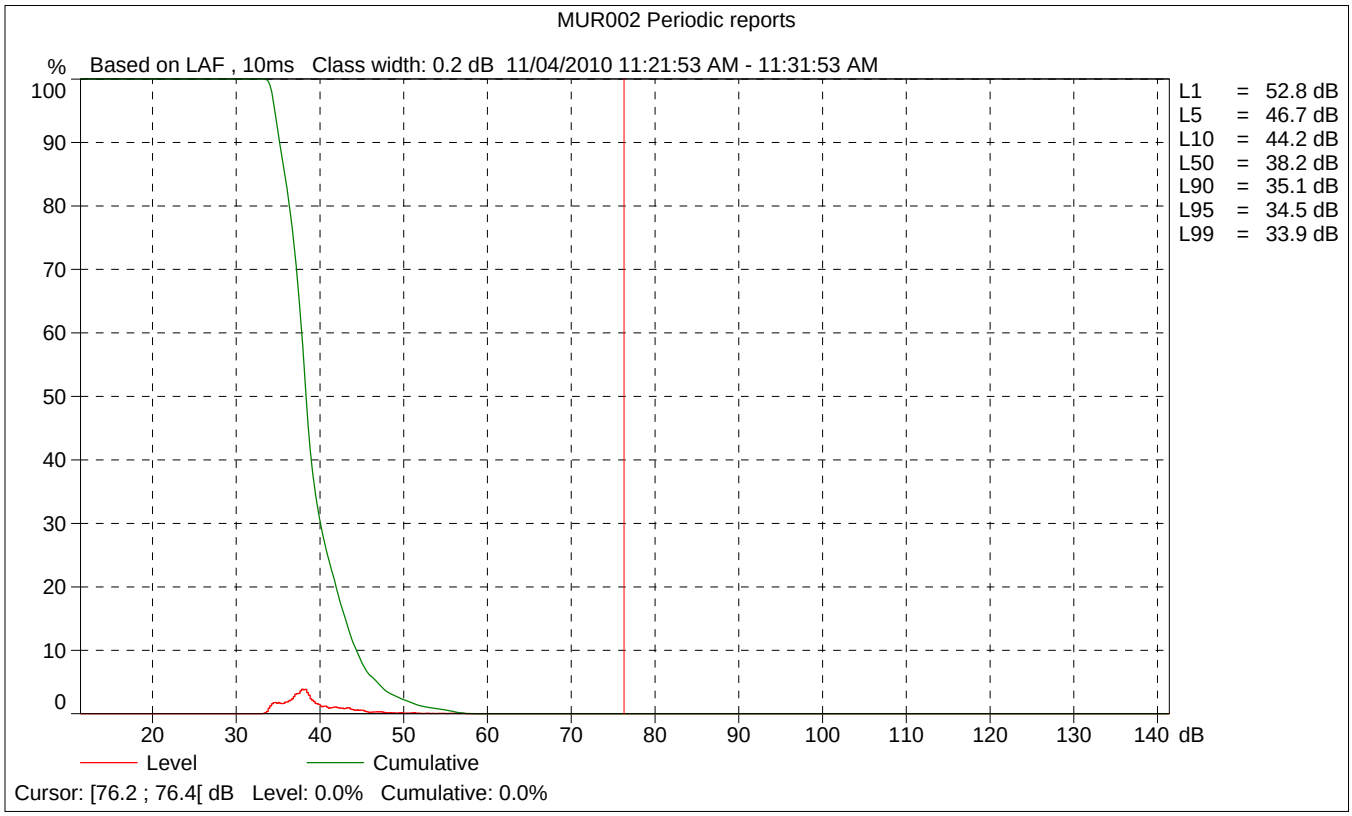

MUR002
%
Based on LAF , 10ms Class width: 0.2 dB 11/04/2010 11:26:52 AM - 11:26:53 AM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140 dB
L1 = 50.3 dB
L5 = 50.0 dB
L10 = 49.7 dB
L50 = 47.3 dB
L90 = 45.4 dB
L95 = 44.8 dB
L99 = 44.5 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%

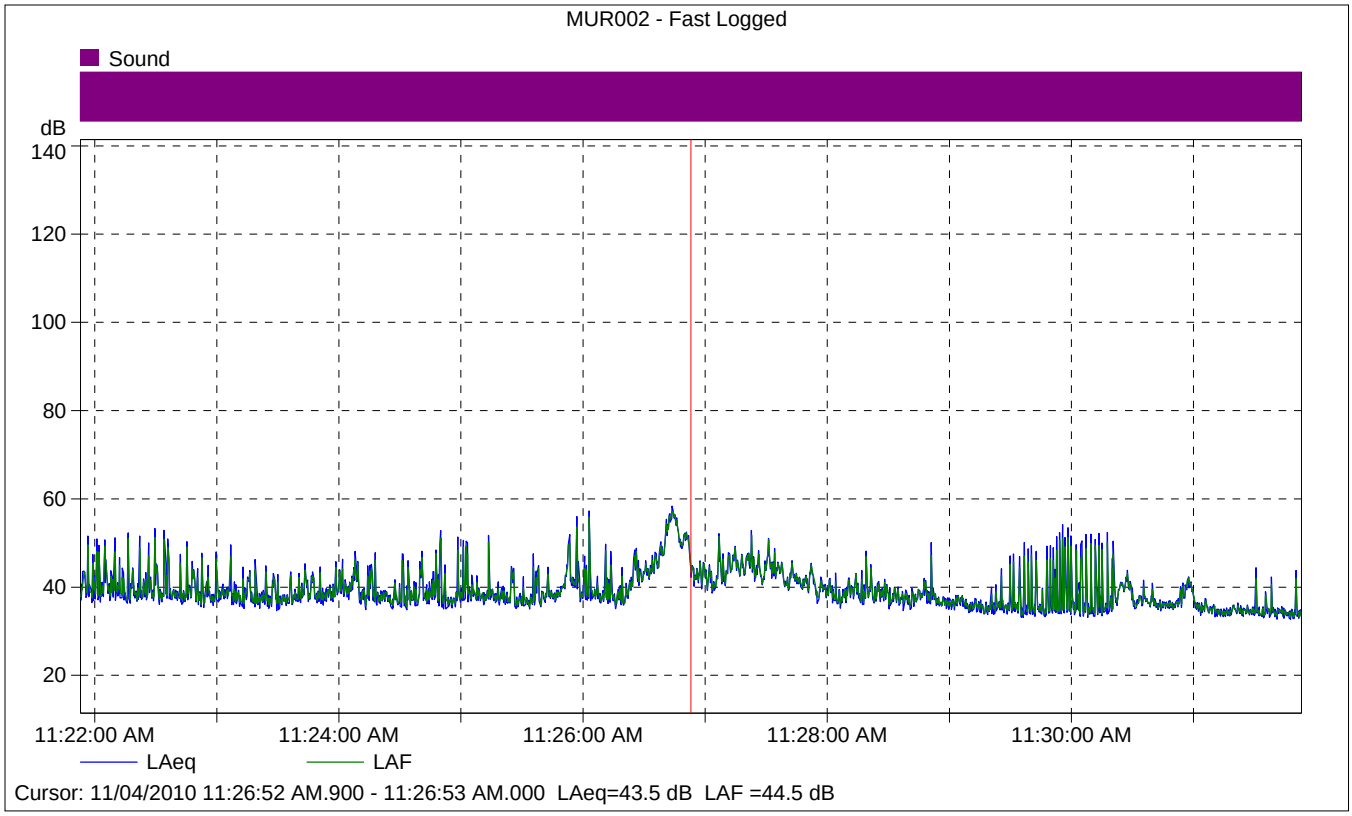


MUR002 Periodic reports

	Start time	Elapsed time	Overload [%]	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			0.00	46.8	57.8	33.1
Time	11:21:53 AM	0:10:00				
Date	11/04/2010					


MUR002 Periodic reports
dB
11/04/2010 11:21:53 AM - 11:31:53 AM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=41.9 dB LFmax=57.8 dB LFmin=33.1 dB


MUR002 Periodic reports
%
Based on LAF , 10ms Class width: 0.2 dB 11/04/2010 11:21:53 AM - 11:31:53 AM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 52.8 dB
L5 = 46.7 dB
L10 = 44.2 dB
L50 = 38.2 dB
L90 = 35.1 dB
L95 = 34.5 dB
L99 = 33.9 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%



MUR002 - Fast Logged

	Start time	Elapsed time	LAeq [dB]
Value			43.5
Time	11:26:52 AM.900	0:00:00.100	
Date	11/04/2010		

Site Number: City of Murrieta (MUR003)
Recorded By: Brian Allee
Job Number: 10106976
Date: November 4, 2010
Time: 11:53 AM
Location: Intersection of Jefferson Avenue and Kalmia Street (adjacent to City Hall Employee Parking Lot).
Source of Peak Noise: Vehicular noise from Jefferson Avenue and Kalmia Street – vehicle noise in City Hall parking lot – vehicle noise in parking lots across Jefferson Avenue and Kalmia Street – birds chirping.

Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
58.4	49.6	72.3	102.0

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Brüel & Kjær**	**2250**	**2548189**	**9/10/2009**	
	Microphone	**Brüel & Kjær**	**4189**	**2543364**	**9/10/2009**	
	Preamp	**Brüel & Kjær**	**ZC 0032**	**4265**	**9/10/2009**	
	Calibrator	**Brüel & Kjær**	**4231**	**2545667**	**9/10/2009**	

Weather Data			
Est.	**Duration:** 10 minutes		**Sky:** ☼
	Note: dBA Offset = 0.02		**Sensor Height (ft):** 5 ft
	Wind Ave Speed (mph / m/s)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	2.6	93.4	976.6

Photo of Measurement Location

2250

Instrument:		2250
Application:		BZ7225 Version 2.0.2
Start Time:		11/04/2010 11:52:41
End Time:		11/04/2010 12:02:41
Elapsed Time:		00:10:00
Bandwidth:		1/3-octave
Max Input Level:		140.13

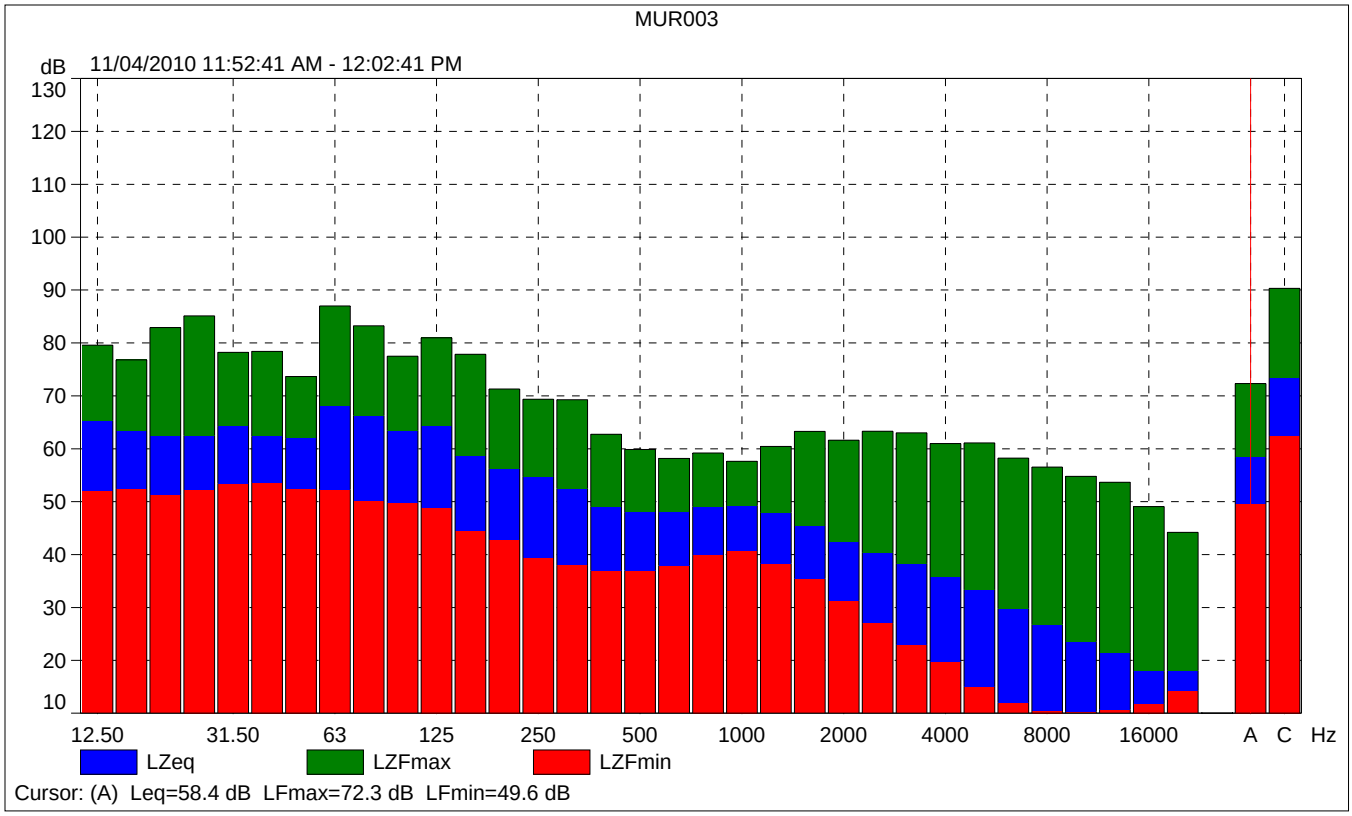
	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	Z

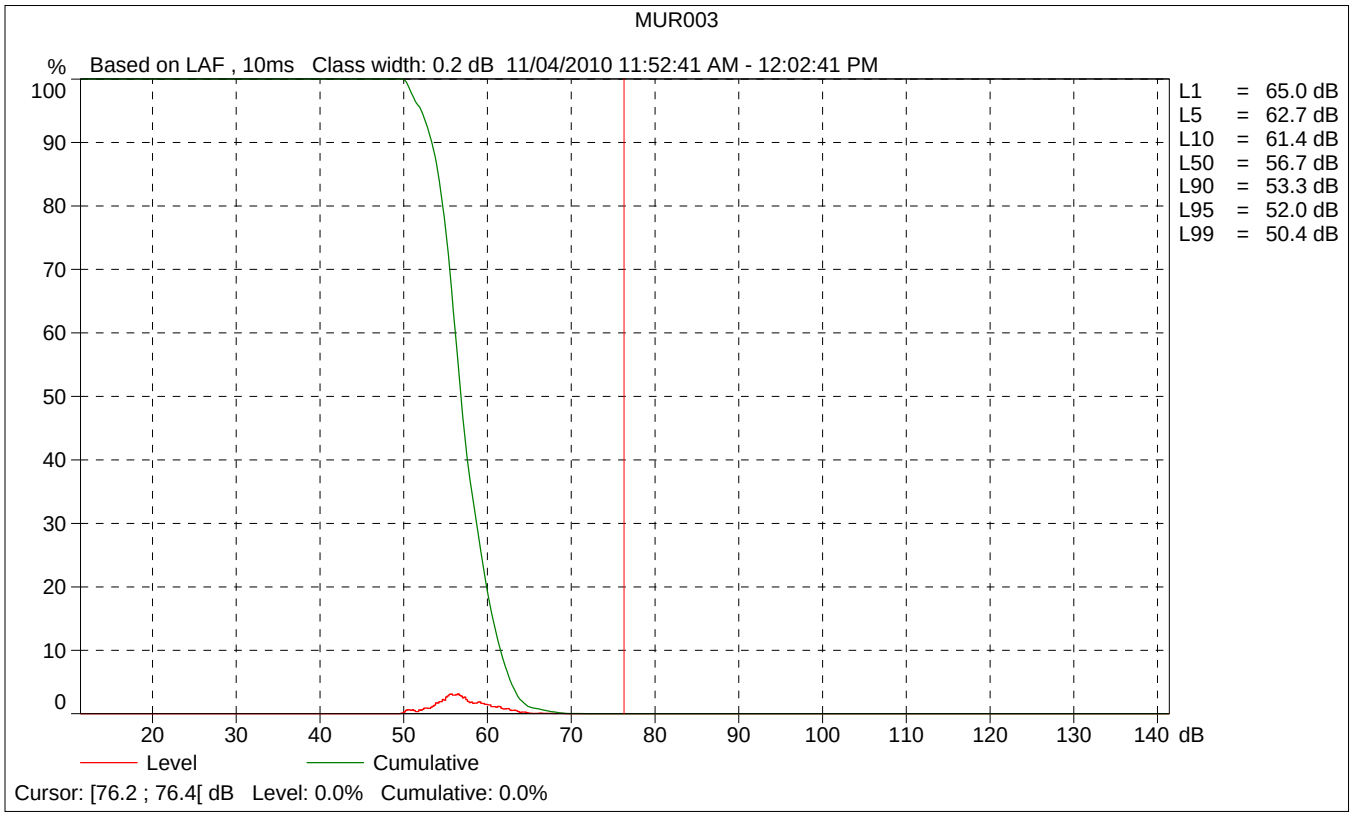
Instrument Serial Number:		2548189
Microphone Serial Number:		2543364
Input:		Top Socket
Windscreen Correction:		None
Sound Field Correction:		Diffuse-field

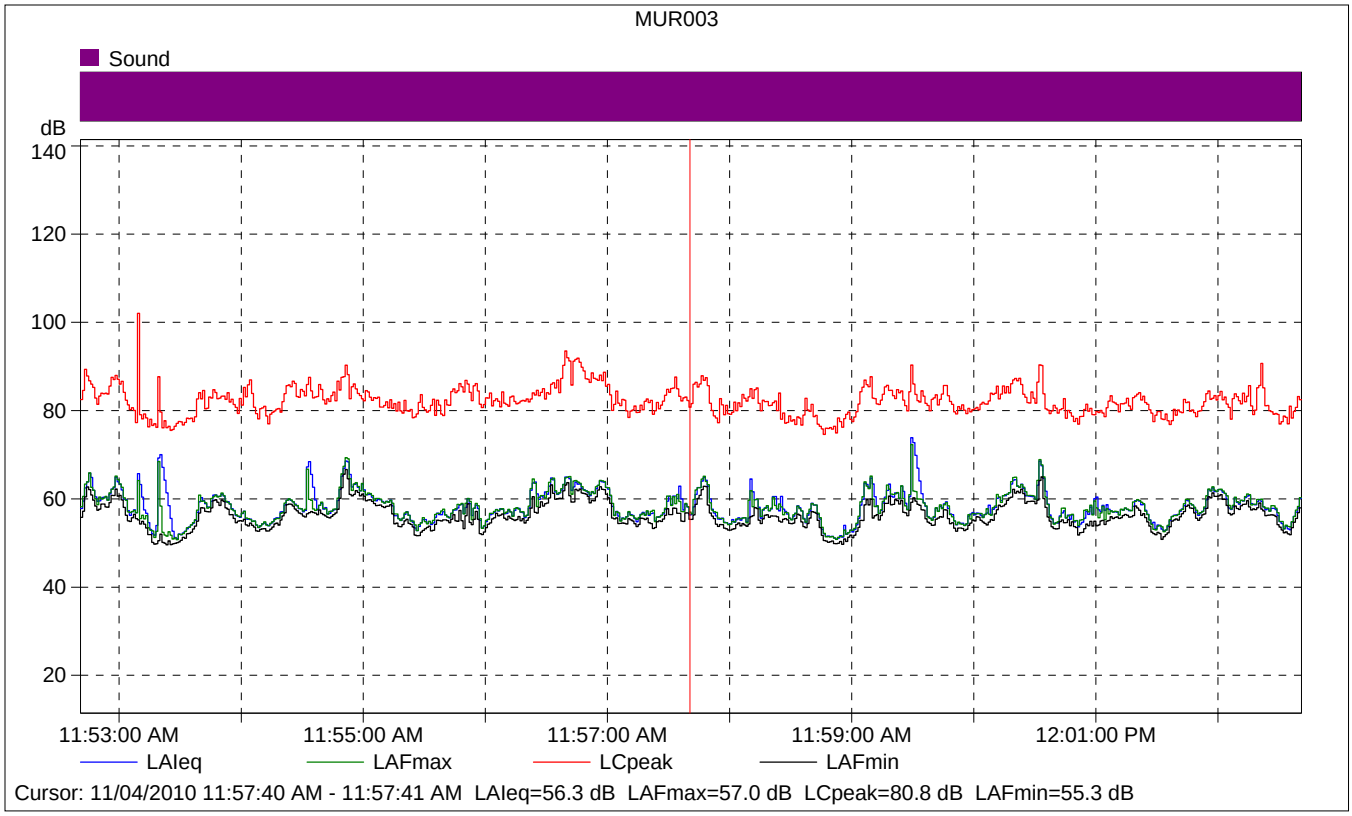
Calibration Time:		11/04/2010 08:39:06
Calibration Type:		External reference
Sensitivity:		54.83 mV/Pa

MUR003

	Start time	End time	Elapsed time	Overload [%]	LAeq [dB]	LAFmax [dB]	LAFmin [dB]
Value				0.00	58.4	72.3	49.6
Time	11:52:41 AM	12:02:41 PM	0:10:00				
Date	11/04/2010	11/04/2010					

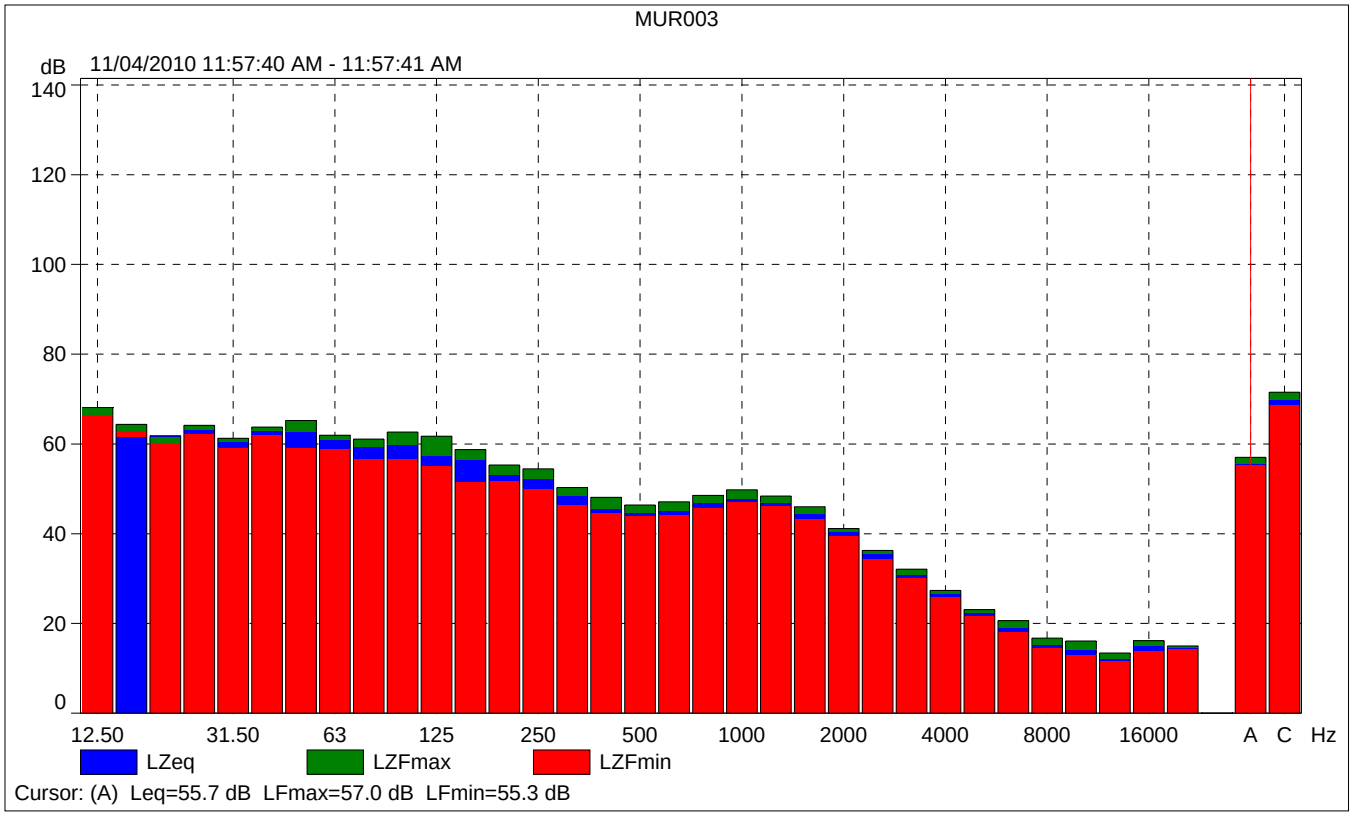

MUR003
dB
11/04/2010 11:52:41 AM - 12:02:41 PM
130
120
110
100
90
80
70
60
50
40
30
20
10
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=58.4 dB LFmax=72.3 dB LFmin=49.6 dB

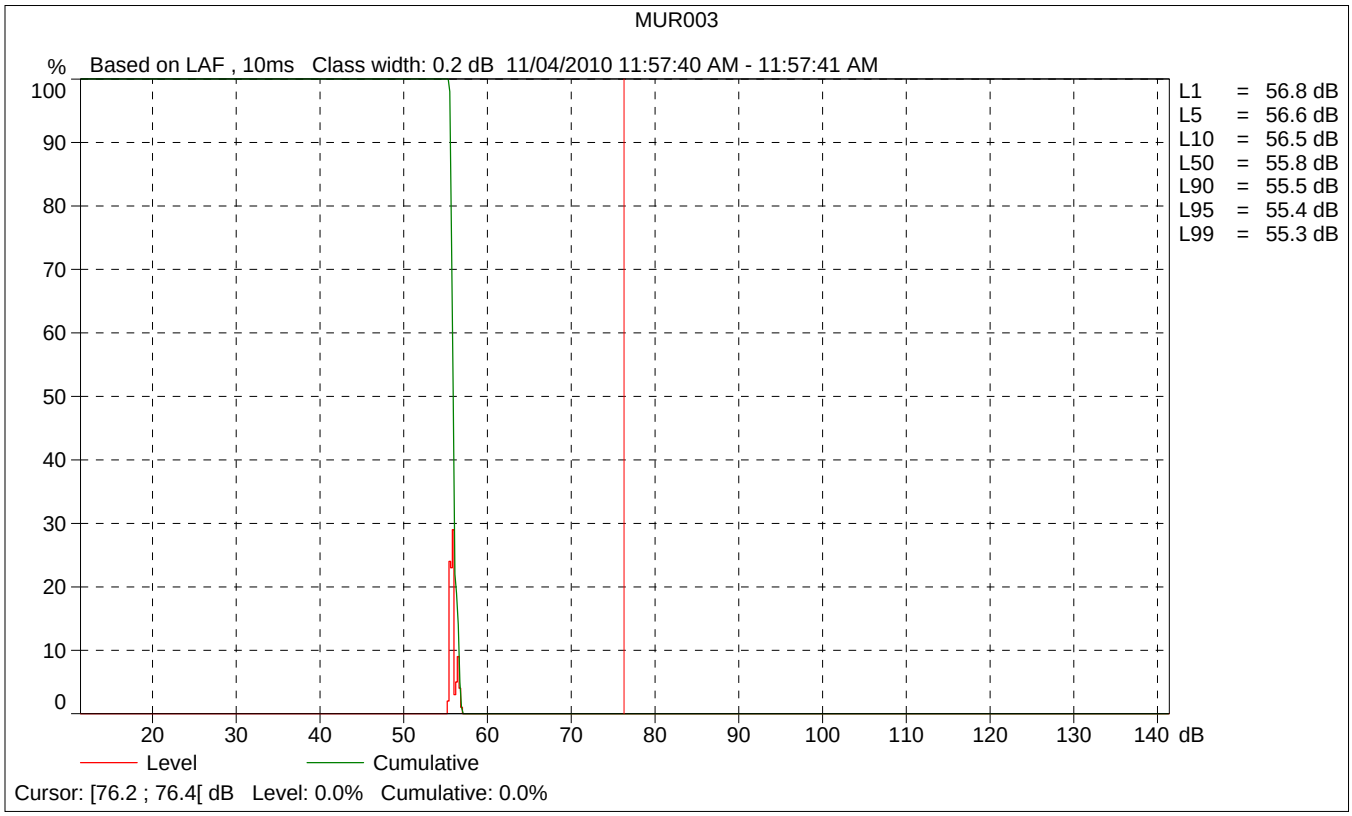

MUR003
%
Based on LAF , 10ms Class width: 0.2 dB 11/04/2010 11:52:41 AM - 12:02:41 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 65.0 dB
L5 = 62.7 dB
L10 = 61.4 dB
L50 = 56.7 dB
L90 = 53.3 dB
L95 = 52.0 dB
L99 = 50.4 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%

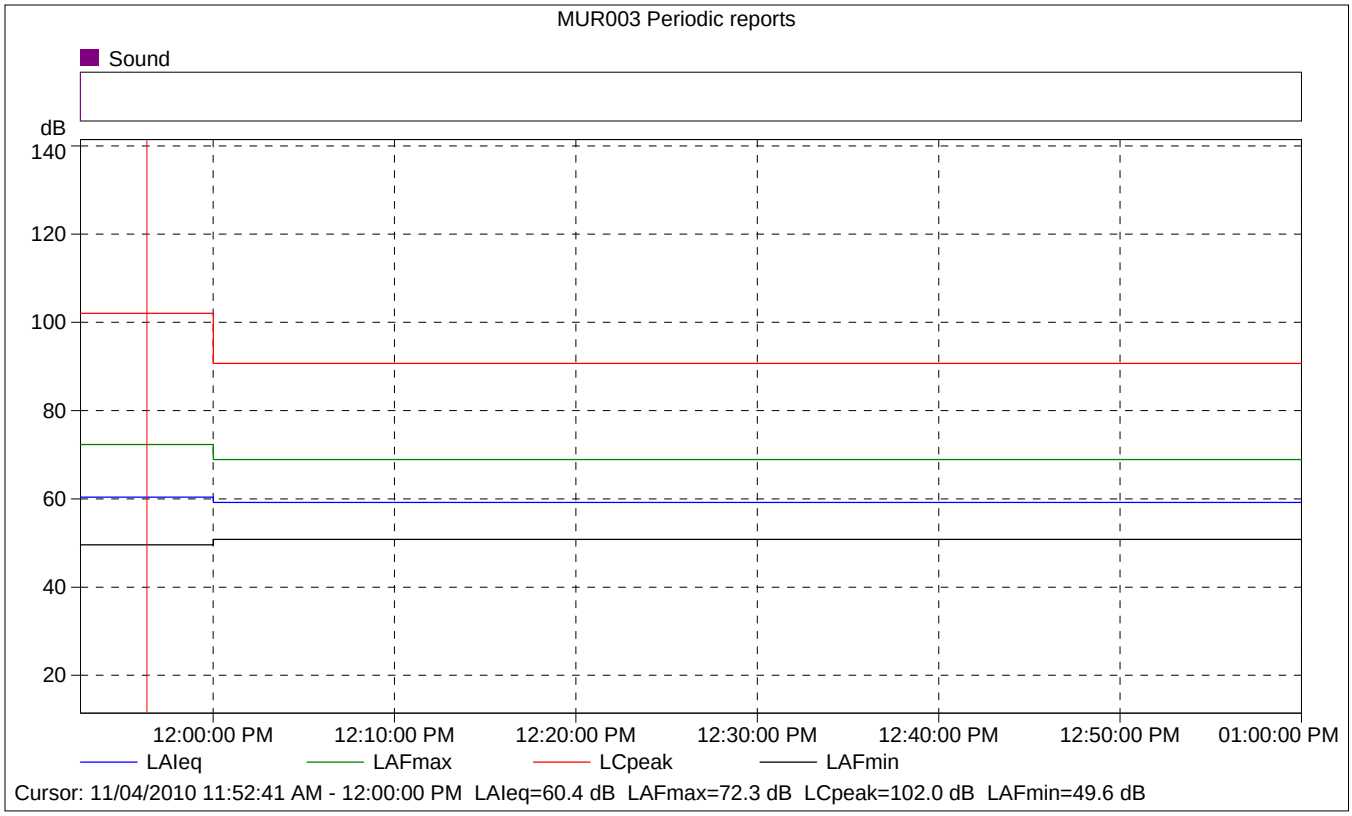


MUR003

	Start time	Elapsed time	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			56.3	57.0	55.3
Time	11:57:40 AM	0:00:01			
Date	11/04/2010				

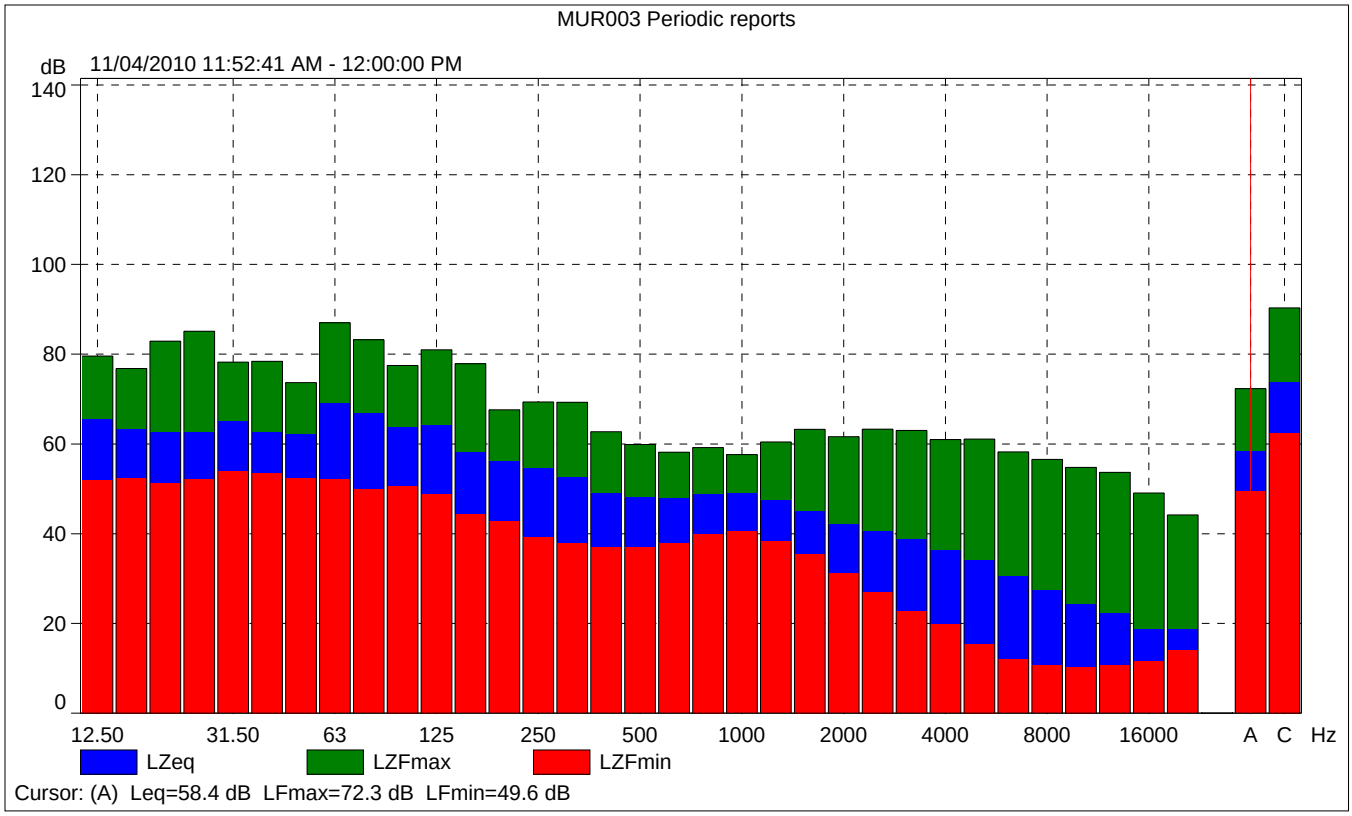

MUR003
dB
11/04/2010 11:57:40 AM - 11:57:41 AM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=55.7 dB LFmax=57.0 dB LFmin=55.3 dB

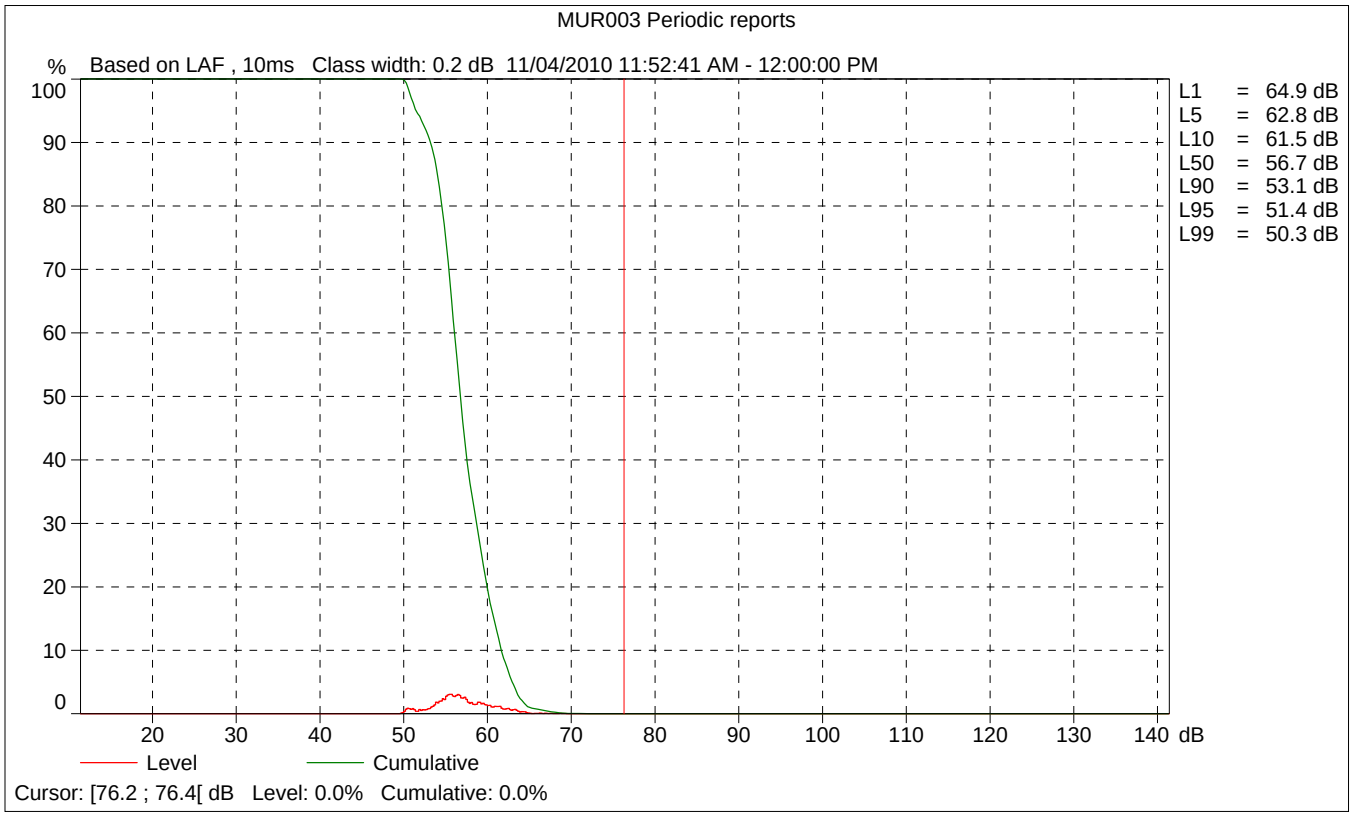

MUR003
%
Based on LAF , 10ms Class width: 0.2 dB 11/04/2010 11:57:40 AM - 11:57:41 AM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 56.8 dB
L5 = 56.6 dB
L10 = 56.5 dB
L50 = 55.8 dB
L90 = 55.5 dB
L95 = 55.4 dB
L99 = 55.3 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%

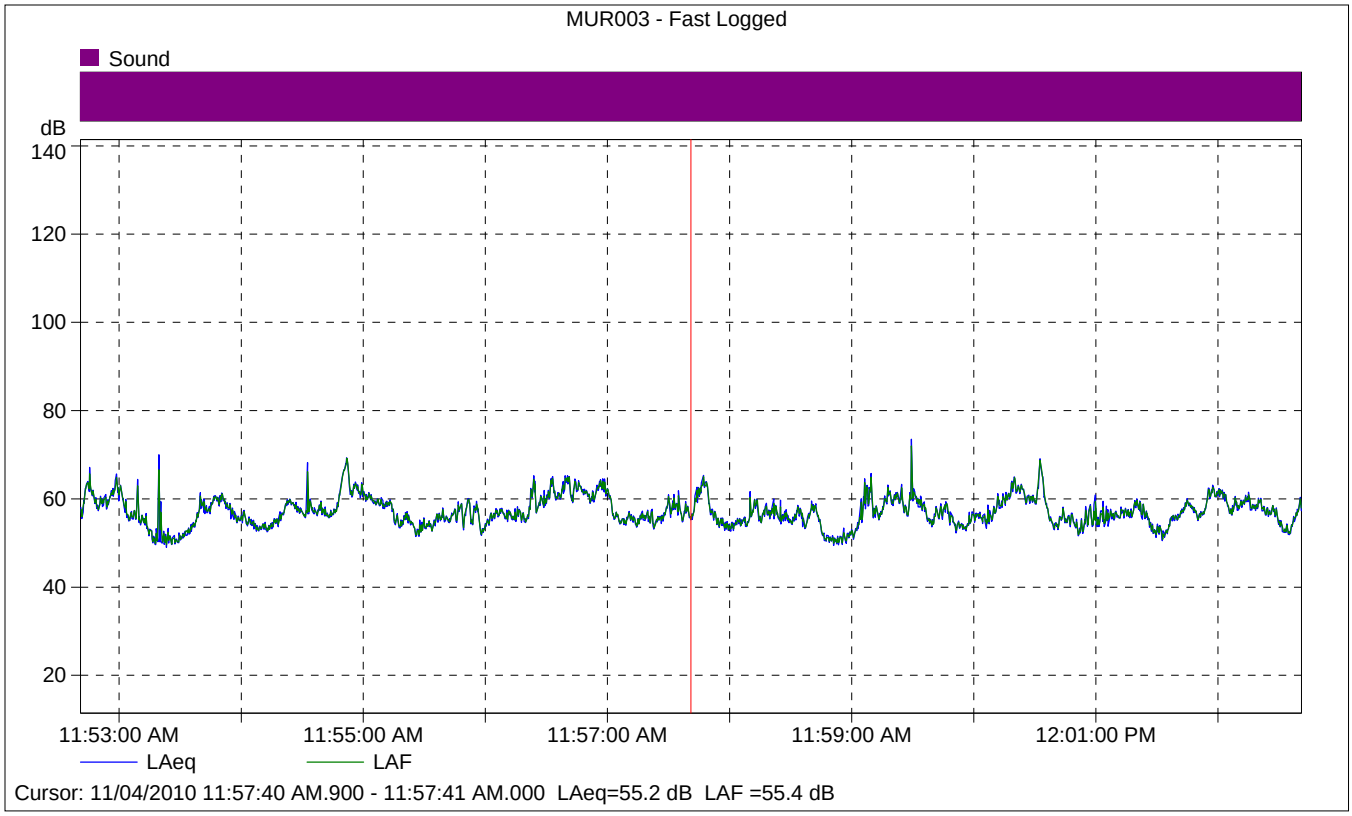


MUR003 Periodic reports

	Start time	Elapsed time	Overload [%]	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			0.00	60.4	72.3	49.6
Time	11:52:41 AM	0:07:19				
Date	11/04/2010					


MUR003 Periodic reports
dB
11/04/2010 11:52:41 AM - 12:00:00 PM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=58.4 dB LFmax=72.3 dB LFmin=49.6 dB


MUR003 Periodic reports
%
Based on LAF , 10ms Class width: 0.2 dB 11/04/2010 11:52:41 AM - 12:00:00 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 64.9 dB
L5 = 62.8 dB
L10 = 61.5 dB
L50 = 56.7 dB
L90 = 53.1 dB
L95 = 51.4 dB
L99 = 50.3 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%



MUR003 - Fast Logged

	Start time	Elapsed time	LAeq [dB]
Value			55.2
Time	11:57:40 AM.900	0:00:00.100	
Date	11/04/2010		

Site Number: City of Murrieta (MUR004)
Recorded By: Brian Allee
Job Number: 10106976
Date: November 4, 2010
Time: 12:15 PM
Location: Cul-de-sac of Pomerado Court off of Douglas Avenue.
Source of Peak Noise: Vehicular noise from Douglas Avenue – plane flew over – dog barking – birds chirping – windy.

Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
51.3	41.9	72.1	89.4

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Brüel & Kjær**	**2250**	**2548189**	**9/10/2009**	
	Microphone	**Brüel & Kjær**	**4189**	**2543364**	**9/10/2009**	
	Preamp	**Brüel & Kjær**	**ZC 0032**	**4265**	**9/10/2009**	
	Calibrator	**Brüel & Kjær**	**4231**	**2545667**	**9/10/2009**	

Weather Data			
Est.	**Duration:** 10 minutes		**Sky:** ☼
	Note: dBA Offset = 0.02		**Sensor Height (ft):** 5 ft
	Wind Ave Speed (mph / m/s)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	2.3	94.0	976.4

Photo of Measurement Location

2250

Instrument:		2250
Application:		BZ7225 Version 2.0.2
Start Time:		11/04/2010 12:16:32
End Time:		11/04/2010 12:26:32
Elapsed Time:		00:10:00
Bandwidth:		1/3-octave
Max Input Level:		140.13

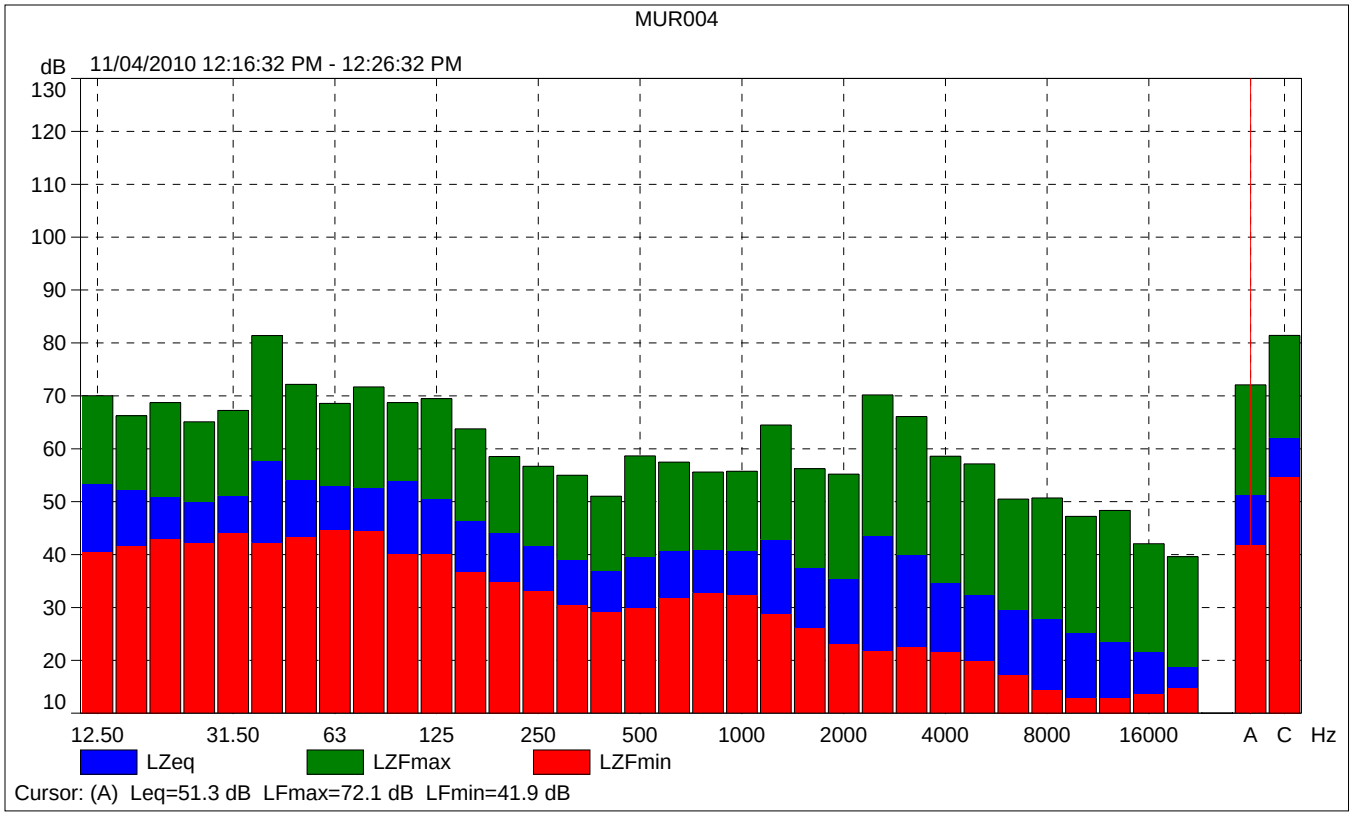
	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	Z

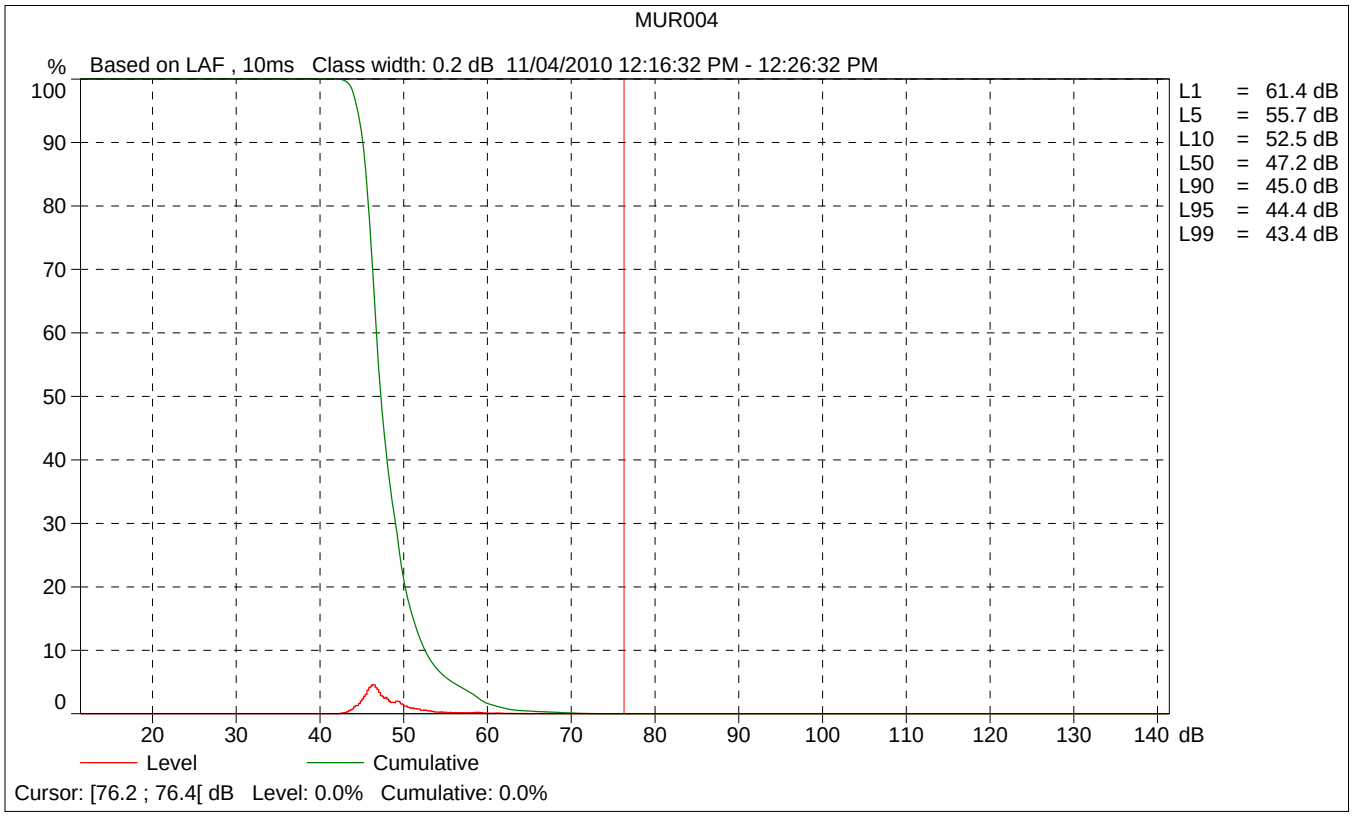
Instrument Serial Number:		2548189
Microphone Serial Number:		2543364
Input:		Top Socket
Windscreen Correction:		UA-1650
Sound Field Correction:		Diffuse-field

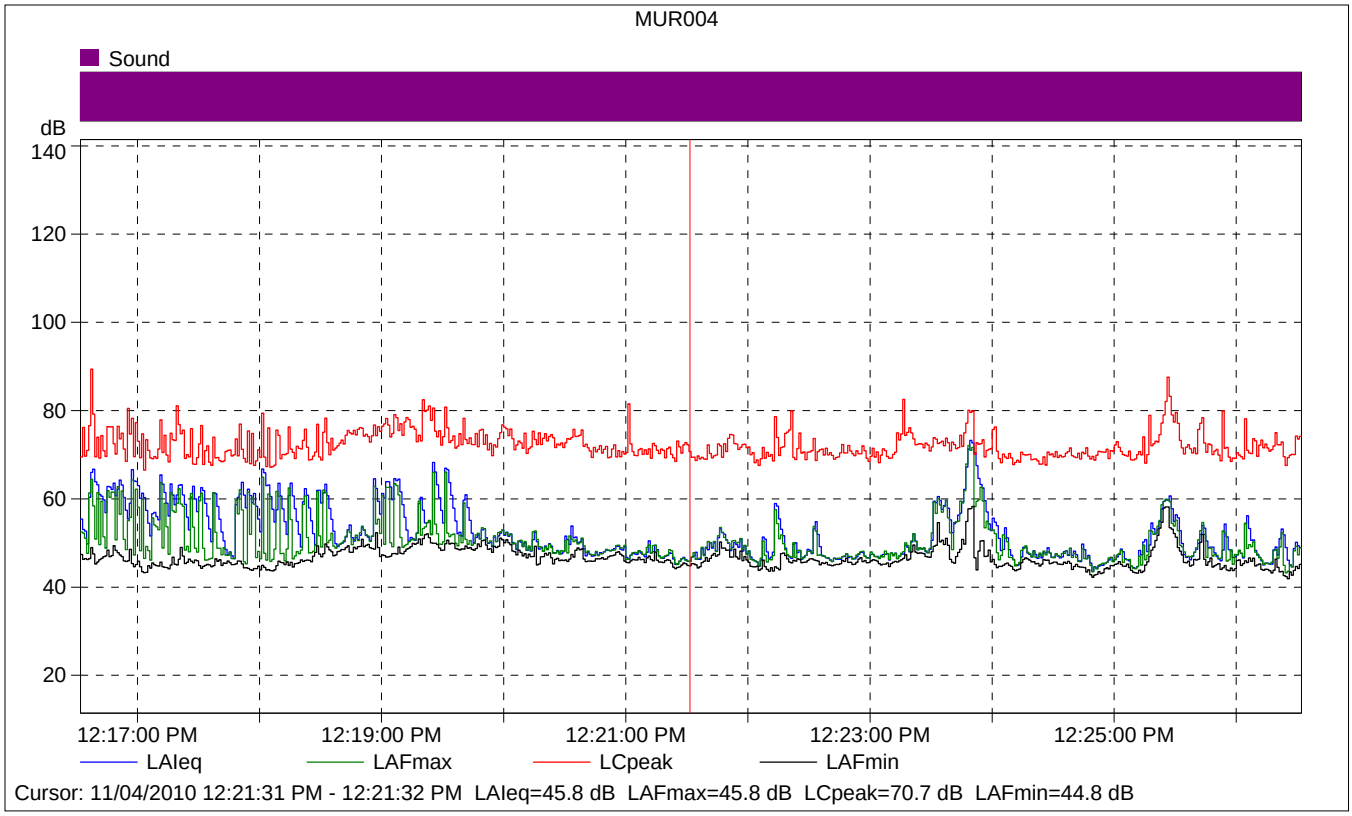
Calibration Time:		11/04/2010 08:39:06
Calibration Type:		External reference
Sensitivity:		54.83 mV/Pa

MUR004

	Start time	End time	Elapsed time	Overload [%]	LAeq [dB]	LAFmax [dB]	LAFmin [dB]
Value				0.00	51.3	72.1	41.9
Time	12:16:32 PM	12:26:32 PM	0:10:00				
Date	11/04/2010	11/04/2010					

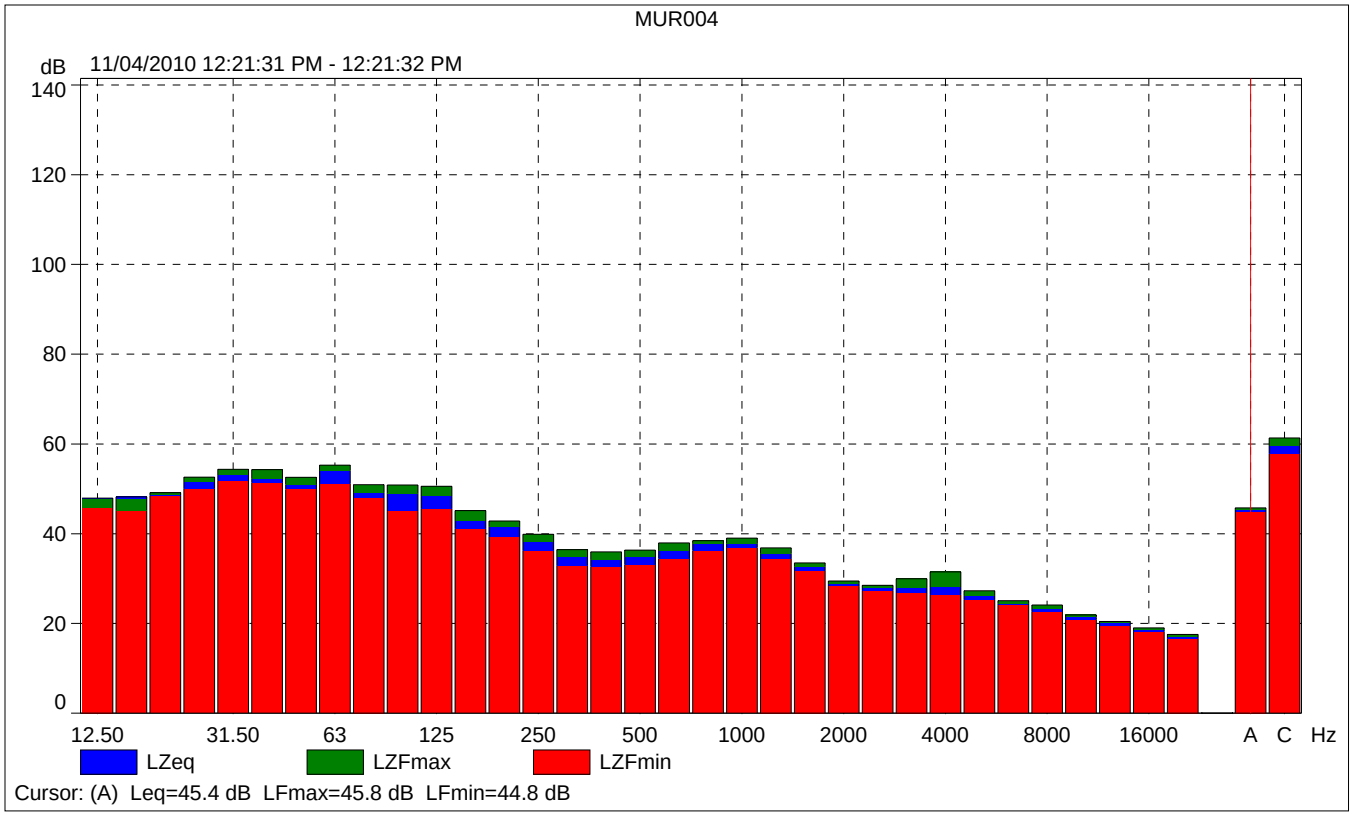

MUR004
dB
11/04/2010 12:16:32 PM - 12:26:32 PM
130
120
110
100
90
80
70
60
50
40
30
20
10
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=51.3 dB LFmax=72.1 dB LFmin=41.9 dB

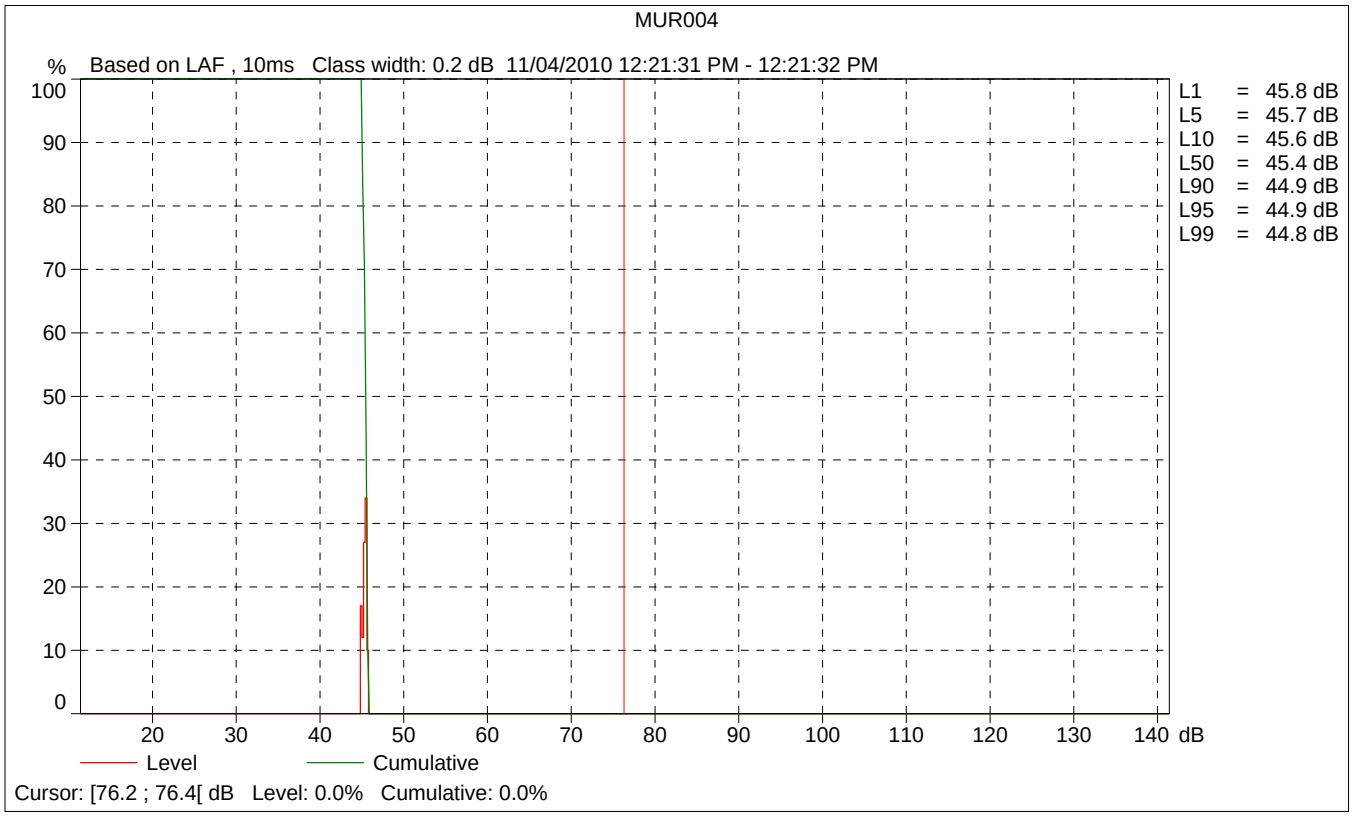

MUR004
%
Based on LAF , 10ms Class width: 0.2 dB 11/04/2010 12:16:32 PM - 12:26:32 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 61.4 dB
L5 = 55.7 dB
L10 = 52.5 dB
L50 = 47.2 dB
L90 = 45.0 dB
L95 = 44.4 dB
L99 = 43.4 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%

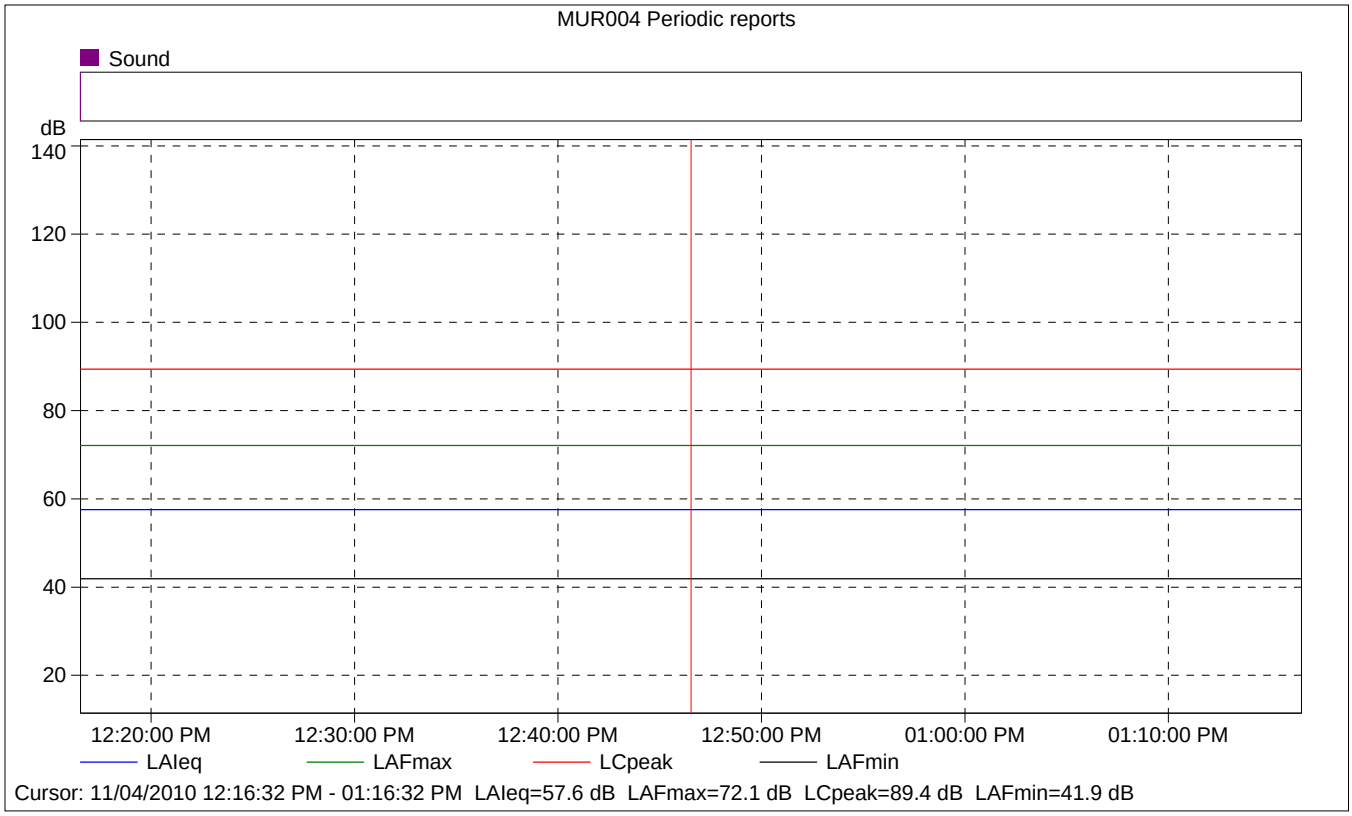


MUR004

	Start time	Elapsed time	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			45.8	45.8	44.8
Time	12:21:31 PM	0:00:01			
Date	11/04/2010				

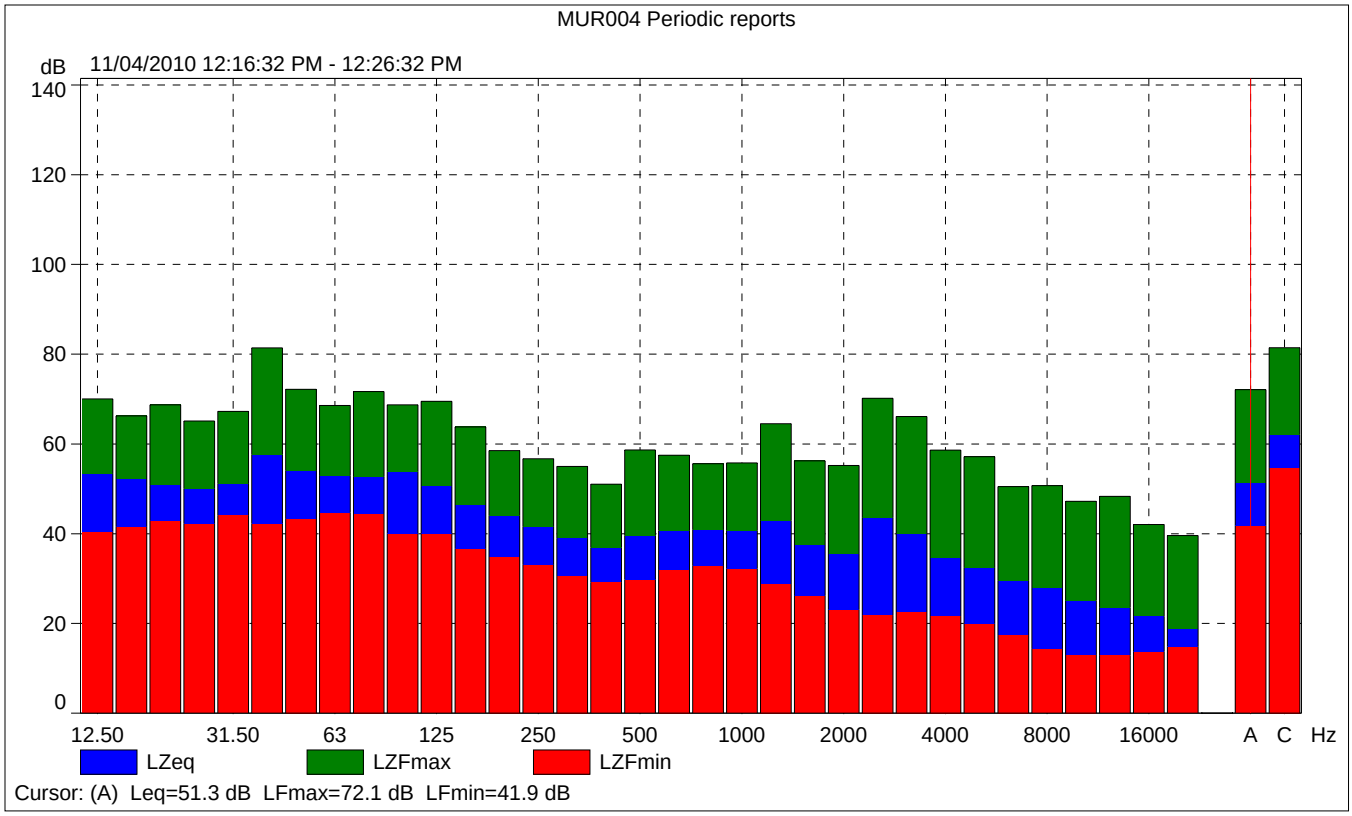

MUR004
dB
11/04/2010 12:21:31 PM - 12:21:32 PM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=45.4 dB LFmax=45.8 dB LFmin=44.8 dB

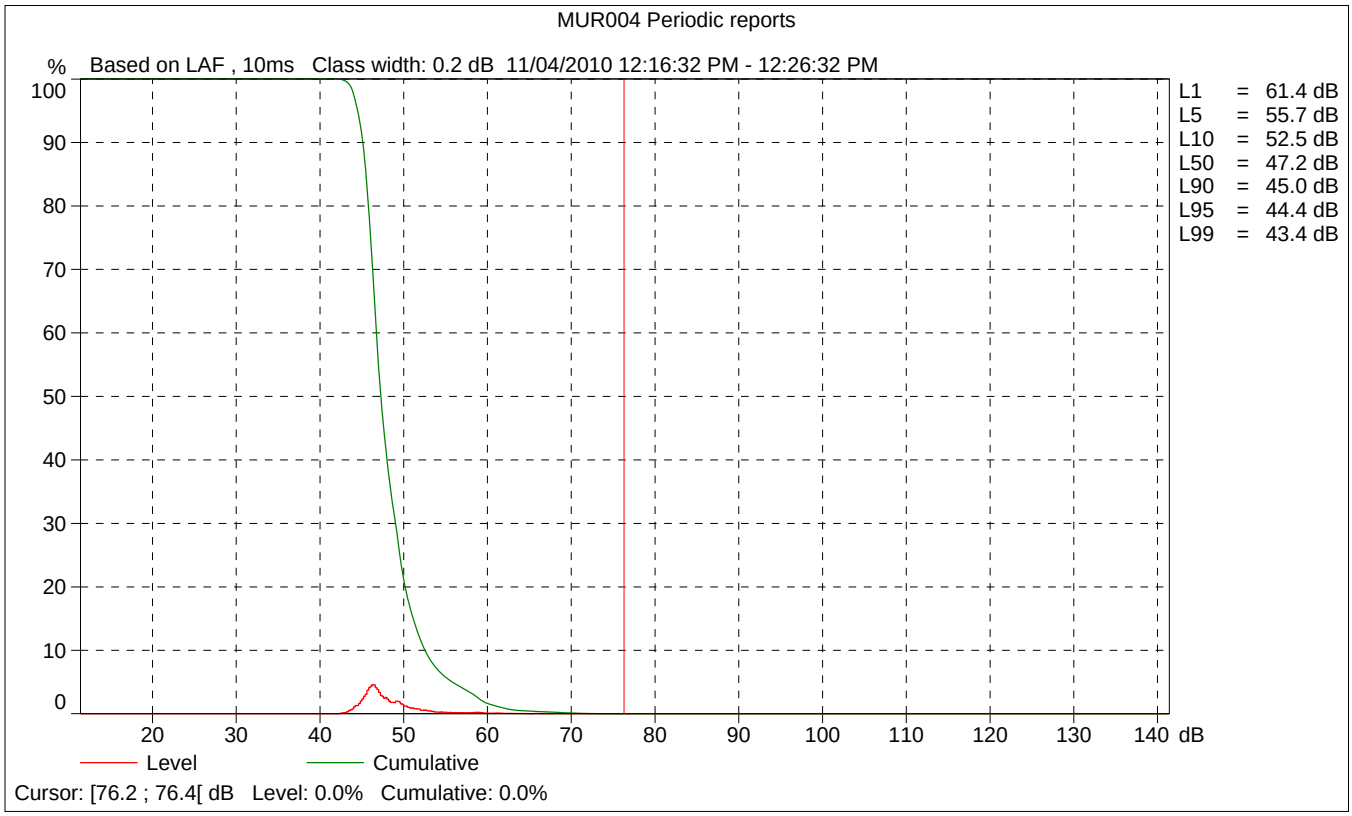

MUR004
%
Based on LAF , 10ms Class width: 0.2 dB 11/04/2010 12:21:31 PM - 12:21:32 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140 dB
L1 = 45.8 dB
L5 = 45.7 dB
L10 = 45.6 dB
L50 = 45.4 dB
L90 = 44.9 dB
L95 = 44.9 dB
L99 = 44.8 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%

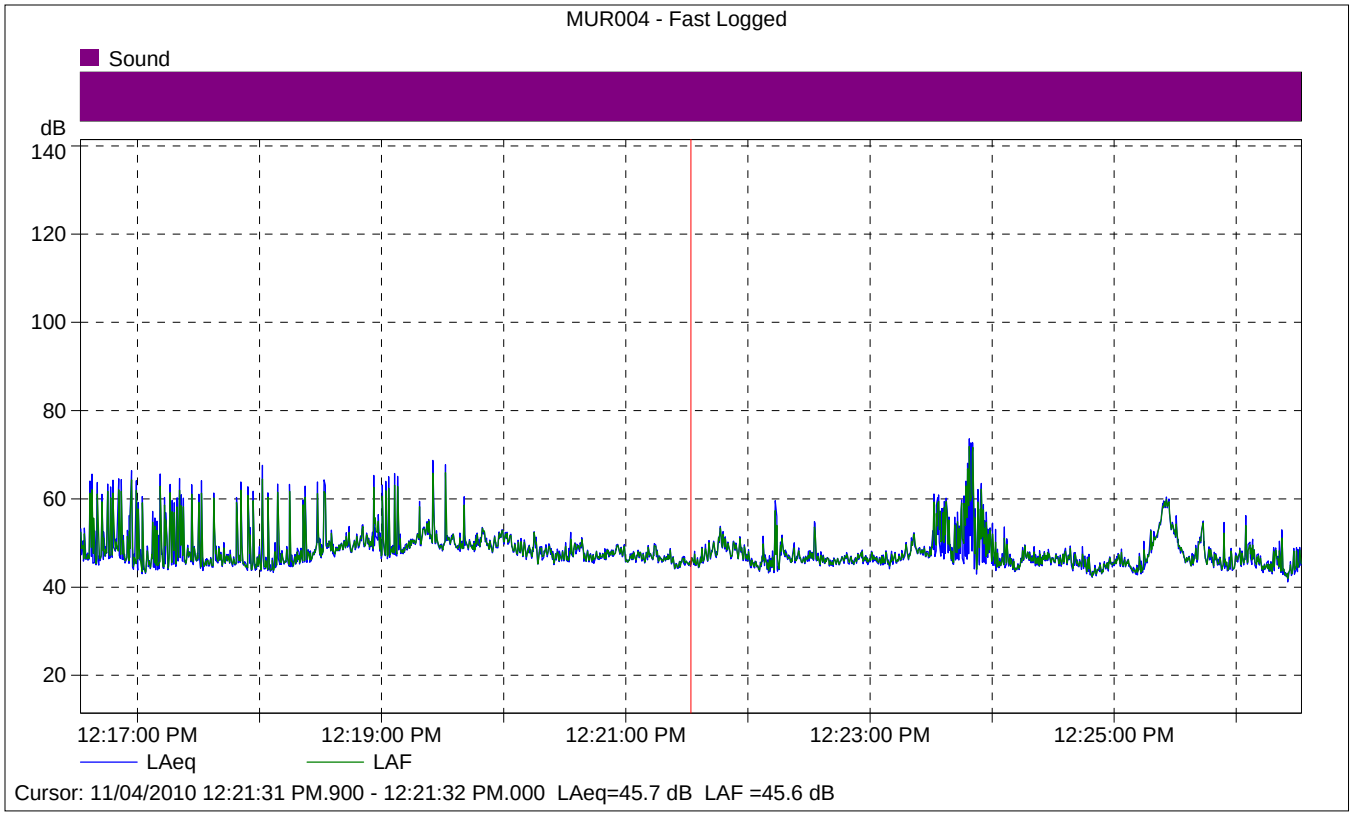


MUR004 Periodic reports

	Start time	Elapsed time	Overload [%]	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			0.00	57.6	72.1	41.9
Time	12:16:32 PM	0:10:00				
Date	11/04/2010					


MUR004 Periodic reports
dB
11/04/2010 12:16:32 PM - 12:26:32 PM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=51.3 dB LFmax=72.1 dB LFmin=41.9 dB


MUR004 Periodic reports
%
Based on LAF , 10ms Class width: 0.2 dB 11/04/2010 12:16:32 PM - 12:26:32 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 61.4 dB
L5 = 55.7 dB
L10 = 52.5 dB
L50 = 47.2 dB
L90 = 45.0 dB
L95 = 44.4 dB
L99 = 43.4 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%



MUR004 - Fast Logged

	Start time	Elapsed time	LAeq [dB]
Value			45.7
Time	12:21:31 PM.900	0:00:00.100	
Date	11/04/2010		

Site Number: City of Murrieta (MUR005)
Recorded By: Brian Allee
Job Number: 10106976
Date: November 4, 2010
Time: 12:46 PM
Location: Cul-de-sac of Summit Park Center off Vineyard Knoll Drive.
Source of Peak Noise: Vehicular noise from Clinton Keith Road – gardner pulled up, unloaded lawn maintenance equipment, and started lawn mower – baby screaming – children playing – pedestrians nearby – birds chirping – windy.

Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
49.9	35.7	71.0	89.9

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Brüel & Kjær**	**2250**	**2548189**	**9/10/2009**	
	Microphone	**Brüel & Kjær**	**4189**	**2543364**	**9/10/2009**	
	Preamp	**Brüel & Kjær**	**ZC 0032**	**4265**	**9/10/2009**	
	Calibrator	**Brüel & Kjær**	**4231**	**2545667**	**9/10/2009**	

Weather Data			
Est.	**Duration:** 10 minutes		**Sky:** ☼
	Note: dBA Offset = 0.02		**Sensor Height (ft):** 5 ft
	Wind Ave Speed (mph / m/s)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	2.0	91.3	969.5

Photo of Measurement Location

2250

Instrument:		2250
Application:		BZ7225 Version 2.0.2
Start Time:		11/04/2010 12:45:58
End Time:		11/04/2010 12:58:46
Elapsed Time:		00:10:00
Bandwidth:		1/3-octave
Max Input Level:		140.13

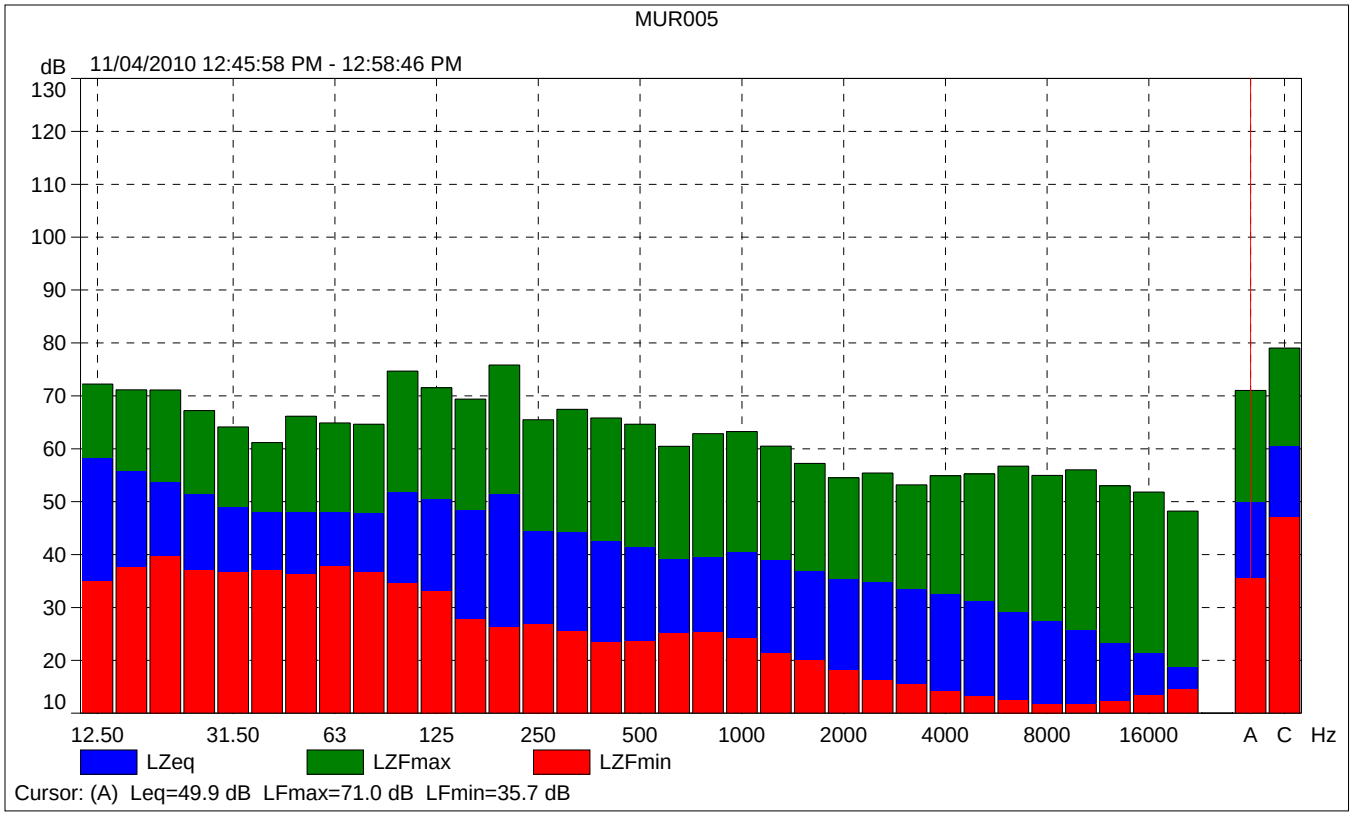
	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	Z

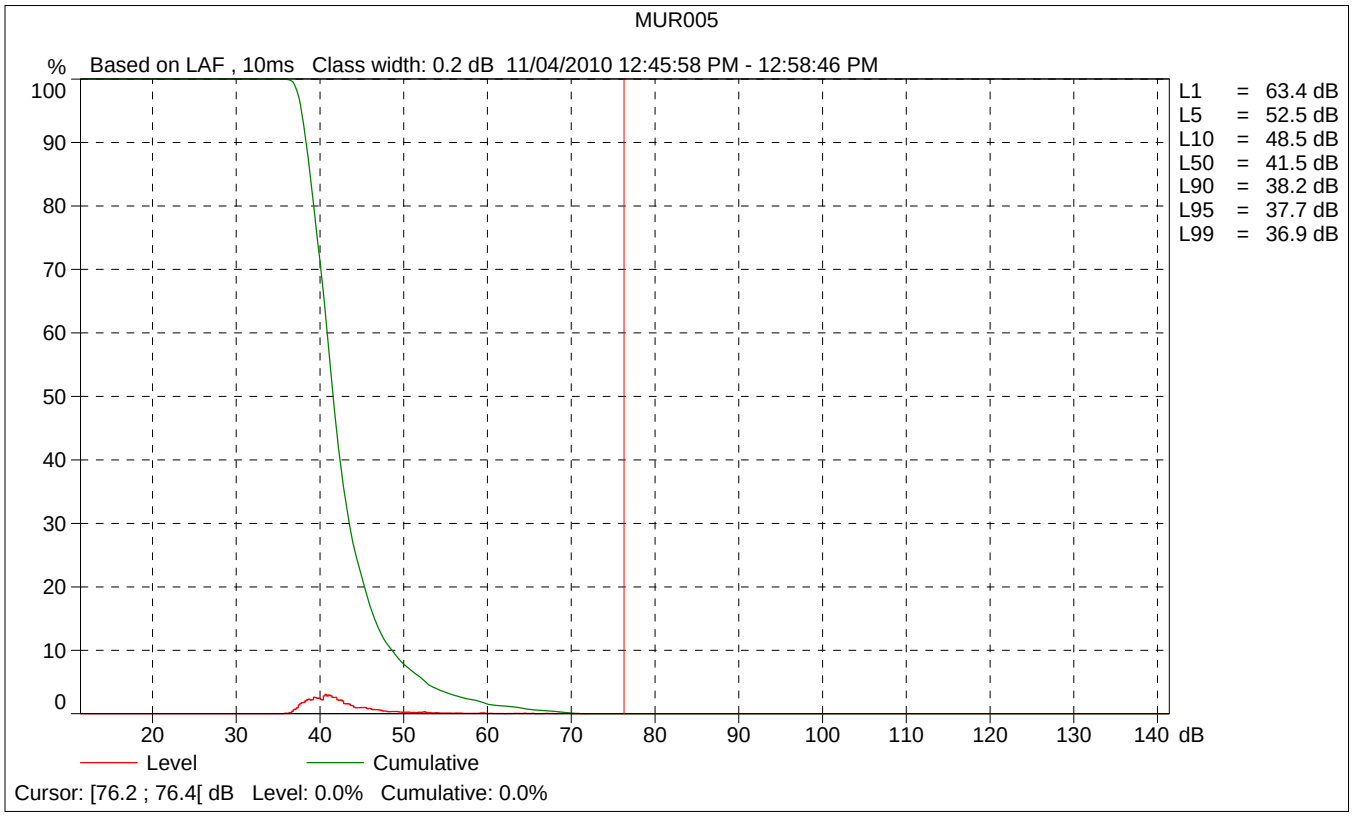
Instrument Serial Number:		2548189
Microphone Serial Number:		2543364
Input:		Top Socket
Windscreen Correction:		UA-1650
Sound Field Correction:		Diffuse-field

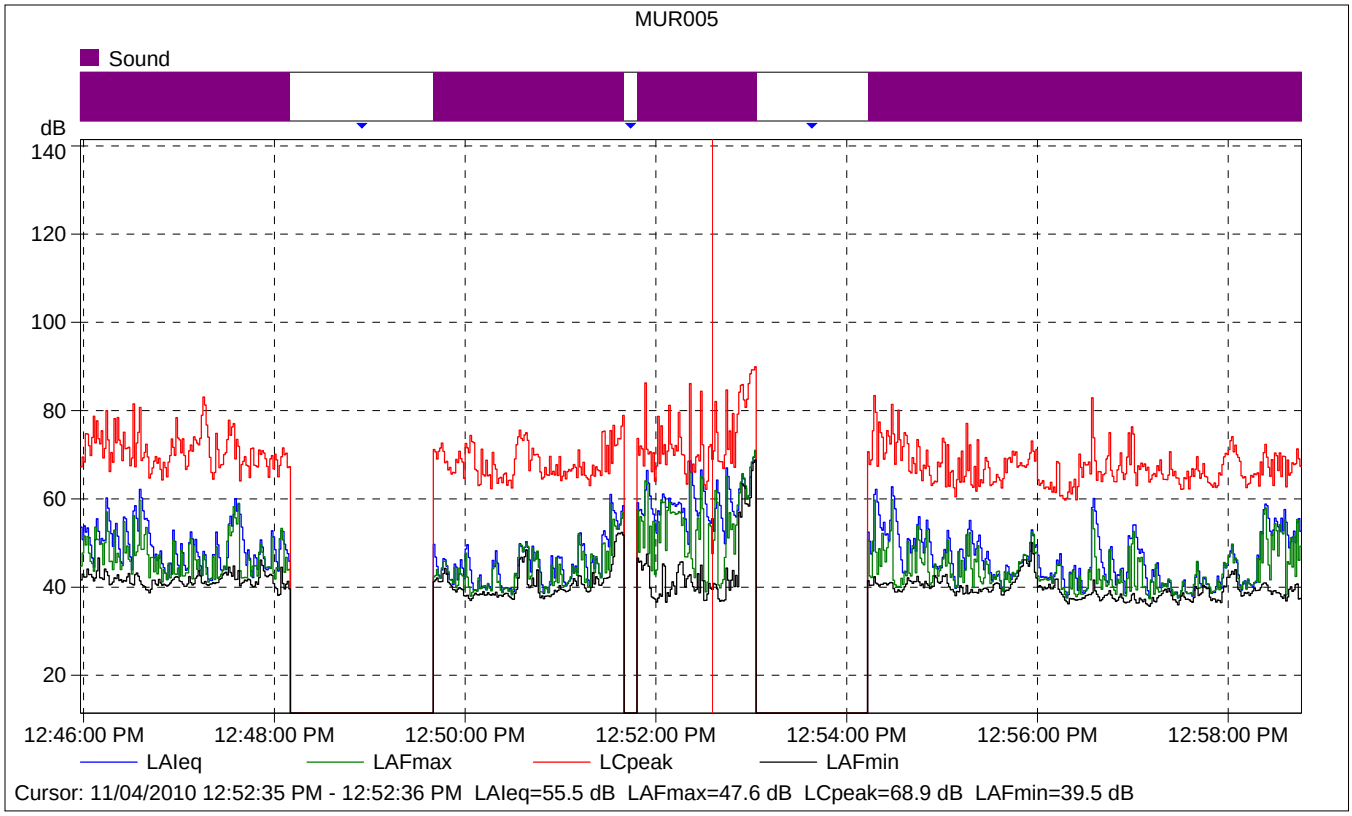
Calibration Time:		11/04/2010 08:39:06
Calibration Type:		External reference
Sensitivity:		54.83 mV/Pa

MUR005

	Start time	End time	Elapsed time	Overload [%]	LAeq [dB]	LAFmax [dB]	LAFmin [dB]
Value				0.00	49.9	71.0	35.7
Time	12:45:58 PM	12:58:46 PM	0:10:00				
Date	11/04/2010	11/04/2010					

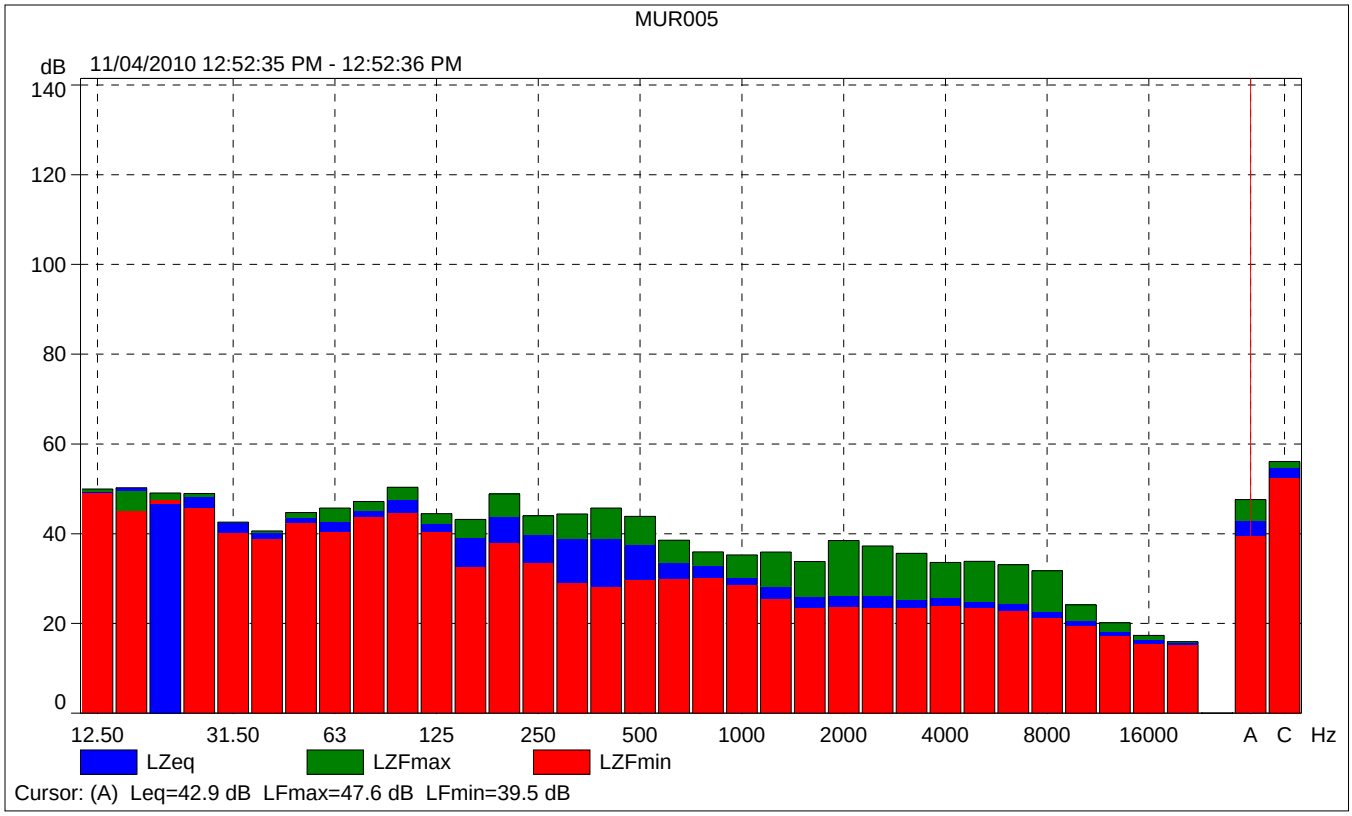

MUR005
dB
11/04/2010 12:45:58 PM - 12:58:46 PM
130
120
110
100
90
80
70
60
50
40
30
20
10
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=49.9 dB LFmax=71.0 dB LFmin=35.7 dB

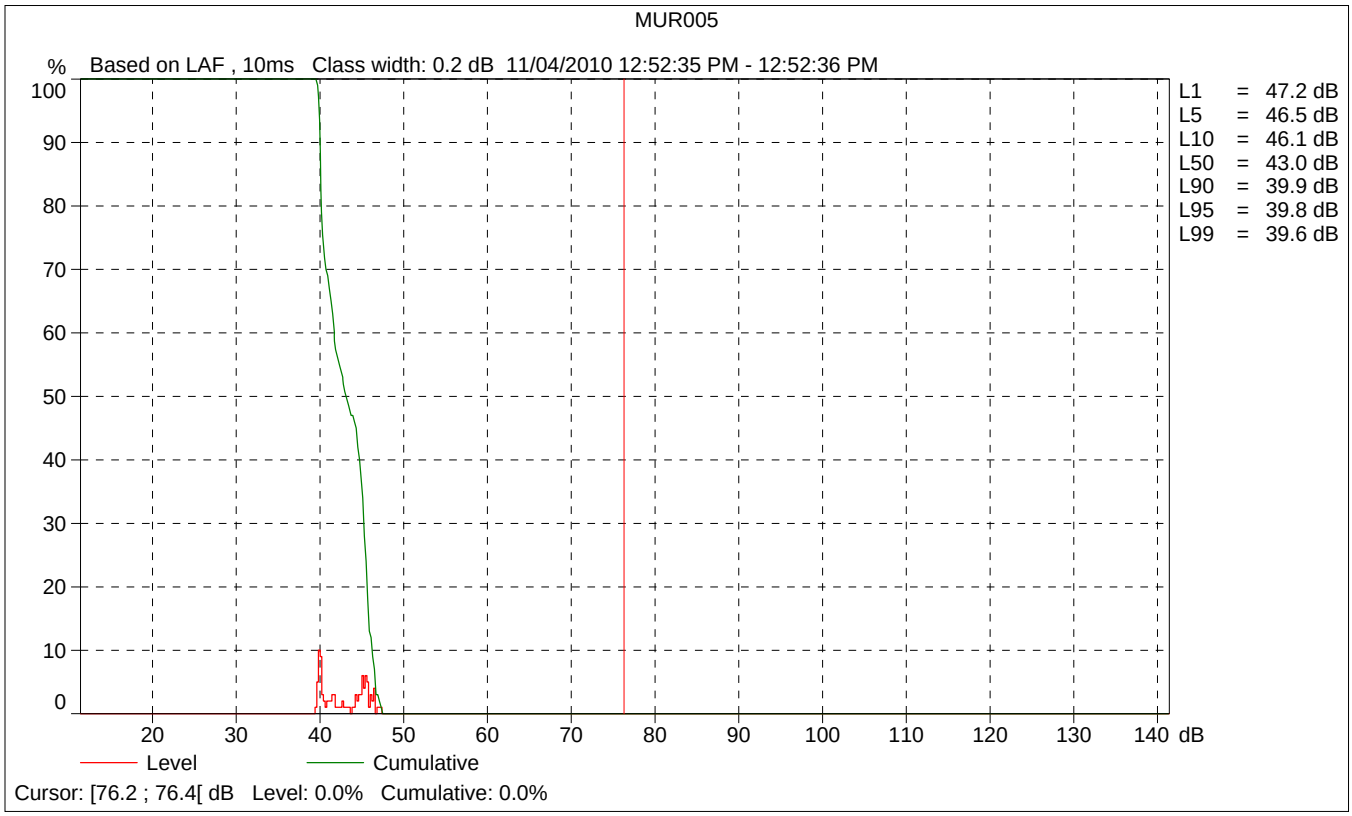

MUR005
%
Based on LAF , 10ms Class width: 0.2 dB 11/04/2010 12:45:58 PM - 12:58:46 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 63.4 dB
L5 = 52.5 dB
L10 = 48.5 dB
L50 = 41.5 dB
L90 = 38.2 dB
L95 = 37.7 dB
L99 = 36.9 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%

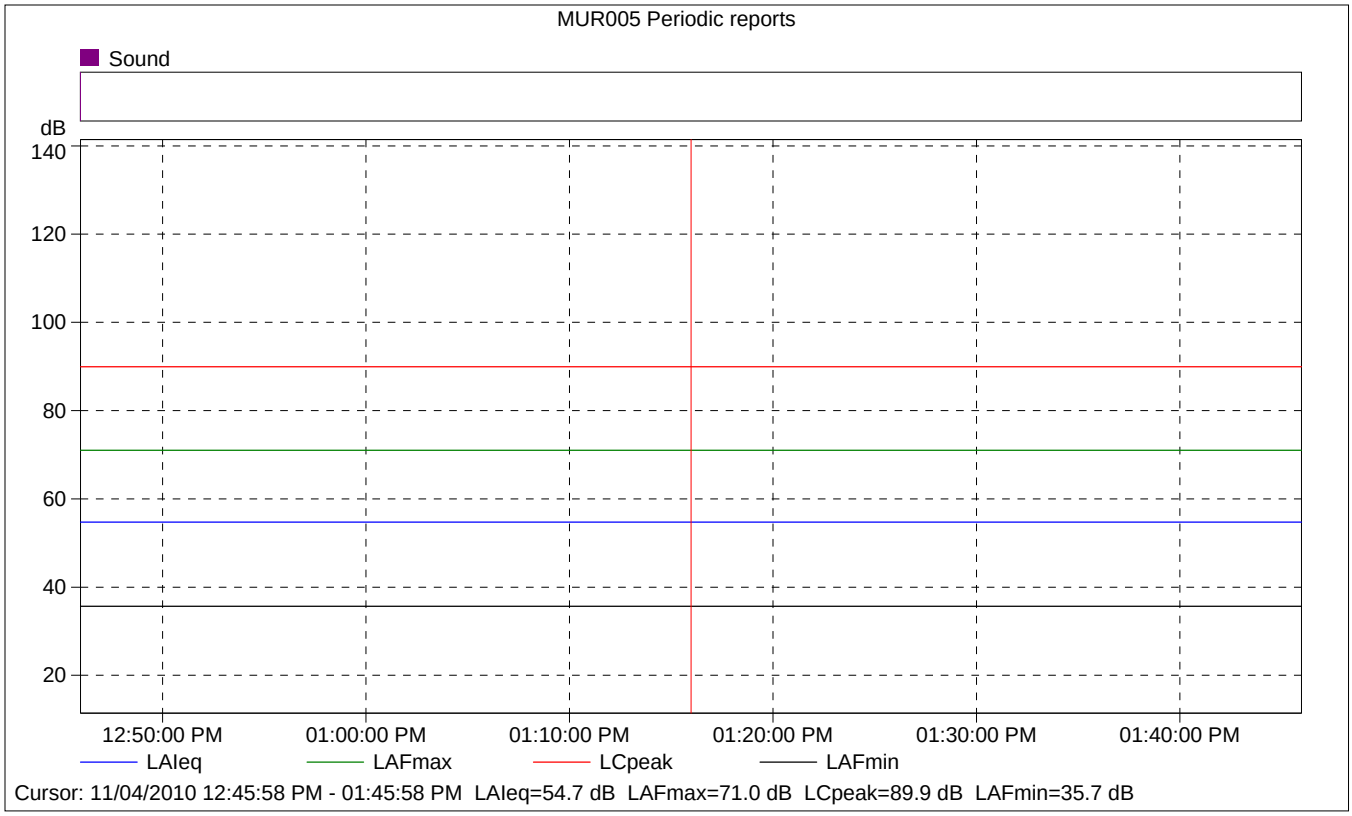


MUR005

	Start time	Elapsed time	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			55.5	47.6	39.5
Time	12:52:35 PM	0:00:01			
Date	11/04/2010				

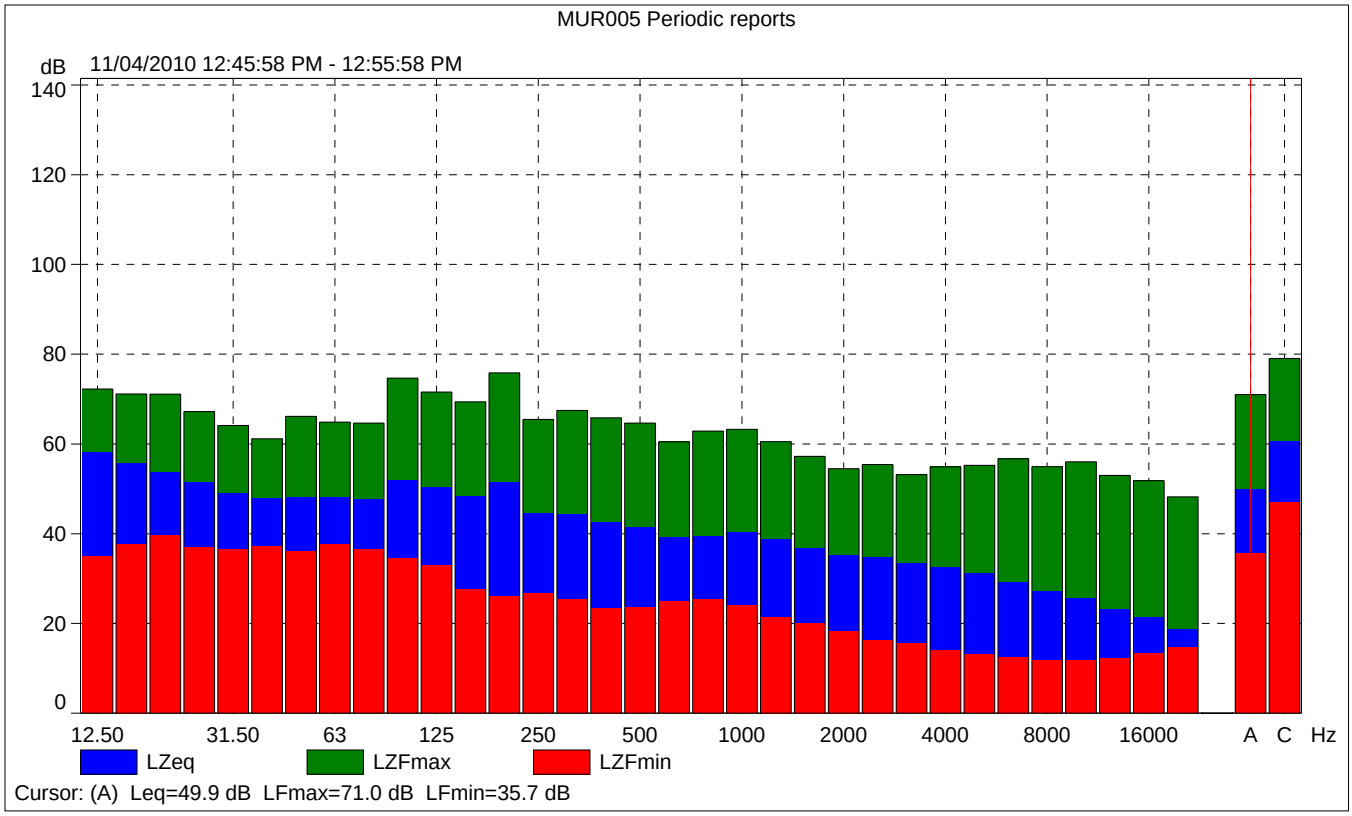

MUR005
dB
11/04/2010 12:52:35 PM - 12:52:36 PM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=42.9 dB LFmax=47.6 dB LFmin=39.5 dB

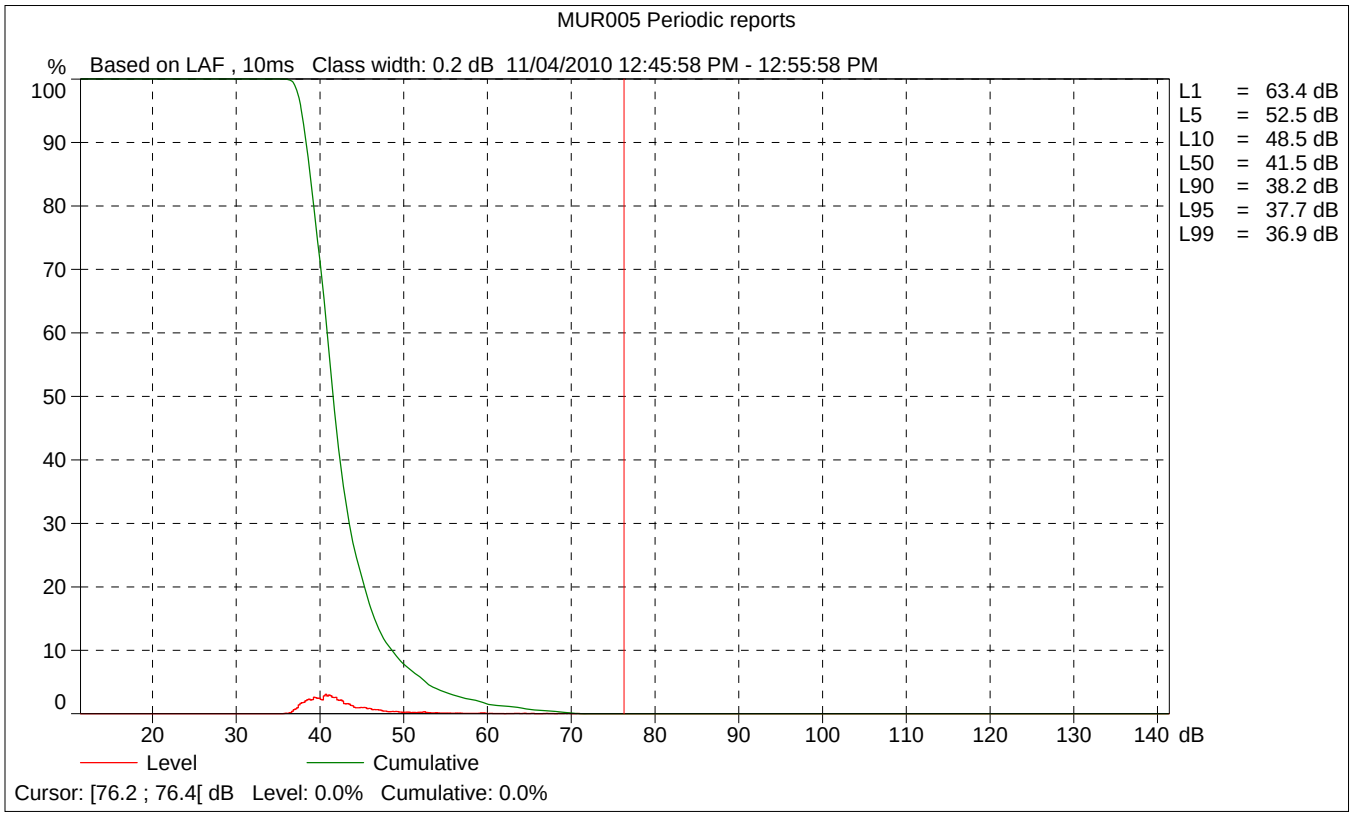

MUR005
%
Based on LAF , 10ms Class width: 0.2 dB 11/04/2010 12:52:35 PM - 12:52:36 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140 dB
L1 = 47.2 dB
L5 = 46.5 dB
L10 = 46.1 dB
L50 = 43.0 dB
L90 = 39.9 dB
L95 = 39.8 dB
L99 = 39.6 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%

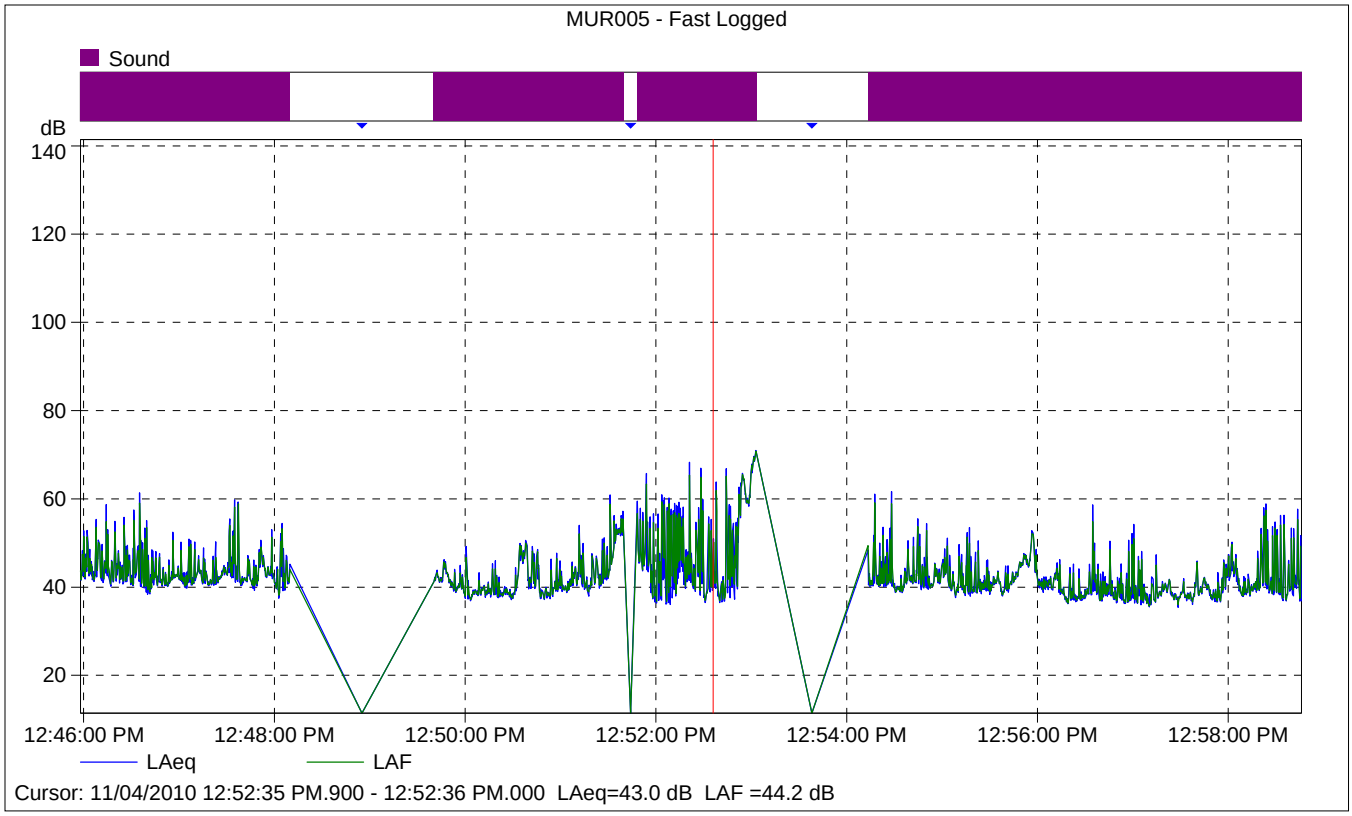


MUR005 Periodic reports

	Start time	Elapsed time	Overload [%]	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			0.00	54.7	71.0	35.7
Time	12:45:58 PM	0:10:00				
Date	11/04/2010					


MUR005 Periodic reports
dB
11/04/2010 12:45:58 PM - 12:55:58 PM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=49.9 dB LFmax=71.0 dB LFmin=35.7 dB


MUR005 Periodic reports
%
Based on LAF , 10ms Class width: 0.2 dB 11/04/2010 12:45:58 PM - 12:55:58 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 63.4 dB
L5 = 52.5 dB
L10 = 48.5 dB
L50 = 41.5 dB
L90 = 38.2 dB
L95 = 37.7 dB
L99 = 36.9 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%



MUR005 - Fast Logged

	Start time	Elapsed time	LAeq [dB]
Value			43.0
Time	12:52:35 PM.900	0:00:00.100	
Date	11/04/2010		

Site Number: City of Murrieta (MUR006)
Recorded By: Brian Allee
Job Number: 10106976
Date: November 4, 2010
Time: 1:30 PM
Location: Cul-de-sac of Kilkare Circle off of Boldin Drive.
Source of Peak Noise: Three planes flew over – two vehicles drove by – ice cream truck in background – pedestrians talking – dog barking – birds chirping – windy.

Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
47.8	40.4	64.1	87.7

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Brüel & Kjær**	**2250**	**2548189**	**9/10/2009**	
	Microphone	**Brüel & Kjær**	**4189**	**2543364**	**9/10/2009**	
	Preamp	**Brüel & Kjær**	**ZC 0032**	**4265**	**9/10/2009**	
	Calibrator	**Brüel & Kjær**	**4231**	**2545667**	**9/10/2009**	

Weather Data			
Est.	**Duration:** 10 minutes		**Sky:** ☼
	Note: dBA Offset = 0.02		**Sensor Height (ft):** 5 ft
	Wind Ave Speed (mph / m/s)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	4.9	90.0	961.4

Photo of Measurement Location

2250

Instrument:		2250
Application:		BZ7225 Version 2.0.2
Start Time:		11/04/2010 13:30:13
End Time:		11/04/2010 13:40:57
Elapsed Time:		00:10:00
Bandwidth:		1/3-octave
Max Input Level:		140.13

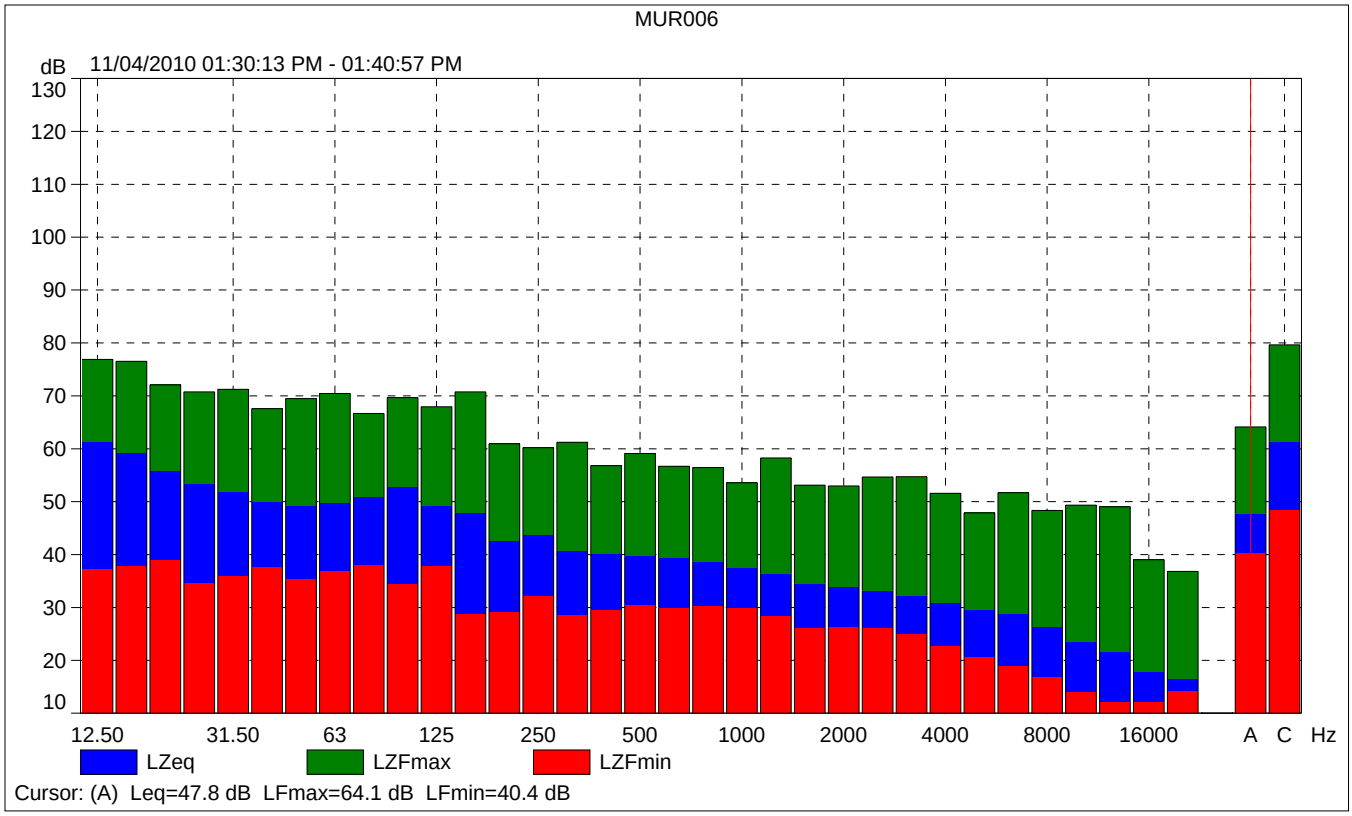
	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	Z

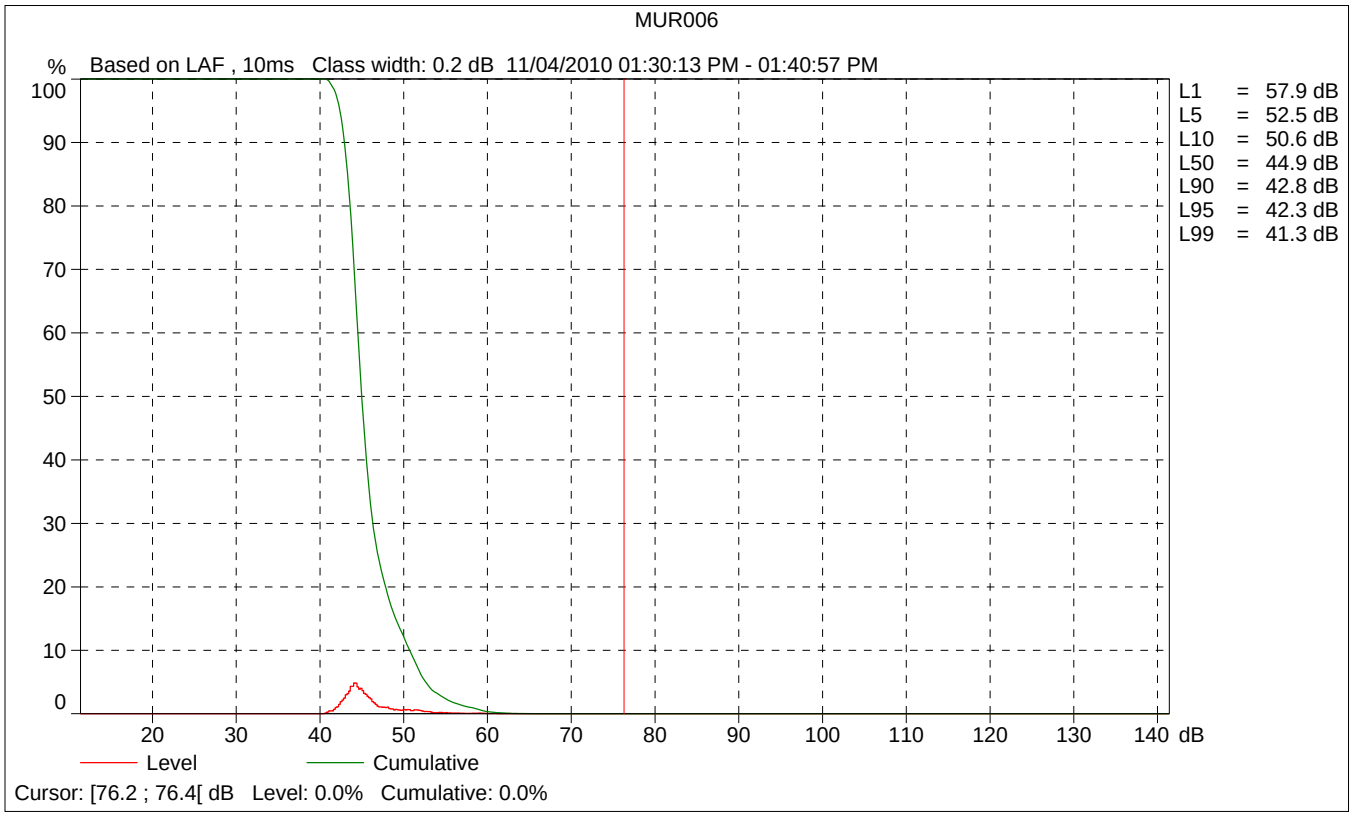
Instrument Serial Number:		2548189
Microphone Serial Number:		2543364
Input:		Top Socket
Windscreen Correction:		None
Sound Field Correction:		Diffuse-field

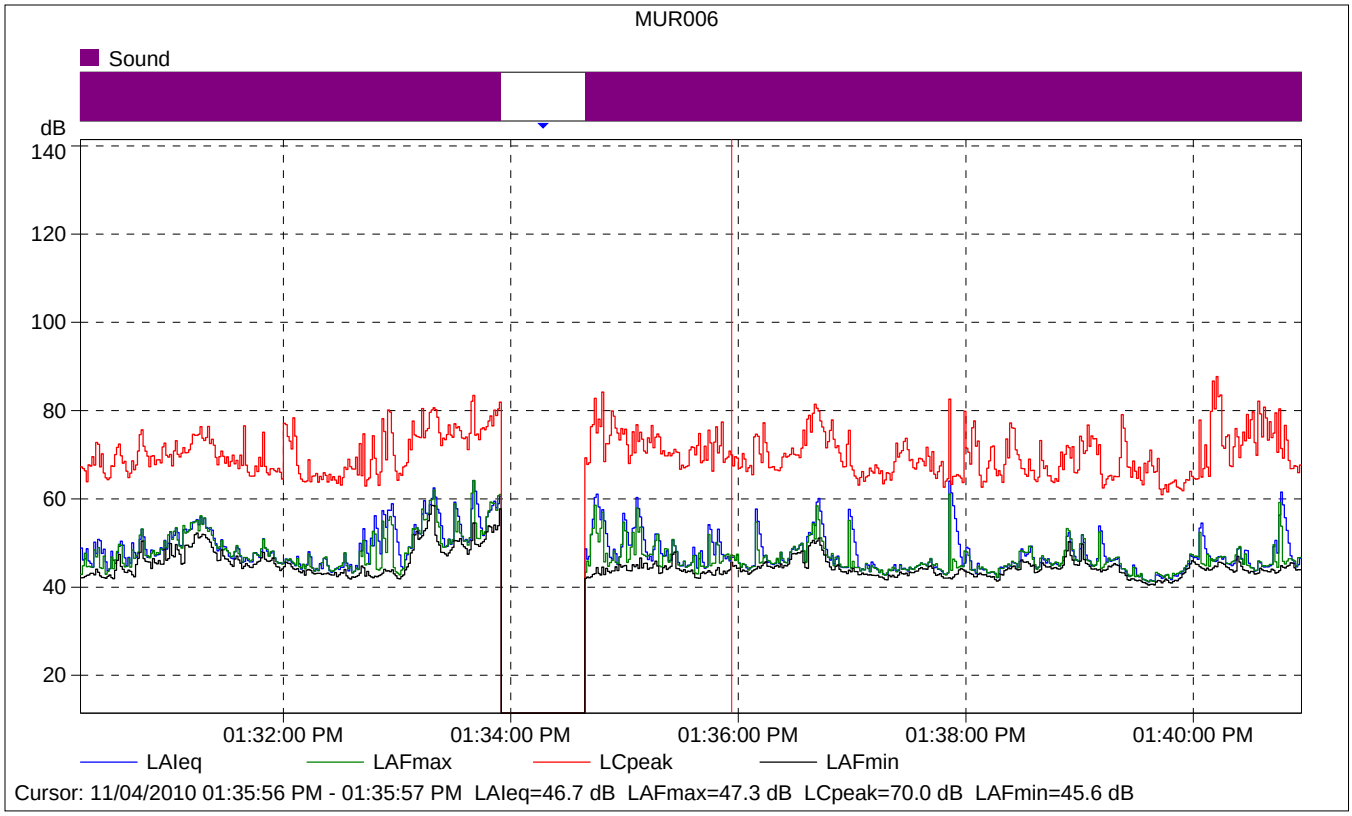
Calibration Time:		11/04/2010 08:39:06
Calibration Type:		External reference
Sensitivity:		54.83 mV/Pa

MUR006

	Start time	End time	Elapsed time	Overload [%]	LAeq [dB]	LAFmax [dB]	LAFmin [dB]
Value				0.00	47.8	64.1	40.4
Time	01:30:13 PM	01:40:57 PM	0:10:00				
Date	11/04/2010	11/04/2010					

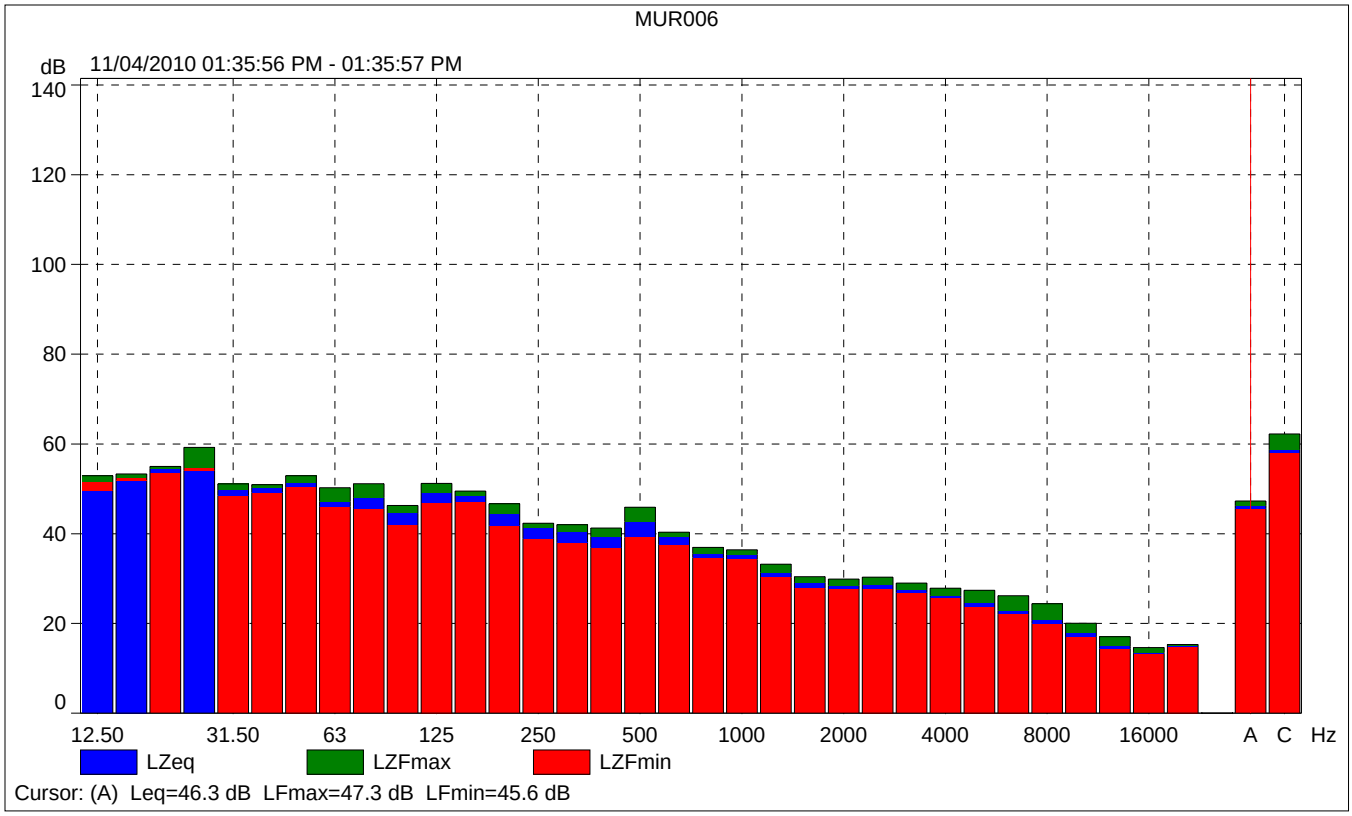

MUR006
dB
11/04/2010 01:30:13 PM - 01:40:57 PM
130
120
110
100
90
80
70
60
50
40
30
20
10
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=47.8 dB LFmax=64.1 dB LFmin=40.4 dB

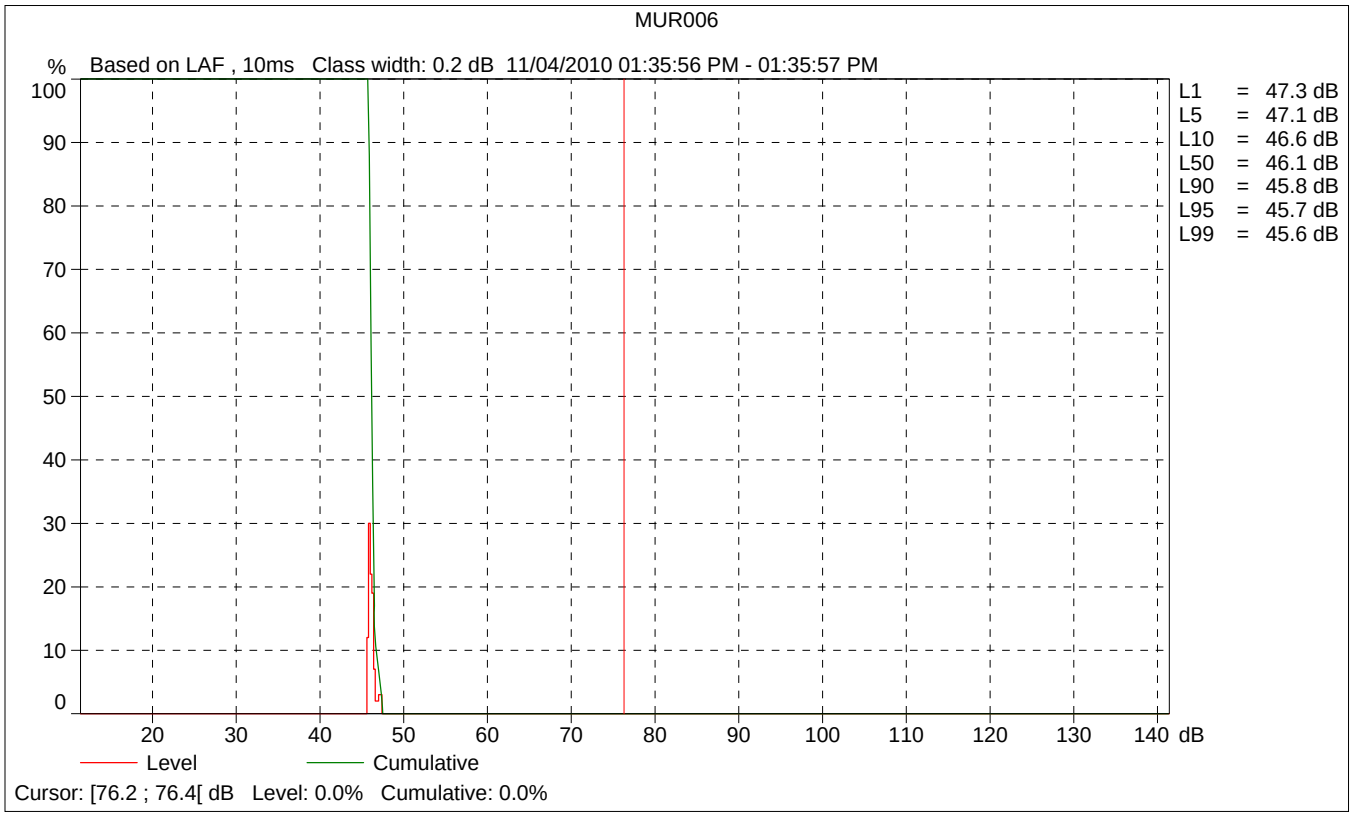

MUR006
%
Based on LAF , 10ms Class width: 0.2 dB 11/04/2010 01:30:13 PM - 01:40:57 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 57.9 dB
L5 = 52.5 dB
L10 = 50.6 dB
L50 = 44.9 dB
L90 = 42.8 dB
L95 = 42.3 dB
L99 = 41.3 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%

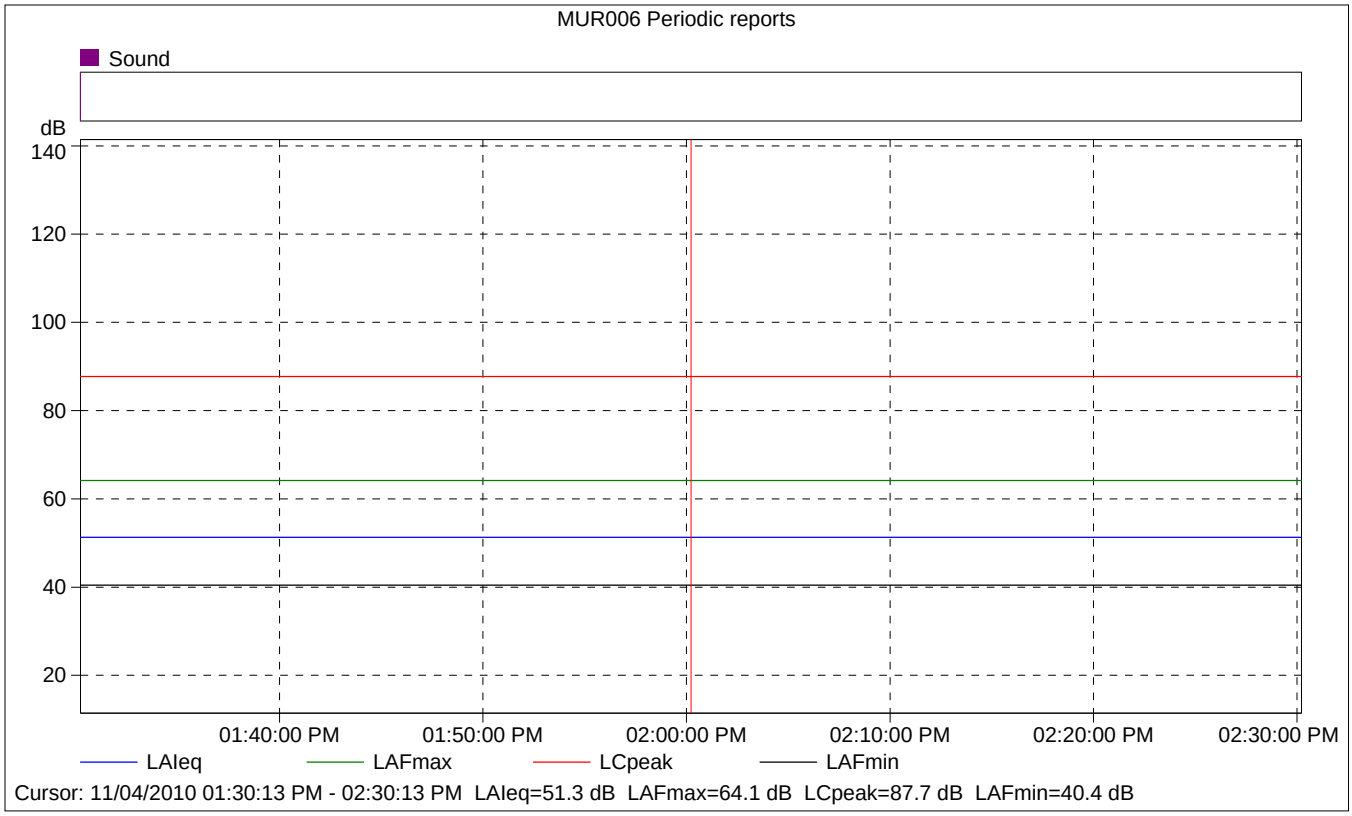


MUR006

	Start time	Elapsed time	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			46.7	47.3	45.6
Time	01:35:56 PM	0:00:01			
Date	11/04/2010				

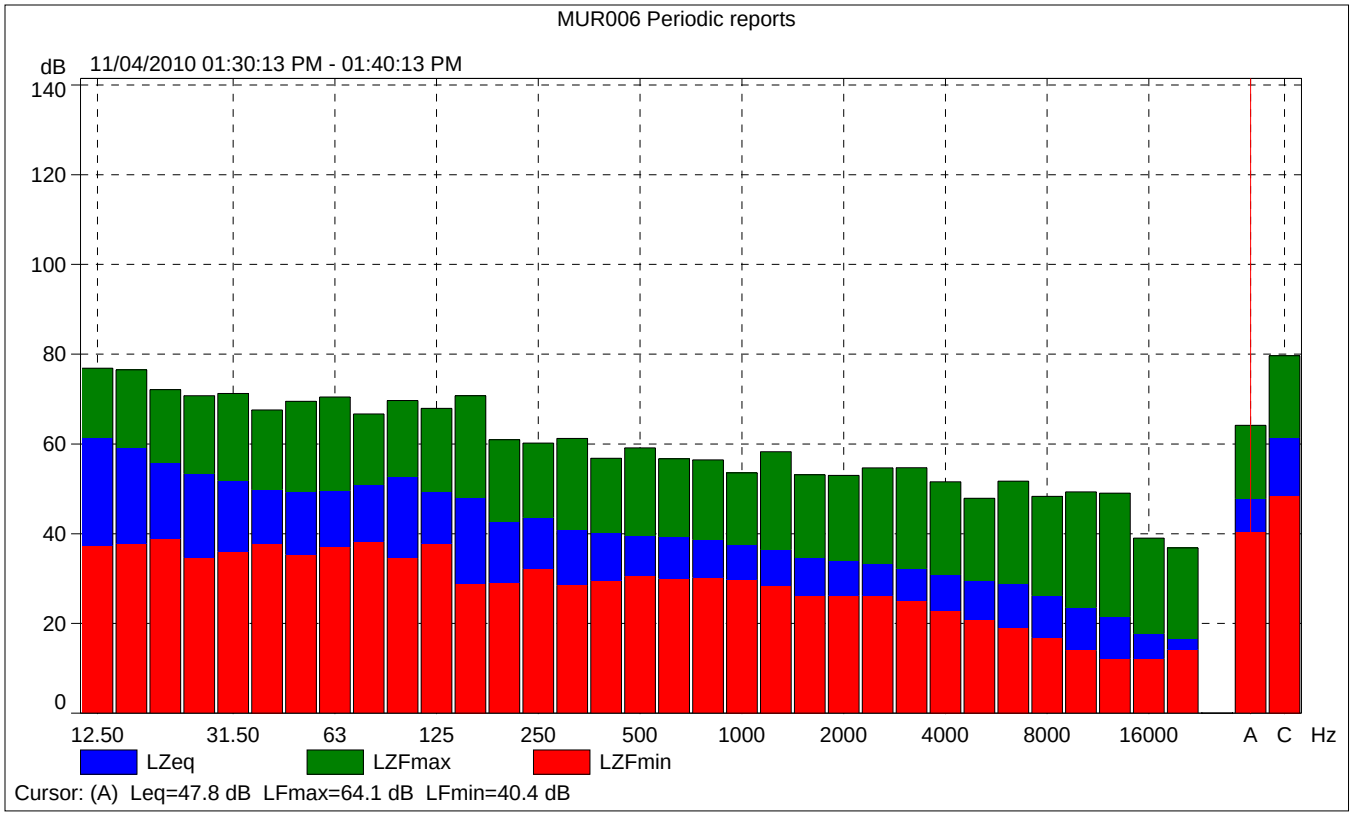

MUR006
dB
11/04/2010 01:35:56 PM - 01:35:57 PM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=46.3 dB LFmax=47.3 dB LFmin=45.6 dB

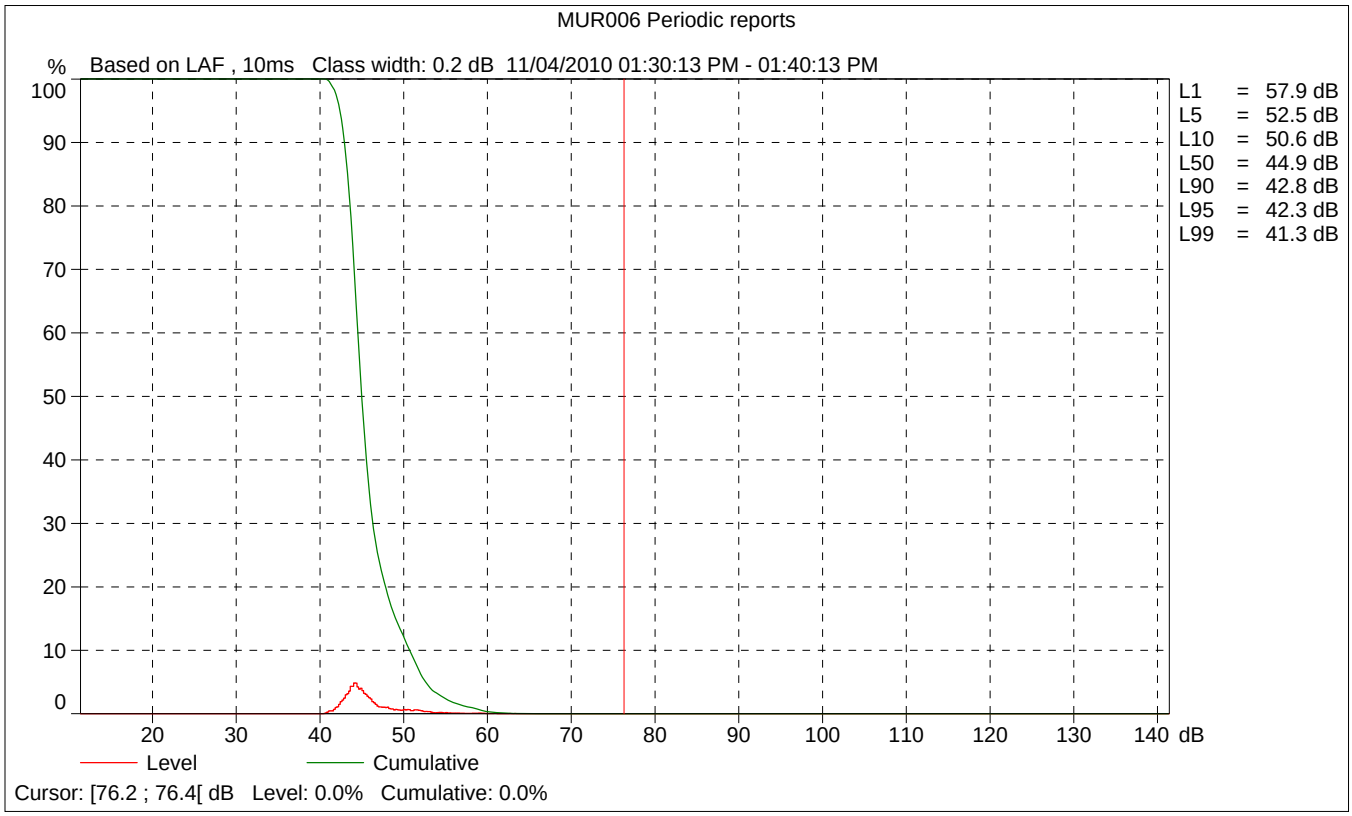

MUR006
%
Based on LAF , 10ms Class width: 0.2 dB 11/04/2010 01:35:56 PM - 01:35:57 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140 dB
L1 = 47.3 dB
L5 = 47.1 dB
L10 = 46.6 dB
L50 = 46.1 dB
L90 = 45.8 dB
L95 = 45.7 dB
L99 = 45.6 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%

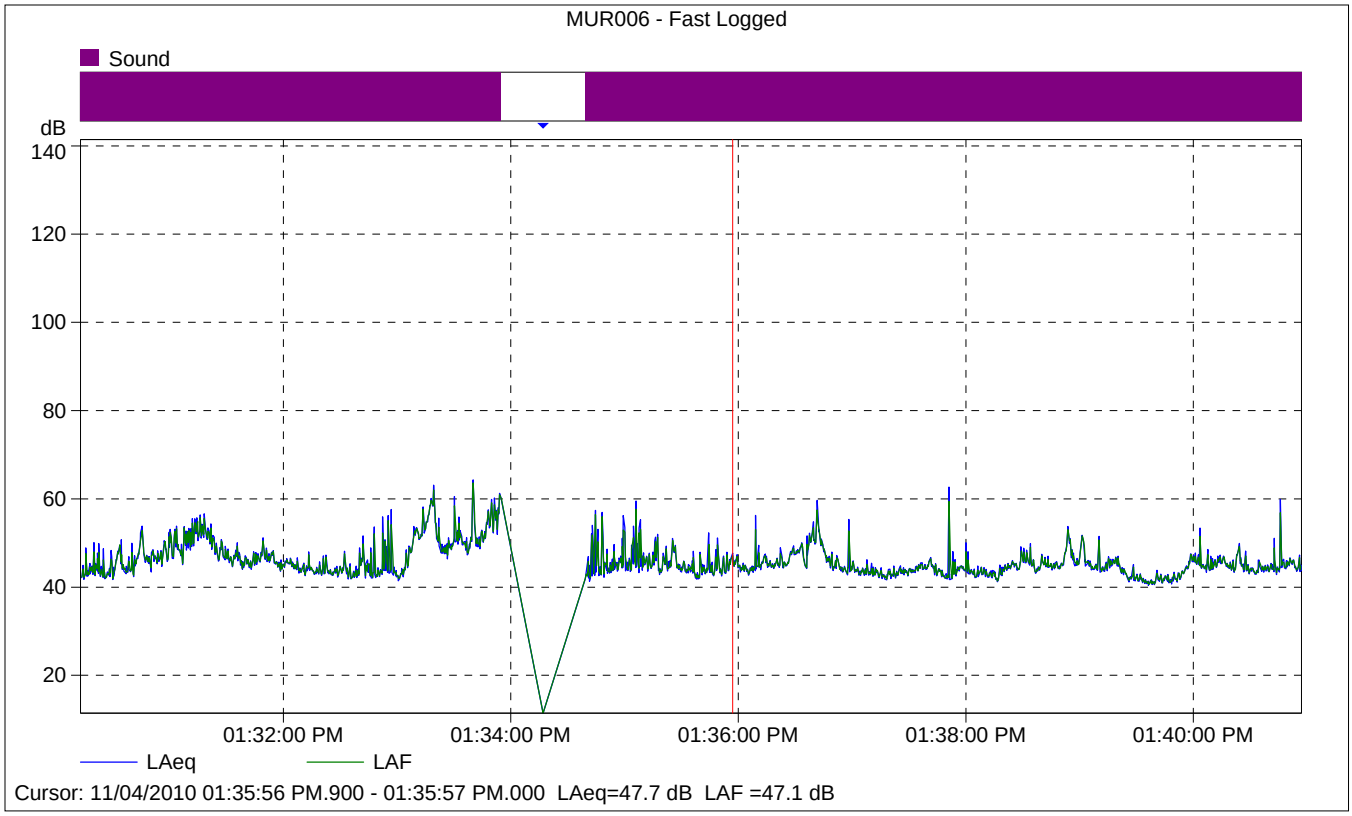


MUR006 Periodic reports

	Start time	Elapsed time	Overload [%]	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			0.00	51.3	64.1	40.4
Time	01:30:13 PM	0:10:00				
Date	11/04/2010					


MUR006 Periodic reports
dB
11/04/2010 01:30:13 PM - 01:40:13 PM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=47.8 dB LFmax=64.1 dB LFmin=40.4 dB


MUR006 Periodic reports
%
Based on LAF , 10ms Class width: 0.2 dB 11/04/2010 01:30:13 PM - 01:40:13 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 57.9 dB
L5 = 52.5 dB
L10 = 50.6 dB
L50 = 44.9 dB
L90 = 42.8 dB
L95 = 42.3 dB
L99 = 41.3 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%



MUR006 - Fast Logged

	Start time	Elapsed time	LAeq [dB]
Value			47.7
Time	01:35:56 PM.900	0:00:00.100	
Date	11/04/2010		

Site Number: City of Murrieta (MUR007)
Recorded By: Brian Allee
Job Number: 10106976
Date: November 4, 2010
Time: 1:56 PM
Location: Intersection of Catalina Street and Chateau Drive (adjacent to 25291 Catalina Street).
Source of Peak Noise: Vehicular noise from freeway – vehicles on Catalina Street – siren in background – windy.

Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
51.4	45.4	68.3	92.0

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Brüel & Kjær**	**2250**	**2548189**	**9/10/2009**	
	Microphone	**Brüel & Kjær**	**4189**	**2543364**	**9/10/2009**	
	Preamp	**Brüel & Kjær**	**ZC 0032**	**4265**	**9/10/2009**	
	Calibrator	**Brüel & Kjær**	**4231**	**2545667**	**9/10/2009**	

Weather Data			
Est.	**Duration:** 10 minutes		**Sky:** ☼
	Note: dBA Offset = 0.02		**Sensor Height (ft):** 5 ft
	Wind Ave Speed (mph / m/s)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	1.6	98.4	973.0

Photo of Measurement Location

2250

Instrument:		2250
Application:		BZ7225 Version 2.0.2
Start Time:		11/04/2010 13:56:33
End Time:		11/04/2010 14:06:33
Elapsed Time:		00:10:00
Bandwidth:		1/3-octave
Max Input Level:		140.13

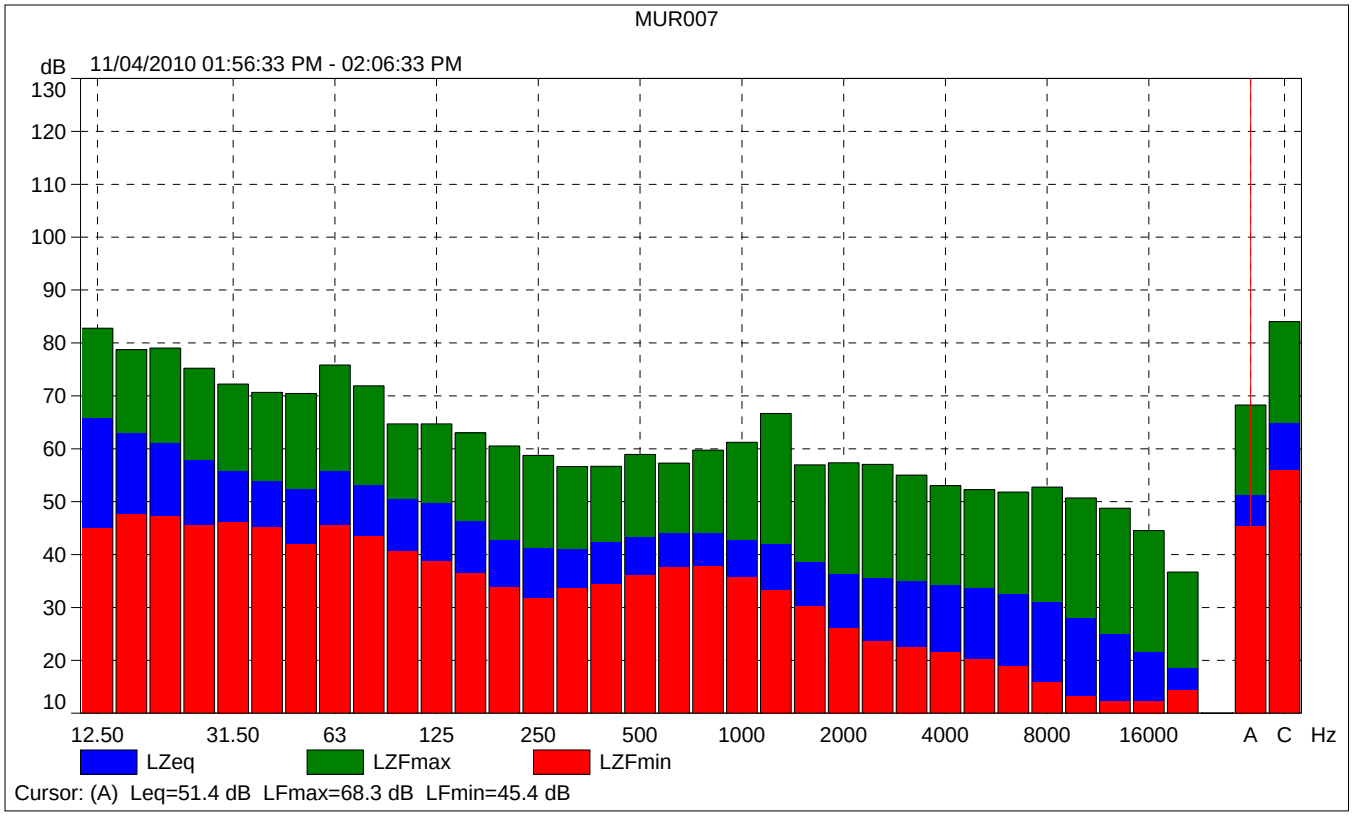
	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	Z

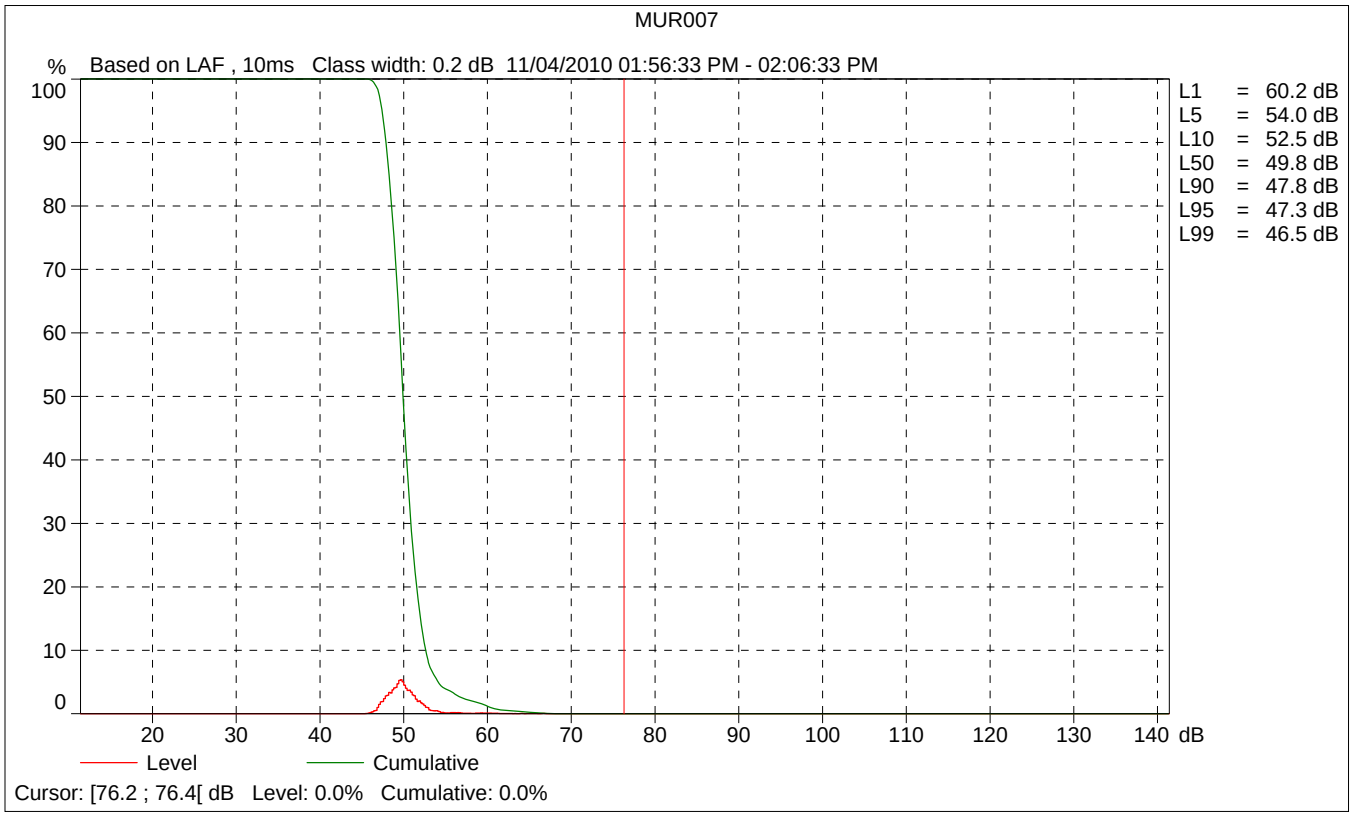
Instrument Serial Number:		2548189
Microphone Serial Number:		2543364
Input:		Top Socket
Windscreen Correction:		None
Sound Field Correction:		Diffuse-field

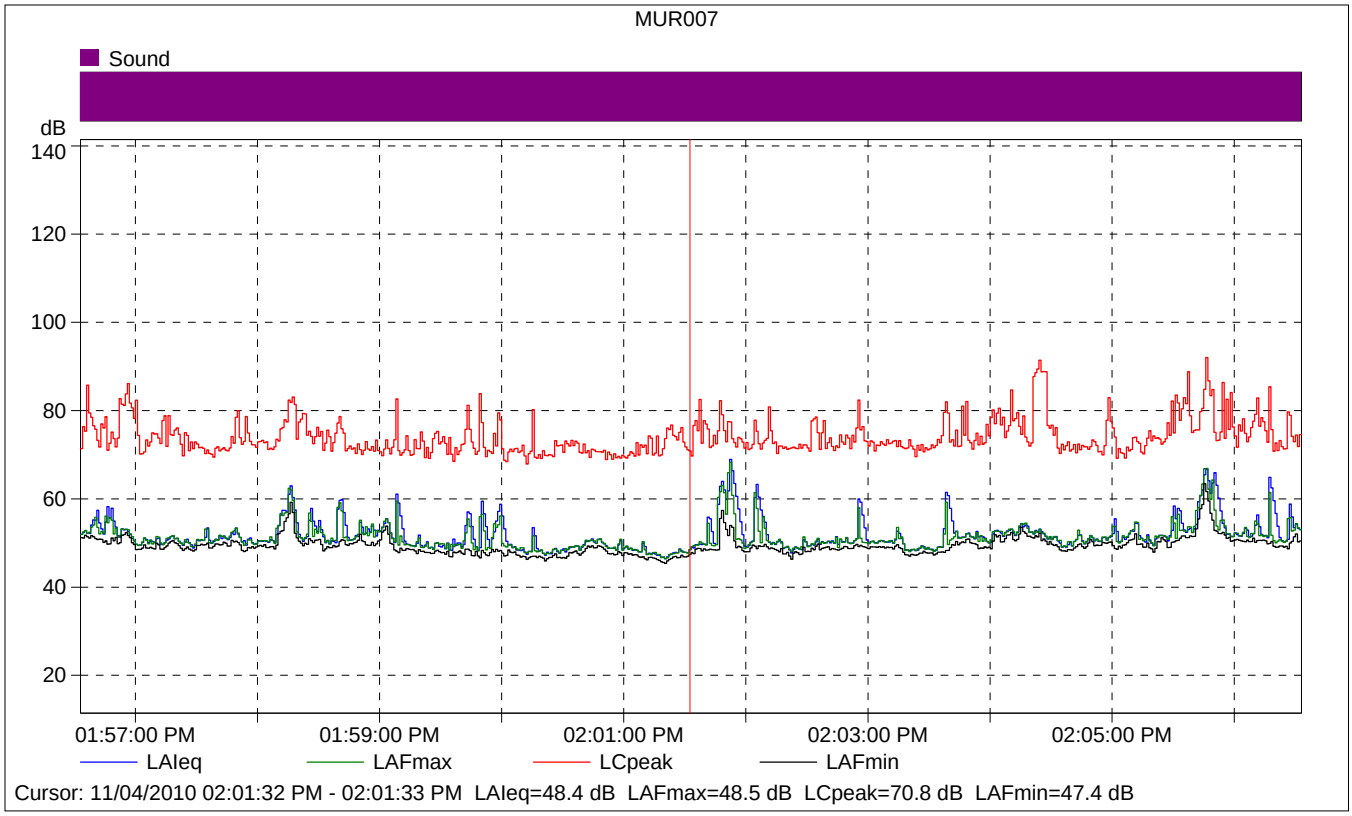
Calibration Time:		11/04/2010 08:39:06
Calibration Type:		External reference
Sensitivity:		54.83 mV/Pa

MUR007

	Start time	End time	Elapsed time	Overload [%]	LAeq [dB]	LAFmax [dB]	LAFmin [dB]
Value				0.00	51.4	68.3	45.4
Time	01:56:33 PM	02:06:33 PM	0:10:00				
Date	11/04/2010	11/04/2010					

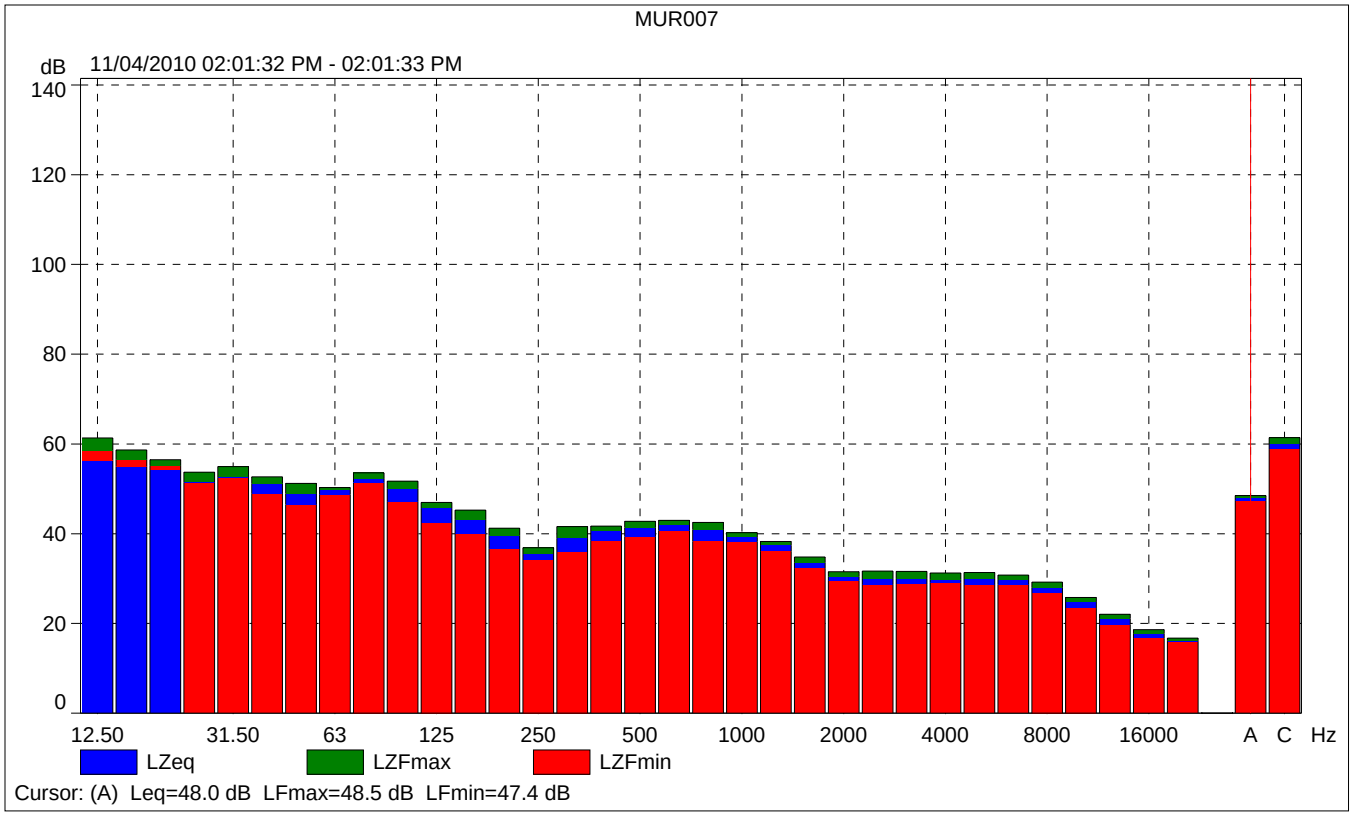

MUR007
dB
11/04/2010 01:56:33 PM - 02:06:33 PM
130
120
110
100
90
80
70
60
50
40
30
20
10
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=51.4 dB LFmax=68.3 dB LFmin=45.4 dB

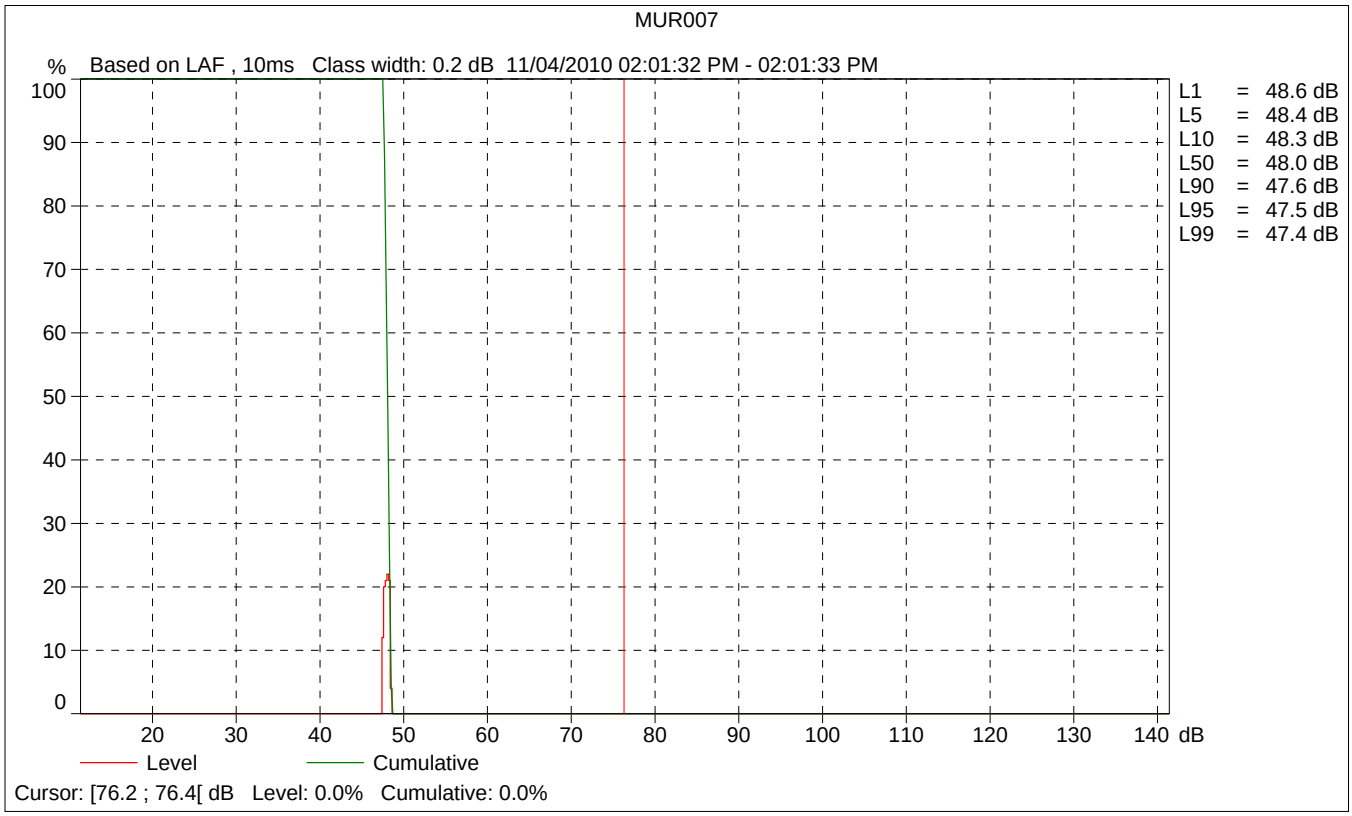

MUR007
%
Based on LAF , 10ms Class width: 0.2 dB 11/04/2010 01:56:33 PM - 02:06:33 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 60.2 dB
L5 = 54.0 dB
L10 = 52.5 dB
L50 = 49.8 dB
L90 = 47.8 dB
L95 = 47.3 dB
L99 = 46.5 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%

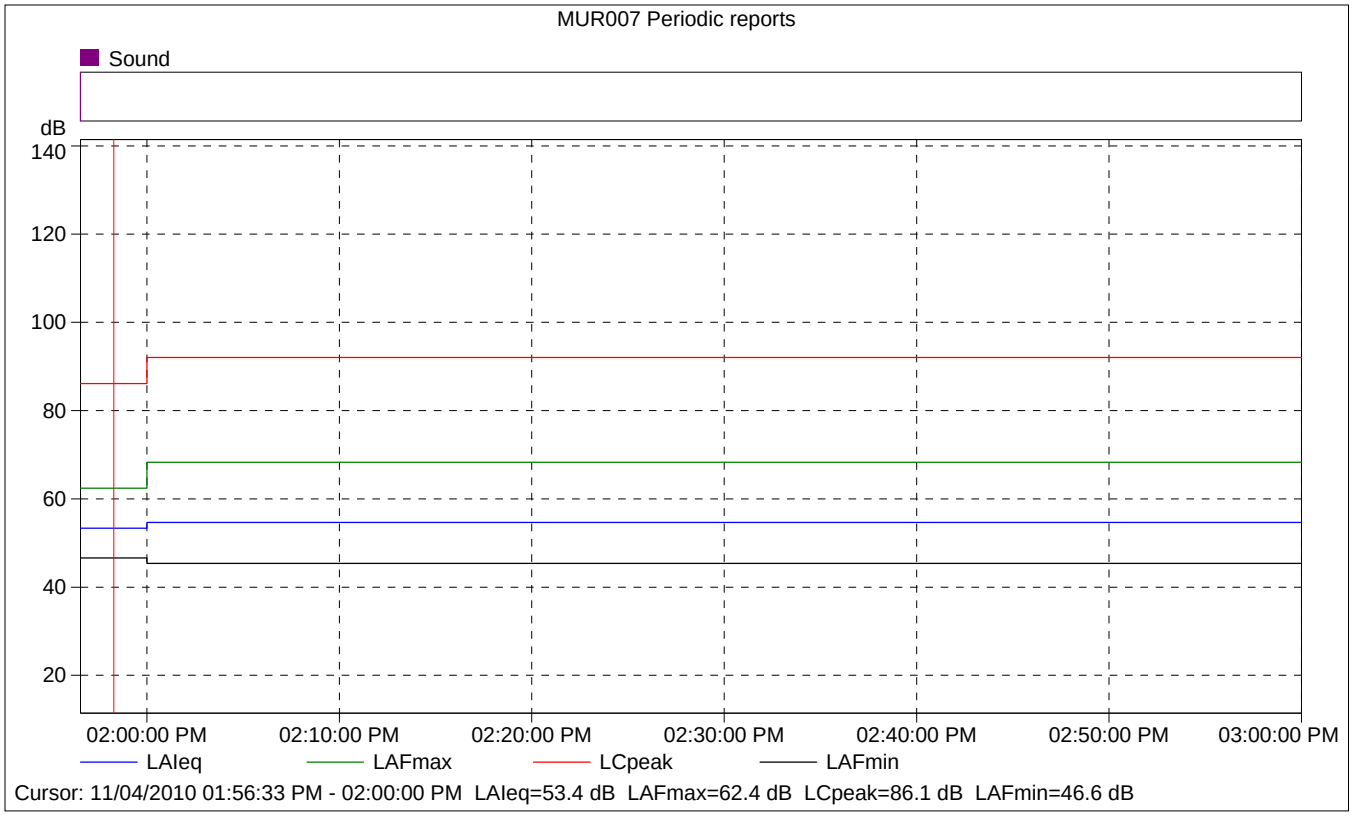


MUR007

	Start time	Elapsed time	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			48.4	48.5	47.4
Time	02:01:32 PM	0:00:01			
Date	11/04/2010				

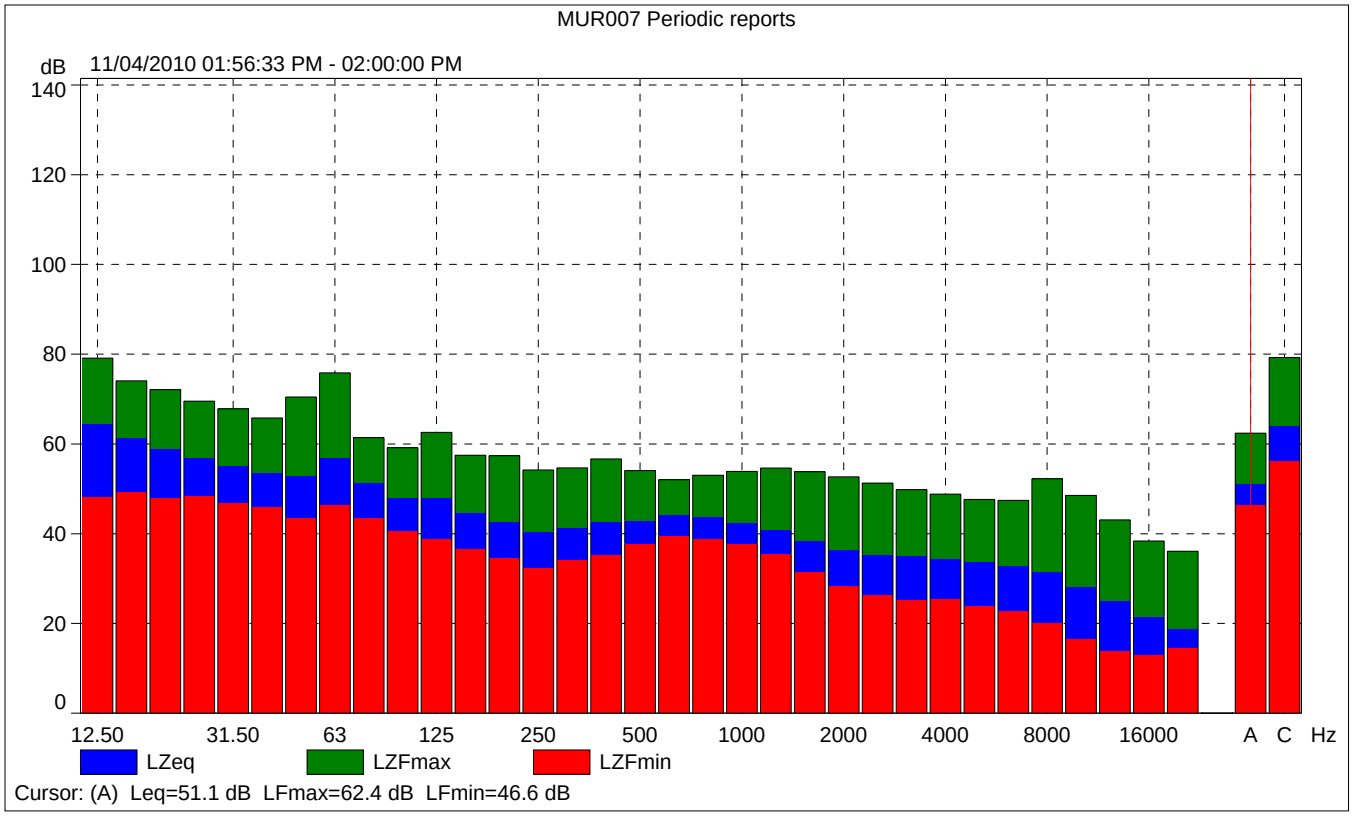

MUR007
dB
11/04/2010 02:01:32 PM - 02:01:33 PM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=48.0 dB LFmax=48.5 dB LFmin=47.4 dB

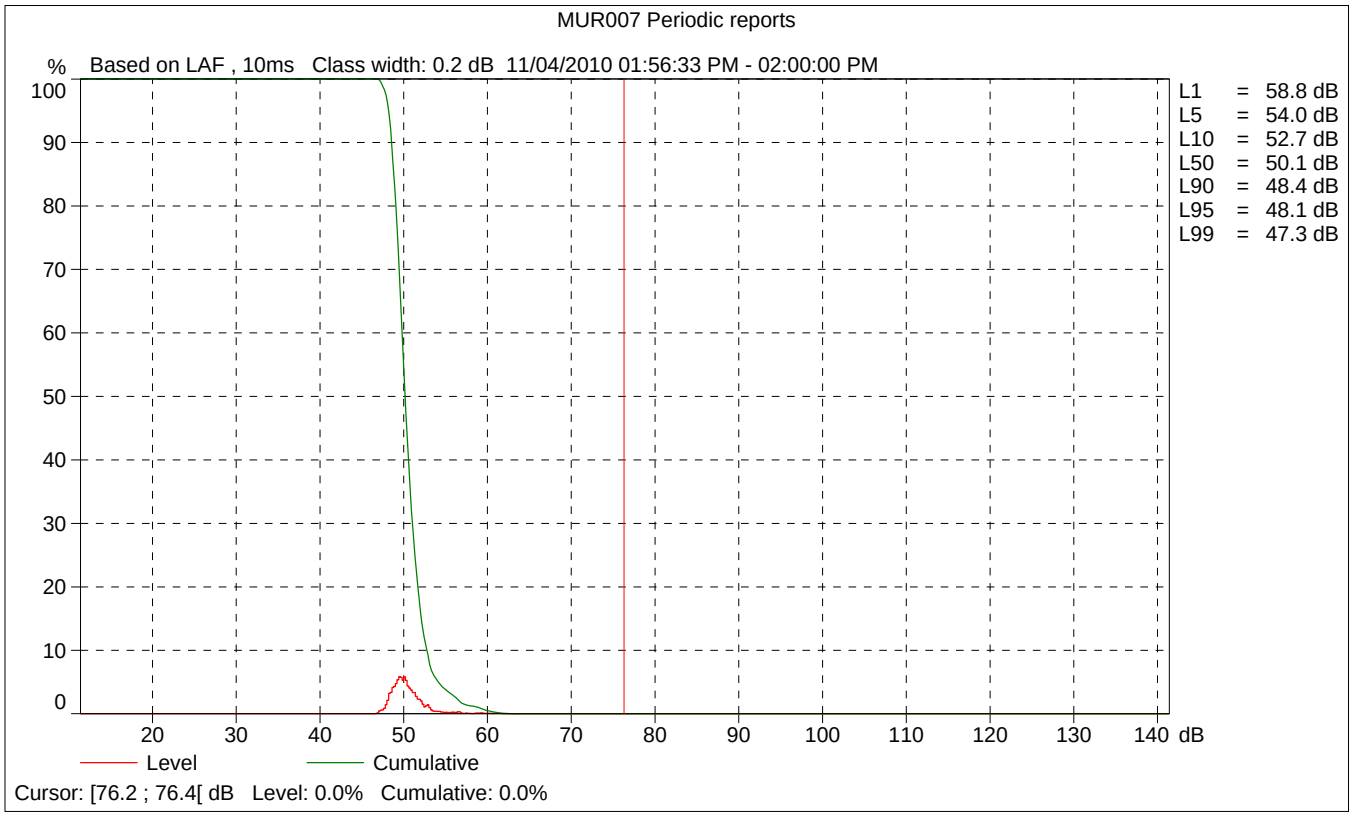

MUR007
%
Based on LAF , 10ms Class width: 0.2 dB 11/04/2010 02:01:32 PM - 02:01:33 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140 dB
L1 = 48.6 dB
L5 = 48.4 dB
L10 = 48.3 dB
L50 = 48.0 dB
L90 = 47.6 dB
L95 = 47.5 dB
L99 = 47.4 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%

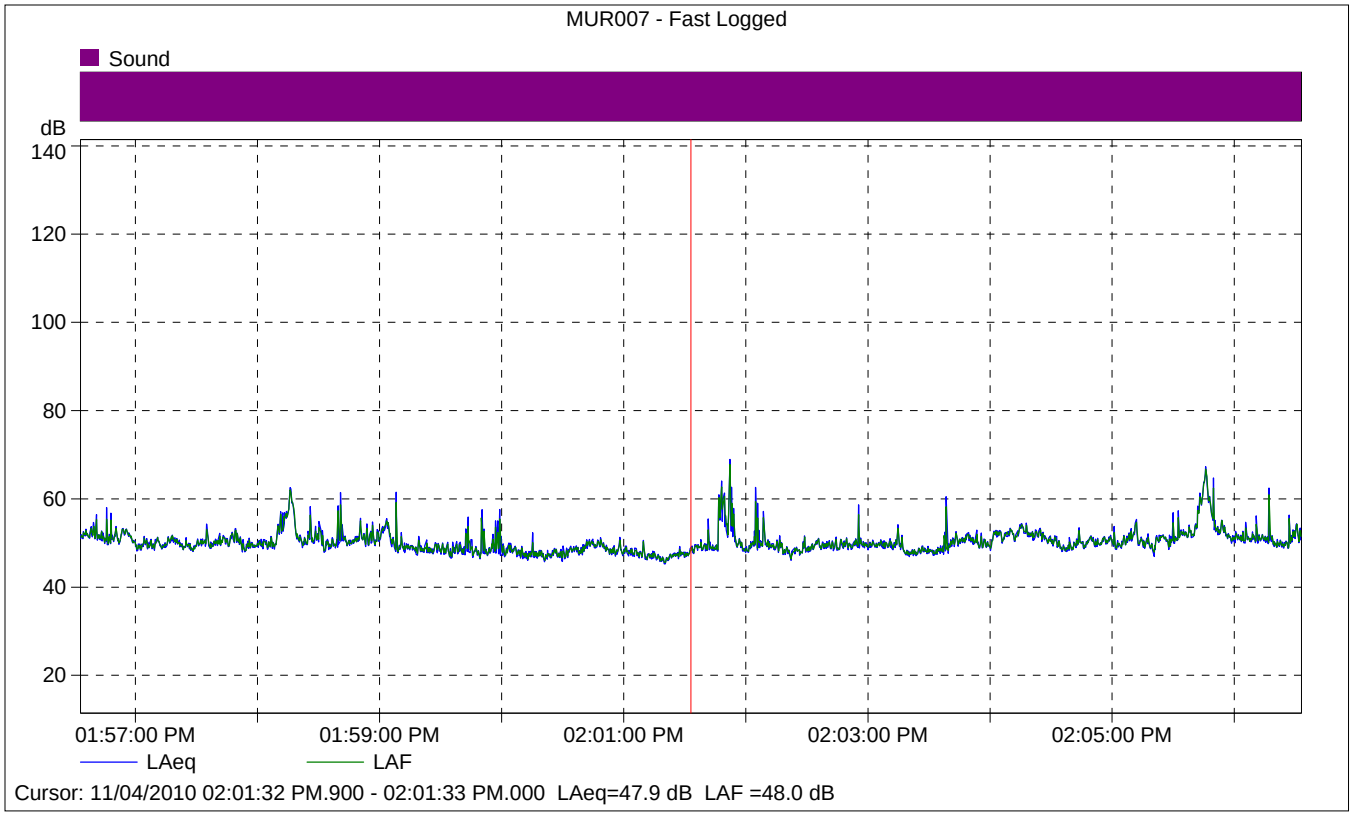


MUR007 Periodic reports

	Start time	Elapsed time	Overload [%]	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			0.00	53.4	62.4	46.6
Time	01:56:33 PM	0:03:27				
Date	11/04/2010					


MUR007 Periodic reports
dB
11/04/2010 01:56:33 PM - 02:00:00 PM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=51.1 dB LFmax=62.4 dB LFmin=46.6 dB


MUR007 Periodic reports
%
Based on LAF , 10ms Class width: 0.2 dB 11/04/2010 01:56:33 PM - 02:00:00 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 58.8 dB
L5 = 54.0 dB
L10 = 52.7 dB
L50 = 50.1 dB
L90 = 48.4 dB
L95 = 48.1 dB
L99 = 47.3 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%



MUR007 - Fast Logged

	Start time	Elapsed time	LAeq [dB]
Value			47.9
Time	02:01:32 PM.900	0:00:00.100	
Date	11/04/2010		

Site Number: City of Murrieta (MUR008)
Recorded By: Brian Allee
Job Number: 10106976
Date: November 4, 2010
Time: 3:10 PM
Location: Cul-de-sac of Kaelan Court off Roland Road.
Source of Peak Noise: Helicopter flew over – plane flew over – windy – wind chimes in background – side fence door slamming against house nearby – birds chirping.

Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
47.1	38.7	66.1	94.9

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Brüel & Kjær**	**2250**	**2548189**	**9/10/2009**	
	Microphone	**Brüel & Kjær**	**4189**	**2543364**	**9/10/2009**	
	Preamp	**Brüel & Kjær**	**ZC 0032**	**4265**	**9/10/2009**	
	Calibrator	**Brüel & Kjær**	**4231**	**2545667**	**9/10/2009**	

Weather Data			
Est.	**Duration:** 10 minutes		**Sky:** ☼
	Note: dBA Offset = 0.02		**Sensor Height (ft):** 5 ft
	Wind Ave Speed (mph / m/s)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	4.2	95.0	974.1

Photo of Measurement Location

2250

Instrument:		2250
Application:		BZ7225 Version 2.0.2
Start Time:		11/04/2010 15:10:35
End Time:		11/04/2010 15:20:35
Elapsed Time:		00:10:00
Bandwidth:		1/3-octave
Max Input Level:		140.13

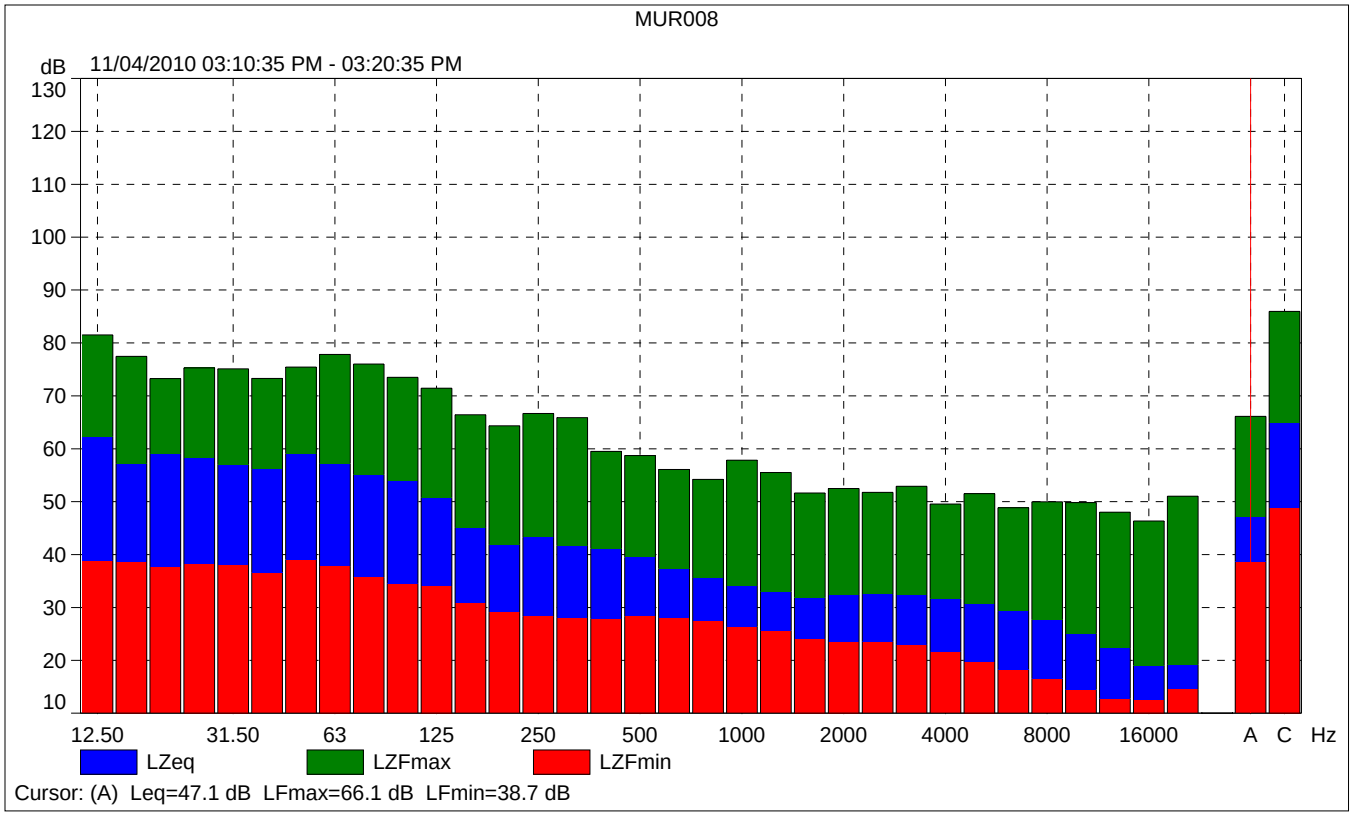
	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	Z

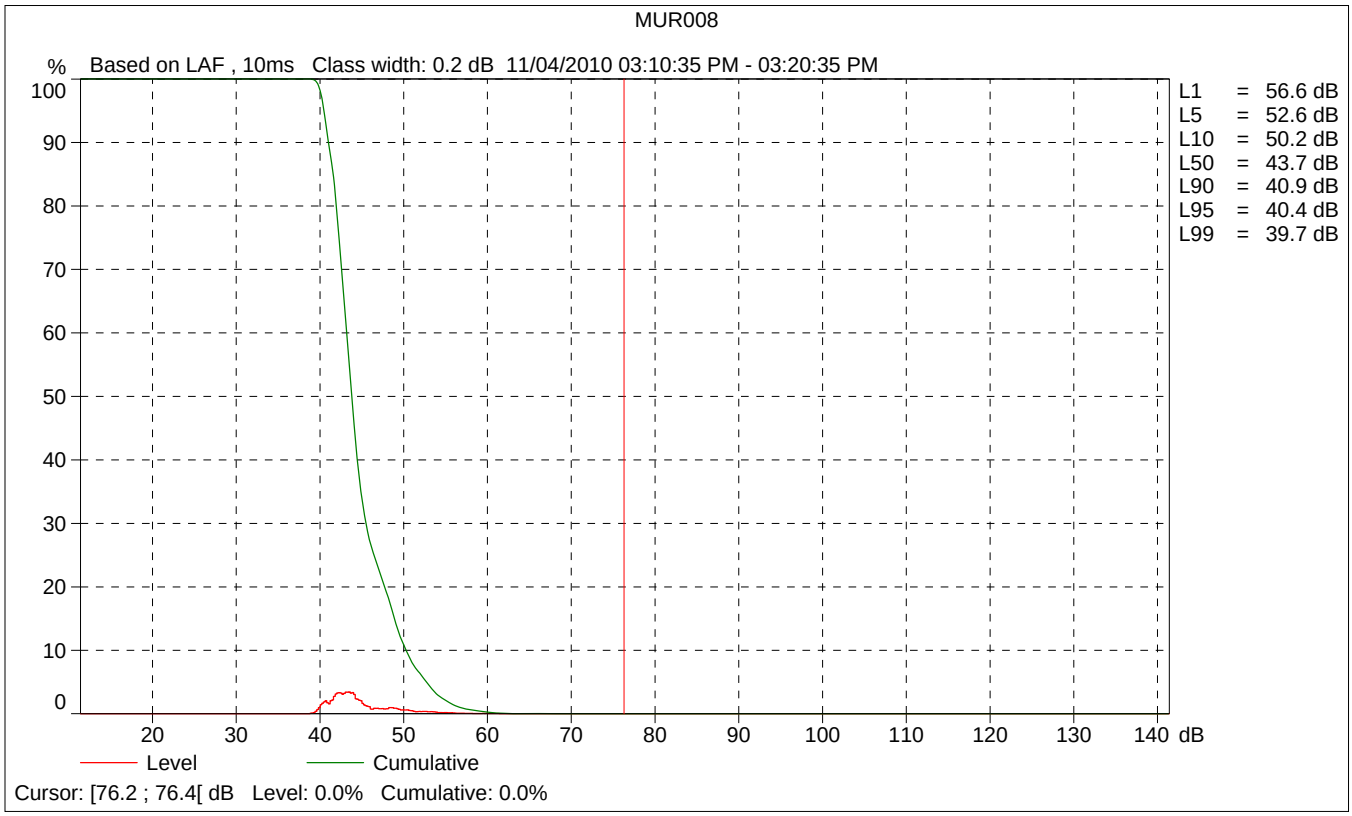
Instrument Serial Number:		2548189
Microphone Serial Number:		2543364
Input:		Top Socket
Windscreen Correction:		None
Sound Field Correction:		Diffuse-field

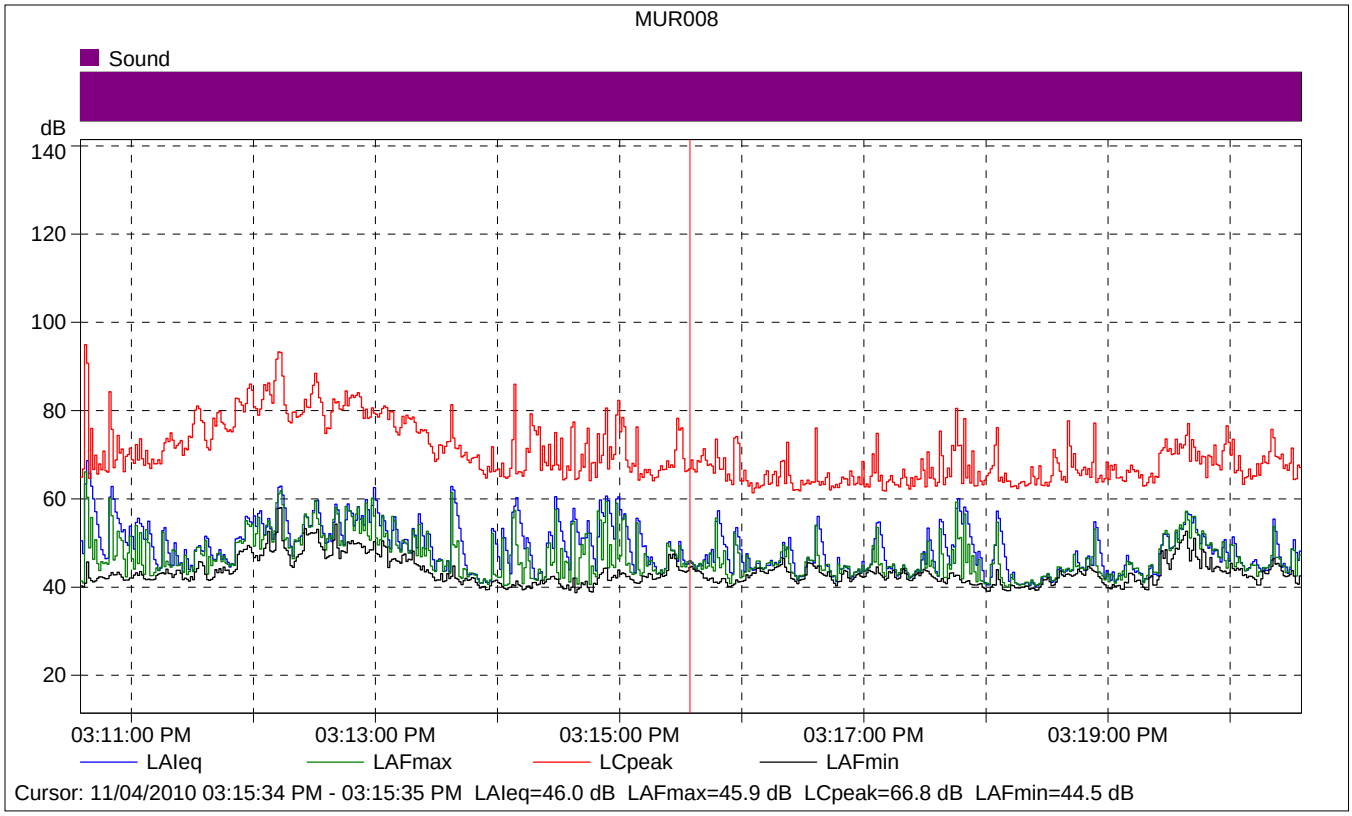
Calibration Time:		11/04/2010 08:39:06
Calibration Type:		External reference
Sensitivity:		54.83 mV/Pa

MUR008

	Start time	End time	Elapsed time	Overload [%]	LAeq [dB]	LAFmax [dB]	LAFmin [dB]
Value				0.00	47.1	66.1	38.7
Time	03:10:35 PM	03:20:35 PM	0:10:00				
Date	11/04/2010	11/04/2010					

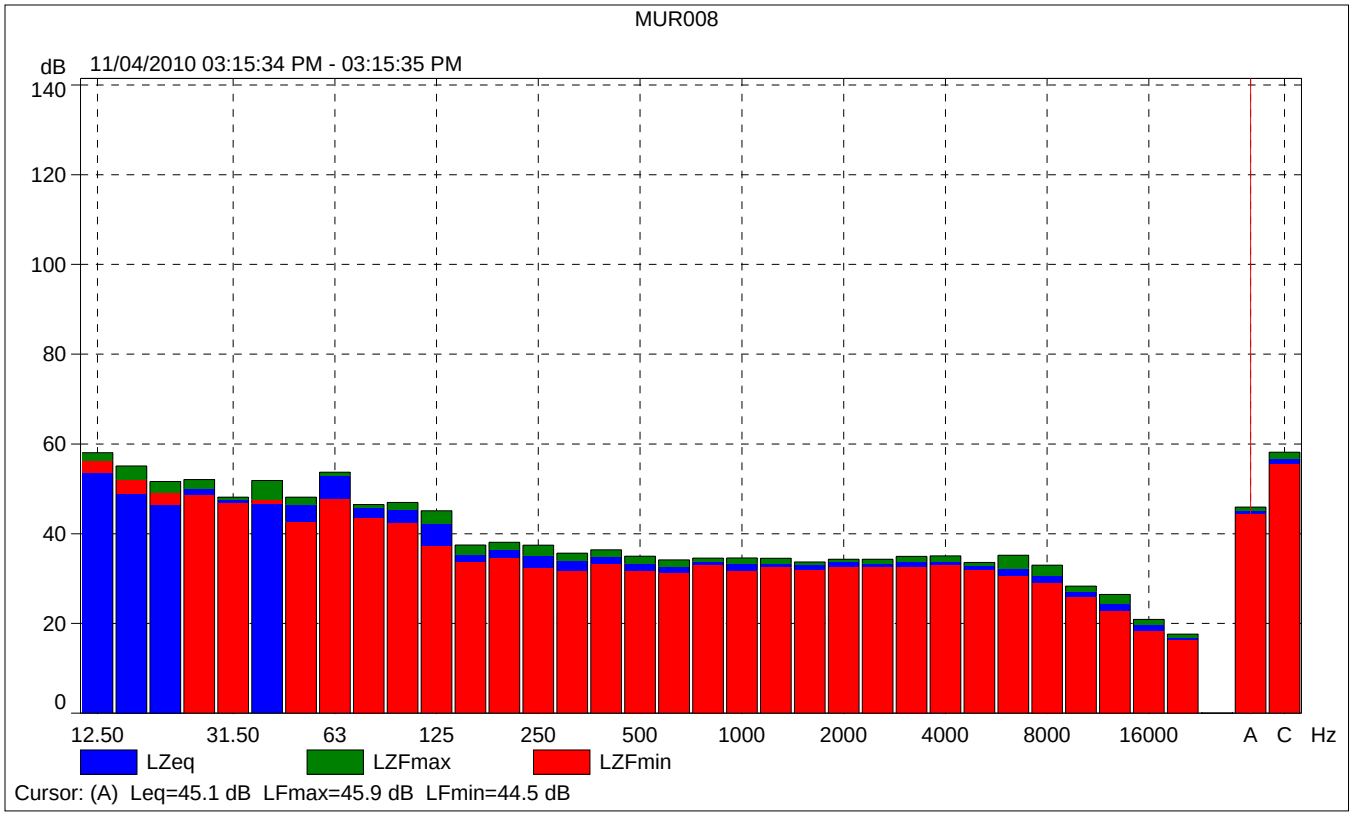

MUR008
dB
11/04/2010 03:10:35 PM - 03:20:35 PM
130
120
110
100
90
80
70
60
50
40
30
20
10
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=47.1 dB LFmax=66.1 dB LFmin=38.7 dB

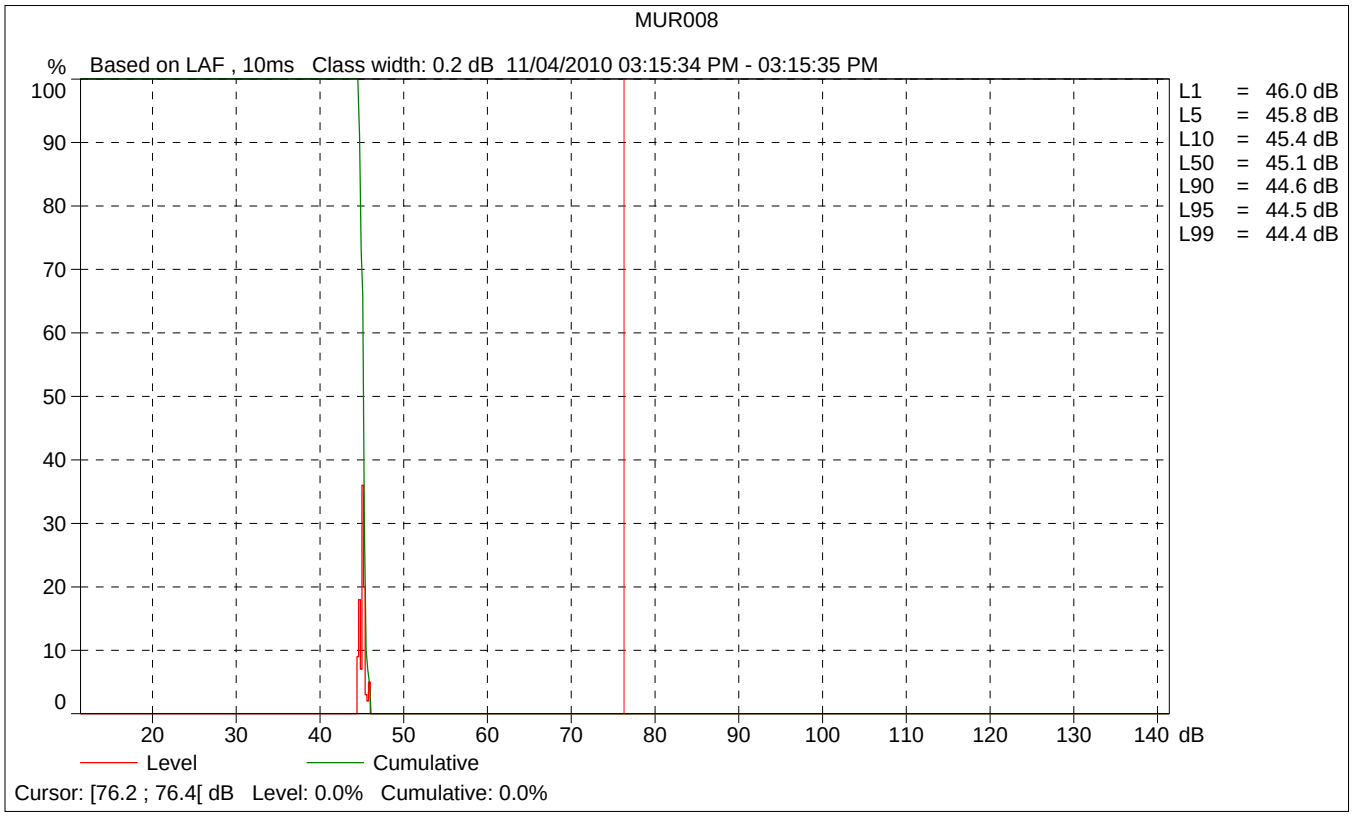

MUR008
%
Based on LAF , 10ms Class width: 0.2 dB 11/04/2010 03:10:35 PM - 03:20:35 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 56.6 dB
L5 = 52.6 dB
L10 = 50.2 dB
L50 = 43.7 dB
L90 = 40.9 dB
L95 = 40.4 dB
L99 = 39.7 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%

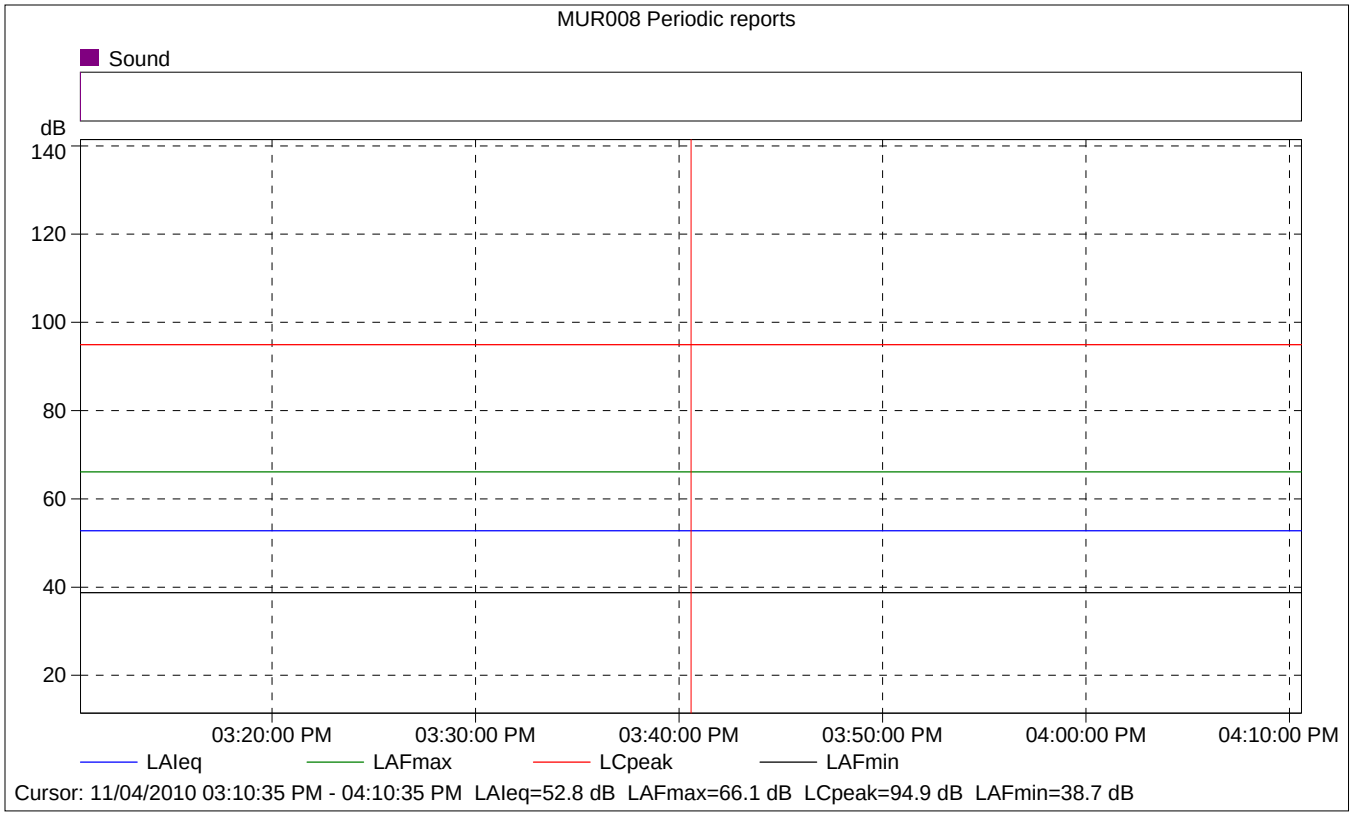


MUR008

	Start time	Elapsed time	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			46.0	45.9	44.5
Time	03:15:34 PM	0:00:01			
Date	11/04/2010				

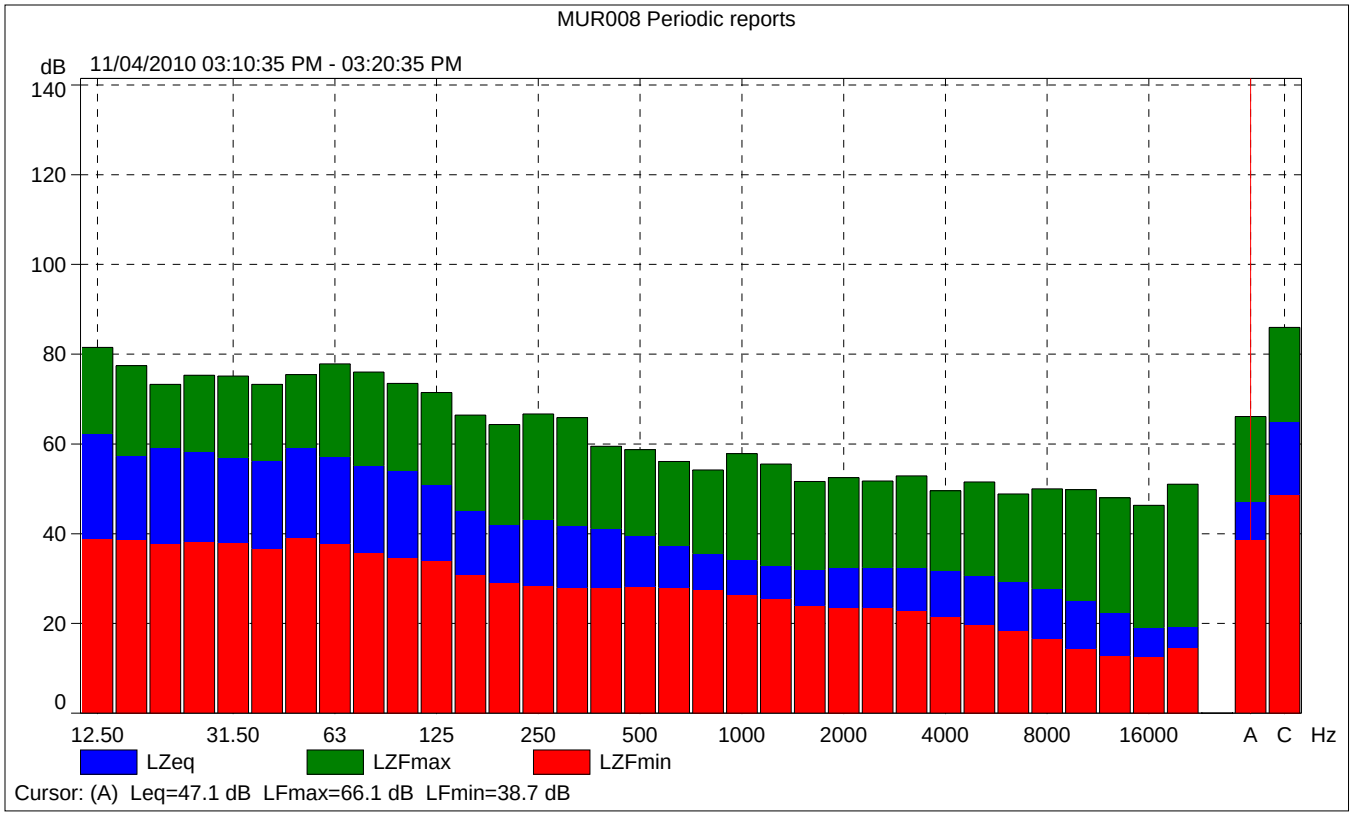

MUR008
dB
11/04/2010 03:15:34 PM - 03:15:35 PM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=45.1 dB LFmax=45.9 dB LFmin=44.5 dB

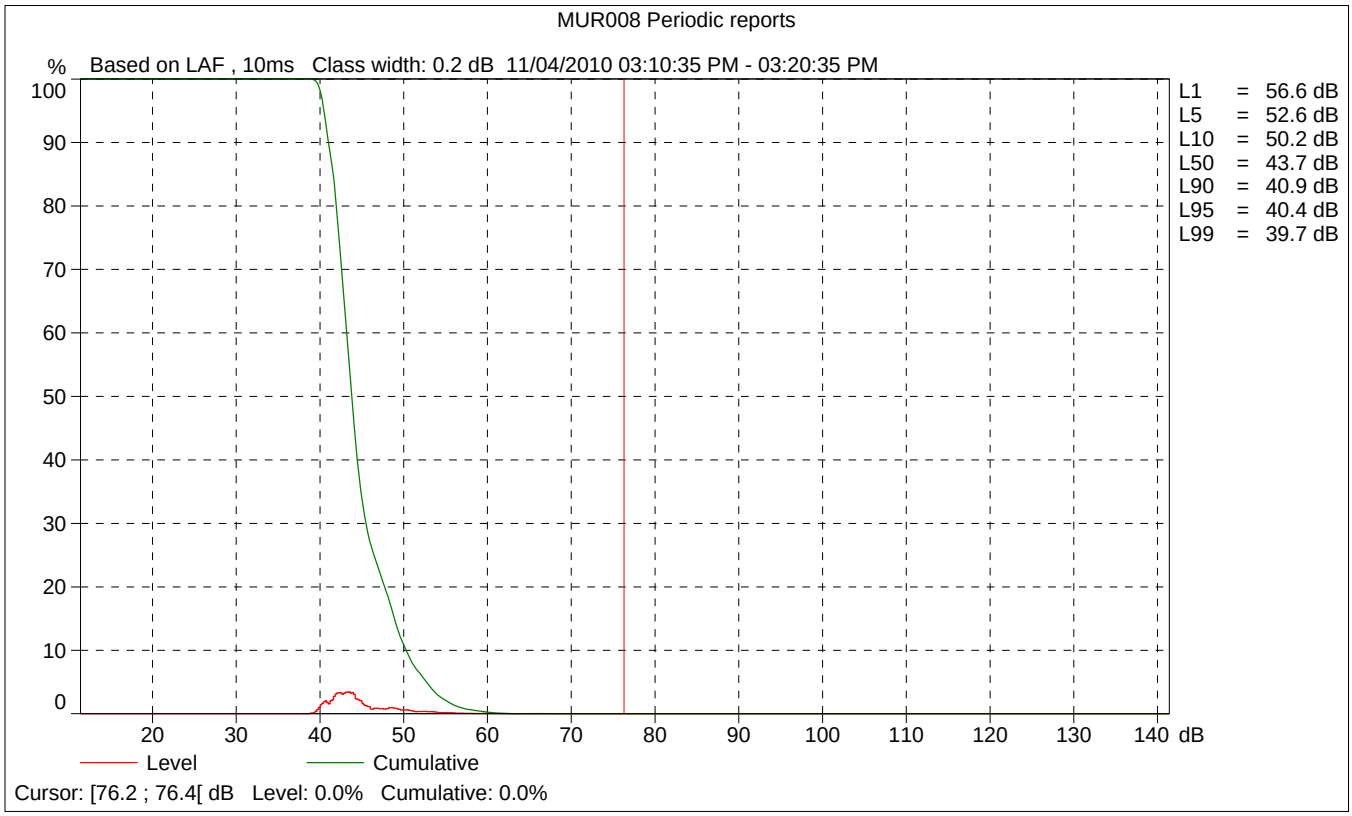

MUR008
%
Based on LAF , 10ms Class width: 0.2 dB 11/04/2010 03:15:34 PM - 03:15:35 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140 dB
L1 = 46.0 dB
L5 = 45.8 dB
L10 = 45.4 dB
L50 = 45.1 dB
L90 = 44.6 dB
L95 = 44.5 dB
L99 = 44.4 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%

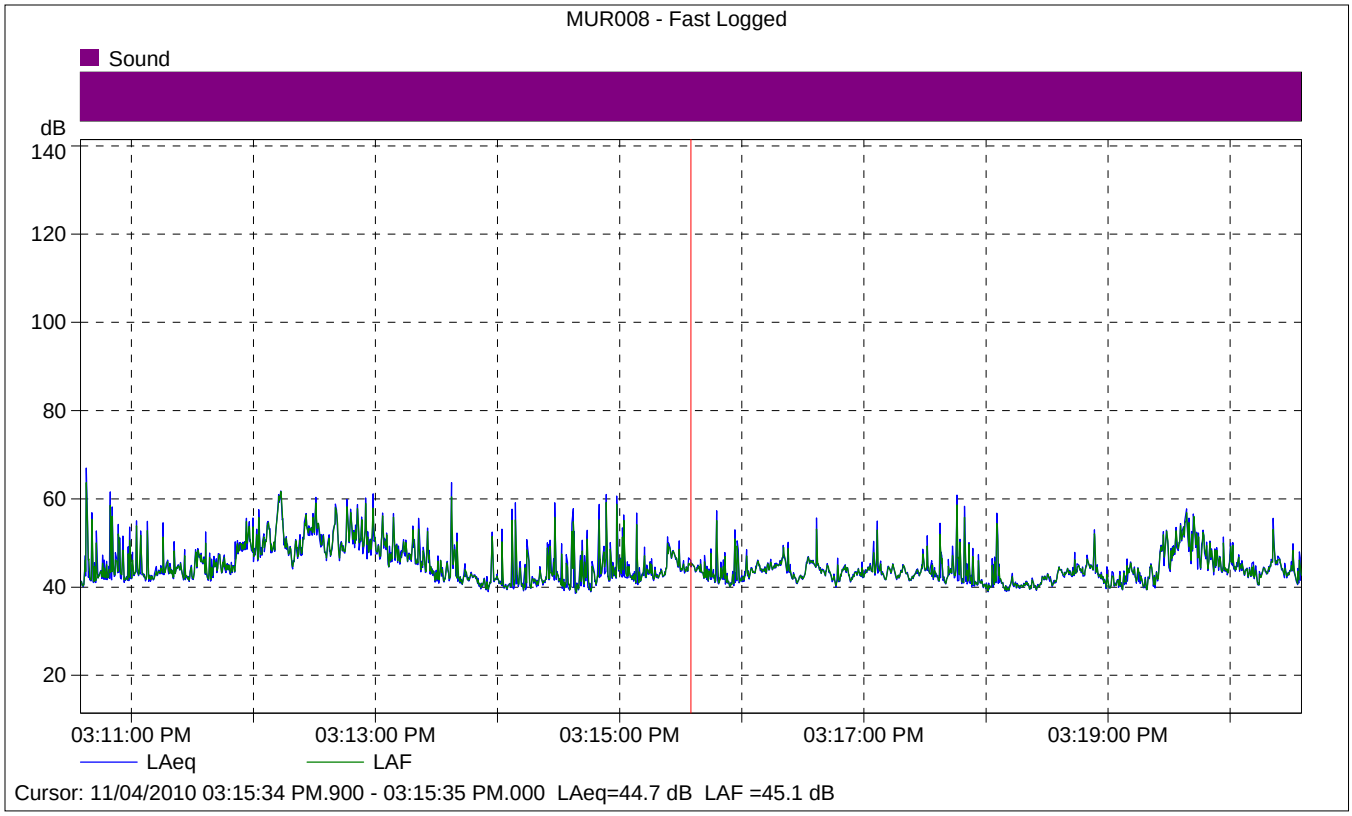


MUR008 Periodic reports

	Start time	Elapsed time	Overload [%]	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			0.00	52.8	66.1	38.7
Time	03:10:35 PM	0:10:00				
Date	11/04/2010					


MUR008 Periodic reports
dB
11/04/2010 03:10:35 PM - 03:20:35 PM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=47.1 dB LFmax=66.1 dB LFmin=38.7 dB


MUR008 Periodic reports
%
Based on LAF , 10ms Class width: 0.2 dB 11/04/2010 03:10:35 PM - 03:20:35 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 56.6 dB
L5 = 52.6 dB
L10 = 50.2 dB
L50 = 43.7 dB
L90 = 40.9 dB
L95 = 40.4 dB
L99 = 39.7 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%



MUR008 - Fast Logged

	Start time	Elapsed time	LAeq [dB]
Value			44.7
Time	03:15:34 PM.900	0:00:00.100	
Date	11/04/2010		

Site Number: City of Murrieta (MUR009)
Recorded By: Brian Allee
Job Number: 10106976
Date: November 4, 2010
Time: 3:40 PM
Location: Cul-de-sac of Copperleaf Court off Mimosa Drive.
Source of Peak Noise: Plane flew over – large truck drove by – pedestrians talking nearby – children playing nearby – garage door closing nearby – hammering in background – dogs barking – birds chirping – windy.

Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
50.4	39.0	68.6	88.9

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Brüel & Kjær**	**2250**	**2548189**	**9/10/2009**	
	Microphone	**Brüel & Kjær**	**4189**	**2543364**	**9/10/2009**	
	Preamp	**Brüel & Kjær**	**ZC 0032**	**4265**	**9/10/2009**	
	Calibrator	**Brüel & Kjær**	**4231**	**2545667**	**9/10/2009**	

Weather Data			
Est.	**Duration:** 10 minutes		**Sky:** ☼
	Note: dBA Offset = 0.02		**Sensor Height (ft):** 5 ft
	Wind Ave Speed (mph / m/s)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	3.8	94.0	969.0

Photo of Measurement Location

2250

Instrument:		2250
Application:		BZ7225 Version 2.0.2
Start Time:		11/04/2010 15:40:16
End Time:		11/04/2010 15:50:16
Elapsed Time:		00:10:00
Bandwidth:		1/3-octave
Max Input Level:		140.13

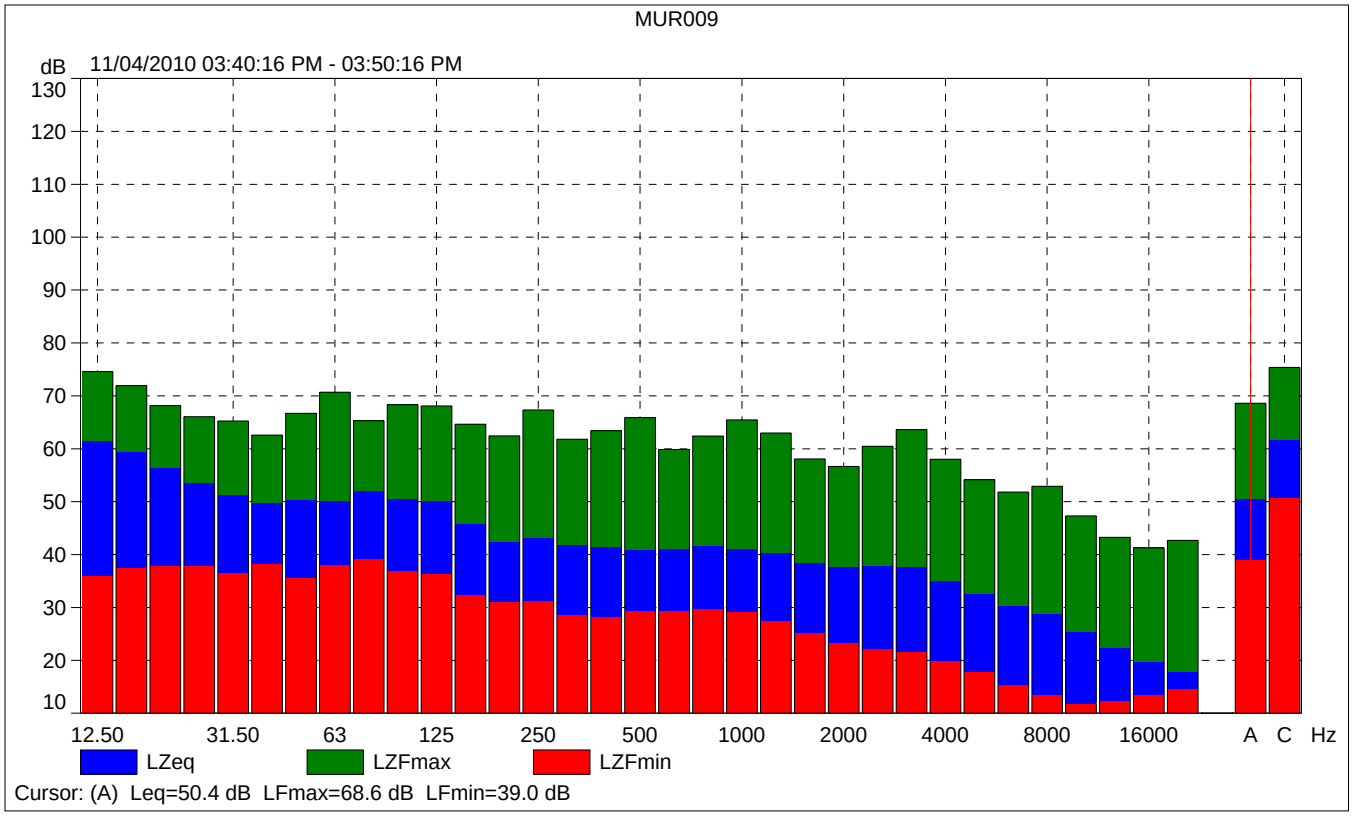
	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	Z

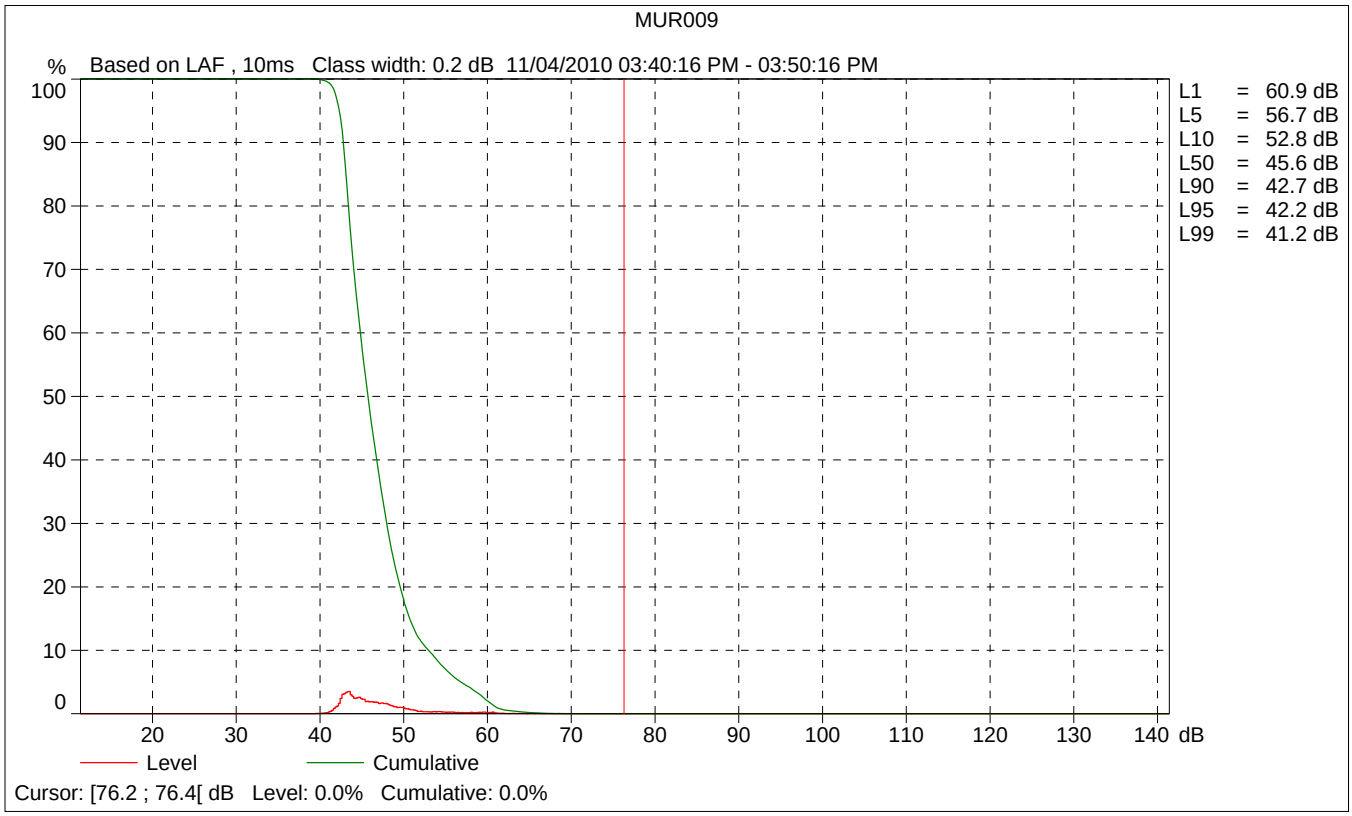
Instrument Serial Number:		2548189
Microphone Serial Number:		2543364
Input:		Top Socket
Windscreen Correction:		UA-1650
Sound Field Correction:		Diffuse-field

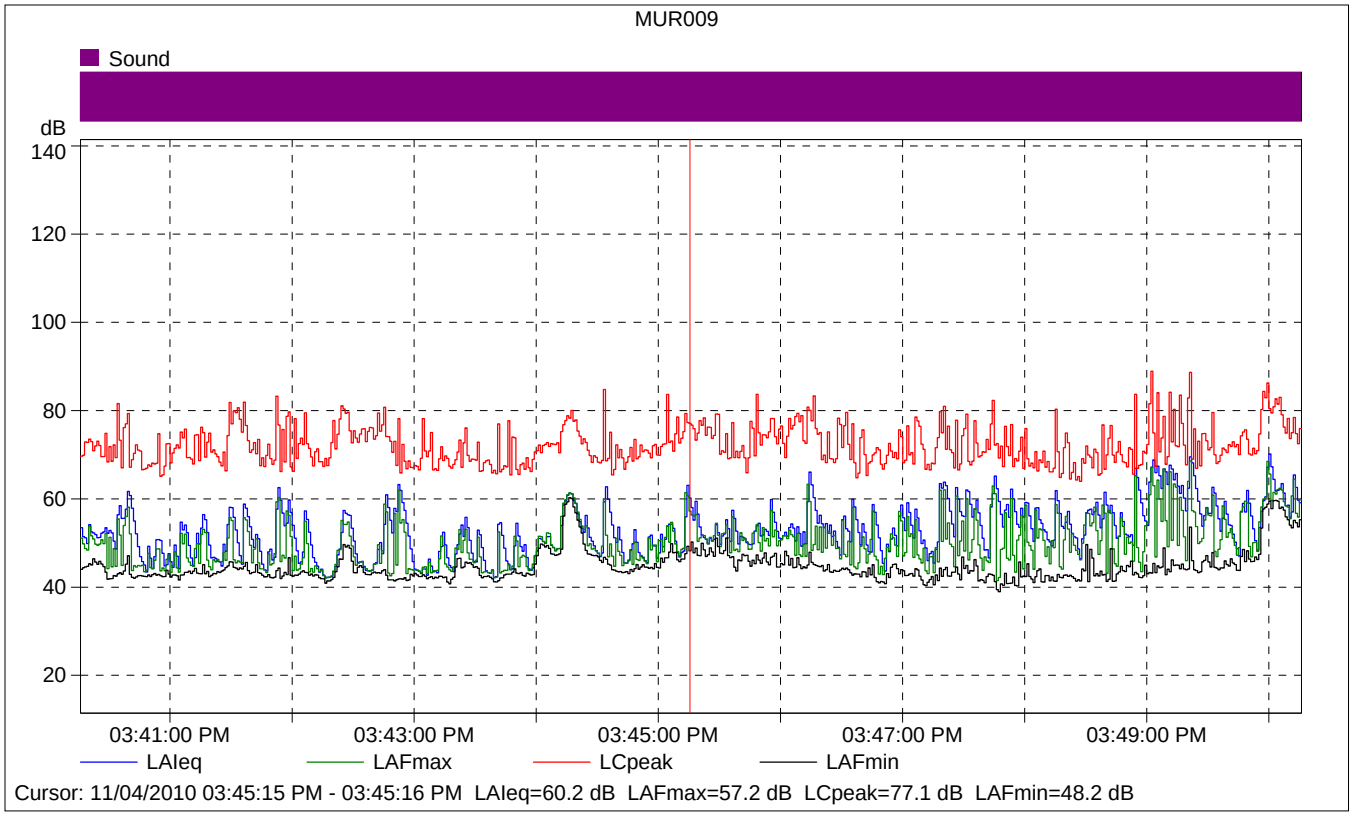
Calibration Time:		11/04/2010 08:39:06
Calibration Type:		External reference
Sensitivity:		54.83 mV/Pa

MUR009

	Start time	End time	Elapsed time	Overload [%]	LAeq [dB]	LAFmax [dB]	LAFmin [dB]
Value				0.00	50.4	68.6	39.0
Time	03:40:16 PM	03:50:16 PM	0:10:00				
Date	11/04/2010	11/04/2010					

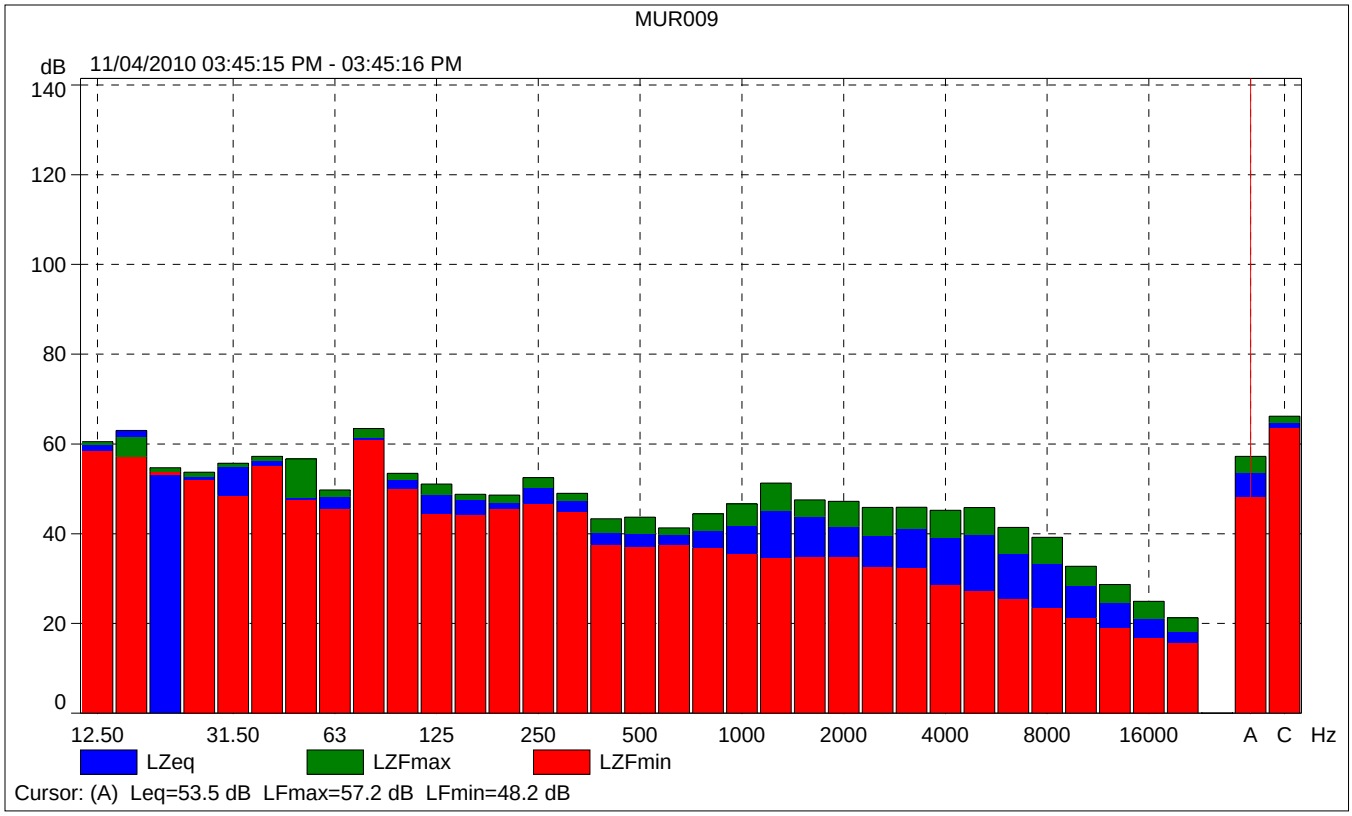

MUR009
dB
11/04/2010 03:40:16 PM - 03:50:16 PM
130
120
110
100
90
80
70
60
50
40
30
20
10
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=50.4 dB LFmax=68.6 dB LFmin=39.0 dB

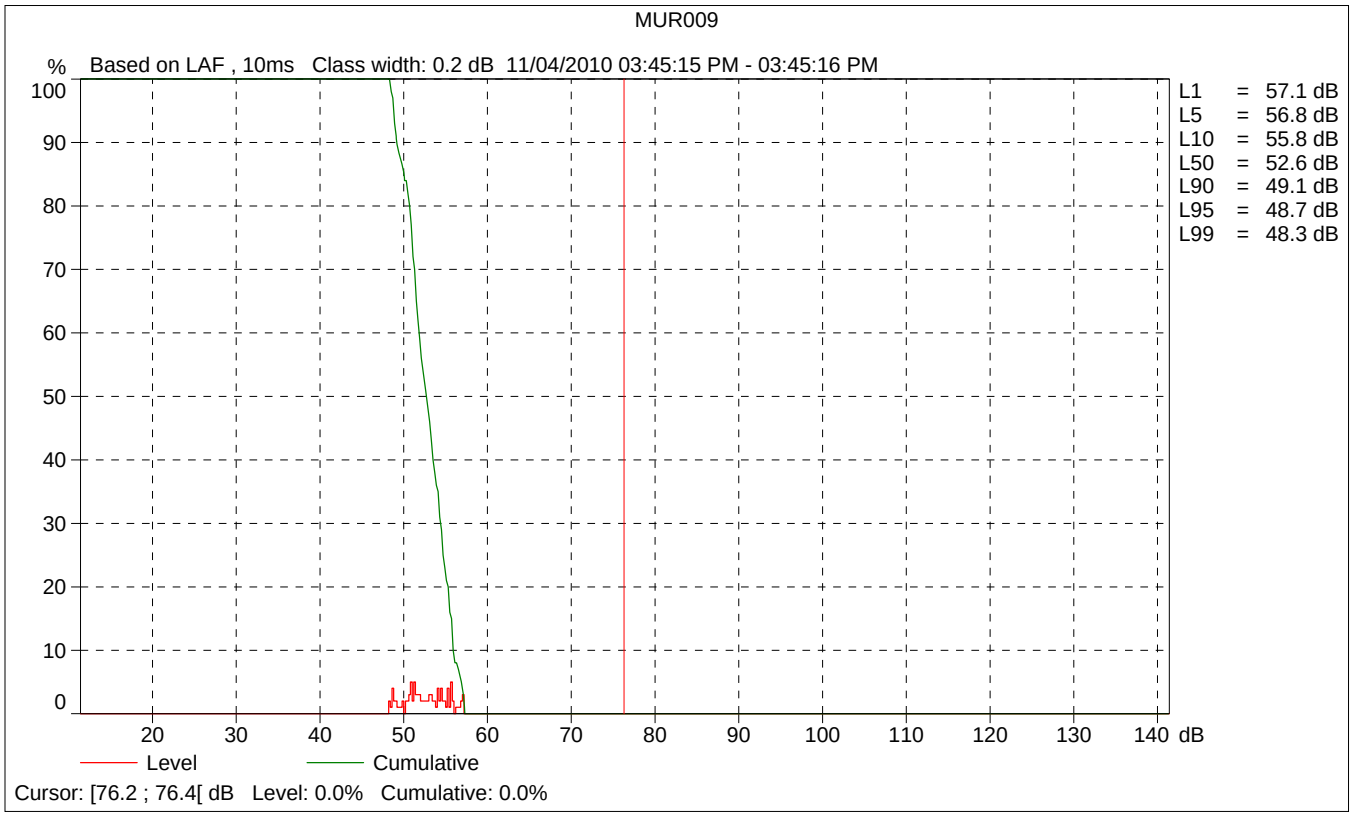

MUR009
%
Based on LAF , 10ms Class width: 0.2 dB 11/04/2010 03:40:16 PM - 03:50:16 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140 dB
L1 = 60.9 dB
L5 = 56.7 dB
L10 = 52.8 dB
L50 = 45.6 dB
L90 = 42.7 dB
L95 = 42.2 dB
L99 = 41.2 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%

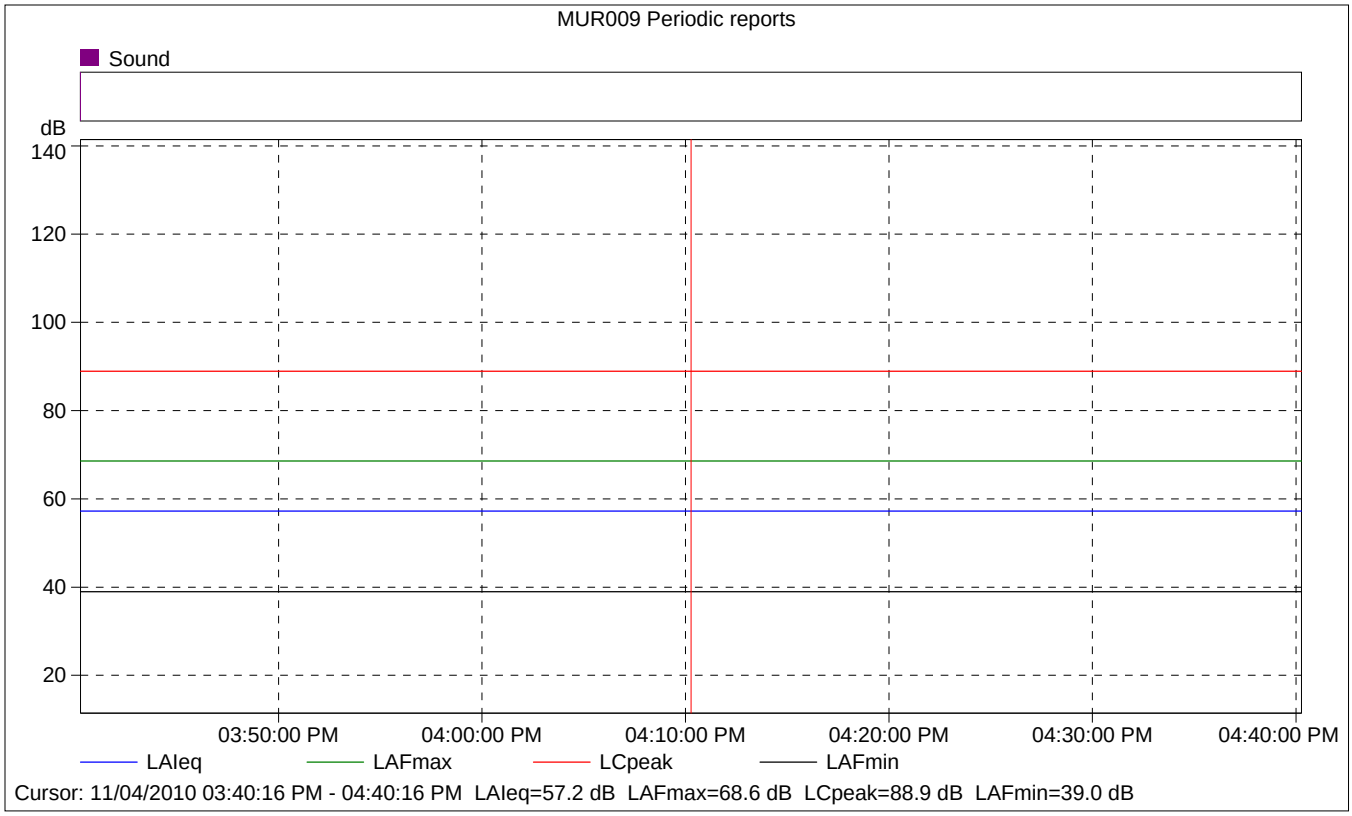


MUR009

	Start time	Elapsed time	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			60.2	57.2	48.2
Time	03:45:15 PM	0:00:01			
Date	11/04/2010				

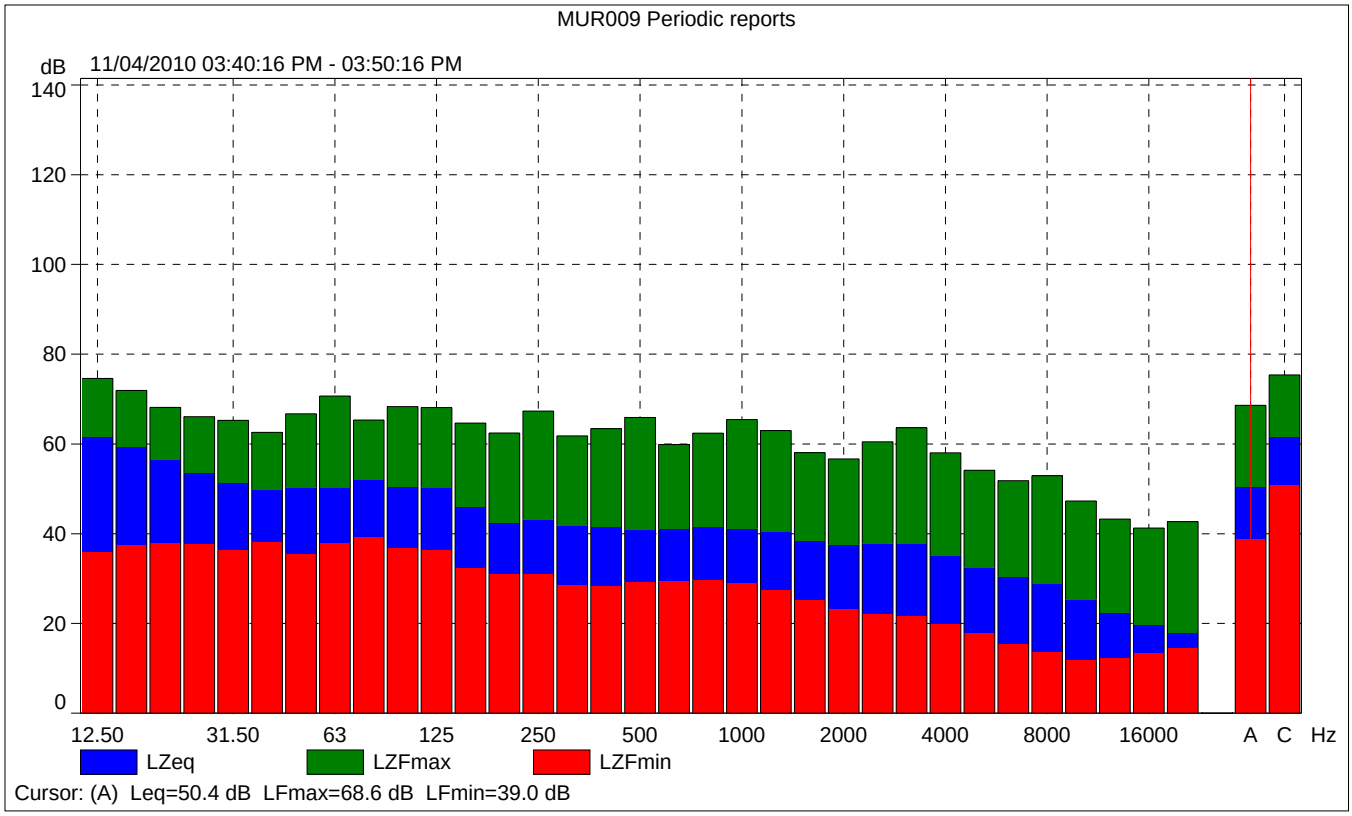

MUR009
dB
11/04/2010 03:45:15 PM - 03:45:16 PM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=53.5 dB LFmax=57.2 dB LFmin=48.2 dB

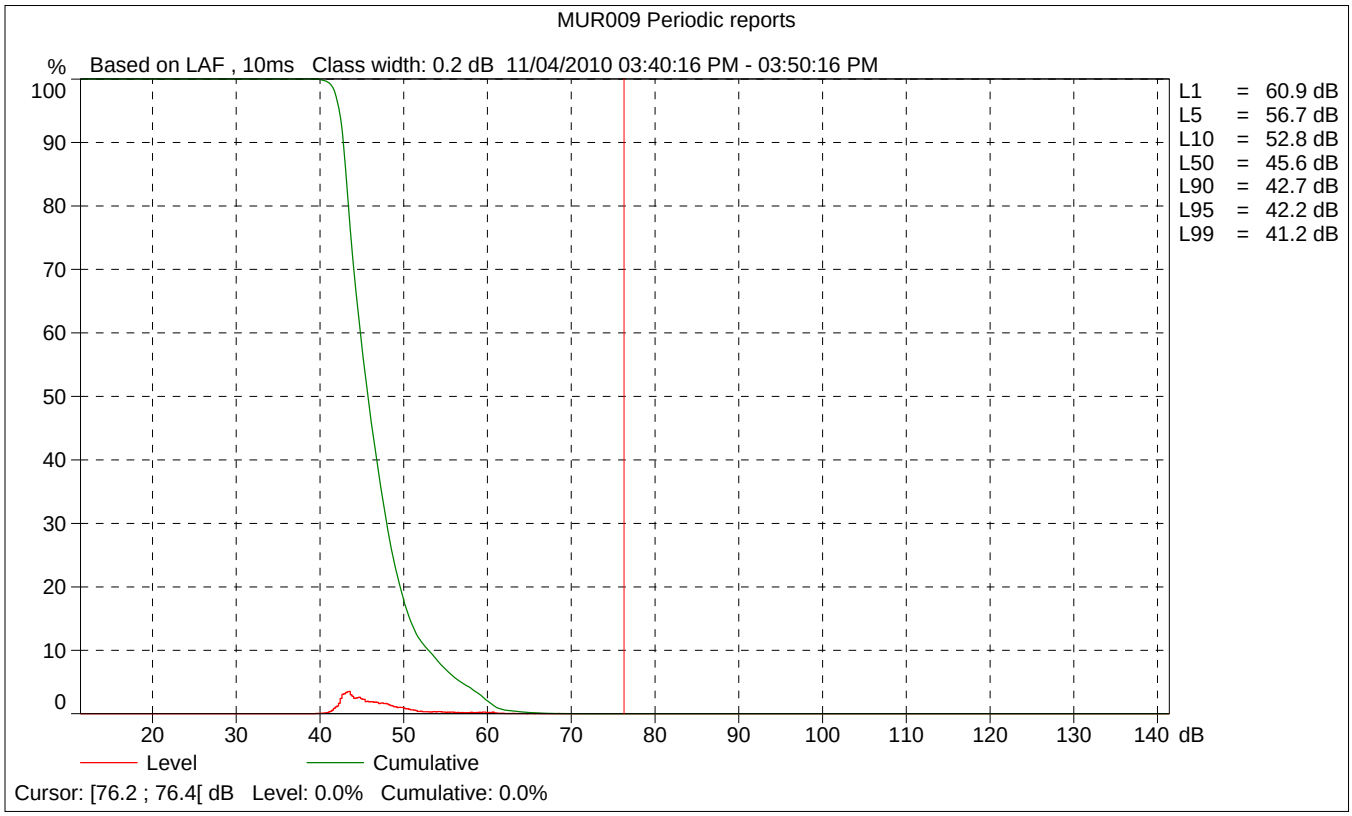

MUR009
%
Based on LAF , 10ms Class width: 0.2 dB 11/04/2010 03:45:15 PM - 03:45:16 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 57.1 dB
L5 = 56.8 dB
L10 = 55.8 dB
L50 = 52.6 dB
L90 = 49.1 dB
L95 = 48.7 dB
L99 = 48.3 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%

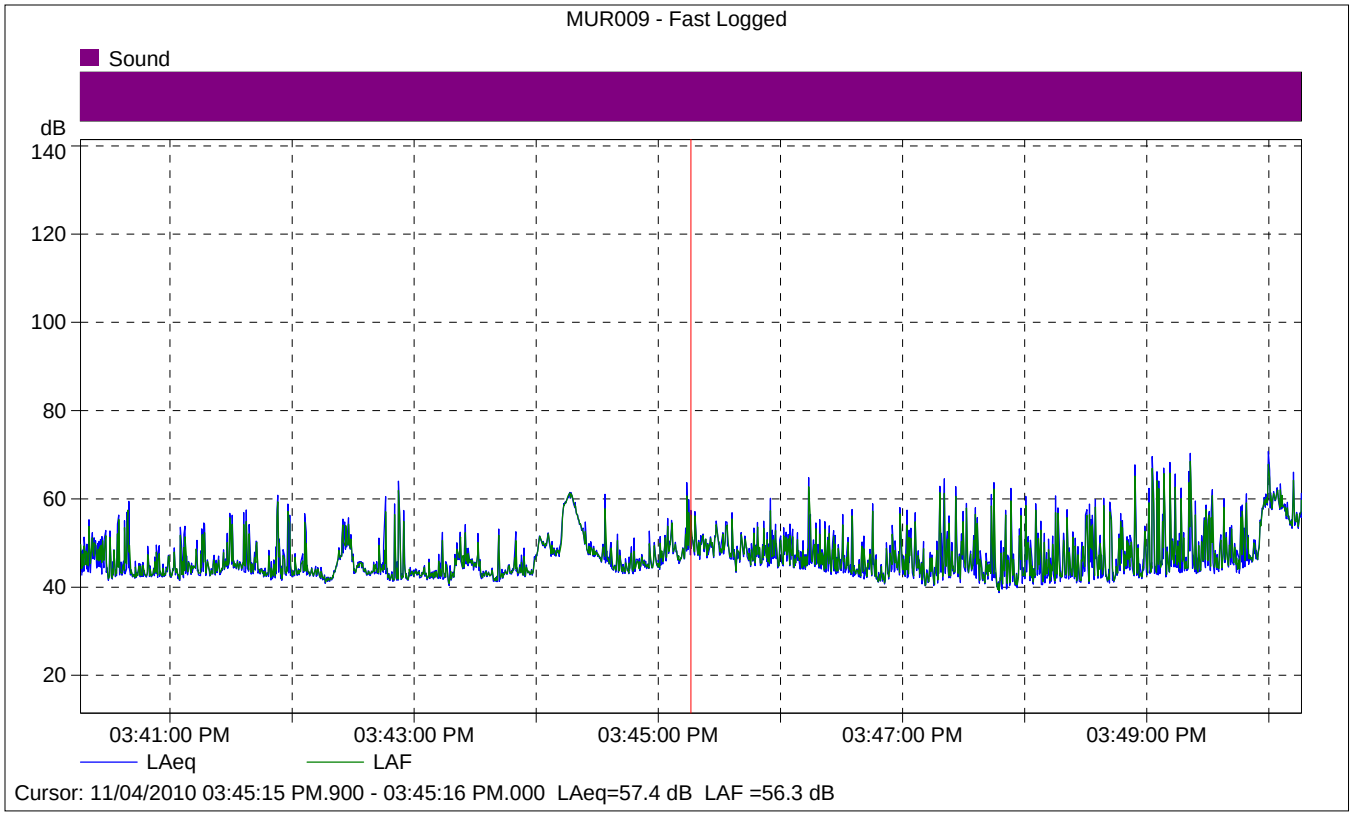


MUR009 Periodic reports

	Start time	Elapsed time	Overload [%]	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			0.00	57.2	68.6	39.0
Time	03:40:16 PM	0:10:00				
Date	11/04/2010					


MUR009 Periodic reports
dB
11/04/2010 03:40:16 PM - 03:50:16 PM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=50.4 dB LFmax=68.6 dB LFmin=39.0 dB


MUR009 Periodic reports
%
Based on LAF , 10ms Class width: 0.2 dB 11/04/2010 03:40:16 PM - 03:50:16 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 60.9 dB
L5 = 56.7 dB
L10 = 52.8 dB
L50 = 45.6 dB
L90 = 42.7 dB
L95 = 42.2 dB
L99 = 41.2 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%



MUR009 - Fast Logged

	Start time	Elapsed time	LAeq [dB]
Value			57.4
Time	03:45:15 PM.900	0:00:00.100	
Date	11/04/2010		

Site Number: City of Murrieta (MUR010)
Recorded By: Brian Allee
Job Number: 10106976
Date: November 4, 2010
Time: 4:30 PM
Location: Baxter off of Antelope Road (adjacent to Loma Linda Medical Center)
Source of Peak Noise: Vehicular noise from Interstate 215 – vehicular noise from Antelope Road – two planes flew over – windy.

Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
41.6	33.1	60.5	96.7

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Brüel & Kjær**	**2250**	**2548189**	**9/10/2009**	
	Microphone	**Brüel & Kjær**	**4189**	**2543364**	**9/10/2009**	
	Preamp	**Brüel & Kjær**	**ZC 0032**	**4265**	**9/10/2009**	
	Calibrator	**Brüel & Kjær**	**4231**	**2545667**	**9/10/2009**	

Weather Data			
Est.	**Duration:** 10 minutes		**Sky:** ☼
	Note: dBA Offset = 0.02		**Sensor Height (ft):** 5 ft
	Wind Ave Speed (mph / m/s)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	5.7	91	960.3

Photo of Measurement Location

2250

Instrument:		2250
Application:		BZ7225 Version 2.0.2
Start Time:		11/04/2010 16:30:52
End Time:		11/04/2010 16:40:52
Elapsed Time:		00:10:00
Bandwidth:		1/3-octave
Max Input Level:		140.13

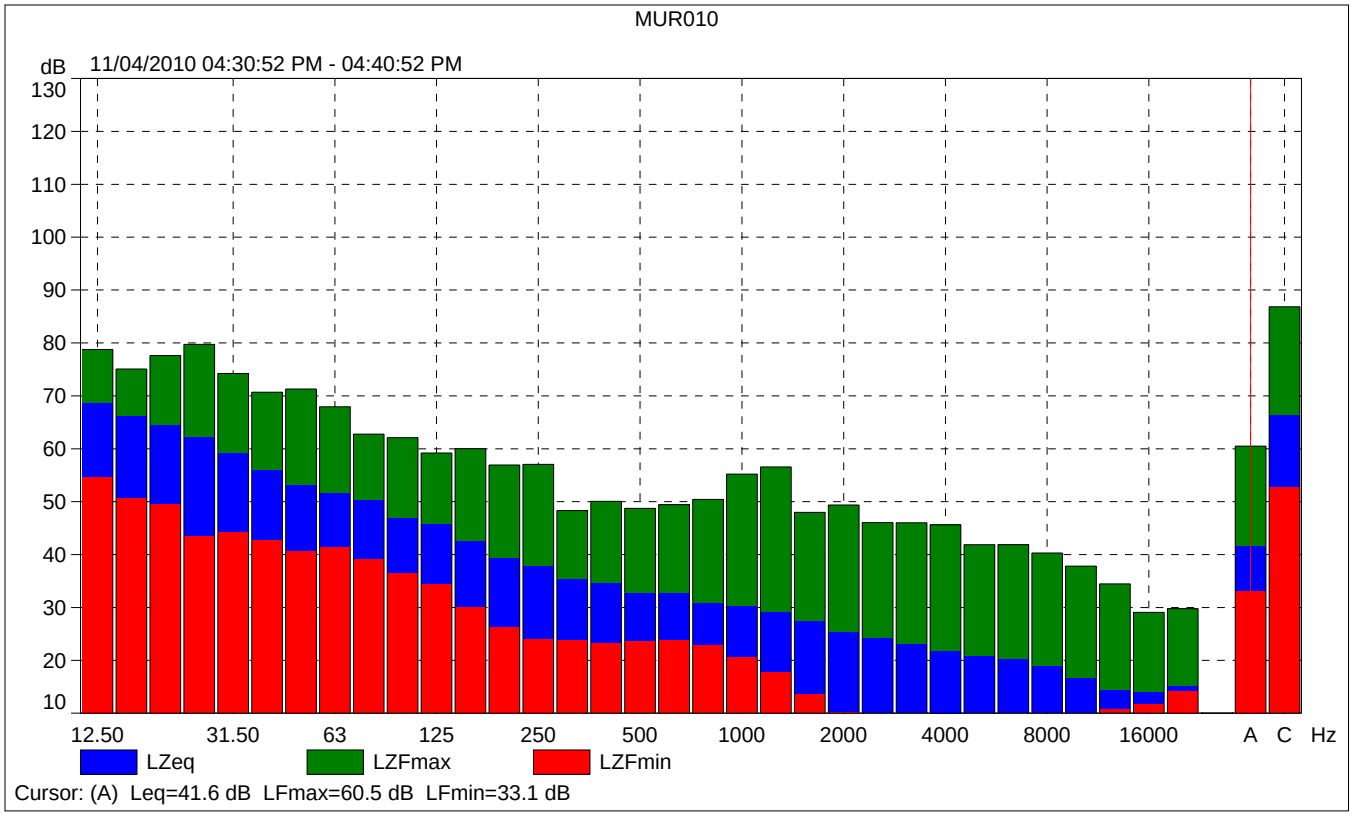
	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	Z

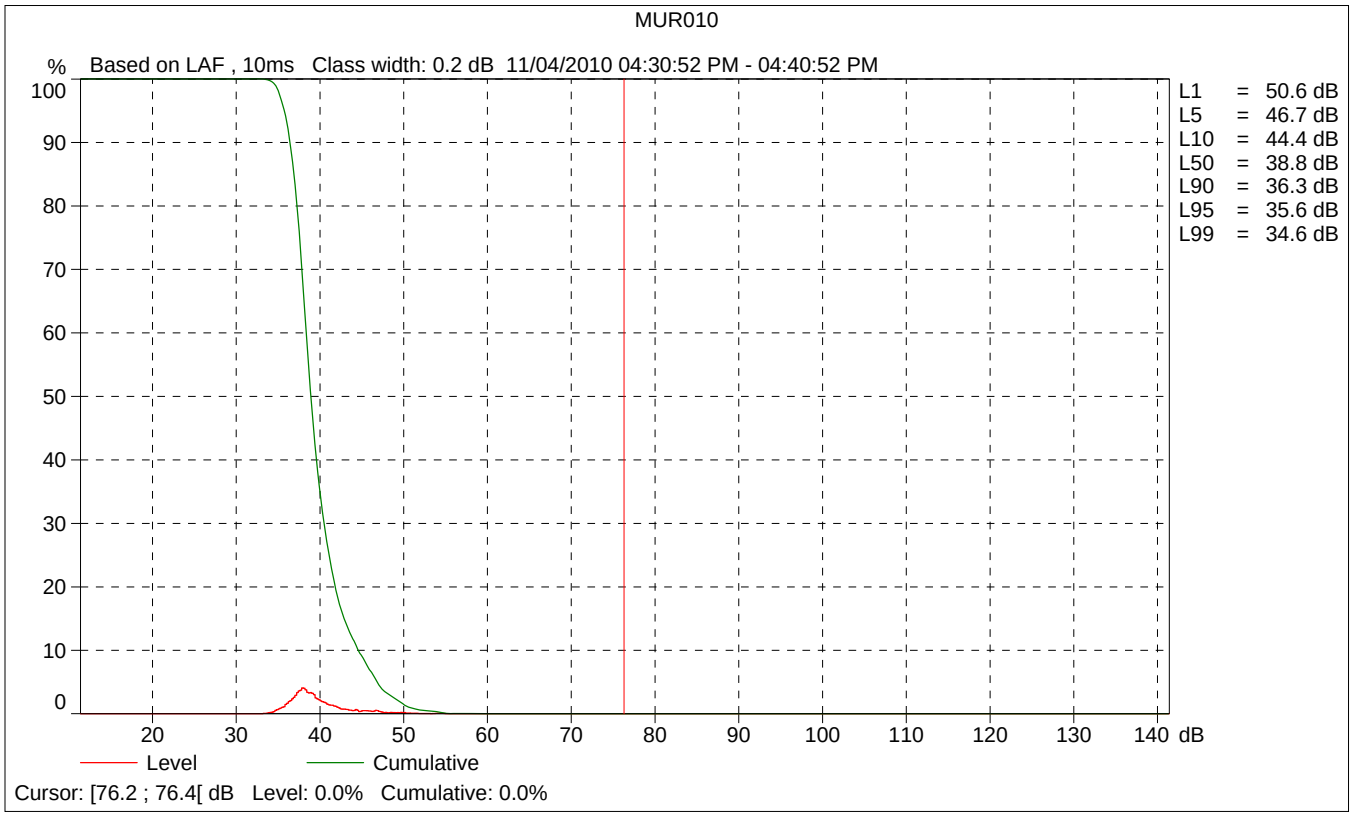
Instrument Serial Number:		2548189
Microphone Serial Number:		2543364
Input:		Top Socket
Windscreen Correction:		None
Sound Field Correction:		Diffuse-field

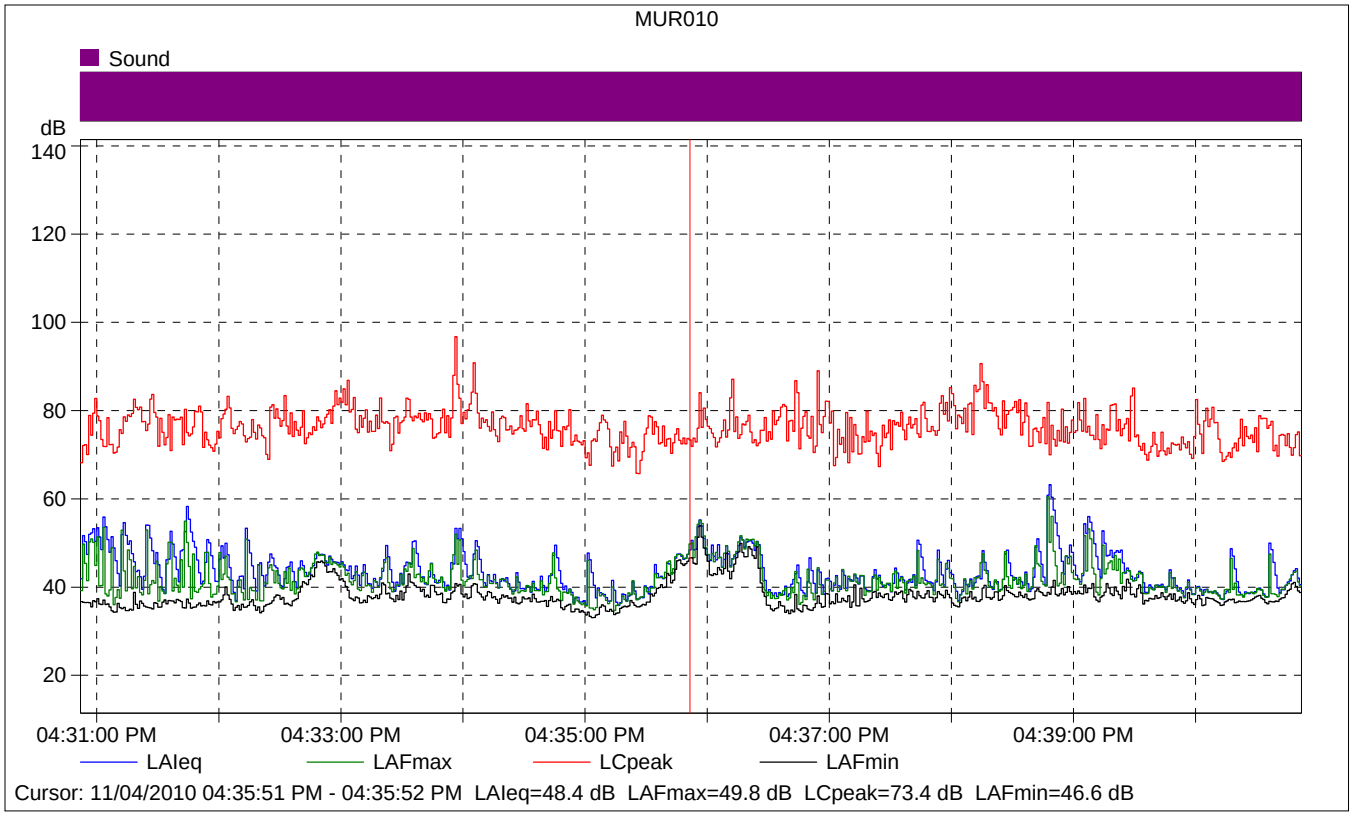
Calibration Time:		11/04/2010 08:39:06
Calibration Type:		External reference
Sensitivity:		54.83 mV/Pa

MUR010

	Start time	End time	Elapsed time	Overload [%]	LAeq [dB]	LAFmax [dB]	LAFmin [dB]
Value				0.00	41.6	60.5	33.1
Time	04:30:52 PM	04:40:52 PM	0:10:00				
Date	11/04/2010	11/04/2010					

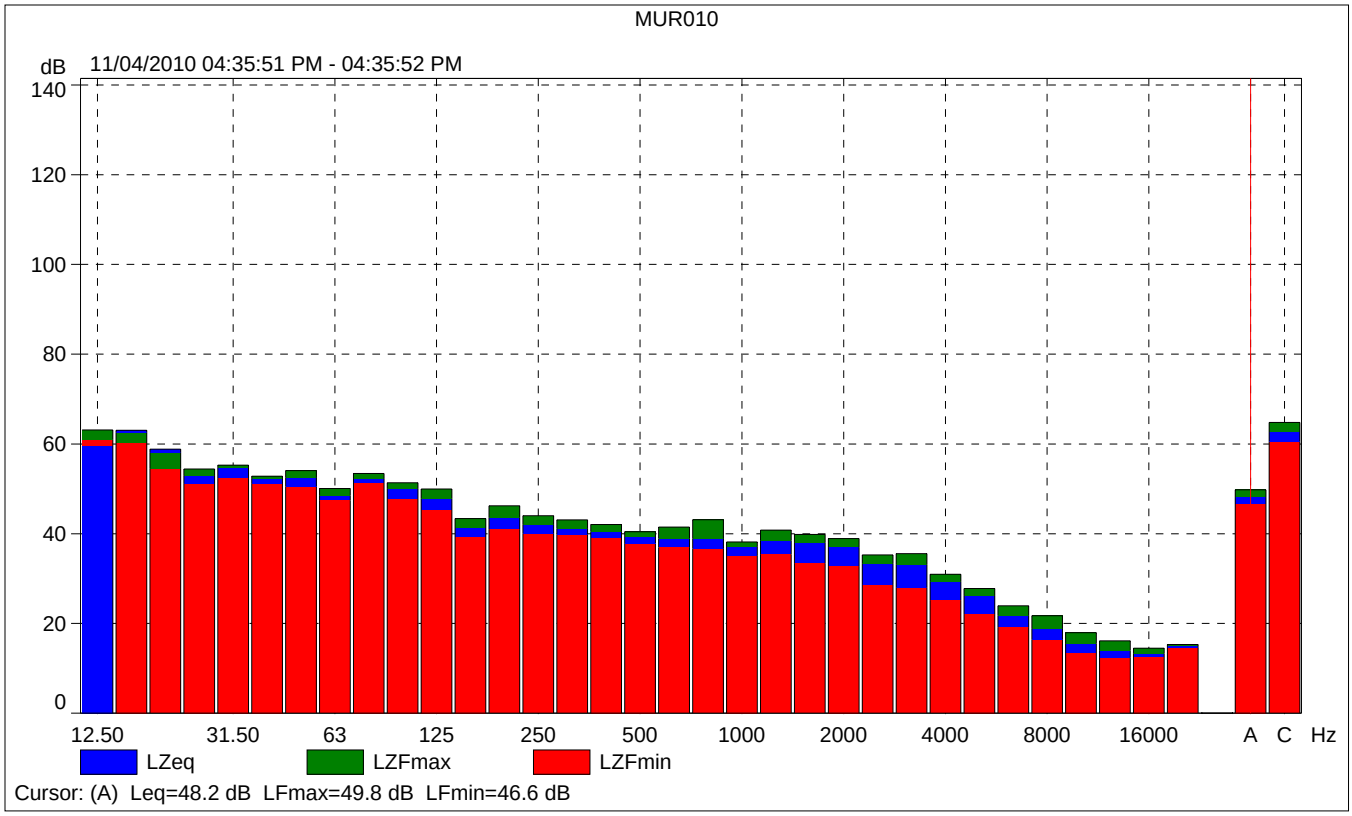

MUR010
dB
11/04/2010 04:30:52 PM - 04:40:52 PM
130
120
110
100
90
80
70
60
50
40
30
20
10
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=41.6 dB LFmax=60.5 dB LFmin=33.1 dB

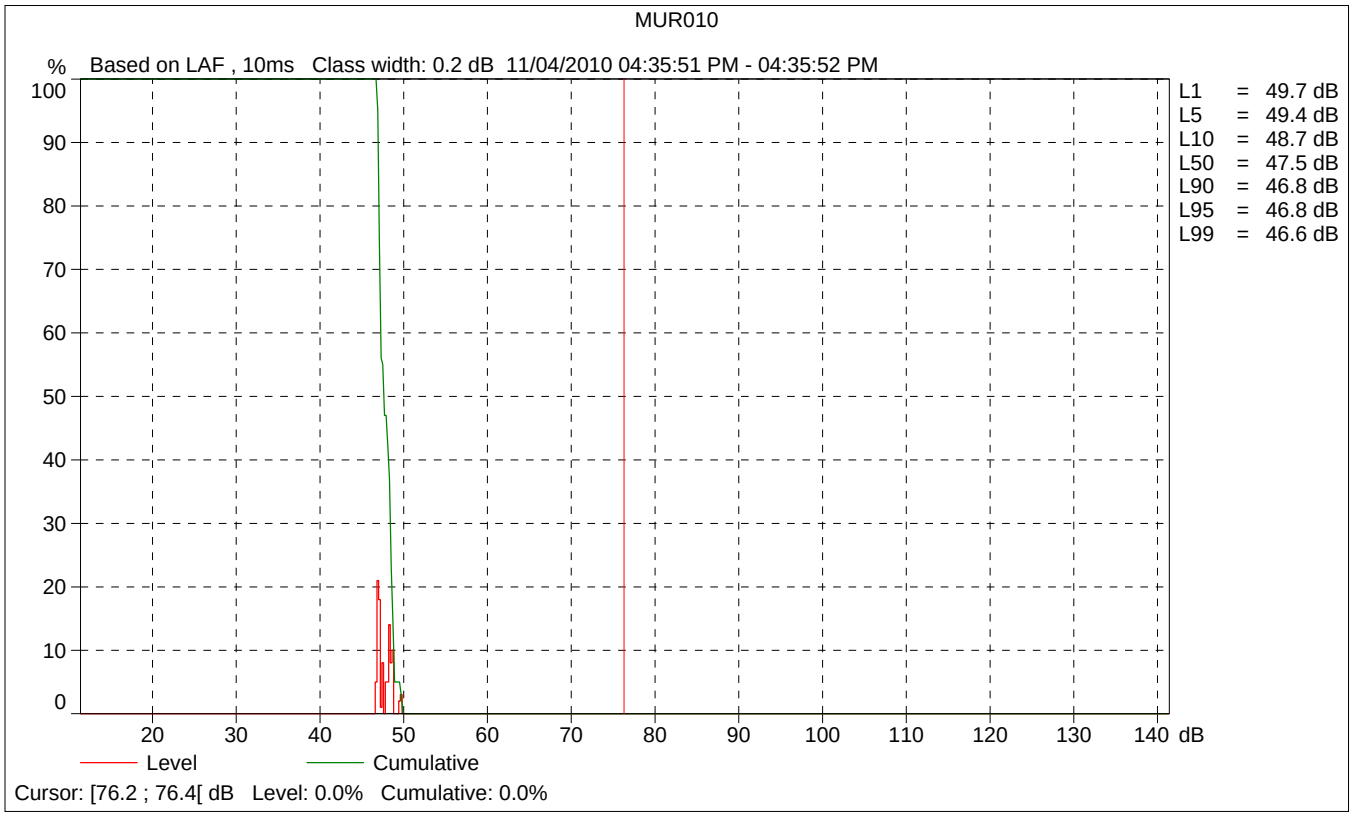

MUR010
%
Based on LAF , 10ms Class width: 0.2 dB 11/04/2010 04:30:52 PM - 04:40:52 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 50.6 dB
L5 = 46.7 dB
L10 = 44.4 dB
L50 = 38.8 dB
L90 = 36.3 dB
L95 = 35.6 dB
L99 = 34.6 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%

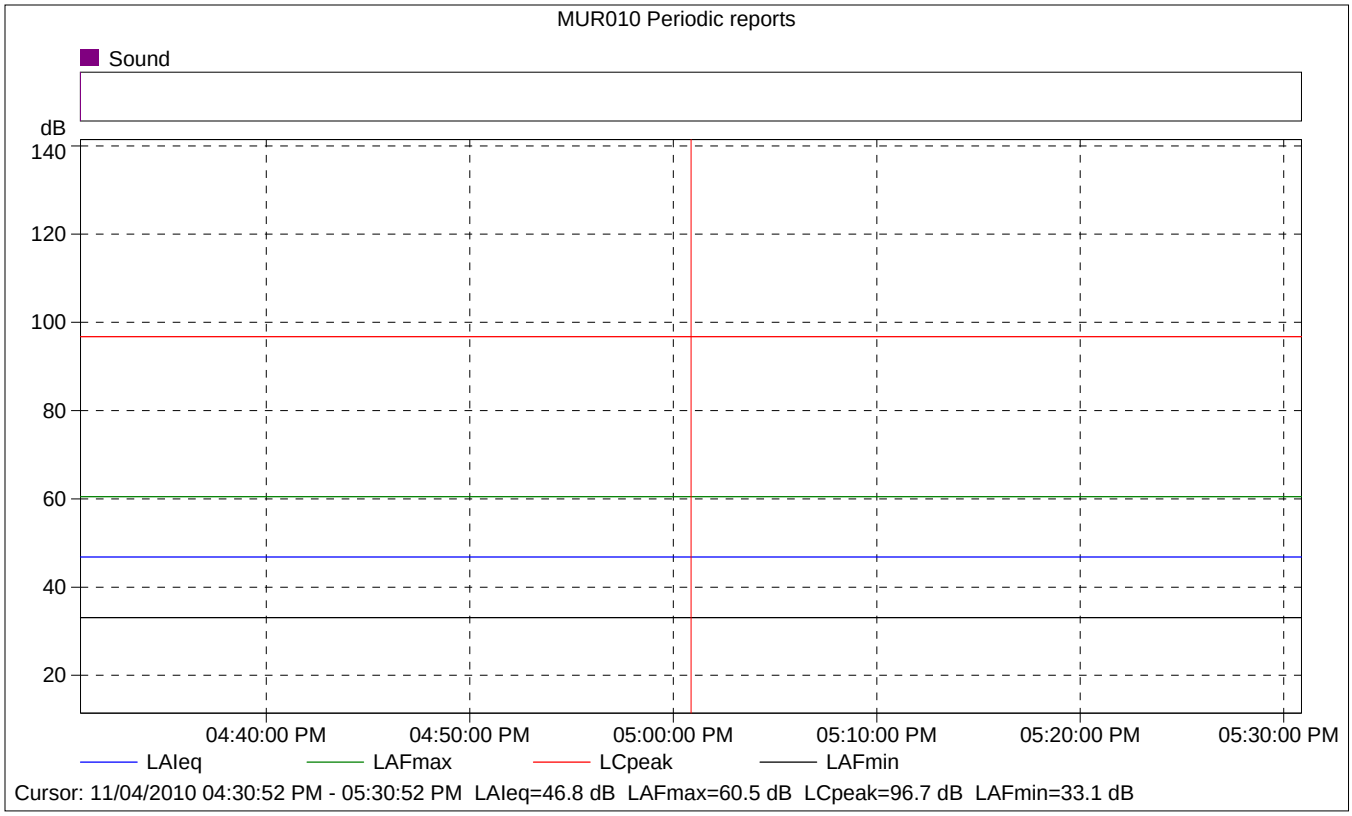


MUR010

	Start time	Elapsed time	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			48.4	49.8	46.6
Time	04:35:51 PM	0:00:01			
Date	11/04/2010				

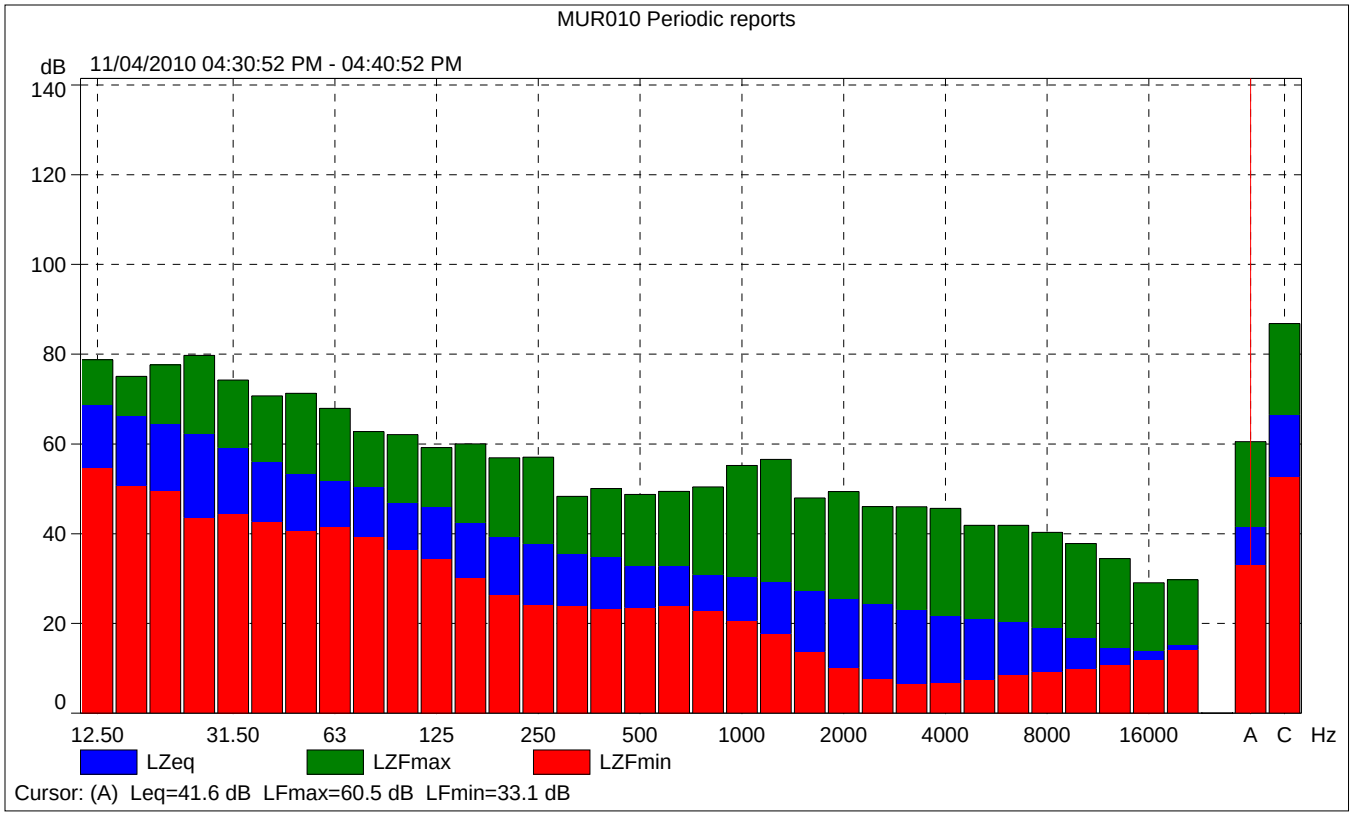

MUR010
dB
11/04/2010 04:35:51 PM - 04:35:52 PM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=48.2 dB LFmax=49.8 dB LFmin=46.6 dB

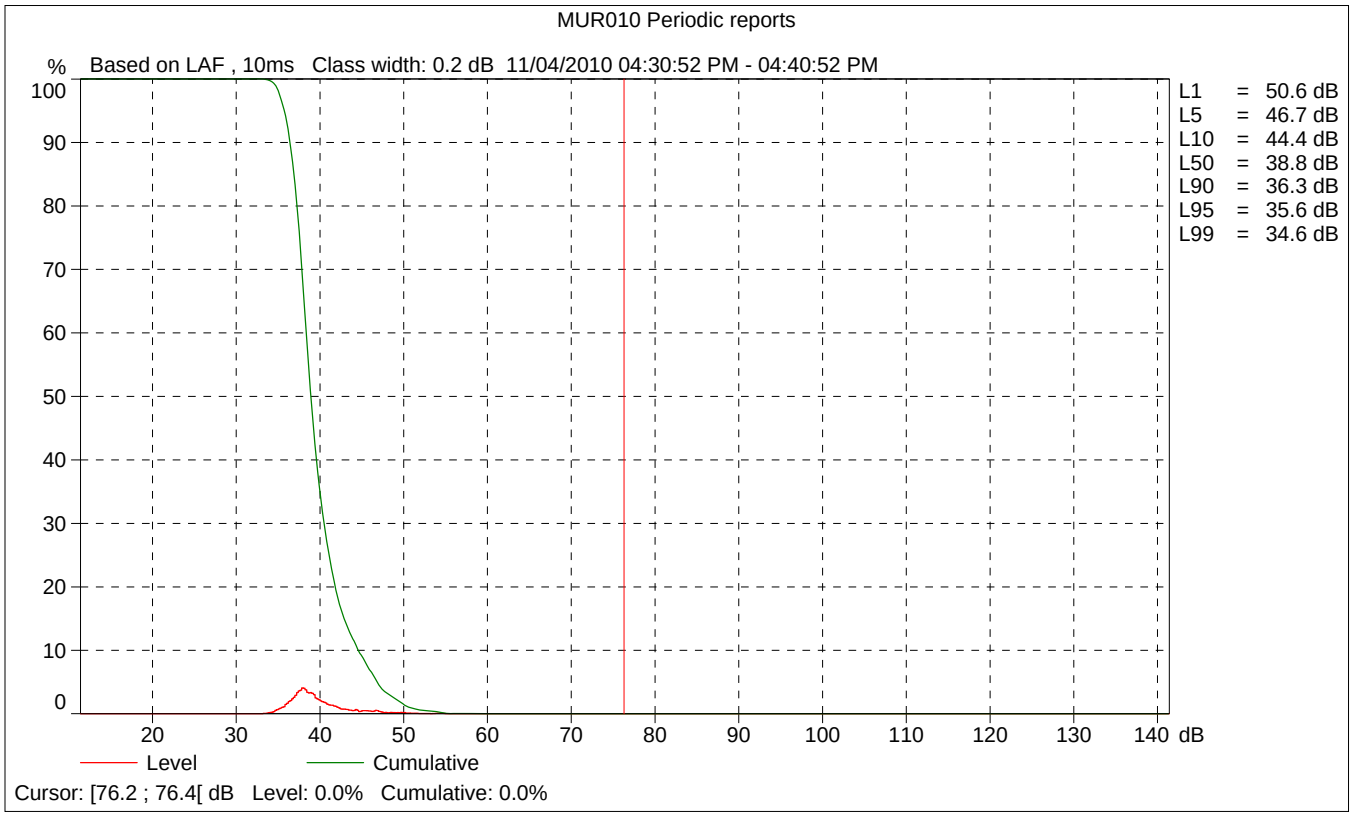

MUR010
%
Based on LAF , 10ms Class width: 0.2 dB 11/04/2010 04:35:51 PM - 04:35:52 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140 dB
L1 = 49.7 dB
L5 = 49.4 dB
L10 = 48.7 dB
L50 = 47.5 dB
L90 = 46.8 dB
L95 = 46.8 dB
L99 = 46.6 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%

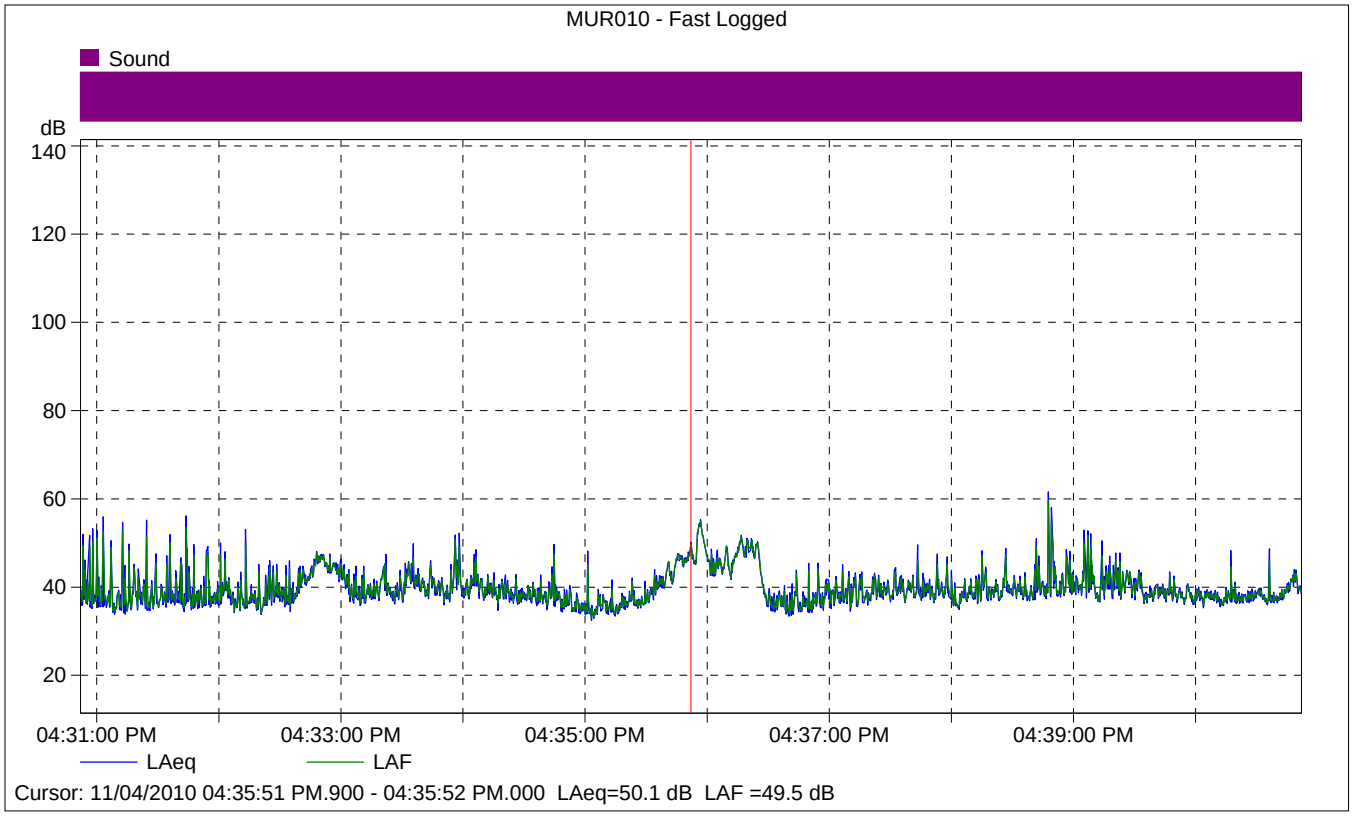


MUR010 Periodic reports

	Start time	Elapsed time	Overload [%]	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			0.00	46.8	60.5	33.1
Time	04:30:52 PM	0:10:00				
Date	11/04/2010					


MUR010 Periodic reports
dB
11/04/2010 04:30:52 PM - 04:40:52 PM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=41.6 dB LFmax=60.5 dB LFmin=33.1 dB


MUR010 Periodic reports
%
Based on LAF , 10ms Class width: 0.2 dB 11/04/2010 04:30:52 PM - 04:40:52 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 50.6 dB
L5 = 46.7 dB
L10 = 44.4 dB
L50 = 38.8 dB
L90 = 36.3 dB
L95 = 35.6 dB
L99 = 34.6 dB
Level
Cumulative
Cursor: [76.2 ; 76.4[dB Level: 0.0% Cumulative: 0.0%



MUR010 - Fast Logged

	Start time	Elapsed time	LAeq [dB]
Value			50.1
Time	04:35:51 PM.900	0:00:00.100	
Date	11/04/2010		

Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Clinton Keith Road		
Road Segment:	Southwestern City Limits to Calle del Oso Oro		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	9100
Peak Hour Traffic:	**910**
Vehicle Speed:	45
Centerline Separation:	35.5

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

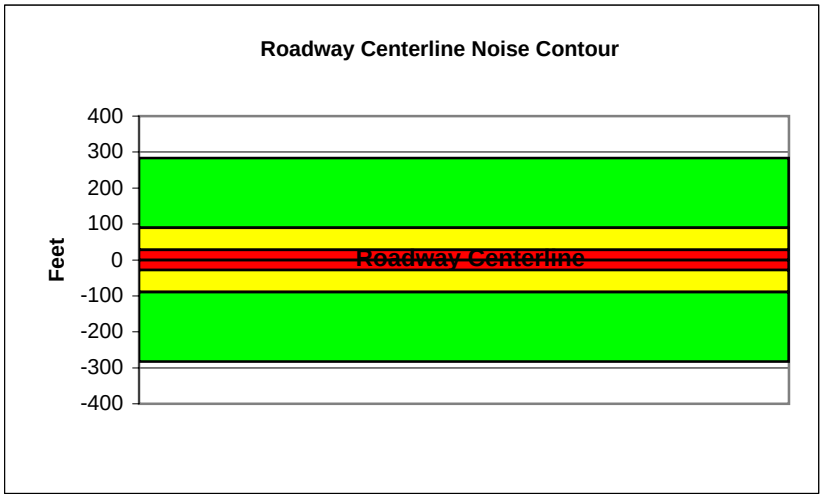
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	52.6	61.3	59.6	53.5	62.1	62.7
Medium Trucks:	60.8	52.8	46.4	44.8	53.3	53.5
Heavy Trucks:	65.4	53.4	44.4	45.6	55.1	55.3
Vehicle Noise:	**67.7**	**62.6**	**59.9**	**54.8**	**63.4**	**63.9**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	283
65 dBA	90
70 dBA	28
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Clinton Keith Road		
Road Segment:	Calle del Oso Oro to Grand Avenue		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	11,100
Peak Hour Traffic:	**1110**
Vehicle Speed:	50
Centerline Separation:	34

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

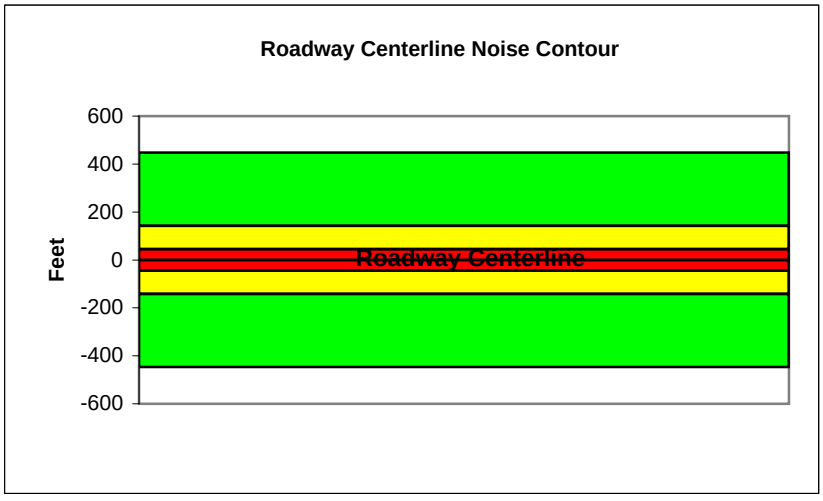
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	54.8	63.5	61.8	55.7	64.3	64.9
Medium Trucks:	62.4	54.4	48.0	46.4	54.9	55.1
Heavy Trucks:	66.7	54.7	45.7	46.9	56.3	56.4
Vehicle Noise:	**69.0**	**64.6**	**62.1**	**56.8**	**65.4**	**65.9**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	448
65 dBA	142
70 dBA	45
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Clinton Keith Road		
Road Segment:	Grand to Nutmeg		

PROJECT DATA		SITE DATA	
Centerline Dist to Barrier	**0**	Road Grade:	0
Barrier (0=wall, 1= berm):	**0**	Average Daily Traffic:	19,000
Receiver Barrier Dist:	**0**	Peak Hour Traffic:	**1900**
Centerline Dist. To Observer:	**100**	Vehicle Speed:	45
Barrier Near Lane CL Dist:	**0**	Centerline Separation:	36.5
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View: **90**	Lft View: **-90**		

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

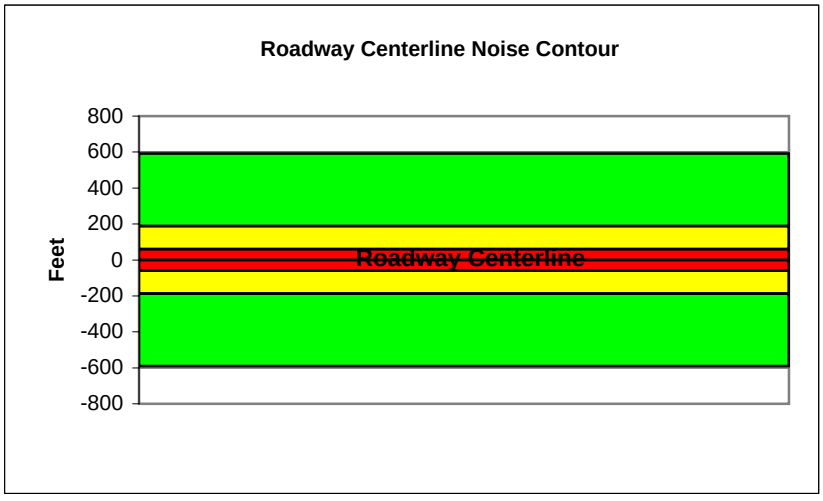
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	55.7	64.5	62.7	56.6	65.3	65.9
Medium Trucks:	64.0	55.9	49.6	48.0	56.5	56.7
Heavy Trucks:	68.5	56.6	47.5	48.8	58.3	58.4
Vehicle Noise:	**70.9**	**65.8**	**63.1**	**57.9**	**66.5**	**67.0**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	591
65 dBA	187
70 dBA	59
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Clinton Keith Road		
Road Segment:	Nutmeg to Murrieta Oaks		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	27,300
Peak Hour Traffic:	**2730**
Vehicle Speed:	45
Centerline Separation:	36.5

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

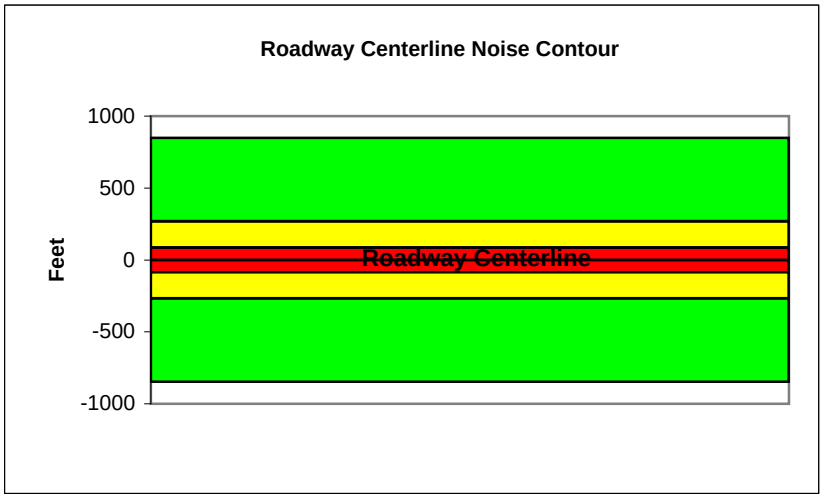
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.3	66.1	64.3	58.2	66.9	67.5
Medium Trucks:	65.6	57.5	51.1	49.6	58.1	58.3
Heavy Trucks:	70.1	58.2	49.1	50.3	59.9	60.0
Vehicle Noise:	**72.4**	**67.4**	**64.7**	**59.5**	**68.1**	**68.6**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	848
65 dBA	268
70 dBA	85
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Clinton Keith Road		
Road Segment:	Murrieta Oaks to I-215		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	27,040
Peak Hour Traffic:	**2704**
Vehicle Speed:	45
Centerline Separation:	32.5

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

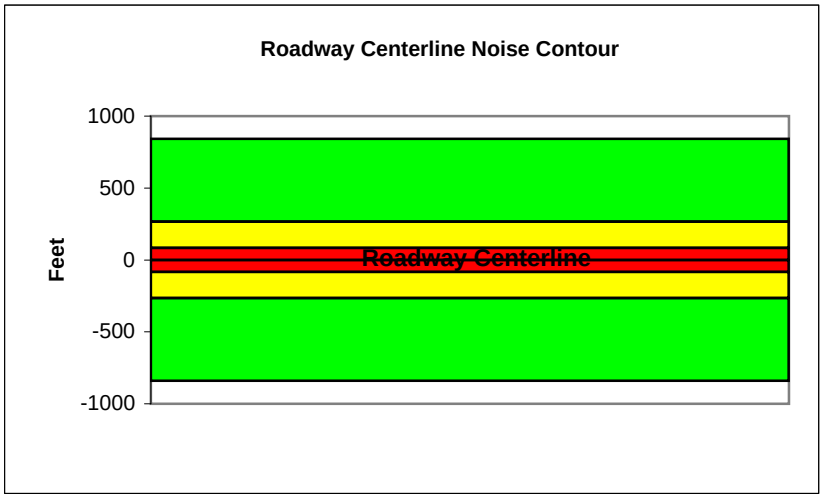
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.3	66.1	64.3	58.2	66.9	67.5
Medium Trucks:	65.6	57.5	51.2	49.6	58.1	58.3
Heavy Trucks:	70.1	58.2	49.1	50.4	59.9	60.0
Vehicle Noise:	**72.5**	**67.4**	**64.7**	**59.5**	**68.1**	**68.6**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	842
65 dBA	266
70 dBA	84
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Clinton Keith Road		
Road Segment:	I-215 to Antelope Road		

PROJECT DATA

Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	5,281
Peak Hour Traffic:	**528.1**
Vehicle Speed:	35
Centerline Separation:	36.3

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

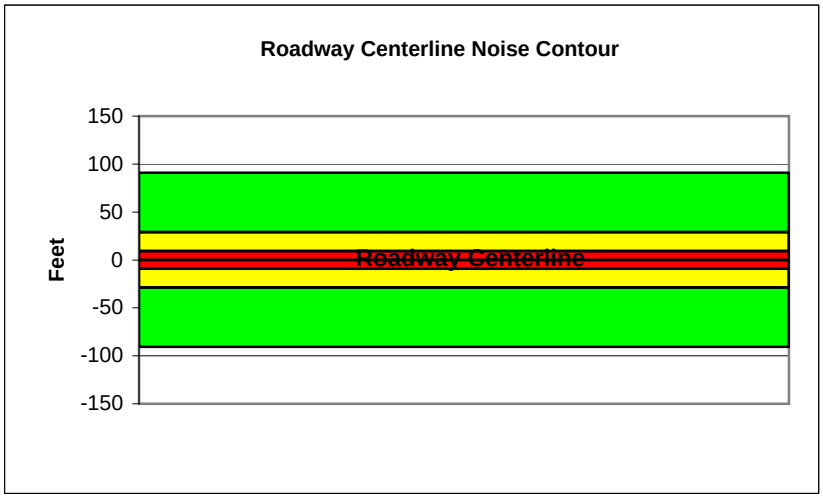
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	47.0	55.8	54.0	47.9	56.6	57.2
Medium Trucks:	56.8	48.7	42.3	40.7	49.2	49.5
Heavy Trucks:	62.0	50.0	41.0	42.2	52.1	52.2
Vehicle Noise:	**64.4**	**57.8**	**54.6**	**49.9**	**58.5**	**58.9**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	91
65 dBA	29
70 dBA	9
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Clinton Keith Road		
Road Segment:	Antelope Road to Whitewood Lane/Meadowlark Road		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	13,000
Peak Hour Traffic:	**1300**
Vehicle Speed:	35
Centerline Separation:	35.3

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

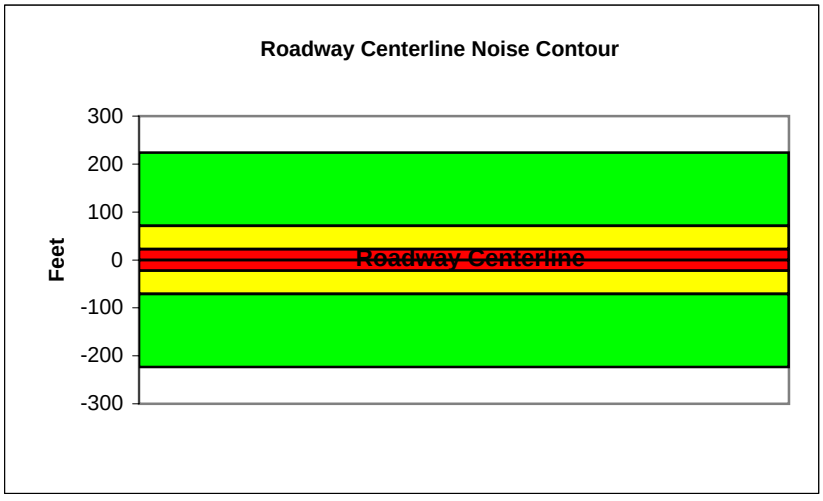
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	51.0	59.7	58.0	51.9	60.5	61.1
Medium Trucks:	60.7	52.6	46.2	44.7	53.2	53.4
Heavy Trucks:	65.9	54.0	44.9	46.1	56.0	56.2
Vehicle Noise:	**68.3**	**61.7**	**58.5**	**53.8**	**62.4**	**62.9**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	224
65 dBA	71
70 dBA	22
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Calle Del Oso Oro		
Road Segment:	Clinton Keith to Calle Cipres		

PROJECT DATA

Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	4200
Peak Hour Traffic:	**420**
Vehicle Speed:	40
Centerline Separation:	32.3

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

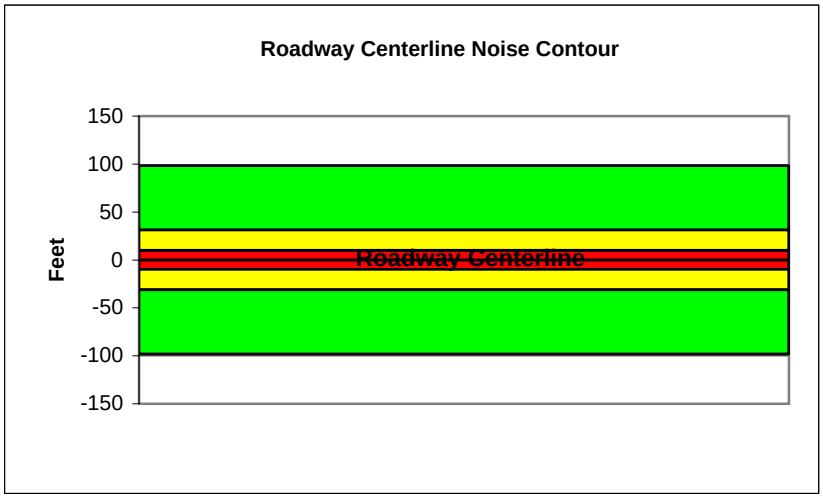
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	47.8	56.6	54.8	48.7	57.3	57.9
Medium Trucks:	56.7	48.7	42.3	40.7	49.2	49.4
Heavy Trucks:	61.6	49.6	40.6	41.8	51.5	51.6
Vehicle Noise:	**64.0**	**58.1**	**55.2**	**50.3**	**58.8**	**59.3**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	98
65 dBA	31
70 dBA	10
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Calle Del Oso Oro		
Road Segment:	Calle Cipres to Washington Avenue		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	11,400
Peak Hour Traffic:	**1140**
Vehicle Speed:	40
Centerline Separation:	32.5

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

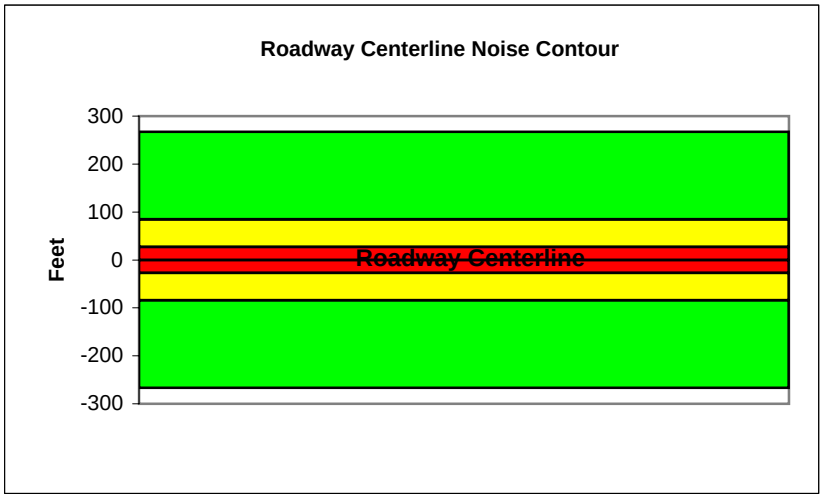
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	52.1	60.9	59.1	53.0	61.7	62.3
Medium Trucks:	61.1	53.0	46.6	45.0	53.5	53.8
Heavy Trucks:	65.9	54.0	44.9	46.1	55.9	56.0
Vehicle Noise:	**68.3**	**62.5**	**59.6**	**54.6**	**63.2**	**63.7**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	267
65 dBA	85
70 dBA	27
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Nutmeg Street		
Road Segment:	Washington Avenue to Adams Avenue		

PROJECT DATA		SITE DATA	
Centerline Dist to Barrier	0	Road Grade:	0
Barrier (0=wall, 1= berm):	0	Average Daily Traffic:	5900
Receiver Barrier Dist:	0	Peak Hour Traffic:	**590**
Centerline Dist. To Observer:	**100**	Vehicle Speed:	40
Barrier Near Lane CL Dist:	0	Centerline Separation:	25.8
Barrier Far lane CL Dist:	0	**NOISE INPUTS**	
Pad Elevation:	**0.5**	Site conditions **HARD SITE**	
Road Elevation:	0	**FLEET MIX**	
Observer Height (above grade):	0		
Barrier Height:	0		
Rt View: **90**	Lft View: **-90**		

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

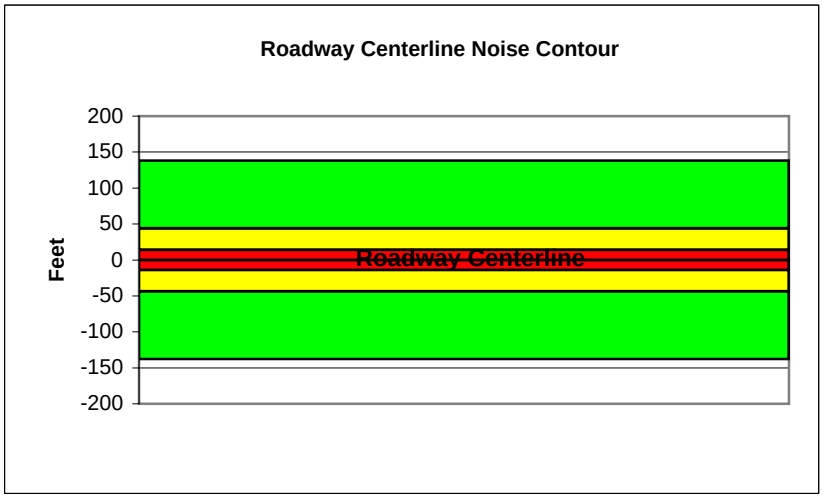
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	49.4	58.1	56.4	50.3	58.9	59.5
Medium Trucks:	58.3	50.2	43.9	42.3	50.8	51.0
Heavy Trucks:	63.2	51.2	42.2	43.4	53.1	53.2
Vehicle Noise:	**65.5**	**59.7**	**56.8**	**51.9**	**60.4**	**60.9**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	138
65 dBA	44
70 dBA	14
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Nutmeg Street		
Road Segment:	Adams Avenue to Jefferson Avenue		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	5900
Peak Hour Traffic:	**590**
Vehicle Speed:	40
Centerline Separation:	34

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

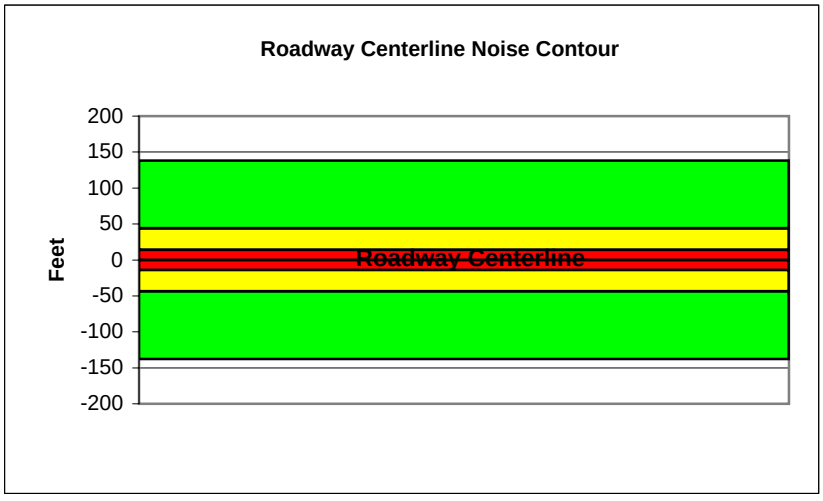
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	49.2	58.0	56.2	50.1	58.8	59.4
Medium Trucks:	58.2	50.1	43.7	42.2	50.6	50.9
Heavy Trucks:	63.0	51.1	42.0	43.3	53.0	53.1
Vehicle Noise:	**65.4**	**59.6**	**56.7**	**51.7**	**60.3**	**60.8**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	138
65 dBA	44
70 dBA	14
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Nutmeg Street		
Road Segment:	Jefferson Avenue to Jackson Avenue		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	9300
Peak Hour Traffic:	**930**
Vehicle Speed:	40
Centerline Separation:	31

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

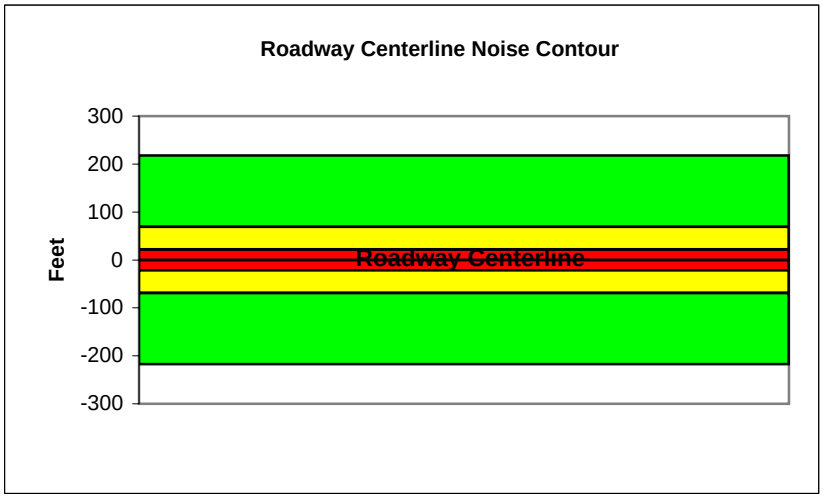
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	51.3	60.0	58.2	52.2	60.8	61.4
Medium Trucks:	60.2	52.1	45.8	44.2	52.7	52.9
Heavy Trucks:	65.1	53.1	44.1	45.3	55.0	55.1
Vehicle Noise:	**67.4**	**61.6**	**58.7**	**53.7**	**62.3**	**62.8**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	218
65 dBA	69
70 dBA	22
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Nutmeg Street		
Road Segment:	Jackson to Clinton Keith Road		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	10,900
Peak Hour Traffic:	**1090**
Vehicle Speed:	45
Centerline Separation:	33.4

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

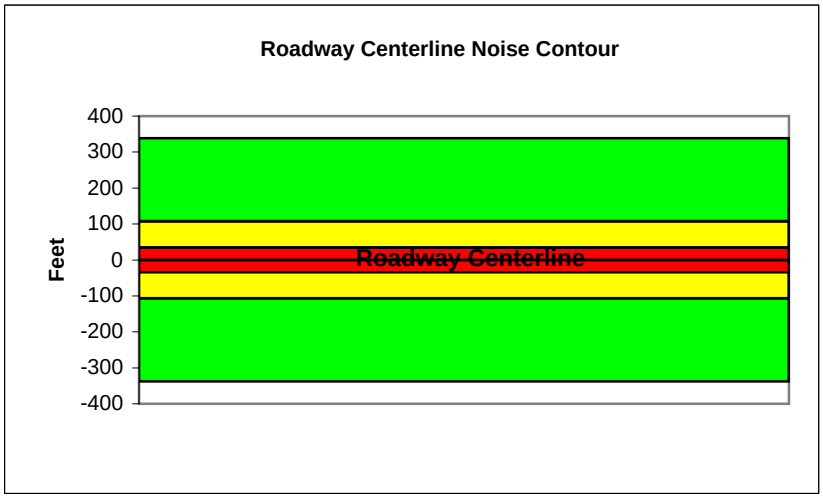
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	53.4	62.2	60.4	54.3	62.9	63.5
Medium Trucks:	61.7	53.6	47.2	45.6	54.1	54.4
Heavy Trucks:	66.2	54.2	45.2	46.4	55.9	56.1
Vehicle Noise:	**68.5**	**63.5**	**60.7**	**55.6**	**64.2**	**64.7**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	339
65 dBA	107
70 dBA	34
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Lemon Street		
Road Segment:	Washington Avenue to Adams Avenue		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	3300
Peak Hour Traffic:	**330**
Vehicle Speed:	40
Centerline Separation:	10

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

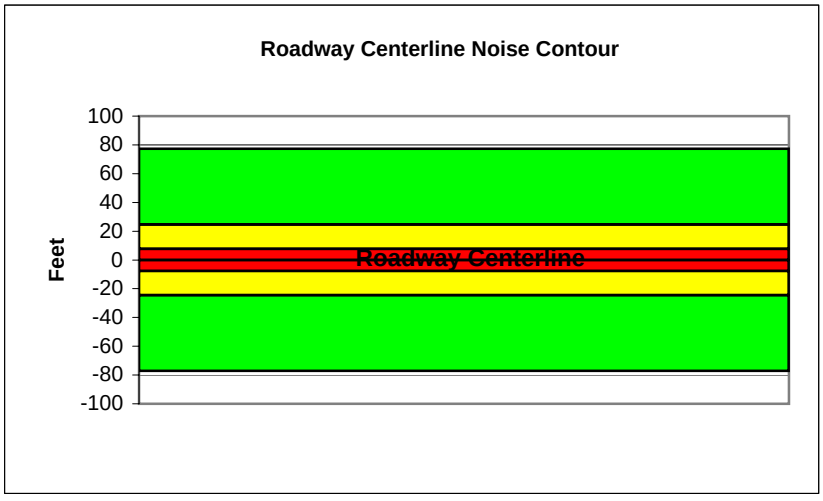
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	47.1	55.9	54.1	48.0	56.7	57.3
Medium Trucks:	56.1	48.0	41.6	40.1	48.6	48.8
Heavy Trucks:	60.9	49.0	39.9	41.2	50.9	51.0
Vehicle Noise:	**63.3**	**57.5**	**54.6**	**49.6**	**58.2**	**58.7**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	77
65 dBA	24
70 dBA	8
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Lemon Street		
Road Segment:	Adams Avenue to Jefferson Avenue		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	4200
Peak Hour Traffic:	**420**
Vehicle Speed:	40
Centerline Separation:	10

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

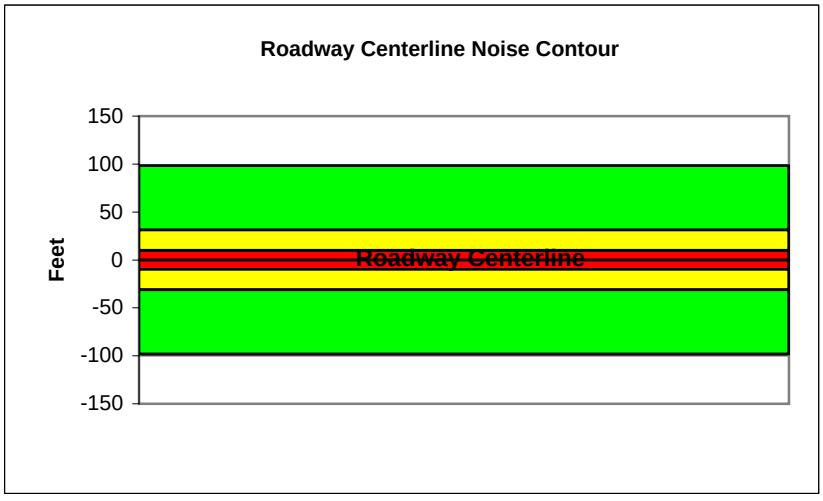
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	48.2	57.0	55.2	49.1	57.7	58.3
Medium Trucks:	57.1	49.1	42.7	41.1	49.6	49.8
Heavy Trucks:	62.0	50.0	41.0	42.2	51.9	52.0
Vehicle Noise:	**64.4**	**58.5**	**55.6**	**50.7**	**59.2**	**59.7**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	98
65 dBA	31
70 dBA	10
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Kalmia Street		
Road Segment:	Hayes Avenue to Washington Avenue		

PROJECT DATA		SITE DATA	
Centerline Dist to Barrier	0	Road Grade:	0
Barrier (0=wall, 1= berm):	0	Average Daily Traffic:	1500
Receiver Barrier Dist:	0	Peak Hour Traffic:	**150**
Centerline Dist. To Observer:	**100**	Vehicle Speed:	40
Barrier Near Lane CL Dist:	0	Centerline Separation:	11.8
Barrier Far lane CL Dist:	0	**NOISE INPUTS**	
Pad Elevation:	**0.5**	Site conditions **HARD SITE**	
Road Elevation:	0	**FLEET MIX**	
Observer Height (above grade):	0		
Barrier Height:	0		
Rt View: **90**	Lft View: **-90**		

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

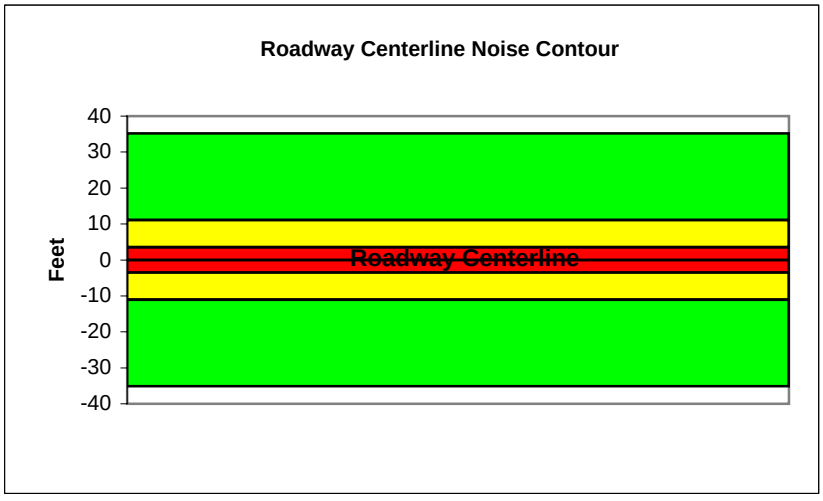
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	43.7	52.5	50.7	44.6	53.2	53.8
Medium Trucks:	52.6	44.6	38.2	36.6	45.1	45.3
Heavy Trucks:	57.5	45.5	36.5	37.7	47.4	47.5
Vehicle Noise:	**59.8**	**54.0**	**51.1**	**46.2**	**54.7**	**55.2**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	35
65 dBA	11
70 dBA	4
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Kalmia Street		
Road Segment:	Washington Avenue to Adams Avenue		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	15,400
Peak Hour Traffic:	**1540**
Vehicle Speed:	45
Centerline Separation:	26.5

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

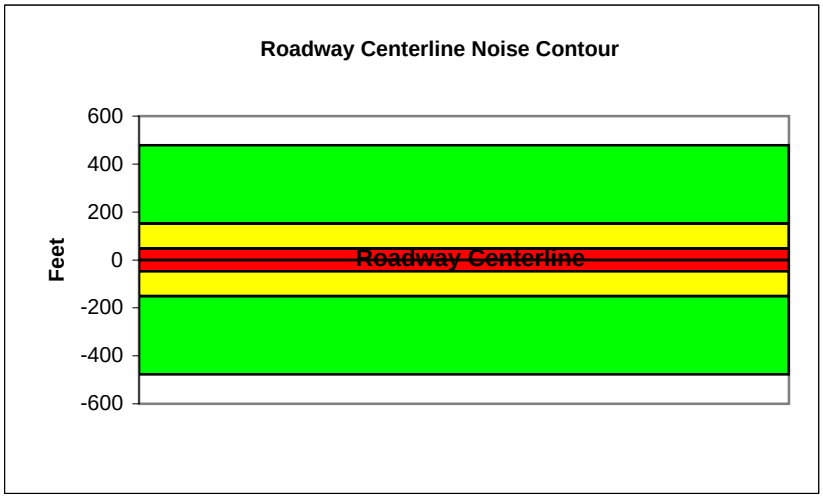
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	55.0	63.8	62.0	55.9	64.6	65.2
Medium Trucks:	63.3	55.2	48.8	47.2	55.7	56.0
Heavy Trucks:	67.8	55.9	46.8	48.0	57.6	57.7
Vehicle Noise:	**70.1**	**65.1**	**62.4**	**57.2**	**65.8**	**66.3**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	479
65 dBA	151
70 dBA	48
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Kalmia Street		
Road Segment:	Adams Avenue to Jefferson Avenue		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	20600
Peak Hour Traffic:	**2060**
Vehicle Speed:	45
Centerline Separation:	26.5

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

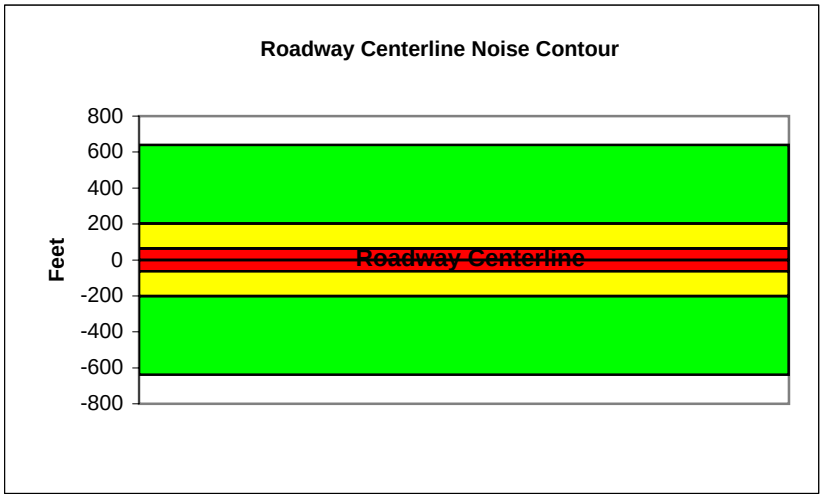
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.3	65.0	63.2	57.2	65.8	66.4
Medium Trucks:	64.5	56.5	50.1	48.5	57.0	57.2
Heavy Trucks:	69.1	57.1	48.1	49.3	58.8	59.0
Vehicle Noise:	**71.4**	**66.3**	**63.6**	**58.5**	**67.1**	**67.6**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	640
65 dBA	202
70 dBA	64
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Kalmia Street		
Road Segment:	Jefferson Avenue to Madison Avenue		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	25,500
Peak Hour Traffic:	**2550**
Vehicle Speed:	45
Centerline Separation:	37

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

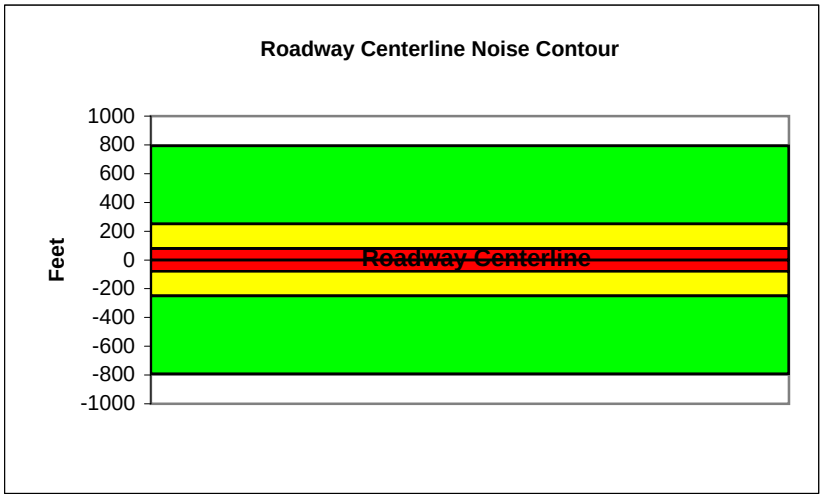
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.0	65.8	64.0	57.9	66.6	67.2
Medium Trucks:	65.3	57.2	50.8	49.3	57.8	58.0
Heavy Trucks:	69.8	57.9	48.8	50.0	59.6	59.7
Vehicle Noise:	**72.1**	**67.1**	**64.4**	**59.2**	**67.8**	**68.3**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	793
65 dBA	251
70 dBA	79
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Kalmia Street		
Road Segment:	Madison Avenue to I-15		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	35,300
Peak Hour Traffic:	**3530**
Vehicle Speed:	45
Centerline Separation:	36.4

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

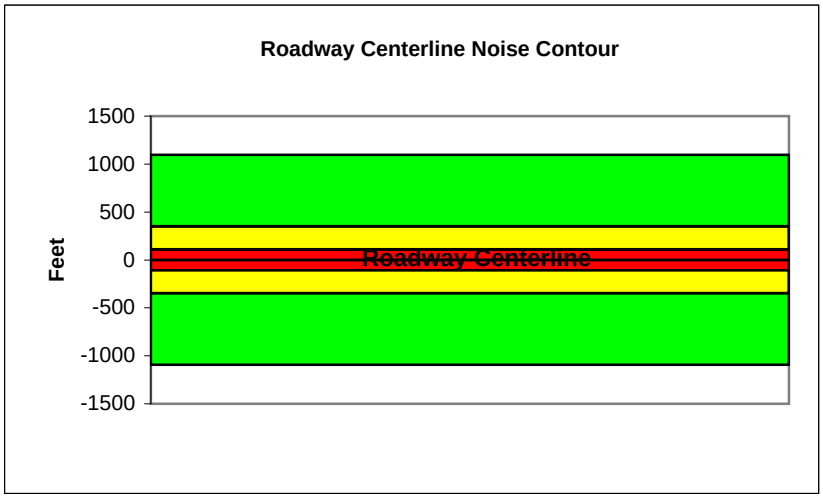
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	58.4	67.2	65.4	59.3	68.0	68.6
Medium Trucks:	66.7	58.6	52.3	50.7	59.2	59.4
Heavy Trucks:	71.2	59.3	50.2	51.5	61.0	61.1
Vehicle Noise:	**73.6**	**68.5**	**65.8**	**60.6**	**69.2**	**69.7**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	1098
65 dBA	347
70 dBA	110
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	California Oaks Road		
Road Segment:	I-15 to Monroe		

PROJECT DATA

Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	29,500
Peak Hour Traffic:	**2950**
Vehicle Speed:	45
Centerline Separation:	45

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

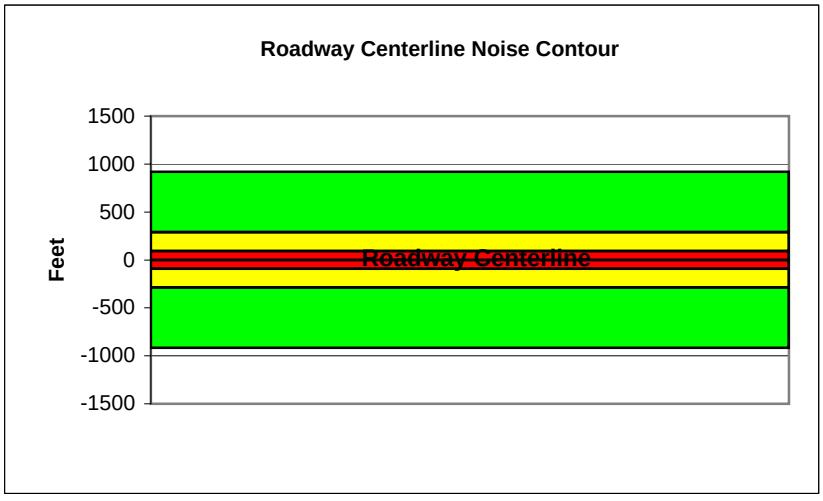
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.5	66.3	64.5	58.4	67.1	67.7
Medium Trucks:	65.8	57.7	51.3	49.8	58.3	58.5
Heavy Trucks:	70.3	58.4	49.3	50.5	60.1	60.2
Vehicle Noise:	**72.7**	**67.6**	**64.9**	**59.7**	**68.3**	**68.8**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	918
65 dBA	290
70 dBA	92
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	California Oaks Road		
Road Segment:	Monroe Avenue to Jackson Avenue		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	29,200
Peak Hour Traffic:	**2920**
Vehicle Speed:	45
Centerline Separation:	52

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

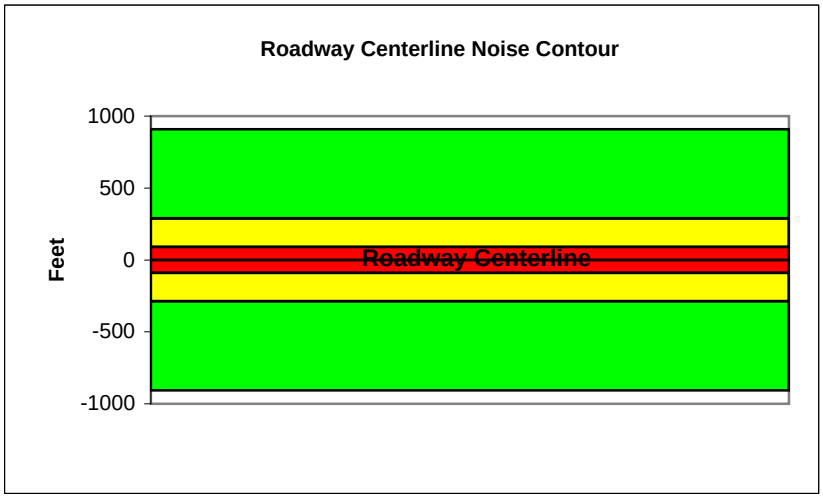
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.4	66.2	64.4	58.3	66.9	67.5
Medium Trucks:	65.6	57.6	51.2	49.6	58.1	58.3
Heavy Trucks:	70.2	58.2	49.2	50.4	59.9	60.1
Vehicle Noise:	**72.5**	**67.5**	**64.7**	**59.6**	**68.2**	**68.7**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	908
65 dBA	287
70 dBA	91
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	California Oaks Road		
Road Segment:	Jackson Avenue to Hancock Avenue		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	24,900
Peak Hour Traffic:	**2490**
Vehicle Speed:	40
Centerline Separation:	36.2

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

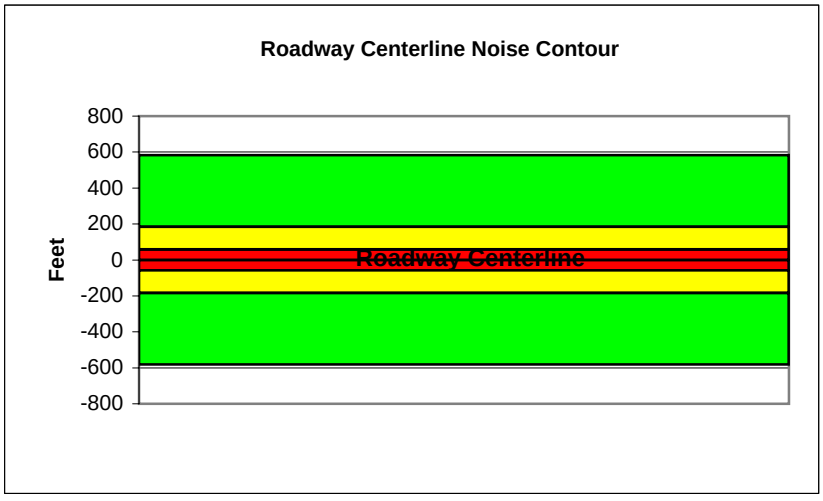
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	55.4	64.2	62.4	56.4	65.0	65.6
Medium Trucks:	64.4	56.3	49.9	48.4	56.9	57.1
Heavy Trucks:	69.2	57.3	48.3	49.5	59.2	59.3
Vehicle Noise:	**71.6**	**65.8**	**62.9**	**57.9**	**66.5**	**67.0**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	584
65 dBA	185
70 dBA	58
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	California Oaks Road		
Road Segment:	Hancock Avenue to Clinton Keith Road		

PROJECT DATA		SITE DATA	
Centerline Dist to Barrier	**0**	Road Grade:	0
Barrier (0=wall, 1= berm):	**0**	Average Daily Traffic:	15,100
Receiver Barrier Dist:	**0**	Peak Hour Traffic:	**1510**
Centerline Dist. To Observer:	**100**	Vehicle Speed:	45
Barrier Near Lane CL Dist:	**0**	Centerline Separation:	35.4
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View: **90**	Lft View: **-90**		

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

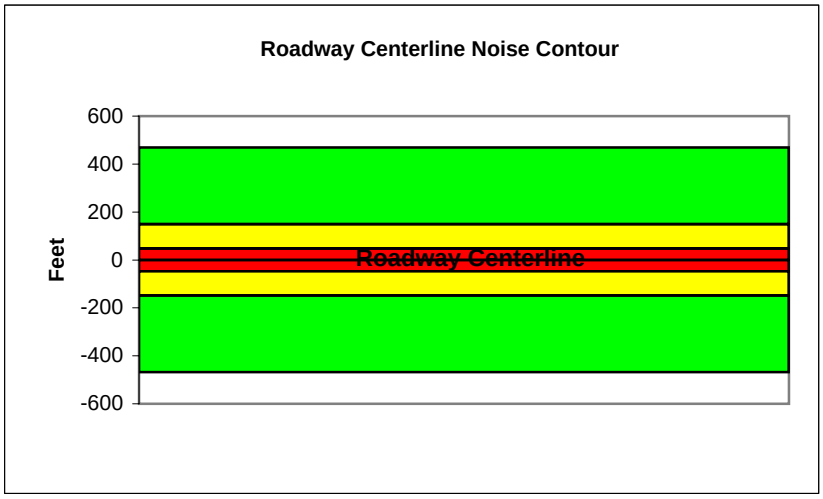
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	54.8	63.5	61.8	55.7	64.3	64.9
Medium Trucks:	63.0	55.0	48.6	47.0	55.5	55.7
Heavy Trucks:	67.6	55.6	46.6	47.8	57.3	57.5
Vehicle Noise:	**69.9**	**64.8**	**62.1**	**57.0**	**65.6**	**66.1**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	470
65 dBA	149
70 dBA	47
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Ivy Street		
Road Segment:	Hayes Street to Washington Avenue		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	900
Peak Hour Traffic:	**90**
Vehicle Speed:	25
Centerline Separation:	10

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

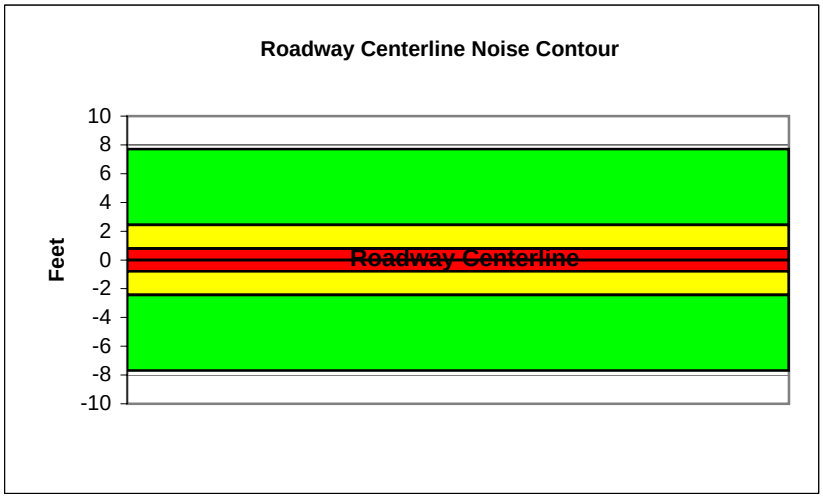
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	35.6	44.4	42.6	36.5	45.2	45.8
Medium Trucks:	47.3	39.2	32.8	31.2	39.7	40.0
Heavy Trucks:	53.4	41.5	32.4	33.6	44.0	44.2
Vehicle Noise:	**56.1**	**47.6**	**43.6**	**39.8**	**48.3**	**48.7**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	8
65 dBA	2
70 dBA	1
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Ivy Street		
Road Segment:	Washington Avenue to Adams Avenue		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	8900
Peak Hour Traffic:	**890**
Vehicle Speed:	45
Centerline Separation:	26

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

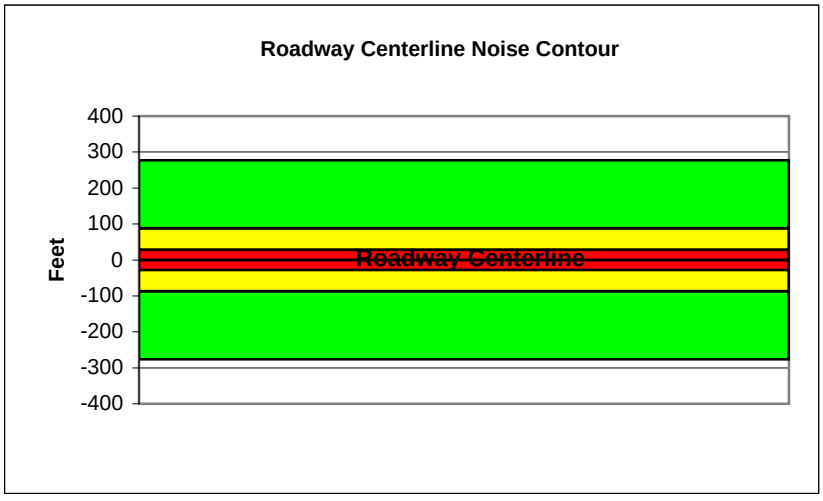
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	52.6	61.4	59.6	53.5	62.2	62.8
Medium Trucks:	60.9	52.8	46.4	44.9	53.4	53.6
Heavy Trucks:	65.4	53.5	44.4	45.6	55.2	55.3
Vehicle Noise:	**67.8**	**62.7**	**60.0**	**54.8**	**63.4**	**63.9**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	277
65 dBA	88
70 dBA	28
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Ivy Street		
Road Segment:	Adams Avenue to Jefferson Avenue		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	9500
Peak Hour Traffic:	**950**
Vehicle Speed:	45
Centerline Separation:	25

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

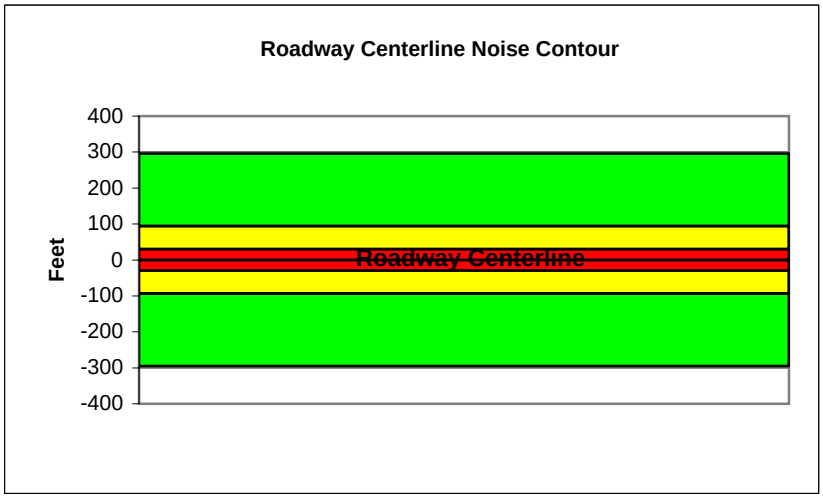
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	52.9	61.7	59.9	53.8	62.5	63.1
Medium Trucks:	61.2	53.1	46.7	45.2	53.7	53.9
Heavy Trucks:	65.7	53.8	44.7	45.9	55.5	55.6
Vehicle Noise:	**68.1**	**63.0**	**60.3**	**55.1**	**63.7**	**64.2**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	295
65 dBA	93
70 dBA	30
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Ivy Street		
Road Segment:	Jefferson Avenue to Madison Avenue		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	11300
Peak Hour Traffic:	**1130**
Vehicle Speed:	45
Centerline Separation:	34.8

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

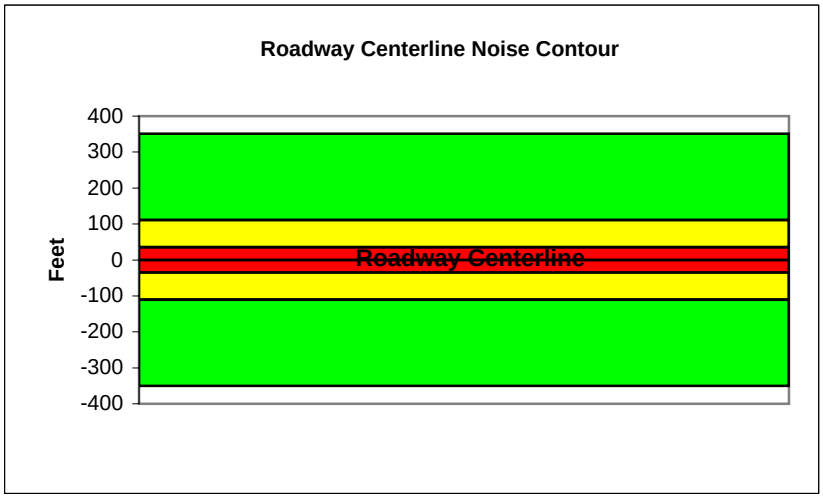
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	53.5	62.3	60.5	54.4	63.1	63.7
Medium Trucks:	61.8	53.7	47.3	45.8	54.3	54.5
Heavy Trucks:	66.3	54.4	45.3	46.5	56.1	56.2
Vehicle Noise:	**68.6**	**63.6**	**60.9**	**55.7**	**64.3**	**64.8**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	351
65 dBA	111
70 dBA	35
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Los Alamos Road		
Road Segment:	Madison Avenue to Lincoln Avenue		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	10400
Peak Hour Traffic:	**1040**
Vehicle Speed:	45
Centerline Separation:	33

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

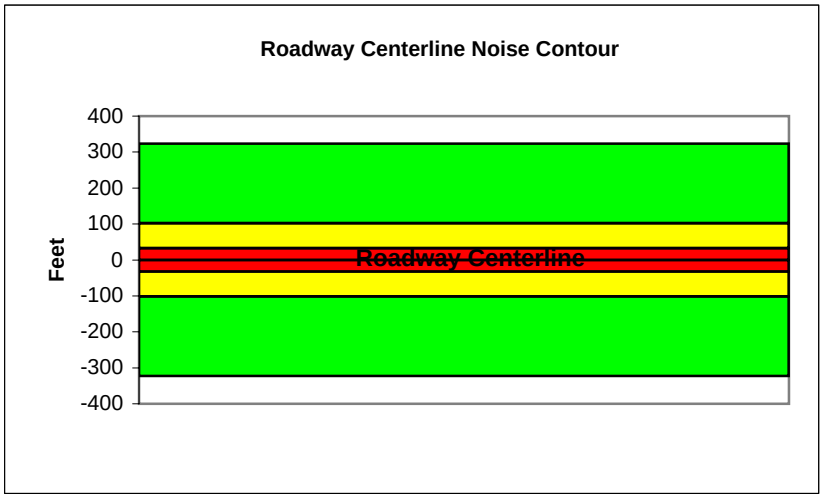
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	53.2	62.0	60.2	54.1	62.7	63.3
Medium Trucks:	61.5	53.4	47.0	45.4	53.9	54.2
Heavy Trucks:	66.0	54.0	45.0	46.2	55.7	55.9
Vehicle Noise:	**68.3**	**63.3**	**60.5**	**55.4**	**64.0**	**64.5**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	324
65 dBA	102
70 dBA	32
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Los Alamos Road		
Road Segment:	Lincoln Avenue to Hancock Avenue		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	19,000
Peak Hour Traffic:	**1900**
Vehicle Speed:	45
Centerline Separation:	38.8

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

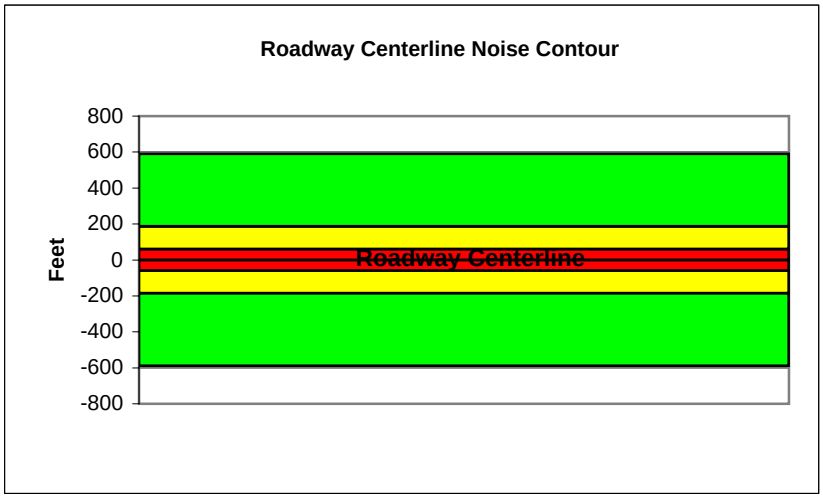
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	55.7	64.5	62.7	56.6	65.3	65.9
Medium Trucks:	64.0	55.9	49.5	48.0	56.4	56.7
Heavy Trucks:	68.5	56.6	47.5	48.7	58.3	58.4
Vehicle Noise:	**70.8**	**65.8**	**63.1**	**57.9**	**66.5**	**67.0**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	591
65 dBA	187
70 dBA	59
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Los Alamos Road		
Road Segment:	Hancock Avenue to I-215		

PROJECT DATA

Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	19,200
Peak Hour Traffic:	**1920**
Vehicle Speed:	45
Centerline Separation:	38.2

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

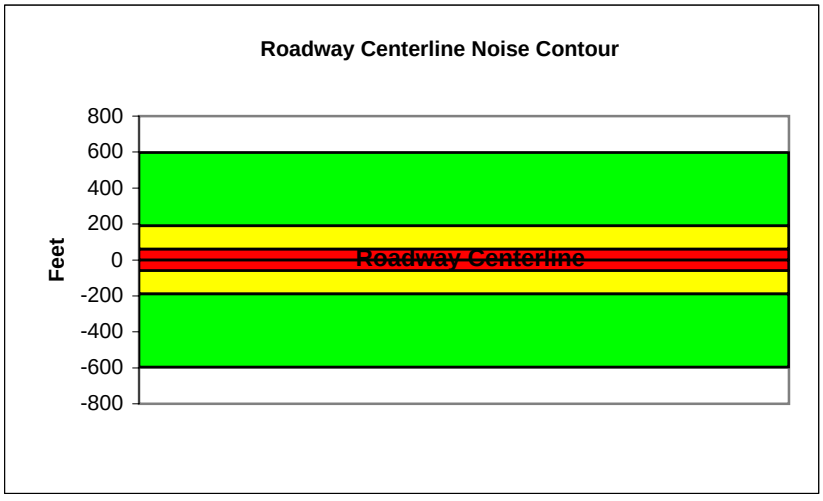
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	55.8	64.5	62.8	56.7	65.3	65.9
Medium Trucks:	64.0	56.0	49.6	48.0	56.5	56.7
Heavy Trucks:	68.6	56.6	47.6	48.8	58.3	58.5
Vehicle Noise:	**70.9**	**65.8**	**63.1**	**58.0**	**66.6**	**67.1**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	597
65 dBA	189
70 dBA	60
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Los Alamos Road		
Road Segment:	I-215 to Whitewood Road		

PROJECT DATA		SITE DATA	
Centerline Dist to Barrier	**0**	Road Grade:	0
Barrier (0=wall, 1= berm):	**0**	Average Daily Traffic:	23,000
Receiver Barrier Dist:	**0**	Peak Hour Traffic:	**2300**
Centerline Dist. To Observer:	**100**	Vehicle Speed:	40
Barrier Near Lane CL Dist:	**0**	Centerline Separation:	42
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View: **90**	Lft View: **-90**		

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

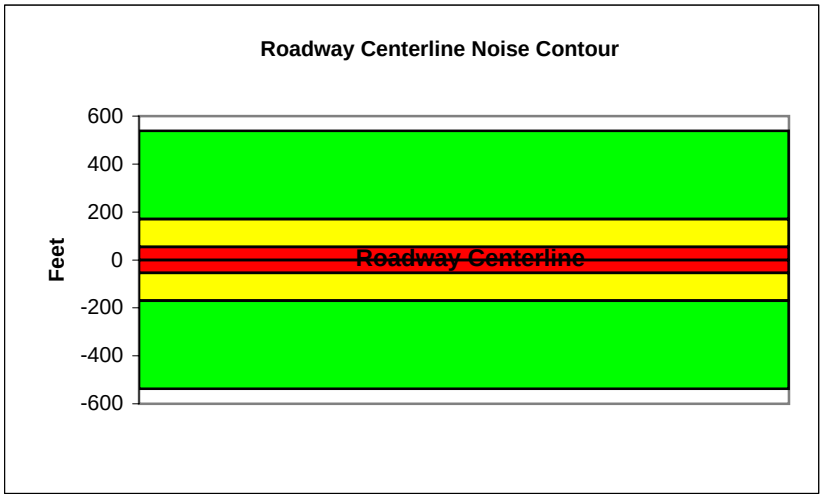
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	55.0	63.8	62.0	55.9	64.6	65.2
Medium Trucks:	64.0	55.9	49.5	47.9	56.4	56.7
Heavy Trucks:	68.8	56.9	47.8	49.0	58.8	58.9
Vehicle Noise:	**71.2**	**65.4**	**62.4**	**57.5**	**66.1**	**66.6**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	538
65 dBA	170
70 dBA	54
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Los Alamos Road		
Road Segment:	Whitewood Road to Ruth Ellen Way		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	3800
Peak Hour Traffic:	**380**
Vehicle Speed:	40
Centerline Separation:	10

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

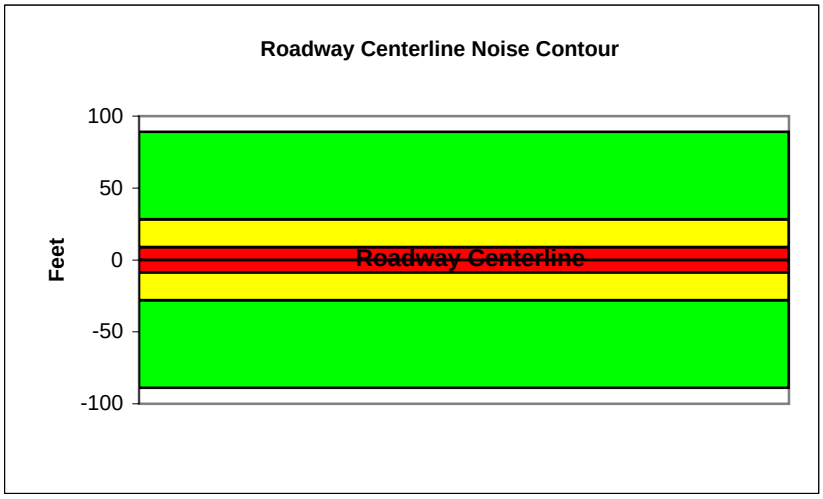
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	47.7	56.5	54.7	48.7	57.3	57.9
Medium Trucks:	56.7	48.6	42.2	40.7	49.2	49.4
Heavy Trucks:	61.5	49.6	40.6	41.8	51.5	51.6
Vehicle Noise:	**63.9**	**58.1**	**55.2**	**50.2**	**58.8**	**59.3**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	89
65 dBA	28
70 dBA	9
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Murrieta Hot Springs Road		
Road Segment:	Jefferson Avenue to Madison Avenue		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	18,285
Peak Hour Traffic:	**1828.5**
Vehicle Speed:	45
Centerline Separation:	23.4

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

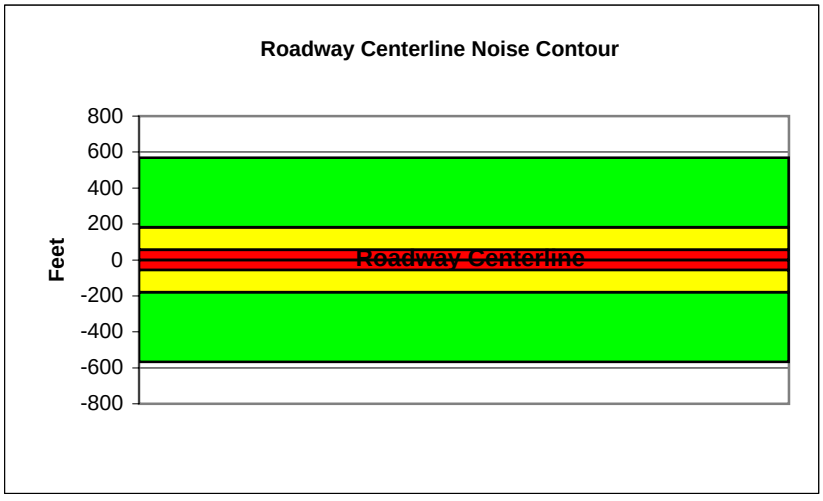
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	55.8	64.6	62.8	56.7	65.4	66.0
Medium Trucks:	64.1	56.0	49.6	48.0	56.5	56.8
Heavy Trucks:	68.6	56.7	47.6	48.8	58.4	58.5
Vehicle Noise:	**70.9**	**65.9**	**63.2**	**58.0**	**66.6**	**67.1**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	568
65 dBA	180
70 dBA	57
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Murrieta Hot Springs Road		
Road Segment:	Madison Avenue to I-15		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	42,600
Peak Hour Traffic:	**4260**
Vehicle Speed:	45
Centerline Separation:	63.8

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

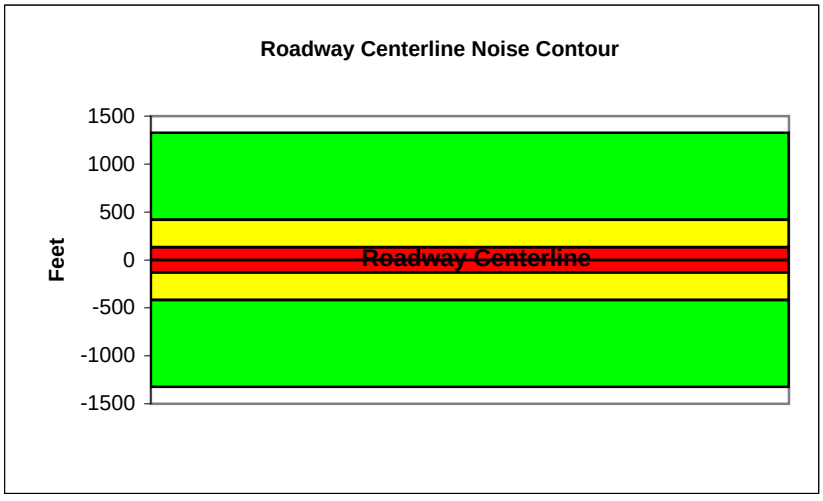
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	58.9	67.6	65.8	59.8	68.4	69.0
Medium Trucks:	67.1	59.1	52.7	51.1	59.6	59.8
Heavy Trucks:	71.6	59.7	50.7	51.9	61.4	61.5
Vehicle Noise:	**74.0**	**68.9**	**66.2**	**61.1**	**69.7**	**70.2**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	1325
65 dBA	419
70 dBA	132
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Murrieta Hot Springs Road		
Road Segment:	from I-15 to I-215		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	65100
Peak Hour Traffic:	**6510**
Vehicle Speed:	45
Centerline Separation:	70.4

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

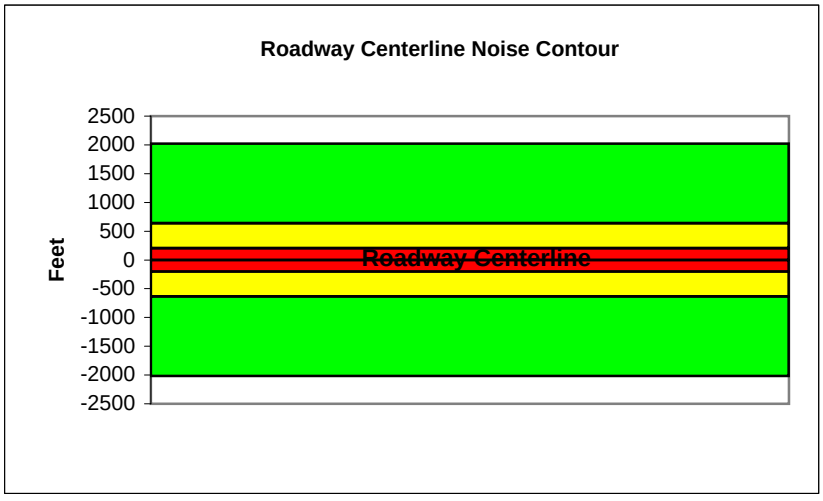
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	60.6	69.4	67.6	61.5	70.2	70.8
Medium Trucks:	68.9	60.8	54.4	52.9	61.3	61.6
Heavy Trucks:	73.4	61.5	52.4	53.6	63.2	63.3
Vehicle Noise:	**75.7**	**70.7**	**68.0**	**62.8**	**71.4**	**71.9**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	2022
65 dBA	639
70 dBA	202
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Murrieta Hot Springs Road		
Road Segment:	from I-215 to Alta Murrieta Drive		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	74,500
Peak Hour Traffic:	**7450**
Vehicle Speed:	45
Centerline Separation:	39

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

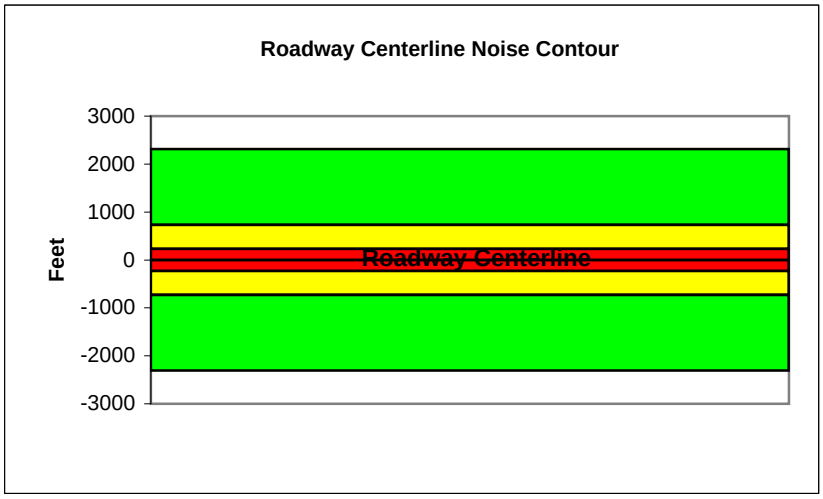
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.6	70.4	68.6	62.5	71.2	71.8
Medium Trucks:	69.9	61.8	55.5	53.9	62.4	62.6
Heavy Trucks:	74.4	62.5	53.4	54.7	64.2	64.3
Vehicle Noise:	**76.8**	**71.7**	**69.0**	**63.8**	**72.4**	**72.9**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	2315
65 dBA	732
70 dBA	231
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Murrieta Hot Springs Road		
Road Segment:	Alta Murrieta Drive to Jackson Street		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	48,000
Peak Hour Traffic:	**4800**
Vehicle Speed:	45
Centerline Separation:	42.3

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

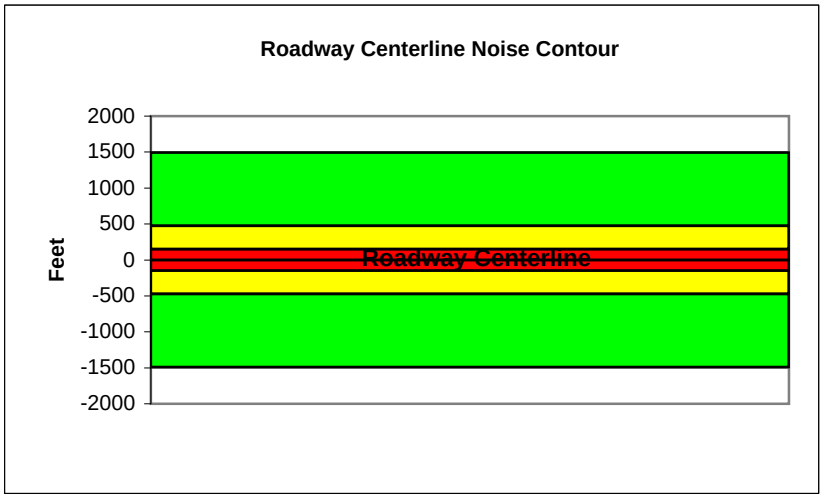
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.7	68.5	66.7	60.6	69.2	69.8
Medium Trucks:	68.0	59.9	53.5	51.9	60.4	60.6
Heavy Trucks:	72.5	60.5	51.5	52.7	62.2	62.4
Vehicle Noise:	**74.8**	**69.8**	**67.0**	**61.9**	**70.5**	**71.0**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	1492
65 dBA	472
70 dBA	149
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Murrieta Hot Springs Road		
Road Segment:	Jackson Street to Whitewood Road		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**
Rt View: **90**	Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	43,263
Peak Hour Traffic:	**4326.3**
Vehicle Speed:	45
Centerline Separation:	42.7

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

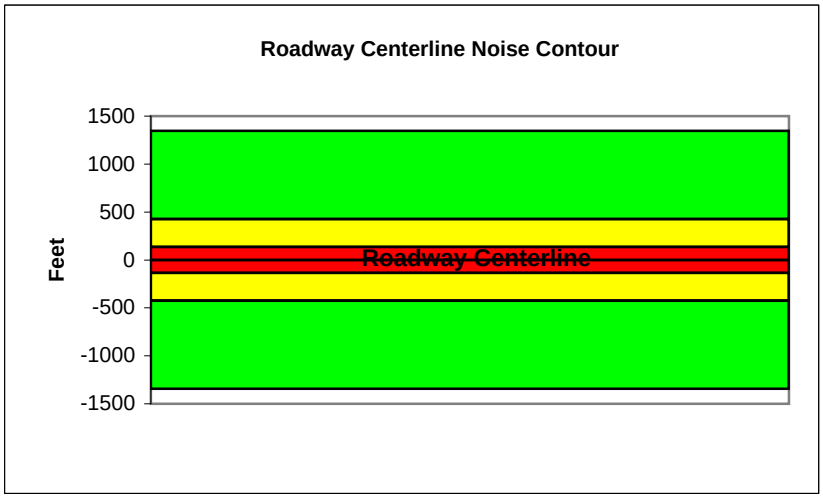
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.2	68.0	66.2	60.1	68.8	69.4
Medium Trucks:	67.5	59.4	53.0	51.5	60.0	60.2
Heavy Trucks:	72.0	60.1	51.0	52.2	61.8	61.9
Vehicle Noise:	**74.4**	**69.3**	**66.6**	**61.4**	**70.0**	**70.5**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	1347
65 dBA	426
70 dBA	135
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Murrieta Hot Springs Road		
Road Segment:	Whitewood Road to Margarita Road		

PROJECT DATA	
Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**
Rt View: **90**	Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	51,200
Peak Hour Traffic:	**5120**
Vehicle Speed:	45
Centerline Separation:	42.3

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

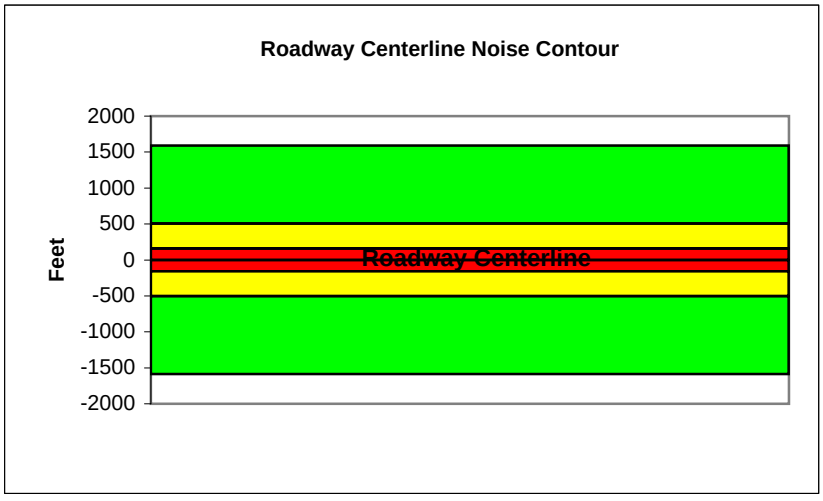
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	60.0	68.7	66.9	60.9	69.5	70.1
Medium Trucks:	68.2	60.2	53.8	52.2	60.7	60.9
Heavy Trucks:	72.8	60.8	51.8	53.0	62.5	62.6
Vehicle Noise:	**75.1**	**70.0**	**67.3**	**62.2**	**70.8**	**71.3**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	1591
65 dBA	503
70 dBA	159
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Murrieta Hot Springs Road		
Road Segment:	Margarita Road to Eastern City Limits		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	40,000
Peak Hour Traffic:	**4000**
Vehicle Speed:	45
Centerline Separation:	41.8

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

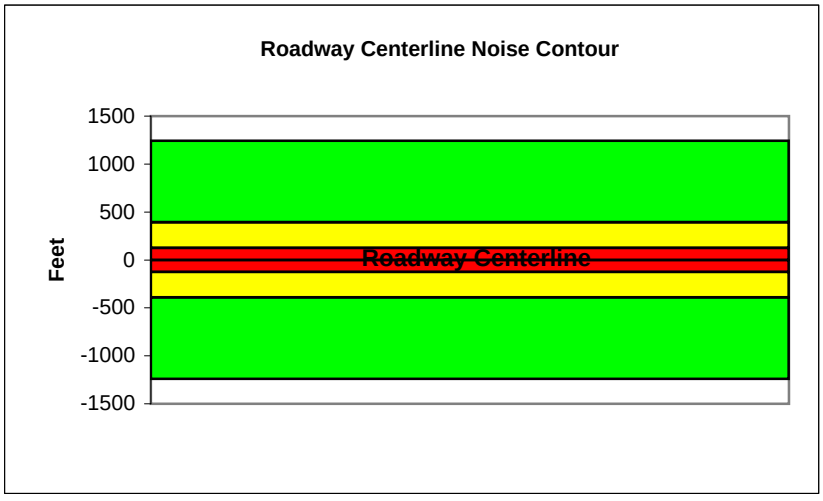
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	58.9	67.7	65.9	59.8	68.4	69.1
Medium Trucks:	67.2	59.1	52.7	51.1	59.6	59.9
Heavy Trucks:	71.7	59.7	50.7	51.9	61.5	61.6
Vehicle Noise:	**74.0**	**69.0**	**66.2**	**61.1**	**69.7**	**70.2**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	1244
65 dBA	393
70 dBA	124
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Guava Street		
Road Segment:	West of Hayes		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	500
Peak Hour Traffic:	**50**
Vehicle Speed:	35
Centerline Separation:	10

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

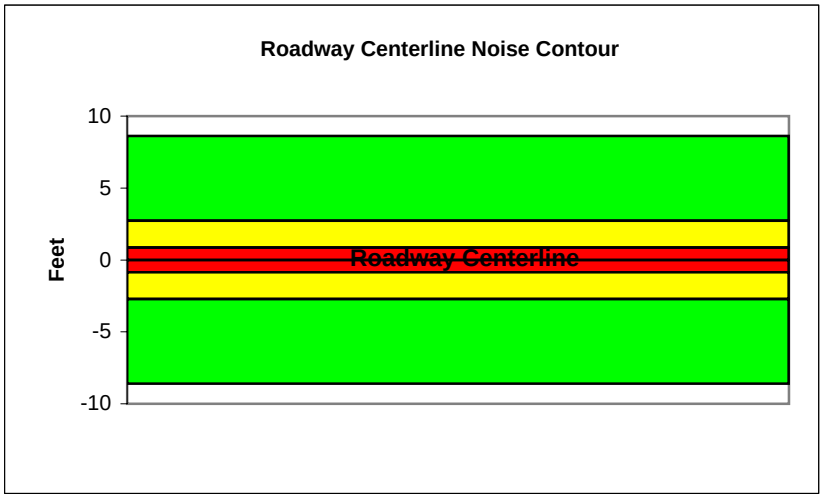
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	37.3	46.0	44.3	38.2	46.8	47.4
Medium Trucks:	47.0	38.9	32.5	31.0	39.5	39.7
Heavy Trucks:	52.2	40.3	31.2	32.4	42.3	42.5
Vehicle Noise:	**54.6**	**48.0**	**44.8**	**40.1**	**48.7**	**49.2**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	9
65 dBA	3
70 dBA	1
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Guava Street		
Road Segment:	from Hayes Avenue to Douglas Avenue		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	700
Peak Hour Traffic:	**70**
Vehicle Speed:	35
Centerline Separation:	14.2

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

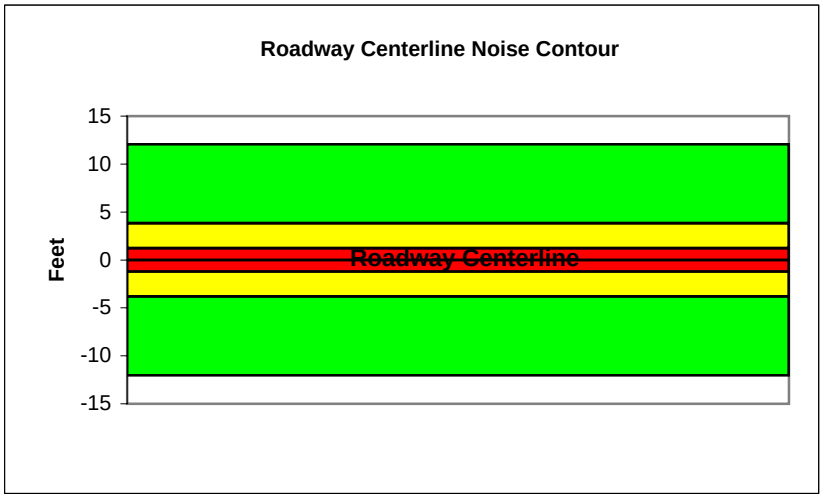
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	38.6	47.4	45.6	39.6	48.2	48.8
Medium Trucks:	48.4	40.3	33.9	32.3	40.8	41.1
Heavy Trucks:	53.6	41.6	32.6	33.8	43.7	43.8
Vehicle Noise:	**56.0**	**49.4**	**46.2**	**41.5**	**50.1**	**50.5**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	12
65 dBA	4
70 dBA	1
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Guava Street		
Road Segment:	Douglas Avenue to Washington Avenue		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	1200
Peak Hour Traffic:	**120**
Vehicle Speed:	35
Centerline Separation:	10

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

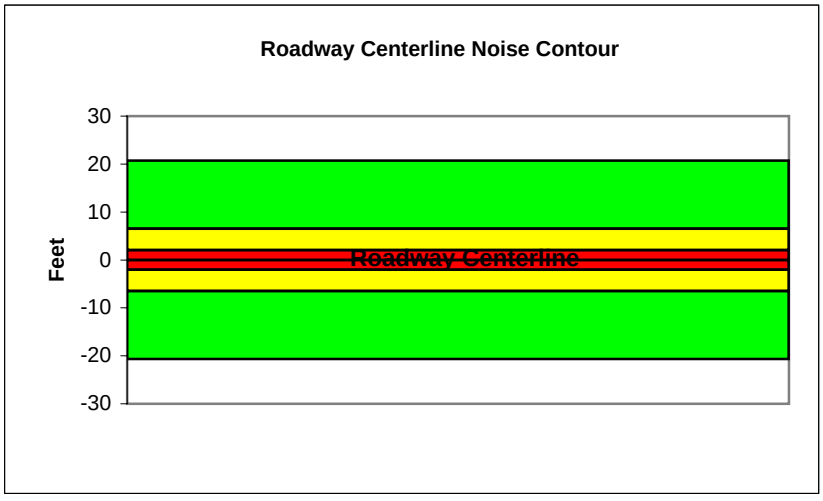
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	41.1	49.8	48.1	42.0	50.6	51.2
Medium Trucks:	50.8	42.7	36.3	34.8	43.3	43.5
Heavy Trucks:	56.0	44.1	35.0	36.2	46.1	46.3
Vehicle Noise:	**58.4**	**51.8**	**48.6**	**43.9**	**52.5**	**53.0**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	21
65 dBA	7
70 dBA	2
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Guava Street		
Road Segment:	Adams Avenue to Jefferson Avenue		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	2100
Peak Hour Traffic:	**210**
Vehicle Speed:	35
Centerline Separation:	10

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

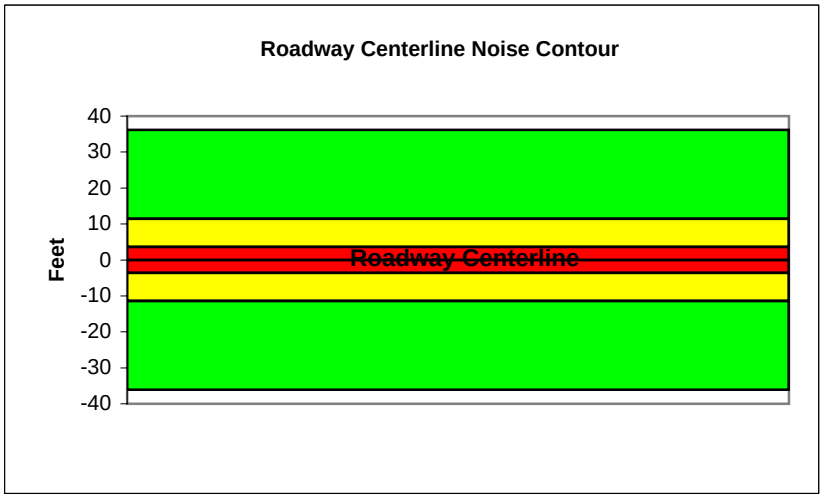
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	43.5	52.3	50.5	44.4	53.1	53.7
Medium Trucks:	53.2	45.2	38.8	37.2	45.7	45.9
Heavy Trucks:	58.4	46.5	37.4	38.7	48.6	48.7
Vehicle Noise:	**60.9**	**54.2**	**51.1**	**46.4**	**54.9**	**55.4**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	36
65 dBA	11
70 dBA	4
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Guava Street		
Road Segment:	from Jefferson Avenue to Madison Avenue		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	3100
Peak Hour Traffic:	**310**
Vehicle Speed:	35
Centerline Separation:	10

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

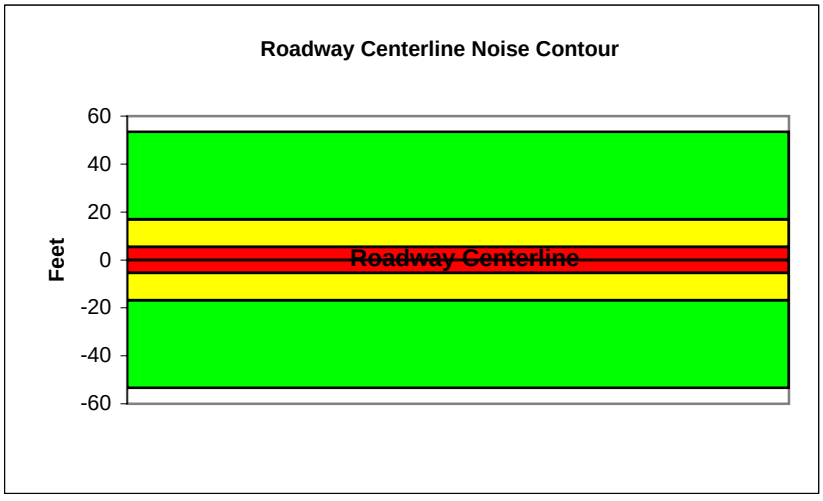
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	45.2	54.0	52.2	46.1	54.7	55.4
Medium Trucks:	54.9	46.8	40.5	38.9	47.4	47.6
Heavy Trucks:	60.1	48.2	39.1	40.4	50.3	50.4
Vehicle Noise:	**62.6**	**55.9**	**52.7**	**48.1**	**56.6**	**57.1**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	53
65 dBA	17
70 dBA	5
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Guava Street		
Road Segment:	West of Hayes		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	200
Peak Hour Traffic:	**20**
Vehicle Speed:	35
Centerline Separation:	10

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

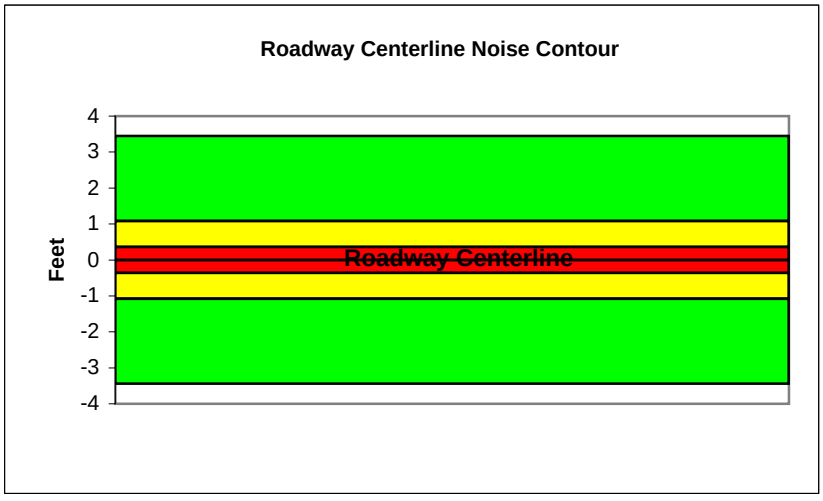
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	33.3	42.1	40.3	34.2	42.8	43.5
Medium Trucks:	43.0	34.9	28.6	27.0	35.5	35.7
Heavy Trucks:	48.2	36.3	27.2	28.5	38.4	38.5
Vehicle Noise:	**50.7**	**44.0**	**40.8**	**36.2**	**44.7**	**45.2**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	3
65 dBA	1
70 dBA	0
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Elm Street		
Road Segment:	Adams Avenue to Madison Street		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	2500
Peak Hour Traffic:	**250**
Vehicle Speed:	35
Centerline Separation:	22.2

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

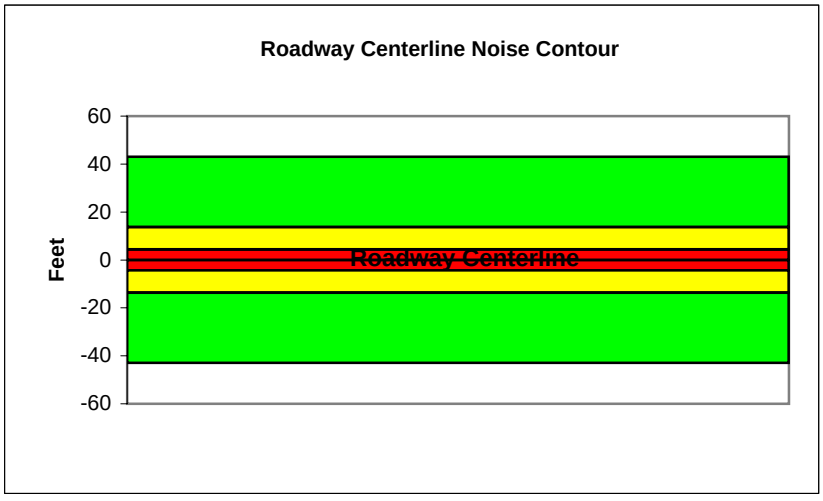
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	44.0	52.8	51.0	44.9	53.6	54.2
Medium Trucks:	53.7	45.7	39.3	37.7	46.2	46.4
Heavy Trucks:	59.0	47.0	38.0	39.2	49.1	49.2
Vehicle Noise:	**61.4**	**54.8**	**51.6**	**46.9**	**55.5**	**55.9**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	43
65 dBA	14
70 dBA	4
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Hayes Avenue		
Road Segment:	from Nighthawk Way to Vineyard Parkway		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	1900
Peak Hour Traffic:	**190**
Vehicle Speed:	35
Centerline Separation:	16.2

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

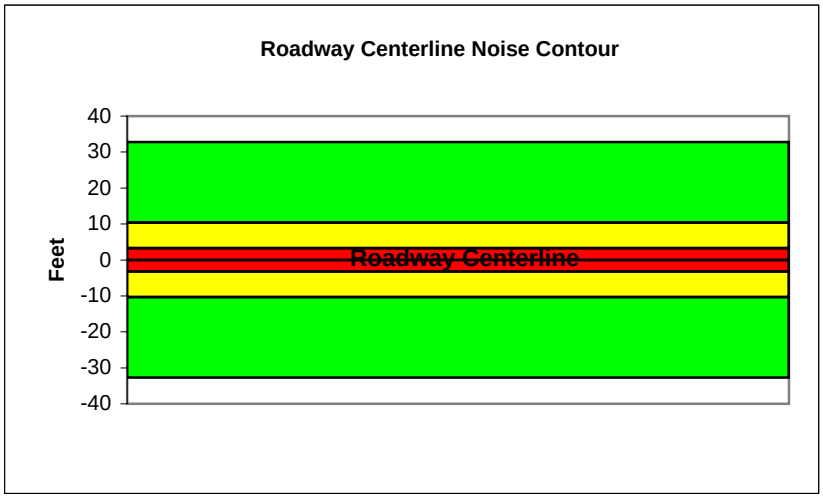
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	42.9	51.7	49.9	43.9	52.5	53.1
Medium Trucks:	52.7	44.6	38.2	36.6	45.1	45.4
Heavy Trucks:	57.9	45.9	36.9	38.1	48.0	48.1
Vehicle Noise:	**60.3**	**53.7**	**50.5**	**45.8**	**54.4**	**54.8**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	33
65 dBA	10
70 dBA	3
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Hayes Avenue		
Road Segment:	Kalmia Street to Ivy Street		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	1900
Peak Hour Traffic:	**190**
Vehicle Speed:	40
Centerline Separation:	10.2

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

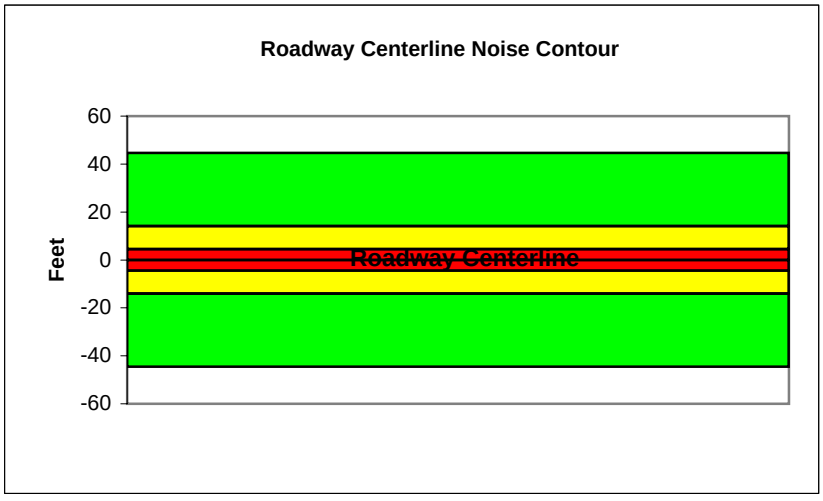
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	44.7	53.5	51.7	45.6	54.3	54.9
Medium Trucks:	53.7	45.6	39.2	37.7	46.1	46.4
Heavy Trucks:	58.5	46.6	37.5	38.8	48.5	48.6
Vehicle Noise:	**60.9**	**55.1**	**52.2**	**47.2**	**55.8**	**56.3**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	45
65 dBA	14
70 dBA	4
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Hayes Avenue		
Road Segment:	Ivy Street to Hawthorne Street		

PROJECT DATA

Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	1300
Peak Hour Traffic:	**130**
Vehicle Speed:	25
Centerline Separation:	10.2

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

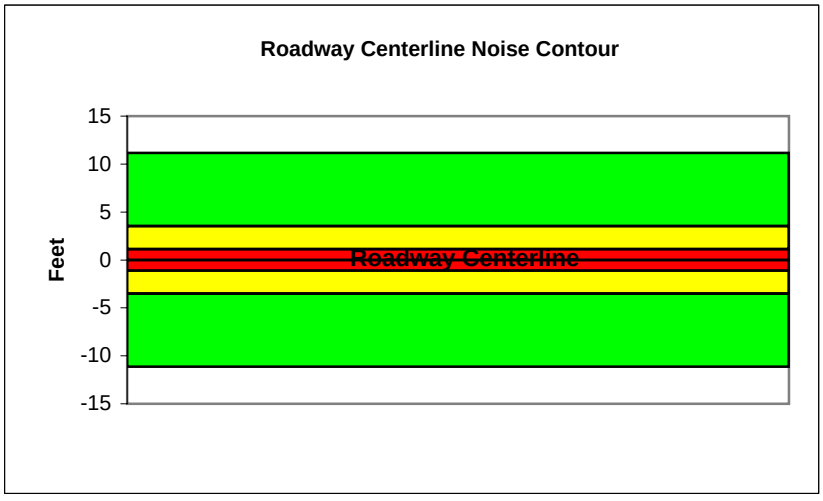
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	37.2	46.0	44.2	38.1	46.8	47.4
Medium Trucks:	48.9	40.8	34.4	32.8	41.3	41.5
Heavy Trucks:	55.0	43.1	34.0	35.2	45.6	45.7
Vehicle Noise:	**57.7**	**49.2**	**45.2**	**41.4**	**49.9**	**50.3**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	11
65 dBA	4
70 dBA	1
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Hayes Avenue		
Road Segment:	Kalmia Street to Guava Street		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	700
Peak Hour Traffic:	**70**
Vehicle Speed:	35
Centerline Separation:	15.7

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

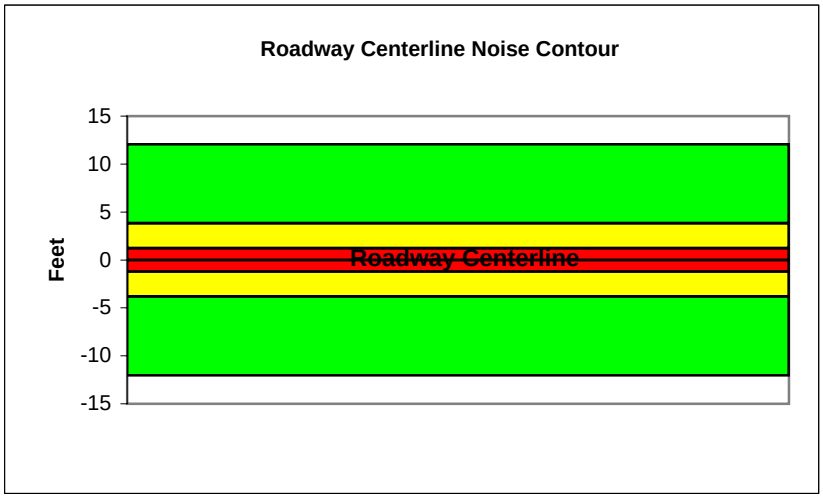
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	38.6	47.4	45.6	39.5	48.2	48.8
Medium Trucks:	48.3	40.3	33.9	32.3	40.8	41.0
Heavy Trucks:	53.6	41.6	32.6	33.8	43.7	43.8
Vehicle Noise:	**56.0**	**49.4**	**46.2**	**41.5**	**50.0**	**50.5**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	12
65 dBA	4
70 dBA	1
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Washington Avenue		
Road Segment:	North of Calle del Oso Oro		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	10000
Peak Hour Traffic:	**1000**
Vehicle Speed:	40
Centerline Separation:	24.2

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

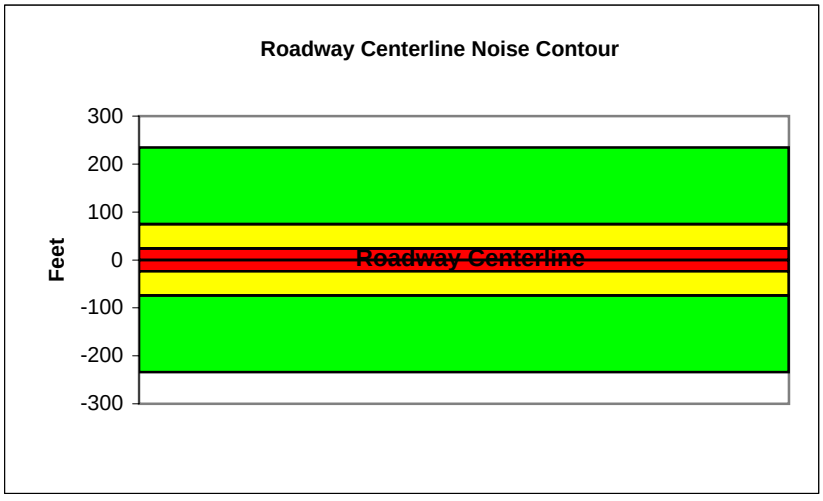
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	51.7	60.5	58.7	52.6	61.2	61.8
Medium Trucks:	60.6	52.6	46.2	44.6	53.1	53.3
Heavy Trucks:	65.5	53.5	44.5	45.7	55.4	55.6
Vehicle Noise:	**67.9**	**62.0**	**59.1**	**54.2**	**62.8**	**63.2**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	234
65 dBA	74
70 dBA	23
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Washington Avenue		
Road Segment:	Calle del Oso Oro to Nighthawk Way/Mangolia Street		

PROJECT DATA

Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	14300
Peak Hour Traffic:	**1430**
Vehicle Speed:	40
Centerline Separation:	24.9

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

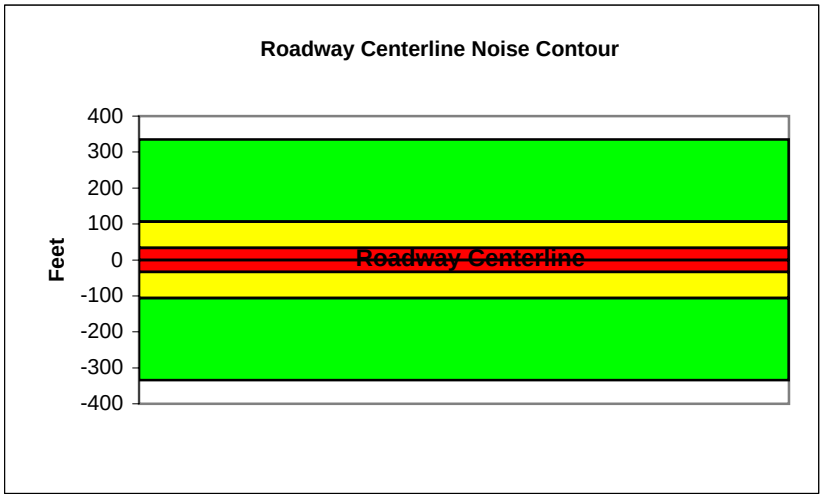
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	53.2	62.0	60.2	54.1	62.8	63.4
Medium Trucks:	62.2	54.1	47.7	46.2	54.6	54.9
Heavy Trucks:	67.0	55.1	46.0	47.3	57.0	57.1
Vehicle Noise:	**69.4**	**63.6**	**60.7**	**55.7**	**64.3**	**64.8**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	335
65 dBA	106
70 dBA	34
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Washington Avenue		
Road Segment:	Nighthawk/Magnolia Street to Vineyard Parkway		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	12,600
Peak Hour Traffic:	**1260**
Vehicle Speed:	40
Centerline Separation:	23.8

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

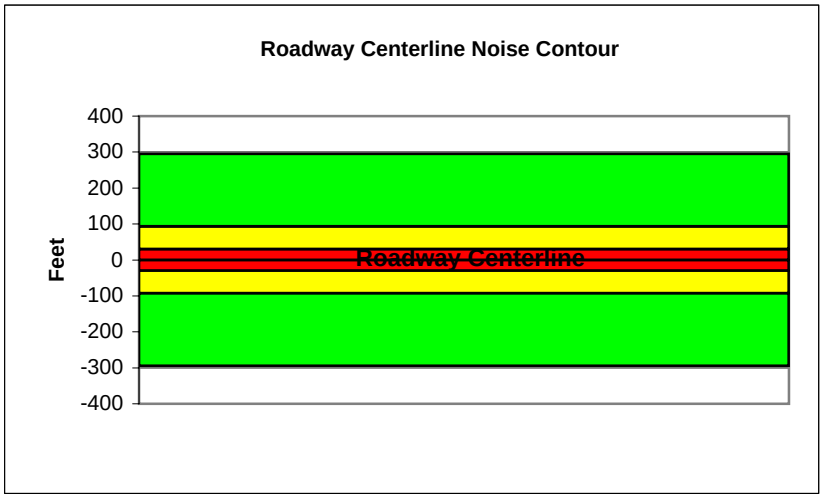
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	52.7	61.5	59.7	53.6	62.3	62.9
Medium Trucks:	61.6	53.6	47.2	45.6	54.1	54.3
Heavy Trucks:	66.5	54.6	45.5	46.7	56.4	56.6
Vehicle Noise:	**68.9**	**63.1**	**60.1**	**55.2**	**63.8**	**64.2**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	295
65 dBA	93
70 dBA	30
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Washington Avenue		
Road Segment:	Vineyard Avenue to Kalmia Street		

PROJECT DATA

Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	20800
Peak Hour Traffic:	**2080**
Vehicle Speed:	40
Centerline Separation:	36.2

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

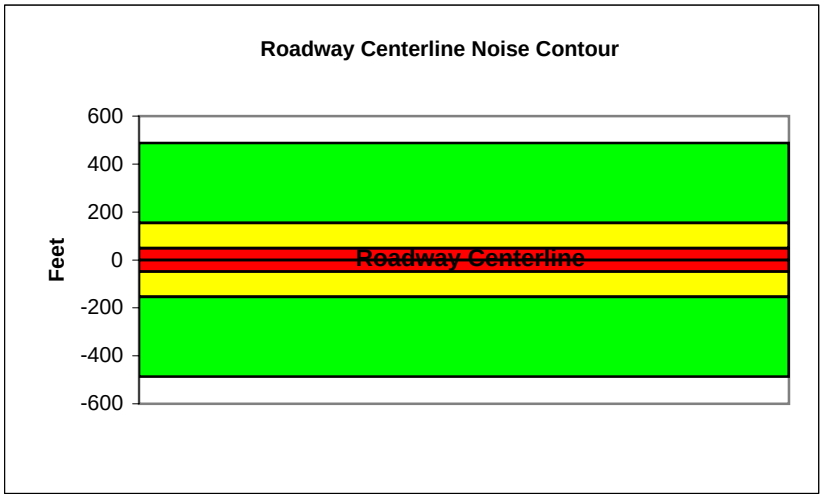
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	54.7	63.4	61.7	55.6	64.2	64.8
Medium Trucks:	63.6	55.5	49.2	47.6	56.1	56.3
Heavy Trucks:	68.5	56.5	47.5	48.7	58.4	58.5
Vehicle Noise:	**70.8**	**65.0**	**62.1**	**57.2**	**65.7**	**66.2**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	488
65 dBA	154
70 dBA	49
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Washington Avenue		
Road Segment:	Kalmia Street to Ivy Street		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	8300
Peak Hour Traffic:	**830**
Vehicle Speed:	25
Centerline Separation:	10.5

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

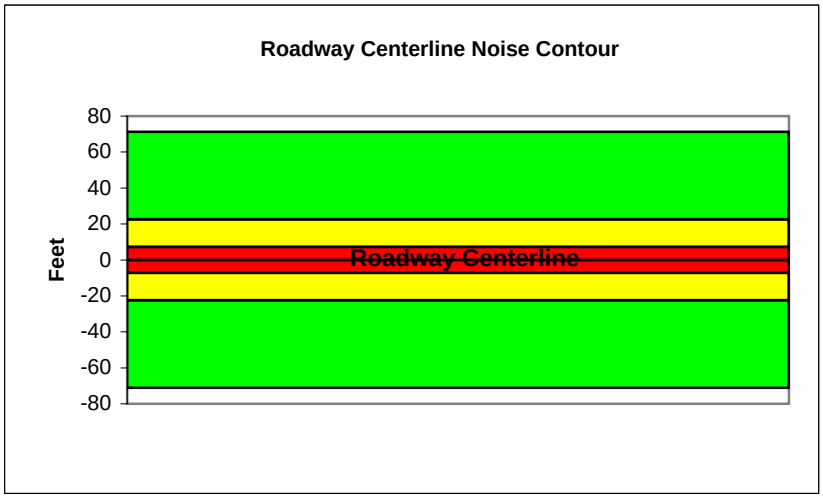
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	45.2	54.0	52.2	46.2	54.8	55.4
Medium Trucks:	56.9	48.8	42.4	40.9	49.4	49.6
Heavy Trucks:	63.1	51.1	42.1	43.3	53.7	53.8
Vehicle Noise:	**65.7**	**57.3**	**53.2**	**49.4**	**57.9**	**58.3**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	71
65 dBA	23
70 dBA	7
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Washington Avenue		
Road Segment:	South of Hawthorne Street		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	1300
Peak Hour Traffic:	**130**
Vehicle Speed:	35
Centerline Separation:	8.7

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

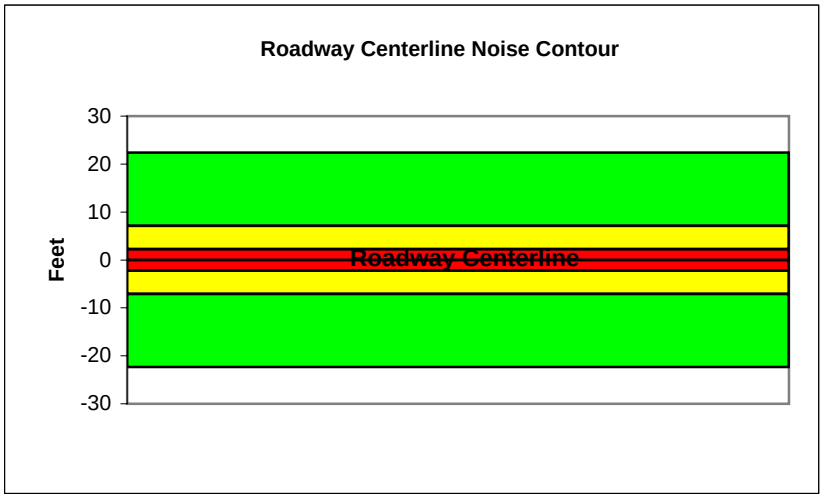
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	41.4	50.2	48.4	42.4	51.0	51.6
Medium Trucks:	51.2	43.1	36.7	35.1	43.6	43.9
Heavy Trucks:	56.4	44.4	35.4	36.6	46.5	46.6
Vehicle Noise:	**58.8**	**52.2**	**49.0**	**44.3**	**52.9**	**53.3**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	22
65 dBA	7
70 dBA	2
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Washington Avenue		
Road Segment:	South of Guava Street		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	600
Peak Hour Traffic:	**60**
Vehicle Speed:	35
Centerline Separation:	8.7

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

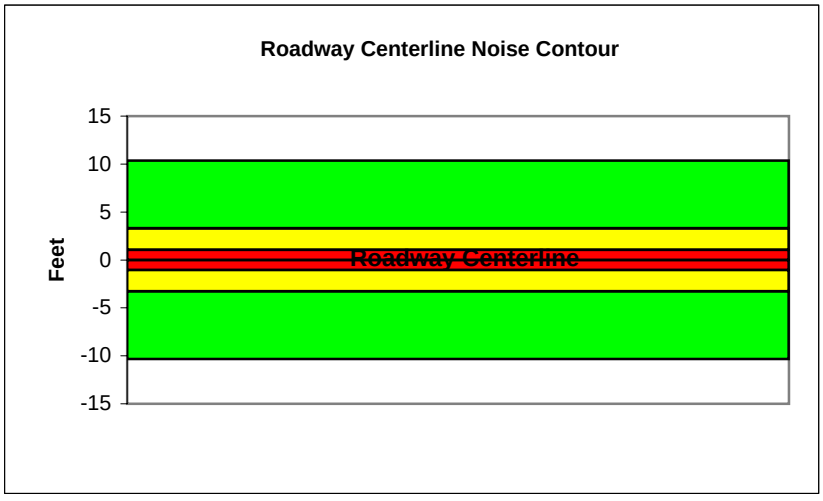
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	38.1	46.9	45.1	39.0	47.6	48.3
Medium Trucks:	47.8	39.7	33.4	31.8	40.3	40.5
Heavy Trucks:	53.0	41.1	32.0	33.2	43.2	43.3
Vehicle Noise:	**55.5**	**48.8**	**45.6**	**40.9**	**49.5**	**50.0**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	10
65 dBA	3
70 dBA	1
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Jefferson Avenue		
Road Segment:	North of Nutmeg Street		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	2,800
Peak Hour Traffic:	**280**
Vehicle Speed:	45
Centerline Separation:	13.8

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

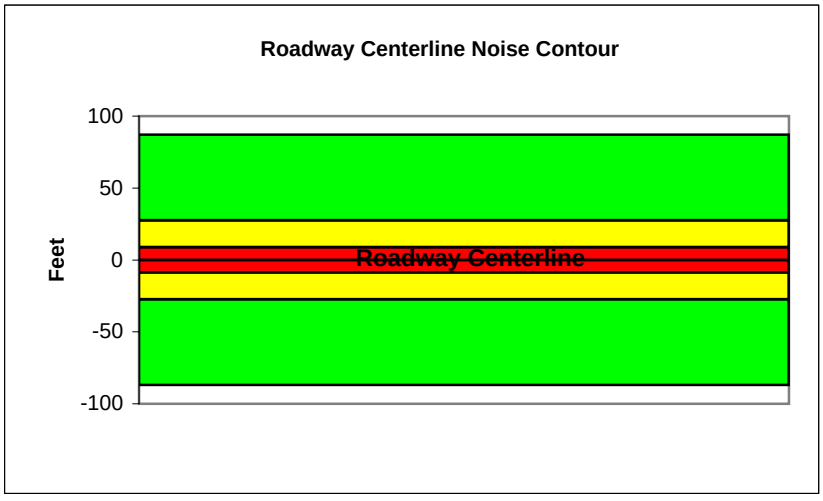
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	47.8	56.6	54.8	48.7	57.4	58.0
Medium Trucks:	56.1	48.0	41.6	40.1	48.6	48.8
Heavy Trucks:	60.6	48.7	39.6	40.8	50.4	50.5
Vehicle Noise:	**63.0**	**57.9**	**55.2**	**50.0**	**58.6**	**59.1**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	87
65 dBA	28
70 dBA	9
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Jefferson Avenue		
Road Segment:	Nutmeg Street to Magnolia Street		

PROJECT DATA

Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	9000
Peak Hour Traffic:	**900**
Vehicle Speed:	40
Centerline Separation:	23

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

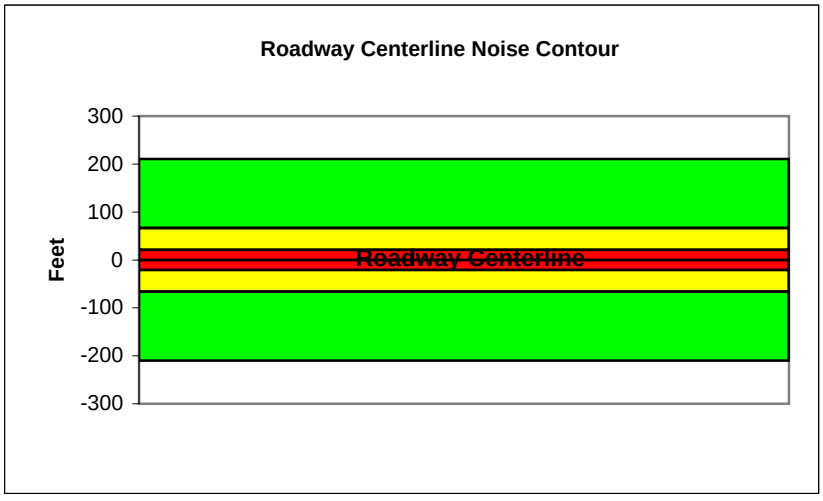
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	51.2	60.0	58.2	52.2	60.8	61.4
Medium Trucks:	60.2	52.1	45.8	44.2	52.7	52.9
Heavy Trucks:	65.0	53.1	44.1	45.3	55.0	55.1
Vehicle Noise:	**67.4**	**61.6**	**58.7**	**53.7**	**62.3**	**62.8**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	211
65 dBA	67
70 dBA	21
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Jefferson Avenue		
Road Segment:	Magnolia Street to Lemon Street		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	10000
Peak Hour Traffic:	**1000**
Vehicle Speed:	45
Centerline Separation:	16.8

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

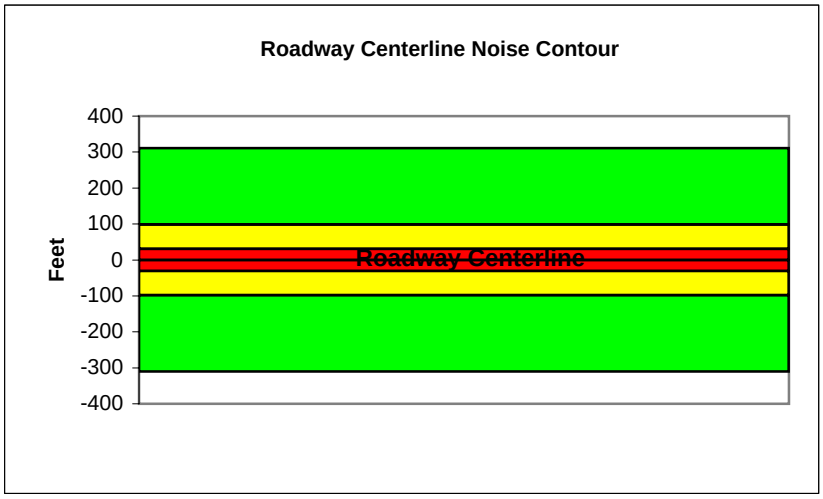
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	53.3	62.1	60.3	54.2	62.8	63.5
Medium Trucks:	61.6	53.5	47.1	45.5	54.0	54.3
Heavy Trucks:	66.1	54.2	45.1	46.3	55.9	56.0
Vehicle Noise:	**68.4**	**63.4**	**60.6**	**55.5**	**64.1**	**64.6**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	311
65 dBA	98
70 dBA	31
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Jefferson Avenue		
Road Segment:	Lemon Street to Kalmia Street		

PROJECT DATA

Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	11200
Peak Hour Traffic:	**1120**
Vehicle Speed:	45
Centerline Separation:	20.7

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

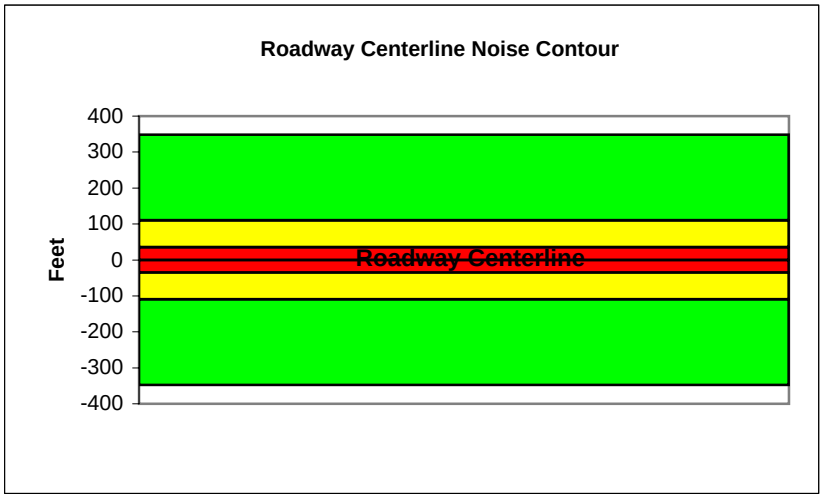
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	53.7	62.5	60.7	54.6	63.3	63.9
Medium Trucks:	62.0	53.9	47.5	46.0	54.5	54.7
Heavy Trucks:	66.5	54.6	45.5	46.7	56.3	56.4
Vehicle Noise:	**68.8**	**63.8**	**61.1**	**55.9**	**64.5**	**65.0**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	348
65 dBA	110
70 dBA	35
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Jefferson Avenue		
Road Segment:	Kalmia Street to Ivy Street		

PROJECT DATA

Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	17,900
Peak Hour Traffic:	**1790**
Vehicle Speed:	45
Centerline Separation:	34

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

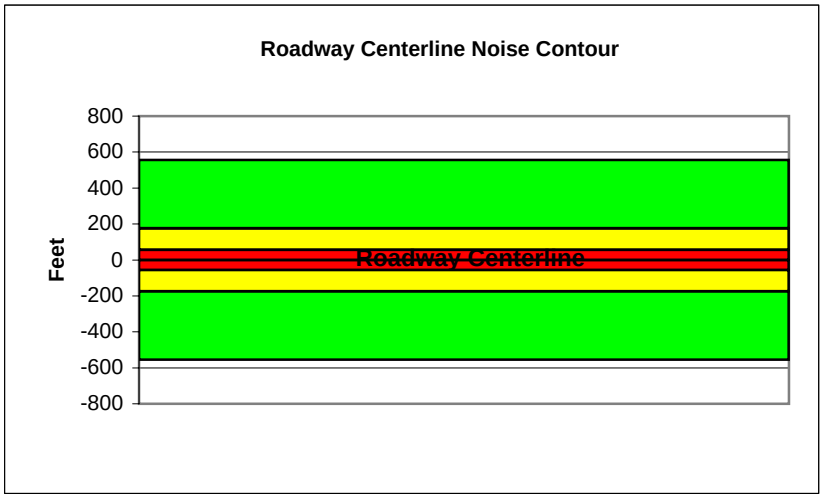
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	55.5	64.3	62.5	56.4	65.1	65.7
Medium Trucks:	63.8	55.7	49.3	47.8	56.3	56.5
Heavy Trucks:	68.3	56.4	47.3	48.5	58.1	58.2
Vehicle Noise:	**70.7**	**65.6**	**62.9**	**57.7**	**66.3**	**66.8**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	557
65 dBA	176
70 dBA	56
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Jefferson Avenue		
Road Segment:	Ivy Street to Murrieta Hot Springs Road		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	12000
Peak Hour Traffic:	**1200**
Vehicle Speed:	45
Centerline Separation:	33.7

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

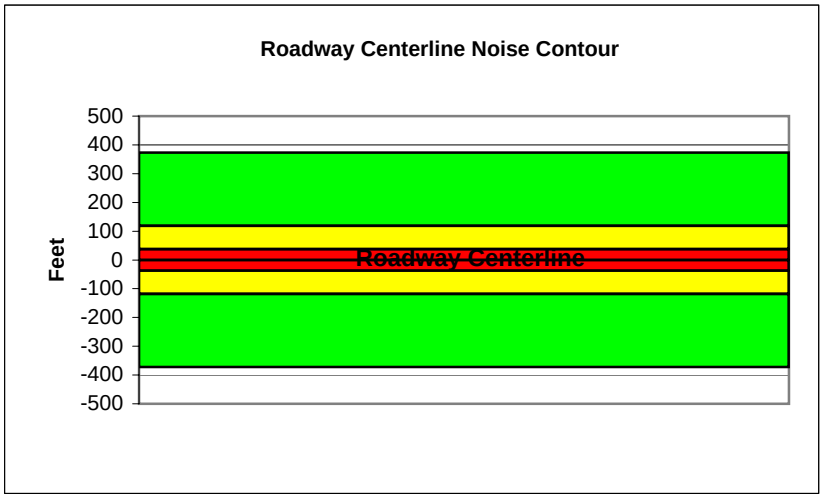
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	53.8	62.6	60.8	54.7	63.3	64.0
Medium Trucks:	62.1	54.0	47.6	46.0	54.5	54.8
Heavy Trucks:	66.6	54.6	45.6	46.8	56.4	56.5
Vehicle Noise:	**68.9**	**63.9**	**61.1**	**56.0**	**64.6**	**65.1**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	373
65 dBA	118
70 dBA	37
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Jefferson Avenue		
Road Segment:	Murrieta Hot Springs Road to Guava Street		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	27,800
Peak Hour Traffic:	**2780**
Vehicle Speed:	45
Centerline Separation:	33.4

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

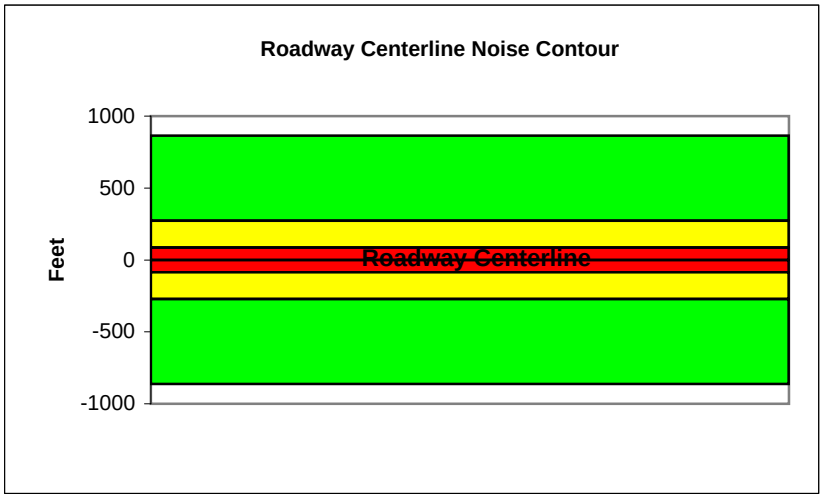
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.4	66.2	64.4	58.4	67.0	67.6
Medium Trucks:	65.7	57.7	51.3	49.7	58.2	58.4
Heavy Trucks:	70.2	58.3	49.2	50.5	60.0	60.1
Vehicle Noise:	**72.6**	**67.5**	**64.8**	**59.7**	**68.2**	**68.7**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	864
65 dBA	273
70 dBA	86
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Jefferson Avenue		
Road Segment:	Guava Street to Fig Street		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	28,000
Peak Hour Traffic:	**2800**
Vehicle Speed:	50
Centerline Separation:	31.5

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

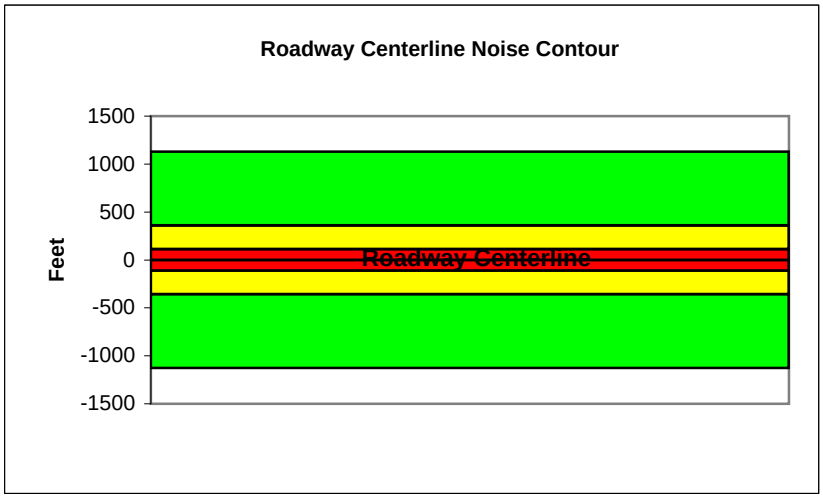
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	58.8	67.6	65.8	59.7	68.4	69.0
Medium Trucks:	66.5	58.4	52.0	50.5	59.0	59.2
Heavy Trucks:	70.7	58.8	49.7	50.9	60.3	60.5
Vehicle Noise:	**73.0**	**68.7**	**66.1**	**60.8**	**69.4**	**69.9**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	1131
65 dBA	358
70 dBA	113
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Jefferson Avenue		
Road Segment:	Fig Street to Elm Street		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	29,000
Peak Hour Traffic:	**2900**
Vehicle Speed:	50
Centerline Separation:	32.3

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

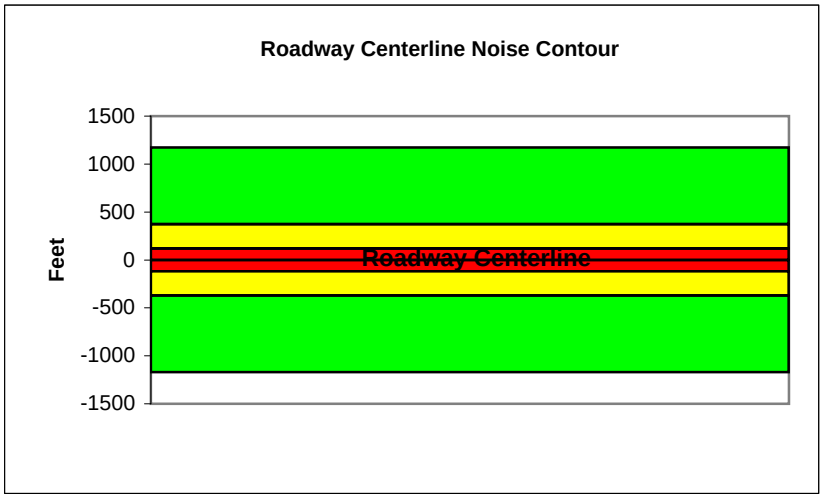
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.0	67.7	66.0	59.9	68.5	69.1
Medium Trucks:	66.6	58.6	52.2	50.6	59.1	59.3
Heavy Trucks:	70.9	58.9	49.9	51.1	60.5	60.6
Vehicle Noise:	**73.2**	**68.8**	**66.3**	**61.0**	**69.6**	**70.1**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	1172
65 dBA	371
70 dBA	117
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Jefferson Avenue		
Road Segment:	south of Elm Street		

PROJECT DATA

Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	20736
Peak Hour Traffic:	**2073.6**
Vehicle Speed:	45
Centerline Separation:	36.2

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

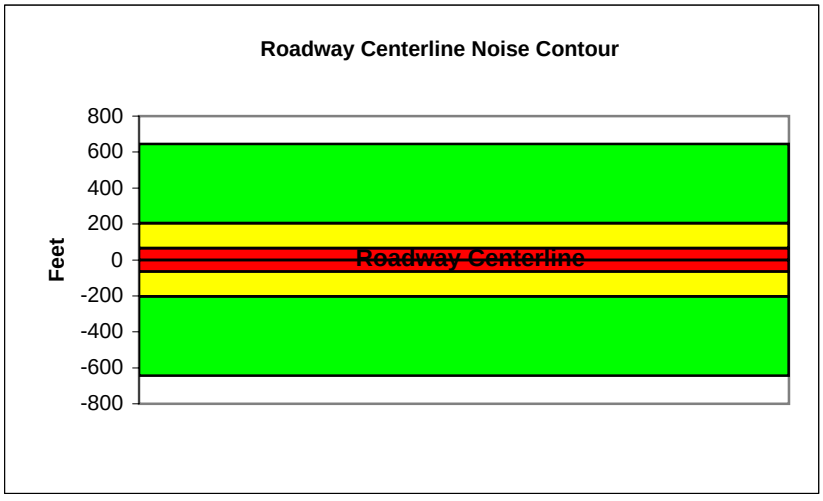
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.1	64.9	63.1	57.0	65.7	66.3
Medium Trucks:	64.4	56.3	50.0	48.4	56.9	57.1
Heavy Trucks:	68.9	57.0	47.9	49.1	58.7	58.8
Vehicle Noise:	**71.3**	**66.2**	**63.5**	**58.3**	**66.9**	**67.4**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	644
65 dBA	204
70 dBA	64
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Madison Avenue		
Road Segment:	Kalmia Street to Ivy St/Los Alamos		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	14,914
Peak Hour Traffic:	**1491.4**
Vehicle Speed:	50
Centerline Separation:	36.5

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

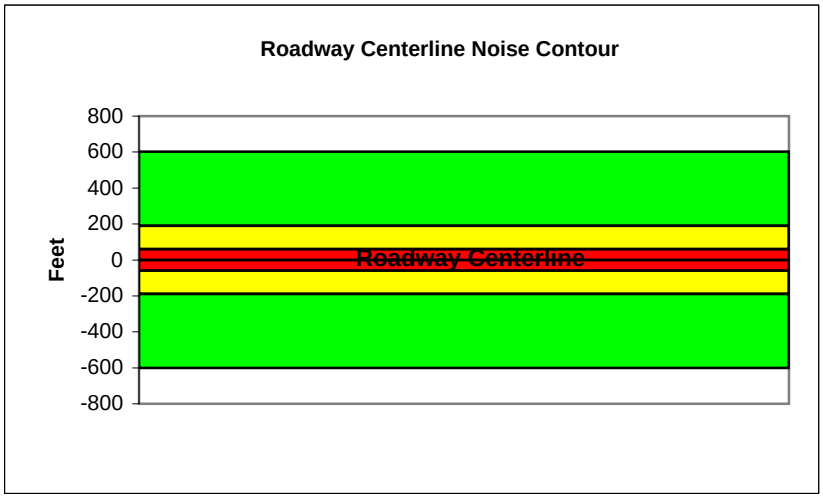
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.0	64.8	63.0	56.9	65.6	66.2
Medium Trucks:	63.7	55.6	49.2	47.7	56.1	56.4
Heavy Trucks:	67.9	56.0	46.9	48.1	57.5	57.7
Vehicle Noise:	**70.2**	**65.9**	**63.3**	**58.0**	**66.6**	**67.1**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	602
65 dBA	190
70 dBA	60
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Madison Avenue		
Road Segment:	Ivy St/Los Alamos to Murrieta Hot Springs Road		

PROJECT DATA

Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	24100
Peak Hour Traffic:	**2410**
Vehicle Speed:	45
Centerline Separation:	37.1

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

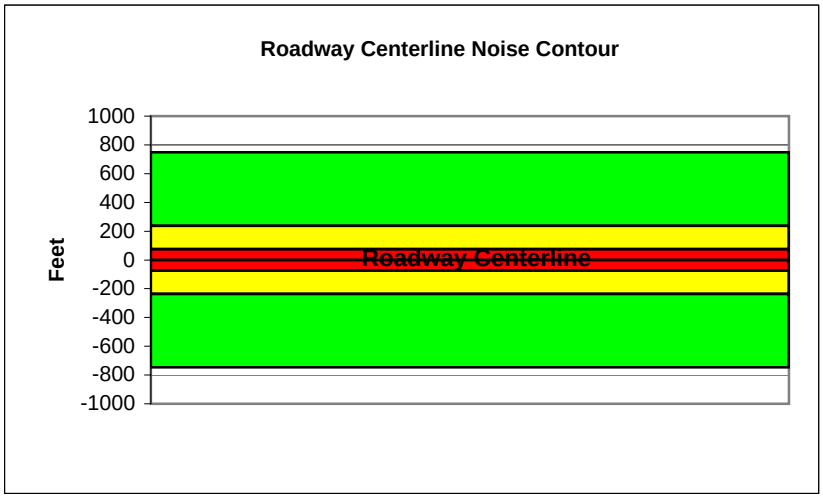
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.8	65.5	63.8	57.7	66.3	66.9
Medium Trucks:	65.0	57.0	50.6	49.0	57.5	57.7
Heavy Trucks:	69.6	57.6	48.6	49.8	59.3	59.5
Vehicle Noise:	**71.9**	**66.8**	**64.1**	**59.0**	**67.6**	**68.1**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	749
65 dBA	237
70 dBA	75
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Madison Avenue		
Road Segment:	Murrieta Hot Springs Road to Guava Street		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	3400
Peak Hour Traffic:	**340**
Vehicle Speed:	25
Centerline Separation:	8.7

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

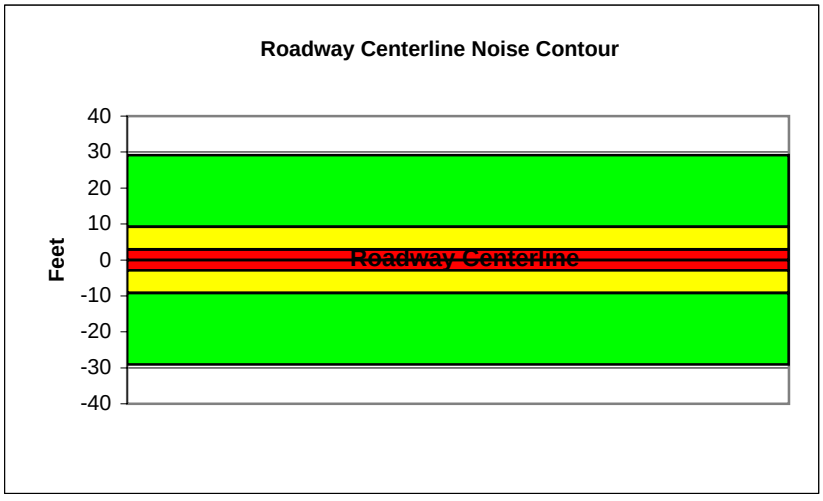
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	41.4	50.2	48.4	42.3	51.0	51.6
Medium Trucks:	53.1	45.0	38.6	37.0	45.5	45.8
Heavy Trucks:	59.2	47.3	38.2	39.4	49.8	50.0
Vehicle Noise:	**61.9**	**53.4**	**49.4**	**45.6**	**54.1**	**54.5**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	29
65 dBA	9
70 dBA	3
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Jackson Avenue		
Road Segment:	North of Nutmeg Street		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	7100
Peak Hour Traffic:	**710**
Vehicle Speed:	40
Centerline Separation:	26.7

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

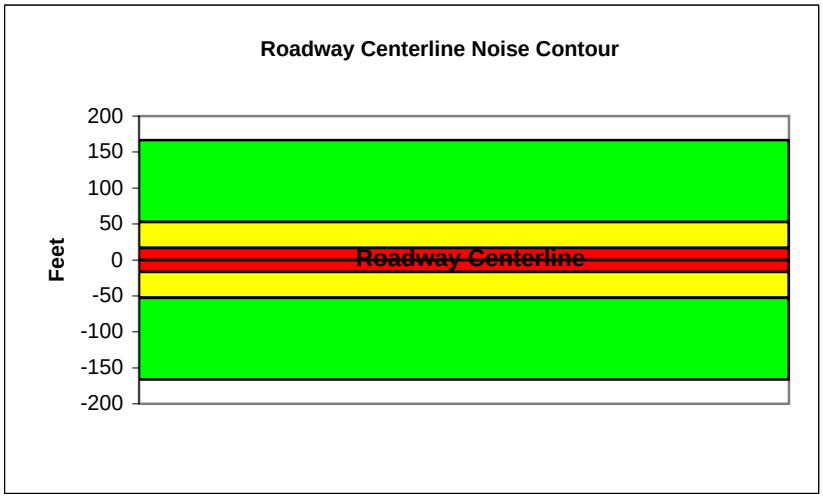
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	50.2	58.9	57.1	51.1	59.7	60.3
Medium Trucks:	59.1	51.0	44.7	43.1	51.6	51.8
Heavy Trucks:	64.0	52.0	43.0	44.2	53.9	54.0
Vehicle Noise:	**66.3**	**60.5**	**57.6**	**52.6**	**61.2**	**61.7**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	167
65 dBA	53
70 dBA	17
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Jackson Avenue		
Road Segment:	Nutmeg Street to Monroe Avenue		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	14900
Peak Hour Traffic:	**1490**
Vehicle Speed:	40
Centerline Separation:	29.5

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

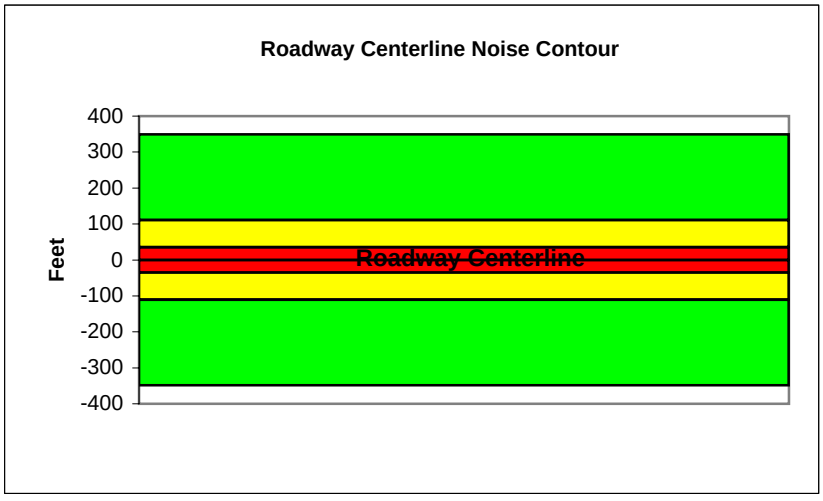
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	53.3	62.1	60.3	54.2	62.9	63.5
Medium Trucks:	62.3	54.2	47.8	46.3	54.7	55.0
Heavy Trucks:	67.1	55.2	46.1	47.4	57.1	57.2
Vehicle Noise:	**69.5**	**63.7**	**60.8**	**55.8**	**64.4**	**64.9**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	349
65 dBA	110
70 dBA	35
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Jackson Avenue		
Road Segment:	Monroe Avenue to California Oaks Road		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	14900
Peak Hour Traffic:	**1490**
Vehicle Speed:	40
Centerline Separation:	32.5

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

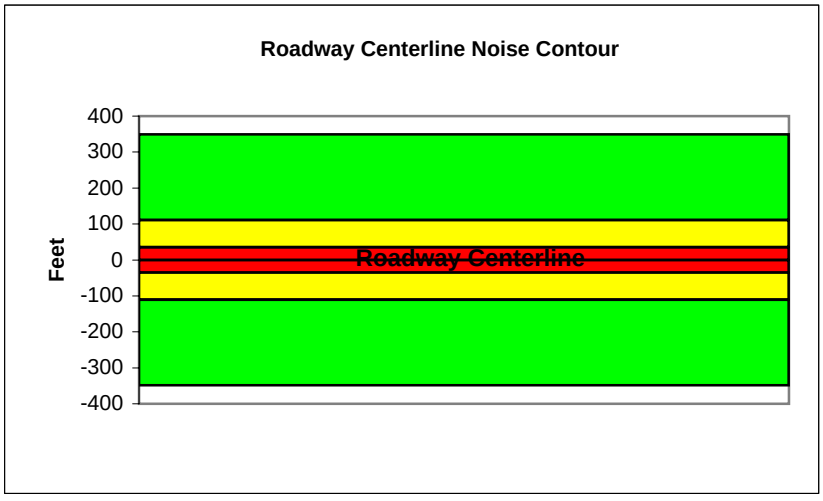
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	53.3	62.1	60.3	54.2	62.8	63.4
Medium Trucks:	62.2	54.2	47.8	46.2	54.7	54.9
Heavy Trucks:	67.1	55.1	46.1	47.3	57.0	57.1
Vehicle Noise:	**69.5**	**63.6**	**60.7**	**55.8**	**64.3**	**64.8**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	349
65 dBA	110
70 dBA	35
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Hancock Avenue		
Road Segment:	California Oaks Road Las Brisas Road		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	14700
Peak Hour Traffic:	**1470**
Vehicle Speed:	40
Centerline Separation:	35.1

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

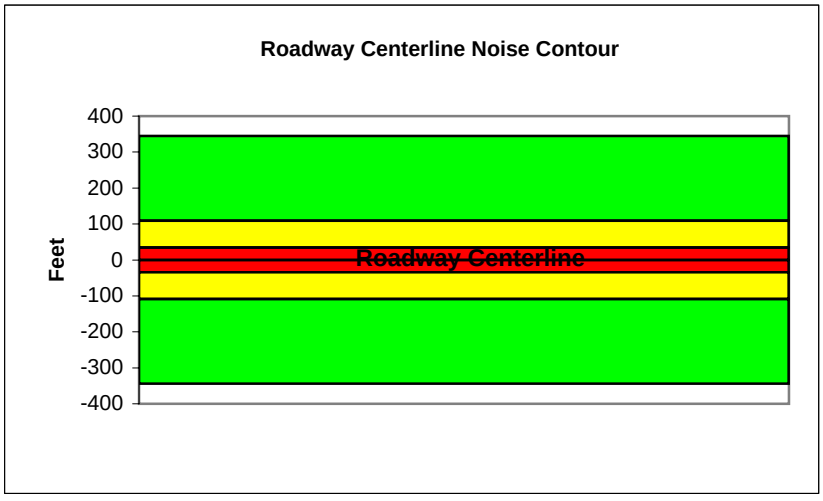
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	53.2	62.0	60.2	54.1	62.7	63.3
Medium Trucks:	62.1	54.1	47.7	46.1	54.6	54.8
Heavy Trucks:	67.0	55.0	46.0	47.2	56.9	57.0
Vehicle Noise:	**69.3**	**63.5**	**60.6**	**55.7**	**64.2**	**64.7**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	345
65 dBA	109
70 dBA	34
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Hancock Avenue		
Road Segment:	From Las Brisas Road to Los Alamos Road		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	19550
Peak Hour Traffic:	**1955**
Vehicle Speed:	40
Centerline Separation:	34

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

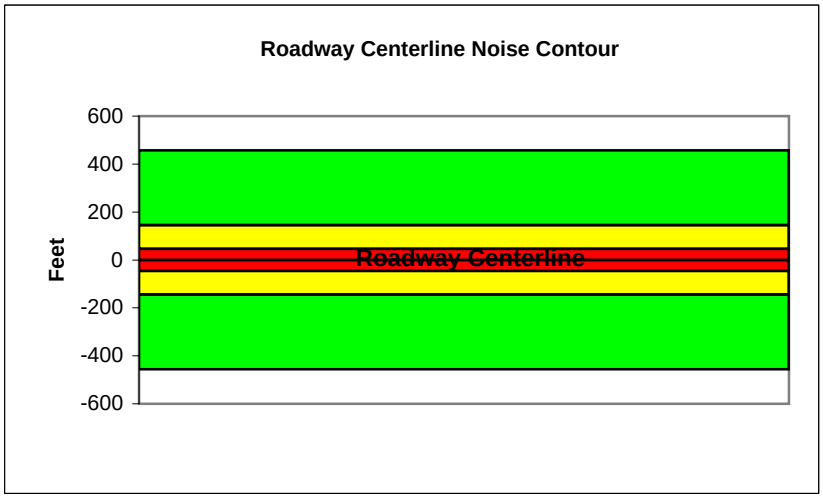
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	54.4	63.2	61.4	55.3	64.0	64.6
Medium Trucks:	63.4	55.3	48.9	47.4	55.8	56.1
Heavy Trucks:	68.2	56.3	47.2	48.5	58.2	58.3
Vehicle Noise:	**70.6**	**64.8**	**61.9**	**56.9**	**65.5**	**66.0**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	458
65 dBA	145
70 dBA	46
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Hancock Avenue		
Road Segment:	From Los Alamos Road to Murrieta Hot Springs Road		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	19500
Peak Hour Traffic:	**1950**
Vehicle Speed:	40
Centerline Separation:	34.6

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

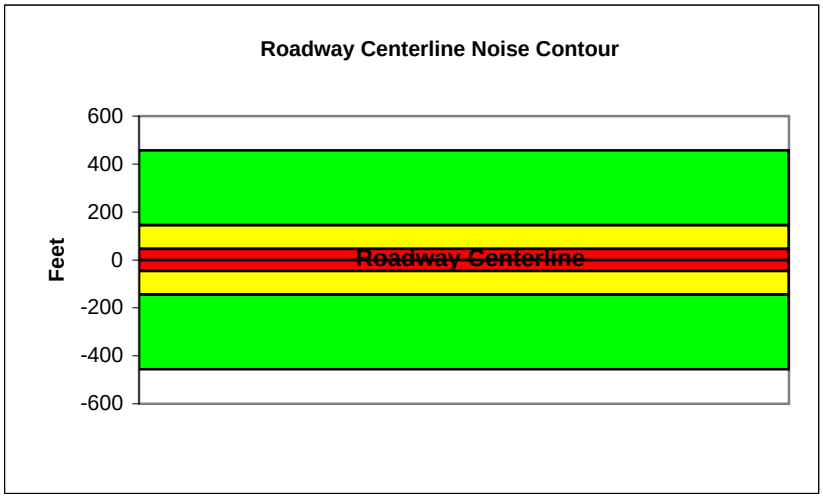
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	54.4	63.2	61.4	55.3	64.0	64.6
Medium Trucks:	63.4	55.3	48.9	47.3	55.8	56.1
Heavy Trucks:	68.2	56.3	47.2	48.4	58.1	58.3
Vehicle Noise:	**70.6**	**64.8**	**61.8**	**56.9**	**65.5**	**66.0**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	457
65 dBA	144
70 dBA	46
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	I-15		
Road Segment:	From City Boundary to Nutmeg Street		

PROJECT DATA		SITE DATA	
Centerline Dist to Barrier	**0**	Road Grade:	0
Barrier (0=wall, 1= berm):	**0**	Average Daily Traffic:	124000
Receiver Barrier Dist:	**0**	Peak Hour Traffic:	**12400**
Centerline Dist. To Observer:	**100**	Vehicle Speed:	70
Barrier Near Lane CL Dist:	**0**	Centerline Separation:	132
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View: **90**	Lft View: **-90**		

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

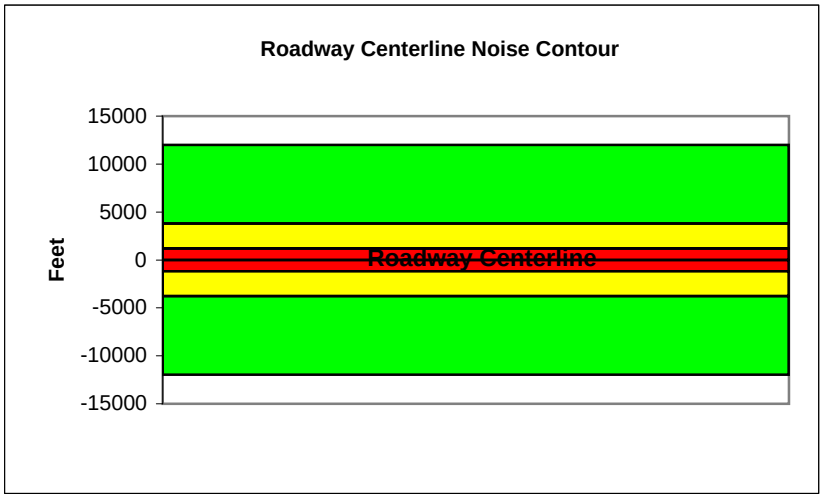
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.3	77.0	75.3	69.2	77.8	78.4
Medium Trucks:	74.0	65.9	59.6	58.0	66.5	66.7
Heavy Trucks:	77.3	65.4	56.3	57.5	66.4	66.6
Vehicle Noise:	**79.7**	**77.7**	**75.4**	**69.8**	**78.4**	**79.0**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	11989
65 dBA	3791
70 dBA	1199
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	I-15		
Road Segment:	From Nutmeg Street to Kalmia Street		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	124000
Peak Hour Traffic:	**12400**
Vehicle Speed:	70
Centerline Separation:	132

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

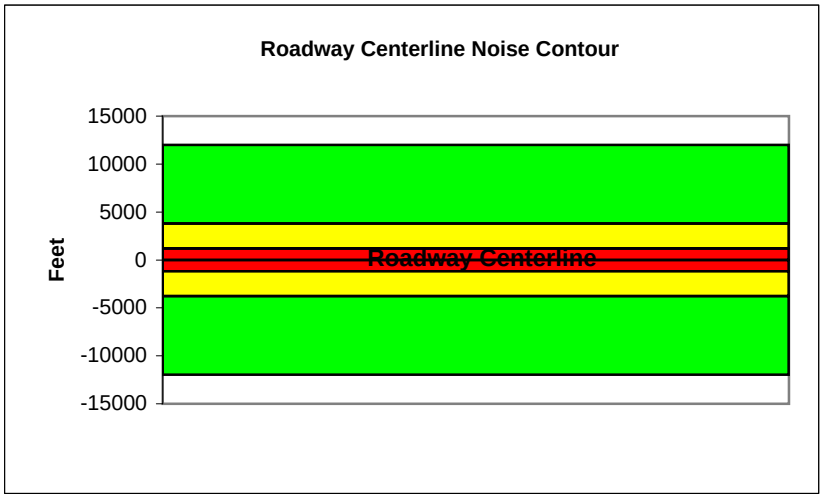
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.3	77.0	75.3	69.2	77.8	78.4
Medium Trucks:	74.0	65.9	59.6	58.0	66.5	66.7
Heavy Trucks:	77.3	65.4	56.3	57.5	66.4	66.6
Vehicle Noise:	**79.7**	**77.7**	**75.4**	**69.8**	**78.4**	**79.0**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	11989
65 dBA	3791
70 dBA	1199
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	I-15		
Road Segment:	From Kalmia Street to Los Alamos Road		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	127000
Peak Hour Traffic:	**12700**
Vehicle Speed:	70
Centerline Separation:	132

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

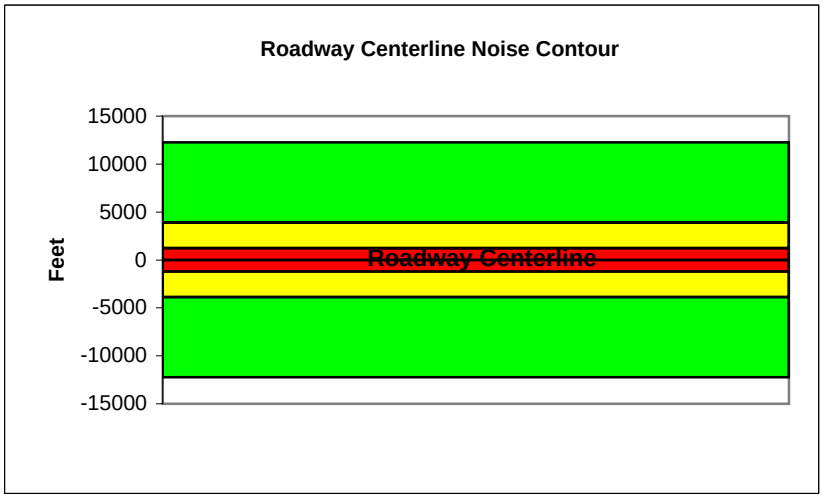
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.4	77.1	75.4	69.3	77.9	78.5
Medium Trucks:	74.1	66.0	59.7	58.1	66.6	66.8
Heavy Trucks:	77.4	65.5	56.4	57.6	66.5	66.7
Vehicle Noise:	**79.8**	**77.8**	**75.5**	**69.9**	**78.5**	**79.1**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	12268
65 dBA	3879
70 dBA	1227
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	I-15		
Road Segment:	From Los Alamos Road to I-215		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	127000
Peak Hour Traffic:	**12700**
Vehicle Speed:	70
Centerline Separation:	132

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

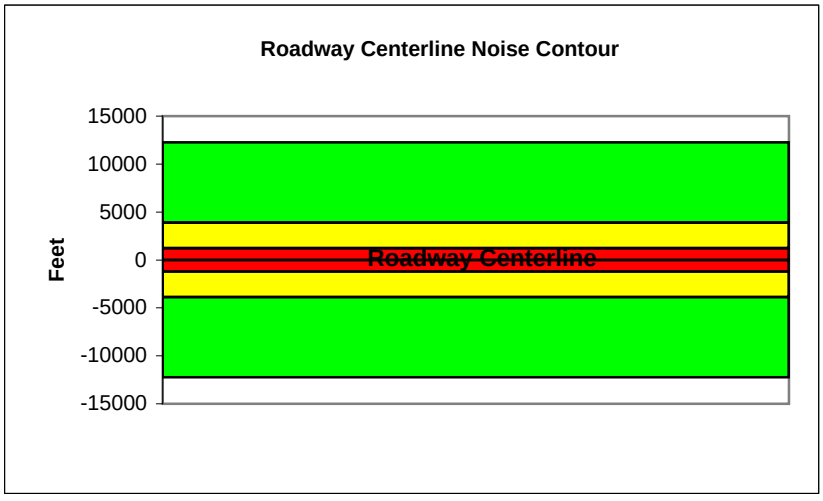
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.4	77.1	75.4	69.3	77.9	78.5
Medium Trucks:	74.1	66.0	59.7	58.1	66.6	66.8
Heavy Trucks:	77.4	65.5	56.4	57.6	66.5	66.7
Vehicle Noise:	**79.8**	**77.8**	**75.5**	**69.9**	**78.5**	**79.1**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	12268
65 dBA	3879
70 dBA	1227
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	I-15		
Road Segment:	From I-215 to Cherry Street		

PROJECT DATA		SITE DATA	
Centerline Dist to Barrier	**0**	Road Grade:	0
Barrier (0=wall, 1= berm):	**0**	Average Daily Traffic:	186,000
Receiver Barrier Dist:	**0**	Peak Hour Traffic:	**18600**
Centerline Dist. To Observer:	**100**	Vehicle Speed:	70
Barrier Near Lane CL Dist:	**0**	Centerline Separation:	122.2
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View: **90**	Lft View: **-90**		

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

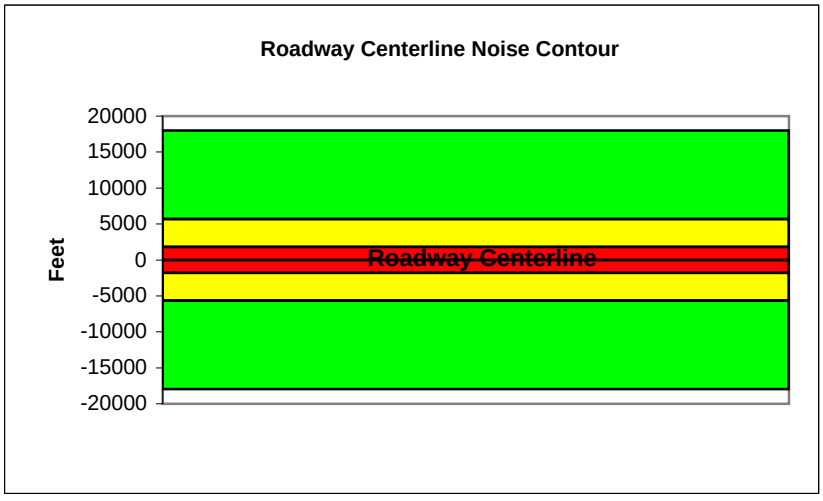
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.1	78.9	77.1	71.0	79.7	80.3
Medium Trucks:	75.9	67.8	61.4	59.8	68.3	68.6
Heavy Trucks:	79.2	67.2	58.2	59.4	68.3	68.4
Vehicle Noise:	**81.5**	**79.5**	**77.3**	**71.6**	**80.3**	**80.8**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	18005
65 dBA	5694
70 dBA	1801
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	I-215		
Road Segment:	From Scott Road to Los Alamos Road		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	89,000
Peak Hour Traffic:	**8900**
Vehicle Speed:	65
Centerline Separation:	71.9

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

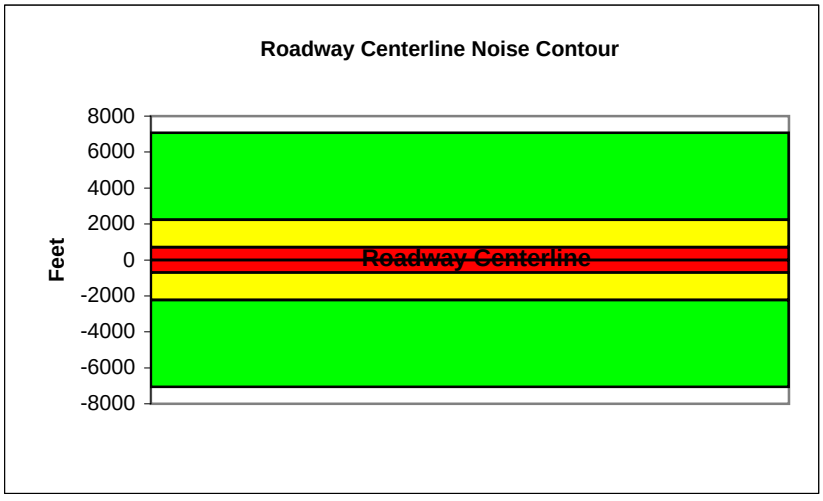
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.5	75.3	73.5	67.5	76.1	76.7
Medium Trucks:	72.7	64.6	58.3	56.7	65.2	65.4
Heavy Trucks:	76.2	64.3	55.2	56.4	65.5	65.6
Vehicle Noise:	**78.5**	**76.0**	**73.7**	**68.2**	**76.8**	**77.3**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	7074
65 dBA	2237
70 dBA	707
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	I-215		
Road Segment:	From Los Alamos Road to Murrieta Hot Springs Road		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**
Rt View: **90**	Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	91,000
Peak Hour Traffic:	**9100**
Vehicle Speed:	70
Centerline Separation:	67.2

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

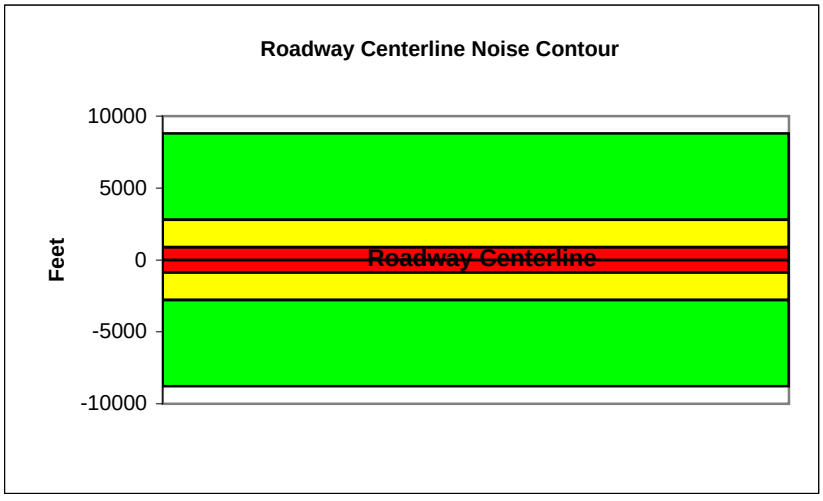
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.6	76.4	74.6	68.5	77.2	77.8
Medium Trucks:	73.4	65.3	58.9	57.3	65.8	66.1
Heavy Trucks:	76.7	64.7	55.7	56.9	65.8	65.9
Vehicle Noise:	**79.0**	**77.0**	**74.8**	**69.2**	**77.8**	**78.3**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	8803
65 dBA	2784
70 dBA	880
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Existing
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	I-215		
Road Segment:	From Murrieta Hot Springs Road to I-15 Merge		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	83,000
Peak Hour Traffic:	**8300**
Vehicle Speed:	70
Centerline Separation:	70.9

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

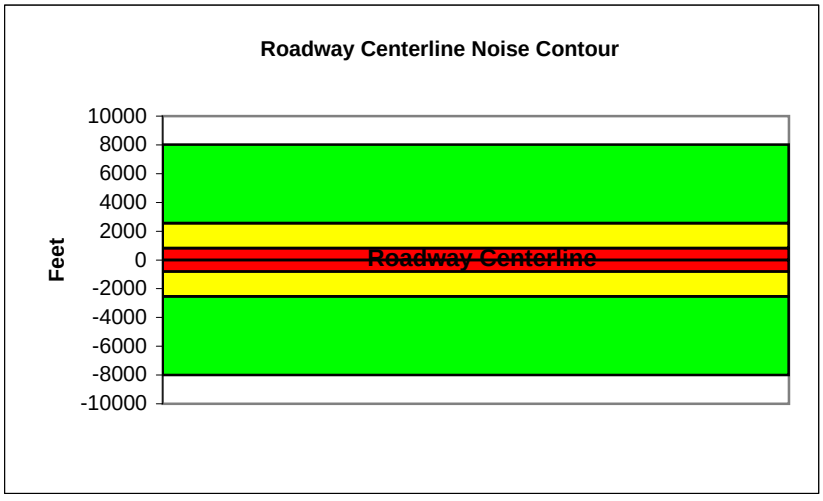
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.2	76.0	74.2	68.1	76.7	77.3
Medium Trucks:	72.9	64.9	58.5	56.9	65.4	65.6
Heavy Trucks:	76.2	64.3	55.2	56.4	65.4	65.5
Vehicle Noise:	**78.6**	**76.6**	**74.3**	**68.7**	**77.3**	**77.9**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	8024
65 dBA	2537
70 dBA	802
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Clinton Keith Road		
Road Segment:	Southwestern City Limits to Calle del Oso Oro		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	33600
Peak Hour Traffic:	**3360**
Vehicle Speed:	45
Centerline Separation:	35.5

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

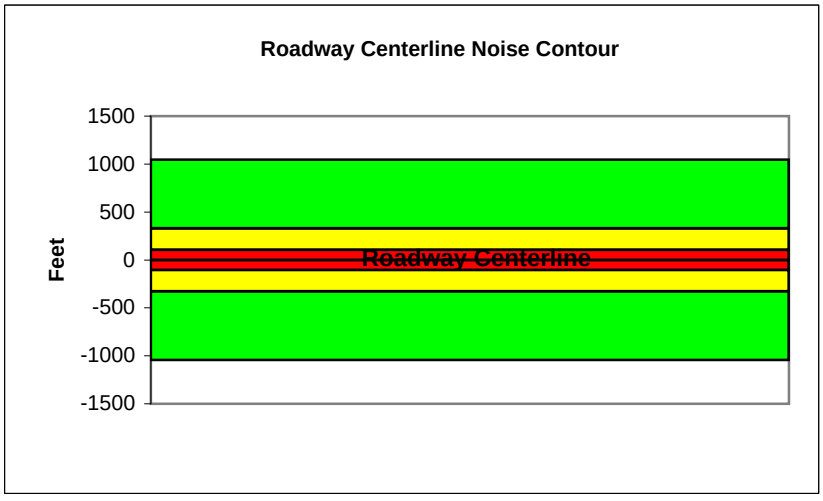
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	58.2	67.0	65.2	59.1	67.8	68.4
Medium Trucks:	66.5	58.4	52.1	50.5	59.0	59.2
Heavy Trucks:	71.0	59.1	50.0	51.3	60.8	60.9
Vehicle Noise:	**73.4**	**68.3**	**65.6**	**60.4**	**69.0**	**69.5**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	1045
65 dBA	330
70 dBA	104
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Clinton Keith Road		
Road Segment:	Calle del Oso Oro to Grand Avenue		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	25,600
Peak Hour Traffic:	**2560**
Vehicle Speed:	50
Centerline Separation:	34

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

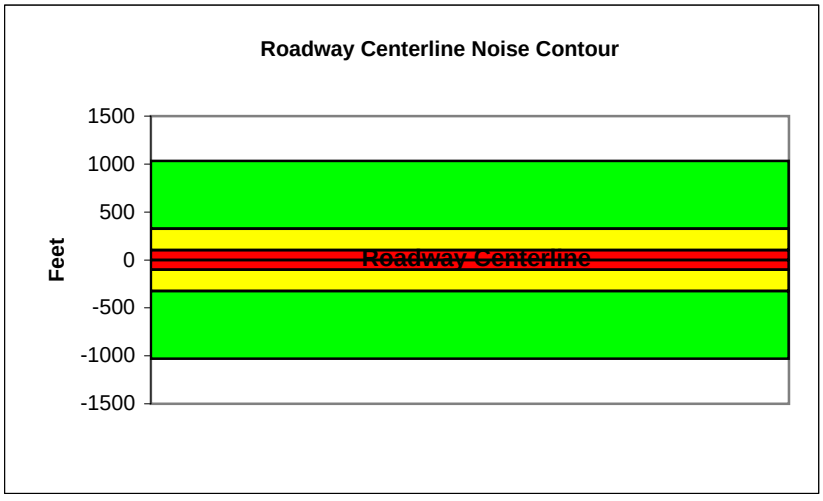
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	58.4	67.2	65.4	59.3	68.0	68.6
Medium Trucks:	66.1	58.0	51.6	50.0	58.5	58.8
Heavy Trucks:	70.3	58.4	49.3	50.5	59.9	60.0
Vehicle Noise:	**72.6**	**68.3**	**65.7**	**60.4**	**69.0**	**69.5**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	1034
65 dBA	327
70 dBA	103
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Clinton Keith Road		
Road Segment:	Western City Limits to Nutmeg		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	56,000
Peak Hour Traffic:	**5600**
Vehicle Speed:	45
Centerline Separation:	36.5

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

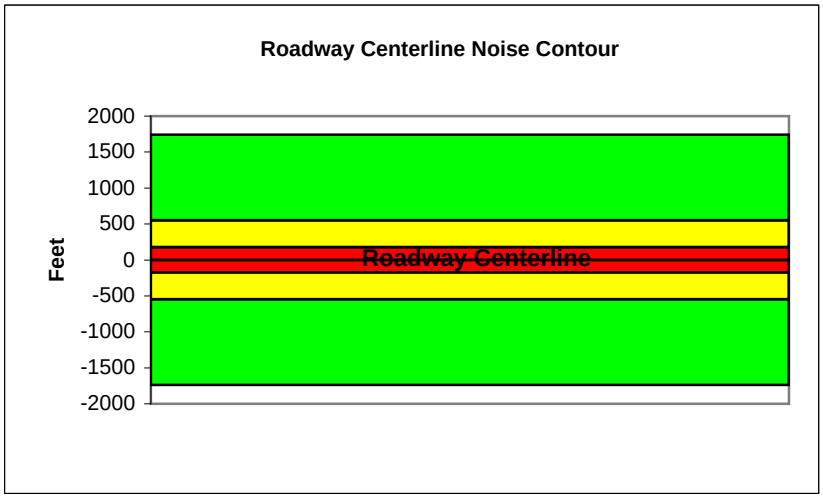
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	60.4	69.2	67.4	61.3	70.0	70.6
Medium Trucks:	68.7	60.6	54.3	52.7	61.2	61.4
Heavy Trucks:	73.2	61.3	52.2	53.5	63.0	63.1
Vehicle Noise:	**75.6**	**70.5**	**67.8**	**62.6**	**71.2**	**71.7**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	1740
65 dBA	550
70 dBA	174
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Clinton Keith Road		
Road Segment:	Nutmeg to Murrieta Oaks		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	82,900
Peak Hour Traffic:	**8290**
Vehicle Speed:	45
Centerline Separation:	36.5

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

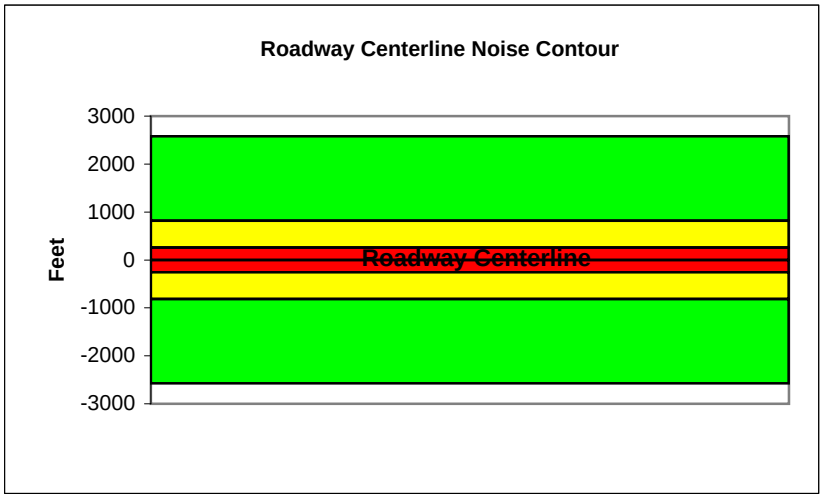
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.1	70.9	69.1	63.0	71.7	72.3
Medium Trucks:	70.4	62.3	56.0	54.4	62.9	63.1
Heavy Trucks:	74.9	63.0	53.9	55.2	64.7	64.8
Vehicle Noise:	**77.3**	**72.2**	**69.5**	**64.3**	**72.9**	**73.4**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	2580
65 dBA	816
70 dBA	258
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Clinton Keith Road		
Road Segment:	Murrieta Oaks to I-215		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	79,000
Peak Hour Traffic:	**7900**
Vehicle Speed:	45
Centerline Separation:	32.5

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

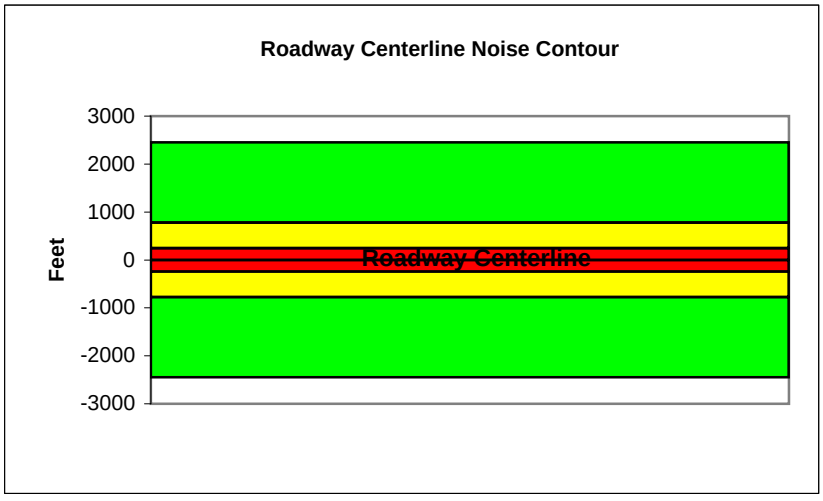
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.0	70.8	69.0	62.9	71.6	72.2
Medium Trucks:	70.3	62.2	55.8	54.2	62.7	63.0
Heavy Trucks:	74.8	62.9	53.8	55.0	64.6	64.7
Vehicle Noise:	**77.1**	**72.1**	**69.4**	**64.2**	**72.8**	**73.3**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	2455
65 dBA	776
70 dBA	246
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Clinton Keith Road		
Road Segment:	I-215 to Antelope Road		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	70,200
Peak Hour Traffic:	**7020**
Vehicle Speed:	35
Centerline Separation:	36.3

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

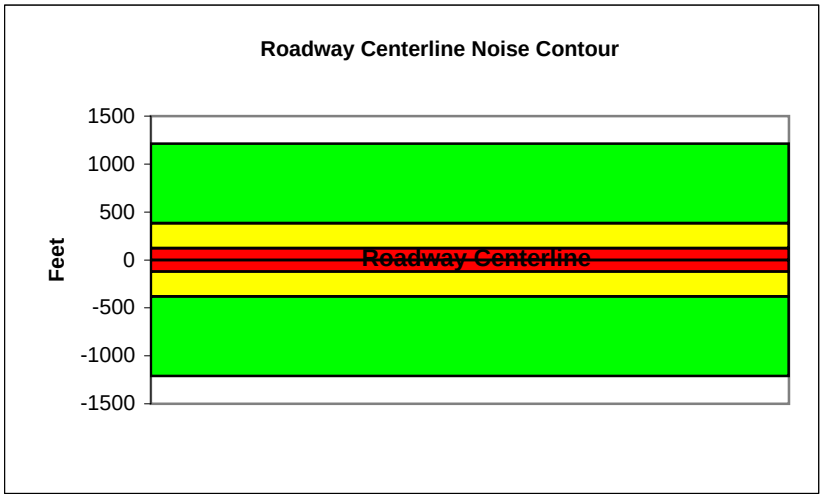
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	58.3	67.1	65.3	59.2	67.8	68.4
Medium Trucks:	68.0	59.9	53.5	52.0	60.5	60.7
Heavy Trucks:	73.2	61.3	52.2	53.4	63.3	63.5
Vehicle Noise:	**75.6**	**69.0**	**65.8**	**61.1**	**69.7**	**70.2**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	1211
65 dBA	383
70 dBA	121
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Clinton Keith Road		
Road Segment:	Antelope Road to Whitewood Lane/Meadowlark Road		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	60,700
Peak Hour Traffic:	**6070**
Vehicle Speed:	35
Centerline Separation:	35.3

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

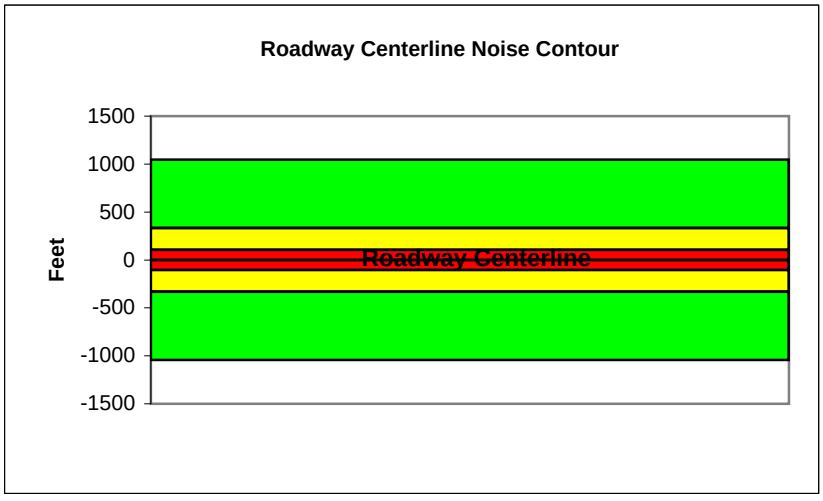
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.7	66.4	64.7	58.6	67.2	67.8
Medium Trucks:	67.4	59.3	52.9	51.4	59.8	60.1
Heavy Trucks:	72.6	60.7	51.6	52.8	62.7	62.9
Vehicle Noise:	**75.0**	**68.4**	**65.2**	**60.5**	**69.1**	**69.5**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	1046
65 dBA	331
70 dBA	105
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Calle Del Oso Oro		
Road Segment:	Clinton Keith to Calle Cipres		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	10200
Peak Hour Traffic:	**1020**
Vehicle Speed:	40
Centerline Separation:	32.3

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

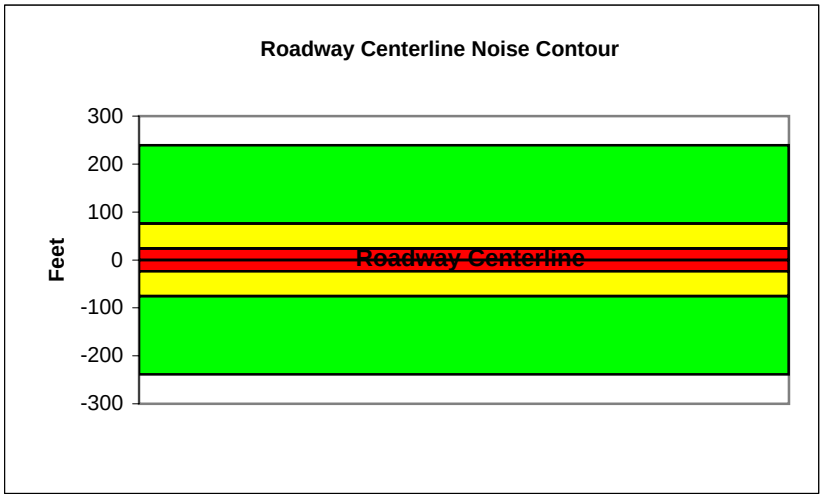
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	51.6	60.4	58.6	52.5	61.2	61.8
Medium Trucks:	60.6	52.5	46.1	44.6	53.1	53.3
Heavy Trucks:	65.4	53.5	44.4	45.7	55.4	55.5
Vehicle Noise:	**67.8**	**62.0**	**59.1**	**54.1**	**62.7**	**63.2**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	239
65 dBA	76
70 dBA	24
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Calle Del Oso Oro		
Road Segment:	Calle Cipres to Washington Avenue		

PROJECT DATA

Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	19,800
Peak Hour Traffic:	**1980**
Vehicle Speed:	40
Centerline Separation:	32.5

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

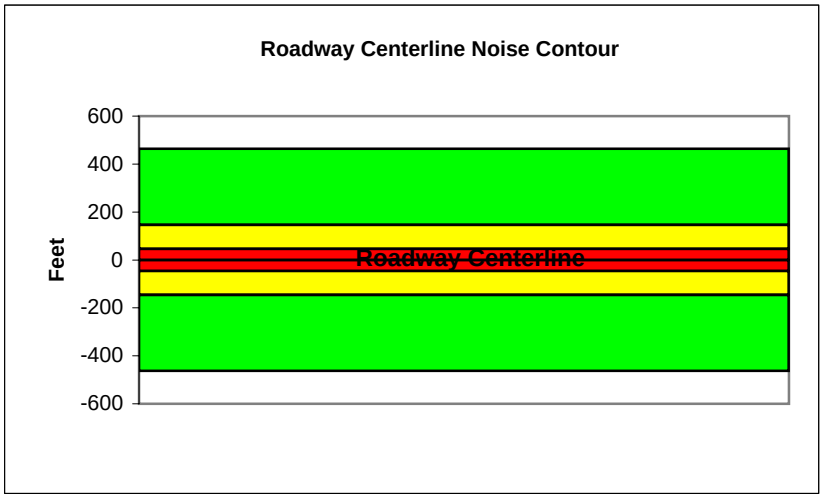
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	54.5	63.3	61.5	55.4	64.1	64.7
Medium Trucks:	63.5	55.4	49.0	47.4	55.9	56.2
Heavy Trucks:	68.3	56.4	47.3	48.5	58.2	58.4
Vehicle Noise:	**70.7**	**64.9**	**61.9**	**57.0**	**65.6**	**66.1**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	464
65 dBA	147
70 dBA	46
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Nutmeg Street		
Road Segment:	Washington Avenue to Adams Avenue		

PROJECT DATA

Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	12800
Peak Hour Traffic:	**1280**
Vehicle Speed:	40
Centerline Separation:	25.8

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

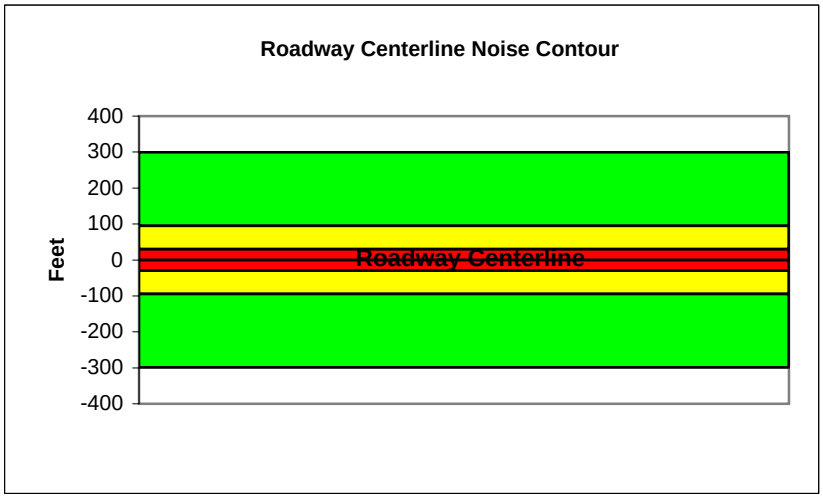
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	52.7	61.5	59.7	53.6	62.3	62.9
Medium Trucks:	61.7	53.6	47.2	45.7	54.1	54.4
Heavy Trucks:	66.5	54.6	45.5	46.8	56.5	56.6
Vehicle Noise:	**68.9**	**63.1**	**60.2**	**55.2**	**63.8**	**64.3**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	300
65 dBA	95
70 dBA	30
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Nutmeg Street		
Road Segment:	Adams Avenue to Jefferson Avenue		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	13200
Peak Hour Traffic:	**1320**
Vehicle Speed:	40
Centerline Separation:	34

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

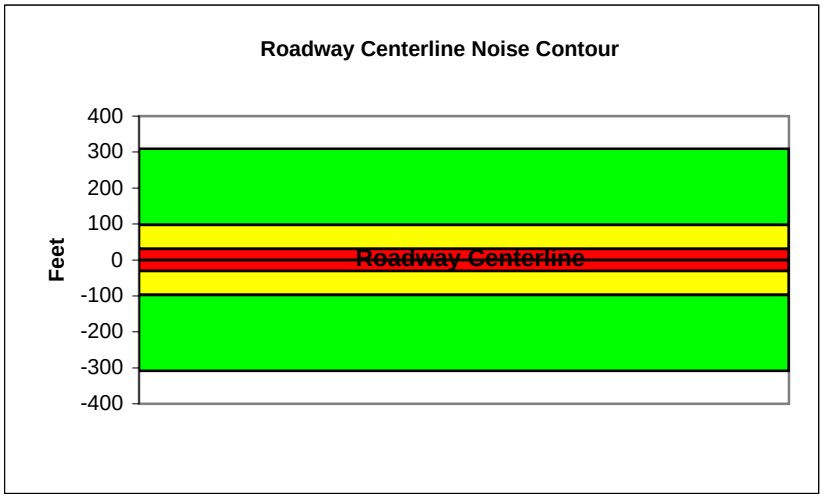
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	52.7	61.5	59.7	53.6	62.3	62.9
Medium Trucks:	61.7	53.6	47.2	45.7	54.1	54.4
Heavy Trucks:	66.5	54.6	45.5	46.8	56.5	56.6
Vehicle Noise:	**68.9**	**63.1**	**60.2**	**55.2**	**63.8**	**64.3**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	309
65 dBA	98
70 dBA	31
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Nutmeg Street		
Road Segment:	Jefferson Avenue to Jackson Avenue		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	14200
Peak Hour Traffic:	**1420**
Vehicle Speed:	40
Centerline Separation:	31

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

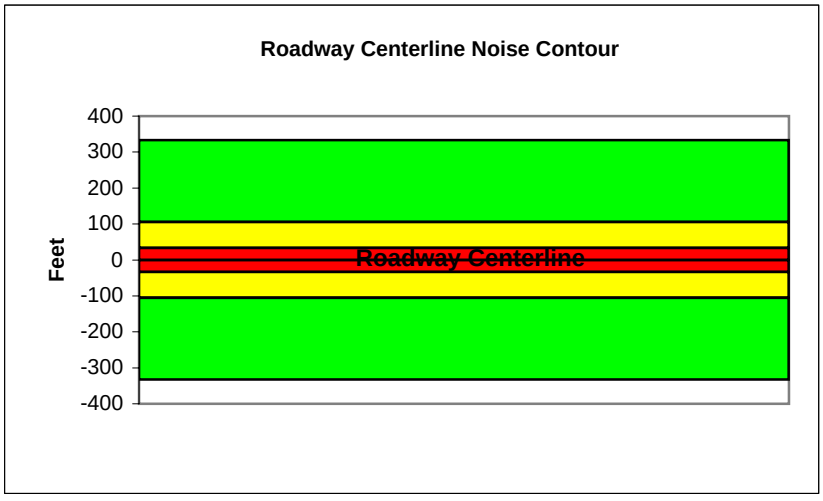
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	53.1	61.9	60.1	54.0	62.6	63.3
Medium Trucks:	62.0	54.0	47.6	46.0	54.5	54.7
Heavy Trucks:	66.9	55.0	45.9	47.1	56.8	57.0
Vehicle Noise:	**69.3**	**63.5**	**60.5**	**55.6**	**64.2**	**64.6**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	333
65 dBA	105
70 dBA	33
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Nutmeg Street		
Road Segment:	Jackson to Clinton Keith Road		

PROJECT DATA

Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	15,200
Peak Hour Traffic:	**1520**
Vehicle Speed:	45
Centerline Separation:	33.4

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

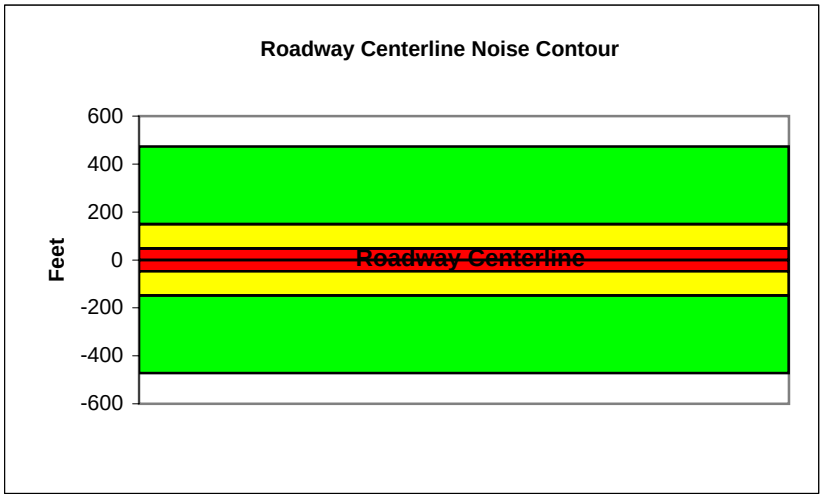
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	54.8	63.6	61.8	55.7	64.4	65.0
Medium Trucks:	63.1	55.0	48.6	47.1	55.6	55.8
Heavy Trucks:	67.6	55.7	46.6	47.8	57.4	57.5
Vehicle Noise:	**70.0**	**64.9**	**62.2**	**57.0**	**65.6**	**66.1**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	473
65 dBA	149
70 dBA	47
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Lemon Street		
Road Segment:	Washington Avenue to Adams Avenue		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	6300
Peak Hour Traffic:	**630**
Vehicle Speed:	40
Centerline Separation:	10

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

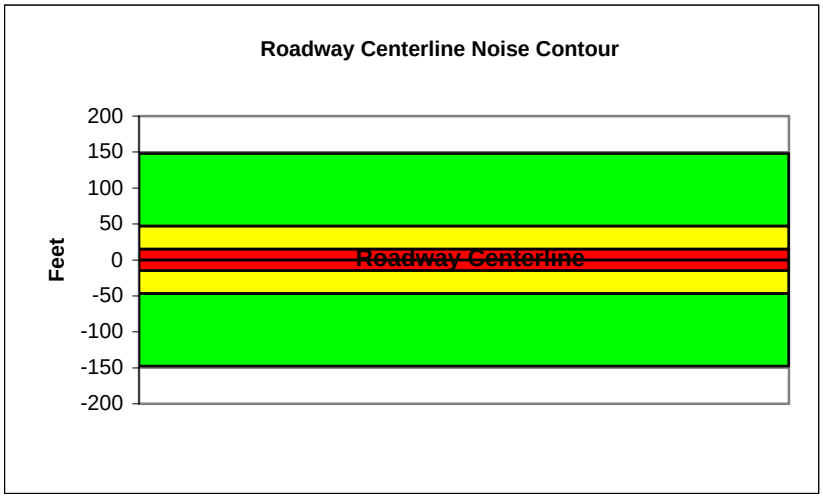
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	49.9	58.7	56.9	50.9	59.5	60.1
Medium Trucks:	58.9	50.8	44.4	42.9	51.4	51.6
Heavy Trucks:	63.7	51.8	42.7	44.0	53.7	53.8
Vehicle Noise:	**66.1**	**60.3**	**57.4**	**52.4**	**61.0**	**61.5**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	148
65 dBA	47
70 dBA	15
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Lemon Street		
Road Segment:	Adams Avenue to Jefferson Avenue		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	12100
Peak Hour Traffic:	**1210**
Vehicle Speed:	40
Centerline Separation:	10

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

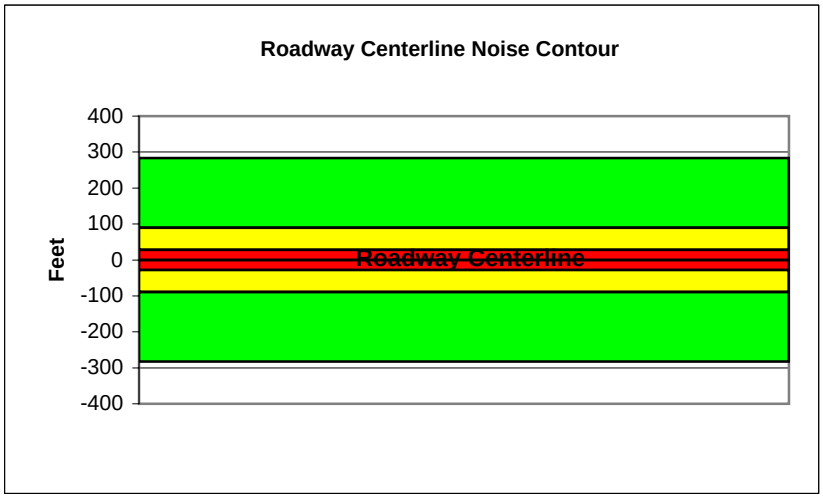
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	52.8	61.6	59.8	53.7	62.3	62.9
Medium Trucks:	61.7	53.7	47.3	45.7	54.2	54.4
Heavy Trucks:	66.6	54.6	45.6	46.8	56.5	56.6
Vehicle Noise:	**69.0**	**63.1**	**60.2**	**55.3**	**63.8**	**64.3**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	284
65 dBA	90
70 dBA	28
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Kalmia Street		
Road Segment:	Hayes Avenue to Washington Avenue		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	8200
Peak Hour Traffic:	**820**
Vehicle Speed:	40
Centerline Separation:	11.8

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

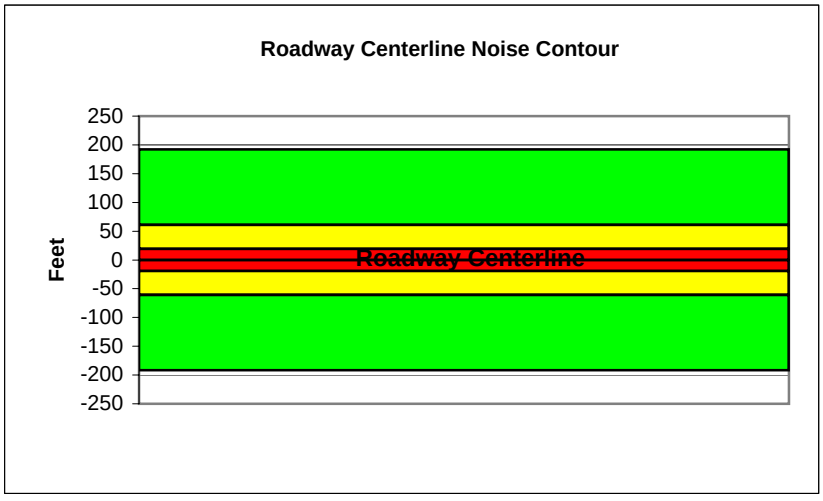
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	51.1	59.8	58.0	52.0	60.6	61.2
Medium Trucks:	60.0	51.9	45.6	44.0	52.5	52.7
Heavy Trucks:	64.9	52.9	43.9	45.1	54.8	54.9
Vehicle Noise:	**67.2**	**61.4**	**58.5**	**53.5**	**62.1**	**62.6**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	192
65 dBA	61
70 dBA	19
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Kalmia Street		
Road Segment:	Washington Avenue to Adams Avenue		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	18,800
Peak Hour Traffic:	**1880**
Vehicle Speed:	45
Centerline Separation:	26.5

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

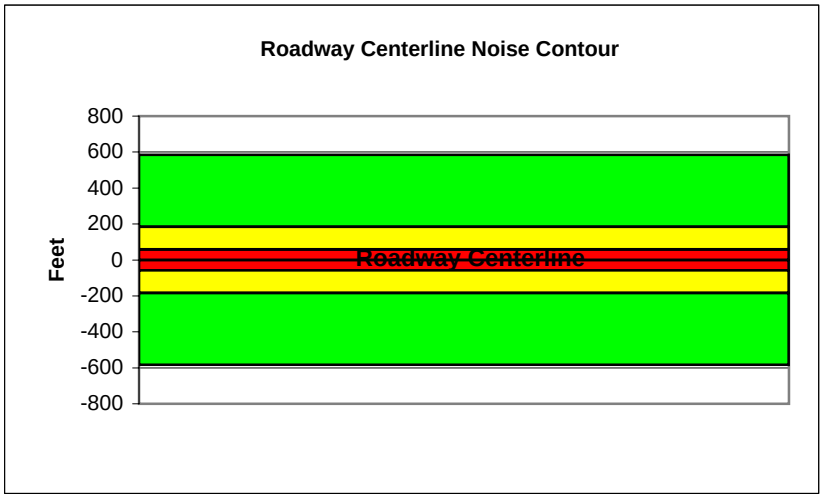
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	55.9	64.6	62.9	56.8	65.4	66.0
Medium Trucks:	64.1	56.1	49.7	48.1	56.6	56.8
Heavy Trucks:	68.7	56.7	47.7	48.9	58.4	58.6
Vehicle Noise:	**71.0**	**65.9**	**63.2**	**58.1**	**66.7**	**67.2**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	585
65 dBA	185
70 dBA	59
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Kalmia Street		
Road Segment:	Adams Avenue to Jefferson Avenue		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	28400
Peak Hour Traffic:	**2840**
Vehicle Speed:	45
Centerline Separation:	26.5

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

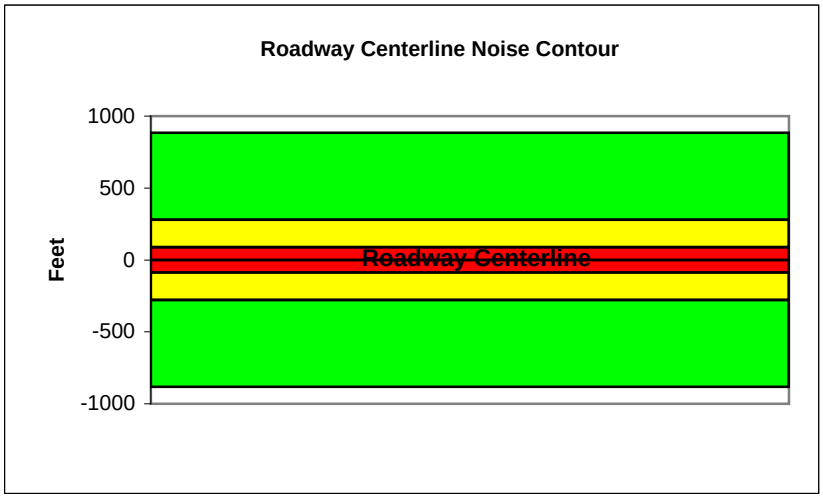
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.7	66.4	64.6	58.6	67.2	67.8
Medium Trucks:	65.9	57.9	51.5	49.9	58.4	58.6
Heavy Trucks:	70.4	58.5	49.5	50.7	60.2	60.3
Vehicle Noise:	**72.8**	**67.7**	**65.0**	**59.9**	**68.5**	**69.0**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	883
65 dBA	279
70 dBA	88
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Kalmia Street		
Road Segment:	Jefferson Avenue to Madison Avenue		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	49,300
Peak Hour Traffic:	**4930**
Vehicle Speed:	45
Centerline Separation:	37

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

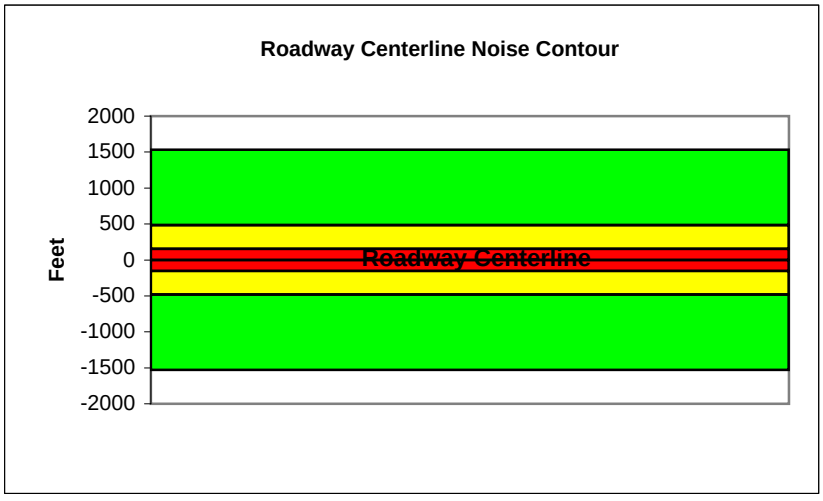
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.9	68.7	66.9	60.8	69.4	70.0
Medium Trucks:	68.2	60.1	53.7	52.1	60.6	60.8
Heavy Trucks:	72.7	60.7	51.7	52.9	62.4	62.6
Vehicle Noise:	**75.0**	**70.0**	**67.2**	**62.1**	**70.7**	**71.2**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	1532
65 dBA	485
70 dBA	153
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Kalmia Street		
Road Segment:	Madison Avenue to I-15		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	54,500
Peak Hour Traffic:	**5450**
Vehicle Speed:	45
Centerline Separation:	36.4

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

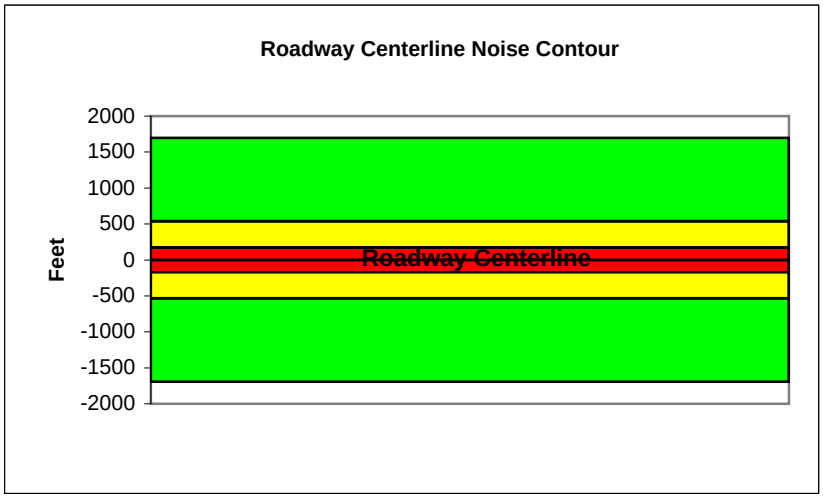
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	60.3	69.1	67.3	61.2	69.9	70.5
Medium Trucks:	68.6	60.5	54.1	52.6	61.1	61.3
Heavy Trucks:	73.1	61.2	52.1	53.3	62.9	63.0
Vehicle Noise:	**75.5**	**70.4**	**67.7**	**62.5**	**71.1**	**71.6**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	1696
65 dBA	536
70 dBA	170
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	California Oaks Road		
Road Segment:	I-15 to Monroe		

PROJECT DATA		SITE DATA	
Centerline Dist to Barrier	**0**	Road Grade:	0
Barrier (0=wall, 1= berm):	**0**	Average Daily Traffic:	54,500
Receiver Barrier Dist:	**0**	Peak Hour Traffic:	**5450**
Centerline Dist. To Observer:	**100**	Vehicle Speed:	45
Barrier Near Lane CL Dist:	**0**	Centerline Separation:	45
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View: **90**	Lft View: **-90**		

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

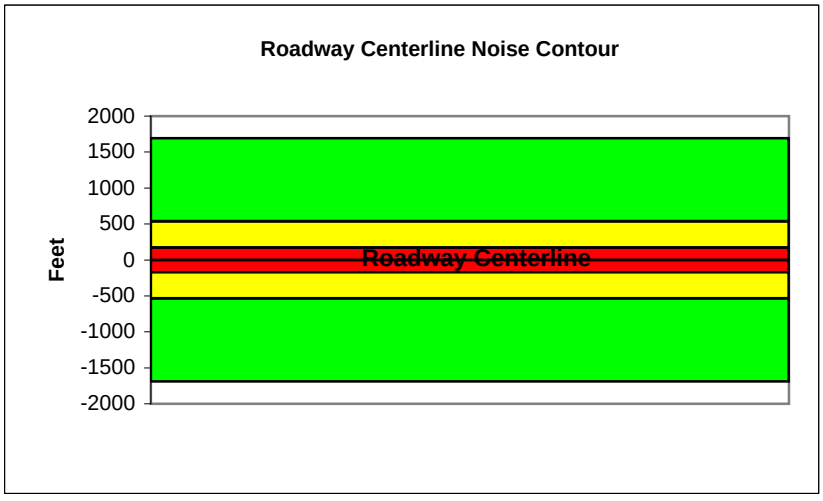
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	60.2	69.0	67.2	61.1	69.7	70.4
Medium Trucks:	68.5	60.4	54.0	52.4	60.9	61.2
Heavy Trucks:	73.0	61.0	52.0	53.2	62.8	62.9
Vehicle Noise:	**75.3**	**70.3**	**67.5**	**62.4**	**71.0**	**71.5**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	1693
65 dBA	535
70 dBA	169
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	California Oaks Road		
Road Segment:	Monroe Avenue to Jackson Avenue		

PROJECT DATA

Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	52,400
Peak Hour Traffic:	**5240**
Vehicle Speed:	45
Centerline Separation:	52

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

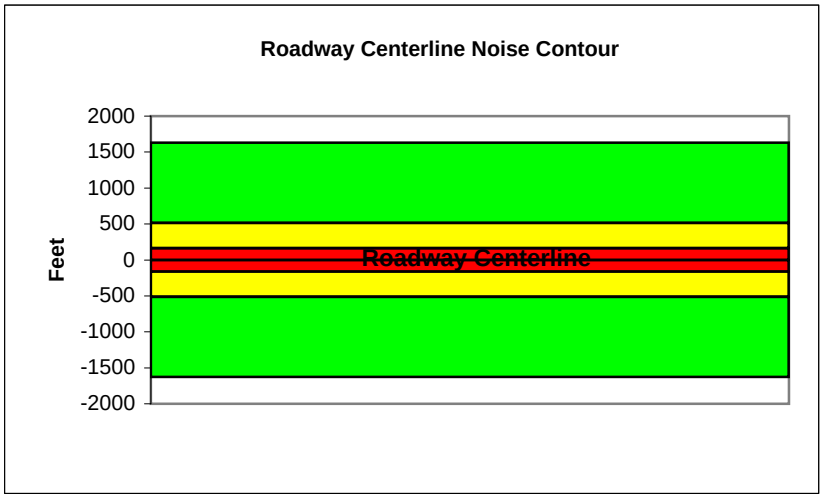
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.9	68.7	66.9	60.8	69.5	70.1
Medium Trucks:	68.2	60.1	53.7	52.2	60.7	60.9
Heavy Trucks:	72.7	60.8	51.7	52.9	62.5	62.6
Vehicle Noise:	**75.0**	**70.0**	**67.3**	**62.1**	**70.7**	**71.2**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	1629
65 dBA	515
70 dBA	163
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	California Oaks Road		
Road Segment:	Jackson Avenue to Hancock Avenue		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	31,700
Peak Hour Traffic:	**3170**
Vehicle Speed:	40
Centerline Separation:	36.2

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

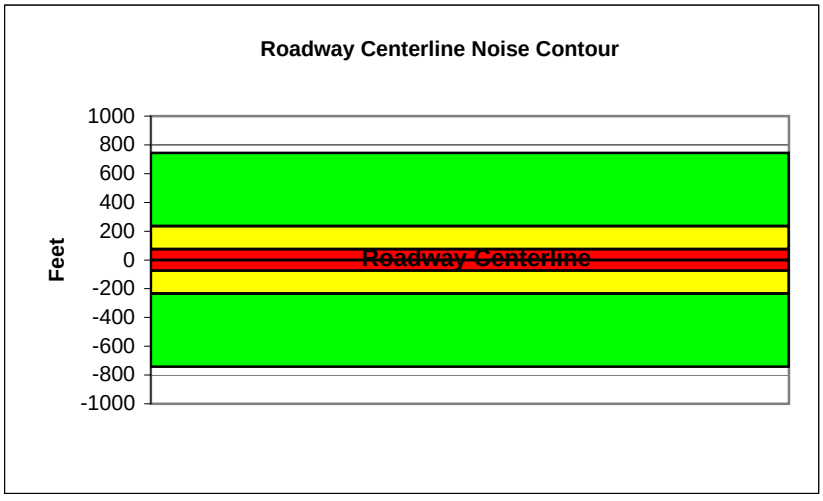
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.5	65.3	63.5	57.4	66.1	66.7
Medium Trucks:	65.4	57.4	51.0	49.4	57.9	58.1
Heavy Trucks:	70.3	58.4	49.3	50.5	60.2	60.4
Vehicle Noise:	**72.7**	**66.9**	**63.9**	**59.0**	**67.6**	**68.0**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	743
65 dBA	235
70 dBA	74
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	California Oaks Road		
Road Segment:	Hancock Avenue to Clinton Keith Road		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	25,800
Peak Hour Traffic:	**2580**
Vehicle Speed:	45
Centerline Separation:	35.4

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

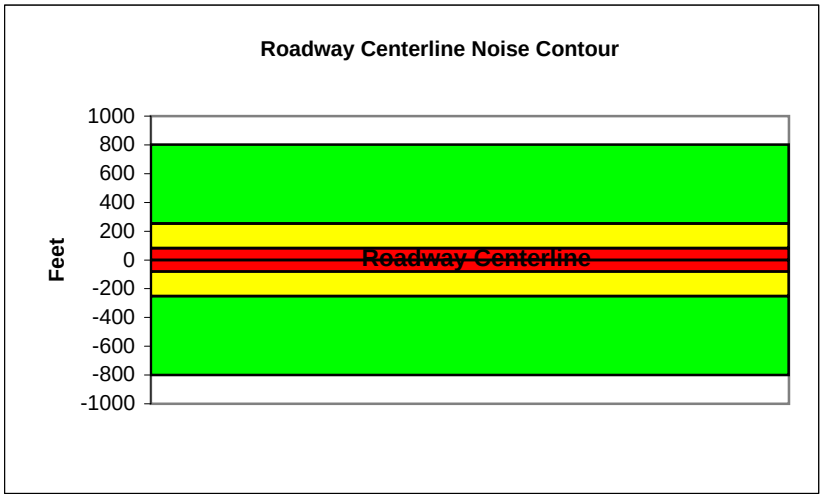
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.1	65.9	64.1	58.0	66.6	67.3
Medium Trucks:	65.4	57.3	50.9	49.3	57.8	58.1
Heavy Trucks:	69.9	57.9	48.9	50.1	59.7	59.8
Vehicle Noise:	**72.2**	**67.2**	**64.4**	**59.3**	**67.9**	**68.4**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	801
65 dBA	253
70 dBA	80
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Ivy Street		
Road Segment:	Hayes Street to Washington Avenue		

PROJECT DATA

Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	700
Peak Hour Traffic:	**70**
Vehicle Speed:	25
Centerline Separation:	10

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

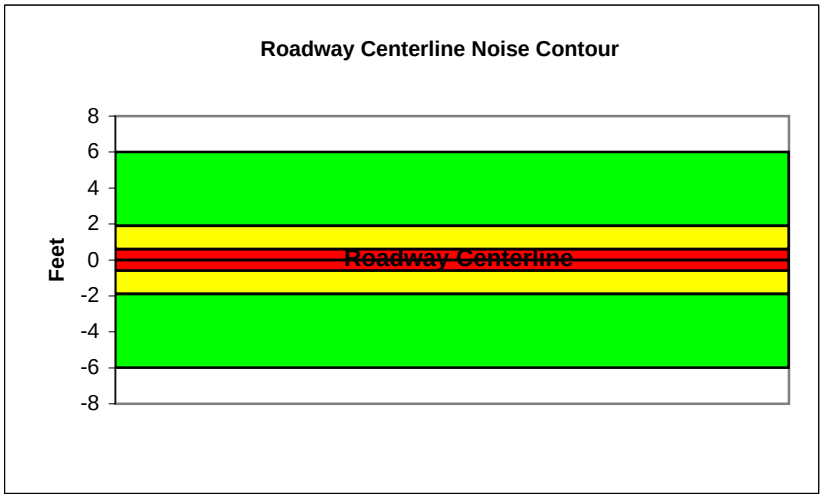
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	34.5	43.3	41.5	35.4	44.1	44.7
Medium Trucks:	46.2	38.1	31.7	30.1	38.6	38.9
Heavy Trucks:	52.3	40.4	31.3	32.5	42.9	43.1
Vehicle Noise:	**55.0**	**46.5**	**42.5**	**38.7**	**47.2**	**47.6**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	6
65 dBA	2
70 dBA	1
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Ivy Street		
Road Segment:	Washington Avenue to Adams Avenue		

PROJECT DATA

Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	8900
Peak Hour Traffic:	**890**
Vehicle Speed:	45
Centerline Separation:	26

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

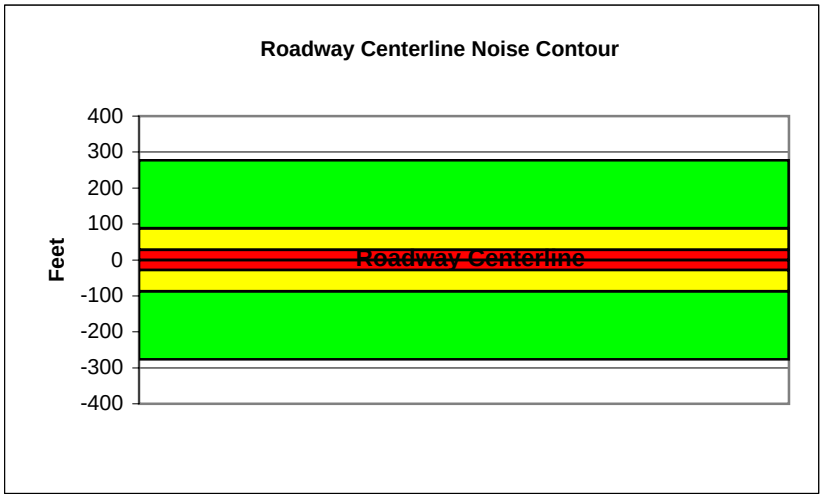
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	52.6	61.4	59.6	53.5	62.2	62.8
Medium Trucks:	60.9	52.8	46.4	44.9	53.4	53.6
Heavy Trucks:	65.4	53.5	44.4	45.6	55.2	55.3
Vehicle Noise:	**67.8**	**62.7**	**60.0**	**54.8**	**63.4**	**63.9**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	277
65 dBA	88
70 dBA	28
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Ivy Street		
Road Segment:	Adams Avenue to Jefferson Avenue		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	14100
Peak Hour Traffic:	**1410**
Vehicle Speed:	45
Centerline Separation:	25

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

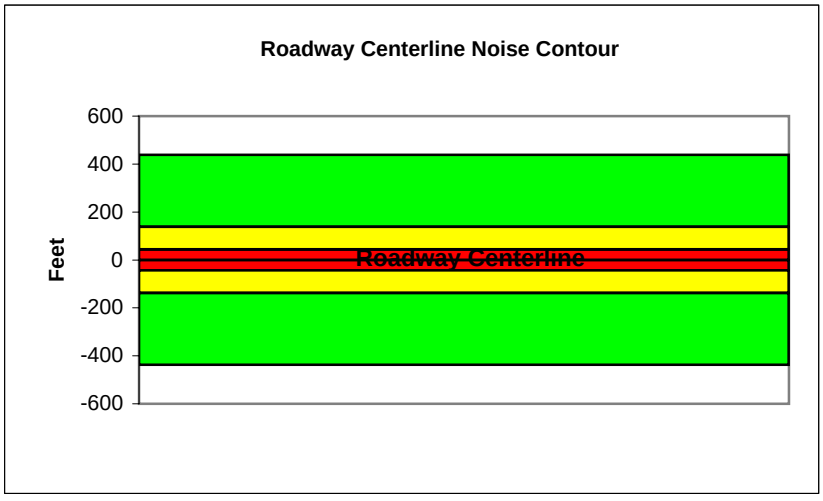
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	54.6	63.4	61.6	55.5	64.2	64.8
Medium Trucks:	62.9	54.8	48.5	46.9	55.4	55.6
Heavy Trucks:	67.4	55.5	46.4	47.7	57.2	57.3
Vehicle Noise:	**69.8**	**64.7**	**62.0**	**56.8**	**65.4**	**65.9**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	438
65 dBA	139
70 dBA	44
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Ivy Street		
Road Segment:	Jefferson Avenue to Madison Avenue		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	22600
Peak Hour Traffic:	**2260**
Vehicle Speed:	45
Centerline Separation:	34.8

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

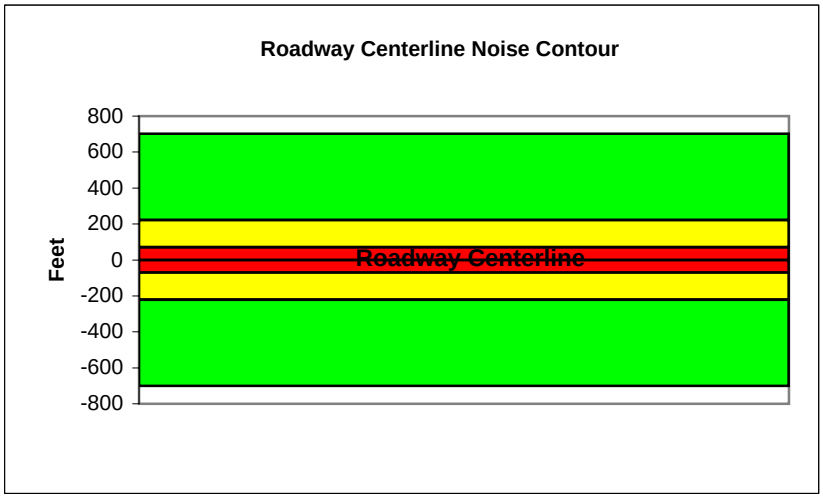
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.5	65.3	63.5	57.4	66.1	66.7
Medium Trucks:	64.8	56.7	50.3	48.8	57.3	57.5
Heavy Trucks:	69.3	57.4	48.3	49.5	59.1	59.2
Vehicle Noise:	**71.7**	**66.6**	**63.9**	**58.7**	**67.3**	**67.8**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	703
65 dBA	222
70 dBA	70
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Los Alamos Road		
Road Segment:	Madison Avenue to Lincoln Avenue		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	24700
Peak Hour Traffic:	**2470**
Vehicle Speed:	45
Centerline Separation:	33

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

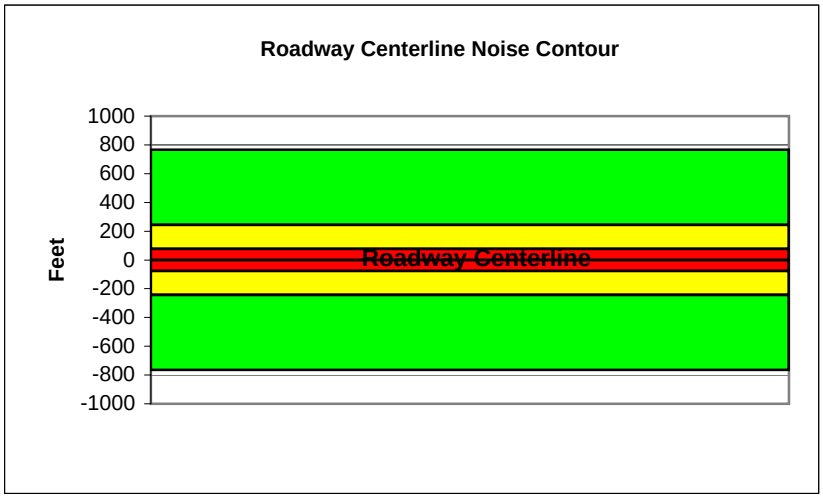
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.9	65.7	63.9	57.8	66.5	67.1
Medium Trucks:	65.2	57.1	50.8	49.2	57.7	57.9
Heavy Trucks:	69.7	57.8	48.7	50.0	59.5	59.6
Vehicle Noise:	**72.1**	**67.0**	**64.3**	**59.1**	**67.7**	**68.2**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	767
65 dBA	243
70 dBA	77
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Los Alamos Road		
Road Segment:	Lincoln Avenue to Hancock Avenue		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	35,100
Peak Hour Traffic:	**3510**
Vehicle Speed:	45
Centerline Separation:	38.8

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

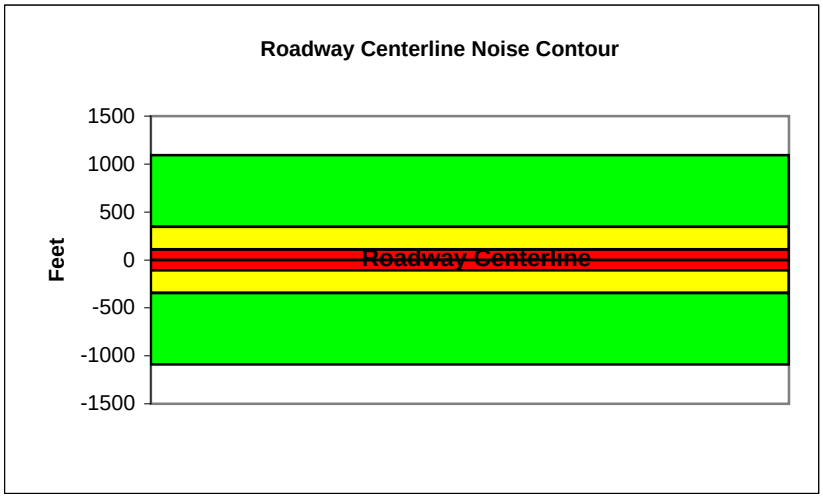
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	58.4	67.1	65.4	59.3	67.9	68.5
Medium Trucks:	66.6	58.6	52.2	50.6	59.1	59.3
Heavy Trucks:	71.2	59.2	50.2	51.4	60.9	61.1
Vehicle Noise:	**73.5**	**68.5**	**65.7**	**60.6**	**69.2**	**69.7**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	1092
65 dBA	345
70 dBA	109
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Los Alamos Road		
Road Segment:	Hancock Avenue to I-215		

PROJECT DATA

Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	53,600
Peak Hour Traffic:	**5360**
Vehicle Speed:	45
Centerline Separation:	38.2

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

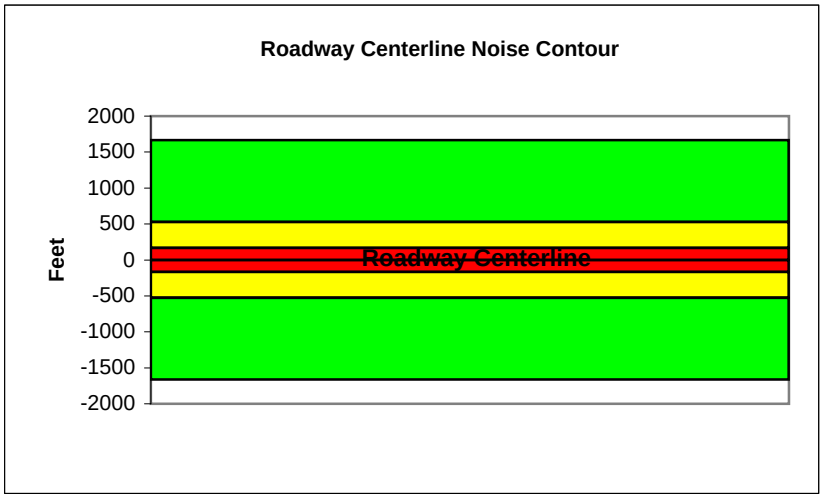
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	60.2	69.0	67.2	61.1	69.8	70.4
Medium Trucks:	68.5	60.4	54.0	52.5	61.0	61.2
Heavy Trucks:	73.0	61.1	52.0	53.2	62.8	62.9
Vehicle Noise:	**75.4**	**70.3**	**67.6**	**62.4**	**71.0**	**71.5**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	1668
65 dBA	528
70 dBA	167
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Los Alamos Road		
Road Segment:	I-215 to Whitewood Road		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	31,000
Peak Hour Traffic:	**3100**
Vehicle Speed:	40
Centerline Separation:	42

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

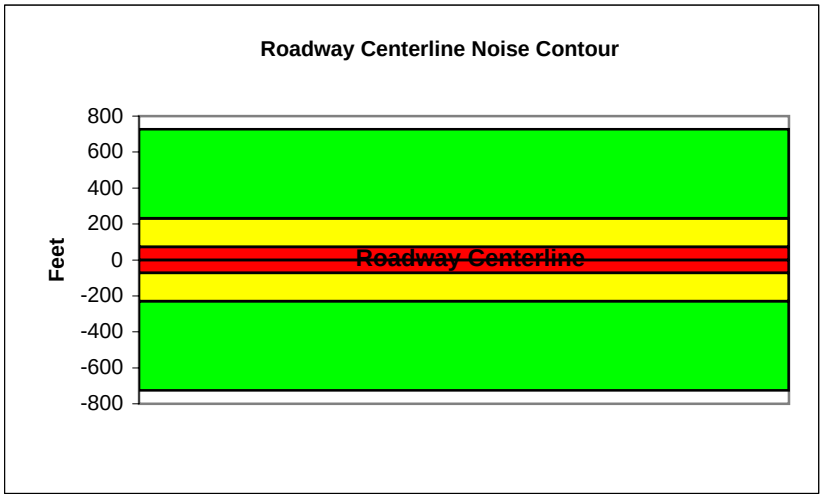
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.3	65.1	63.3	57.2	65.9	66.5
Medium Trucks:	65.3	57.2	50.8	49.2	57.7	58.0
Heavy Trucks:	70.1	58.2	49.1	50.3	60.0	60.2
Vehicle Noise:	**72.5**	**66.7**	**63.7**	**58.8**	**67.4**	**67.9**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	726
65 dBA	230
70 dBA	73
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Los Alamos Road		
Road Segment:	Whitewood Road to Ruth Ellen Way		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	3800
Peak Hour Traffic:	**380**
Vehicle Speed:	40
Centerline Separation:	10

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

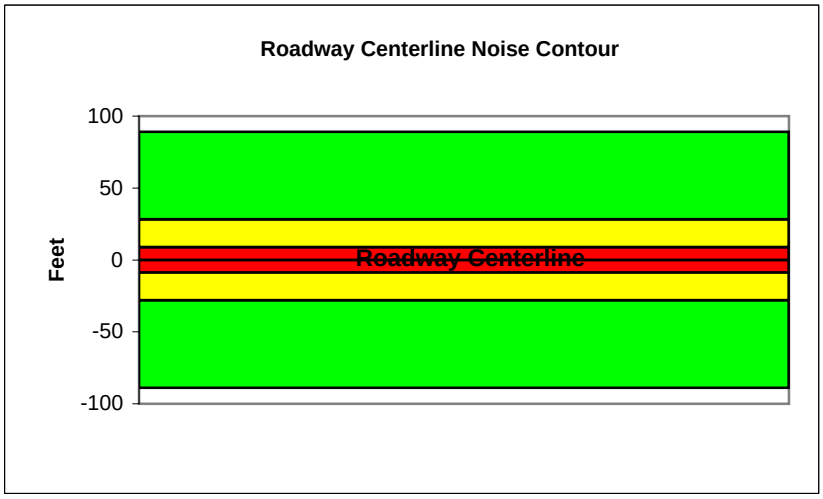
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	47.7	56.5	54.7	48.7	57.3	57.9
Medium Trucks:	56.7	48.6	42.2	40.7	49.2	49.4
Heavy Trucks:	61.5	49.6	40.6	41.8	51.5	51.6
Vehicle Noise:	**63.9**	**58.1**	**55.2**	**50.2**	**58.8**	**59.3**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	89
65 dBA	28
70 dBA	9
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Murrieta Hot Springs Road		
Road Segment:	Jefferson Avenue to Madison Avenue		

PROJECT DATA

Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	46,400
Peak Hour Traffic:	**4640**
Vehicle Speed:	45
Centerline Separation:	23.4

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

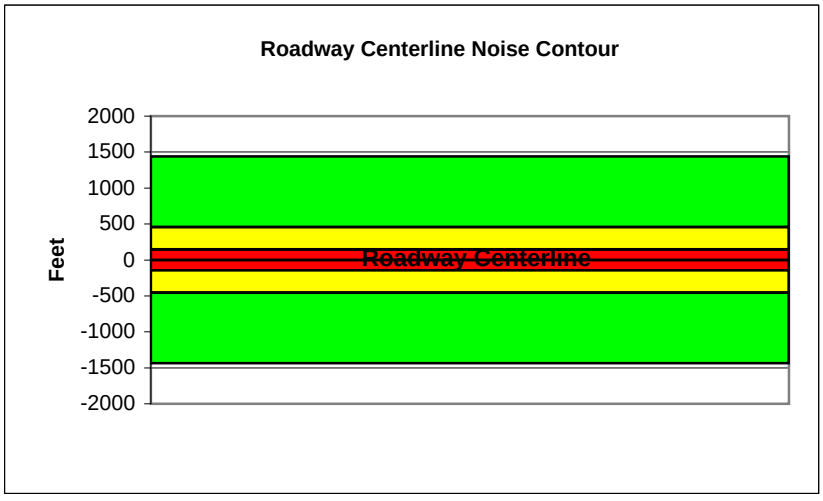
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.8	68.6	66.8	60.7	69.4	70.0
Medium Trucks:	68.1	60.0	53.7	52.1	60.6	60.8
Heavy Trucks:	72.6	60.7	51.6	52.9	62.4	62.5
Vehicle Noise:	**75.0**	**69.9**	**67.2**	**62.0**	**70.6**	**71.1**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	1441
65 dBA	456
70 dBA	144
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Murrieta Hot Springs Road		
Road Segment:	Madison Avenue to I-15		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	77,500
Peak Hour Traffic:	**7750**
Vehicle Speed:	45
Centerline Separation:	63.8

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

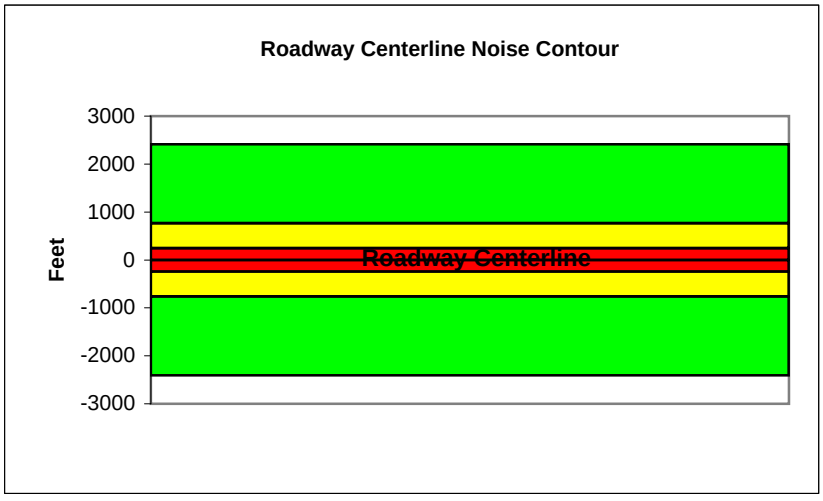
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.4	70.2	68.4	62.4	71.0	71.6
Medium Trucks:	69.7	61.7	55.3	53.7	62.2	62.4
Heavy Trucks:	74.2	62.3	53.3	54.5	64.0	64.1
Vehicle Noise:	**76.6**	**71.5**	**68.8**	**63.7**	**72.3**	**72.8**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	2411
65 dBA	762
70 dBA	241
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Murrieta Hot Springs Road		
Road Segment:	from I-15 to I-215		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	91000
Peak Hour Traffic:	**9100**
Vehicle Speed:	45
Centerline Separation:	70.4

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

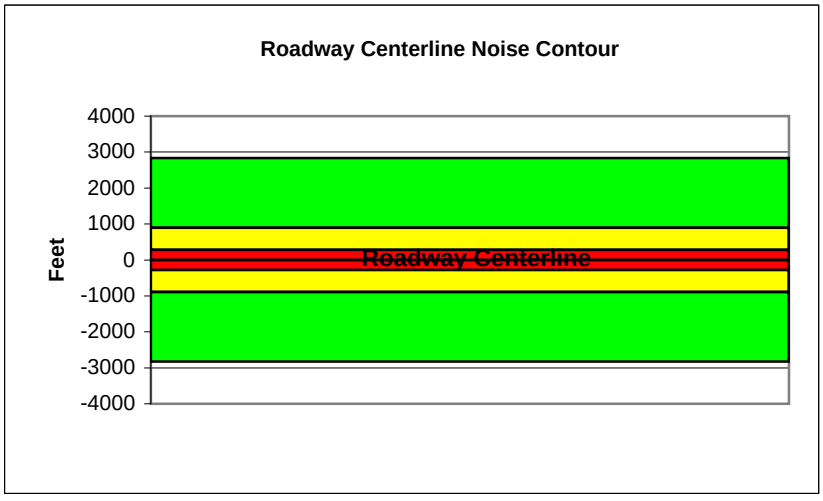
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.1	70.8	69.1	63.0	71.6	72.2
Medium Trucks:	70.3	62.3	55.9	54.3	62.8	63.0
Heavy Trucks:	74.9	62.9	53.9	55.1	64.6	64.8
Vehicle Noise:	**77.2**	**72.1**	**69.4**	**64.3**	**72.9**	**73.4**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	2830
65 dBA	895
70 dBA	283
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Murrieta Hot Springs Road		
Road Segment:	from I-215 to Alta Murrieta Drive		

PROJECT DATA

Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	93,000
Peak Hour Traffic:	**9300**
Vehicle Speed:	45
Centerline Separation:	39

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

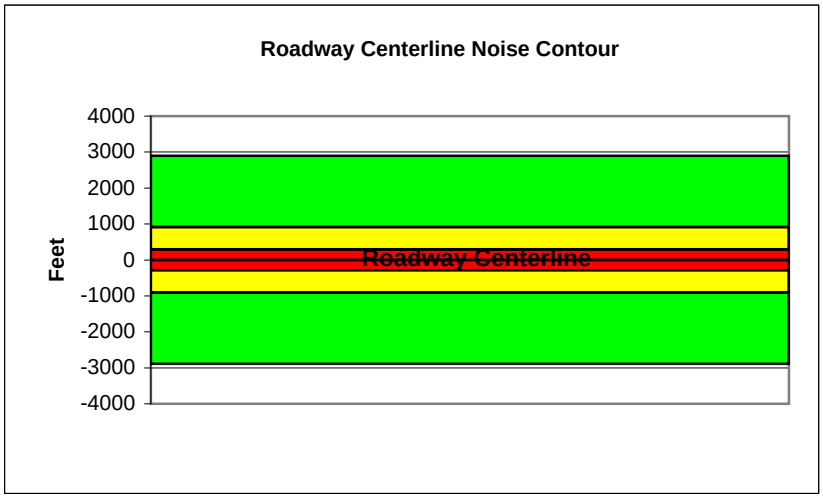
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.6	71.4	69.6	63.5	72.2	72.8
Medium Trucks:	70.9	62.8	56.4	54.9	63.3	63.6
Heavy Trucks:	75.4	63.5	54.4	55.6	65.2	65.3
Vehicle Noise:	**77.7**	**72.7**	**70.0**	**64.8**	**73.4**	**73.9**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	2894
65 dBA	915
70 dBA	289
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Murrieta Hot Springs Road		
Road Segment:	Alta Murrieta Drive to Jackson Street		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	63,200
Peak Hour Traffic:	**6320**
Vehicle Speed:	45
Centerline Separation:	42.3

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

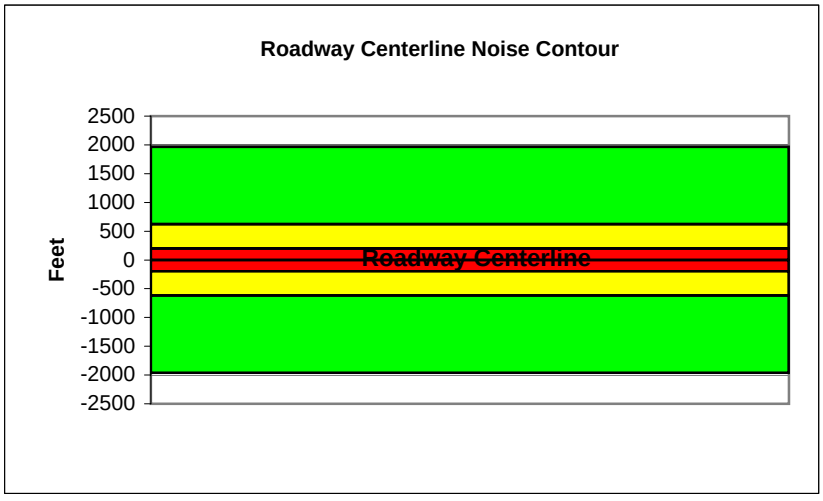
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	60.9	69.6	67.9	61.8	70.4	71.0
Medium Trucks:	69.1	61.1	54.7	53.1	61.6	61.8
Heavy Trucks:	73.7	61.7	52.7	53.9	63.4	63.6
Vehicle Noise:	**76.0**	**71.0**	**68.2**	**63.1**	**71.7**	**72.2**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	1966
65 dBA	622
70 dBA	197
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Murrieta Hot Springs Road		
Road Segment:	Jackson Street to Whitewood Road		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	57,600
Peak Hour Traffic:	**5760**
Vehicle Speed:	45
Centerline Separation:	42.7

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

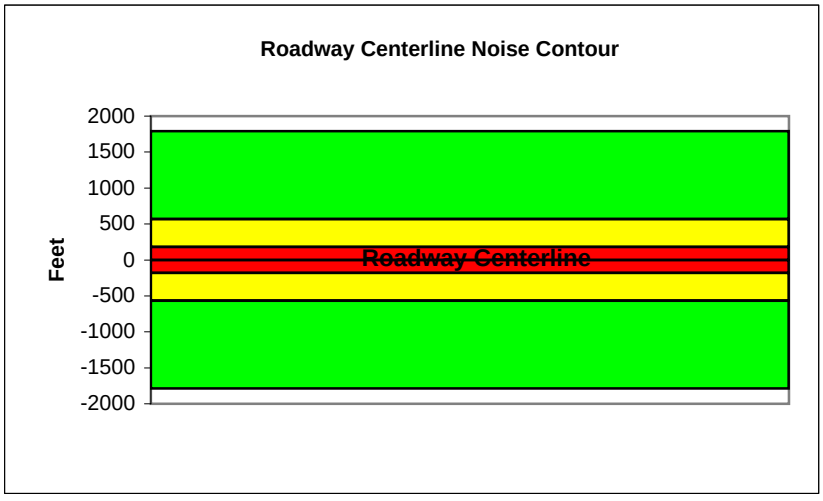
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	60.5	69.2	67.5	61.4	70.0	70.6
Medium Trucks:	68.7	60.7	54.3	52.7	61.2	61.4
Heavy Trucks:	73.3	61.3	52.3	53.5	63.0	63.2
Vehicle Noise:	**75.6**	**70.5**	**67.8**	**62.7**	**71.3**	**71.8**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	1792
65 dBA	567
70 dBA	179
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Murrieta Hot Springs Road		
Road Segment:	Whitewood Road to Margarita Road		

PROJECT DATA

Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	66,400
Peak Hour Traffic:	**6640**
Vehicle Speed:	45
Centerline Separation:	42.3

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

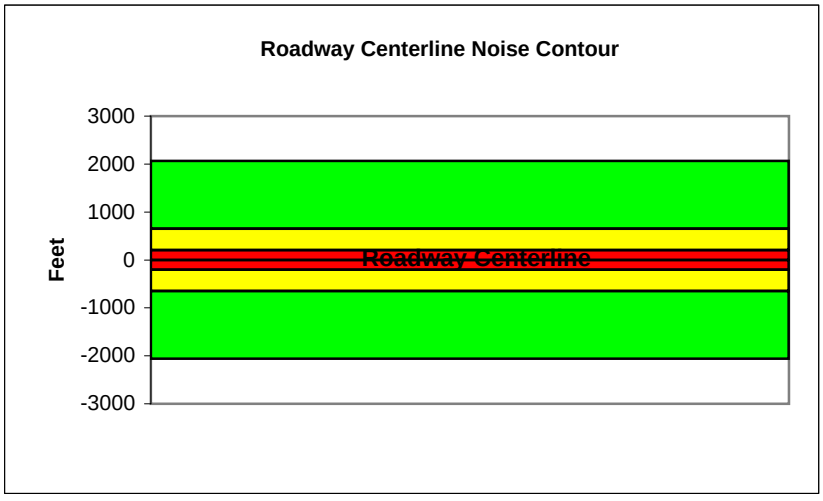
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	61.1	69.9	68.1	62.0	70.6	71.2
Medium Trucks:	69.4	61.3	54.9	53.3	61.8	62.1
Heavy Trucks:	73.9	61.9	52.9	54.1	63.7	63.8
Vehicle Noise:	**76.2**	**71.2**	**68.4**	**63.3**	**71.9**	**72.4**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	2064
65 dBA	653
70 dBA	206
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Murrieta Hot Springs Road		
Road Segment:	Margarita Road to Eastern City Limits		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	52,500
Peak Hour Traffic:	**5250**
Vehicle Speed:	45
Centerline Separation:	41.8

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

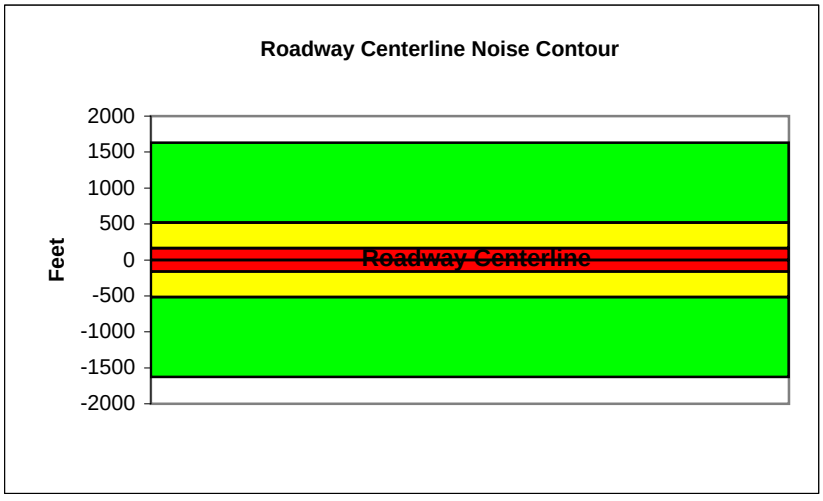
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	60.1	68.9	67.1	61.0	69.6	70.2
Medium Trucks:	68.3	60.3	53.9	52.3	60.8	61.0
Heavy Trucks:	72.9	60.9	51.9	53.1	62.6	62.8
Vehicle Noise:	**75.2**	**70.2**	**67.4**	**62.3**	**70.9**	**71.4**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	1633
65 dBA	516
70 dBA	163
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Guava Street		
Road Segment:	West of Hayes		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	5900
Peak Hour Traffic:	**590**
Vehicle Speed:	35
Centerline Separation:	10

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

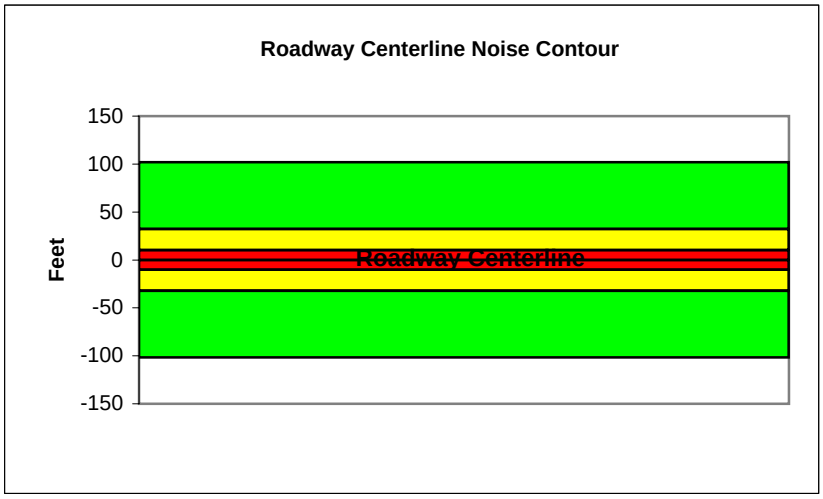
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	48.0	56.8	55.0	48.9	57.5	58.2
Medium Trucks:	57.7	49.6	43.3	41.7	50.2	50.4
Heavy Trucks:	62.9	51.0	41.9	43.1	53.1	53.2
Vehicle Noise:	**65.4**	**58.7**	**55.5**	**50.8**	**59.4**	**59.9**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	102
65 dBA	32
70 dBA	10
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Guava Street		
Road Segment:	from Hayes Avenue to Douglas Avenue		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	6300
Peak Hour Traffic:	**630**
Vehicle Speed:	35
Centerline Separation:	14.2

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

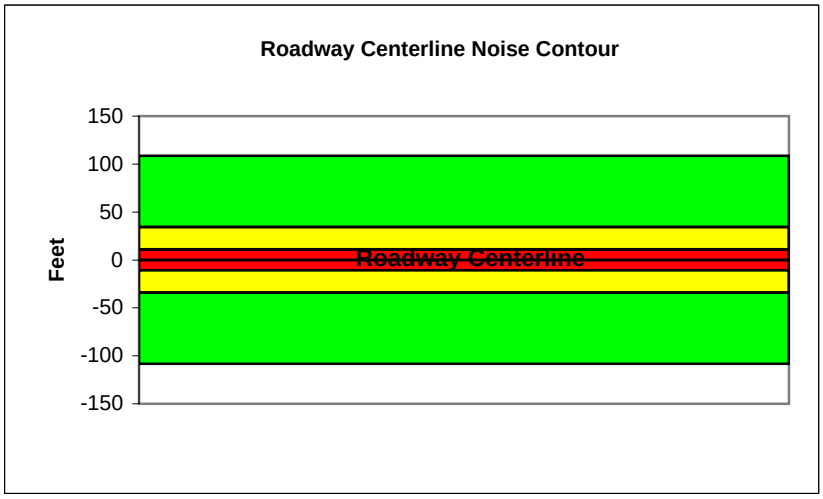
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	48.2	57.0	55.2	49.1	57.7	58.4
Medium Trucks:	57.9	49.8	43.5	41.9	50.4	50.6
Heavy Trucks:	63.1	51.2	42.1	43.4	53.3	53.4
Vehicle Noise:	**65.6**	**58.9**	**55.7**	**51.1**	**59.6**	**60.1**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	109
65 dBA	34
70 dBA	11
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Guava Street		
Road Segment:	Douglas Avenue to Washington Avenue		

PROJECT DATA		SITE DATA	
Centerline Dist to Barrier	0	Road Grade:	0
Barrier (0=wall, 1= berm):	0	Average Daily Traffic:	5200
Receiver Barrier Dist:	0	Peak Hour Traffic:	**520**
Centerline Dist. To Observer:	**100**	Vehicle Speed:	35
Barrier Near Lane CL Dist:	0	Centerline Separation:	10
Barrier Far lane CL Dist:	0	**NOISE INPUTS**	
Pad Elevation:	**0.5**	Site conditions **HARD SITE**	
Road Elevation:	0	**FLEET MIX**	
Observer Height (above grade):	0		
Barrier Height:	0		
Rt View: **90**	Lft View: **-90**		

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	0
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

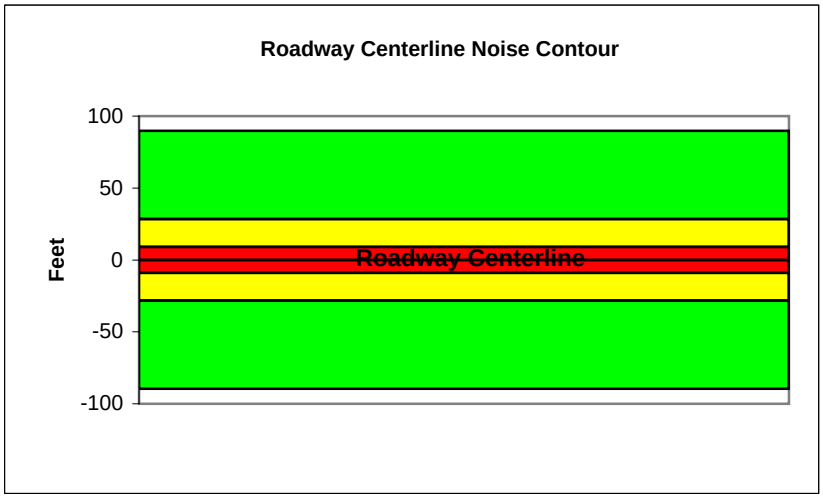
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	47.4	56.2	54.4	48.3	57.0	57.6
Medium Trucks:	57.2	49.1	42.7	41.1	49.6	49.9
Heavy Trucks:	62.4	50.4	41.4	42.6	52.5	52.6
Vehicle Noise:	**64.8**	**58.2**	**55.0**	**50.3**	**58.9**	**59.3**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	90
65 dBA	28
70 dBA	9
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Guava Street		
Road Segment:	Adams Avenue to Jefferson Avenue		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	11400
Peak Hour Traffic:	**1140**
Vehicle Speed:	35
Centerline Separation:	10

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

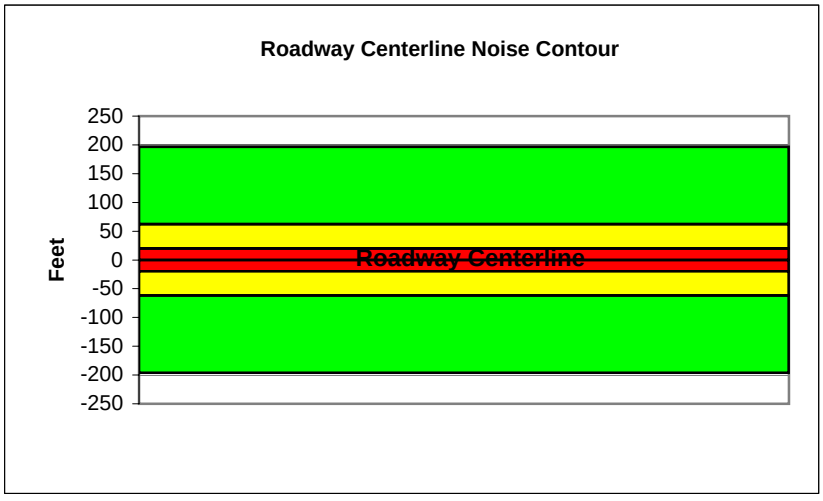
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	50.8	59.6	57.8	51.8	60.4	61.0
Medium Trucks:	60.6	52.5	46.1	44.5	53.0	53.3
Heavy Trucks:	65.8	53.8	44.8	46.0	55.9	56.0
Vehicle Noise:	**68.2**	**61.6**	**58.4**	**53.7**	**62.3**	**62.7**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	197
65 dBA	62
70 dBA	20
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Guava Street		
Road Segment:	from Jefferson Avenue to Madison Avenue		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	1100
Peak Hour Traffic:	**110**
Vehicle Speed:	35
Centerline Separation:	10

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

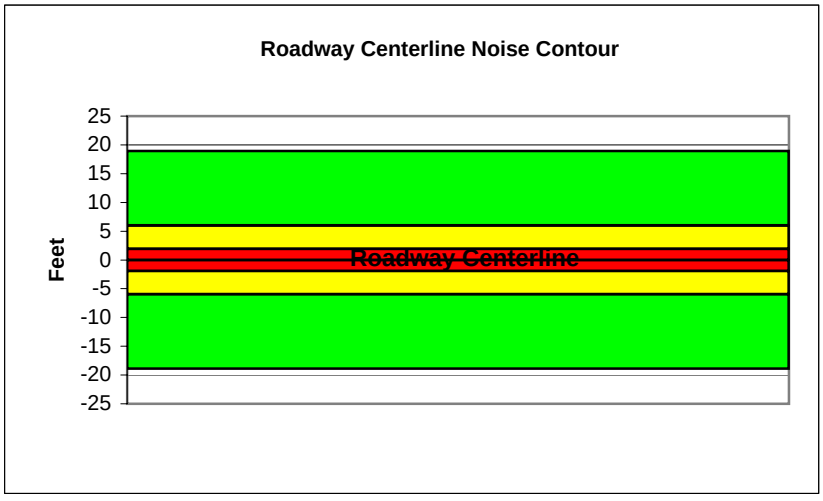
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	40.7	49.5	47.7	41.6	50.3	50.9
Medium Trucks:	50.4	42.3	36.0	34.4	42.9	43.1
Heavy Trucks:	55.6	43.7	34.6	35.9	45.8	45.9
Vehicle Noise:	**58.1**	**51.4**	**48.2**	**43.6**	**52.1**	**52.6**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	19
65 dBA	6
70 dBA	2
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Guava Street		
Road Segment:	West of Hayes		

PROJECT DATA		SITE DATA	
Centerline Dist to Barrier	0	Road Grade:	0
Barrier (0=wall, 1= berm):	0	Average Daily Traffic:	3300
Receiver Barrier Dist:	0	Peak Hour Traffic:	**330**
Centerline Dist. To Observer:	**100**	Vehicle Speed:	35
Barrier Near Lane CL Dist:	0	Centerline Separation:	10
Barrier Far lane CL Dist:	0	**NOISE INPUTS**	
Pad Elevation:	**0.5**	Site conditions **HARD SITE**	
Road Elevation:	0	**FLEET MIX**	
Observer Height (above grade):	0		
Barrier Height:	0		
Rt View: **90**	Lft View: **-90**		

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	0
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

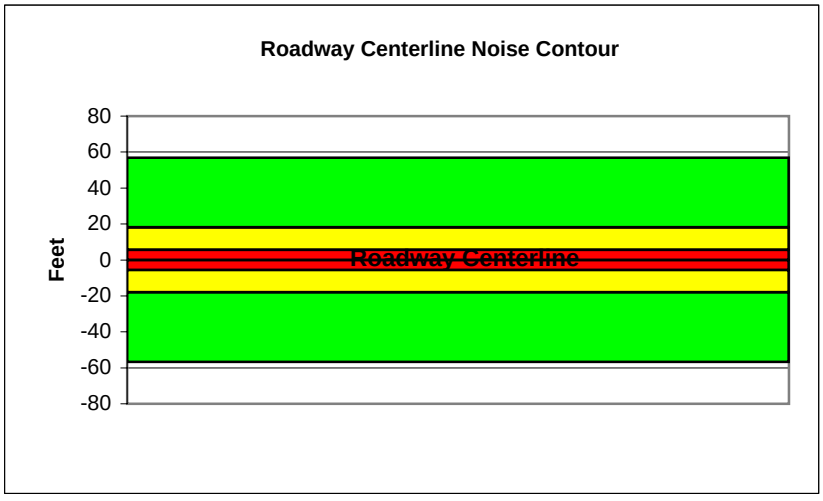
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	45.5	54.2	52.5	46.4	55.0	55.6
Medium Trucks:	55.2	47.1	40.7	39.2	47.6	47.9
Heavy Trucks:	60.4	48.5	39.4	40.6	50.5	50.7
Vehicle Noise:	**62.8**	**56.2**	**53.0**	**48.3**	**56.9**	**57.3**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	57
65 dBA	18
70 dBA	6
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Elm Street		
Road Segment:	Adams Avenue to Madison Street		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	2800
Peak Hour Traffic:	**280**
Vehicle Speed:	35
Centerline Separation:	22.2

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

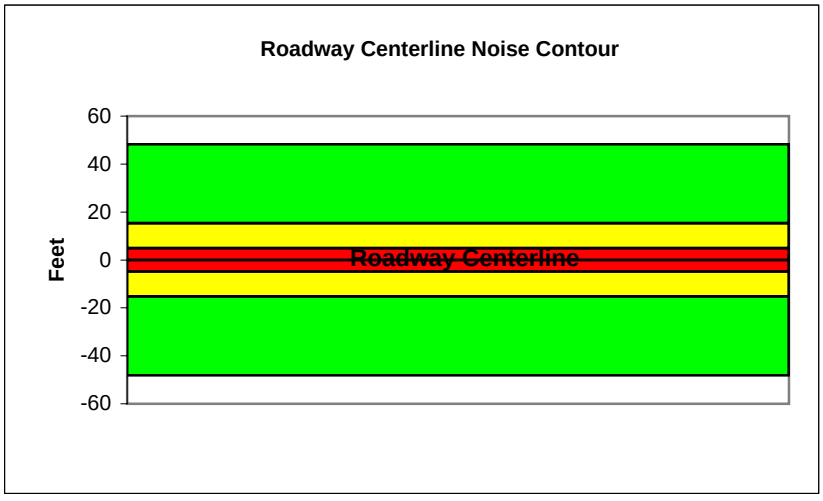
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	44.5	53.3	51.5	45.4	54.1	54.7
Medium Trucks:	54.2	46.2	39.8	38.2	46.7	46.9
Heavy Trucks:	59.5	47.5	38.5	39.7	49.6	49.7
Vehicle Noise:	**61.9**	**55.3**	**52.1**	**47.4**	**56.0**	**56.4**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	48
65 dBA	15
70 dBA	5
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Hayes Avenue		
Road Segment:	from Nighthawk Way to Vineyard Parkway		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	3600
Peak Hour Traffic:	**360**
Vehicle Speed:	35
Centerline Separation:	16.2

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

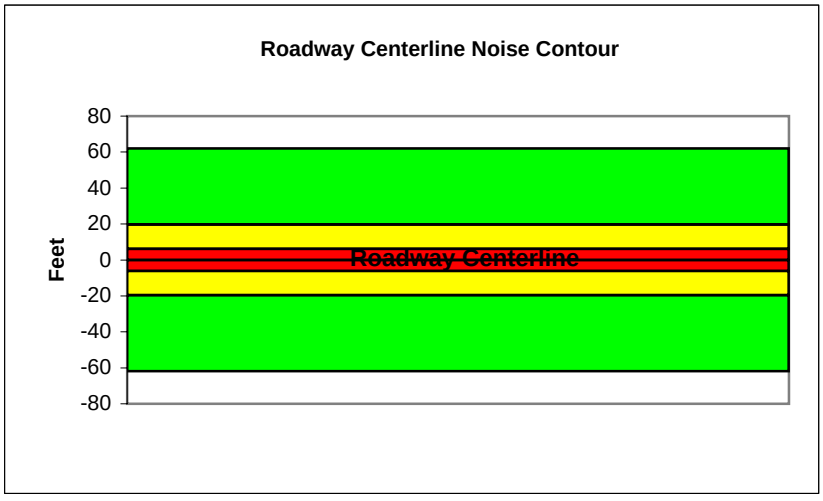
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	45.7	54.5	52.7	46.6	55.3	55.9
Medium Trucks:	55.4	47.4	41.0	39.4	47.9	48.1
Heavy Trucks:	60.7	48.7	39.7	40.9	50.8	50.9
Vehicle Noise:	**63.1**	**56.5**	**53.3**	**48.6**	**57.2**	**57.6**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	62
65 dBA	20
70 dBA	6
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Hayes Avenue		
Road Segment:	Kalmia Street to Ivy Street		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	6500
Peak Hour Traffic:	**650**
Vehicle Speed:	40
Centerline Separation:	10.2

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

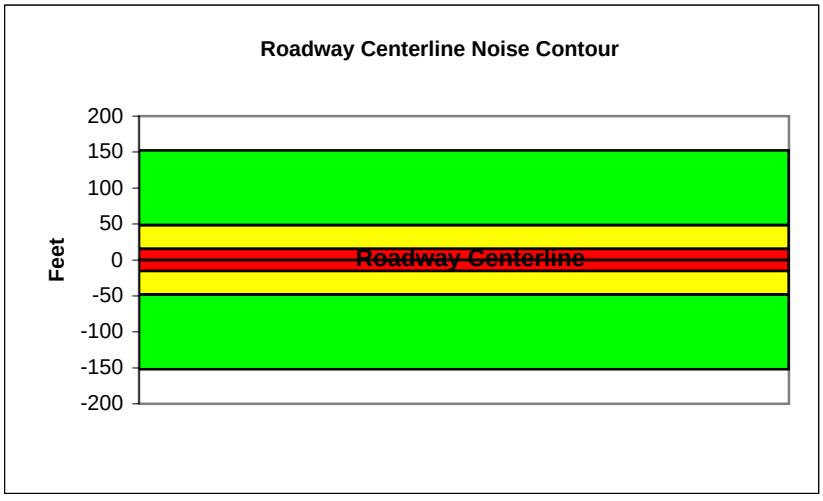
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	50.1	58.9	57.1	51.0	59.6	60.2
Medium Trucks:	59.0	51.0	44.6	43.0	51.5	51.7
Heavy Trucks:	63.9	51.9	42.9	44.1	53.8	53.9
Vehicle Noise:	**66.2**	**60.4**	**57.5**	**52.6**	**61.1**	**61.6**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	152
65 dBA	48
70 dBA	15
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Hayes Avenue		
Road Segment:	Ivy Street to Hawthorne Street		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	4900
Peak Hour Traffic:	**490**
Vehicle Speed:	25
Centerline Separation:	10.2

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

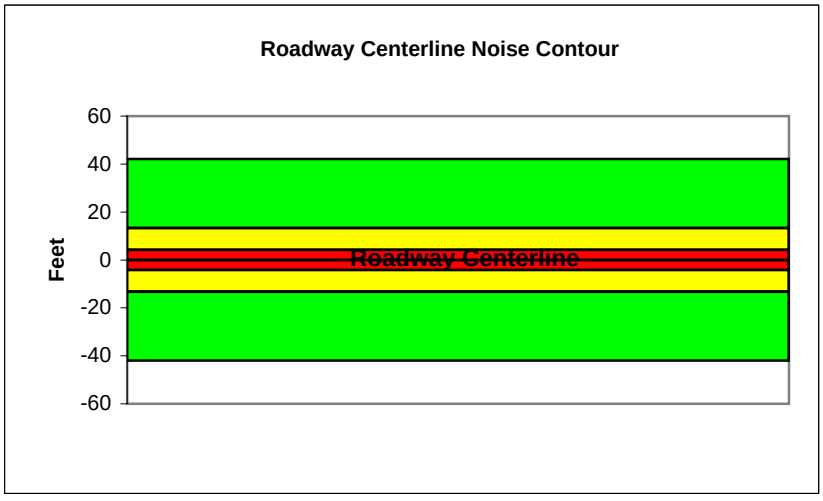
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	43.0	51.7	50.0	43.9	52.5	53.1
Medium Trucks:	54.6	46.5	40.2	38.6	47.1	47.3
Heavy Trucks:	60.8	48.8	39.8	41.0	51.4	51.5
Vehicle Noise:	**63.4**	**55.0**	**51.0**	**47.1**	**55.7**	**56.0**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	42
65 dBA	13
70 dBA	4
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Hayes Avenue		
Road Segment:	Hawthorne Street to Guava Street		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	4500
Peak Hour Traffic:	**450**
Vehicle Speed:	35
Centerline Separation:	15.7

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

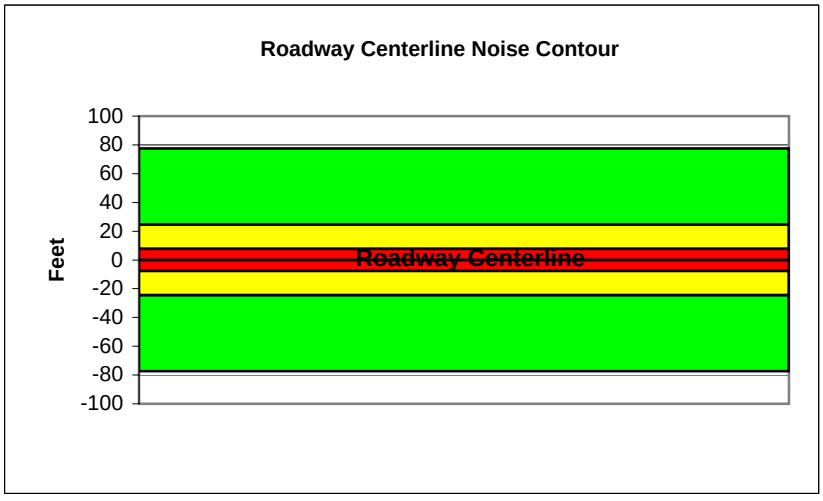
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	46.7	55.5	53.7	47.6	56.3	56.9
Medium Trucks:	56.4	48.4	42.0	40.4	48.9	49.1
Heavy Trucks:	61.6	49.7	40.6	41.9	51.8	51.9
Vehicle Noise:	**64.1**	**57.4**	**54.3**	**49.6**	**58.1**	**58.6**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	78
65 dBA	25
70 dBA	8
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Washington Avenue		
Road Segment:	North of Calle del Oso Oro		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	10000
Peak Hour Traffic:	**1000**
Vehicle Speed:	40
Centerline Separation:	24.2

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

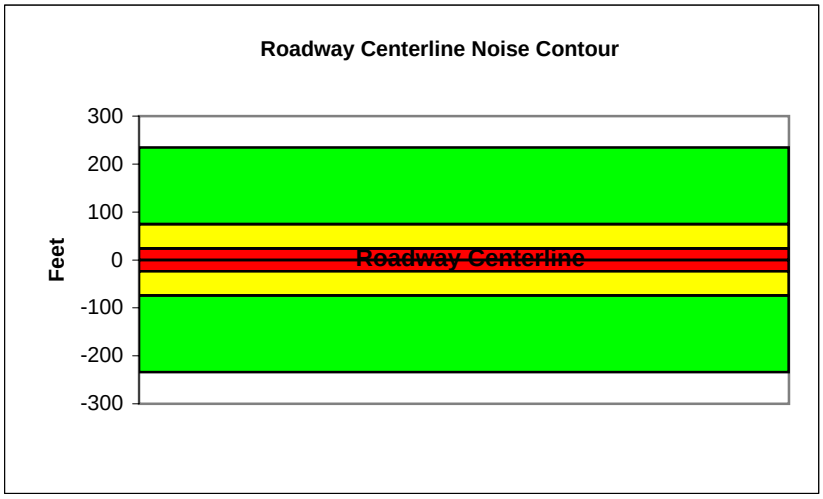
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	51.7	60.5	58.7	52.6	61.2	61.8
Medium Trucks:	60.6	52.6	46.2	44.6	53.1	53.3
Heavy Trucks:	65.5	53.5	44.5	45.7	55.4	55.6
Vehicle Noise:	**67.9**	**62.0**	**59.1**	**54.2**	**62.8**	**63.2**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	234
65 dBA	74
70 dBA	23
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Washington Avenue		
Road Segment:	Calle del Oso Oro to Nighthawk Way/Mangolia Street		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	14900
Peak Hour Traffic:	**1490**
Vehicle Speed:	40
Centerline Separation:	24.9

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

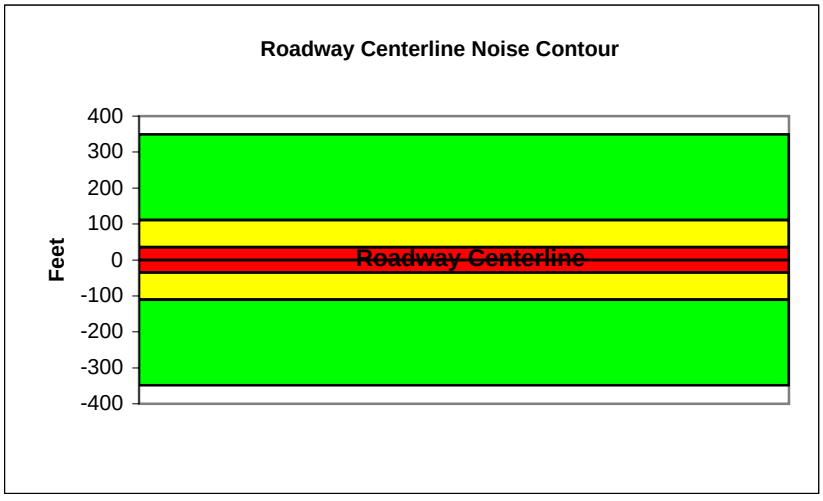
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	53.4	62.2	60.4	54.3	63.0	63.6
Medium Trucks:	62.4	54.3	47.9	46.3	54.8	55.1
Heavy Trucks:	67.2	55.3	46.2	47.4	57.1	57.3
Vehicle Noise:	**69.6**	**63.8**	**60.8**	**55.9**	**64.5**	**65.0**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	349
65 dBA	110
70 dBA	35
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Washington Avenue		
Road Segment:	Nighthawk/Magnolia Street to Vineyard Parkway		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	12,600
Peak Hour Traffic:	**1260**
Vehicle Speed:	40
Centerline Separation:	23.8

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

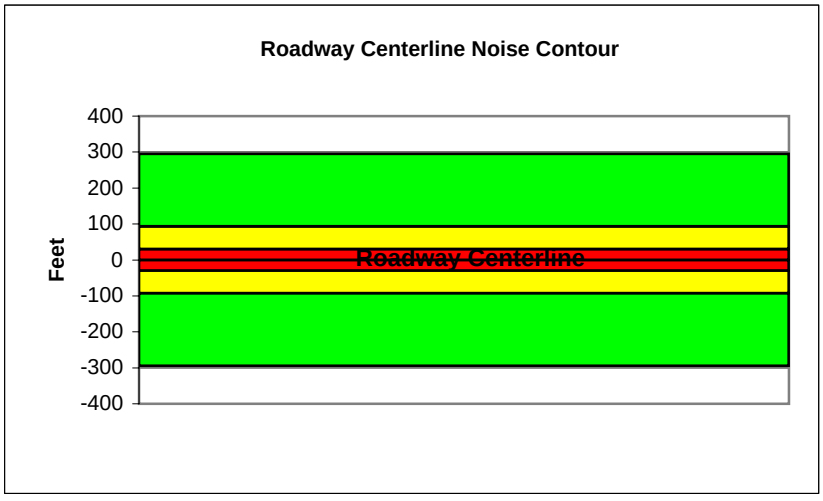
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	52.7	61.5	59.7	53.6	62.3	62.9
Medium Trucks:	61.6	53.6	47.2	45.6	54.1	54.3
Heavy Trucks:	66.5	54.6	45.5	46.7	56.4	56.6
Vehicle Noise:	**68.9**	**63.1**	**60.1**	**55.2**	**63.8**	**64.2**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	295
65 dBA	93
70 dBA	30
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Washington Avenue		
Road Segment:	Vineyard Avenue to Kalmia Street		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	20800
Peak Hour Traffic:	**2080**
Vehicle Speed:	40
Centerline Separation:	36.2

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

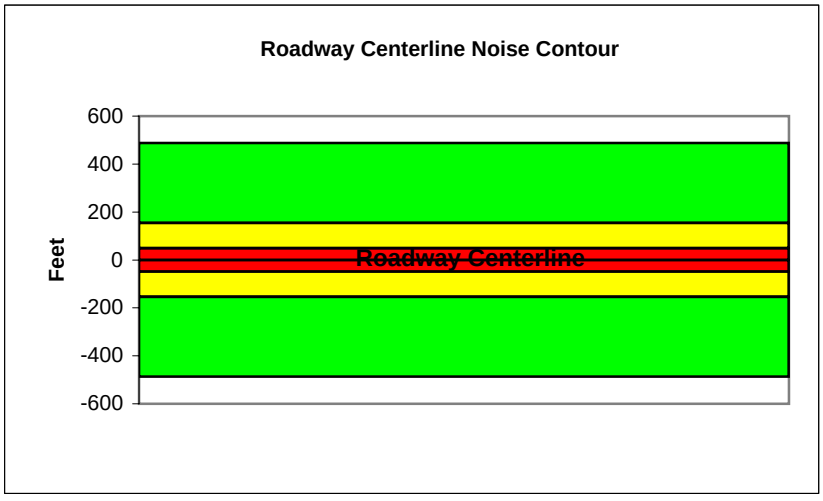
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	54.7	63.4	61.7	55.6	64.2	64.8
Medium Trucks:	63.6	55.5	49.2	47.6	56.1	56.3
Heavy Trucks:	68.5	56.5	47.5	48.7	58.4	58.5
Vehicle Noise:	**70.8**	**65.0**	**62.1**	**57.2**	**65.7**	**66.2**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	488
65 dBA	154
70 dBA	49
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Washington Avenue		
Road Segment:	Kalmia Street to Ivy Street		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	8300
Peak Hour Traffic:	**830**
Vehicle Speed:	25
Centerline Separation:	10.5

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

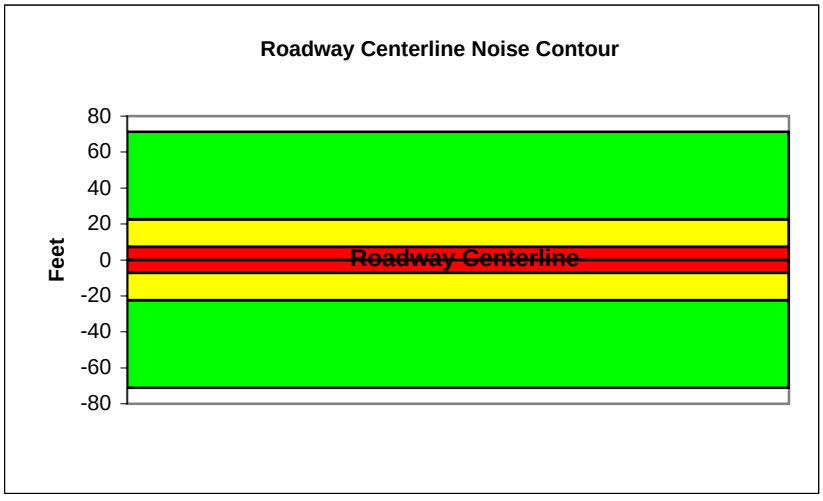
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	45.2	54.0	52.2	46.2	54.8	55.4
Medium Trucks:	56.9	48.8	42.4	40.9	49.4	49.6
Heavy Trucks:	63.1	51.1	42.1	43.3	53.7	53.8
Vehicle Noise:	**65.7**	**57.3**	**53.2**	**49.4**	**57.9**	**58.3**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	71
65 dBA	23
70 dBA	7
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Washington Avenue		
Road Segment:	Ivy Street to Hawthorne Street		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	1400
Peak Hour Traffic:	**140**
Vehicle Speed:	35
Centerline Separation:	12

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

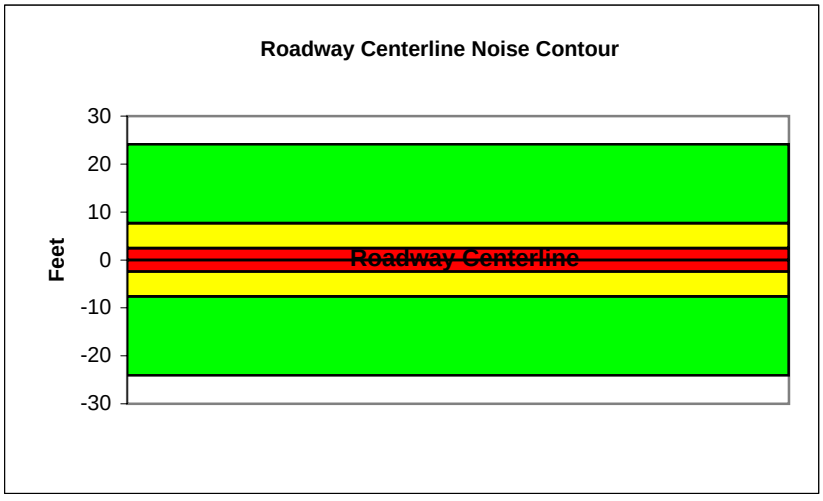
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	41.7	50.5	48.7	42.6	51.3	51.9
Medium Trucks:	51.4	43.4	37.0	35.4	43.9	44.1
Heavy Trucks:	56.6	44.7	35.6	36.9	46.8	46.9
Vehicle Noise:	**59.1**	**52.4**	**49.3**	**44.6**	**53.1**	**53.6**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	24
65 dBA	8
70 dBA	2
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Washington Avenue		
Road Segment:	South of Hawthorne Street		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	3300
Peak Hour Traffic:	**330**
Vehicle Speed:	35
Centerline Separation:	8.7

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

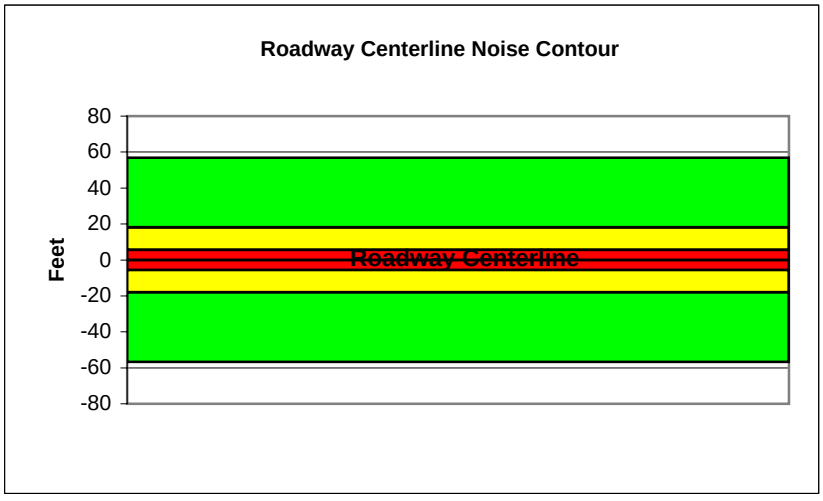
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	45.5	54.3	52.5	46.4	55.0	55.7
Medium Trucks:	55.2	47.1	40.8	39.2	47.7	47.9
Heavy Trucks:	60.4	48.5	39.4	40.7	50.6	50.7
Vehicle Noise:	**62.9**	**56.2**	**53.0**	**48.4**	**56.9**	**57.4**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	57
65 dBA	18
70 dBA	6
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Jefferson Avenue		
Road Segment:	North of Nutmeg Street		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	24,500
Peak Hour Traffic:	**2450**
Vehicle Speed:	45
Centerline Separation:	13.8

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

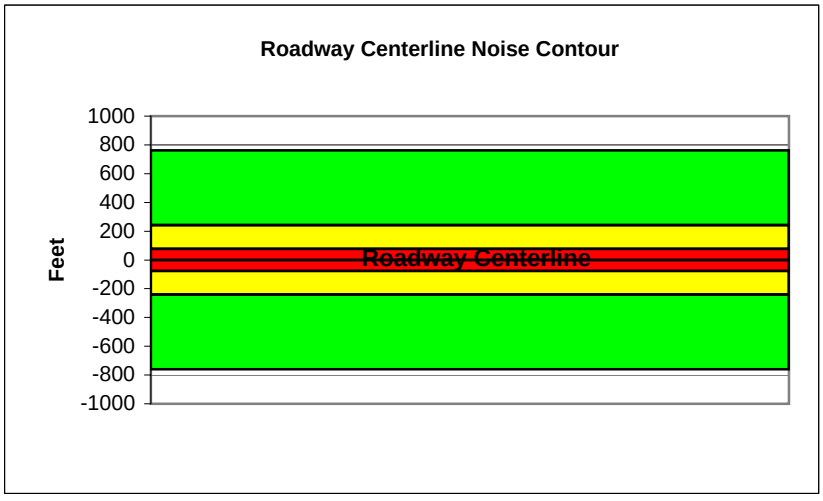
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.2	66.0	64.2	58.1	66.8	67.4
Medium Trucks:	65.5	57.4	51.1	49.5	58.0	58.2
Heavy Trucks:	70.0	58.1	49.0	50.3	59.8	59.9
Vehicle Noise:	**72.4**	**67.3**	**64.6**	**59.4**	**68.0**	**68.5**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	762
65 dBA	241
70 dBA	76
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Jefferson Avenue		
Road Segment:	Nutmeg Street to Magnolia Street		

PROJECT DATA

Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	39700
Peak Hour Traffic:	**3970**
Vehicle Speed:	40
Centerline Separation:	23

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

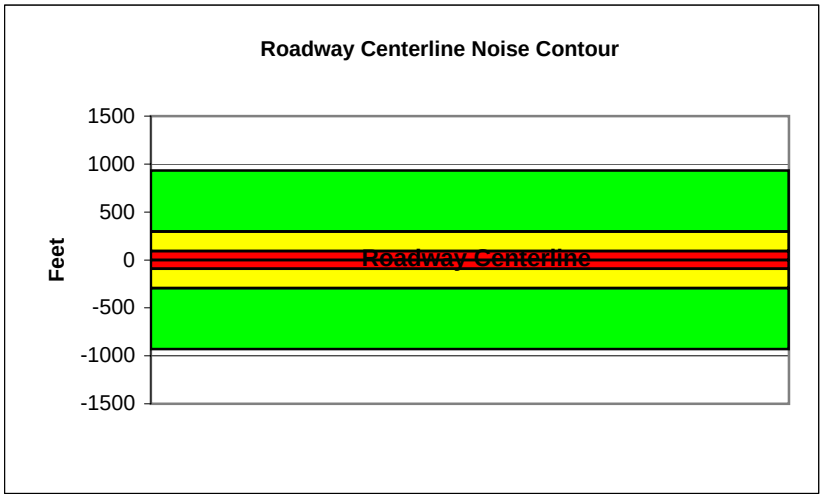
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.7	66.5	64.7	58.6	67.3	67.9
Medium Trucks:	66.6	58.6	52.2	50.6	59.1	59.3
Heavy Trucks:	71.5	59.6	50.5	51.7	61.4	61.6
Vehicle Noise:	**73.9**	**68.1**	**65.1**	**60.2**	**68.8**	**69.2**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	931
65 dBA	294
70 dBA	93
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Jefferson Avenue		
Road Segment:	Magnolia Street to Lemon Street		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	40100
Peak Hour Traffic:	**4010**
Vehicle Speed:	45
Centerline Separation:	16.8

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

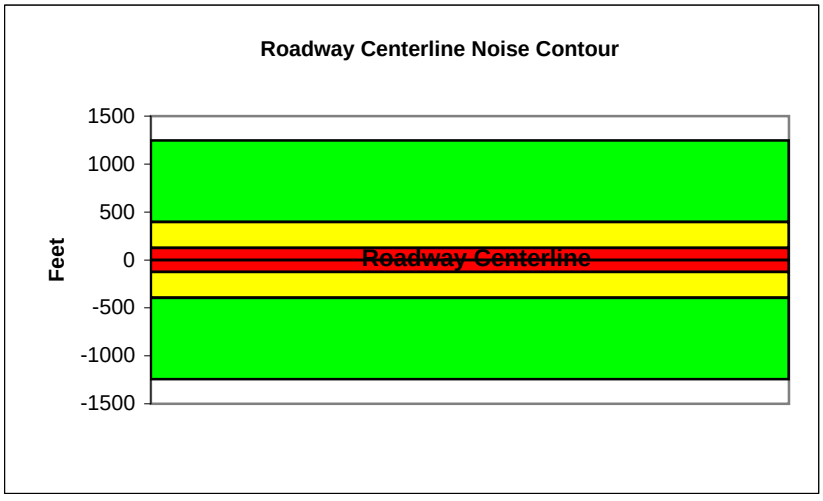
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.3	68.1	66.3	60.2	68.9	69.5
Medium Trucks:	67.6	59.5	53.1	51.6	60.1	60.3
Heavy Trucks:	72.1	60.2	51.1	52.3	61.9	62.0
Vehicle Noise:	**74.5**	**69.4**	**66.7**	**61.5**	**70.1**	**70.6**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	1247
65 dBA	394
70 dBA	125
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Jefferson Avenue		
Road Segment:	Lemon Street to Kalmia Street		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	46900
Peak Hour Traffic:	**4690**
Vehicle Speed:	45
Centerline Separation:	20.7

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

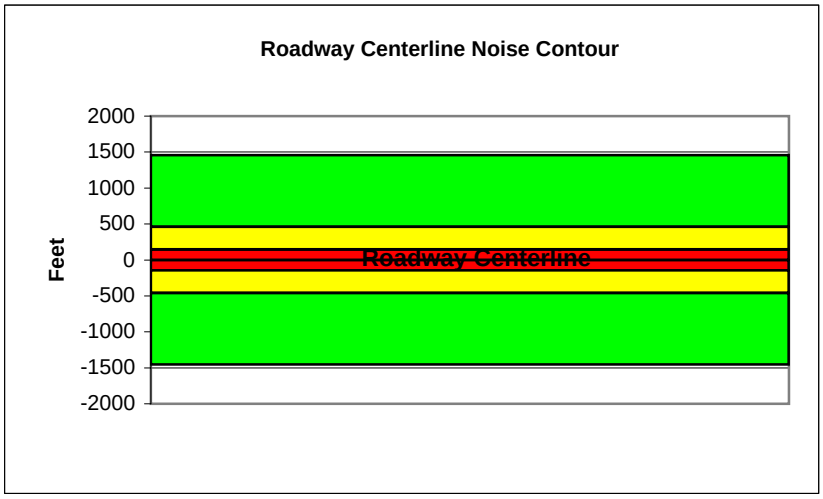
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	59.9	68.7	66.9	60.8	69.5	70.1
Medium Trucks:	68.2	60.1	53.8	52.2	60.7	60.9
Heavy Trucks:	72.7	60.8	51.7	53.0	62.5	62.6
Vehicle Noise:	**75.1**	**70.0**	**67.3**	**62.1**	**70.7**	**71.2**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	1458
65 dBA	461
70 dBA	146
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Jefferson Avenue		
Road Segment:	Kalmia Street to Ivy Street		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	61,500
Peak Hour Traffic:	**6150**
Vehicle Speed:	45
Centerline Separation:	34

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

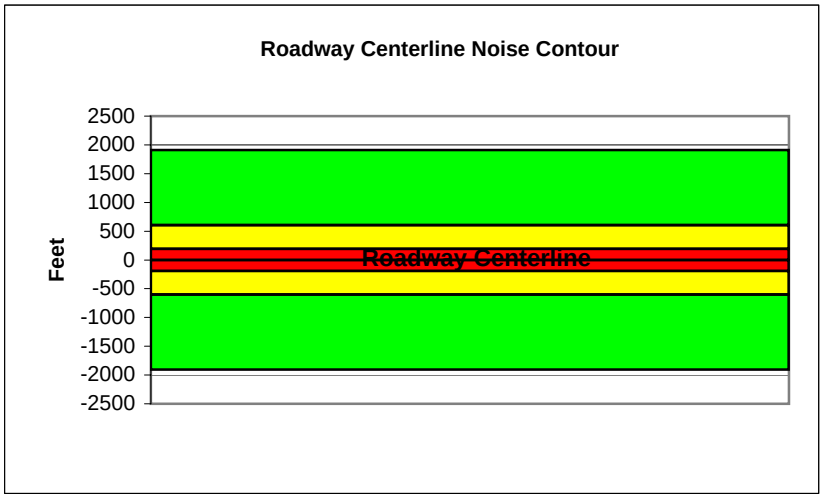
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	60.9	69.7	67.9	61.8	70.4	71.0
Medium Trucks:	69.2	61.1	54.7	53.1	61.6	61.9
Heavy Trucks:	73.7	61.7	52.7	53.9	63.4	63.6
Vehicle Noise:	**76.0**	**71.0**	**68.2**	**63.1**	**71.7**	**72.2**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	1912
65 dBA	605
70 dBA	191
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Jefferson Avenue		
Road Segment:	Ivy Street to Murrieta Hot Springs Road		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	53600
Peak Hour Traffic:	**5360**
Vehicle Speed:	45
Centerline Separation:	33.7

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

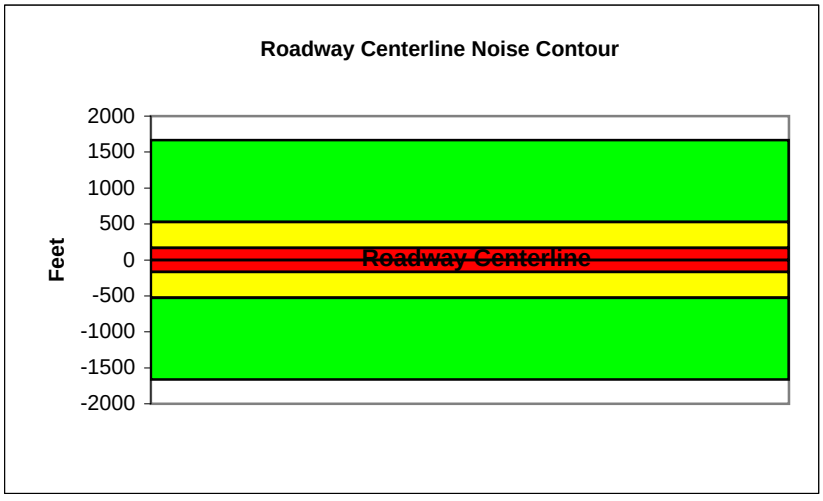
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	60.3	69.1	67.3	61.2	69.8	70.5
Medium Trucks:	68.6	60.5	54.1	52.5	61.0	61.3
Heavy Trucks:	73.1	61.1	52.1	53.3	62.9	63.0
Vehicle Noise:	**75.4**	**70.4**	**67.6**	**62.5**	**71.1**	**71.6**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	1668
65 dBA	527
70 dBA	167
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Jefferson Avenue		
Road Segment:	Murrieta Hot Springs Road to Guava Street		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	53,100
Peak Hour Traffic:	**5310**
Vehicle Speed:	45
Centerline Separation:	33.4

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

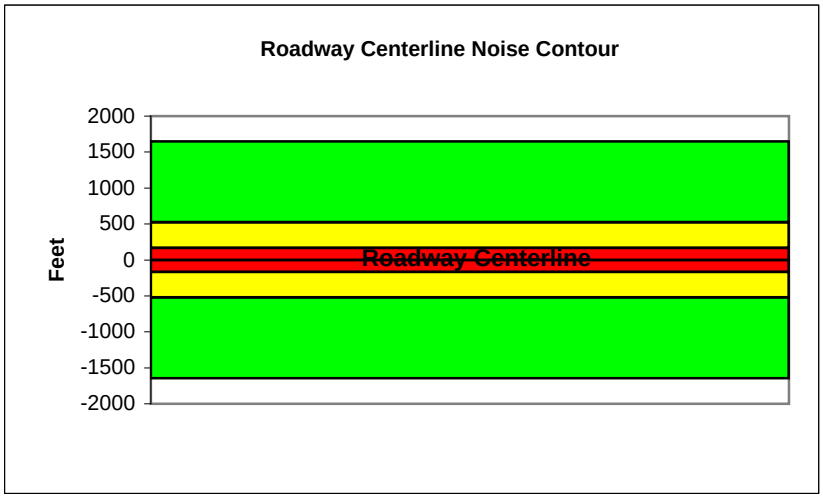
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	60.3	69.0	67.2	61.2	69.8	70.4
Medium Trucks:	68.5	60.5	54.1	52.5	61.0	61.2
Heavy Trucks:	73.0	61.1	52.1	53.3	62.8	62.9
Vehicle Noise:	**75.4**	**70.3**	**67.6**	**62.5**	**71.1**	**71.6**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	1650
65 dBA	522
70 dBA	165
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Jefferson Avenue		
Road Segment:	Guava Street to Fig Street		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	45,100
Peak Hour Traffic:	**4510**
Vehicle Speed:	50
Centerline Separation:	31.5

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

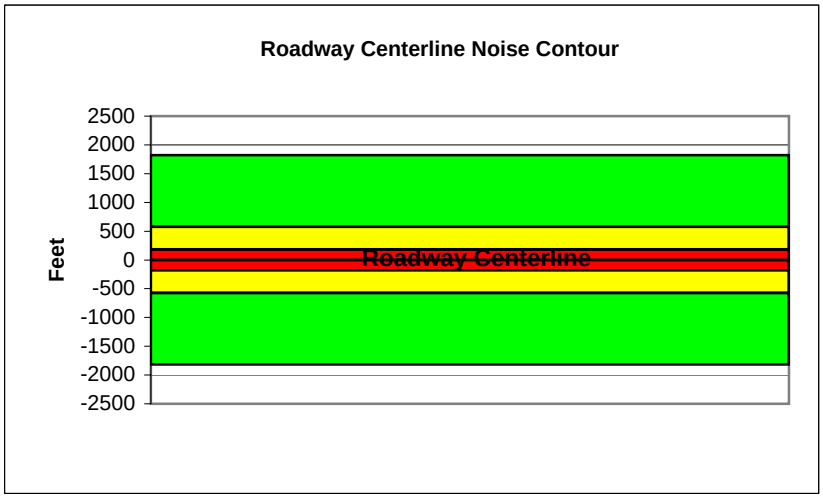
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	60.9	69.7	67.9	61.8	70.5	71.1
Medium Trucks:	68.6	60.5	54.1	52.5	61.0	61.3
Heavy Trucks:	72.8	60.9	51.8	53.0	62.4	62.5
Vehicle Noise:	**75.1**	**70.8**	**68.2**	**62.9**	**71.5**	**72.0**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	1822
65 dBA	576
70 dBA	182
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Jefferson Avenue		
Road Segment:	Fig Street to Elm Street		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	44,600
Peak Hour Traffic:	**4460**
Vehicle Speed:	50
Centerline Separation:	32.3

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

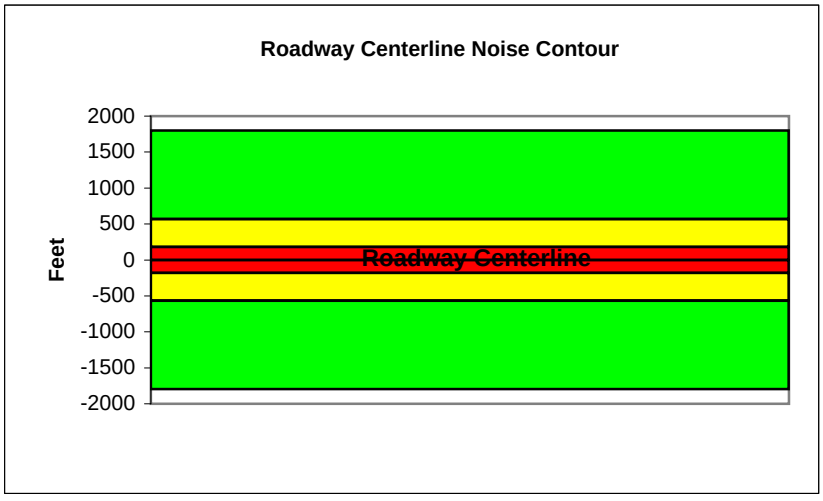
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	60.8	69.6	67.8	61.7	70.4	71.0
Medium Trucks:	68.5	60.4	54.1	52.5	61.0	61.2
Heavy Trucks:	72.7	60.8	51.7	53.0	62.4	62.5
Vehicle Noise:	**75.0**	**70.7**	**68.1**	**62.8**	**71.4**	**71.9**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	1798
65 dBA	569
70 dBA	180
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Jefferson Avenue		
Road Segment:	south of Elm Street		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	30300
Peak Hour Traffic:	**3030**
Vehicle Speed:	45
Centerline Separation:	36.2

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

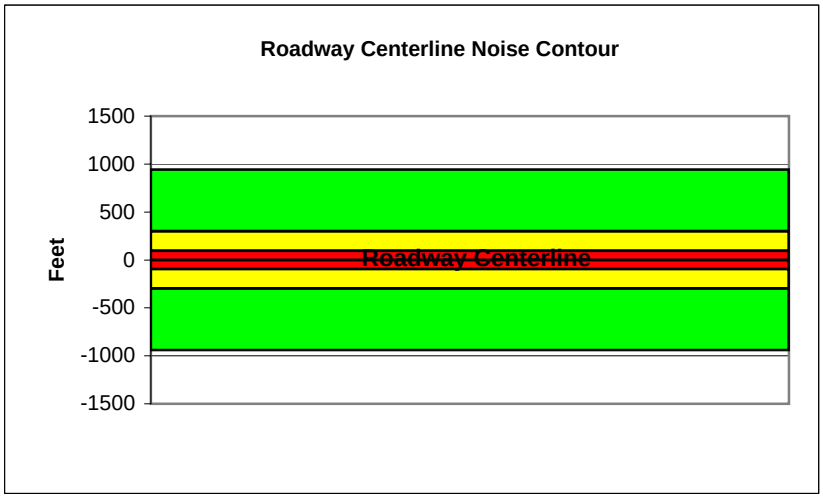
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	57.8	66.6	64.8	58.7	67.3	67.9
Medium Trucks:	66.0	58.0	51.6	50.0	58.5	58.7
Heavy Trucks:	70.6	58.6	49.6	50.8	60.3	60.5
Vehicle Noise:	**72.9**	**67.9**	**65.1**	**60.0**	**68.6**	**69.1**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	942
65 dBA	298
70 dBA	94
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Madison Avenue		
Road Segment:	Kalmia Street to Ivy St/Los Alamos		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	16,900
Peak Hour Traffic:	**1690**
Vehicle Speed:	50
Centerline Separation:	36.5

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

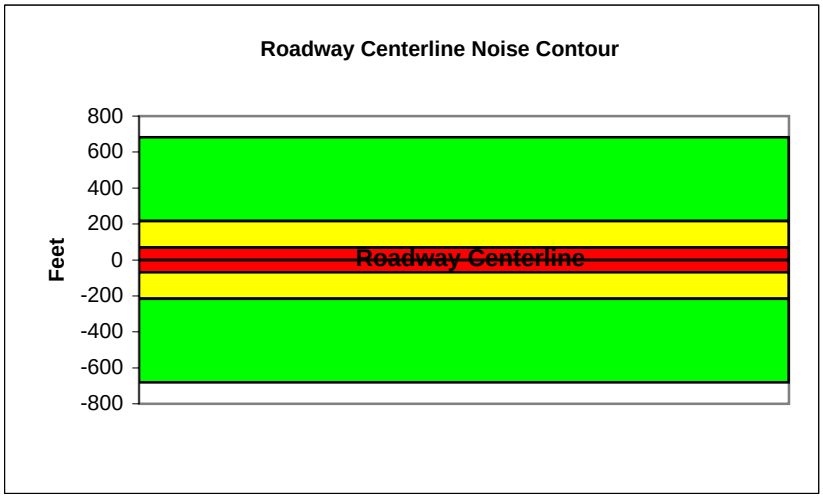
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.5	65.3	63.5	57.5	66.1	66.7
Medium Trucks:	64.2	56.2	49.8	48.2	56.7	56.9
Heavy Trucks:	68.4	56.5	47.5	48.7	58.1	58.2
Vehicle Noise:	**70.8**	**66.4**	**63.8**	**58.5**	**67.2**	**67.7**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	682
65 dBA	216
70 dBA	68
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Madison Avenue		
Road Segment:	Ivy St/Los Alamos to Murrieta Hot Springs Road		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	24100
Peak Hour Traffic:	**2410**
Vehicle Speed:	45
Centerline Separation:	37.1

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

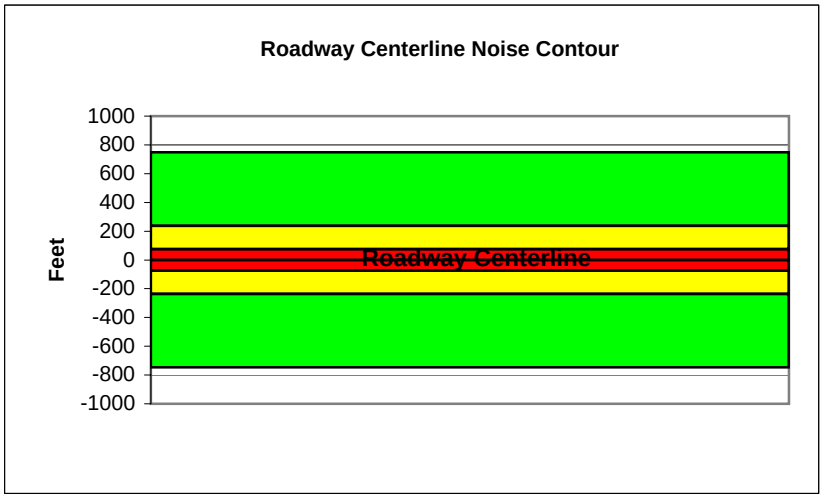
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	56.8	65.5	63.8	57.7	66.3	66.9
Medium Trucks:	65.0	57.0	50.6	49.0	57.5	57.7
Heavy Trucks:	69.6	57.6	48.6	49.8	59.3	59.5
Vehicle Noise:	**71.9**	**66.8**	**64.1**	**59.0**	**67.6**	**68.1**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	749
65 dBA	237
70 dBA	75
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Madison Avenue		
Road Segment:	Murrieta Hot Springs Road to Guava Street		

PROJECT DATA

Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	18000
Peak Hour Traffic:	**1800**
Vehicle Speed:	25
Centerline Separation:	8.7

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

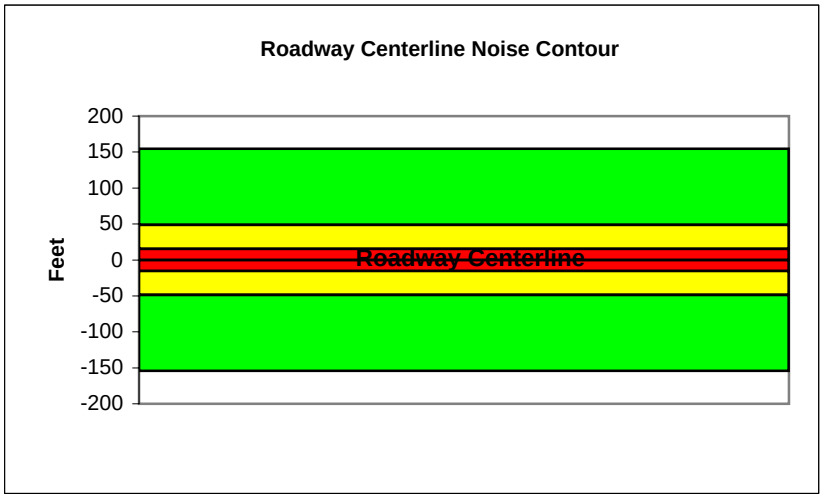
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	48.6	57.4	55.6	49.6	58.2	58.8
Medium Trucks:	60.3	52.2	45.8	44.3	52.8	53.0
Heavy Trucks:	66.4	54.5	45.5	46.7	57.1	57.2
Vehicle Noise:	**69.1**	**60.7**	**56.6**	**52.8**	**61.3**	**61.7**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	155
65 dBA	49
70 dBA	15
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Jackson Avenue		
Road Segment:	North of Nutmeg Street		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	9600
Peak Hour Traffic:	**960**
Vehicle Speed:	40
Centerline Separation:	26.7

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

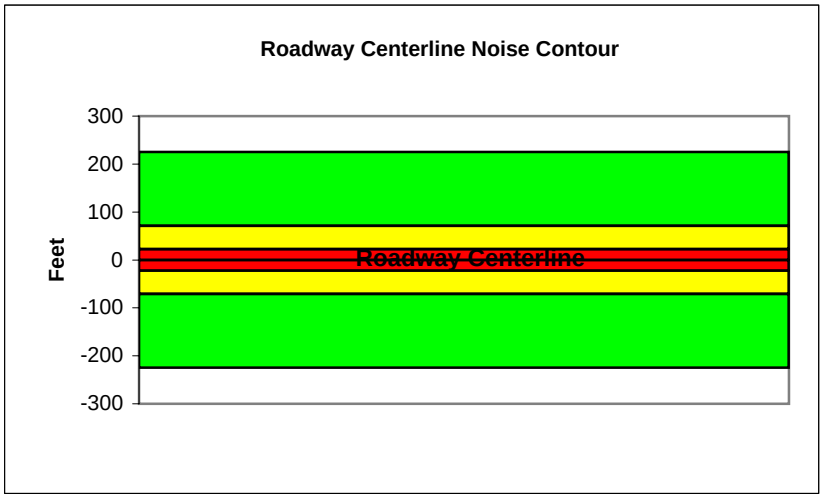
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	51.5	60.2	58.5	52.4	61.0	61.6
Medium Trucks:	60.4	52.3	46.0	44.4	52.9	53.1
Heavy Trucks:	65.3	53.3	44.3	45.5	55.2	55.3
Vehicle Noise:	**67.6**	**61.8**	**58.9**	**53.9**	**62.5**	**63.0**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	225
65 dBA	71
70 dBA	23
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Jackson Avenue		
Road Segment:	Nutmeg Street to Monroe Avenue		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	18000
Peak Hour Traffic:	**1800**
Vehicle Speed:	40
Centerline Separation:	29.5

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

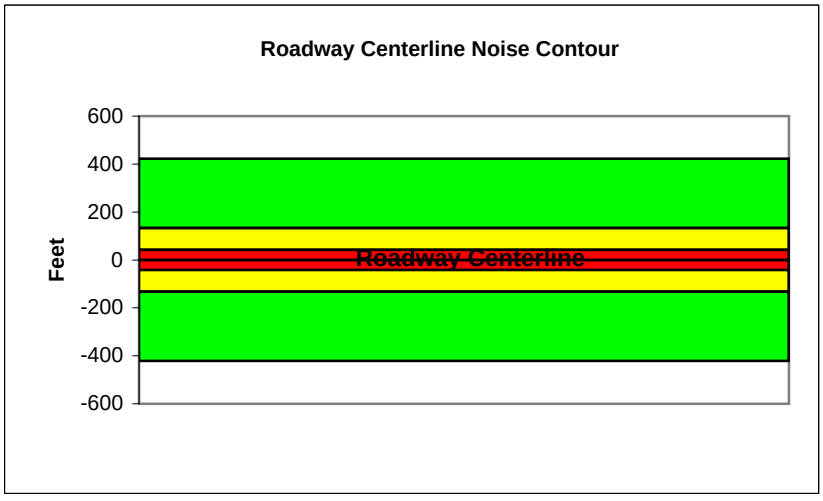
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	54.1	62.9	61.1	55.1	63.7	64.3
Medium Trucks:	63.1	55.0	48.6	47.1	55.6	55.8
Heavy Trucks:	67.9	56.0	47.0	48.2	57.9	58.0
Vehicle Noise:	**70.3**	**64.5**	**61.6**	**56.6**	**65.2**	**65.7**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	422
65 dBA	133
70 dBA	42
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Jackson Avenue		
Road Segment:	Monroe Avenue to California Oaks Road		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	17600
Peak Hour Traffic:	**1760**
Vehicle Speed:	40
Centerline Separation:	32.5

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

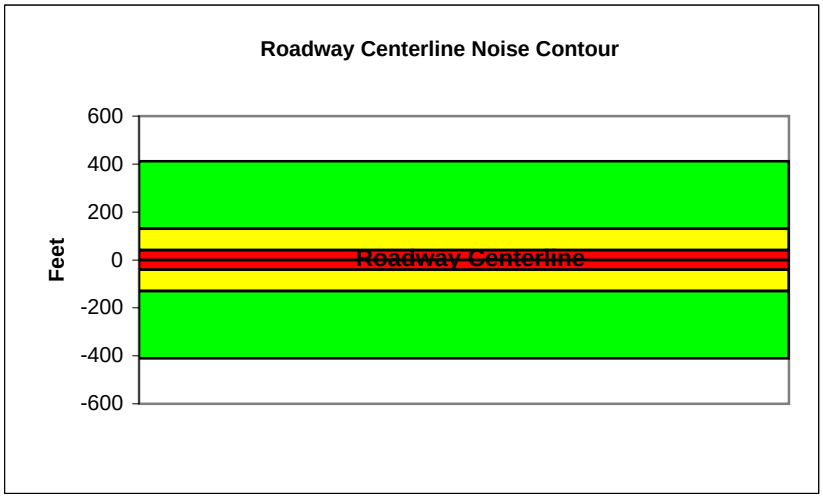
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	54.0	62.8	61.0	54.9	63.6	64.2
Medium Trucks:	63.0	54.9	48.5	46.9	55.4	55.6
Heavy Trucks:	67.8	55.9	46.8	48.0	57.7	57.9
Vehicle Noise:	**70.2**	**64.4**	**61.4**	**56.5**	**65.1**	**65.5**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	412
65 dBA	130
70 dBA	41
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Hancock Avenue		
Road Segment:	California Oaks Road Las Brisas Road		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	15300
Peak Hour Traffic:	**1530**
Vehicle Speed:	40
Centerline Separation:	35.1

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

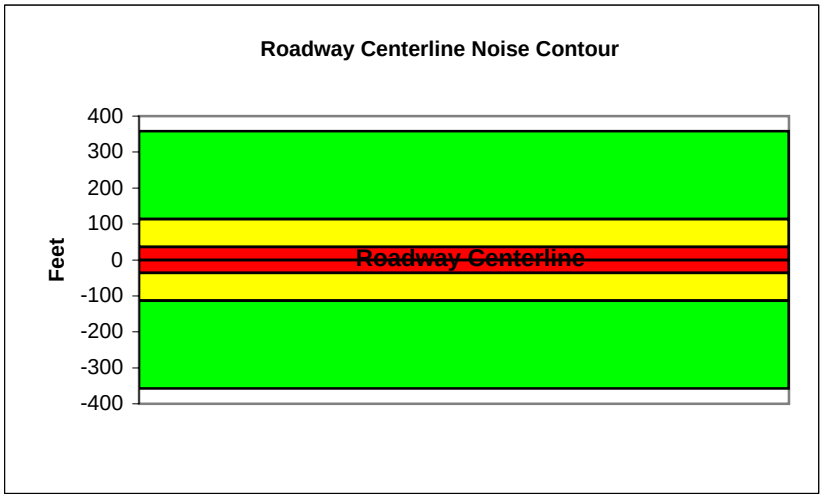
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	53.3	62.1	60.3	54.3	62.9	63.5
Medium Trucks:	62.3	54.2	47.9	46.3	54.8	55.0
Heavy Trucks:	67.1	55.2	46.2	47.4	57.1	57.2
Vehicle Noise:	**69.5**	**63.7**	**60.8**	**55.8**	**64.4**	**64.9**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	358
65 dBA	113
70 dBA	36
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Hancock Avenue		
Road Segment:	From Las Brisas Road to Los Alamos Road		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	24600
Peak Hour Traffic:	**2460**
Vehicle Speed:	40
Centerline Separation:	34

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

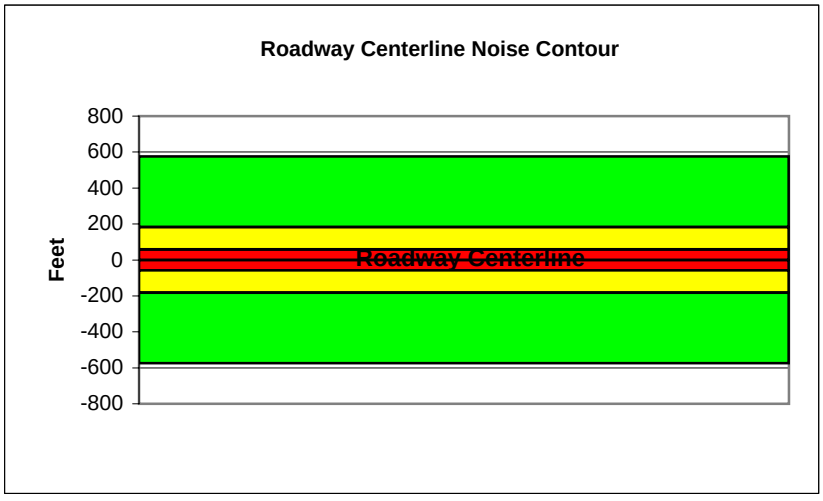
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	55.4	64.2	62.4	56.3	65.0	65.6
Medium Trucks:	64.4	56.3	49.9	48.4	56.8	57.1
Heavy Trucks:	69.2	57.3	48.2	49.5	59.2	59.3
Vehicle Noise:	**71.6**	**65.8**	**62.9**	**57.9**	**66.5**	**67.0**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	576
65 dBA	182
70 dBA	58
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	Hancock Avenue		
Road Segment:	From Los Alamos Road to Murrieta Hot Springs Road		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	27000
Peak Hour Traffic:	**2700**
Vehicle Speed:	40
Centerline Separation:	34.6

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

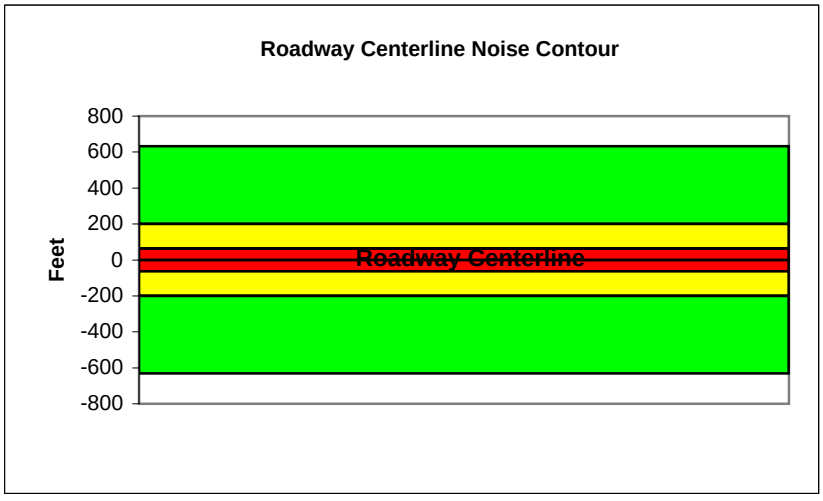
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	55.8	64.6	62.8	56.7	65.4	66.0
Medium Trucks:	64.8	56.7	50.3	48.8	57.2	57.5
Heavy Trucks:	69.6	57.7	48.6	49.8	59.6	59.7
Vehicle Noise:	**72.0**	**66.2**	**63.3**	**58.3**	**66.9**	**67.4**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	633
65 dBA	200
70 dBA	63
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	I-15		
Road Segment:	From City Boundary to Nutmeg Street		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	199900
Peak Hour Traffic:	**19990**
Vehicle Speed:	70
Centerline Separation:	132

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

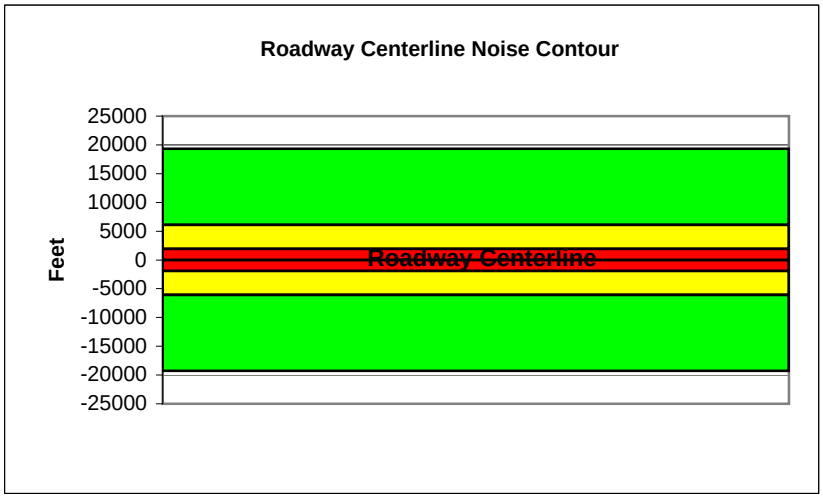
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.3	79.1	77.3	71.2	79.9	80.5
Medium Trucks:	76.1	68.0	61.6	60.1	68.5	68.8
Heavy Trucks:	79.4	67.4	58.4	59.6	68.5	68.6
Vehicle Noise:	**81.7**	**79.7**	**77.5**	**71.9**	**80.5**	**81.0**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	19309
65 dBA	6106
70 dBA	1931
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	I-15		
Road Segment:	From Nutmeg Street to Kalmia Street		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	199900
Peak Hour Traffic:	**19990**
Vehicle Speed:	70
Centerline Separation:	132

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

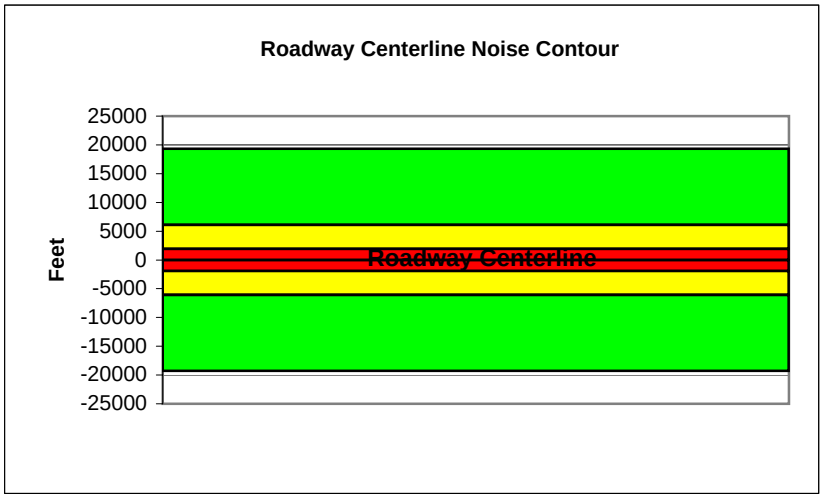
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.3	79.1	77.3	71.2	79.9	80.5
Medium Trucks:	76.1	68.0	61.6	60.1	68.5	68.8
Heavy Trucks:	79.4	67.4	58.4	59.6	68.5	68.6
Vehicle Noise:	**81.7**	**79.7**	**77.5**	**71.9**	**80.5**	**81.0**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	19309
65 dBA	6106
70 dBA	1931
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	I-15		
Road Segment:	From Kalmia Street to Los Alamos Road		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	197000
Peak Hour Traffic:	**19700**
Vehicle Speed:	70
Centerline Separation:	132

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

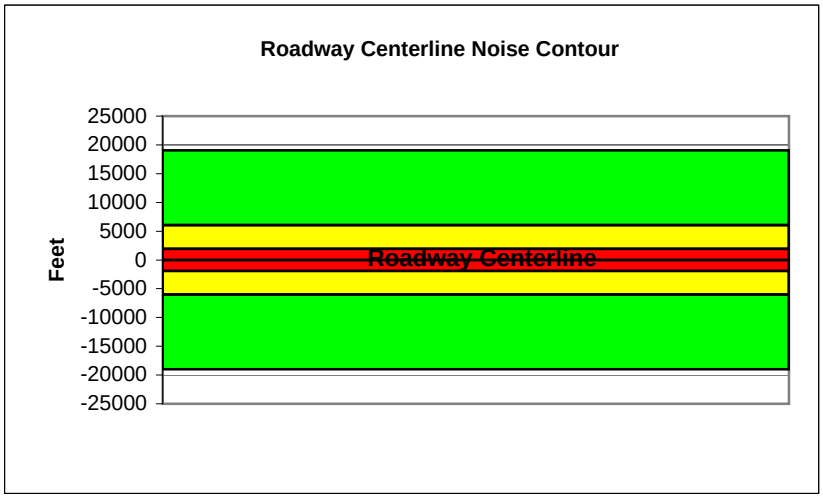
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.3	79.1	77.3	71.2	79.8	80.4
Medium Trucks:	76.0	67.9	61.6	60.0	68.5	68.7
Heavy Trucks:	79.3	67.4	58.3	59.5	68.4	68.6
Vehicle Noise:	**81.7**	**79.7**	**77.4**	**71.8**	**80.4**	**81.0**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	19045
65 dBA	6022
70 dBA	1904
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	I-15		
Road Segment:	From Los Alamos Road to I-215		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	142600
Peak Hour Traffic:	**14260**
Vehicle Speed:	70
Centerline Separation:	132

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

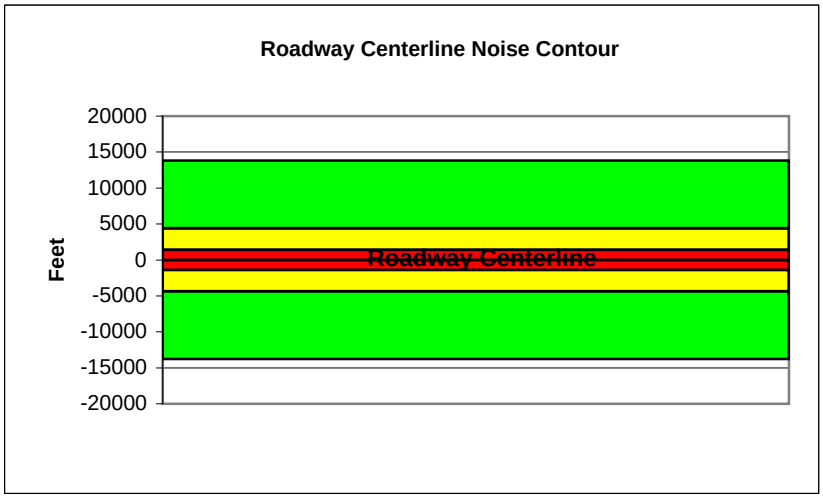
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.9	77.6	75.9	69.8	78.4	79.0
Medium Trucks:	74.6	66.5	60.2	58.6	67.1	67.3
Heavy Trucks:	77.9	66.0	56.9	58.1	67.0	67.2
Vehicle Noise:	**80.3**	**78.3**	**76.0**	**70.4**	**79.0**	**79.6**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	13797
65 dBA	4363
70 dBA	1380
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	I-15		
Road Segment:	From I-215 to Cherry Street		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	248,800
Peak Hour Traffic:	**24880**
Vehicle Speed:	70
Centerline Separation:	122.2

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

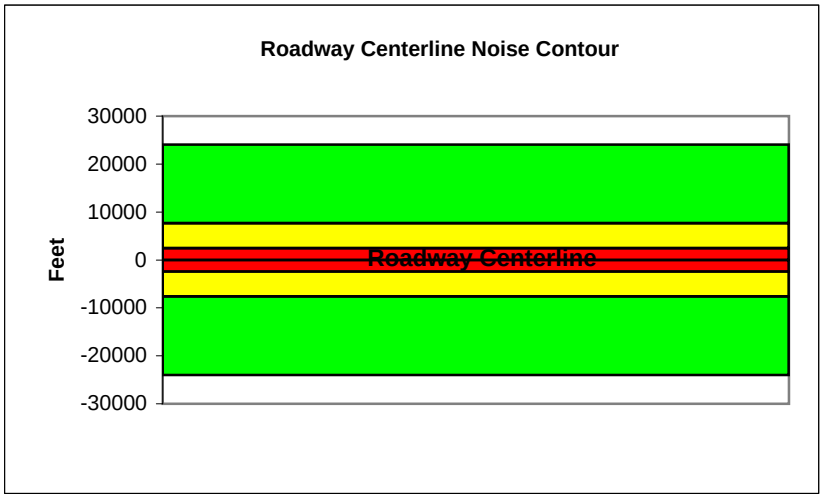
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.4	80.2	78.4	72.3	80.9	81.5
Medium Trucks:	77.1	69.1	62.7	61.1	69.6	69.8
Heavy Trucks:	80.4	68.5	59.4	60.6	69.6	69.7
Vehicle Noise:	**82.8**	**80.8**	**78.5**	**72.9**	**81.5**	**82.1**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	24066
65 dBA	7610
70 dBA	2407
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	I-215		
Road Segment:	From Scott Road to Los Alamos Road		

PROJECT DATA		SITE DATA	
Centerline Dist to Barrier	**0**	Road Grade:	0
Barrier (0=wall, 1= berm):	**0**	Average Daily Traffic:	195,300
Receiver Barrier Dist:	**0**	Peak Hour Traffic:	**19530**
Centerline Dist. To Observer:	**100**	Vehicle Speed:	65
Barrier Near Lane CL Dist:	**0**	Centerline Separation:	71.9
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View: **90**	Lft View: **-90**		

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

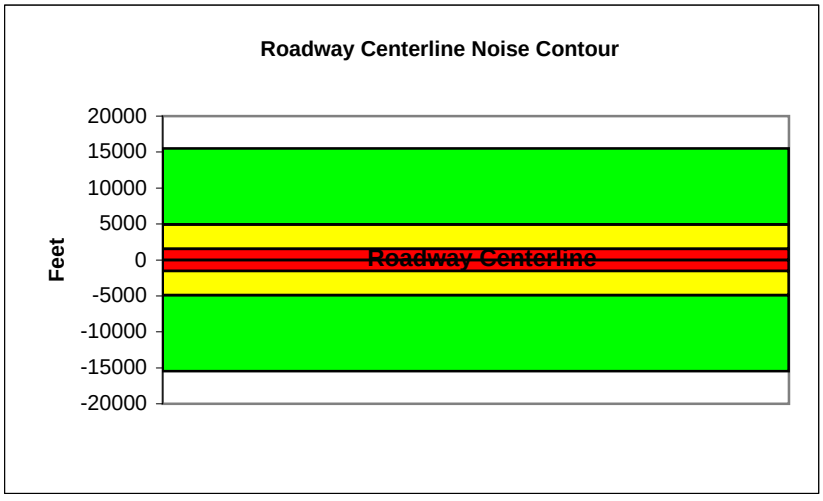
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.0	78.7	77.0	70.9	79.5	80.1
Medium Trucks:	76.1	68.1	61.7	60.1	68.6	68.8
Heavy Trucks:	79.6	67.7	58.6	59.9	68.9	69.0
Vehicle Noise:	**82.0**	**79.4**	**77.1**	**71.6**	**80.2**	**80.7**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	15512
65 dBA	4905
70 dBA	1551
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	I-215		
Road Segment:	From Los Alamos Road to Murrieta Hot Springs Road		

PROJECT DATA			
Centerline Dist to Barrier	**0**		
Barrier (0=wall, 1= berm):	**0**		
Receiver Barrier Dist:	**0**		
Centerline Dist. To Observer:	**100**		
Barrier Near Lane CL Dist:	**0**		
Barrier Far lane CL Dist:	**0**		
Pad Elevation:	**0.5**		
Road Elevation:	**0**		
Observer Height (above grade):	**0**		
Barrier Height:	**0**		
Rt View:	**90**	Lft View:	**-90**

NOISE SOURCE ELEVATIONS (Feet)	
Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA	
Road Grade:	0
Average Daily Traffic:	170,600
Peak Hour Traffic:	**17060**
Vehicle Speed:	70
Centerline Separation:	67.2

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

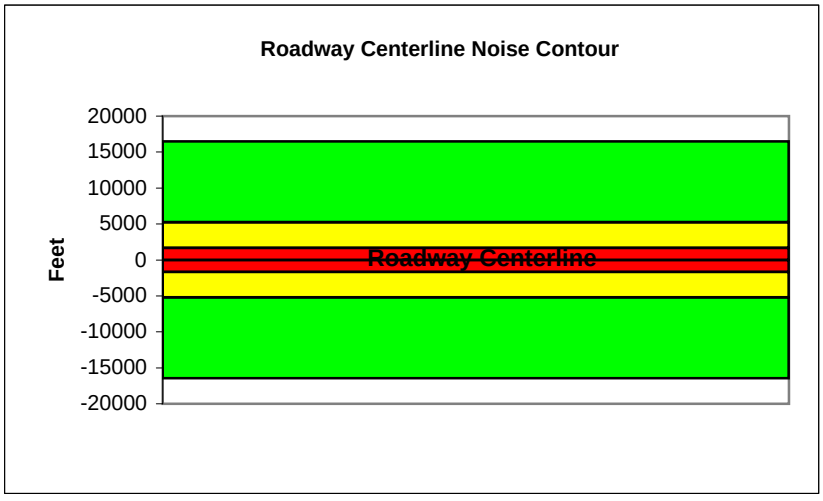
UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	70.4	79.1	77.4	71.3	79.9	80.5
Medium Trucks:	76.1	68.0	61.7	60.1	68.6	68.8
Heavy Trucks:	79.4	67.5	58.4	59.6	68.5	68.7
Vehicle Noise:	**81.8**	**79.8**	**77.5**	**71.9**	**80.5**	**81.1**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR	
Unmitigated	
60 dBA	16506
65 dBA	5220
70 dBA	1651
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Federal Highway Administration RD-77-108
Traffic Noise Prediction Model (CALVENO)

Project Name:	Murrieta General Plan Update	Scenario:	Future
Analyst:	Kelly Chiene	Job #:	10106976
Roadway:	I-215		
Road Segment:	From Murrieta Hot Springs Road to I-15 Merge		

PROJECT DATA

Centerline Dist to Barrier	**0**
Barrier (0=wall, 1= berm):	**0**
Receiver Barrier Dist:	**0**
Centerline Dist. To Observer:	**100**
Barrier Near Lane CL Dist:	**0**
Barrier Far lane CL Dist:	**0**
Pad Elevation:	**0.5**
Road Elevation:	**0**
Observer Height (above grade):	**0**
Barrier Height:	**0**

Rt View: **90** Lft View: **-90**

NOISE SOURCE ELEVATIONS (Feet)

Autos:	**0**
Medium Trucks:	**2.3**
Heavy Trucks:	**8**

SITE DATA

Road Grade:	0
Average Daily Traffic:	149,900
Peak Hour Traffic:	**14990**
Vehicle Speed:	70
Centerline Separation:	70.9

NOISE INPUTS

Site conditions **HARD SITE**

FLEET MIX

Type	Day	Evening	Night	Daily
Auto	0.775	0.129	0.096	0.9742
Med. Truck	0.848	0.049	0.103	0.0184
Heavy Truck	0.865	0.027	0.108	0.0074

UNMITIGATED NOISE LEVELS (No topographic or barrier attenuation)

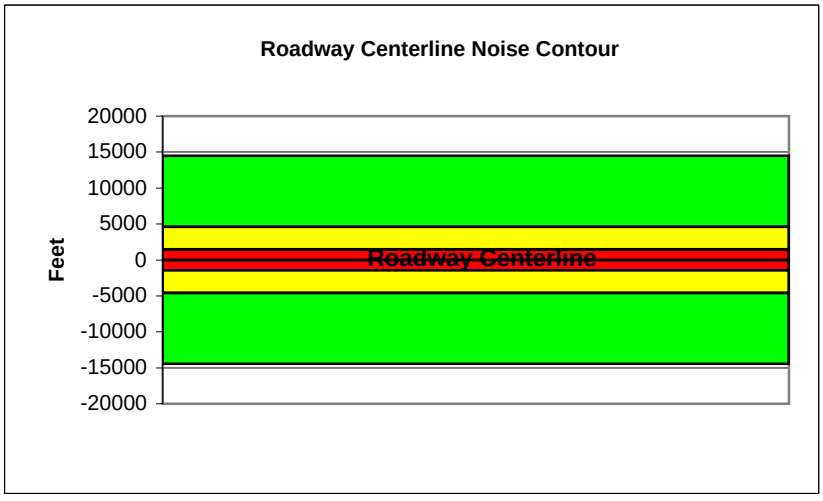
Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.7	78.5	76.7	70.7	79.3	79.9
Medium Trucks:	75.5	67.4	61.0	59.5	68.0	68.2
Heavy Trucks:	78.8	66.8	57.8	59.0	67.9	68.0
Vehicle Noise:	**81.1**	**79.2**	**76.9**	**71.3**	**79.9**	**80.5**

MITIGATED NOISE LEVELS (With topographic or barrier attenuation)

Vehicle Type	Peak Leq	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:						
Medium Trucks:						
Heavy Trucks:						
Vehicle Noise:						

CENTERLINE NOISE CONTOUR

Unmitigated	
60 dBA	14501
65 dBA	4586
70 dBA	1450
Mitigated	
60 dBA	
65 dBA	
70 dBA	



Appendix F:

Public Service / Utility Correspondence

Paul Tabone - General Plan Questions

From: "Kean, Steven (Fire)" <SKean@murrieta.org>
To: "Paul Tabone" <PTABONE@rbf.com>
Date: 1/9/2011 9:17 AM
Subject: General Plan Questions

Paul, Here are the answers to the question you have asked. The new general plan does not create significant changes to our services

- Please indicate any updated assessment fees required for new developments. There have been no Additions or changes in our fee schedule or assessments

- Do you anticipate that required fees and taxes provided by new developments associated with the Murrieta General Plan

Update will adequately mitigate the expected increase in fire and emergency medical service demand? This depends. The Murrieta Fire Department is a Fire District funded by property tax revenue. The assessed values are where we get the larger share of our budget. Also Redevelopment areas established shift the tax monies we would normally receive into the redevelopment areas thus creating an impact to us. So it is difficult to answer this question not knowing what the economy is going to do and what property values will look like in the near future. I feel with our current staffing and facilities, we could handle the impacts of the changes, however additional growth would be difficult to achieve in our current environment.

- Do y**ou have any required or recommended mitigation measures for significant impacts**? Not at this time

- Do you anticipate that implementation of the Murrieta General Plan Update would result in the need for physical additions

to your agency (i.e., construction of new fire stations, equipment or staffing)? With the current update, I do not see any additions to facilities; I could potentially see a need for the addition of a Truck Company with a staffing of four for the added commercial Development

- Is there any other relevant information regarding potential significant impacts? The 2010 Fire Code requires residential sprinkler systems in each new home built. This became effective January 1 and will be implemented in each new residential building permit.

You may provide your answers to the above questions in an email back to me. Due to our aggressive timeline and schedule

constraints, I respectfully ask that you please provide the requested information at your earliest convenience. If there is

anything I can do to help you expedite this request, please contact me; my information is provided below.

Steve Kean, Battalion Chief

Murrieta Fire Department

(951) 677-5511 office

(951) 903-9106 cell

skean@murrieta.org

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MISSION STATEMENT -

"The Riverside County Fire Department is a public safety agency dedicated to protecting life, property and the environment through professionalism, integrity and efficiency."

VISION STATEMENT -

"The Riverside County Fire Department is committed to exemplary customer service and will be a leader in fire protection and emergency services through continuous improvement, innovation and the most efficient and responsible use of resources."

Overview of the Riverside County Fire Department

County Fire Department is one of the largest regional fire service organizations in California. The Department responded to 110,224 incidents during the 2005 calendar year. The Department is staffed with approximately 952 career and 1,100 volunteer personnel, and currently serves approximately 2 million residents in an area of 7,004 square miles. The Riverside County Fire Department service area consists of the unincorporated county areas; 18 contract cities, and one Community Service District (CSD). The incorporated cities of Hemet, Palm Springs, Cathedral City, Murrieta, Riverside, Corona and Norco administer and operate their own fire departments.

The Cities and CSD Proudly Served are:

- Banning
- Beaumont
- Calimesa
- Canyon Lake
- Coachella
- Desert Hot Springs
- Lake Elsinore
- Indian Wells
- Indio
- La Quinta
- Menifee
- Moreno Valley
- Palm Desert

- Perris
- Rancho Mirage
- San Jacinto
- Temecula
- Wildomar
- Rubidoux Community Services District

The RCOFD operates 95 fire stations in 17 battalions, providing fire suppression, emergency medical, rescue, and fire prevention services. The department's service area is organized into six divisions. The equipment used by the department has the versatility to respond to both urban and wildland emergency conditions. The RCOFD inventory includes structural engines, rural engines, brush engines, telesquirts, trucks, paramedic units, a helicopter, hazardous materials unit, incident command units, water tenders, fire crew vehicles, mobile communications centers, breathing support units, lighting units, power supply units, fire dozers, mobile training vans, and mobile emergency feeding units.

The Riverside County Fire Department is the Operational Area Coordinator for the California Fire and Rescue Mutual Aid System for all fire service jurisdictions in the County of Riverside. Riverside County Fire Departmentalso has several automatic aid agreements with other city jurisdictions as well as the adjacent National Forests.

The County of Riverside contracts with the State of California for fire protection. Public Resources Code (PRC) 4142 affords legal authority for the California Department of Forestry and Fire Protection (CAL FIRE) to enter into agreements with local government entities to provide fire protection services with the approval of the Department of General Services. By virtue of this authority, CAL FIRE administers the Riverside County Fire Department.

CAL FIREis primarily a wildland fire protection agency with the legal responsibility for protection of approximately 33 million acres of private and state lands in California. The Riverside Unit of CAL FIRE (with headquarters in Perris) provides direct protection for 1,070,000 acres of " wildland." These vegetation-covered, watershed lands are designated by the State Board of Forestry as state responsibility areas. This is generally private land, outside of incorporated cities and federally owned land, where the organized protection force is at maximum strength during the declared "fire season."

Governance of RCOFD

Riverside County was one of the first in California to endorse and support cooperative and integrated fire protection for the greatest efficiency and economy, authorizing funds to augment the State effort as early as 1906. Since 1921, the County has appointed the CAL FIRE Riverside Unit Chief as the County Fire Chief. It has appropriated County funds to augment and improve the level of protection of an additional 3,570,000 acres of local responsibility area, and protect lives and structural property in the unincorporated areas of the County. The County determines the level of contractual service. The County enhances the existing CDF system, which protects 1,070,000 acres of state responsibility area, for year-round protection. The first county-owned fire stations and engines were provided in 1946. Gradually, as it grew in population and structural development, the County authorized additional facilities and equipment using a small nucleus of paid firefighters and organized volunteers to augment the existing administrative and support positions already funded by the State.

Today, with over 50 years of service, the Riverside County Fire Department includes City, County, State, and volunteer fire stations in its regional, integrated fire protection organization. Of the twenty-four cities in Riverside County, Riverside County Fire Department serves 18 of them as well as one Community Services District. Volunteer firefighters, trained and available for emergencies are paid for actual fire fighting services. Funding for the Riverside County Fire Department is obtained from various sources such as the County general fund and city general and benefit assessment funds, redevelopment money and other

sources. Riverside County Fire Department's combined State, County, and contract cities budget is over 80 million dollars.

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Contact Site Administrator

January 20, 2011

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Fire Department News

- Video Link at Station 4
- News Releases

Public Education

- Attic heater safety
- Drowning prevention
- Fireplace safety
- Wildland Fire Information
- Ready Set Go Action Plan

Fire Chief: Vacant

>> Department Staff Directory

The Fire Department is the primary provider of fire suppression, pre-hospital emergency medical care, disaster preparedness coordination, hazard mitigation and fire prevention services.

Forms

- Emergency Preparedness Quick Checklist
- Firemen's Annual BBQ
- Home Emergency Comprehensive Supply List
- Trap Shoot 2010
- Wildland Defensible Space

Quick Links

- CERT TRAINING
- DISASTER NOTIFICATION CELL PHONE AND VOIP REGISTRATIOM
- Firemen's Annual BBQ

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Fire Department Facilities

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Fire Department Administration
41825 Juniper St.
Murrieta, CA 92562
Phone: (951) 304-FIRE (3473)
Fax (951) 677-6799

Fire Station No. 1
41825 Juniper Street
Murrieta, CA 92562
Phone: (951) 461-6175
Opened April 1966
Enlarged to 4 bays in 1987

Fire Station No. 2
40060 California Oaks Road
Murrieta, CA 92562
Phone: (951) 461-6180
Opened May 23, 1990

Fire Station No. 3
39985 Whitewood Rd.
Murrieta, CA 92563
Phone: (951) 461-6185
Opened November 1, 1992
Closed October 2, 1993
Reopened February 4, 1994

Fire Station No. 4
28155 Baxter Rd.
Murrieta, CA 92563
Phone: (951) 461-6190
Opened October 15, 2005

Fire Station 5
38391 Vineyard Parkway
Murrieta, CA 92562
Phone: 951 461-6195
Opened May 7, 2010

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California Department of Forestry and Fire Protection

About CAL FIRE

The men and women of the California Department of Forestry and Fire Protection (CAL FIRE) are dedicated to the fire protection and stewardship of over 31 million acres of California's privately-owned wildlands. In addition, the Department provides varied emergency services in 36 of the State's 58 counties via contracts with local governments.

The Department's firefighters, fire engines, and aircraft respond to an average of more than 5,600 wildland fires each year. Those fires burn more than 172,000 acres annually.

While Californians are learning more and more about the good as well as the bad of fire, the prevention of large, damaging fires remains a priority for CAL FIRE. From Smokey Bear, to the thousands of CAL FIRE Volunteers in Prevention (VIPs), to new alliances with communities, private industry, and government agencies, aggressive action in fire prevention and fire safety is occurring throughout the State.

Beyond its wildland fire fighting role, CAL FIRE answers the call more than 350,000 times for other emergencies each year. It may very well be a CAL FIRE engine and crew that is dispatched to the scene of an auto accident, or to a home where a child has become the victim of a drowning incident. The Department is always ready to respond - medical aids; hazardous material spills; swiftwater rescues; search and rescue missions; civil disturbances; train wrecks; floods, earthquakes and more.

Because of the Department's size and major incident management experience, it is often asked to assist or take the lead in disasters, including the Northern and Central California floods of 1997, 1998, and 2006; the 1991 Cantara train derailment and toxic spill; 1994 Northridge earthquake; 1989 Loma Prieta earthquake; the 1991 Tunnel Fire in the Oakland/Berkeley Hills; and the 2003 Southern California Fire Siege.

As part of the CAL FIRE team since 1995, the Office of the State Fire Marshal (OSFM) supports the CAL FIRE mission to protect life and property through fire prevention engineering programs, law and code enforcement and education. The OSFM provides for fire prevention by enforcing fire-related laws in state-owned or operated buildings, investigating arson fires in California, licensing those who inspect and service fire protection systems, approving fireworks as safe and sane for use in California, regulating the use of chemical flame retardants, evaluating building materials against fire safety standards, regulating hazardous liquid pipelines, and tracking incident statistics for local and state government emergency response agencies.

The OSFM, State Fire Training, and CAL FIRE Academy programs provide training education and certification programs for the California Fire Service. Through practical training exercises and classroom courses, every California firefighter is exposed to training standards that have been approved by CAL FIRE and OSFM, each among the best institutions in the nation for fire training education. Offering more than 1,000 classes annually, State Fire Training programs reach over 24,000 students each year and have issued over 100,000 certifications to members of the more than 900 fire California fire departments. Each year over 2,000 personnel attend the CAL FIRE Academy in Ione, California participating in courses ranging from basic fire control and arson investigation, to leadership development and forest practice enforcement.

CAL FIRE's mission emphasizes the management and protection of California's natural resources; a goal that is accomplished through ongoing assessment and study of the State's natural resources and an extensive CAL FIRE Resource Management Program. CAL FIRE oversees enforcement of California's forest practice regulations, which guide timber harvesting on private lands. Department foresters review an average 500 to 1,400 Timber Harvesting Plans (THPs) and conduct over 6,500 site inspections each year. THPs are submitted by private landowners and logging companies who want to harvest their trees. The reviews and inspections ensure protection of watershed and wildlife, as well as renewal of timber resources. Department foresters and fire personnel work closely to encourage and implement fuels management projects to reduce the threat of uncontrolled wildfires. Vegetation management projects such as "controlled burns" take teamwork between foresters, firefighters, landowners, and the local communities. CAL FIRE Foresters promote conservation and the importance of our trees and forests to Californians of all ages.

CAL FIRE manages eight Demonstration State Forests that provide

for commercial timber production, public recreation, and research and demonstration of good forest management practices. CAL FIRE foresters can be found in urban areas working to increase the number of trees planted in our cities, or preventing the spread of disease by identifying and removing infected trees. A Native American burial ground in the path of a logging operation or fire may be verified and saved due to a CAL FIRE archaeologist's review of the area. And, an improved strain of trees, resistant to disease and pests, may be nurtured and introduced by a CAL FIRE forester.

What is CAL FIRE? It is many things for the citizens of the State, and we encourage you to check this web site regularly for new and updated information.

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From: "Vrooman, Dennis (Police)" <DVrooman@murrieta.org>
To: "Paul Tabone" <PTABONE@rbf.com>
Date: 12/11/2010 7:18 PM
Subject: RE: Police Protection Questions - Murrieta General Plan Update EIR
Attachments: Existing Goals and Policies.doc; 20091113145959.pdf; POLICE SERVICES.doc; E xisting Goals and Policies.doc; 20091113145959.pdf; POLICE SERVICES.doc

Lt. Dennis Vrooman

From: Paul Tabone [mailto:PTABONE@rbf.com]
Sent: Monday, December 06, 2010 1:24 PM
To: Vrooman, Dennis (Police)
Cc: Smith, Greg (Planning)
Subject: Police Protection Questions - Murrieta General Plan Update EIR

Good afternoon,

My name is Paul Tabone and I am working for RBF Consulting on the Murrieta General Plan Update EIR. I understand you assisted RBF in preparing an existing conditions report; this report will be very helpful for the Police Protection Section that I am working on.

However, there are just a few more questions I have so that I can complete this section. As you are probably aware, the General Plan Update is being written based on the following growth projections:

- An addition of 3,346 dwelling units

- An addition of 22,156,784 square feet of non-residential uses, broken down into the following categories:

* 2,655,023 square feet of business park uses
* 14,807,287 square feet of professional and office uses
* 3,663,446 square feet of commercial uses
* 2,028 square feet of civic and institutional uses

The above-mentioned square footages are targeted in updated focus areas, which are shown in Exhibit 2, attached in this email.

Based on the future-projected development scenario, I just wanted to obtain some answers to the following questions:

- Please indicate any updated assessment fees required for new developments.

I don't have any updated fees.

- Do you anticipate any significant impacts associated with the Murrieta General Plan Update on current service within the city,

such as increasing service calls or the need for additional personnel or patrol cars? Please provide generation factors if it is

determined that additional personnel or patrol cars are required.

Absolutely, the City Council has adopted a general rule that we have 1 officer per 1,000 population. Additionally, our civilian staffing is about .5 officers per thousand population. Whatever these developments impact on increasing the population, they should pay an impact fee to increase the police department staffing levels.

- Do you have any required or recommended mitigation measures for significant impacts?

This would be a Planning Department question, or information we have already submitted.

- Do you anticipate that implementation of the Murrieta General Plan Update would result in the need for physical additions to

your agency (i.e., construction of new police stations, equipment or staffing)?

Yes, I believe the city has an existing formula to add DIF for an

expansion of the existing police facility.

- Is there any other relevant information regarding potential significant impacts?

Attached is some information that may be helpful.

You may provide your answers to the above questions in an email back to me. Due to our aggressive timeline and schedule

constraints, I respectfully ask that you please provide the requested information at your earliest convenience. If there is

anything I can do to help you expedite this request, please contact me; my information is provided below.

Thank you,

Paul Tabone

Paul J. Tabone
Project Planner
RBF Consulting
14725 Alton Parkway
Irvine, CA 92618
Phone: 949.330.4166
Fax: 949.837.4122

www.rbf.com <http://www.rbf.com/>

January 20, 2011

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Murrieta's Most WANTED

SUBSCRIBE

- Indecent Exposure Suspect Arrested
- Attempt Murder Suspect Wanted
- Target Forgery Suspects
- Home Invasion Update
- Radio Shack Robbery
- Lottery Scam
- CVS Pharmacy Burglary

General Information

- Our Mission, Vision & Values Statements
- Message From the Chief

How To...

- Business License Background Requirements
- Facilities Tour Information
- Fingerprint Information
- How to Volunteer at the Police Department
- Purchase Accident Reports
- Ride-Along Program
- Start a Neighborhood Watch
- Vehicle Release Information

Crime Service Information

- December 2010 Activity Report
- NOVEMBER 2010 ACTIVITY REPORT
- OCTOBER 2010 ACTIVITY REPORT
- SEPTEMBER 2010 ACTIVITY REPORT
- AUGUST 2010 ACTIVITY REPORT
- JULY 2010 ACTIVITY REPORT
- June 2010 Activity Report
- MAY 2010 ACTIVITY REPORT
- APRIL 2010 ACTIVITY REPORT
- March 2010 Activity Report
- FEBRUARY 2010 ACTIVITY REPORT
- JANUARY 2010 ACTIVITY REPORT
- DECEMBER 2009 ACTIVITY REPORT

Alerts

SUBSCRIBE

- Current Amber Alerts
- Missing Persons
- Runaway Juvenile - Armijo
- We Tip - Slash Attack

News Releases

SUBSCRIBE

- Armed Robbery Series
- Felony Vandalism Arrest (x2)
- Full list >>
- Media Contact/Public Information Officer

Programs

- 24-Hour Emergency Dispatch Center
- 9-1-1 For Kids
- Code Enforcement
- Court Ordered Registrants
- Crime Free Multi-housing
- Detective Bureau
- Drug Abuse Resistance Education (D.A.R.E.) & red ribbon week
- DUI Checkpoints and Roving Patrols
- Every-15-Minutes Program
- Fingerprinting/Livescan
- Home to School Safety Patrols
- K-9 Program
- Kid Print/Safety Fairs
- Major Traffic Accident Investigation Team
- Motor Officers

Mark Wright
Chief of Police

>> Department Staff Directory

The Police Department serves as the primary law enforcement agency for the City.

Forms

- Crime Free multi-housing lease addendum form
- Neighborhood Watch
- Request for station tour
- Ride along request form

Quick Links

- 211 Riverside County
- Murrieta, Second Safest City in the Nation
- Riverside County Sheriff
- Traffic Commission

Crime Prevention Pamphlets

- Burglary Prevention
- Business Security
- Check, Credit Card Refund Fraud
- Child Safety
- Crime Prevention Tips For Seniors
- Crime Prevention Tips For the Disabled
- Dispute Resolution Pamphlet
- Domestic Violence Pamphlet
- Home Security
- Home Security hardware
- Make Robbery Risky
- Neighborhood Watch
- Operation Identification
- Personal Security
- Prevent arson & Vandalism
- Shoplifting & Internal Theft

View full list

Safety Tips/Crime Prevention Information

- Amber Alert Information
- Child Safety Zones
- Family Justice Center
- Identity Theft
- Megan's Law information
- National Sex Offender Registry
- Spotlight Column
- Victims' Bill of Rights

Legal Information

- Administrative Office of the Courts
- California Laws
- Murrieta Municipal Ordinances
- Riverside County Court Computer
- Riverside County Ordinances
- Traffic Fines and Bail Amounts

- Mounted Equestrian Patrol
- Neighborhood Watch
- Off-Road Motorcycle Enforcement
- Police Activities League (PAL)
- Police Station Tours
- Property and Evidence
- Records Bureau
- Reserve Officer Program
- Ride-Along Program
- S.W.A.T.
- School Resource Officer Program
- Special Enforcement Team
- Towed/Impounded Vehicles
- Traffic Division
- Volunteer Program
- Youth Accountability Board
- Youth Accountability Team
- Youth Court

- Prevention
- Vehicle Security

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Police Department

The Youth Accountability Team

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Phone: 951-461-6359

Contact: Det. John Therien

The Youth Accountability Team (YAT) consists of a Murrieta Police Detective, a Deputy District Attorney and a Deputy Probation Officer. The team reviews all misdemeanor juvenile arrests and collaboratively evaluates each individual case. YAT then implements the most appropriate disposition for the delinquent behavior. The team also accepts referrals for at-risk youth who have not been arrested or charged with a crime.

YAT participants must be between the ages of 12-17 and exhibit one or more of the following forms of delinquency: substance abuse, school discipline problems, family conflict, mental health issues, gang association or habitual truancy or curfew violations. An assessment of individual needs is made by the team, followed by appropriate referrals for services.

YAT participants, with the approval of their parents, can be placed on informal probation contract for up to six months and must adhere to behavioral standards to maintain program eligibility. The team members make routine visits with the YAT participants at their school, home, and in the community.

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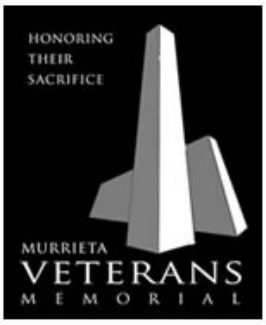

Special Enforcement Team

Previous Page

Phone: (951) 304-COPS(951) 461-6396

Contact: S.E.T. Direct Line

The Special Enforcement Team follows up on drug complaints and investigations and manages the Neighborhood Watch and Crime Free Multi-housing programs, and provides guest speakers. Call the Special Enforcement Team to report any type of ongoing drug activity or suspicious activity. Requests for anonymity will be honored.

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Police Activities League

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Phone: 951-304-2677 ext. 6886

Contact: Officer Stacie Day

The Police Activities League (PAL) is a partnership between Safe Alternatives For Everyone (SAFE) and the Murrieta and Temecula Police Departments. SAFE is a local non-profit domestic violence and family support organization located in Temecula.

PAL coordinates recreational, educational, and athletic activities for disadvantaged or at-risk youth within our community. Police officers volunteer their time to attend PAL events with the intention of providing mentorship and to serve as a positive role model. PAL activities create an environment where youth and law enforcement are able to communicate with each other in a neutral environment to foster positive attitudes and mutual respect.

Activities include bowling, movie nights, arts and crafts, mountain biking, sailing, camping, fishing and other outdoor activities. PAL also has a boxing program with weekly training.

PAL participation is for students between the ages of 5-17 years old. Activities are organized within specific age categories and are age appropriate. Students ages 5-12 participate in Young PAL, and students 13 and older participate in Teen PAL. PAL has an annual enrollment fee of $20/child per calendar year.

View PAL Frequently Asked Questions

For more information please contact:

PAL Youth Services Specialist:
Jami Barthelme
951-587-3900
pal@safefamiliesca.org

PAL Coordinator:
Officer Stacie Day
951-304-2677 ext. 6886
sday@murrieta.org

PAL Boxing Coordinator
Officer Roy Vargas
951-304-2677 ext. 6858
rvargas@murrieta.org

PAL Program Manager:
Lieutenant Bob Davenport
951-461-6354
bdavenport@murrieta.org

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Murrieta General Plan Update

HONORING THEIR SACRIFICE
MURRIETA VETERANS MEMORIAL

Healthy Murrieta

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School Resource Officer Program

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Phone: 951-461-6308

Contact: Sgt. Dave Baca

In cooperation with the Murrieta Valley Unified School District, Murrieta police officers are assigned full-time to the high schools and middle schools within the school district. School Resource Officers interact with students and serve as positive role models for students, as well as enforce criminal conduct occurring on the high school, middle school campuses.

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Volunteer Program

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Phone: 951-304-COPS (2677) or 951-461-6318

Contact: Volunteer Coordinators - Sergeant Don Weller and Corporal Spencer Parker

The Murrieta Police Department has an active volunteer program of persons wanting to volunteer at least 16 hours per month at the Murrieta Police Department. Volunteers assist in Neighborhood Watch, Crime Free Multi-housing, YANA, parades, citizen patrols, front counter and receptionist responsibilities, as well as school patrols and other special events. To participate in the volunteer program, please call the Volunteer Coordinator, Cpl Spencer Parker sparker@murrieta.org or Sgt Don Weller dweller@murrieta.org

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Yourth Accountability Board

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Phone: 951.461-6373

Contact: Terri Burmeister

The Murrieta Police Department in cooperation with the Riverside County Juvenile Probation Department and the District Attorney's Office has a diversion program for juveniles who have been arrested for minor criminal law violations. The Youth Accountability Board is made up of volunteers and leaders throughout the community wanting to assist in the rehabilitation of the youthful offender and their parent's). The Murrieta Police Department is consistently looking for new volunteers to add to the program.

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Paul Tabone - RE: School Facility Questions - Murrieta General Plan Update

From: "Shaw, Bruce" <bshaw@menifeeusd.org>
To: "Paul Tabone" <PTABONE@rbf.com>
Date: 12/22/2010 8:50 AM
Subject: RE: School Facility Questions - Murrieta General Plan Update

The SGR's are measured as a rate per Single Family Detached Unit.

Bruce H. Shaw

Director of Facilities

Menifee Union School District

30205 Menifee Road

Menifee, CA 92584

(951) 672-1851 Office

(951)679-7237 Fax

bshaw@menifeeusd.org

From: Paul Tabone [mailto:PTABONE@rbf.com]
Sent: Tuesday, December 21, 2010 3:14 PM
To: Shaw, Bruce
Subject: RE: School Facility Questions - Murrieta General Plan Update

Bruce,

I had one more question: are the generation rates per sf or per residential dwelling unit?

Could you please confirm?

Thank you!

Paul Tabone

PAUL J. TABONE
PROJECT PLANNER
RBF CONSULTING
14725 ALTON PARKWAY
IRVINE, CA 92618
PHONE: 949.330.4166
FAX: 949.837.4122

WWW.RBF.COM

>>> "Shaw, Bruce" <bshaw@menifeeusd.org> 12/21/2010 11:25 AM >>>

Answers follow questions below:

Bruce H. Shaw

Director of Facilities

Menifee Union School District

30205 Menifee Road

Menifee, CA 92584

(951) 672-1851 Office

(951)679-7237 Fax

bshaw@menifeeusd.org

From: Paul Tabone [mailto:PTABONE@rbf.com]
Sent: Thursday, December 16, 2010 3:19 PM
To: Shaw, Bruce; rwolfe@musd.org.
Cc: gsmith@murrieta.org
Subject: School Facility Questions - Murrieta General Plan Update

Good afternoon gentlemen,

My name is Paul Tabone and I am working for RBF Consulting on the Murrieta General Plan Update EIR. Betti Cadmus gave me your information, and said she forwarded you both the questions regarding the Murrieta General Plan update listed below. As you are probably aware, the General Plan Update is being written based on the following growth projections over the next 25 years:

- An addition of 3,346 dwelling units

- An addition of 22,156,784 square feet of non-residential uses, broken down into the following categories:

- 2,655,023 square feet of business park uses
- 14,807,287 square feet of professional and office uses
- 3,663,446 square feet of commercial uses
- 2,028 square feet of civic and institutional uses

The above-mentioned square footages are targeted in updated focus areas, which are shown in Exhibit 2, attached in this email.

Based on the future-projected development scenario, I just wanted to obtain some answers to the following questions:

- Are there any updated plans for facility expansion or new facilities, please provide as much detail as possible. Where does the

District acquire funding for new facilities?

The District acquires funding for facilities through several different means. The most prevalent is CFD's, mitigation payments,

Developer fees, and local Bond issues.

The District requires land in the southeast quadrant of the district (covers portions of Murrieta) in order to build a new elementary

School to relieve overcrowding at Oak Meadows Elementary, which is also located within the Murrieta city limits.

- Are fees assessed against new developments for school-related services? Have they changed from $2.21 per SF

for residential development and $0.3384 per SF for non-residential development? If so, what are they now?

The District charges level II fees for residential development, or $2.35 sf, and $ .3384 sf for commercial/industrial development.

- What is the generation rate used by the district to predict future population growth?

SGR for grades K-5 is .3637 and .1517 for grades 6-8

- Does the District anticipate being able to accommodate for the population that may be generated by the proposed Murrieta

General Plan Update?

As mentioned above, the District definitely needs another elementary in the Southeast quadrant of the District in order to house

the existing student population currently generated from Murrieta and surrounding county areas. With any growth at all in the

area mentioned, the need will only increase.

- Please provide any additional comments that would pertain to impacts associated with the Murrieta General

Plan Update.

Should you have any additional questions, please contact me.

You may provide your answers to the above questions in an email back to me. Due to our aggressive timeline and schedule

constraints, I respectfully ask that you please provide the requested information at your earliest convenience. If there is

anything I can do to help you expedite this request, please contact me; my information is provided below.

Thank you,

Paul Tabone

Paul J. Tabone
Project Planner
RBF Consulting
14725 Alton Parkway
Irvine, CA 92618
Phone: 949.330.4166
Fax: 949.837.4122

www.rbf.com

Paul Tabone - RE: Murrieta General Plan Update - School Facilities Questions

From: "Jones, Chuck" <cjones@murrieta.k12.ca.us>
To: Paul Tabone <PTABONE@rbf.com>
Date: 1/3/2011 7:05 AM
Subject: RE: Murrieta General Plan Update - School Facilities Questions

The rates are broken down per UNIT. No problem….

From: Paul Tabone [mailto:PTABONE@rbf.com]
Sent: Wednesday, December 22, 2010 9:20 AM
To: Jones, Chuck
Subject: RE: Murrieta General Plan Update - School Facilities Questions

Chuck,

One last question...sorry to keep bugging you.

If the gen rates are per sf, then students would be added very quickly....

for example, the 9-12 gen rate is .5, so that means that 2 sf would equal 1 student.

Are the gen rates per 1,000 sf? Or would it be possible to get it broken down by unit?

Please confirm.

Thank you,

Paul

Paul J. Tabone
Project Planner
RBF Consulting
14725 Alton Parkway
Irvine, CA 92618
Phone: 949.330.4166
Fax: 949.837.4122

www.rbf.com

>>> "Jones, Chuck" <cjones@murrieta.k12.ca.us> 12/21/2010 2:47 PM >>>

Per square foot

From: Paul Tabone [mailto:PTABONE@rbf.com]
Sent: Tuesday, December 21, 2010 2:46 PM
To: Jones, Chuck
Subject: RE: Murrieta General Plan Update - School Facilities Questions

Chuck,

Thanks for all of this information.....I just had one more question: are the generation rates per square foot or per residential dwelling unit? Could you please confirm?

Thank you,

Paul Tabone

Paul J. Tabone
Project Planner
RBF Consulting
14725 Alton Parkway
Irvine, CA 92618
Phone: 949.330.4166

Fax: 949.837.4122

www.rbf.com

>>> "Jones, Chuck" <cjones@murrieta.k12.ca.us> 12/10/2010 7:31 AM >>>

- Are there any updated plans for facility expansion or new facilities, please provide as much detail as possible. Where does the

District acquire funding for new facilities?

MVUSD does not have plans for facility expansion or new facilities in the next 3-5 years. We are planning a 6 million dollar summer 2011 renovation at Murrieta Valley High School. We have only 1 more elementary school to build in the district before "build out." This school will be located in the Vineyard Project which is yet to be developed. The school is not needed until development of the project. Money used to construct new schools comes from local bonds, Developer Fees and matching money from the state.

- Are fees assessed against new developments for school-related services? Have they changed from $2.97 per SF

for residential development and $0.47 per SF for non-residential development? If so, what are they now?

That is the correct rates.

- What is the generation rate used by the district to predict future population growth?

.9 K-5 students

.3 6-8 students

.5 9-12

- Does the District anticipate being able to accommodate for the population that may be generated by the proposed Murrieta

General Plan Update?

YES

- Please provide any additional comments that would pertain to impacts associated with the Buena Park General

Plan Update.

Our plan for schools was predicated on the City Plan. Adequate space has been anticipated for the proposed modifications to the General Plan. Boundary changes may be necessary between some school sites to balance enrollment.

You may provide your answers to the above questions in an email back to me. Due to our aggressive timeline and schedule

constraints, I respectfully ask that you please provide the requested information at your earliest convenience. If there is

anything I can do to help you expedite this request, please contact me; my information is provided below.

Thank you,

Paul Tabone

Paul J. Tabone
Project Planner
RBF Consulting
14725 Alton Parkway
Irvine, CA 92618
Phone: 949.330.4166

Fax: 949.837.4122

www.rbf.com

Paul Tabone - Re: Murrieta General Plan Update - School District Questions

From: Fred Good <fredgoodandassoc@mac.com>
To: Paul Tabone <PTABONE@rbf.com>
Date: 12/21/2010 4:59 PM
Subject: Re: Murrieta General Plan Update - School District Questions

Paul -

The Perris UHSD has one student generation rate - it is a blended rate between SFD & MF - although most of the units constructed within the District have been more SFD - the generation rate is .16 student/DU.

Fred

On Dec 21, 2010, at 4:56 PM, Paul Tabone wrote:

> Fred,
>
> Do you have generation rates for each of the grade levels? Would those have changed? And would they be on a square-foot or per-unit basis?
>
> Please confirm.
> Thank you!
>
> Paul Tabone

PAUL J. TABONE
PROJECT PLANNER
RBF CONSULTING
14725 ALTON PARKWAY
IRVINE, CA 92618
PHONE: 949.330.4166
FAX: 949.837.4122
WWW.RBF.COM

>>> Fred Good <fredgoodandassoc@mac.com> 12/6/2010 3:13 PM >>>
Paul -

I am providing this additional information per the request of Xochitl from the Perris Union High School District.

With regard to plans for new facilities that would serve existing and future students from Murrieta, the PUHSD is planning a new comprehensive high school at the northwest corner of Wickerd and Leon Roads in the unincorporated area of Riverside County. This new

school will likely include approximately 260,000 square feet of building area and will accommodate approximately 2,800 students in grades 9 thru 12. Funding for past capital facility projects has come from a variety of sources: school impact fees, developer/mitigation agreements, State funding through the School Facilities Program and a variety of other State and Federal funding programs. Additionally, the PUHSD voters approved a local bond ballot measure in 2004 with a $46,000,000 GO bond authorization - all series of bonds have been sold and $2.5 million of the proceeds were used to acquire the aforementioned new high school site.

With regard to developer fees, nothing has changed from the last time we provided information to you.

Don't hesitate to contact me if you need any additional information Paul - best wishes with the General Plan update.

Fred Good

Fred Good and Associates
23902 Flores Avenue
Laguna Niguel, California 92677
p. (949) 751-9636
f. (949) 363-1851
e. fredgoodandassoc@mac.com

On Dec 6, 2010, at 2:35 PM, Xochitl Molina wrote:

> Hi Fred,
>
> Remember this person J. He is requesting additional information and I hope that you can help me. Please!
>
> Thanks,
>
> **Xochitl Tafolla-Molina**
> **Accounting Technician**
> **Facilities & Planning Department**
> **Perris Union High School District**
> **(951) 943-6369 ext: 132**
>
> **xochitl.molina@puhsd.org**
>
> **From:** Paul Tabone [mailto:PTABONE@rbf.com]
> **Sent:** Monday, December 06, 2010 2:31 PM
> **To:** Xochitl Molina
> **Cc:** gsmith@murrieta.org
> **Subject:** Murrieta General Plan Update - School District Questions

Good afternoon,
My name is Paul Tabone and I am working for RBF Consulting on the Murrieta General Plan Update EIR. I understand you assisted RBF in preparing an existing conditions report earlier this year; this report will be very helpful for the Schools Section that I am working on.
However, there are just a few more questions I wanted to verify. As you are probably aware, the General Plan Update is being written based on the following growth projections:
- An addition of 3,346 dwelling units
- An addition of 22,156,784 square feet of non-residential uses, broken down into the following categories:

- 2,655,023 square feet of business park uses
- 14,807,287 square feet of professional and office uses
- 3,663,446 square feet of commercial uses
- 2,028 square feet of civic and institutional uses

The above-mentioned square footages are targeted in updated focus areas, which are shown in Exhibit 2, attached in this email.
Based on the future-projected development scenario, I just wanted to obtain some answers to the following questions:
- Are there any updated plans for facility expansion or new facilities, please provide as much detail as possible. Where does the
District acquire funding for new facilities?
- Are fees assessed against new developments for school-related services? Have they changed from $0.94 per SF
for residential development and $0.132 per SF for non-residential development? If so, what are they now?

- What is the generation rate used by the district to predict future population growth?

- Does the District anticipate being able to accommodate for the population that may be generated by the proposed Murrieta
General Plan Update?
- Please provide any additional comments that would pertain to impacts associated with the Murrieta General
Plan Update.

You may provide your answers to the above questions in an email back to me. Due to our aggressive timeline and schedule

constraints, I respectfully ask that you please provide the requested information at your earliest convenience. If there is

anything I can do to help you expedite this request, please contact me; my information is provided below.

Thank you,

Paul Tabone

Paul J. Tabone
Project Planner
RBF Consulting
14725 Alton Parkway
Irvine, CA 92618
Phone: 949.330.4166
Fax: 949.837.4122
www.rbf.com
<GPLU_Alternative_RecommendedScenario_101510.pdf><Paul Tabone.vcf>

<Paul Tabone.vcf>

Facilities & Operations

pages in this section

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Departments

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- Student Support

SCHOOL BOUNDARIES

MVUSD ELEMENTARY AND MIDDLE SCHOOLS MAY BE AT OR NEAR CAPACITY

Students may be assigned to any school in the Murrieta Valley Unified School District where classroom space exists. For information regarding student registration, please call the school sites. For student transfer information, contact Student Services at 696-1600 ext 1037.

Map to Support Center - Find your school with School Locator

2009/10 Boundary Maps

ELEMENTARY SCHOOL BOUNDARIES

Download Map

MIDDLE SCHOOL BOUNDARIES

Download Map

HIGH SCHOOL BOUNDARIES

Download Map

Note: Murrieta Mesa High School is open to ninth, tenth and eleventh graders. Students entering their senior year in 2010/11 will attend Murrieta Valley High School or Vista Murrieta High School.

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District | Select a School...

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Tenaja Canyon Academy School

Welcome to Tenaja Canyon Academy

QUICK LINKS

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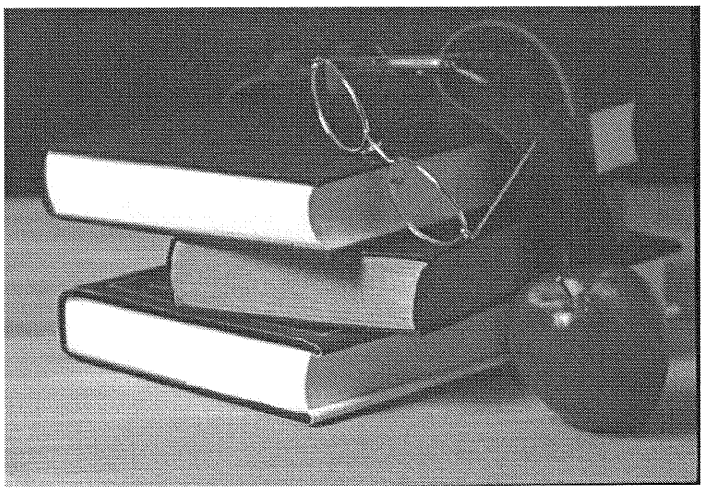
MVUSD

Tenaja Canyon Academy serves students in grades 1-12. The program is designed to match the curriculum of the Murrieta Valley Unified School District, while emphasizing individual instruction. This one-on-one teaching allows the teacher and student to work together to create a fun and challenging educational experience that will enhance the student's strengths and improve their weaknesses. Tenaja Canyon Academy is accredited by the Western Association of Schools and Colleges.



ANNOUNCEMENTS

UPCOMING EVENTS

TODAY

Winter Break

TOMORROW

Holiday

SORRY, NO EVENTS EXIST.

View Calendar

Tenaja Canyon Academy
24150 Hayes Avenue
Murrieta, CA 92562
phone 951.304.1661
fax 951.304.1666

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Murrieta Valley Adult School

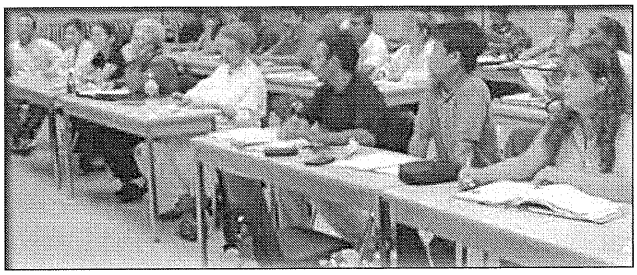
Home | School Information | School Directory | Registration | Classes | Teachers | Students | Calendars

Welcome to Murrieta Valley Adult School

the pathway to success

Mission Statement

"Inspire every student to achieve the power and success that knowledge from education brings."



QUICK LINKS

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MVUSD

ANNOUNCEMENTS

Click here for registration information

The Parent Center provides low cost parenting programs for families living in Murrieta.

Check out MVAS Matters, the blog for students and staff

RSS Feed

UPCOMING EVENTS

TODAY

Winter Break

TOMORROW

Holiday

SORRY, NO EVENTS EXIST.

View Calendar

MV Adult School
24150 Hayes Avenue
Murrieta, CA 92562
phone 951.696.3805
fax 951.304.1604

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Family Services

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- School Readiness Programs
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Parents

sections in this channel

- Welcome Parents
- Child Care
- Developmental Assets
- District Transfers
- Family Services
- Health Services
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- Nutrition Services
- Parent Rights
- PTA
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- Student Support
- Special Education
- Safety & Security

SCHOOL READINESS

Proud recipient of the 2009 California School Board Association Golden Bell in Early Childhood Education

2010/11 Parent Handbook / Snack Calendar

The district's School Readiness Programs provide high quality, age appropriate activities that help children acquire the skills and behaviors needed to prepare them to enter school.
Children learn to follow directions; recognize numbers, letters and shapes; work in centers, develop social skills and follow a classroom routine.
Children attend school three hours per day, 180 days per year. Children must be four years old by December 2nd of the current school year. Classes are taught by licensed early childhood educators and all school readiness classrooms are licensed through the Department of Social Services-Community Care Licensing.

Kindergarten Readiness

The Kindergarten Readiness parent-pay program offers a flexible schedule where children attend for three or six hours a day; from two to five days per week. Extended day is also available from 6:30 a.m.- 6:00 p.m. and camp is available during Fall, Winter, Spring and Summer breaks.

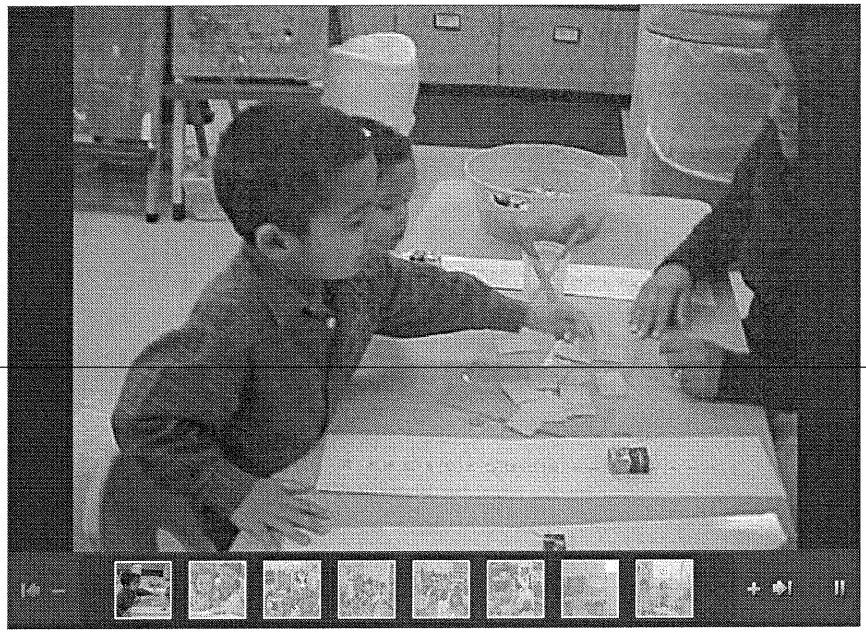
State Preschool

The district offers State Preschool Program funded by the California State Department of Education for children of families who meet the State's income income qualification guidelines.

Preschool For All

Preschool for All, funded by First Five Riverside, aims to provide children with universal access to preschool and it is available for children of families who do not meet or exceed by 50% the California Department of Education income guidelines. To be eligible, families must live within the Murrieta Valley Unified School District boundaries.

The district received a $966,588 grant in August, 2010 to support and expand the Preschool for All initiative . The grant will allow the district to expand its school readiness program from seven locations to ten. Programs will be added at Antelope Hills Elementary and Monte Vista Elementary in in 2010/11 and at Cole Canyon Elementary in 2011/12.



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MEASURE E

Overview

With the passage of Measure E, a $120 million bond measure approved by the voters on June 6, 2006, voters continued to show their support for a top-quality education for the children in Murrieta.

Three new schools have been built with Measure E funds:

- Lisa J. Mails Elementary
- Dorothy McElhinney Middle School
- Murrieta Mesa High School

In addition, $10.5 million of Measure E funds have been used to fund major improvements over a ten year period starting in the summer of 2007. These major improvements consist of repairing and replacing aging and defective building systems including deteriorated roofs, inefficient heating, ventilation and air conditioning systems, aging and deteriorated plumbing and rest rooms, upgrading building exteriors, walkways, grounds, fencing, seating areas, storm drains and installation of improved systems for school safety and security.

Work was completed in 2008 on technology infrastructure upgrades throughout the district that included upgrading electrical capacity, data and communications systems, upgrading the district-wide server and installing technology systems to improve school safety and security.

$20.9 million went to fund infrastructure and renovation projects at school sites throughout the district including replacing portables with permanent classrooms and reconfiguring offices, parking and drop-off zones and playgrounds.

Measure E Independent Citizens' Bond Oversight Committee

Established by the Board of Education pursuant to the passage of Measure E, the Citizens' Oversight Committee was created to represent the community's interests, monitor the implementation of Measure K and report their findings to the community. The Committee's tasks were to:

- Meet with the Assistant Superintendent of Facilities and district staff regularly to review the use of general obligation bond funds and monitor the implementation of Measure E.
- Review scheduling, budgeting, planning and construction of projects to be funded by the bond measure.
- Verify that work was completed and bond funds were expended in accordance with the bond measure.

The committee members served for a term of two years and no more than two consecutive terms. The Committee will not be disbanded until all bond funds are spent.

All committee proceedings are open to the public and subject to the provisions of the Ralph M. Brown Act.

In accordance with Proposition 39, committee members cannot be compensated for their service and no bond funds will be used to pay for any committee expenses. Expenses related to the publication of committee reports and meeting materials for the committee will be paid from the District's general fund.

While serving on the Committee and for one year following membership, members of the committee and their companies or businesses are prohibited from contracting with the District with respect to, or bidding on projects funded by, the bond measure. Members serve two-year terms.

Oversight Committee Members

- Anthony Zecca
- Howard Goldenstein
- Leonard Kahn
- Lorie Abeles
- Glenn Butler
- Richard Whittington
- Janann des Garennes
- Robert Webster
- Darryl Vidal
- Gerald J. Buydos
- Michael S. Chapman
- Richard Taylor

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Wednesday, December 22, 2010

MENIFEE PRIDE
Working For You

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- We Tip
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- William's Settlement
- Lunch Menu
- School Registration Forms

Site Translator

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Translate
English

Some files on this web site may require Adobe Acrobat Reader - download free
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Schools

Bell Mountain Middle School

28525 La Piedra Rd.
Menifee, CA 92584
Tel: (951) 301-8496
Fax: (951) 301-5286

24 Hour Attendance Hotline: 672-3819

Callie Kirkpatrick Elementary School

28800 Reviere Drive
Menifee, CA 92584
Tel: (951) 672-6420

24 Hour Attendance Hotline: 672-6411

Chester W Morrison Elementary School

30250 Bradley Road
Menifee, CA 92584
Tel: (951) 679-7076
Fax: (951) 672-6436

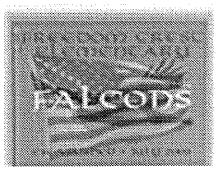
24 Hour Attendance Hotline: 672-6438

Evans Ranch Elementary School

30465 Evans Road
Menifee, CA 92584
Tel: (951) 246-7690
Fax: (951) 246-7805

24 Hour Attendance Hotline: 246-7690

For technical questions and comments regarding this website, please contact the Webmaster.



Freedom Crest Elementary School

29282 Menifee Road
Menifee, CA 92584
Tel: (951) 679-5285
Fax: (951) 672-2651

24 Hour Attendance Hotline: 672-2795

Hans Christensen Middle School

27625 Sherman Road
Menifee, CA 92586
Tel: (951) 679-8356
Fax: (951) 679-4090

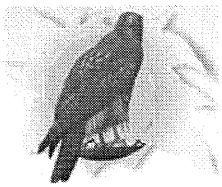
24 Hour Attendance Hotline: 679-7139

Menifee Valley Middle School

26255 Garbani Rd.
Menifee, CA 92584
Tel: (951) 672-6400

Fax: (951) 672-6415

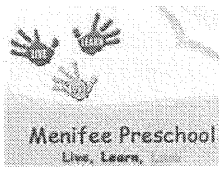
24 Hour Attendance Hotline: 672-6405



Oak Meadows Elementary School

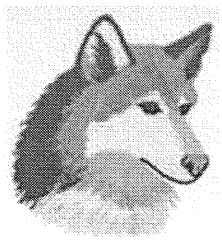
28600 Poinsettia Street
Murrieta, CA 92563
Tel: (951) 246-4210
Fax: (951) 679-4637

24 Hour Attendance Hotline: 246-4310



Menifee Preschool

26350 La Piedra Rd.
Menifee, CA 92584
Tel: (951) 672-6478



Quail Valley Elementary School

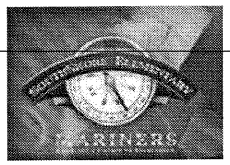
23757 Canyon Heights Drive
Quail Valley, CA 92587
Tel: (951) 244-1937
Fax: (951) 244-6842

24 Hour Attendance Hotline: 244-6596

Ridgemoor Elementary School

25455 Ridgemoor Road
Sun City, CA 92586
Tel: 951-672-6450
Fax: 951-672-6456

24 Hour Attendance Hotline: 672-6455



Southshore Elementary School

30975 Southshore Drive
Menifee, CA 92584
Tel: (951) 672-0013
Fax: (951) 723-1230

24 Hour Attendance Hotline: 723-1229

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- Student Support

DEVELOPER FEES

Developer Fee Collections
MVUSD Facilities Services Department
District Support Center
41870 McAlby Court, Murrieta, CA 92562

Office Hours 8:00 a.m. to 4:00 p.m. **Please call for an appointment**

Developer Fees Contact Information

Name	Position	Phone
Denise Umphress	Secretary	(951) 696-1600 ext. 1182
FAX Number		(951) 304-1530

With the adoption of Senate Bill 50 and Proposition 1A in 1998, school districts which meet certain requirements now have the option of adopting alternative school fees "Alternative School Fees", also known as Level 2 Fees and Level 3 Fees, in accordance with Government Code Sections 65995.5, 65995.6 and 65995.7. In general, Alternative School Fees, which are calculated for each school district, apply solely to residential construction within a school district. More specifically, the Level 2 Fee, which is intended to represent fifty percent (50%) of a school district's school facility construction costs per new home served, applies when the State Allocation Board (SAB) is apportioning State Funding to school districts in California. The Level 3 Fee, on the other hand, is intended to represent one hundred percent (100%) of a school district's school facility construction costs per new home served, and applies when the SAB officially declares that it is no longer making such apportionments.

In order to impose Alternative School Fees on new residential construction within the District, the district prepares and adopts a School Facilities Needs Analysis (SFNA) annually as required by applicable law. The SFNA adopted by the MVUSD on September 2, 2008, expired on September 1, 2009 and due to declining land value data, etc., the District will not be adopting a new SFNA at this time. Therefore, the District will drop to the State Level 1 rate until a new SFNA is adopted in 2010.

- Fees shall be made payable to the "Murrieta Valley Unified School District", and must be in the form of a "Cashier's Check" or "Bank Check".
- Payments received for the incorrect amount will not be accepted.
- Fees are subject to change at any time, therefore, please contact the District to verify current rates prior to securing school fee payments.
- The District will require a copy of the "School Fee Letter" (City) or "Notice of School Impact Mitigation Requirement" (County) in order to prepare your certificate.
- Please fax a copy of the letter or notice to the Facilities Office at (951) 304-1530 in advance or bring it with you to avoid a delay in preparing your document.
- Staff will not be able to prepare your certificate without this letter or notice.

For all projects, not otherwise mitigated

Type	Fee

Single Family and Multi-Family Residential Units	$2.97
Restricted Senior Communities	$0.47
Commercial, Industrial and Office Buildings	$0.47

per square foot of accessible space

Last Modified on 11/16/2009 1:54:48 PM

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DISTRICT Select a School...

SIGN IN EMAIL

Home District Info Board of Trustees Divisions Parents Students Staff

Perris Union High School District

155 East 4th Street
Perris CA, 92570
951.943.6369

Search... GO

- SubFinder Online
- Board Policies & Agendas
- Contracting Opportunities
- 2010-2011 Student/Teacher Calendar
- Nutrition Services
- Bus Transportation
- Employment Opportunities
- School Accountability Report Cards

Announcements

The PUHSD website has been updated! This new look should help improve readability and is the first of many steps in the ongoing evolution of the PUHSD website. Stay tuned for new, expanded functionality and information.

RSS Feed

Welcome to PUHSD

Mission Statement

The mission of the Perris Union High School District is to provide quality educational programs and meaningful opportunities which encompass the intellectual, social, emotional, and physical aspects of all students within the district and which will enable them to become productive members of society.

Headlines

Notice of Availability and Notice of Intent to Adopt a Mitigated Negative Declaration for the Pinacate Middle School Modernization Perris Union High School District
Public Notice: Notice is hereby given that the Perris Union High School District has completed a Mitigated Negative Declaration (MND) for the proposed Pinacate Middle School Modernization project.

Hour-Zero Emergency Preparedness Program Now ONLINE
The Hour-Zero online emergency program is now online. If you are a PUHSD employee, CLICK HERE to go to the Sign-In page.

Student Services Center
PUHSD's Student Services Center is now OPEN. In an effort to maximize our resources and accommodate the growing needs of our district, several departments have relocated to the old DPSS building on North A Street...

RCOE Emergency Preparedness - Pertussis
The (CDPH) California Department of Public Health has declared an epidemic of Pertussis (whooping cough) in the State of California. With the high number of reported confirmed cases and several hundred more under investigation. The CDPH health experts advocate that this outbreak could be the largest in the state in the past 50 years.

New PUHSD Nutrition and Fitness Website
The Perris Union High School District has created a new website for Nutrition Services...

RSS Feed

Nutrition Services
PERRIS UNION HIGH SCHOOL DISTRICT

Upcoming Events

Today
Winter Recess

Tomorrow
Winter Recess

December 24, 2010
Winter Recess

December 27, 2010
Winter Recess

December 28, 2010
Winter Recess

December 29, 2010
Winter Recess

View Calendar

2009 Perris Union High School District

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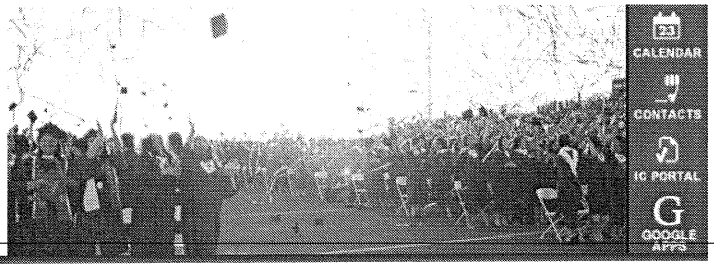
Perris Union High School District
155 East 4th Street
Perris CA, 92570
951.943.6369



Citizens Oversight Committee (Measure Z)

- Overview
- **Announcements**
- Handouts
- Agendas and Minutes

District Info

- Uniform Complaint Procedures
- District Profile
- **Citizens Oversight Committee**
- School Accountability Report Cards
- Superintendent's Office
- Educational Options (Adult Ed)
- District Contacts
- Sites Directory

CITIZEN'S OVERSIGHT COMMITTEE RECRUITMENT

The Perris Union High School District is currently recruiting for new committee members to fill four vacant positions on our Citizen's Oversight Committee. These are two year terms in volunteer positions.

In November of 2004, the District successfully passed Measure Z, a General Obligation Bond authorization for the District in order to acquire, construct and modernize school facilities and to benefit current and future students.

If you would like to fill out an application please click on the link below. The application deadline is December 31, 2010 at 4:00 p.m.

If you have other questions or concerns, please call our Facilities Department at 951.943.6369 x132.

Measure Z Committee Member Application

2009 Perris Union High School District

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PPD 275: Community Planning Practicum "B" – DRAFT

Winter Quarter 2010

Days: Fridays, 9:30 to 12:20 pm
Location: SE II - 1306
Instructors: Susan J. Harden, AICP, LEED AP, CNU-A and Mario Chavez-Marquez, Associate AIA
e-mail: sharden@rbf.com and mcmarquez@mve-architects.com
Phone: 949.472.3467 (Susan) and 949.809.3380 (Mario)
Office hours: 8:15 to 9:15 am, 3rd Floor

Course Description

In this course, students will explore regional planning process through (1) analyzing the social, physical and economic aspects of an individual development; (2) analyzing closely the developments to better understand opportunities and constraints; and, (3) applying that information to prepare a comparative analysis on how the development would serve Orange County as a whole.

Each team of students will focus on one of eight developments to examine in the course:

1. The Great Park in Irvine
2. Irvine Business Center (IBC)
3. The Spectrum (Irvine)
4. Platinum Triangle in Anaheim
5. Downtown Disney District (Anaheim)
6. The Station District in Santa Ana
7. Downtown Santa Ana
8. South Coast Plaza District in Costa Mesa

As part of their analysis for each development, students will focus on which development could potentially be considered as the County's central downtown location. This projection would be based on assessing how well these developments can respond to growing call from the public for greater integration and efficiency as well as accountability around several areas, including economic development, housing, tourism, transportation, urban design, and water quality.

Students in the course will develop substantive knowledge of urban and regional planning issues and processes through a series of presentations, readings, guest lectures, case studies, and class dialogue. Students will also develop an awareness of the complexity of planning projects and their prospective regional impacts.

Learning Objectives

- To develop an understanding of urban and regional planning processes,
- To develop an awareness of the complex issues relating to urban and regional projects
- To experience the diversity in stakeholder groups associated with regional projects
- To develop regional planning related data collection and analysis skills
- To develop planning related decision making and presentation skills.

Course schedule and assigned readings

The following schedule is tentative. Topics may be re-arranged in response to client and/or presenter availability, student progress, and other project-related situationspments that may arise. Students will be promptly notified of any changes.

WEEK	DATE	TOPIC	READINGS/ ASSIGNMENTS	INVITED SPEAKERS
1	January 7	Course overview, virtual tours, team selection , OC background	TBD	US
2	January 14	Introduction, orientation and introduction to Urban and Regional Planning (models/governance/equity/ participation)	TBD	US Peter Buffa Martha Matsoka
3	January 21	Economic Development/Tourism	TBD	OC Chamber/ Business Council (Lucy Dunn?) OCCORD
4	January 28	Transportation – rail, freeways, TOD, bike/ped, SB 375	TBD	Ernesto Vasquez Sara Katz
5	February 18	Urban Design Hands-on exercise/graphic quality	TBD	Mario
6	February 11	Mid-point presentations	TBD	
7	February 4	Housing	TBD	Panel: -Mark Butala - Kennedy Commission -Bob Santos - Bill Wittie or Jamboree
8	February 25	Environment/Natural Resources	TBD	Panel: Energy - SC? Water – David Feldman Air quality –

Hemet Unified School District

1791 W. Acacia Ave. Hemet, CA 92545
951.765.5100

"Believe and Achieve"

Superintendent
Human Resources
Business
Educational Departments
Governing Board

FAQ's
Academic Achievement
Enrolling
Schools
Calendar
Bell Schedules
Boundaries
District Contacts

HUSD School Fees

School Fees School Locator Construction Updates School Maps
Contacts Home

The Hemet Unified School District Facilities Department collects school fees as necessary. Fees are collected during regular office hours:

Hours

Monday - Friday
8:00am - 4:00pm
Closed 12:00pm-1:00pm for lunch

Location

1791 W. Acacia Avenue
Hemet, CA 92545
(951) 765-5100, x5480

School Fees Notice

Effective June 2, 2010, Hemet Unified School District's school fees are as follows:

- The District's residential Alternative School Fee (Level 2) is $3.55 per square foot for single and multi-family dwelling units.
- The approved Statutory School fee for commercial/industrial and senior housing is $0.47 per square foot.

The Hemet Unified School District will ***ONLY ACCEPT CERTIFIED CHECKS*** as payment for school fees.

Top of Page

CALVARY MURRIETA CHRISTIAN SCHOOLS

HIGH SCHOOL CAMPUS

WARRIORS

2 Timothy 3:16-17

Contact Us

Secondary Campus
Calvary Murrieta Christian School 24225 Monroe Ave. Murrieta, CA 92562 Phone: (951) 834-9190 - Press 3 **Calvary Murrieta Athletic Office** Phone: 951.834-9190 - Press 4 Fax: 951.834- 9191 Website: www.CalvaryMurrietaSports.com

Elementary Campus
Calvary Murrieta Christian School 24227 Monroe Ave. Murrieta, CA 92562 Phone: (951) 834-9190 - Press 2
Calvary Murrieta Christian **Pre-School** 24227 Monroe Ave. Murrieta, CA 92562 Phone: (951) 834-9190 - Press 1

Registrar/Admissions: ext. 1152- Email: smorgan@ccmurrieta.com
Report absences: ext. 1151 - Email: bchaves@ccmurrieta.com

Calvary Murrieta Christian Schools • 24225 Monroe Avenue, Murrieta CA 92562
Phone (951) 834-9190 • Fax (951) 698-4896 • webservant@ccmurrieta.com
A Ministry of Calvary Murrieta

The mission of Oak Grove...
to rebuild the lives of at-risk children and their families through educating, healing, restoring relationships, building character and instilling hope.

Residential Treatment Center and Nonpublic School

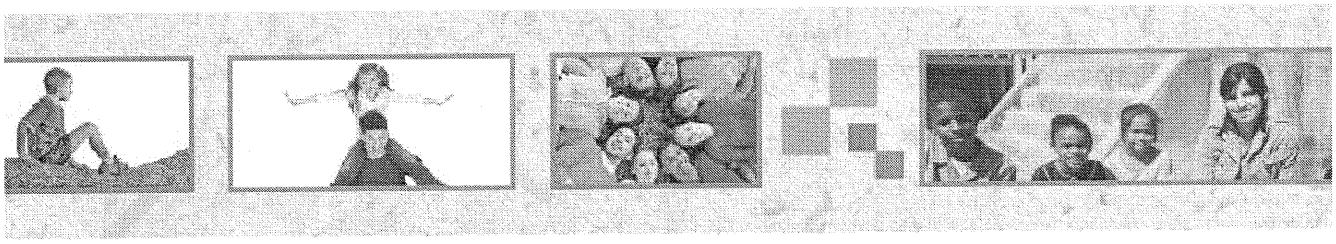
Oak Grove is a nonprofit 24-hour residential and educational treatment center that serves 76 children who live on campus and an additional 80-90 day students who attend our nonpublic school day program. Oak Grove is located in Murrieta, Southwest Riverside County. Oak Grove also operates a second campus in Perris, Oak Grove at the Ranch, serving an additional 50 students. Children and youth are admitted with a variety of psychological, social, emotional, behavioral, medical and neurological problems with concurrent behavioral difficulties, school problems, family dysfunction and alcohol or substance abuse. Many of the children have suffered physical and/or sexual abuse, other traumas or experienced many other social, emotional or behavioral challenges.

We are licensed as a level 12 group home and have the additional distinction of being accredited by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), as well as the non-public school on grounds having accreditation by the Western Association of Schools and Colleges (WASC).

Oak Grove works with children and adolescents whose needs and problems can be quite complex. One of our greatest assets lies in the sophistication and experience level of a team of clinicians comprised of psychiatrists and licensed independent practitioners (MFT, LCSW, Psy. D), as well as our nursing staff, behavior intervention specialists, teachers, milieu and activities staff that together make up the Treatment Team.

Accreditations/Memberships/Licensure:

- Joint Commission of Accreditation of Healthcare Organizations (JCAHO)
- California State Department of Education Non-Public School Certification
- Western Association of Schools & Colleges (WASC)
- California Alliance for Children & Families
- Licensed by the State Department of Social Services Community Care Licensing Division



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  - History and Accomplishments
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  - Newsletter
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  - Partial Hospitalization
  - Day Programs
  - Special Education Nonpublic School
  - Specialty Programs
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  - Temecula Live
  - Evening Under the Oaks
  - Temecula Gospel Festival

  - Golf Tournament
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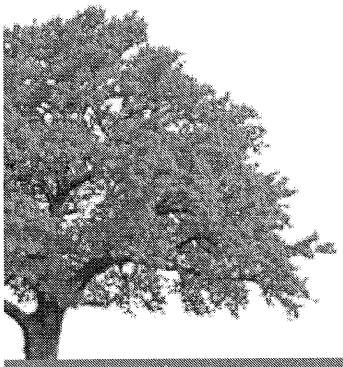
  - Volunteer Opportunities
  - Contribute
  - Our Community Partners & Supporters
  - Wish List
- In the News
- Arts & Performances
- OAK GROVE FACILITY VIDEO
- Contact Us
- Career Opportunities & Employment
- Testimonials
- Briar Rose Dickens Christmas Carol Dec 11th



Oak Grove Phone 951-677-5599 24275 Jefferson Ave. Murrieta, CA 92562
Oak Grove at the Ranch Phone 951-238-6022 25115 Rider St. Perris, CA 92570

Site Design & Development: TT Graphic Studio

Paul Tabone - RE: Murrieta General Plan Update - Park and Rec Questions

From: "Kast, Robert (Comm Svcs)" <RKast@murrieta.org>
To: "Paul Tabone" <PTABONE@rbf.com>
Date: 1/4/2011 2:59 PM
Subject: RE: Murrieta General Plan Update - Park and Rec Questions
CC: "Smith, Greg (Planning)" <GSmith@murrieta.org>, "Mina Brown" <MBROWN@rbf.com>

Paul,

No problem. Please see my responses below.

1. I realize that the park plan designates about 14 sites as future park and rec "opportunity" sites. Do you know how much acreage actually is included in these sites?

It would be about 40 acres.

2. Buildout population in the Parks Master plan is estimated at 120,000. The General Plan Update estimates a buildout population of about 133,000. Would this be an issue in the future?

No, we are just looking at the build out of the last general plan update. With the new update, any further building will work out with the parks. We will still require 5 acres per thousand.

3. I found on the City's fee schedule that the City charges a Parkland Facilities Development Impact Fee of $3,829 per single family unit and $2,412 per multi-family unit. I assume this fee would be charged as the GP is built out on a project-by-project basis. Could you please confirm?

Yes, that is correct.

Thank You,

Bob Kast

Parks Maintenance Superintendent

City of Murrieta - CSD

From: Paul Tabone [mailto:PTABONE@rbf.com]
Sent: Monday, January 03, 2011 10:52 AM
To: Kast, Robert (Comm Svcs)
Cc: Smith, Greg (Planning); Mina Brown
Subject: RE: Murrieta General Plan Update - Park and Rec Questions

Thank you Robert,

I sent you this questionnaire before I had a chance to review the parks master plan; the deficit concerned me when I read it. I am glad you have cleared that question up for existing conditions.

I just wanted to clear up a couple other things:

1. I realize that the park plan designates about 14 sites as future park and rec "opportunity" sites. Do you know how much acreage actually is included in these sites?

2. Buildout population in the Parks Master plan is estimated at 120,000. The General Plan Update estimates a buildout population of about 133,000. Would this be an issue in the future?

3. I found on the City's fee schedule that the City charges a Parkland Facilities Development Impact Fee of $3,829 per single family unit and $2,412 per multi-family unit. I assume this fee would be charged as the GP is built out on a project-by-project basis. Could you please confirm?

Thanks,

Paul Tabone

Paul J. Tabone
Project Planner
RBF Consulting
14725 Alton Parkway
Irvine, CA 92618
Phone: 949.330.4166
Fax: 949.837.4122

www.rbf.com

>>> "Kast, Robert (Comm Svcs)" <RKast@murrieta.org> 12/30/2010 9:55 AM >>>

Paul,

I do apologize for the delay on getting this information back to you. Nevertheless, please see my responses below and do not hesitate to contact me with any further questions you may have.

- An addition of 3,346 dwelling units

- An addition of 22,156,784 square feet of non-residential uses, broken down into the following categories:

- 2,655,023 square feet of business park uses
- 14,807,287 square feet of professional and office uses
- 3,663,446 square feet of commercial uses
- 2,028 square feet of civic and institutional uses

The above-mentioned square footages are targeted in updated focus areas, which are shown in Exhibit 2, attached in this email.

Based on the future-projected development scenario, I just wanted to obtain some answers to the following questions:

1. Do you anticipate significant impacts to existing parks and recreational facilities?

According to our Parks and Recreation master plan prepared in June 2009, there are no significant shortages on park land even though it shows a deficit of 133 acres based on 120,000 people. This figure is based on 5 acres per person.

2. Please indicate if there will be any updated required fees to help mitigate potential impacts to parks and recreational

facilities.

According to our Parks and Recreation master plan prepared in June 2009, there will be no significant increase in fees.

4. Do you anticipate that implementation of the Murrieta General Plan Update would result in the need for physical additions to your agency (i.e., construction of new parks and recreational facilities)?

We are only looking at the areas where housing will be implanted and building park sites based on 5 acres per 1,000 people.

5. Do you have any required or recommended mitigation measures for significant impacts?

No, just as outlined in the Parks and Recreation master plan.

6. Please include any additional information you feel is pertinent to the Environmental Impact Report analysis for the Murrieta General Plan Update.

Please refer to the Parks and Recreation master plan prepared in June 2009.

Thank You,

Bob Kast

Parks Maintenance Superintendent

City of Murrieta - CSD

From: Paul Tabone [mailto:PTABONE@rbf.com]
Sent: Monday, December 06, 2010 2:56 PM
To: Kast, Robert (Comm Svcs)
Cc: Smith, Greg (Planning)
Subject: Murrieta General Plan Update - Park and Rec Questions

Good afternoon,

My name is Paul Tabone and I am working for RBF Consulting on the Murrieta General Plan Update EIR. I was directed to you to obtain some information regarding park and recreational facilities in the City of Murrieta. As you may or may not be aware, the General Plan Update is being written based on the following growth projections:

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You may provide your answers to the above questions in an email back to me. Due to our aggressive timeline and schedule

constraints, I respectfully ask that you please provide the requested information at your earliest convenience. If there is

anything I can do to help you expedite this request, please contact me; my information is provided below.

Thank you,

Paul Tabone

Paul J. Tabone
Project Planner
RBF Consulting
14725 Alton Parkway
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Phone: 949.330.4166
Fax: 949.837.4122

www.rbf.com

Paul Tabone - RE: Murrieta General Plan Update - Park and Rec Questions

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Date: 12/30/2010 9:55 AM
Subject: RE: Murrieta General Plan Update - Park and Rec Questions
CC: "Smith, Greg (Planning)" <GSmith@murrieta.org>, "Mina Brown" <MBROWN@rbf.com>, "Tharp, Debbie (Comm Svcs)" <DTharp@murrieta.org>, "Kolek, Lea (Comm Svcs)" <LKolek@murrieta.org>, "Mackenzie, Jim (Planning)" <JMackenzie@murrieta.org>

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Irvine, CA 92618
Phone: 949.330.4166
Fax: 949.837.4122

www.rbf.com

Lake and Aquatic Resources

Welcome to Southern California's largest freshwater lake

Lake Elsinore is the largest natural freshwater lake in Southern California with 3,000 surface acres and over 14 miles of shoreline.

Lake Hours

The Lake is open from sunrise to sunset.

Health Facts for Lake Users and information from the Centers for Disease Control and Prevention

Lake Attractions

Lake Elsinore is ideal for motor boating, jet skiiing, waterskiing, wake boarding, kayaking and fishing. It boasts public beaches with picnic and shade features, plenty of safe easy-access parking, a three mile levee for hiking, nature watching and fishing (some areas restricted), and a tournament channel for professional ski instruction and club and pro competitions.

Fees

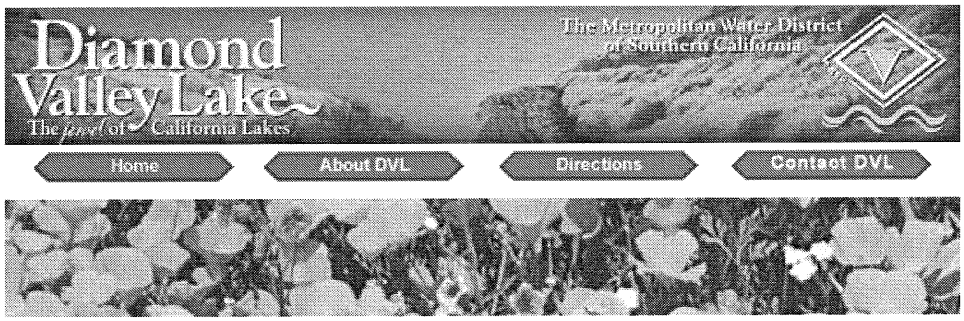
All boaters are required to have a Lake Use Pass when on the Lake. Daily Lake Use passes are $15 and can be purchased at all boat launch facilities. A separate fee may be charged for boat launching and day use, which varies per facility. Annual Lake Use Passes, good for the calendar year are available only at the Cashier at City Hall during regular business hours. Fishing is permitted by boat or from designated public fishing beaches. Anyone 16 years and older must have a valid California State fishing license.

Safety

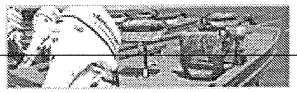
Safety is our number one priority. All boaters must carry approved safety equipment and may be subject to inspection. Visitors are advised to heed all safety rules and posted signs in and around the Lake. Loaner life jackets for beach users are available at no cost. Be water wise and be safe. Please review the lake rules when planning a visit.

Lake and Aquatic Resources Department

Please contact the Lake Department for further information or to report problems with buoys, docks, shoreline facilities or aeration system. Phone (951) 674-7730.



Driving Directions to:
Diamond Valley Lake
Lake Skinner

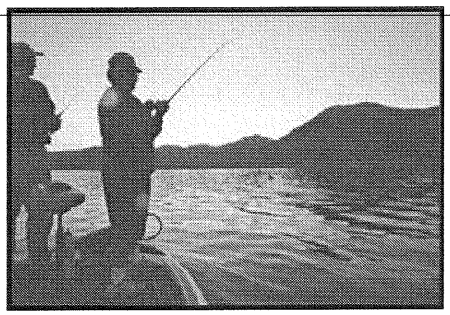


Boat Registration
Click Here for more information

Boat Requirements

Recreation Rules and Regulations
for Diamond Valley Lake and Lake Skinner, (en Espanol)

~~Diamond Valley Lake Boating Guide~~



Metropolitan's Diamond Valley Lake and Lake Skinner are a delicate balance between fun and function. While they each provide Southern California residents exciting boating and fishing opportunities, they are, first and foremost, vital drinking water reservoirs. The water stored in the two reservoirs is enough to serve almost a half million Southern California families for a year. That's why Metropolitan keeps a close eye on any activity on the lakes and in their respective watersheds.

Recognizing the lakes' recreational value as well as the need to protect water quality and guard the health and safety of the public, Metropolitan's board of directors adopted boating rules for both Diamond Valley Lake and Lake Skinner, which will become effective once Diamond Valley Lake opens. A summary of the rules follows.

We hope you enjoy your visit while you help us protect a valuable water supply for Southern California.

While Diamond Valley is a large lake, our east marina parking lot is limited.

We have 250 parking spaces for vehicles with boats, another 50 spaces set aside for people who plan to rent boats and another 50 for people who plan to fish from the shoreline near the Marina.

The concessionaire has a limited amount of food for sale; it is advisable to bring your picnic baskets with you.

Permanent restrooms are not available at the marina and are not allowed on boats. There are portable toilets in the marina and along the shoreline fishing area and floating toilet facilities on the lake.

Fishing bag limits

Effective March 1, 2004, the California Department of Fish and Game posted their 2004 Freshwater Fishing Regulations. Limits on the size and number of fish each person can catch at Diamond Valley Lake is set by the California Department of Fish and Game.

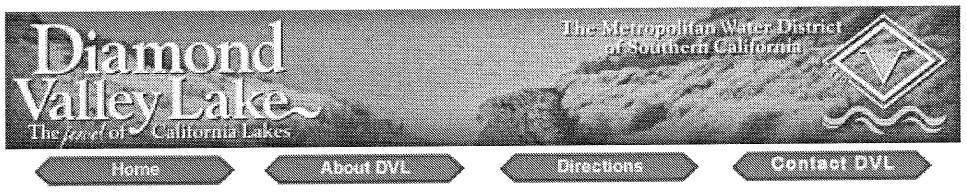
Fishing Bag Limits*:
Largemouth Bass: 5 fish, minimum size 15 inches

Smallmouth Bass: no possession allowed
Sunfish (i.e. bluegill and red ear): no size limits
Catfish Limit 10 fish, no size limit
Striped Bass: 10 fish, no size limit
Trout: 5 fish, no size limit

*Limits set by the California Department of Fish and Game. Click here for a complete list of regulations. You are responsible for knowing and complying with all Fish and Game regulations.

1. **NO** swimming, personal watercraft, water skiing, float tubes or body contact of any kind is allowed.
2. No smoking except in designated areas.
3. Alcohol is not permitted at the marina or anywhere on the lake, including the shoreline.
4. Boats powered by humans, sail or electric motors are allowed on lakes.
5. Boats with four-stroke or direct fuel injection two-stroke combustion engines are allowed, as are two-stroke engines that comply with the California Air Resources Control Board 2001 or later model year spark ignition marine engine standard (or U.S. Environmental Protection Agency 2006 equivalent). This rule will be strictly enforced and any questions regarding your engine compliance should be resolved prior to entrance into the park.
6. Traditional carbureted two-stroke engines are not allowed.
7. Only gasoline free of the additive MTBE is allowed. Boats containing MTBE fuel will be turned away. The California Air Resources Board has reported that MTBE was removed from all gasoline refined for sale in California in Nov. 2003. Therefore, all gasoline must be purchased in California and proof of purchase will be required for boats with out-of-state registration. Refueling is prohibited except in designated areas.
8. Boats equipped with sink drains or flush toilets are barred unless the drains and toilets are sealed, inoperable, or are designed so that no waste can be discharged into the lake.
9. Boats must be at least 12 feet long, 42 inches wide, and have 12 inches of freeboard at idle speed. Multi-hulled boats must have solid and fixed decking. Engine noise must not exceed 75 decibels at a distance of 50 feet with the engine running at 80 percent of redline RPM. All engines must be unmodified, standard equipment.
10. Kayaks and canoes, at least 10 feet long, non-bailing and with seating for all passengers inside the boat, are allowed. No sit-on-top kayaks are allowed.
11. All boats must carry approved life jackets for each person aboard. Type B fire extinguishers are required on boats where a fire hazard could be expected from the motors or the fuel system.
12. Boat launching and landing is allowed only at designated docks and ramps.
13. Generally, the lakes open at sunrise and close at sunset. The hours of operation vary seasonally and are posted at the site. All boats shall be removed from the lake one hour before the posted closing time. There is no boat storage.
14. Metropolitan can close the lake to boating at any time and the number of boats allowed on the lake will be determined by lake elevation, public safety considerations and water quality concerns.
15. The speed limit for all watercraft on Diamond Valley Lake is 25 MPH. The maximum speed for boats within 200 feet of the shore, dams, other operational structures and in marina areas is 5 MPH.
16. Pets are not allowed within the recreation area or on boats.

We hope you enjoy your outdoor experience at Diamond Valley Lake and Lake Skinner while the Metropolitan Water District of Southern California continues to protect water at its source so you can trust it at the tap.



Diamond Valley Second Annual Poker Ride, Oct. 2
Ride begins at 8 a.m. Click here for more information.
Register online or use this form.

Farmers Market Every Thursday
Fresh fruits and vegetables, food, jewelry, crafts, flowers and much more. Click here for more information.

Wildflowers at DVL
Click here for news release. Click here to view the seasonal wildflower trail at Diamond Valley Lake. Click here for more information on the wildflowers.Click here to view a wildflower slideshow.

Boat Launch Ramp Reopens
Metropolitan will reopen the boat launch ramp to the general public on December 20 with a recently completed three-lane extension. Water supply challenges due to drought and environmental restrictions in the Sacramento-San Joaquin Delta will continue to affect lake levels and dictate future boat launch suspensions. Click here for details.

Stop The Spread of Invasive Mussels
Harmful quagga mussels have been discovered along the Colorado River at Lake Havasu, Lake Mead and Lake Mohave. Click here to learn more about how you can help prevent the spread of these and other harmful aquatic plants and animals. Click here for additional information and updates.

7.25lb trout
John Jameson-4yrs old caught a 7.25lb trout on a spoon on 5/26/08. (Click image to enlarge)

New Record Breaker
Mike Long, of Poway, set the new largemouth bass record at DVL with this 16.43 pounder caught March 16. It beats the previous record by about two pounds. (Click image to enlarge)

DVL Museum
The Western Science Center is now open to the public.

Diamond Valley Aquatic Center
The new Aquatic Center is open daily and houses a play gym and water slide for all your water fun.

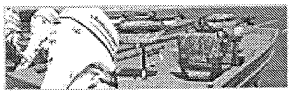
Current weather conditions

DVL Stories and Fish plant schedule

Hours of Operation:
6:30 a.m. to 6:00 p.m.

Fees:
Annual Pass $450*
$7 entrance / $125 annual*
$12 boat launch
$3 fishing access permit
$5 for reservations

Marina Office - (951) 926-7201 or (800) 590-LAKE
*Annual Pass does NOT include reservation fee.

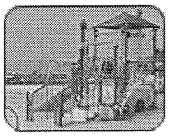


Click here for boat rental fees.

Dry Storage Rates:

For all NEW and EXISTING customers effective March 1. Existing MONTHLY customers can take advantage of the $400 annual rate before March 1.

Changes:
Monthly increased from $50 to $65
Annual increased from $400 to $500



Call (951) 929-0047 for location, pool times and fee information.

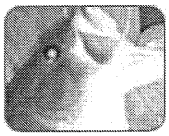
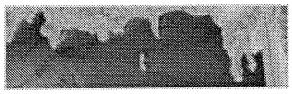


Photo Gallery

Boat Registrations
Boat registrations are performed at DVL and Lake Skinner daily.
More

Boat Requirements
Find out about the kinds of boats that can be launched at DV Lake.

General Boating and Fishing Information

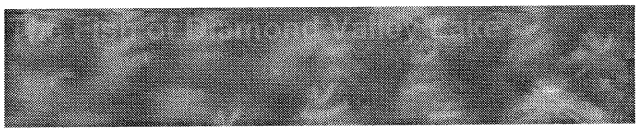


Shoreline Information
Metropolitan offers 1 1/2 miles of shoreline fishing. Terrain: Rugged.

DVL Trails
Click here for map.

Click here to view the wildflowers of DVL.

North Hills Trail Map
Click here



Contact

Reservations

(951) 303-0173 / 1-866-VAILLAKE

Memberships

Jaroslav, Director of Sales
sales@vaillakeresort.com
(951) 303-5738

General Information

(951) 303-0173 / 1-866-VAILLAKE
info@vaillakeresort.com

Vail Lake Resort
38000 Highway 79 South
Temecula, CA 92591
Phone: 951-303-0173 / 1-866-824-5525
Fax: 951-303-0167

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- Maps and Directions »
- Events & Photos »
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- **New Year's Eve**
  Casino Night and The Petty Breakers
- See All Entertainment, Activities & Events »

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- Lake Membership »
- Camp Hosts Program »

Contact Us

Reservations
951-303-0173
866-VAILLAKE

Lake Memberships
Jaroslav, Director of Sales
sales@vaillakeresort.com
951-303-5738

General Information
951-303-0173
866-VAILLAKE
info@vaillakeresort.com

Vail Lake Resort
38000 Highway 79 South
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Phone: 951-303-0173
Toll-Free: 866-824-5525
Fax: 951-303-0167

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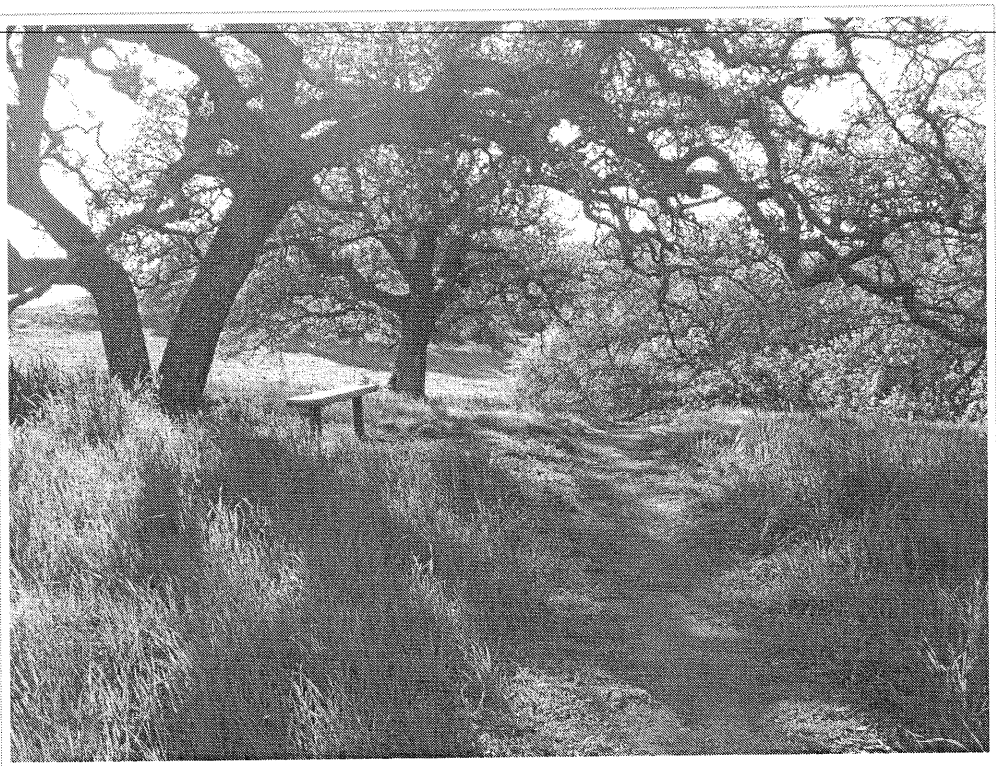
RiversideCountyParks.org

Riverside County Regional Park & Open-Space District

Santa Rosa Plateau

Browsing: Home / Locations / Nature historic centers / **Santa Rosa Plateau**



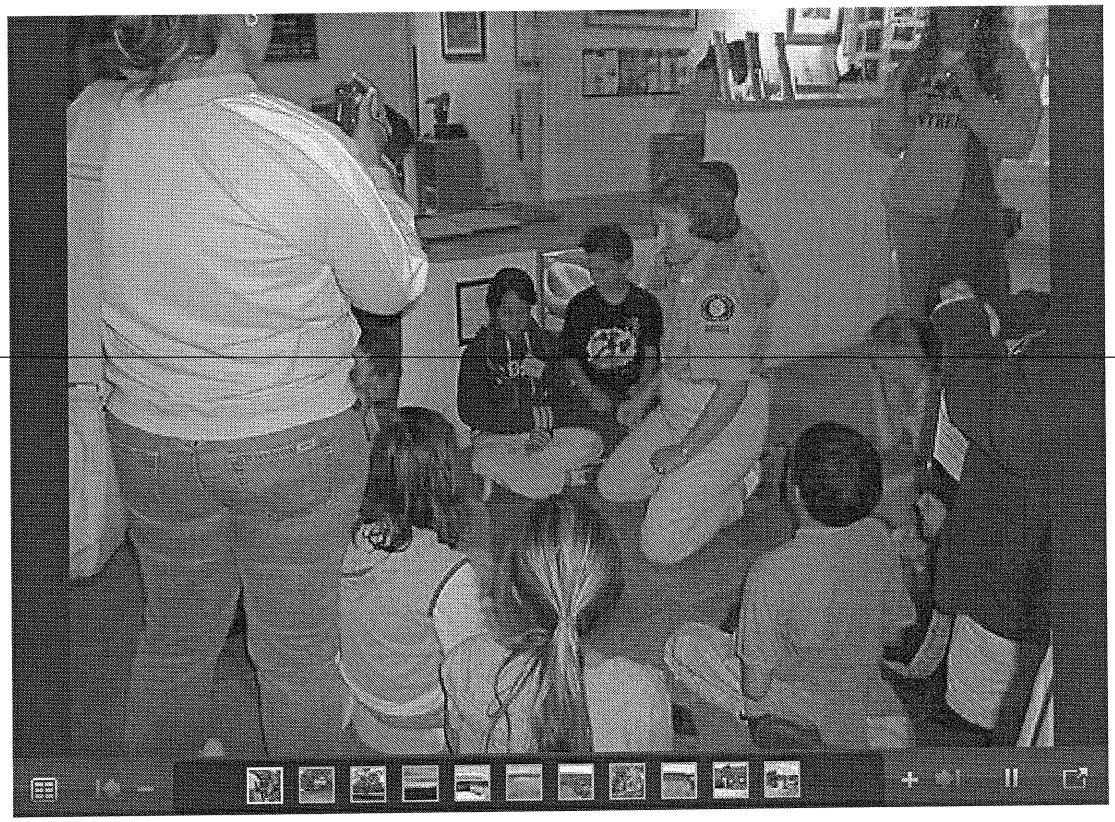
Los Santos Trail Off Vernal Pool Trail

The Santa Rosa Plateau Ecological Reserve 39400 Clinton Keith Road is located at the southern end of the Santa Ana Mountains in southwest Riverside County, near the city of Murrieta, 92562.

The Reserve consists of 8,300 acres and protects unique ecosystems like Engelmann oak woodlands, riparian wetlands, coastal sage scrub, chaparral, bunchgrass prairie and vernal pools.

Visitors to the Reserve can enjoy the oldest standing structures in Riverside County that once served as bunkhouses for cowboys dating back to 1846. These two adobe structures remain shaded by a 400 year old tree and separated by a relaxing, one-of-a-kind, picnic area.

Other recreational activities include hiking, horseback riding, mountain biking, and attending interpretive programs. (Horseback riding and mountain biking are restricted to the Sylvan Meadows Multi-Use Area of the Plateau.)



Programs at the Santa Rosa Plateau are enhanced through funding raised by the Santa Rosa Plateau Foundation

More Pages:

- Outreach Programs
- Reserve Newsletter
- Field Trips
- Plateau History
- Group Programs
- Plateau Visitor Information
- Plateau Map
- Plateau Volunteer Opportunities
- Reserve Features

RiversideCountyParks.org

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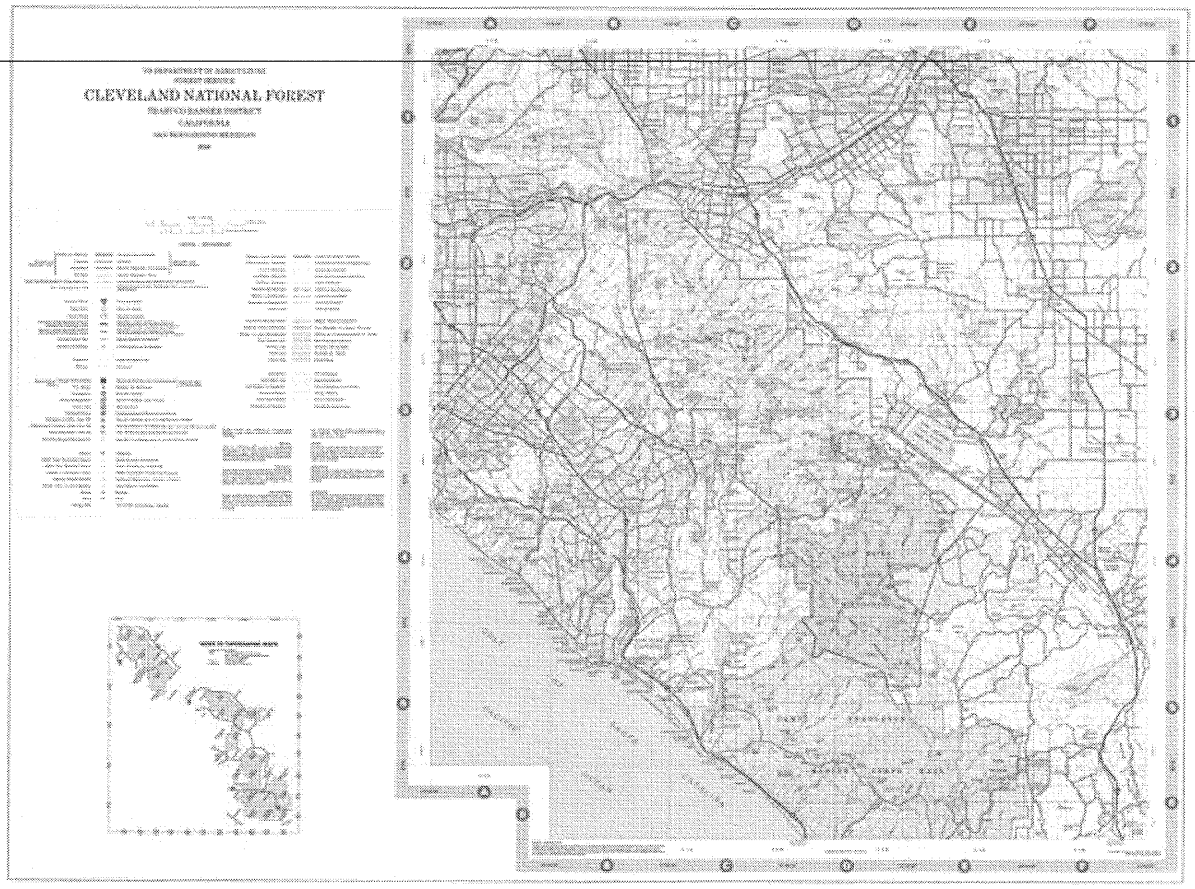
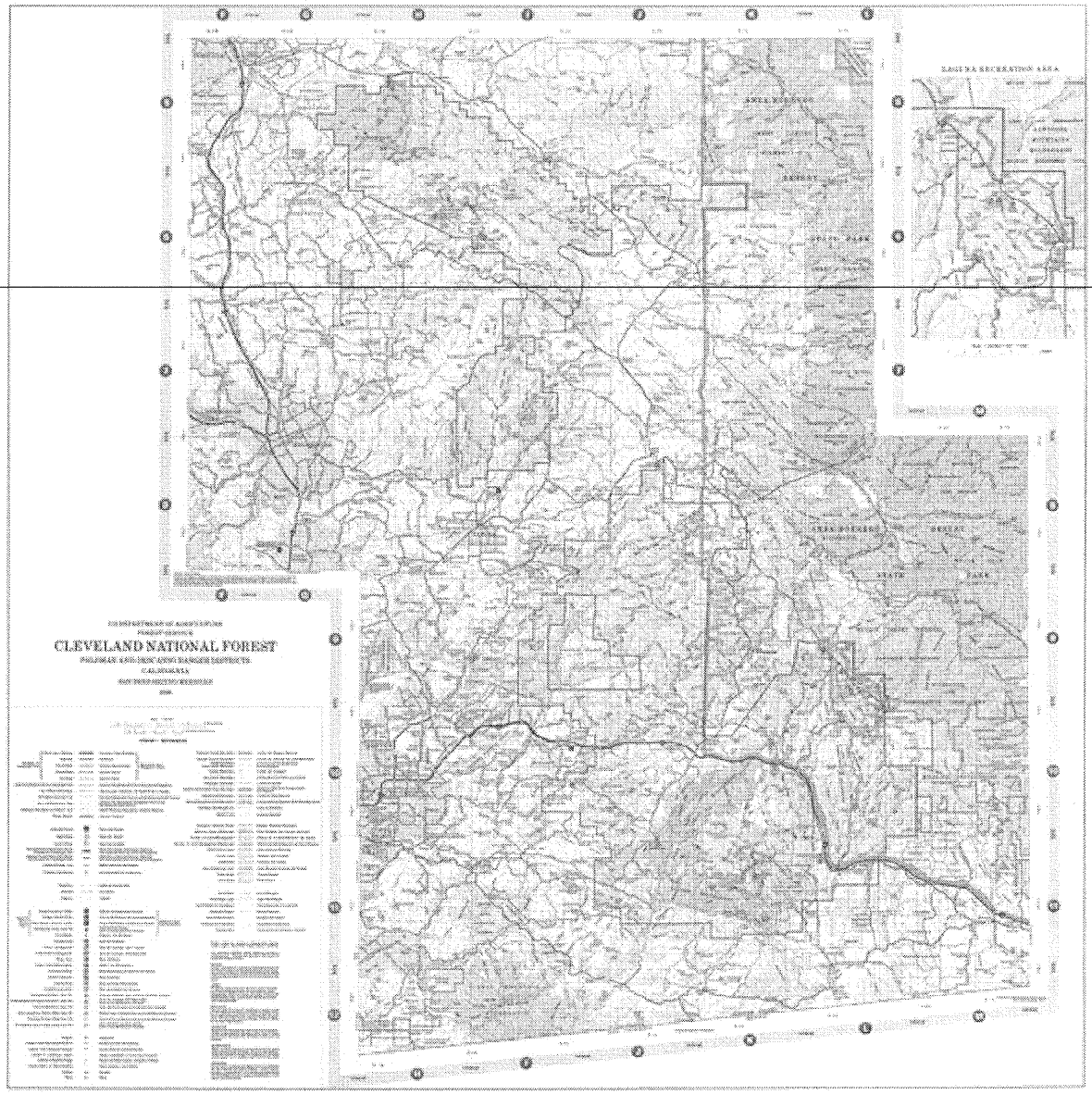
Pacific Southwest Region

Forest Visitor Maps

Cleveland National Forest

Select a map section for a detailed view, or here to choose another forest. Visit the National Forest Store to order published Forest Visitor Maps.





US Forest Service · Pacific Southwest Region
Last modified: Thursday, 19 February 2009 at 20:25:42 EST

Paul Tabone - RE: Murrieta General Plan Update - Solid Waste Questions

From: "Glynn, Steve" <SGlynn@wm.com>
To: "Paul Tabone" <PTABONE@rbf.com>
Date: 12/16/2010 4:06 PM
Subject: RE: Murrieta General Plan Update - Solid Waste Questions

Paul,

Here is the response to your questions:

1. What is the estimated solid waste generation in the city of Murrieta?

· Roughly 78,000 tons annually

2. Do surrounding landfill(s) have sufficient permitted capacity to accommodate the anticipated solid waste disposal

demands associated with the Murrieta General Plan Update?

· Yes

3. Does your agency have any plans to expand existing facilities or acquire new landfill sites?

· Not at this time

4. Do you anticipate any impacts with respect to solid waste service associated with the Murrieta General Plan Update?

· No, WM is able to increase service offerings based on the General Plan Update.

5. Do you have any required or recommended mitigation measures for any significant impacts?

· No

6. Is there any other relevant information regarding significant projects impacts?

· No

Please call me with additional questions you may have.

Regards,

Steve Glynn

(951) 280-5433

From: Paul Tabone [mailto:PTABONE@rbf.com]
Sent: Tuesday, December 07, 2010 2:07 PM
To: Reyes, Julie; Glynn, Steve; Kanow, Steve
Cc: gsmith@murrieta.org
Subject: Murrieta General Plan Update - Solid Waste Questions

Good Afternoon,

My name is Paul Tabone and I am working for RBF Consulting on the Murrieta General Plan Update EIR. Before I can complete the Solid Waste Section of the Environmental Analysis, I was hoping I might obtain some information from Waste Mangement, as I understand that Waste Management provides solid waste disposal services to the City of Murrieta.

The City's General Plan Update is being written based on the following growth projections:

- An addition of 3,346 dwelling units

- An addition of 22,156,784 square feet of non-residential uses, broken down into the following categories:

- 2,655,023 square feet of business park uses

- 14,807,287 square feet of professional and office uses
- 3,663,446 square feet of commercial uses
- 2,028 square feet of civic and institutional uses

The above-mentioned square footages are targeted in updated focus areas, which are shown in Exhibit 2, attached in this email.

Based on the future-projected development scenario, I just wanted to obtain some answers to the following questions:

1. What is the estimated solid waste generation in the city of Murrieta?

2. Do surrounding landfill(s) have sufficient permitted capacity to accommodate the anticipated solid waste disposal

demands associated with the Murrieta General Plan Update?

3. Does your agency have any plans to expand existing facilities or acquire new landfill sites?

4. Do you anticipate any impacts with respect to solid waste service associated with the Murrieta General Plan Update?

5. Do you have any required or recommended mitigation measures for any significant impacts?

6. Is there any other relevant information regarding significant projects impacts?

You may provide your answers to the above questions in an email back to me. Due to our aggressive timeline and schedule

constraints, I respectfully ask that you please provide the requested information at your earliest convenience. If there is

anything I can do to help you expedite this request, please contact me; my information is provided below.

Thank you,

Paul Tabone

Paul J. Tabone
Project Planner
RBF Consulting
14725 Alton Parkway

Irvine, CA 92618
Phone: 949.330.4166
Fax: 949.837.4122

www.rbf.com

Waste Management recycles enough paper every year to save 41 million trees. Please recycle any printed emails.

Facility/Site Search

The Solid Waste Information System (SWIS) search page allows searching of all facilities/sites by multiple criteria, or location of a specific facility by name or SWIS number. The advanced search function allows for specific site selection from the categories searched. The database is continuously updated.

Complete the search criteria to generate a list of solid waste facilities/sites/operators:

County: All Counties **OR** LEA Jurisdiction: All LEAs

Regulatory status: All Statuses

Facility type: All Types

Operational status: All Statuses **Display By:** General Detail

SWIS site name:(optional)

SWIS number: - - (optional)

Search Reset

Downloadable Files:

SWIS Data File (MS Excel 97/2000, 2 MB) Includes basic information on each facility in the database including site, enforcement agency, operator, land owner, throughput, capacity, acreage, permit date, waste types, activity type, regulatory status and operational status. This file is updated every Monday, Wednesday, and Friday at 6:00 a.m. The data dictionary includes a description of each of the data fields.

Excel Display Note: In some instances the client workbook display will not be maximized within the Excel container. When this happens you will not see the multiple sheets contained within the workbook. To maximize the workbook, double click on the workbook header.

SWIS GIS Data File (Text, 1 MB) This delimited text file is designed for inclusion into GIS software as a data table. Includes basic information on each facility in the database including site, enforcement agency, operator, activity type, regulatory status, operational status and latitude/longitude coordinates. The source latitude/longitude coordinates are geographic decimal degrees (GCS_North_American_1983). This file is updated every Monday, Wednesday, and Friday at 6:00 a.m. The data dictionary includes a description of each of the data fields.

Last updated: Data updated continuously.
Solid Waste Information System(SWIS), http://www.calrecycle.ca.gov/SWFacilities/Directory/
Skip Amerine, skip.amerine@calrecycle.ca.gov (916) 341-6322

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Jurisdiction Profile for City of Murrieta

Overall Waste Stream: Diversion

County Disposal and Trends

Jurisdiction Trends

Diversion Facilities used by Jurisdiction

Certified Used Oil Centers: 1

Board Reviewed Diversion Rates for Murrieta

Graph

Annual Diversion Rates

1995 Diversion Rate:	28%
1996 Diversion Rate:	28%
1997 Diversion Rate:	27%
1998 Diversion Rate:	29%
1999 Diversion Rate:	39%
2000 Diversion Rate:	49%
2005 Diversion Rate:	45%
2006 Diversion Rate:	49%

Preliminary Rates for later years...

Diversion Programs Summary for Murrieta in 2008 [More...]

Graph

	Number of Programs Operating	*Average Jurisdiction*
Composting	3	4
Facility Recovery	3	3
HHW	5	4
Policy Incentives	3	2
Public Education	4	3
Recycling	8	7
Source Reduction	6	6
Special Waste Materials	8	5
Transformation	1	0

Overall Waste Stream: Disposal (2008)

	Amount (Tons)	*Integrated Waste Management Fees Paid ($)*
Solid Waste Landfilled (buried):	65,874	88,271
Solid Waste Transformed/Waste-to-Energy (burned)	0	--
Solid Waste Exported from the State for Disposal	0	--
Total Disposed	**65,874**	**88,271**

Disposal Facilities Used By Murrieta in 2008

Landfills: Azusa Land Reclamation Co. Landfill (Los Angeles) , Badlands Sanitary Landfill (Riverside) , Bakersfield Metropolitan (Bena) SLF (Kern) , El Sobrante Landfill (Riverside) , Lamb Canyon Sanitary Landfill (Riverside) , Mid-Valley Sanitary Landfill (San Bernardino) , Olinda Alpha Sanitary Landfill (Orange) , Prima Deshecha Sanitary Landfill (Orange) , San Timoteo Sanitary Landfill (San Bernardino) , Simi Valley Landfill & Recycling

Center (Ventura) , Sycamore Sanitary Landfill (San Diego) , Victorville Sanitary Landfill (San Bernardino)

Transformation Facilities (Waste-to-Energy):	[none]

Disposal Facilities Located Within Murrieta in 2008

Landfills:	[none]
Transformation Facilities (Waste-to-Energy):	[none]

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January 20, 2011

Search web site GO

Trash, recycling and yard waste services

Residential Services

Commercial Services

Special Services

Murrieta provides an array of trash, recycling and special waste handling services to residents and businesses. For more information about these programs, use the drop down menus above to find answers to your questions.

All cities and counties in California are required to have in place programs that seek to keep as much trash out of landfills as possible. Local government has an ongoing obligation to meet a 50% diversion goal, meaning that no more than half the trash sent to landfills in 1990 should be dumped today. (Annual adjustments allow for growth.) While the community's recycling program is voluntary, residents and businesses are strongly encouraged to make full use of these services. Recycling and reuse of materials extends the life of landfills, results in less use of natural resources and improves the environment.

Murrieta's latest diversion rate is 47%. The city has been found to be in compliance with state requirements, having made a "good faith" effort to meet the goal. But more can be done.

Recycle. It's good for the bottle. It's good for the can. It's good for all of us.

Murrieta requires all residential and business properties to have trash collection services. The city contracts with Waste Management to provide collection and recycling services. No other haulers are authorized.

Waste Management contact: (800) 423-9986

City contact: (951) 461-6007

Riverside County Household Hazardous Waste Schedule

Murrieta
the future of southern california

City Information

- Murrieta Home
- About Murrieta
- City Departments
- City Services
- Council & Commissions
- Development
- Economic Development
- Historic Downtown
- Recreation
- Recreation Class Registration

Instant Information

- City Jobs
- Official Meetings & Business Hours
- City Special Events
- Bids & Notices
- Online Photo Albums
- Online Forms
- How To...
- Public Projects
- Staff & Facilities Directory
- SubscribeLine
- Surplus Auction

City of Murrieta ● 1 Town Square, 24601 Jefferson Ave., Murrieta CA 92562 ● (951) 304-CITY (2489)
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Email Webmaster ● Site by: SiteCreators

Murrieta
the future of southern california

Paul Tabone - Re: Fwd: Re: Fw: Murrieta General Plan Update - SCE Questions

From: <Ronald.Wold@sce.com>
To: "Paul Tabone" <PTABONE@rbf.com>
Date: 12/21/2010 2:57 PM
Subject: Re: Fwd: Re: Fw: Murrieta General Plan Update - SCE Questions

Paul,
to your questions:

1a. How often is your Distribution System Plan Updated?
Our plan is updated every year

1b. Would it be possible for me to get a copy?
The plan is not for public release.

2a. With regard to the focus areas, where are existing facilities located?
The substation that would serve the new developments in the north would be Auld Substation, which is located at Clinton Keith and Liberty. The new development in the south may be served from a new substation being built in Temecula (or this may take load from Auld, allowing to serve in the north) and the existing Stadler Substation, located by Ivy and Jefferson.

2b. According to your Distribution system plan, are there plans for any other facilities to be coming on-line in the next 5-10 years, aside from the system and its components being updated constantly as necessary?
We are planning on a new substation in Temecula, which may be on-line in a year or two. We just upgraded Tenaja Substation, located at Clinton Keith and Grand, which may help serve the new growth in the south, or may help off load Stadler Sub so it could serve the load.

Ron

Mr. Ronald Wold PE
Southern California Edison
Distribution Field Engineering
Southern Zone pax 52664

From: "Paul Tabone" <PTABONE@rbf.com>
To: <Ronald.Wold@sce.com>
Date: 12/16/2010 04:13 PM
Subject: Re: Fwd: Re: Fw: Murrieta General Plan Update - SCE Questions

Ron,

Thanks for your reply; the problem with this scenario is that the General Plan is not a single development. The City's General Plan is a policy document that governs development as it happens and the typical life of a General Plan document is 25 years; then it needs to be updated again. Think of it as the "constitution for development". It provides guidance as to what the City wants to see built where. So, I cannot tell you phases or precise timing, or exact locations (other than the focus areas) because development will be driven by the private market, on a case-by-case basis. Of course, as a parcel or project is developed, the developer would come to you, and then SCE would do its thing through the course of that particular development. These are just growth projections that are anticipated within the City during this next cycle of the newly updated General Plan.

Maybe it would be helpful if you could tell me this:

1. How often is your Distribution System Plan Updated? Would it be possible for me to get a copy?
2. With regard to the focus areas, where are existing facilities located? According to your Distribution system plan, are there plans for any other facilities to be coming online in the next 5-10 years, aside from the system and its components being updated constantly as necessary?

I think if I could get answers to these questions, in addition to what you have provided below, it would be a huge help. Please let me know.

Thanks,

Paul

PAUL J. TABONE
PROJECT PLANNER
RBF CONSULTING
14725 ALTON PARKWAY
IRVINE, CA 92618
PHONE: 949.330.4166
FAX: 949.837.4122
WWW.RBF.COM

>>> <Ronald.Wold@sce.com> 12/16/2010 3:54 PM >>>
Paul,

I did recieved your email. To determine if we can accommodate the growth, we need to know how much growth and when it needs to be served. You said this is a 25 year plan, but what are the phases? What will be built and when is the information I need. You have given the foot print in square feet, but different types of commercial usage can require different amounts of power. Typically, a developer comes to the Edison Local Planner with a design in mind and they determine the amount of power required by the type of building and its occupants. There are 3,346 dwelling units in the list. An apartment uses less electricity than a house. A business park with warehouses has different service requirements that a site that manufactures goods.

For question 1, more information is needed on the amount of load coming on line and when it will come on-line. In the email, you said this is a 25 year plan. Our Distribution System plan looks out 10 years.
The particular land use that can have and adverse effect is an area of high load density or an area that is far from the distribution system. The map show the locations but not the amount of load or when it will be needed.
As to question 3, the system is constantly being upgraded or adding facilities. New wire or cable is being installed,

structures and equipment are being maintain or replaced as necessary.
I don't know about fees for new developments. This would be handled through the Local Planner and may depend on the type of development
For question 5, if you mean municipal uses such as buildings, each meter is checked and a bill created for the power used.

I will need information about a particular site location, how much power it will require and when it is coming on-line, and even then, the Distribution Plan is for 10 years out.

Ron

Mr. Ronald Wold PE
Southern California Edison
Distribution Field Engineering
Southern Zone

From: "Paul Tabone" <PTABONE@rbf.com>
To: <Ronald.Wold@sce.com>
Date: 12/16/2010 03:13 PM
Subject: Fwd: Re: Fw: Murrieta General Plan Update - SCE Questions

---

Hello Ronald,

I wanted to make sure you received my reply on the 9th. Could you please confirm that you received my email and please let me know if and when you might be able to provide the answers to those questions?

Thanks so much, and happy holidays!

Paul Tabone

PAUL J. TABONE
PROJECT PLANNER
RBF CONSULTING
14725 ALTON PARKWAY
IRVINE, CA 92618
PHONE: 949.330.4166
FAX: 949.837.4122
WWW.RBF.COM

----- Message from "Paul Tabone" <PTABONE@rbf.com> on Thu, 09 Dec 2010 13:42:04 -0800 -----

To: <Ronald.Wold@sce.com>

Subject: Re: Fw: Murrieta General Plan Update - SCE Questions

Hello Ron,

Thanks for your reply. By load, do you mean the amount of electricity that will be required by the city during build-out? I am not sure what that would be. We would need generation rates for the various land uses listed; I do not know what those would be. Does SCE have typical consumption rates for single-family, business park, office, commercial, and civic land uses? Obviously this would be an estimate but I think this is where we need to start.

And the development is slated to take place over a 25 year period, through 2030; these are just the anticipated growth projections.

I hope this helps.

Thank you,

Paul

PAUL J. TABONE
PROJECT PLANNER
RBF CONSULTING
14725 ALTON PARKWAY
IRVINE, CA 92618
PHONE: 949.330.4166
FAX: 949.837.4122
WWW.RBF.COM

>>> <Ronald.Wold@sce.com> 12/9/2010 1:26 PM >>>
Paul,

Can you tell me the amount of load demand and when the load will come on-line?
Ron

Mr. Ronald Wold PE
Southern California Edison
Distribution Field Engineering
Southern Zone

----- Forwarded by Ronald Wold/SCE/EIX on 12/09/2010 01:23 PM -----

From: "Paul Tabone" <PTABONE@rbf.com>
To: <katie.parsell@sce.com>
Cc: <gsmith@murrieta.org>, "Achilles Malisos" <AMALISOS@rbf.com>
Date: 12/07/2010 03:22 PM
Subject: Murrieta General Plan Update - SCE Questions

Good Afternoon,

My name is Paul Tabone and I am working for RBF Consulting on the Murrieta General Plan Update EIR. Before I can complete the Electricity Section of the Environmental Analysis, I was hoping I might obtain some information from Southern California Edison, as I understand that SCE provides electrical service to the City of Murrieta.

The City's General Plan Update is being written based on the following growth projections:

- An addition of 3,346 dwelling units within the City

- An addition of 22,156,784 square feet of non-residential uses, broken down into the following categories:

- 2,655,023 square feet of business park uses
- 14,807,287 square feet of professional and office uses
- 3,663,446 square feet of commercial uses
- 2,028 square feet of civic and institutional uses

The above-mentioned square footages are targeted in updated focus areas, which are shown in Exhibit 2, attached in this email.
Based on the future-projected development scenario, I just wanted to obtain some answers to the following questions:

1. Would SCE be able to accommodate new development associated with the Murrieta General Plan Update based on the information provided?

2. Do any particular land uses adversely impact your company's ability to provide an adequate level of service? Long-term service?

3. Does your company have any plans to upgrade its facilities or add additional facilities that would provide service to the city?

4. Do you have any required connection fees or assessment fees for new developments?

5. Does SCE have records of quantities of electricity consumed by municipal uses within Murrieta?

6. Please include any additional information you feel is pertinent to the Environmental Impact Report analysis for the Murrieta General Plan Update.

You may provide your answers to the above questions in an email back to me. Due to our aggressive timeline and schedule
constraints, I respectfully ask that you please provide the requested information at your earliest convenience. If there is
anything I can do to help you expedite this request, please contact me; my information is provided below.

Thank you,

Paul Tabone

Paul J. Tabone
Project Planner
RBF Consulting
14725 Alton Parkway
Irvine, CA 92618
Phone: 949.330.4166
Fax: 949.837.4122
www.rbf.com[attachment "Paul Tabone.vcf" deleted by Ronald Wold/SCE/EIX] [attachment "Paul Tabone.vcf" deleted by Ronald Wold/SCE/EIX] [attachment "Paul Tabone.vcf" deleted by Ronald Wold/SCE/EIX]

Southern California Edison

Southern California Edison (SCE) is one of the largest electric utilities in California, serving more than 14 million people in a 50,000 square-mile area of central, coastal and Southern California, excluding the City of Los Angeles and certain other cities.

Based in Rosemead, California, the utility has been providing electric service in the region for more than 120 years. SCE's service territory includes more than 180 cities.

Supplemental Materials

- Southern California Edison Service Territory Map
- List of Cities in SCE Service Territory
- SCE Corporate Org Chart

Current Southern California Edison Power Plants

- Big Creek Hydro Facilities, Shaver Lake, California
- Four Corners Generating Station, Fruitland, New Mexico
- Mountainview Power Plant, Redlands, California
- Palo Verde Nuclear Generating Station, Wintersburg, Arizona
- San Onofre Nuclear Generating Station (SONGS), San Clemente, California

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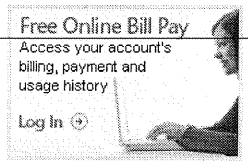

SCE.com Links

Customer Service
- Pay Bill
- Turn On Service
- Turn Off Service
- Transfer Service

Rebates and Savings
- Residential
- Business

Safety

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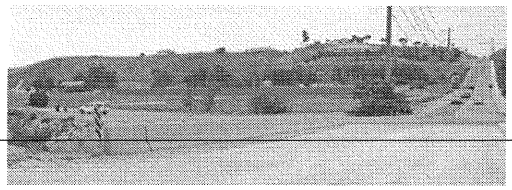
New user? Learn more | Register

- Environmental Commitment
- Smart Grid
- Plug-In Electric Vehicles
- Power Generation
- Renewable Energy
- Transmission Projects
  - Current Projects
    - Tehachapi Renewable Segments 1-3
    - Tehachapi Renewable Segments 4-11
    - Eldorado-Ivanpah Transmission Project
    - Devers-Mirage
    - Devers-Palo Verde No. 2
    - Triton 115/12 Kilovolt Substation
      - Project Description
      - Project Location
      - Project Approval Process
      - Public Outreach
    - Mascot Substation Project
    - San Joaquin Cross Valley Loop Transmission Project
    - Leatherneck Substation Project
    - Presidential Substation Project
    - El Casco System Project
    - Alberhill System Project (Western Riverside County)
    - Ivyglen Project
    - Downs Substation Project
    - Falcon Ridge Substation Project
    - Lakeview Substation Project
    - Red Bluff Substation Project
  - Completed Projects

+ Expand All | - Collapse All

Transmission Projects - Current Projects

Triton Substation Project



Simulation of proposed substation facing south on Nicolas Road and the corner of Calle Medusa towards the proposed site.

The southwestern portion of Riverside County that includes the cities of Temecula and Murrieta has experienced rapid industrial and residential growth over the past several years. The Southern California Association of Governments forecasts that over the next 20 years, the city of Temecula will have a population increase of 22,880, resulting in roughly 10,630 new residential units. Due to this expected growth, Southern California Edison's (SCE) current forecast shows the increased demand for electrical service would exceed the designed operating limits of the existing distribution facilities serving this area as early as the summer of 2010, creating a need for increased load.

SCE is proposing to build a new substation that will maintain electrical system reliability and serve the projected increase in demand in Temecula and Murrieta as well as the new developments of Roripaugh Ranch, Rancho Bella Vista and Johnson Ranch in adjacent unincorporated Riverside County.

At-A-Glance

Project Description

115/12 kilovolt substation and a ¼ mile 12 kilovolt subtransmission line segment.

Communities Potentially Affected:

Temecula and Murrieta.

Project Status

Project was approved by the CPUC in September 2010.

Timeline - Anticipated Project Schedule

November 2008	SCE will submit for approval a Permit to Construct with the California Public Utilities Commission (CPUC)
1st Quarter 2009	The CPUC review of the project is expected to begin.
September 2010	Project approved by the CPUC

Project Contact Information

If you have questions or comments about the project or would like to be added to the project mailing list, please contact:

Viet Tran
Region Manager
Southern California Edison
Wildomar Service Center
(951) 249-8466
viet.tran@sce.com

Project Links

- Project Homepage
- Project Description
- Project Location
- Project Approval Process
- Public Outreach

Project Information

- Triton Substation Project Update (PDF)
- Triton CPUC Application

Related Links

- Utility Glossary
- Path of Electricity Tutorial
- Electric Magnetic Fields (EMF)
- Environmental Protection
- SCE Infrastructure Investment Backgrounder (PDF)

External Links

- CPUC Project Page
- CPUC Step-by-Step Guide (PDF)
- CPUC Overview of Electric Transmission Siting (PDF)

Questions?

- Project Contact Information

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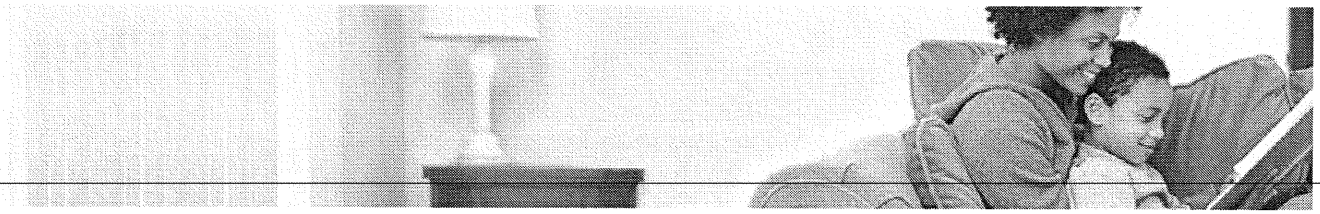


COMPANIES

San Diego Gas & Electric

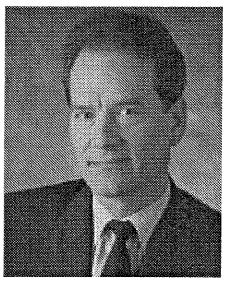
Southern California Gas Co.

Sempra Generation

Sempra LNG

Sempra Pipelines & Storage

Southern California Gas Co.



Mike Allman
President and CEO
SoCalGas

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Appendix G:

Seismic & Geologic Hazards Existing Conditions Report

SEISMIC AND GEOLOGIC HAZARDS REVIEW
GENERAL PLAN UPDATE
CITY OF MURRIETA, CALIFORNIA

Prepared For:

CITY OF MURRIETA
c/o RBF Consulting
14725 Alton Parkway
Irvine, CA 92618

Project No. 602728-001

January 8, 2010

Leighton Consulting, Inc.
A LEIGHTON GROUP COMPANY

Leighton Consulting, Inc.
A LEIGHTON GROUP COMPANY

January 8, 2010

Project No. 602728-001

CITY OF MURRIETA
c/o RBF Consulting
14725 Alton Parkway
Irvine, CA 92618

Attention: Ms. Collette L. Morse, AICP, Vice President

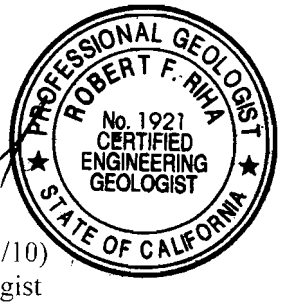
Subject: Seismic and Geologic Hazards Review
General Plan Update, City of Murrieta, California

In accordance with your authorization and our proposal dated June 26, 2009, we have performed a seismic and geologic hazards review for the City of Murrieta (City) in support of the General Plan Update. This report summarizes our findings and provides general recommendations related to potential seismic and geologic hazards within the City. Future land developments within the City limits appear feasible from a seismic/geologic viewpoint provided independent, site-specific evaluations are performed to address the general concerns and constraints outlined in this report.

If you have any questions regarding this report, please do not hesitate to contact the undersigned. We appreciate this opportunity to be of service on this project.

Respectfully submitted,
LEIGHTON CONSULTING, INC.

Simon I. Saiid
GE 2641 (Exp. 09/30/11)
Principal Engineer



Robert F. Riha
CEG 1921 (Exp. 02/28/10)
Senior Principal Geologist

RFR/SIS/dlm

Distribution: (4) Addressee (plus CD copy)

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1.0 INTRODUCTION

1.1 Purpose and Scope

The purpose of this study was to compile and summarize the known seismic and geologic hazards within the City of Murrieta General Plan study area and provide an overview of the known typical geotechnical constraints that might be expected during future land development. More specifically, our scope for this report included the following:

- Establish a geo-referenced maps for the entire City,
- Review in-house and published geologic reports/maps (USGS, CGS, Riverside County, etc.) and transfer pertinent data to the geo-referenced maps,
- Review historic and current aerial photos to evaluate for past or potential geologic hazards specifically for the three (3) specified corridors,
- Provide a general description of the type of native soil and rock units throughout the City,
- Present the potential geologic hazards within the City including mapped fault traces and County and/or State of California Alquist-Priolo (AP) Earthquake Fault Zones. Additionally, areas that are prone to liquefaction or dry seismic settlement, and other seismic hazards such as ground rupture, rock fall hazards, landslide and subsidence are also discussed,
- Present the historic seismic activity within the City area and provide typical Seismic Design Criteria per the current 2007 California Building Code,
- Discuss the potential for encountering shallow groundwater during development of certain areas of the City,
- Discuss the general rippability characteristics of potentially bedrock units in certain areas of the general plan based on exiting in-house data. The report also includes general description of previously used methods of rock excavation/reduction as well as onsite rock disposal/placement methods,
- Discuss the potential for encountering hazardous naturally occurring minerals,
- Summarize potential mass grading challenges within specific areas of the City based on past experience, and
- Describe typical foundation types used and provide generalized geotechnical foundation design recommendations for future structures.

1.2 City Location and General Description

The City of Murrieta is located in southwest Riverside County, north of the City of Temecula and south of the Cities of Menifee and Wildomar. The City consists of approximately 45 square miles of land, which has experienced significant growth in residential development since the first General Plan in 1994. We understand that this General Plan is currently being updated to address the overall City growth and in particular, future development within three specific study areas or corridors, which have the potential to attract businesses and promote diversified job creation for City residents. As such, these three areas or corridors will be specifically evaluated in this report and pertinent geotechnical constraints during future land development are briefly discussed. These corridors will be referred to in this report as Areas 1 through 3 and may be generally described as follows:

- Area 1- Southwest Murrieta / Jefferson Business Corridor: This area is currently the major retail and light industrial agglomeration within Murrieta and located generally west of the Golden Triangle along the west side of Interstate I-15, south of Kalmia Street and north of the City's southern boundary.

- Area 2 -Golden Triangle: This area is generally located north of the intersection of I-15 and I-215 and south of Los Alamos Road.

- Area 3 - Northeast I-215 and Clinton Keith Road: This is generally the northeastern quadrant of the City located along the east side of I-215 and north of Clinton Keith Road where relatively most vacant land currently exists.

2.0 GEOLOGY

2.1 Regional Settings

The City of Murrieta (City) is located within the northern portion of the Peninsular Range geomorphic province which is characterized by steep, elongated ranges and valleys that generally trend northwestward from the tip of Baja California to the Los Angeles Basin. The City is regionally located at the base of the Santa Ana Mountains and the Santa Rosa Plateau. The Santa Margarita and Agua Tibia ranges are approximately 12 to 14 miles to the south, and the San Jacinto ranges lie approximately 35 miles to the east.

More specifically, the City is situated within two structural blocks or subdivisions of the Peninsular Range province. The western foothill boundary of the City is within the Santa Ana Mountains block and the east portion is within the Perris block. These provinces are separated by the active Elsinore fault zone, which forms a complex pull-apart basin (locally known as the Murrieta-Temecula Valley) that is filled with sedimentary deposits. The relatively stable Santa Ana Mountains and the Perris Block are underlain by pre-Cretaceous aged metasedimentary rocks and Cretaceous aged plutonic rocks of the Southern California batholith. Tertiary-aged sediments, volcanics and Quaternary-aged sediments flank the Santa Ana mountain range to the west, elevated portions of the valley floor, and within the western flanks and localized valleys of the Perris Block. The Quaternary sediments include the "Unnamed" Sandstone, Pauba Sandstone, Pauba Fanglomerate, and younger alluvial sediments (Kennedy, 1977).

2.2 Area Geology

The City is underlain by numerous surficial deposits and/or bedrock units based on published geologic maps (Figure 1). The major surficial deposits and bedrock units that are most likely to be encountered during future developments are briefly described below:

- **Artificial Fill (not a mapped unit):** Artificial fills are generally referred to as undocumented fills or engineered (documented) fills. Undocumented fills are typically those fills that were placed without the review and testing of a geotechnical consultant. Engineered fills are those fills that were observed and tested by a geotechnical consultant. Most artificial fills within the City are expected to be engineered and placed during construction of existing public roads and private developments. The engineering characteristics and vertical or horizontal extent of these fills are site-specific.

- **Colluvial Deposits (not a mapped unit):** Colluvium is the name for sediments that have been deposited or built up at the bottom of a low-grade slope or against a barrier on that

slope, transported by gravity. These deposits generally consist of silty sand and sandy gravel with abundant angular and sub-angular fragments of the underlying bedrock units.

- **Young Axial-Channel Deposits (map symbol Qya):** These alluvial deposits (late Holocene) are generally found in active stream beds, flood plains or channels and consist of unconsolidated to locally poorly consolidated sand and gravel with small amounts of silt.

- **Young Alluvial-Valley Deposits (map symbol Qyv):** These alluvial flood plain deposits (Pleistocene, younger than 500,000 years) are generally found along the main Murrieta Creek channel and expected to exceed 100 feet in depth. These deposits cover positions of Area 1.

- **Very Old Alluvial Channel Deposits (map symbol Qvoa):** These alluvial deposits are generally deposited on canyon floors and consist of moderately to well-indurated, reddish-brown mostly dissected gravel, sand, silt and clay. These deposits are generally found in the northeastern portion of the City.

- **Pauba-fanglomerate (map symbol Qpf):** The Pauba-fanglomerate member (Pleistocene) is well indurated, poorly sorted fanglomerate and mudstone and generally found along the east flank of the Santa Ana Mountains (west of the City).

- **Pauba-sandstone (map symbol Qps):** The Pauba-sandstone formation (Pleistocene) is poorly to moderately well-indurated, extensively crossbedded, channeled and filled sandstone and siltstone that contains local intervening cobble-and-boulder conglomerate beds. This formation is generally found in the southern half of the City including most of Area 2 and portions of Area 1.

- **Sandstone and Conglomerate of Wildomar area (map symbol QTws)):** This formation consist primarily of friable, pale yellowish-green, medium grained, caliche-rich sandstone and located in middle portion of the City, just north of the Golden Triangle Area.

- **Basalt of the Hogbacks (not mapped):** The locally named Hogbacks are an elevated hilltop located in the eastern portion of the City. Capping this unique feature is a remnant channel filled with basalt (Tertiary-age).

- **Gabbro (map symbol Kgb)**: This Cretaceous-age granitic formation also constitutes portions of the hills along the northern part of the City and underlies the older alluvium in Area 3 (Northeast I-215 and Clinton Keith Road).

- **Monzogranite to Granodiorite (map symbol Kpvg):** This Cretaceous-age granitic formation locally known as the Paloma Valley Ring Complex constitutes portion of the hills along the northern part of the City and underlies the older alluvium in Area 3 (Northeast I-215 and Clinton Keith Road).

- **Tonalite (map symbol Kpvt):** This Cretaceous-age granitic formation locally known as the Paloma Valley Ring Complex is found along the northeastern part of the City.

- **Metasedimentary Rock (map symbol Trmp/Trmu):** This Mesozoic-aged metamorphic grade marine sedimentary rock unit, locally known as the Bedford Canyon Formation, exists in the northeastern quadrant of the City. This bedrock unit consists of locally folded, laminated to thinly bedded argillite, slate, shale and impure quartzite.

2.3 Site-Specific Geology (Areas 1 through 3)

Based on past experience and review of the referenced reports (Appendix A), the engineering and geologic characteristics of the soils and/or bedrock units within Areas 1 through 3 are further described and summarized as follows:

Area 1 - Southwest Murrieta / Jefferson Business Corridor:

Area 1 is generally underlain by Pauba formation (sandstone-member, Qps) and young alluvial-valley deposits (Qyv) *see Geologic Map – Figure 1*. According to previous site specific reports performed within this area, the following geologic conditions and geotechnical concerns can be summarized:

- The Pauba formation generally consists of brown to light brown, clayey, fine-grained siltstones and silty/clayey, fine- to coarse-grained sandstones (Leighton, 2004 & 2008a, and CHJ, 2007). The Pauba formation in this area is generally considered suitable for support of structures and for use as engineered fill. These soils generally have low Expansion Index (EI<51). However, expansive clay and silt layers may be locally encountered.

- The alluvial-valley deposits are mostly moderately well consolidated, poorly sorted, permeable flood plain deposits consisting of silty sand (SM), poorly-graded to well-graded sand (SP/SW), clayey sand (SC), and sandy clay (CL). Published geologic maps and previous site specific field explorations within this area indicate that the alluvium may exceed 100 feet in depth. The alluvial soils may be susceptible to liquefaction and/or subsidence. The alluvial soils are generally considered suitable for support of structures and for use as engineered fill. These soils generally have low Expansion Index (EI<51). However, expansive clay and silt layers may be locally encountered.

Area 2 - Golden Triangle:

The majority of Area 2 is underlain by the Pauba-sandstone formation (Qps) and conglomerate unit of the Wildomar area (QTws) and localized alluvial-channel deposits (Qya), *see Geologic Map – Figure 1*. According to previous site-specific reports performed within this area, the following geologic/geotechnical conditions can be summarized:

- The Pauba formation consists of brown to light brown, clayey, fine-grained siltstones and silty/clayey, fine- to coarse-grained sandstones (Leighton, 2004 & 2007). The Pauba formation in this area is generally considered suitable for support of structures and for use as engineered fill. These soils generally have low expansion potential (EI<51). However, expansive clay and silt layers may be locally encountered.

- The alluvial-channel deposits consist of unconsolidated to locally poorly consolidated sand and gravel with small amounts of silt. The alluvial soils may be susceptible to liquefaction and/or subsidence and generally not suitable for support of settlement-sensitive structures in their natural state.

Area 3 - Northeast I-215 and Clinton Keith Road:

This northeast development area (Area 3) is primarily underlain by granitic and metamorphic bedrock, *see Geologic Map – Figure 1*. According to previous site-specific reports performed within this area, the following geologic/ geotechnical conditions can be summarized:

- The majority of Area 3 is underlain by Cretaceous-aged granitic bedrock which varies in composition from Monzogranite to Granodiorite (Kpvg) to that of Gabbro (Kgb). The granitic bedrock is locally overlain by a thin veneer of older alluvium (Qvoa). Younger alluvial deposits may also be present locally infilling some surface drainages.

- Based on previous reports in this area (Leighton, 2006 and Kleinfelder, 2007), the condition of the near surface bedrock varies from that of highly disintegrated rock that has weathered becoming soil-like deposits (saprolite) to that of relatively unweathered, hard, very dense, igneous rock. Where exposed, the granitic rocks of monzogranite and granodiorite composition are generally light gray to gray to grayish brown. The gabbroic bedrock observed in this area is generally gray to dark gray.

- The granitic bedrock is generally considered suitable for support of structures and use for engineered fill.

2.4 Groundwater

Based on a review of the referenced reports, groundwater has been encountered less than 10 feet below the existing ground surface along Murrieta Creek. Depth to subsurface water has been reported by the State of California (California Department of Water Resources, 2009) at depths ranging from 21 feet to 100+ feet below ground surface (bgs) in the overall area. However, depending on rainfall and seasonal variation, shallower perched water conditions may exist and typically accumulate within layers of differing permeability, within bedrock fractures and at bedrock/fill contacts. In addition, groundwater seepage can occur in deep cuts in the hills along the northern side of the City as reported during grading of the existing Greer Ranch Residential

development (Leighton, 1999 & 2003). Such conditions are typically mitigated by the placement of subdrains and other appropriate long-term dewatering measures at the time of construction or when the seepage is observed.

2.5 Geologic Hazards

This section discusses the non-earthquake related geologic hazards within the City. The earthquake- or seismically-induced hazards are discussed in Section 3 of this report.

The potential extent and severity of any non-earthquake related geologic hazard varies throughout the General Plan area depending upon the underlying geology, topography, surface soil type, and groundwater conditions. The most common geologic hazards that may be encountered are as follows:

2.5.1 Expansive Soils

Expansive soils are surface deposits rich in clays that expand when wet and shrink when dried. This change in volume can exert detrimental stresses on buildings and cause structural damage. Expansive soils can be widely dispersed and can be found in hillside areas as well as low-lying alluvial basins. There have been reported cases (Leighton, 2004, 2008a) of expansive clay layers within the Pauba formation and Alluvial-Valley deposits.

The site-specific geotechnical reports typically identify the extent of the expansive soils and provide mitigation measures to reduce their impact on the proposed improvements. Such measures may include structural mitigation or ground improvement. The California Building Code contains minimum requirements for construction on expansive soils.

2.5.2 Collapse Soils

The collapse soils phenomenon or "Hydro-consolidation" typically occurs in recently deposited soils (Holocene age - less than 10,000 years old) that were deposited in an arid or semi-arid environment. These soils typically contain a high percentage of voids and possess low relative density. The soil particles may be partially supported by clay or silt, or chemically cemented with carbonates. When inundated by water, these soils collapse and substantial settlement occurs.

Damage to structures and ground cracking due to hydro-consolidation (collapse) of recent alluvial deposits has occurred in the "California Oaks" area of Murrieta (Pacific Soils, 1992). Documented collapsible soils in the Cal Oaks area were determined to be the most severe and resulted in significant property damage. It was discovered that the alluvium was left in place during rough grading, and later collapsed when ground water levels rose significantly due to irrigation or rise in groundwater.

The site-specific geotechnical reports should identify the potential presence of such soils based on laboratory testing and provide mitigation measures to reduce their impact on the proposed improvements. Such measures typically include removing and compacting the collapsible soils.

2.5.3 Loading Settlement

Settlement due to loading can be immediate or occur gradually over a long period of time. Immediate settlement is normally associated with loose granular soils when subjected to loads. Long-term or "consolidation" settlement normally takes place in soft saturated silts and clays. These types of soils are generally found in young alluvium or loosely deposited materials.

Similar to Collapse Soils above, the site-specific geotechnical reports typically identify the potential presence of these materials based on laboratory testing and provide mitigation measures to reduce their impact on the proposed improvements. Such measures typically include removing and compacting the loose or soft soils, surcharging the planned development area or structural mitigation. Structural mitigation may include deep foundation such as piles embedded into underlying dense formation.

2.5.4 Subsidence

Subsidence is the ground settlement that results over time from the extraction of groundwater or oil. This is a phenomenon that usually extends over a large area and occurs on a gradual basis so the settlement effects on a single site, relative to its immediate neighbors, may be negligible as the neighboring properties are also subsiding. However, ground fissuring due to subsidence can cause structural damage and should be evaluated by the site-specific geotechnical report. Although there are no reports of significant subsidence due to groundwater withdrawal in Murrieta, alluvial valley areas are considered susceptible (see Figure 5).

2.5.5 Hazardous Minerals / Radon

Naturally occurring geologic formations throughout California may contain minerals that are considered hazardous. These minerals are Asbestos, Mercury and rocks that contain small amounts of uranium and thorium that decay and release radioactive radon gas.

Radon gas is a naturally occurring radioactive gas that is invisible, tasteless and odorless. Radon gas becomes hazardous when confined in buildings and the long term exposure levels in the air exceed the United States Environmental Protection Agency's (EPA) concentration of 4 picocuries per liter (4pCi/L).

Rocks containing minerals that are known to release radon gas exist in the Murrieta area (CGS, 2009). More information on the risks associated with radon, information on testing and remediation methods can be found at the California Department of Public Health Services website: http://www.cdph.ca.gov/HealthInfo/environhealth/Pages/Radon.

3.0 SEISMICITY AND FAULTING

3.1 General

Murrieta, like the rest of Southern California, is located within a seismically active region as a result of being located near the active margin between the North American and Pacific tectonic plates. Based on published data (Blake 2002), the most significant known active Fault Zones that are capable of seismic ground shaking and can impact the City include:

- *Elsinore Fault Zone:* This fault zone, which includes the local Elsinore-Temecula fault, passes through the City to the west of Interstate I-15 (Figures 2 and 3). The Elsinore-Temecula fault zone is capable of generating a Maximum Earthquake Magnitude (Mw) of 6.8 per the Richter scale.

- *San Jacinto Fault Zone:* This fault zone is located approximately 21 miles northeast of the City and capable of generating earthquakes in excess of 7.1 Mw.

- *Newport-Inglewood Fault Zone (offshore):* This fault zone is located about 28 miles southwest of the City and capable of generating earthquakes in excess of 6.9 Mw.

- *San Andreas Fault Zone (southern section):* This fault zone, located approximately 38 miles northeast of the City, is considered the dominant active fault in California. This fault zone is capable of generating earthquakes in excess of 7.4 Mw.

The Alquist-Priolo Hazards Act (A-P Act) passed by the State legislature in 1972 (renamed the Alquist-Priolo Earthquake Fault Zoning Act in 1994) established earthquake fault zones along faults considered by the State Division of Mines and Geology to be active or potentially active. An active fault is considered one which has experienced surface displacement within the last 11,000 years, while a potentially active fault is a fault which has moved during the past 1.6 million years but proven to have not moved within the past 11,000 years. Such displacement can be recognized by the existence of cliffs in alluvium, terraces, offset stream courses, the alignment of depressions, sag ponds, fault troughs and saddles, and the existence of markedly linear steep mountain fronts. However, some active faults are not visible at the surface and can only be located through detailed subsurface investigations.

The State Geologist designates seismic hazard zones and the State issues earthquake fault zone maps to assist cities and counties in avoiding the hazard of surface fault rupture. The State has identified two Alquist-Priolo Earthquake Fault zones within the City. The Temecula Segment of the Elsinore Fault Zone traverses the City and the Murrieta Creek Fault is located at the extreme southwest corner of the City (See Figure 2 – Alquist-Priolo Earthquake Fault Zone Map). The

earthquake fault zones extend about 500 feet in width on either side of a major active fault trace and about 200 to 300 feet in width on either side of a well defined minor active fault, as designated by the State. Development of a building for human occupancy is generally restricted within 50 feet of an identified fault (Riverside, 2003).

In addition to the State A-P Act mapping, the County of Riverside has zoned fault systems and required similar special studies prior to land development. These are referred to as Riverside County Earthquake Fault Zones (Figure 3).

3.2 Fault Rupture

Faults throughout southern California have formed over millions of years. Some of these faults are generally considered inactive under the present geologic conditions. As indicated above, several State and County Faults systems are mapped within the City boundaries and any proposed tracts of four or more dwelling units or critical structures such as hospitals, schools or emergency structures must investigate the potential for and setback from ground rupture hazards (Riverside County, 2003). This is typically accomplished by excavation of a trench across the site, determining the location of faulting, and establishing building setbacks. Methods for the evaluation of site ground rupture are further presented in the California Geologic Survey Note 49 (CGS, 2002).

In accordance with The Alquist-Priolo Earthquake Fault Zone Act, before a project can be permitted within a fault zone, a geologic investigation must demonstrate that proposed buildings will not be constructed across an A-P or County Fault Zones. A site-specific evaluation and written report must be prepared by a California licensed geologist. If an active fault is found, a structure for human occupancy must be setback 50 feet from the fault unless adequate evidence is presented to support a different setback (Riverside, 2003).

3.3 Ground Shaking

The intensity of earthquake ground shaking varies from one area to another depending primarily upon the distance to the fault, the magnitude of the earthquake, and the local geology. The effect of seismic shaking on future structures or land development projects within the City may be mitigated by adhering to the 2007 California Building Code (CBC) or applicable codes and standards at the time. Site-specific peak and spectral accelerations are to be developed in accordance with Chapter 21 of the 2007 CBC, and the guidelines included in American Society of Civil Engineers Standard 7-05 (ASCE, 2005). For the purpose of illustration, typical seismic design values per the 2007 CBC, Chapter 16, for study Areas 1 through 3 are provided below.

The CBC regulates the design and construction of excavations, foundations, building frames, retaining walls, and other building elements to mitigate the effects of seismic shaking and adverse soil conditions. The procedures and limitations for the design of structures are based on site characteristics, occupancy type, configuration, structural system, height, and seismic zoning.

Area 1- Southwest Murrieta / Jefferson Business Corridor: This area is generally underlain by alluvial deposits and Pauba formation. In accordance with the 2007 CBC, the example site below may be classified as a Class D site, and typical site-specific seismic coefficients are as follows:

Table 1. 2007 CBC Site-Specific Seismic Coefficients – Area 1 Example

CBC Categorization/Coefficient		Acceleration Value (g)
Example Site: Intersection of Guava Street & Jefferson Avenue	Site Latitude (33.5452 N) Site Longitude (-117.1931 W)	
Site Class (Table 1613.5.2) – D		
Mapped Spectral Response Acceleration at 0.2s Period, S_s (Fig. 1613.5(3))		**1.84**
Mapped Spectral Response Acceleration at 1s Period, S_1 (Fig. 1613.5(4))		**0.67**
Short Period Site Coefficient at 0.2s Period, F_a (Table 1613.5.3(1))		1.0
Long Period Site Coefficient at 1s Period, F_v (Table 1613.5.3(2))		1.5
Adjusted Spectral Response Acceleration at 0.2s Period, S_{MS} (Eq. 16-37)		**1.84**
Adjusted Spectral Response Acceleration at 1s Period, S_{M1} (Eq. 16-38)		**1.01**
Design Spectral Response Acceleration at 0.2s Period, S_{DS} (Eq. 16-39)		**1.23**
Design Spectral Response Acceleration at 1s Period, S_{D1} (Eq. 16-40)		**0.67**

* g- Gravity acceleration

Area 2 -Golden Triangle: This area is generally underlain by dense Pauba formation. In accordance with the 2007 CBC, the example site below is classified as a Class D site, and typical site-specific seismic coefficients are as follows.

Table 2. 2007 CBC Site-Specific Seismic Coefficients – Area 2

CBC Categorization/Coefficient		Acceleration Value (g)
Example Site: Intersection of Hancock Avenue and Murrieta Hot Springs Road	Site Latitude (33.5560 N) Site Longitude (-117.1843 W)	
Site Class Definition (Table 1613.5.2) – D		
Mapped Spectral Response Acceleration at 0.2s Period, S_s (Fig. 1613.5(3))		**1.68**
Mapped Spectral Response Acceleration at 1s Period, S_1 (Fig. 1613.5(4))		**0.61**
Short Period Site Coefficient at 0.2s Period, F_a (Table 1613.5.3(1))		1.0
Long Period Site Coefficient at 1s Period, F_v (Table 1613.5.3(2))		1.5
Adjusted Spectral Response Acceleration at 0.2s Period, S_{MS} (Eq. 16-37)		**1.68**
Adjusted Spectral Response Acceleration at 1s Period, S_{M1} (Eq. 16-38)		**0.92**
Design Spectral Response Acceleration at 0.2s Period, S_{DS} (Eq. 16-39)		**1.12**
Design Spectral Response Acceleration at 1s Period, S_{D1} (Eq. 16-40)		**0.61**

* g- Gravity acceleration

Area 3 - Northeast I-215 and Clinton Keith Road: This area is generally underlain by dense granitic rock. In accordance with the 2007 CBC, the example site below is classified as a Class C site, and typical site-specific seismic coefficients are as follows.

Table 3. 2007 CBC Site-Specific Seismic Coefficients – Area 3

CBC Categorization/Coefficient		Acceleration Value (g)
Example Site: Intersection of Baxter Road and Menifee Road	Site Latitude (33.6121 N) Site Longitude (-117.1542 W)	
Site Class Definition (Table 1613.5.2) – C		
Mapped Spectral Response Acceleration at 0.2s Period, S_s (Fig. 1613.5(3))		**1.50**
Mapped Spectral Response Acceleration at 1s Period, S_1 (Fig. 1613.5(4))		**0.60**
Short Period Site Coefficient at 0.2s Period, F_a (Table 1613.5.3(1))		1.0
Long Period Site Coefficient at 1s Period, F_v (Table 1613.5.3(2))		1.3
Adjusted Spectral Response Acceleration at 0.2s Period, S_{MS} (Eq. 16-37)		**1.50**
Adjusted Spectral Response Acceleration at 1s Period, S_{M1} (Eq. 16-38)		**0.78**
Design Spectral Response Acceleration at 0.2s Period, S_{DS} (Eq. 16-39)		**1.00**
Design Spectral Response Acceleration at 1s Period, S_{D1} (Eq. 16-40)		**0.52**

* g- Gravity acceleration

3.4 Secondary Seismic Hazards

Ground shaking can induce "secondary" seismic hazards such as liquefaction and/or lateral spreading, landslides, and subsidence and ground fissuring. Areas of the City known to be at risk from these hazards have been mapped and shown on Figures 4, 5 and 6 (Liquefaction and Subsidence Susceptibility Maps and Seismic Hazard Map, respectfully).

3.4.1 Dynamic Settlement / Liquefaction and "Dry" Settlement

Liquefaction of saturated cohesionless soils can be caused by strong ground motion resulting from earthquakes. Soil liquefaction is a phenomenon in which saturated, cohesionless soils lose their strength due to the build-up of excess pore water pressure during cyclic loading such as that induced by earthquakes. The primary factors affecting the liquefaction potential of deposit are: 1) intensity and duration of earthquake shaking, 2) soil type and relative density, 3) overburden pressures, and 4) depth to groundwater. Soils most susceptible to liquefaction are clean, loose, uniformly graded, fine-grained sands, and non-plastic silts that are saturated. Silty sands, under certain site conditions, may also be susceptible to liquefaction. As depicted on Figure 4, most of the alluvial deposits along the Murrieta Creek lie within liquefaction hazard zone per County of Riverside. Most of these alluvial soils are also considered susceptible to liquefaction per State Seismic Hazard Zones (Figure 6). Future development within these areas, require a site-specific evaluation for liquefaction hazard.

In addition to liquefaction settlement, dynamic densification of "dry" or moist soil above the water table can occur. The site-specific evaluation for future development should also include evaluation for settlement associated with dynamic densification of "dry" soils. To reduce the effects and magnitude of seismically-induced dynamic settlements, remedial grading measures or ground improvement techniques are normally implemented.

3.4.2 Lateral Spreading

The phenomenon of liquefaction may also produce lateral spreading of soils adjacent to a body of water or water course (Murrieta Creek and Warm Springs Creek). Lateral spreading is therefore considered as a liquefaction-induced ground failure whereby block(s) of surficial intact natural or artificial fill soils displace laterally downslope or towards a free face along a shear zone that has formed within the liquefied sediment (Bartlett and Youd, 1995). The displacement of the ground surface associated with this lateral spreading may be on the order of several inches to several feet at the top of the slope and may affect areas well beyond the top-of-slope. Developments located further from the creeks or drainage courses are anticipated to be at less risk from lateral spreading that those adjacent to the creek embankment. Detailed analyses of lateral spreading affects to properties adjacent to creeks and drainages should be performed by

the geotechnical consultant on a site-by-site basis. To reduce the effects or magnitude of lateral spreading, remedial grading measures on ground improvement techniques are normally implemented.

3.4.3 Differential Subsidence and Ground Fissuring

Ground fissuring typically develops along previous established planes of weakness such as active and possibly potentially active fault traces as well as along steep buried contacts between bedrock to recent alluvial soils. The active Elsinore-Temecula and the Murrieta Creek fault may develop fissuring along the fault trace during a significant seismic event or groundwater elevation change. As such, there is a low to high potential for ground fissuring and associated differential subsidence along the active fault zones. If commercial water wells are installed within or near the subsidence zone, the potential for ground fissuring and differential settlement could be substantially increased.

3.4.4 Seiches and Tsunamis

A seiche is an oscillation of a landlocked body of water that can cause water damage to buildings, roads, and infrastructure that surround the body of water. Due to the distance to existing large bodies of water (i.e. Diamond Valley Lake, Lake Skinner, Lake Elsinore, etc.), it is expected that such hazard should not be a concern for structures within the City.

A tsunami is a great ocean wave produced by submarine earth movement or volcanic eruption. The City is more than 20 miles from the Pacific Ocean. Therefore, the potential for tsunamis is nonexistent.

3.4.5 Flooding

Portions of the City lie within the boundaries of the FEMA 100-year flood plain. Potential flood hazard should be evaluated on a case-by-case basis during individual site developments. Flooding could also occur along the Warm Springs Creek due to potential breach of any of dams associated with Diamond Valley Lake and Lake Skinner. This report does not address such flood hazard risk.

3.4.6 Landslides

The potential for earthquake related landsliding within the City limits is based on known conditions and published geologic maps. Several Old landslides have been mapped in some areas along the Santa Ana Mountains eastern slopes and the hills along the northern side of the City. The State Seismic Hazard Zones (CGS, 2007) provides locations of previous known landsliding or where local conditions indicate a potential for ground displacements (see Figure 6). Site-specific geologic review should be performed to

determine whether the potential for landsliding or slope instability exists and whether buttressing or other slope stabilization methods or avoidance are required.

3.4.7 Rock Fall Hazards

The potential for rock fall due to natural weathering and instability or rock falls due to a seismic event are possible in local areas of the City. The hazard areas are limited to those properties at the base of hill sides where rocks and boulders exist. Site-specific geologic review should be performed to evaluate such hazard and provide appropriate corrective measures. To reduce the potential effects from rock falls in these areas, mitigation may include avoidance, rock removal, anchoring or catchment devises.

4.0 GRADING AND DESIGN CONSIDERATIONS

4.1 General

Future land development within the City should be evaluated on a site-specific (or individual project) basis to address the potential hazards outlined in this report. The following sections discuss typical grading concerns and provide general criteria for earthwork construction based on past experience in the City and in accordance with current standard of care in this locality.

4.2 Grading and Earthwork Considerations

Grading and earthwork construction for future land development within the City should conform to the latest edition of the CBC and City and/or County grading ordinances. The General Earthwork and Grading Specifications presented in this report (Appendix B) are provided for typical grading projects in this locality and may be used for future developments provided they are reviewed and found applicable by the geotechnical consultant of the specific development(s).

4.2.1 Site Preparation

Prior to any site grading, the contractor should clear any surface and subsurface obstructions, including debris, abandoned improvements and heavy vegetation. Holes resulting from removal of buried obstructions, which extend below the depth of removal based on site-specific study, should be filled with properly compacted soil. Existing wells, septic tanks and associated utilities should be abandoned and cleared in accordance with City and County guidelines.

4.2.2 Remedial Grading

Remedial grading requirements for any given site are determined based on a site-specific geotechnical investigation to provide stable ground for the proposed development or structures. Generally, the upper weathered formational materials or loose soils are removed until dense, relatively "non-compressible" soils (alluvium or Formation materials) are encountered. This remedial removal will typically reduce the adverse impact of the static or dynamic settlements on settlement-sensitive structures. Based on past experience and review of the references included in Appendix A, the following remedial grading should be anticipated within the following specific three areas:

Area 1- Southwest Murrieta / Jefferson Business Corridor:

This area is generally underlain by Pauba formation (sandstone-member) and young alluvial-valley and –channel deposits as well as undocumented fill soils. For planning

purposes, the following general remedial grading should be anticipated beneath settlement-sensitive structures including slopes and pavement:

- *Undocumented fill:* typically all removed and recompacted provided these soils are suitable for reuse as engineered fill.
- *Alluvial-channel deposits*: typically all removed and recompacted provided depth is less than 10 to 20 feet. Deeper alluvium in some locations may be left in place provided it is found suitable by the geotechnical consultant.
- *Alluvial-valley deposits*: typically the upper 5 to 10 feet are removed and recompacted. Deeper alluvium is generally left in place provided it is found suitable by the geotechnical consultant and/or improved in place.
- *Pauba formation*: typically the upper 2 to 5 feet are removed and recompacted. Deeper soil is generally left in place provided it is found suitable by the geotechnical consultant against collapse potential or slope instability.

Area 2 -Golden Triangle:

This area is generally underlain by Pauba formation (sandstone-member) and young–channel deposits as well as potential undocumented fill soils. In general, the following remedial grading should be anticipated beneath settlement-sensitive structures including slopes and pavement:

- *Undocumented fill:* typically all removed and recompacted provided these soils are suitable for reuse as engineered fill.
- *Alluvial-channel deposits*: typically all removed and recompacted provided depth is less than 10 to 20 feet. Deeper alluvium in some locations may be left in place provided it is found suitable by the geotechnical consultant.
- *Pauba formation*: typically the upper 2 to 5 feet are removed and recompacted. Deeper soil is generally left in place provided it is found suitable by the geotechnical consultant against collapse potential or slope instability.

Area 3 - Northeast I-215 and Clinton Keith Road:

This area is generally underlain by granitic bedrock covered with a relatively thin veneer of older and/or younger alluvial deposits. In general, the following remedial grading should be anticipated beneath settlement-sensitive structures including slopes and pavement:

- *Undocumented fill:* If encountered, all removed and recompacted provided suitable for reuse as engineered fill.

- *Alluvial deposits*: typically all removed and recompacted if depth is less than 5 to 10 feet. Deeper alluvium may be left in place provided found it is found suitable by the geotechnical consultant.
- *Granitic Rock:* typically suitable for foundation support. However, in order to mitigate the potential adverse affects of differential settlement, cut/fill transition subgrade for foundations is normally over-excavated within the cut portion by a minimum depth of 3 feet or one-half of the maximum fill thickness over a certain distance. In addition, such hard rock is over-excavated to a depth of 3 feet below finish grades during mass grading in order to facilitate excavation of footings and utility trenches.
- Based on seismic refraction survey and other rock hardness studies (Leighton, 2006), the granitic bedrock in this area is expected to rippable to depths of approximately 15-25 feet below existing grades utilizing a Caterpillar D9R Tracked Dozer or equivalent. Excavations or grading using conventional earthmoving equipment below 15 to 25 feet of ground surface or within localized areas of elevated resistant rock/boulders will likely be difficult and require blasting or other rock reducing techniques.
- Due to the presence of shallow resistant bedrock, oversize materials may be generated during grading or construction sites that require relatively deep cuts. Oversize materials are generally not suitable to be used as fill and may require special handling and grading procedures.
- Severely weathered bedrock is considered unsuitable for support of engineered fill loads and/or improvements in its current state and should be removed and replaced as compacted fill. Moderately to slightly weathered bedrock may be considered suitable for the support of artificial fills or other structural improvements.

4.2.3 Suitability of Native Soils for Fills

Topsoil and vegetation layers, root zones, and similar surface materials are typically not suitable for re-use as engineered fill and normally striped and stockpiled for either re-use in landscape areas or removed from the site. Most alluvial materials, Pauba formation and granitic bedrock are considered suitable for re-use as compacted engineered fills. However, excavations in the granitic rock in Area 3 may generate oversize materials that are generally not suitable to be used as engineered fill. Typically, cobbles and boulders larger than 6-inches in diameter are not placed in structural fill under settlement-sensitive improvements and may require special handling and grading procedures.

4.2.4 Shrinkage and Bulking Considerations

The volume change of excavated native soils upon compaction is expected to vary with materials, density, insitu moisture content, location and compaction effort. The in-place

and compacted densities of soil materials vary and accurate overall determination of shrinkage and bulking normally cannot be made. Therefore, a balance area or ability to adjust grades slightly to accommodate some variation should be evaluated on a site-specific basis. Based on past experience, the following should be anticipated during future grading:

- Topsoil and loose-reusable Fill: 10 to 30 percent shrinkage
- Alluvium and Colluvium 10 to 20 percent shrinkage
- Pauba Formation: 10 percent bulking to 10 percent shrinkage.
- Granitic Rock: 5 to 15 percent bulking

4.3 Foundation Design

The following foundation systems have been commonly used in the past within the General Plan area to support buildings and infrastructure projects. The most suitable and economical foundation system for any given structure should be selected based site-specific geotechnical evaluation.

Conventional Spread and Continuous Wall Footings:
This shallow foundation type is generally the most economical when near surface soils conditions provide an adequate support for the anticipated structural loads. For footings founded on newly placed properly compacted fill soil or dense formational materials, an allowable vertical bearing capacity of 2,000 pounds-per-square-foot (psf) is typically used. This allowable bearing pressure may be increased with embedment and/or width, based on a site-specific evaluation.

Driven Pile Foundations
Structures underlain by liquefiable, compressible, or collapsible soils that have a potential to exceed standards for conventional foundations may be supported by pile foundations, which should extend to competent or dense formational materials as determined by the geotechnical consultant.

Drilled Pile (Caissons) Foundations
As an alternative to driven piles, drilled cast-in-place piles may be considered to mitigate static or dynamic settlement conditions. However, if relatively loose soils and relatively high ground water table is encountered, the excavation of the drilled piers may be difficult due to caving soils or heaving sands.

Mat Foundation

A concrete mat-type foundation appropriately reinforced may reduce the effects caused by differential settlement. If this foundation system is utilized, the remedial removal earthwork may be minimized based on a site-specific geotechnical investigation. Stiff mat-type foundations, if used, will not preclude the tilt of the foundation due to compression within natural or artificial fills (static or dynamic).

4.4 Soil Corrosivity and Sulfate Attack

Based on review of existing soils reports, the different soils units within the General Plan area are considered corrosive to exposed metal improvements, such as buried conduit or strap-type building to foundation seismic tiedowns.

Corrosion testing should be performed on site-specific basis to confirm the corrosivity characteristics of the onsite soils. Concrete foundations in contact with site soils should be designed in accordance with applicable provisions of the California Building Code. A qualified corrosion engineer should be consulted to provide recommendations for protection of buried metal improvements.

5.0 SITE-SPECIFIC STUDIES

5.1 Geotechnical / Geologic Evaluation

Site-specific geotechnical evaluations should be performed to address the geologic and seismic concerns and provide recommendations to mitigate for such potential hazards as outlined in this report. The geotechnical evaluation should include a review of published geologic maps, aerial photographs, site-specific field explorations (borings and/or trenches), and appropriate laboratory testing on representative soils samples to generate basis for site grading, foundation design and mitigative measures. The State of California has prepared guidelines for the evaluation and mitigation of seismic hazards (http://www.conservation.ca.gov/cgs/shzp/webdocs/Documents/sp117.pdf).

5.2 Fault Investigation

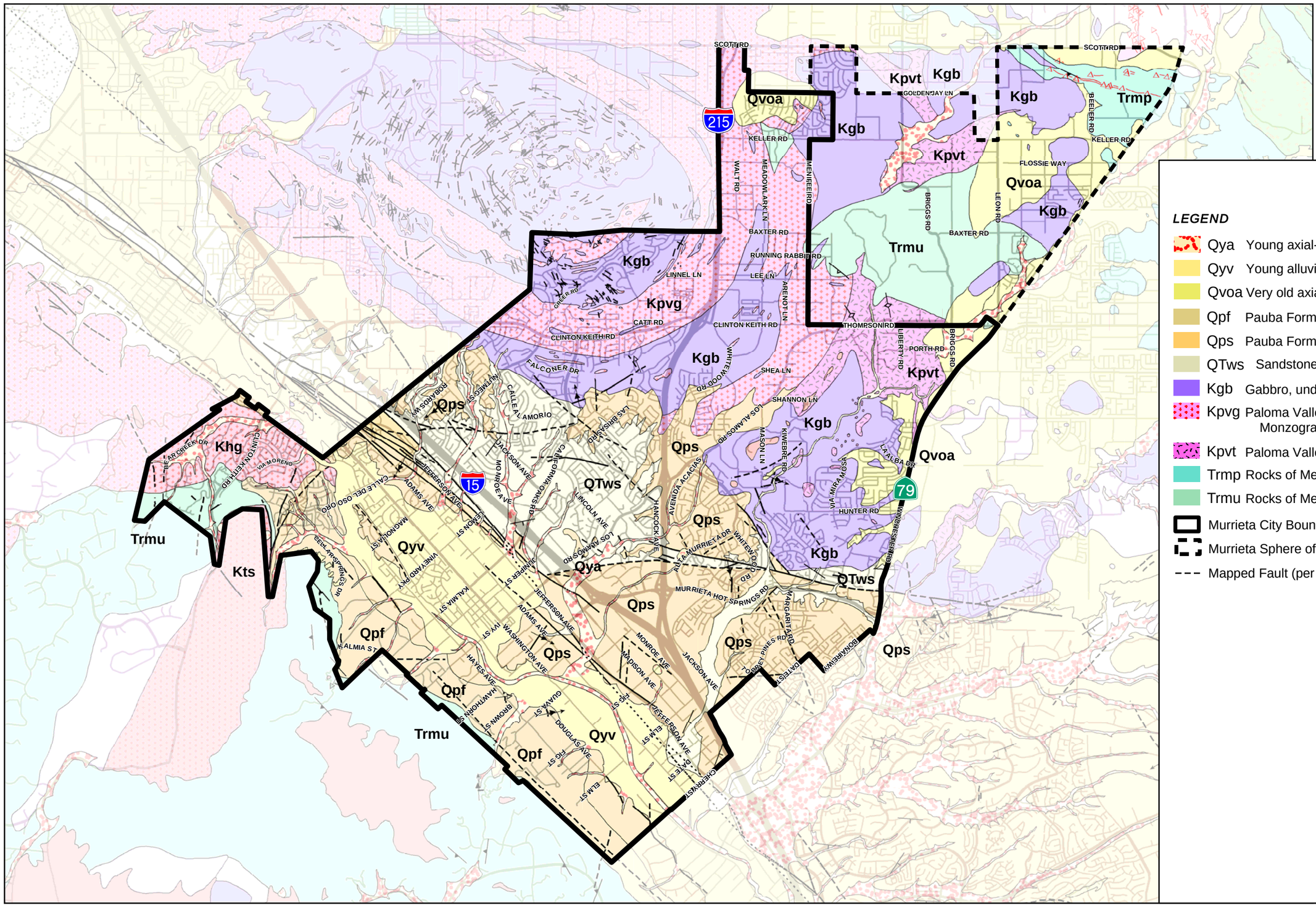
As indicated in previous sections of this report, site-specific fault investigation with respect to development located within the mapped Fault Zones (Exhibits 2 and 3) should be completed as necessary. However, fault investigations within other parts of the City may also be deemed necessary by the geologic consultant. The location of the fault(s) should be determined within the project site in order to establish fault setback recommendations for buildings/structures as per State guidelines. The location(s) of active faults and recommended structure setbacks limits should be surveyed and presented on the site development plan prepared by the project civil engineer. The State of California has prepared guidelines for the evaluation of surface fault rupture (http://www.conservation.ca.gov/cgs/information/publications/cgsnotes/note49/Documents/note49.pdf).

6.0 LIMITATIONS

This report was prepared solely for RBF Consulting on behalf of the City of Murrieta and their design team, solely for their preparation of the General Plan Update. This report was prepared in accordance with generally accepted geologic and geotechnical engineering practices at this time in California. No warranty is expressed or implied.

This report was necessarily based in part upon data obtained from a review of available reports, analyses, histories of occurrences, and limited information on historical events and observations. Such information is necessarily incomplete. It is understood that site-specific subsurface geotechnical data is necessary for future developments. The nature of many sites is such that differing characteristics can be experienced within small distances and under various climatic conditions. Changes in subsurface conditions can, and do, occur over time.

This report is not authorized for use by, and is not to be relied upon by any party except, RBF Consulting on behalf of the City of Murrieta with whom Leighton Consulting, Inc. has contracted for the work. Use of or reliance on this report by any other party is at that party's risk. Unauthorized use of or reliance on this report constitutes an agreement to defend and indemnify Leighton Consulting, Inc. from and against any liability which may arise as a result of such use or reliance, regardless of any fault, negligence, or strict liability of Leighton Consulting, Inc.



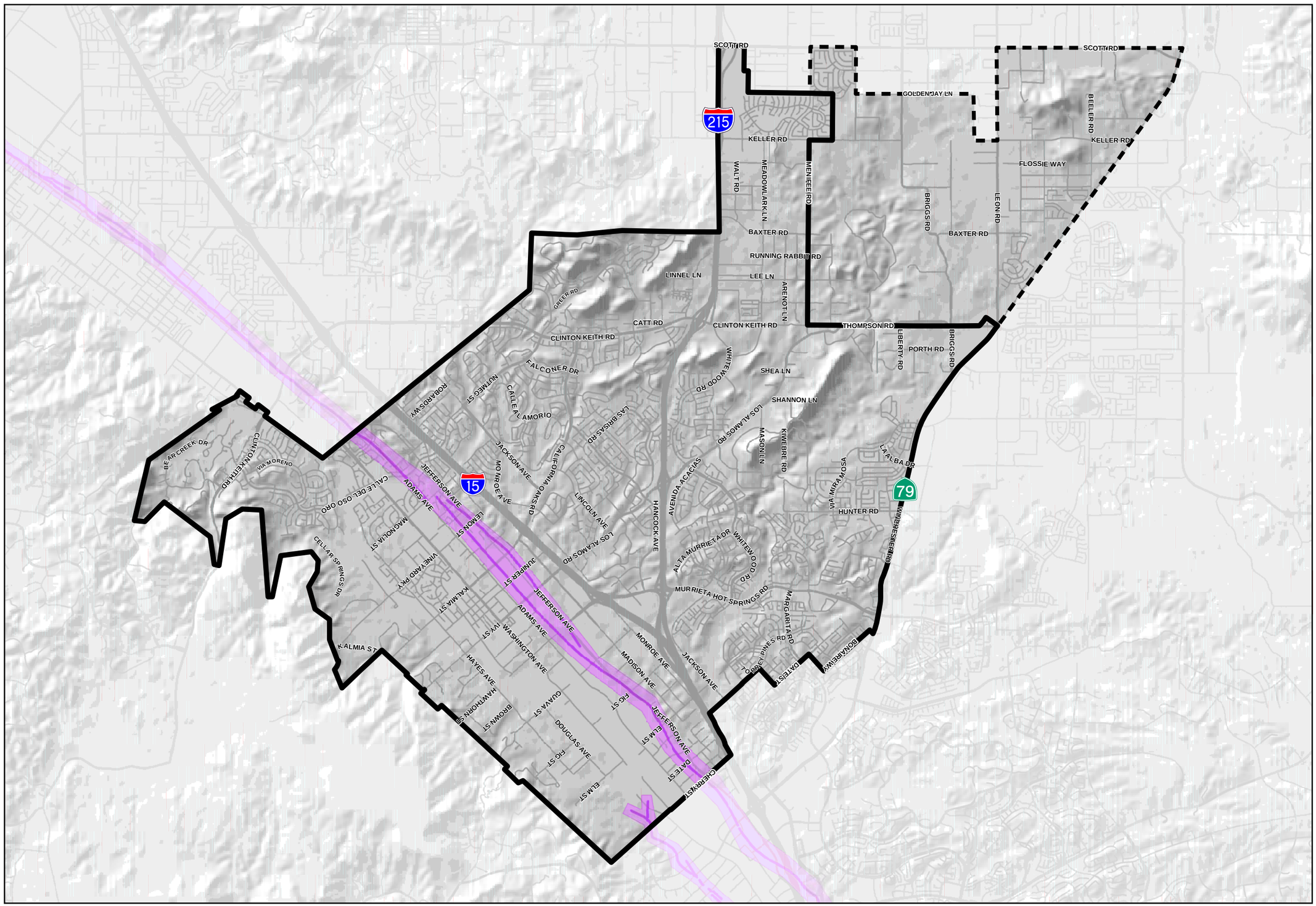
Source: USGS, 2006, Geologic map of the San Bernardino and Santa Ana 30' x 60' quadrangles, California, Version 1.0, Open File Report 2006-1217, Digital Files.

Project: 602728-001

January 2010

Regional Geology Map

Figure 1



LEGEND

- Alquist-Priolo Earthquake Faults
- Alquist-Priolo Earthquake Fault Zones
- Murrieta City Boundary
- Murrieta City Sphere of Influence

0 0.5 1
Miles

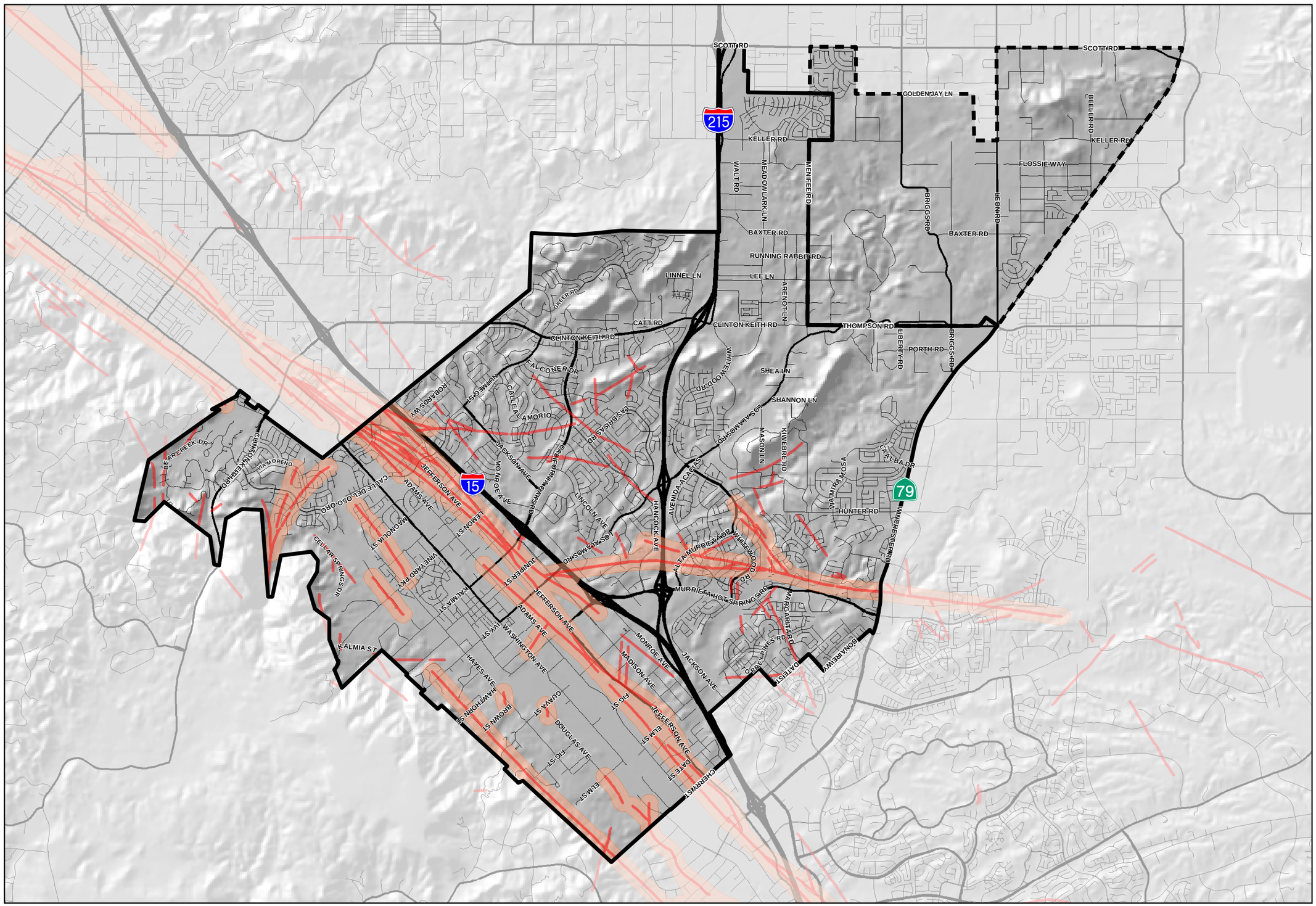
Source: CGS, 2002, State of California Alquist Priolo Fault Zones and Faults, Digital Files

Project: 602728-001

January 2010

Alquist-Priolo Earthquake Fault Zone Map

Figure 2



LEGEND

- Riverside County Earthquake Faults
- Riverside County Earthquake Fault Zones
- Murrieta City Boundary
- Murrieta City Sphere of Influence

0 0.5 1
Miles

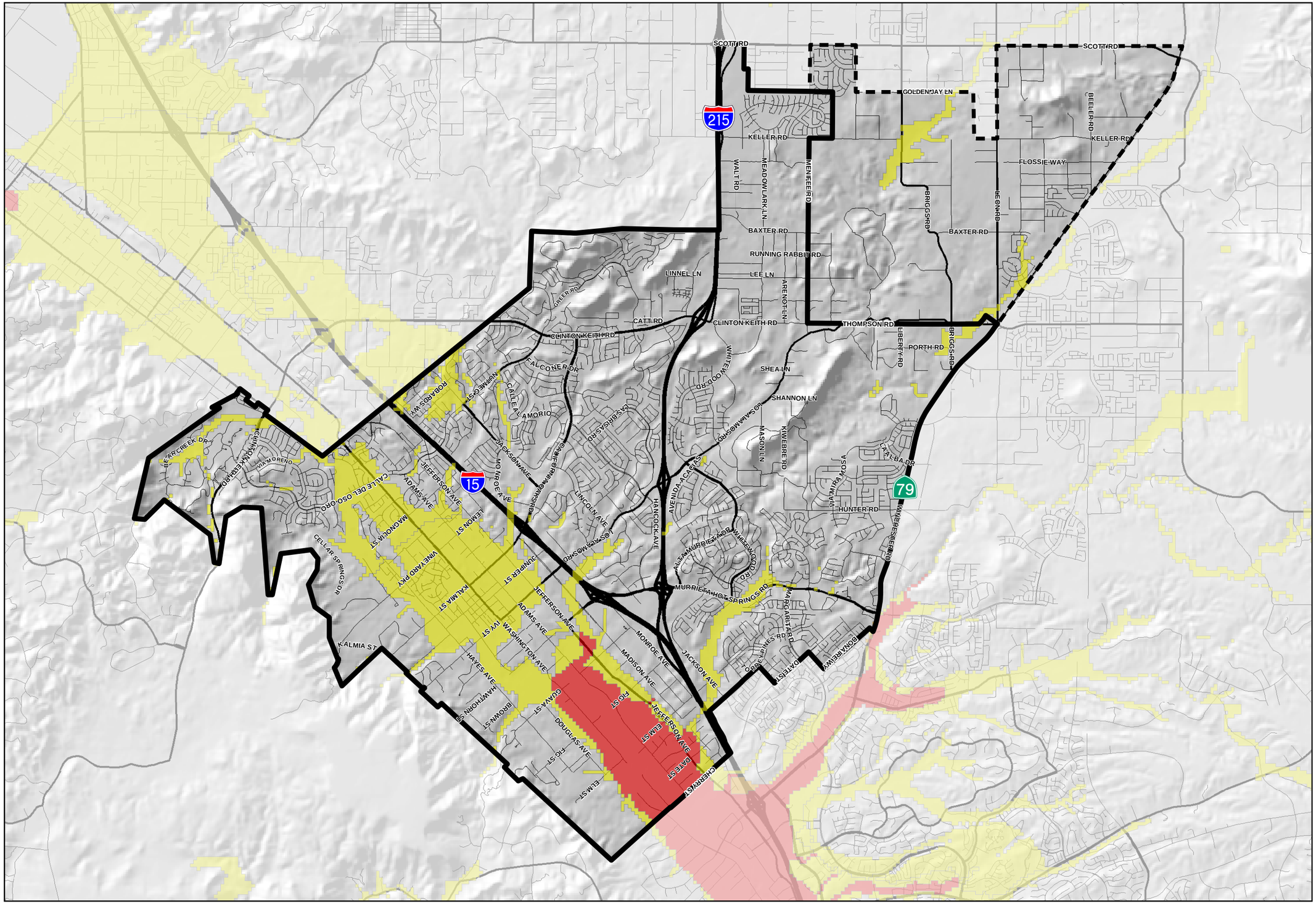
Source: Riverside County Earthquake Fault Zones and Faults; Digital Files

Project: 602728-001

January 2010

Fault Hazard Map per Riverside County

Figure 3



LEGEND

Liquefaction Susceptability

- Very High
- High
- Moderate

- Murrieta City Boundary
- Murrieta City Sphere of Influence

0 0.5 1
Miles

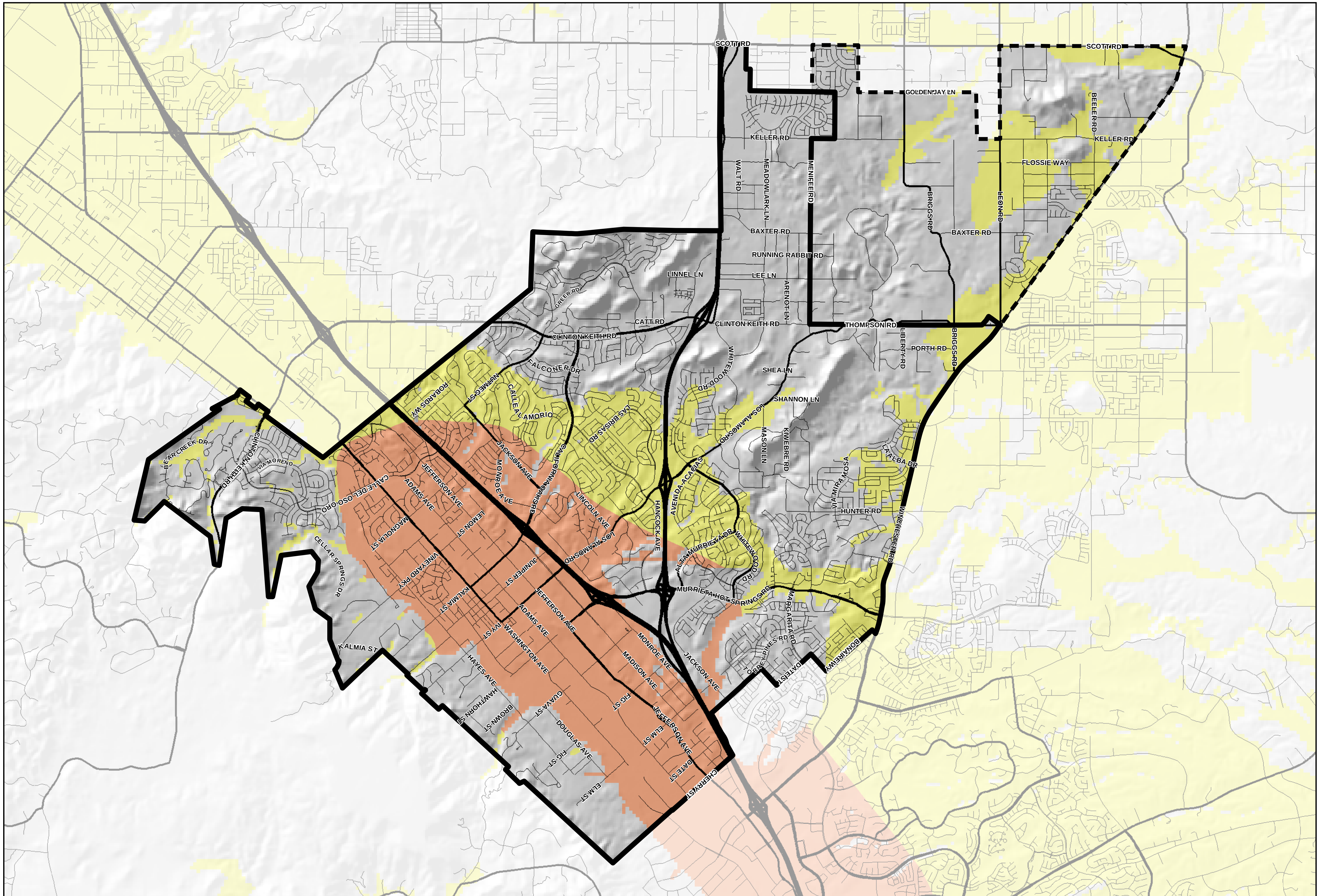
Source: Riverside County, 2006, Liquefaction Susceptibility Data, Digital Files

Project: 602728-001

January 2010

Liquefaction Suceptibility Map Per Riverside County

Figure 4



Murrieta General Plan Update

LEGEND

Subsidence Susceptibility

- Active
- Susceptible
- Murrieta City Boundary
- Murrieta City Sphere of Influence

0 0.5 1

Miles

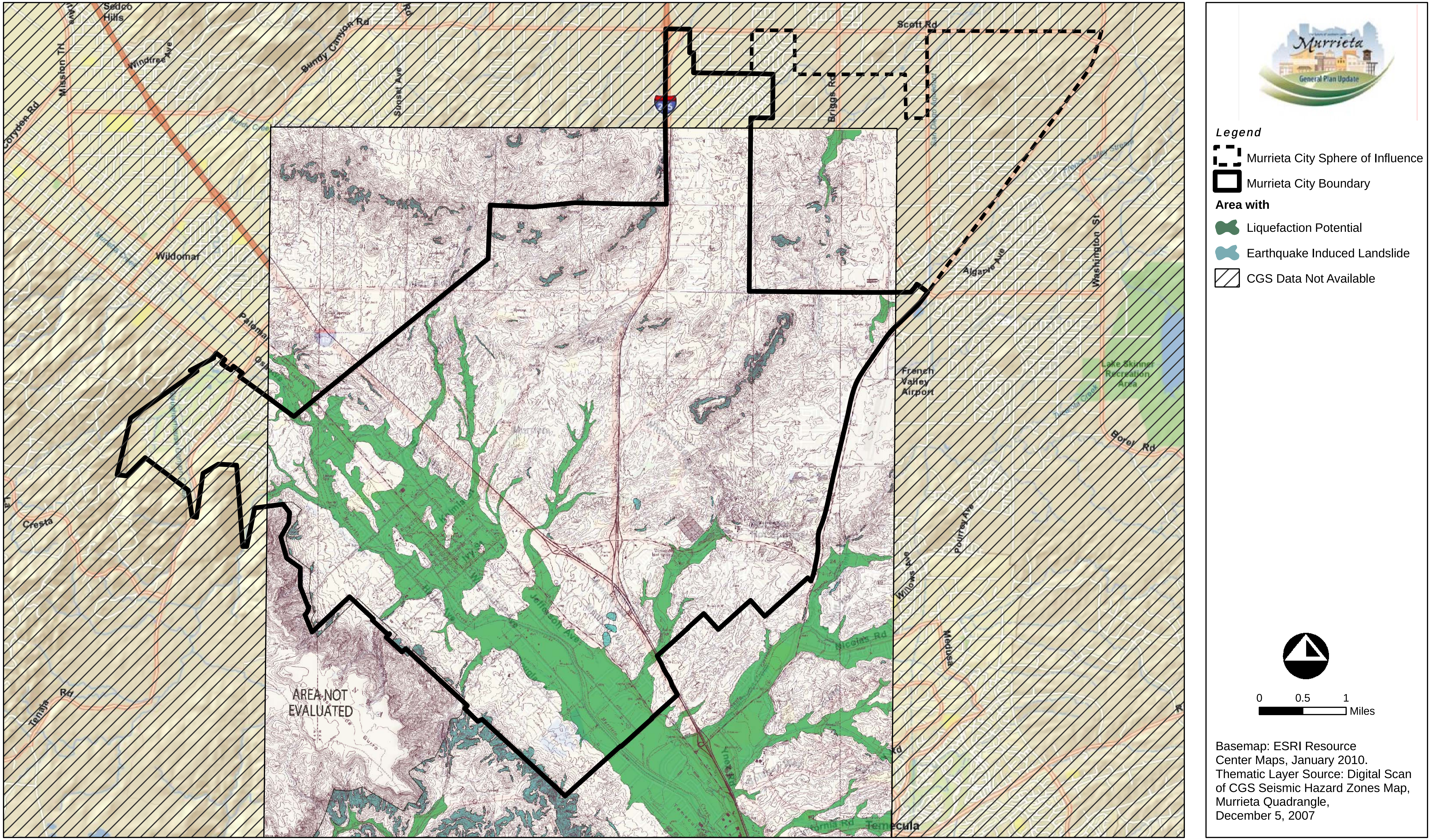
Source: Riverside County, 2007, Subsidence Data.

Project: 602728-001

January 2010

Subsidence Susceptibility Map per Riverside County

Figure 5



Project: 602728-001

January 2010

State Seismic Hazard Zones Map

Figure 6

APPENDIX A

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Aerial Photographs Reviewed

Flight Date	Source	Photograph No.	Scale
3/11/48	USAF	102A, 104A	1:11,300
8/28/53	USDA	AXN – 2K:37-41 57-60, 132, 133, 149-151	1:20,000
5/9/61	RCFCD	4-7	1:12,000
1/28/62	RCFCD	18, 19	1:24,000
1/28/62	RCFCD	1-66, 1-67	1:24,000
1/30/62	RCFCD	3-409, 3-410	1:24,000
9/16/64	RCFCD	1-12, 14-20, 38-40	1:12,000
9/30/64	RCFCD	36-38, 49, 50	1:12,000
11/23/64	RCFCD	70-72, 77-80	1:12,000
5/16/68	RCFCD	14-16, 22-25	1:12,000
6/25/68	RCFCD	1, 2	1:24.000
2/20/72	RCFCD	30-32, 41-43	1:12,000
6/20/74	RCFCD	726, 728-733, 803-808, 874-877, 956, 957	1:24,000
1/27/78	RCFCD	43-45	1:6,000
5/4/80	RCFCD	759, 760, 833, 834, 980, 982, 983	1:24,000
2/28/80	RCFCD	3-7, 20, 21	1:6,000
12/8/83	RCFCD	360-362, 393-399	1:19,200
12/15/83	RCFCD	555-558, 587-589	1:19,200
1/25/90	RCFCD	15-90, 15-20	1:19,800

APPENDIX B

GENERAL SPECIFICATIONS FOR ROUGH GRADING

LEIGHTON CONSULTING, INC

GENERAL EARTHWORK AND GRADING SPECIFICATIONS FOR ROUGH GRADING

1.0 General

1.1 Intent: These General Earthwork and Grading Specifications are for the grading and earthwork shown on the approved grading plan(s) and/or indicated in the geotechnical report(s). These Specifications are a part of the recommendations contained in the geotechnical report(s). In case of conflict, the specific recommendations in the geotechnical report shall supersede these more general Specifications. Observations of the earthwork by the project Geotechnical Consultant during the course of grading may result in new or revised recommendations that could supersede these specifications or the recommendations in the geotechnical report(s).

1.2 The Geotechnical Consultant of Record: Prior to commencement of work, the owner shall employ the Geotechnical Consultant of Record (Geotechnical Consultant). The Geotechnical Consultants shall be responsible for reviewing the approved geotechnical report(s) and accepting the adequacy of the preliminary geotechnical findings, conclusions, and recommendations prior to the commencement of the grading.

Prior to commencement of grading, the Geotechnical Consultant shall review the "work plan" prepared by the Earthwork Contractor (Contractor) and schedule sufficient personnel to perform the appropriate level of observation, mapping, and compaction testing.

During the grading and earthwork operations, the Geotechnical Consultant shall observe, map, and document the subsurface exposures to verify the geotechnical design assumptions. If the observed conditions are found to be significantly different than the interpreted assumptions during the design phase, the Geotechnical Consultant shall inform the owner, recommend appropriate changes in design to accommodate the observed conditions, and notify the review agency where required. Subsurface areas to be geotechnically observed, mapped, elevations recorded, and/or tested include natural ground after it has been cleared for receiving fill but before fill is placed, bottoms of all "remedial removal" areas, all key bottoms, and benches made on sloping ground to receive fill.

The Geotechnical Consultant shall observe the moisture-conditioning and processing of the subgrade and fill materials and perform relative compaction testing of fill to determine the attained level of compaction. The Geotechnical Consultant shall provide the test results to the owner and the Contractor on a routine and frequent basis.

1.3 The Earthwork Contractor: The Earthwork Contractor (Contractor) shall be qualified, experienced, and knowledgeable in earthwork logistics, preparation and processing of ground to receive fill, moisture-conditioning and processing of fill, and compacting fill. The Contractor shall review and accept the plans, geotechnical report(s), and these Specifications prior to commencement of grading. The Contractor shall be solely responsible for performing the grading in accordance with the plans and specifications.
The Contractor shall prepare and submit to the owner and the Geotechnical Consultant a work plan that indicates the sequence of earthwork grading, the number of "spreads" of

work and the estimated quantities of daily earthwork contemplated for the site prior to commencement of grading. The Contractor shall inform the owner and the Geotechnical Consultant of changes in work schedules and updates to the work plan at least 24 hours in advance of such changes so that appropriate observations and tests can be planned and accomplished. The Contractor shall not assume that the Geotechnical Consultant is aware of all grading operations.

The Contractor shall have the sole responsibility to provide adequate equipment and methods to accomplish the earthwork in accordance with the applicable grading codes and agency ordinances, these Specifications, and the recommendations in the approved geotechnical report(s) and grading plan(s). If, in the opinion of the Geotechnical Consultant, unsatisfactory conditions, such as unsuitable soil, improper moisture condition, inadequate compaction, insufficient buttress key size, adverse weather, etc., are resulting in a quality of work less than required in these specifications, the Geotechnical Consultant shall reject the work and may recommend to the owner that construction be stopped until the conditions are rectified.

2.0 Preparation of Areas to be Filled

2.1 Clearing and Grubbing: Vegetation, such as brush, grass, roots, and other deleterious material shall be sufficiently removed and properly disposed of in a method acceptable to the owner, governing agencies, and the Geotechnical Consultant.

The Geotechnical Consultant shall evaluate the extent of these removals depending on specific site conditions. Earth fill material shall not contain more than 1 percent of organic materials (by volume). No fill lift shall contain more than 5 percent of organic matter. Nesting of the organic materials shall not be allowed.

If potentially hazardous materials are encountered, the Contractor shall stop work in the affected area, and a hazardous material specialist shall be informed immediately for proper evaluation and handling of these materials prior to continuing to work in that area.

As presently defined by the State of California, most refined petroleum products (gasoline, diesel fuel, motor oil, grease, coolant, etc.) have chemical constituents that are considered to be hazardous waste. As such, the indiscriminate dumping or spillage of these fluids onto the ground may constitute a misdemeanor, punishable by fines and/or imprisonment, and shall not be allowed.

2.2 Processing: Existing ground that has been declared satisfactory for support of fill by the Geotechnical Consultant shall be scarified to a minimum depth of 6 inches. Existing ground that is not satisfactory shall be overexcavated as specified in the following section. Scarification shall continue until soils are broken down and free of large clay lumps or clods and the working surface is reasonably uniform, flat, and free of uneven features that would inhibit uniform compaction.

2.3 Overexcavation: In addition to removals and overexcavations recommended in the approved geotechnical report(s) and the grading plan, soft, loose, dry, saturated, spongy, organic-rich, highly fractured or otherwise unsuitable ground shall be overexcavated to competent ground as evaluated by the Geotechnical Consultant during grading.

2.4 Benching: Where fills are to be placed on ground with slopes steeper than 5:1 (horizontal to vertical units), the ground shall be stepped or benched. Please see the Standard Details for a graphic illustration. The lowest bench or key shall be a minimum of 15 feet wide and at least 2 feet deep, into competent material as evaluated by the Geotechnical Consultant. Other benches shall be excavated a minimum height of 4 feet into competent material or as otherwise recommended by the Geotechnical Consultant. Fill placed on ground sloping flatter than 5:1 shall also be benched or otherwise overexcavated to provide a flat subgrade for the fill.

2.5 Evaluation/Acceptance of Fill Areas: All areas to receive fill, including removal and processed areas, key bottoms, and benches, shall be observed, mapped, elevations recorded, and/or tested prior to being accepted by the Geotechnical Consultant as suitable to receive fill. The Contractor shall obtain a written acceptance from the Geotechnical Consultant prior to fill placement. A licensed surveyor shall provide the survey control for determining elevations of processed areas, keys, and benches.

3.0 Fill Material

3.1 General: Material to be used as fill shall be essentially free of organic matter and other deleterious substances evaluated and accepted by the Geotechnical Consultant prior to placement. Soils of poor quality, such as those with unacceptable gradation, high expansion potential, or low strength shall be placed in areas acceptable to the Geotechnical Consultant or mixed with other soils to achieve satisfactory fill material.

3.2 Oversize: Oversize material defined as rock, or other irreducible material with a maximum dimension greater than 8 inches, shall not be buried or placed in fill unless location, materials, and placement methods are specifically accepted by the Geotechnical Consultant. Placement operations shall be such that nesting of oversized material does not occur and such that oversize material is completely surrounded by compacted or densified fill. Oversize material shall not be placed within 10 vertical feet of finish grade or within 2 feet of future utilities or underground construction.

3.3 Import: If importing of fill material is required for grading, proposed import material shall

meet the requirements of Section 3.1. The potential import source shall be given to the Geotechnical Consultant at least 48 hours (2 working days) before importing begins so that its suitability can be determined and appropriate tests performed. Import fill should be free of all deleterious material and hazardous waste. Testing for hazardous waste typically takes between 7 and 14 working days.

4.0 Fill Placement and Compaction

4.1 Fill Layers: Approved fill material shall be placed in areas prepared to receive fill (per Section 3.0) in near-horizontal layers not exceeding 8 inches in loose thickness. The Geotechnical Consultant may accept thicker layers if testing indicates the grading procedures can adequately compact the thicker layers. Each layer shall be spread evenly and mixed thoroughly to attain relative uniformity of material and moisture throughout.

4.2 Fill Moisture Conditioning: Fill soils shall be watered, dried back, blended, and/or mixed, as necessary to attain a relatively uniform moisture content at or slightly over optimum. Maximum density and optimum soil moisture content tests shall be performed in accordance with the American Society of Testing and Materials (ASTM Test Method D1557-91).

4.3 Compaction of Fill: After each layer has been moisture-conditioned, mixed, and evenly spread, it shall be uniformly compacted to not less than 90 percent of maximum dry density (ASTM Test Method D1557-91). Compaction equipment shall be adequately sized and be either specifically designed for soil compaction or of proven reliability to efficiently achieve the specified level of compaction with uniformity.

4.4 Compaction of Fill Slopes: In addition to normal compaction procedures specified above, compaction of slopes shall be accomplished by backrolling of slopes with sheepsfoot rollers at increments of 3 to 4 feet in fill elevation, or by other methods producing satisfactory results acceptable to the Geotechnical Consultant. Upon completion of grading, relative compaction of the fill, out to the slope face, shall be at least 90 percent of maximum density per ASTM Test Method D1557-91.

4.5 Compaction Testing: Field tests for moisture content and relative compaction of the fill soils shall be performed by the Geotechnical Consultant. Location and frequency of tests shall be at the Consultant's discretion based on field conditions encountered. Compaction test locations will not necessarily be selected on a random basis. Test locations shall be selected to verify adequacy of compaction levels in areas that are judged to be prone to inadequate compaction (such as close to slope faces and at the fill/bedrock benches).

4.6 Frequency of Compaction Testing: Tests shall be taken at intervals not exceeding 2 feet in vertical rise and/or 1,000 cubic yards of compacted fill soils embankment. In addition, as a guideline, at least one test shall be taken on slope faces for each 5,000 square feet of slope face and/or each 10 feet of vertical height of slope. The Contractor shall assure that fill construction is such that the testing schedule can be accomplished by the Geotechnical Consultant. The Contractor shall stop or slow down the earthwork construction if these minimum standards are not met.

4.7 Compaction Test Locations: The Geotechnical Consultant shall document the approximate elevation and horizontal coordinates of each test location. The Contractor shall coordinate with the project surveyor to assure that sufficient grade stakes are established so that the Geotechnical Consultant can determine the test locations with sufficient accuracy. At a minimum, two grade stakes within a horizontal distance of 100 feet and vertically less than 5 feet apart from potential test locations shall be provided.

5.0 Subdrain Installation

Subdrain systems shall be installed in accordance with the approved geotechnical report(s), the grading plan, and the Standard Details. The Geotechnical Consultant may recommend additional subdrains and/or changes in subdrain extent, location, grade, or material depending on conditions encountered during grading. All subdrains shall be surveyed by a land surveyor/civil engineer for line and grade after installation and prior to burial. Sufficient time should be allowed by the Contractor for these surveys.

6.0 Excavation

Excavations, as well as over-excavation for remedial purposes, shall be evaluated by the Geotechnical Consultant during grading. Remedial removal depths shown on geotechnical plans are estimates only. The actual extent of removal shall be determined by the Geotechnical Consultant based on the field evaluation of exposed conditions during grading. Where fill-over-cut slopes are to be graded, the cut portion of the slope shall be made, evaluated, and accepted by the Geotechnical Consultant prior to placement of materials for construction of the fill portion of the slope, unless otherwise recommended by the Geotechnical Consultant.

7.0 Trench Backfills

7.1 The Contractor shall follow all OHSA and Cal/OSHA requirements for safety of trench excavations.

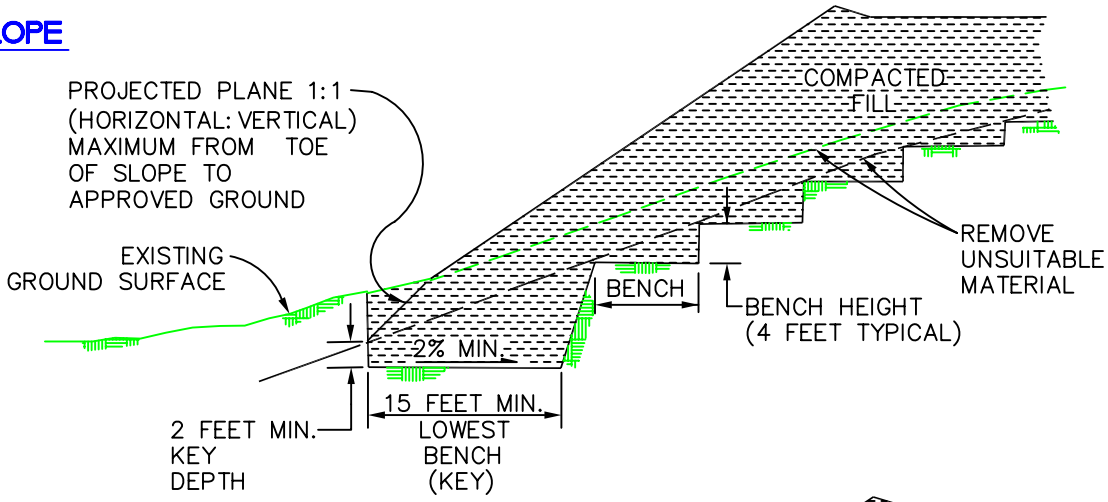
7.2 All bedding and backfill of utility trenches shall be done in accordance with the applicable provisions of Standard Specifications of Public Works Construction. Bedding material shall have a Sand Equivalent greater than 30 (SE>30). The bedding shall be placed to 1 foot over the top of the conduit and densified by jetting. Backfill shall be placed and densified to a minimum of 90 percent of maximum from 1 foot above the top of the conduit to the surface.

7.3 The jetting of the bedding around the conduits shall be observed by the Geotechnical Consultant.

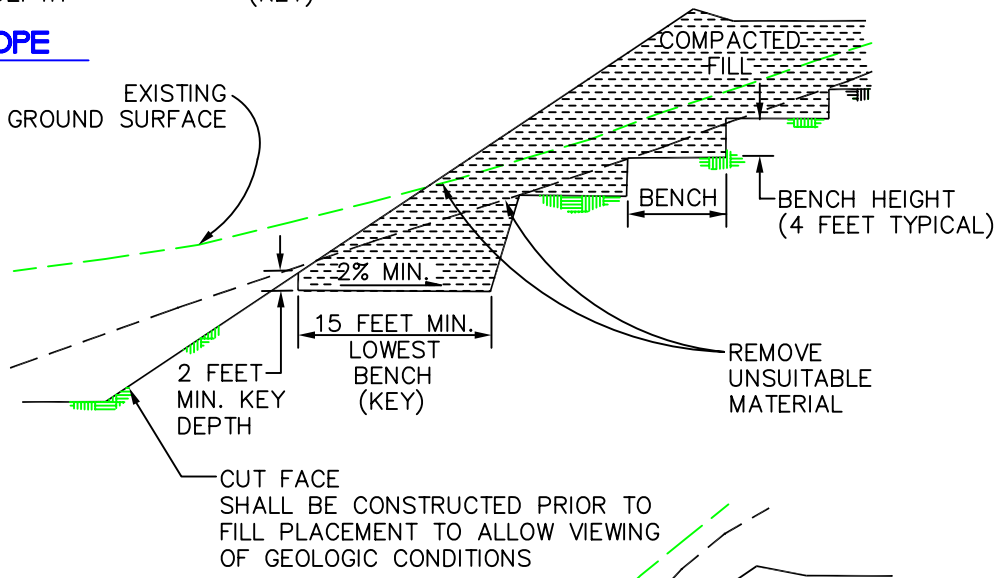
7.4 The Geotechnical Consultant shall test the trench backfill for relative compaction. At least one test should be made for every 300 feet of trench and 2 feet of fill.

7.5 Lift thickness of trench backfill shall not exceed those allowed in the Standard Specifications of Public Works Construction unless the Contractor can demonstrate to the Geotechnical Consultant that the fill lift can be compacted to the minimum relative compaction by his alternative equipment and method.

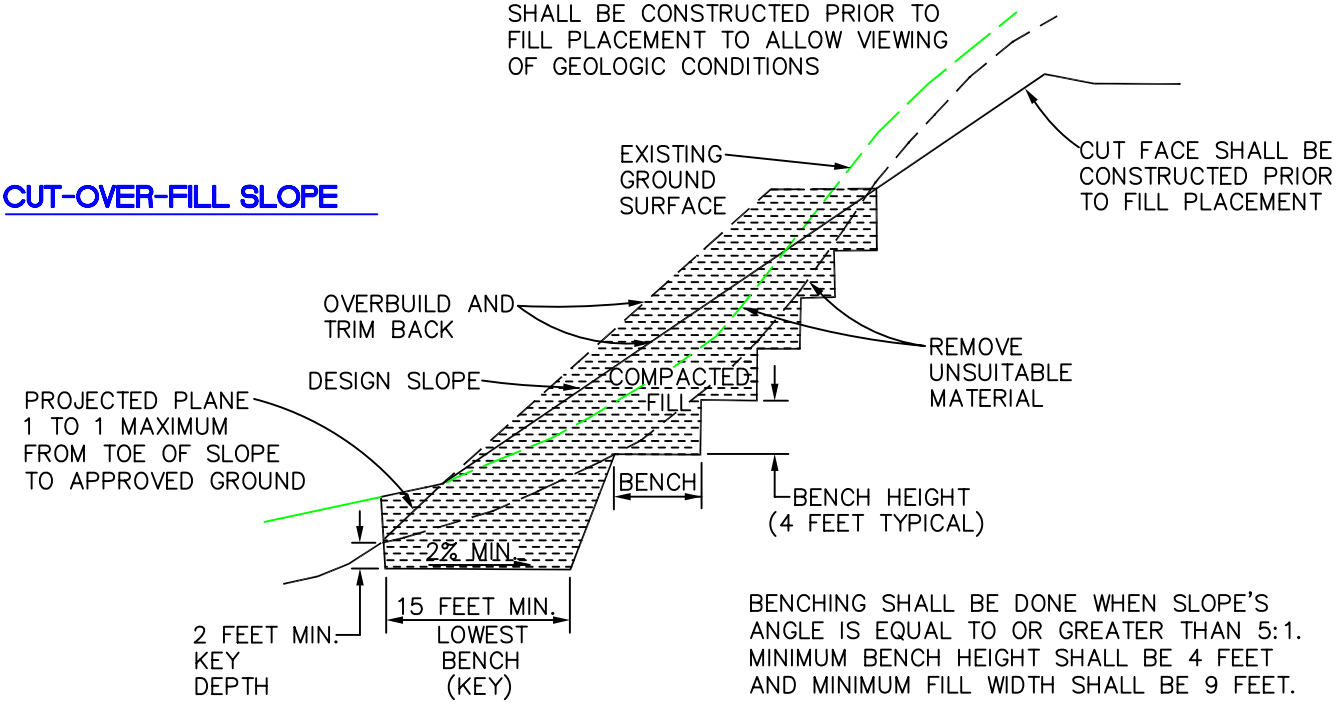
FILL SLOPE



FILL-OVER-CUT SLOPE

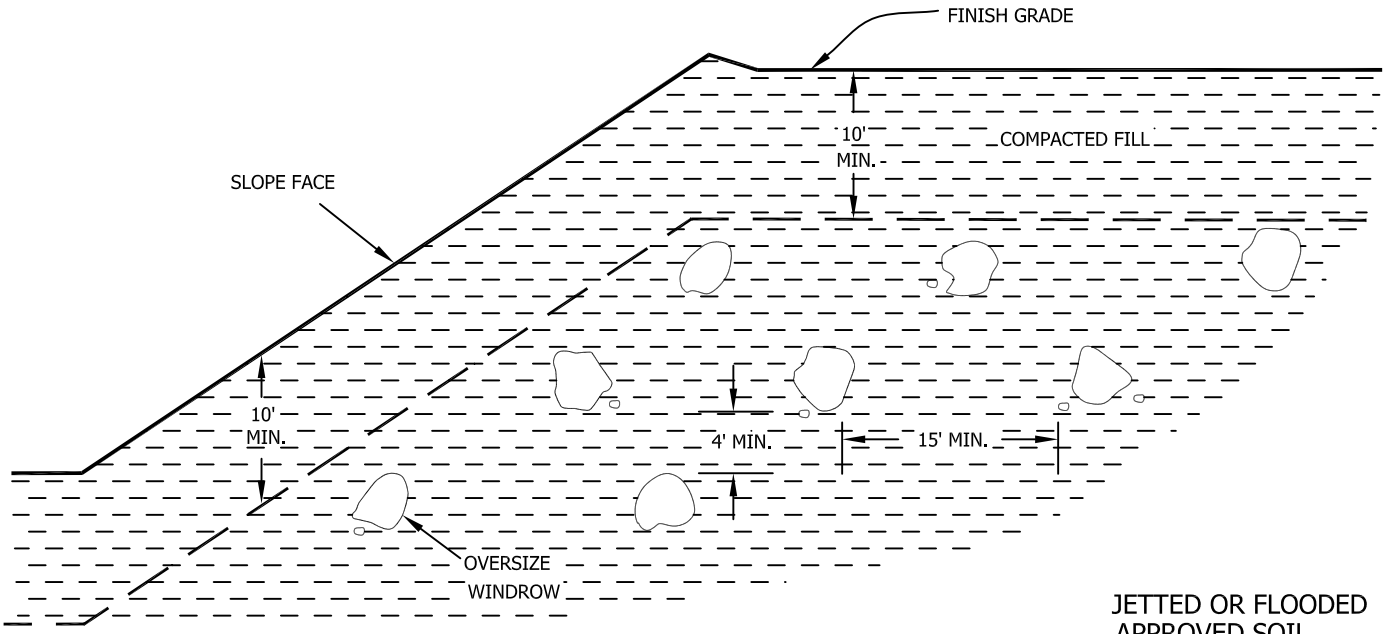


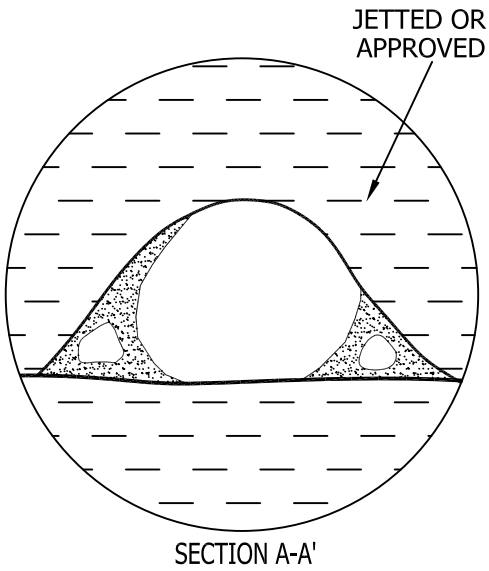
CUT-OVER-FILL SLOPE



BENCHING SHALL BE DONE WHEN SLOPE'S ANGLE IS EQUAL TO OR GREATER THAN 5:1. MINIMUM BENCH HEIGHT SHALL BE 4 FEET AND MINIMUM FILL WIDTH SHALL BE 9 FEET.

KEYING AND BENCHING	GENERAL EARTHWORK AND GRADING SPECIFICATIONS STANDARD DETAILS A	Leighton

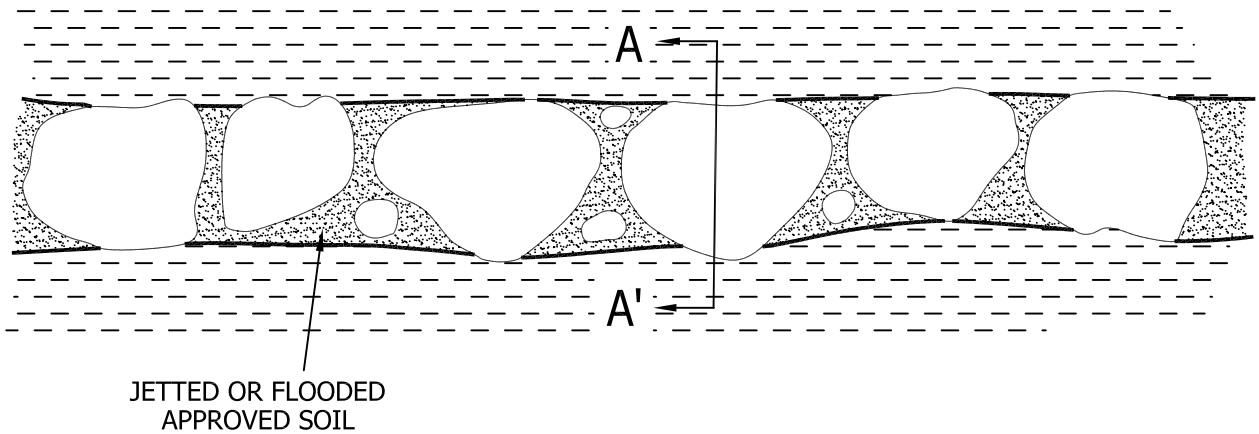




SECTION A-A'

- Oversize rock is larger than 8 inches in largest dimension.
- Backfill with approved soil jetted or flooded in place to fill all the voids.
- Do not bury rock within 10 feet of finish grade.
- Windrow of buried rock shall be parallel to the finished slope face.

PROFILE ALONG WINDROW



OVERSIZE ROCK DISPOSAL

GENERAL EARTHWORK AND GRADING
SPECIFICATIONS
STANDARD DETAILS B

Leighton

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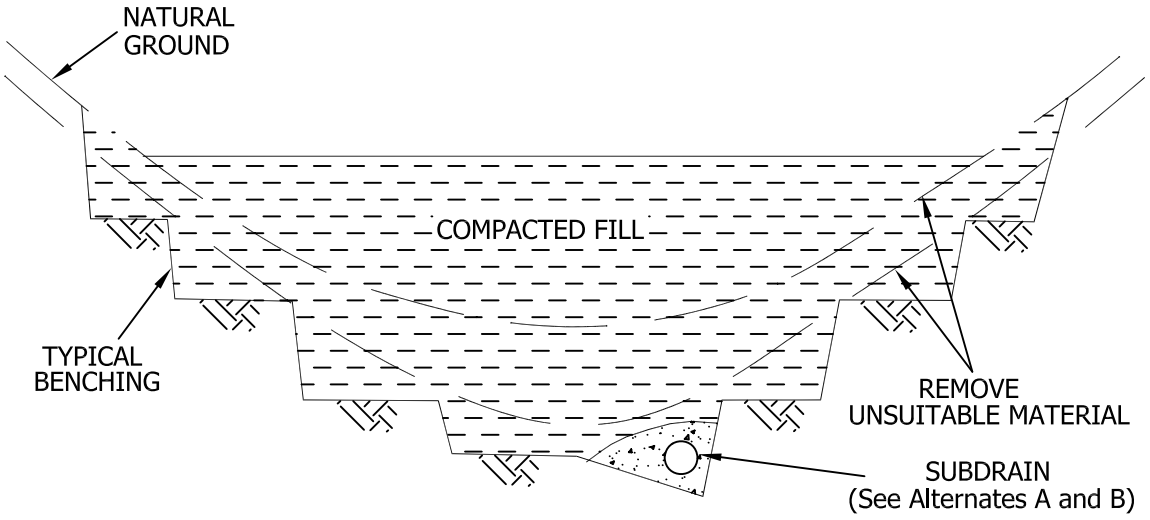
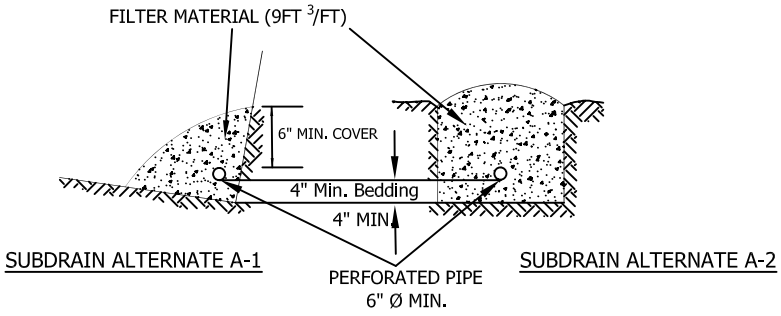


SUBDRAIN ALTERNATE A

PERFORATED PIPE SURROUNDED WITH FILTER MATERIAL

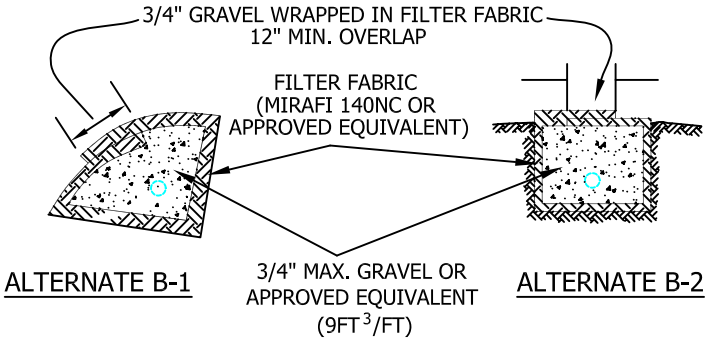


FILTER MATERIAL

FILTER MATERIAL SHALL BE CLASS 2 PERMEABLE MATERIAL PER STATE OF CALIFORNIA STANDARD SPECIFICATION, OR APPROVED ALTERNATE. CLASS 2 GRADING AS FOLLOWS:

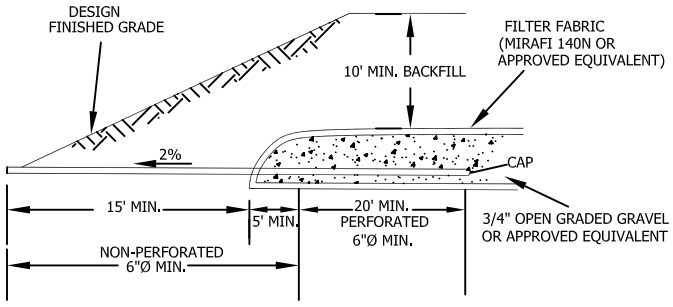
Sieve Size	Percent Passing
1"	100
3/4"	90-100
3/8"	40-100
No. 4	25-40
No. 8	18-33
No. 30	5-15
No. 50	0-7
No. 200	0-3

SUBDRAIN ALTERNATE B



○ PERFORATED PIPE IS OPTIONAL PER GOVERNING AGENCY'S REQUIREMENTS

DETAIL OF CANYON SUBDRAIN TERMINAL



CANYON SUBDRAIN	GENERAL EARTHWORK AND GRADING SPECIFICATIONS STANDARD DETAILS C	Leighton

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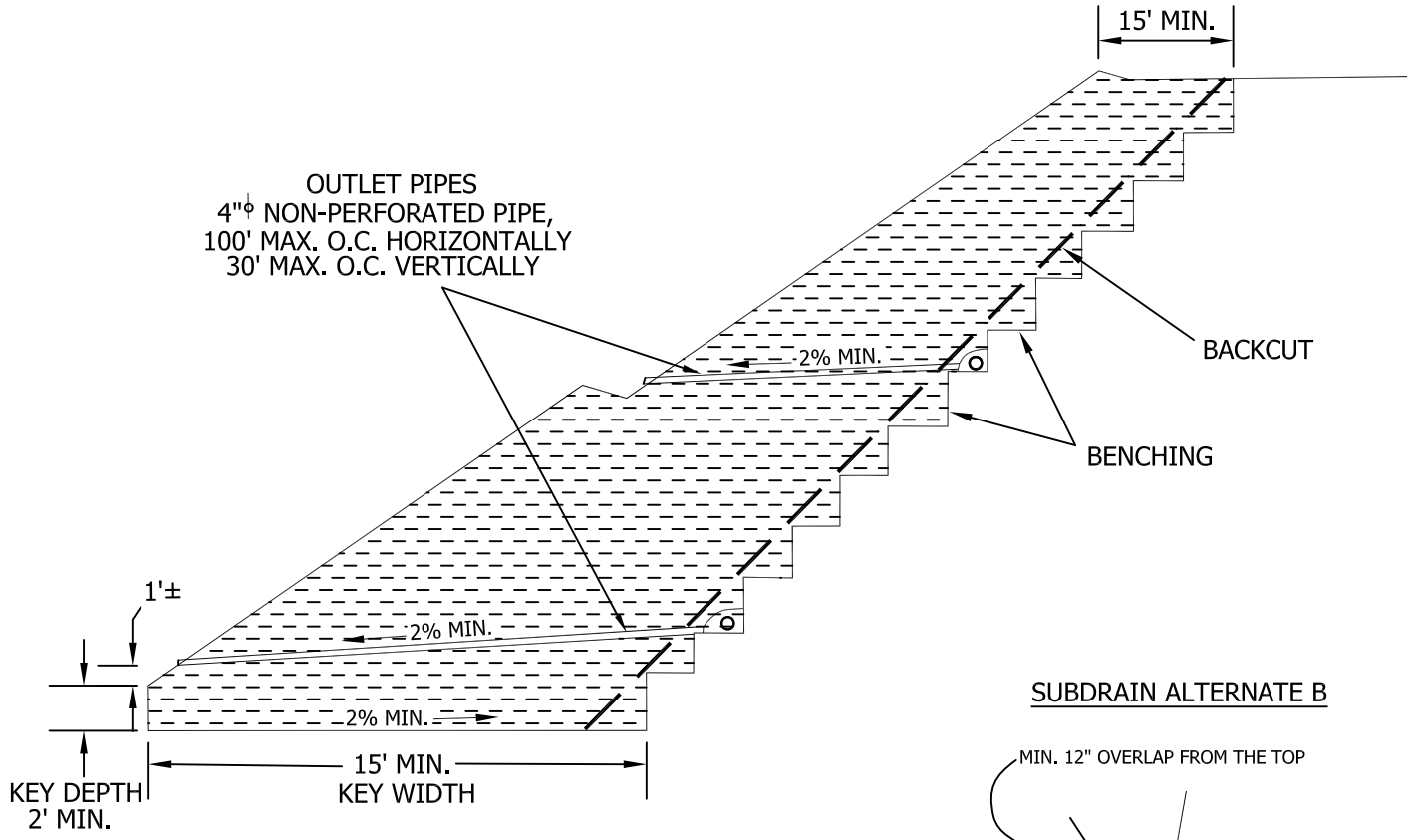
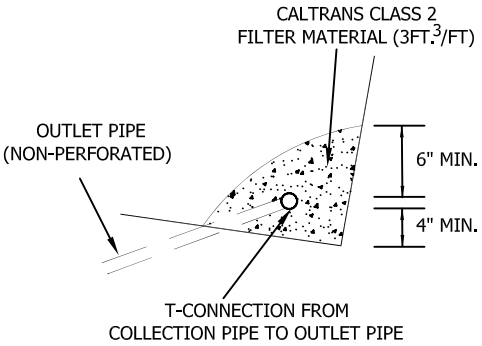
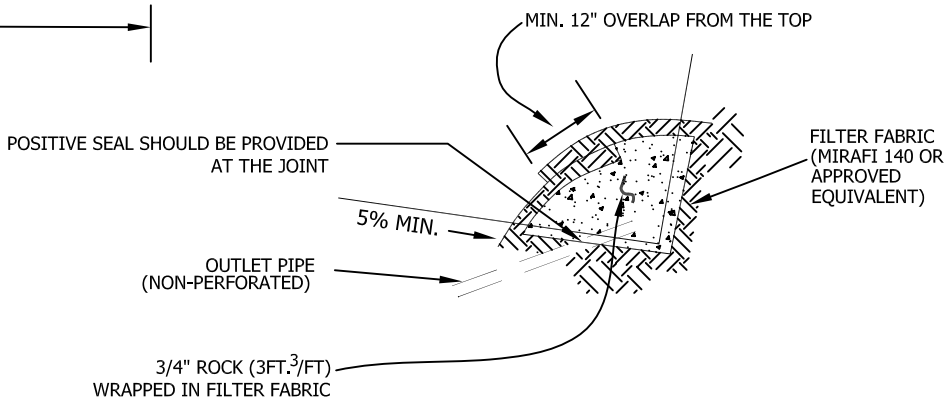


SUBDRAIN ALTERNATE A



SUBDRAIN ALTERNATE B



- SUBDRAIN INSTALLATION - Subdrain collector pipe shall be installed with perforations down or, unless otherwise designated by the geotechnical consultant. Outlet pipes shall be non-perforated pipe. The subdrain pipe shall have at least 8 perforations uniformly spaced per foot. Perforation shall be 1/4" to 1/2" if drilled holes are used. All subdrain pipes shall have a gradient at least 2% towards the outlet.
- SUBDRAIN PIPE - Subdrain pipe shall be ASTM D2751, ASTM D1527 (Schedule 40) or SDR 23.5 ABS pipe or ASTM D3034 (Schedule 40) or SDR 23.5 PVC pipe.
- All outlet pipe shall be placed in a trench and, after fill is placed above it, rodded to verify integrity.

BUTTRESS OR REPLACEMENT FILL SUBDRAINS	GENERAL EARTHWORK AND GRADING SPECIFICATIONS STANDARD DETAILS D	Leighton

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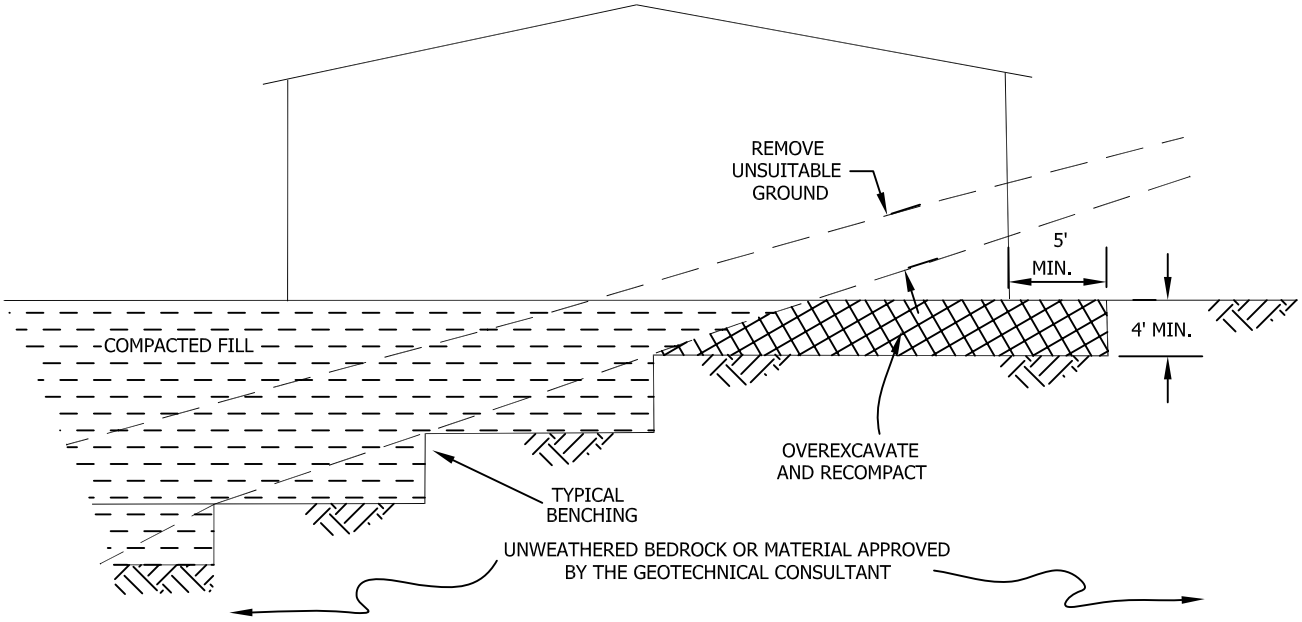
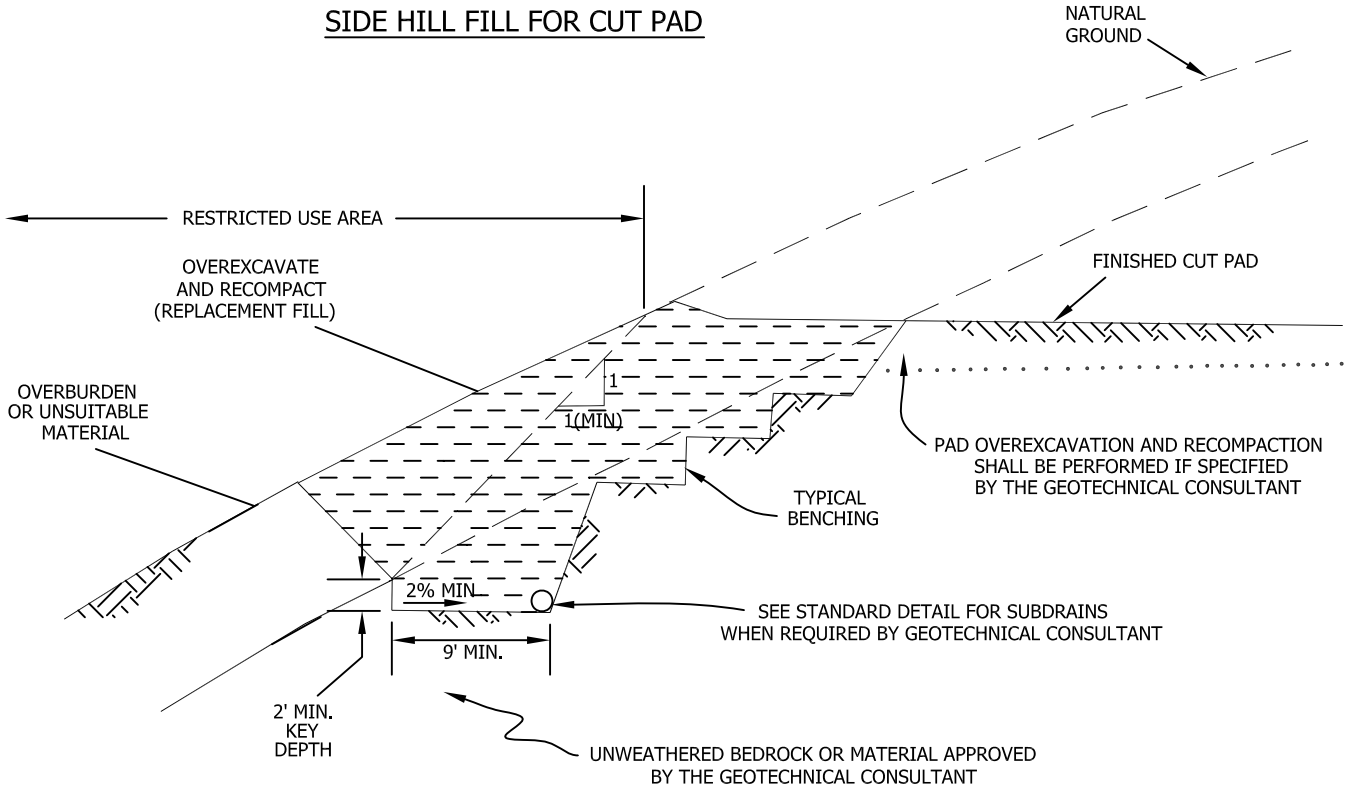
CUT-FILL TRANSITION LOT OVEREXCAVATION



SIDE HILL FILL FOR CUT PAD



TRANSITION LOT FILLS AND SIDE HILL FILLS

GENERAL EARTHWORK AND GRADING SPECIFICATIONS
STANDARD DETAILS E

Leighton

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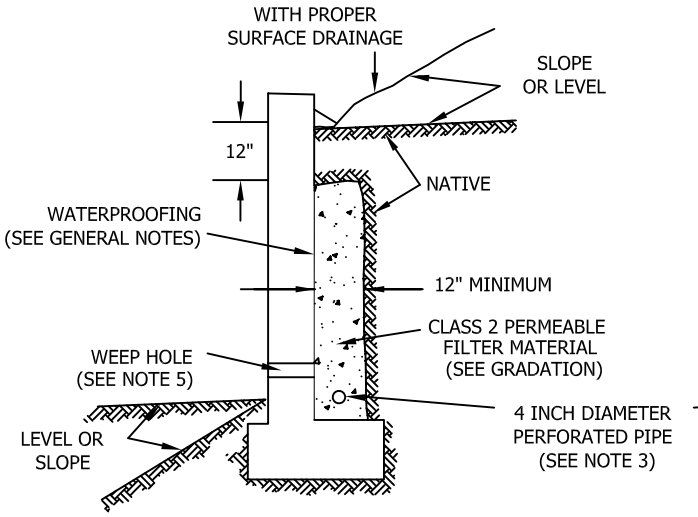
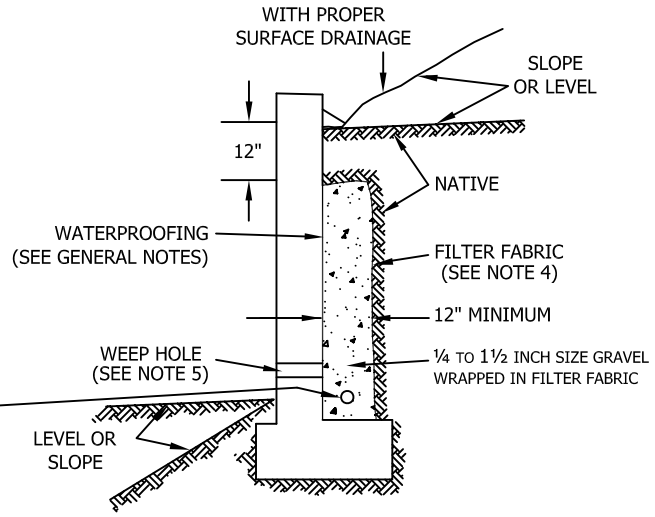
SUBDRAIN OPTIONS AND BACKFILL WHEN NATIVE MATERIAL HAS EXPANSION INDEX OF ≤50

OPTION 1: PIPE SURROUNDED WITH CLASS 2 PERMEABLE MATERIAL



OPTION 2: GRAVEL WRAPPED IN FILTER FABRIC



Class 2 Filter Permeable Material Gradation
Per Caltrans Specifications

Sieve Size	Percent Passing
1"	100
3/4"	90-100
3/8"	40-100
No. 4	25-40
No. 8	18-33
No. 30	5-15
No. 50	0-7
No. 200	0-3

GENERAL NOTES:

* Waterproofing should be provided where moisture nuisance problem through the wall is undesirable.
* Water proofing of the walls is not under purview of the geotechnical engineer
* All drains should have a gradient of 1 percent minimum
*Outlet portion of the subdrain should have a 4-inch diameter solid pipe discharged into a suitable disposal area designed by the project engineer. The subdrain pipe should be accessible for maintenance (rodding)
*Other subdrain backfill options are subject to the review by the geotechnical engineer and modification of design parameters.

Notes:
1) Sand should have a sand equivalent of 30 or greater and may be densified by water jetting.
2) 1 Cu. ft. per ft. of 1/4- to 1 1/2-inch size gravel wrapped in filter fabric
3) Pipe type should be ASTM D1527 Acrylonitrile Butadiene Styrene (ABS) SDR35 or ASTM D1785 Polyvinyl Chloride plastic (PVC), Schedule 40, Armco A2000 PVC, or approved equivalent. Pipe should be installed with perforations down. Perforations should be 3/8 inch in diameter placed at the ends of a 120-degree arc in two rows at 3-inch on center (staggered)
4) Filter fabric should be Mirafi 140NC or approved equivalent.
5) Weephole should be 3-inch minimum diameter and provided at 10-foot maximum intervals. If exposure is permitted, weepholes should be located 12 inches above finished grade. If exposure is not permitted such as for a wall adjacent to a sidewalk/curb, a pipe under the sidewalk to be discharged through the curb face or equivalent should be provided. For a basement-type wall, a proper subdrain outlet system should be provided.
6) Retaining wall plans should be reviewed and approved by the geotechnical engineer.
7) Walls over six feet in height are subject to a special review by the geotechnical engineer and modifications to the above requirements.

RETAINING WALL BACKFILL AND SUBDRAIN DETAIL FOR WALLS 6 FEET OR LESS IN HEIGHT

WHEN NATIVE MATERIAL HAS EXPANSION INDEX OF ≤50

Leighton

Figure

Appendix H:

Biological Resources Existing Conditions Report

BIOLOGICAL RESOURCES

The policies in the Conservation and Open Space Element are now closely tied to the adopted Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). The Riverside County Board of Supervisors adopted the MSHCP on June 23, 2003. This section discusses in detail the biological resource issues and conservation goals for the City of Murrieta.

METHODS

Literature used to document the biological resources existing setting were the MSHCP (2003), the California Department of Fish and Game (CDFG) Natural Diversity Data Base (NDDB) (2009a), the California Native Plant Society (CNPS) Electronic Inventory, the United States Department of Agriculture (USDA) *Soil Survey, Western Riverside Area, California* (Soil Conservation Service 1971), United States Geological Survey (USGS) topographic maps, and California Water Quality Control Board hydrologic data.

CLIMATE

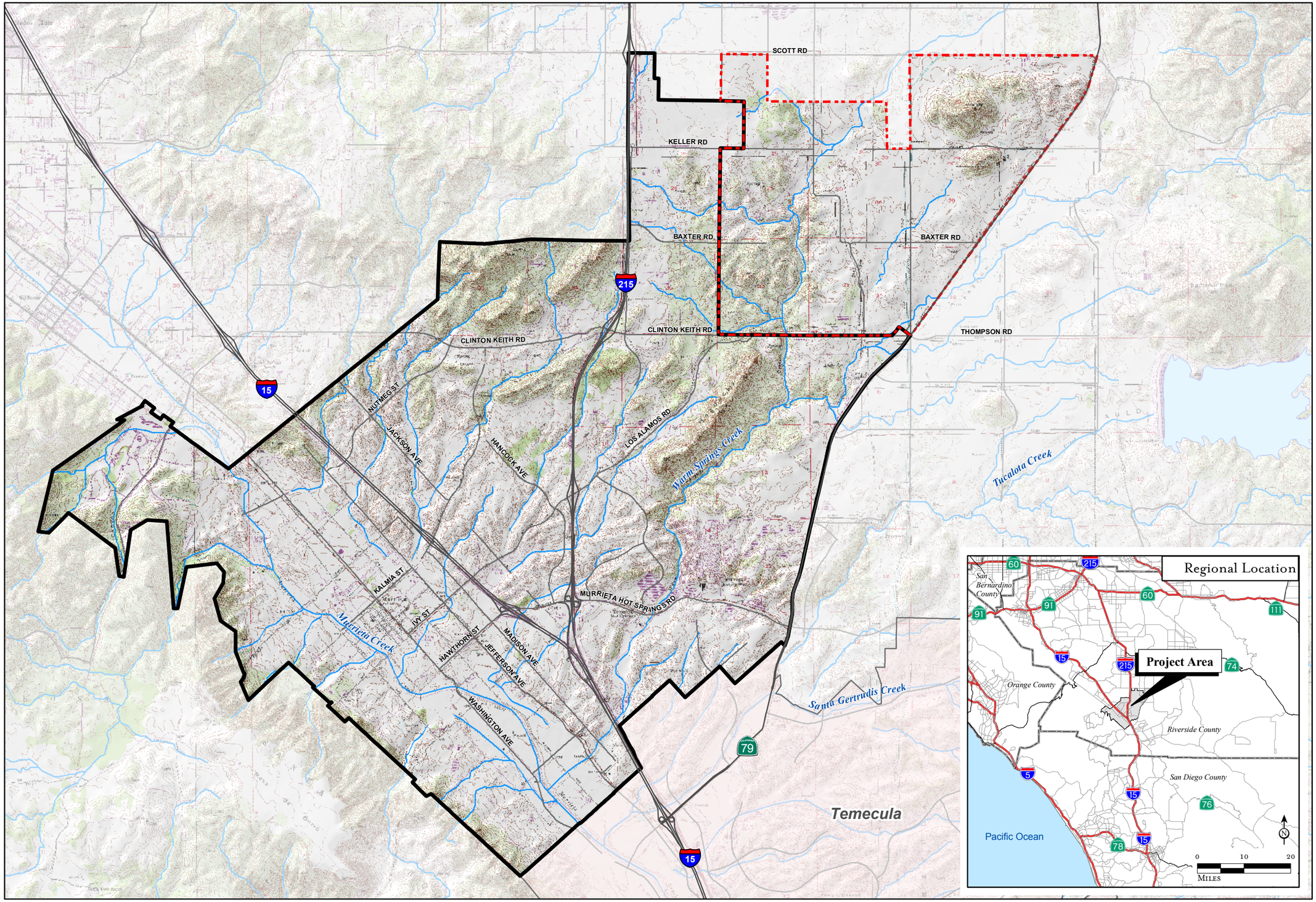
According to the Natural Resources Conservation Service (NRCS 2003), average rainfall is 9 to 18 inches, the average annual temperature is 59 to 65 degrees Fahrenheit, and frost-free days range from 230 to 300 days per year.

TOPOGRAPHY

The City of Murrieta (City) is located in the southern tip of the Riverside Lowlands bioregion. The City is surrounded by three foothill ranges—Sedco Hills, Tucalota Hills (Bachelor Mountain), and Santa Rosa Plateau—and two drainage areas—Murrieta Creek and Warm Springs Creek. Elevation ranges from approximately 1,050 feet to 1,550 feet above mean sea level (amsl). The City is built on a series of plateaus, each raising the land elevation by roughly 100 feet starting from Murrieta Creek, stepping up at Interstate 15 (I-15), again at Murrieta Hot Springs Road, and finally at the Hogbacks. The "Hogbacks" is a small range of foothills situated south to north (1 to 2 miles) with a 300-foot elevation gain above the valley floor. Other unique features within City limits include numerous freshwater springs and one active geothermal vent (Murrieta Hot Springs). Temecula Hot Springs is no longer an active hot spring. Exhibit 1 shows the topography of the region.

SOILS

The Cajalco-Temescal-Las Posas soil association is found in the northern half of the City above I-15. The Hanford-Tujunga-Greenfield association is found along the I-15 corridor and the Monserate-Arlington-Exeter is found along Murrieta Creek. Cieneba-Rock land-Fallbrook and the Friant-Lodo-Escondido associations are found on the north-facing slope of the Santa Ana Mountains below the



Murrieta General Plan Update

Legend

- Sphere of Influence
- City Boundary

January 11, 2010

0 0.5 1

Miles

Source:
USGS 7.5' Quads: Lake Elsinore (88), Romoland (79), Winchester (79), Wildomar (88), Murrieta (79), Bachelor Mtn (73), CA; National Hydrography Dataset, 1999; City of Murrieta, 2009

LSA

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Regional and Project Location

Biological Resources
Exhibit 1

Santa Rosa Plateau. Exhibit 2 shows the boundaries of the soil associations and the mapped soil units that are relevant to MSHCP Species Survey Areas.

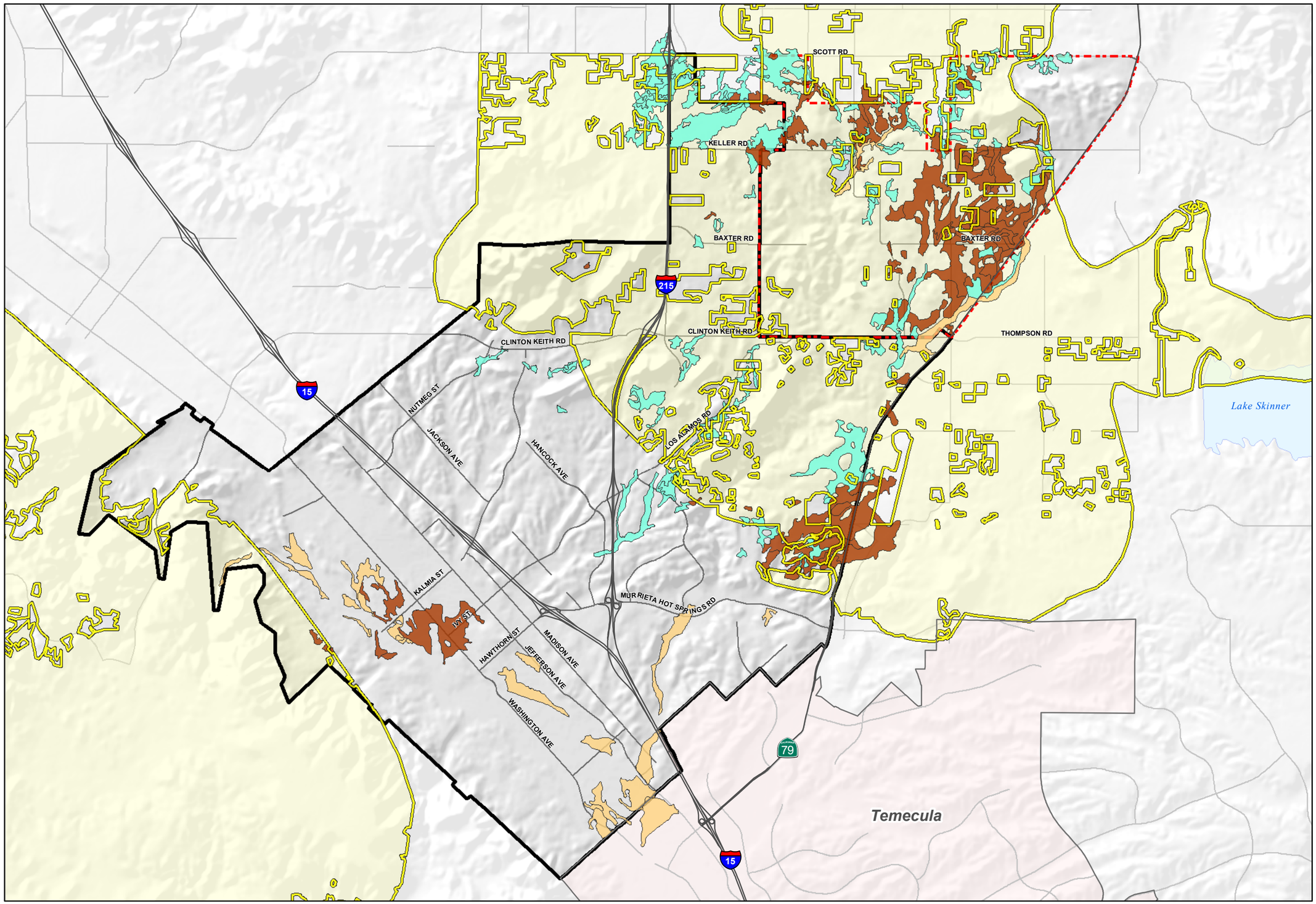
Soils with a variety of properties have been identified in the MSHCP as indicative of rare or listed plant and wildlife species. There are three categories: saline-alkali, heavy clays, and vernal pool soils. The saline-alkali category consists of soils classified by the NRCS as saline-alkali (NRCS mapping units Chino silt loam (Cf), Dello (DpB), Domino (Dt, Dv), Grangerville (GpB, GsB, GuB, GvB, GxA), Traver (Tr2, Ts), Willows (Wa, Wb, Wd, Wg, and Wm)) or strongly saline-alkali (NRCS mapping units Chino (Cg), Domino (Dw), Traver (Tt2), Willow (Wc, Wh, and Wn)). The heavy clays category consists of soils classified by the NRCS as clays (except alkali clays, which were included in the saline-alkali category). The heavy clays category includes NRCS mapping units Auld (AaD, AaE2, AaF, AbF, AuC, AuD, AyF), Bonsanko (BfC, BfD), Porterville (PoC, PrD, PsC, PtB, PvD2), and Willows (Wf). The category of other soils potentially supporting vernal pools (i.e., soils that are known to support vernal pools not already included in the saline-alkali and heavy clays categories) includes NRCS mapping units Las Posas (LaC, LaC2), and Wyman (WyC2). Table A describes the soil associations and the soil types found in the City of Murrieta and its sphere of influence.

Table A: Soil Associates and Soils Types

Soil Association	Description	Soil Types of MSHCP Importance
Cajalco-Temescal-Las Posas	Well-drained, undulating to steep, moderately deep to shallow soils that have a surface layer of fine sandy loam and loam; on gabbro and latite-porphyry. The major and minor soils of this association are known for higher clay content.	Auld, Las Posas, Bonsanko, Porterville clay soil types are found mainly in the sphere of influence. Also, Willow and Domino soils are mapped in the northeast corner of the study area.
Cieneba-Rock land-Fallbrook	Well-drained and somewhat excessively drained, undulating to steep, very shallow to moderately deep soils that have a surface layer of sandy loam and fine sandy loam; on granitic rock.	None
Friant-Lodo-Escondido	Well-drained and somewhat excessively drained, undulating to steep, shallow to deep soils that have a surface layer of fine sandy loam and gravelly loam; on metamorphosed sandstone and mica-schist.	None
Hanford-Tujunga-Greenfield	Very deep, well-drained to excessively drained, nearly level to moderately steep soils that have a surface layer of sand to sandy loam; on alluvial fans and floodplains. These soils are known to have higher alkalinity.	Grangerville soils (saline-alkali) are found along Murrieta Creek and Warm Springs Creek.
Monserate-Arlington-Exeter	Well-drained, nearly level to moderately steep soils that have a surface layer of sandy loam to loam and are shallow to deep to a hard pan.	None

HYDROLOGY

The City of Murrieta is located within the Murrieta Hydrologic Area (2.30) in the Santa Margarita River Hydrologic Unit, regulated by the San Diego Regional Water Quality Control Board (2007).



the future of southern california

Murrieta

General Plan Update

Legend

- Sphere of Influence
- City Boundary
- Narrow Endemic Plant Species Survey Area

Soil Associations*

- Heavy clays
- Other Vernal Pool Soils
- Saline-alkali

*Indicative of Narrow Endemics and other rare species

January 12, 2010

0 0.5 1

Miles

Source:
SoilDataMart 2003;
County of Riverside, 2005.
City of Murrieta, 2009

LSA

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Soils and Survey Areas

Biological Resources
Exhibit 2

The unit is largely drained by the Santa Margarita River, Murrieta Creek, and Temecula River. Previously referenced Exhibit 1 provides an illustration of the tributaries within the study area.

PLANT COMMUNITIES

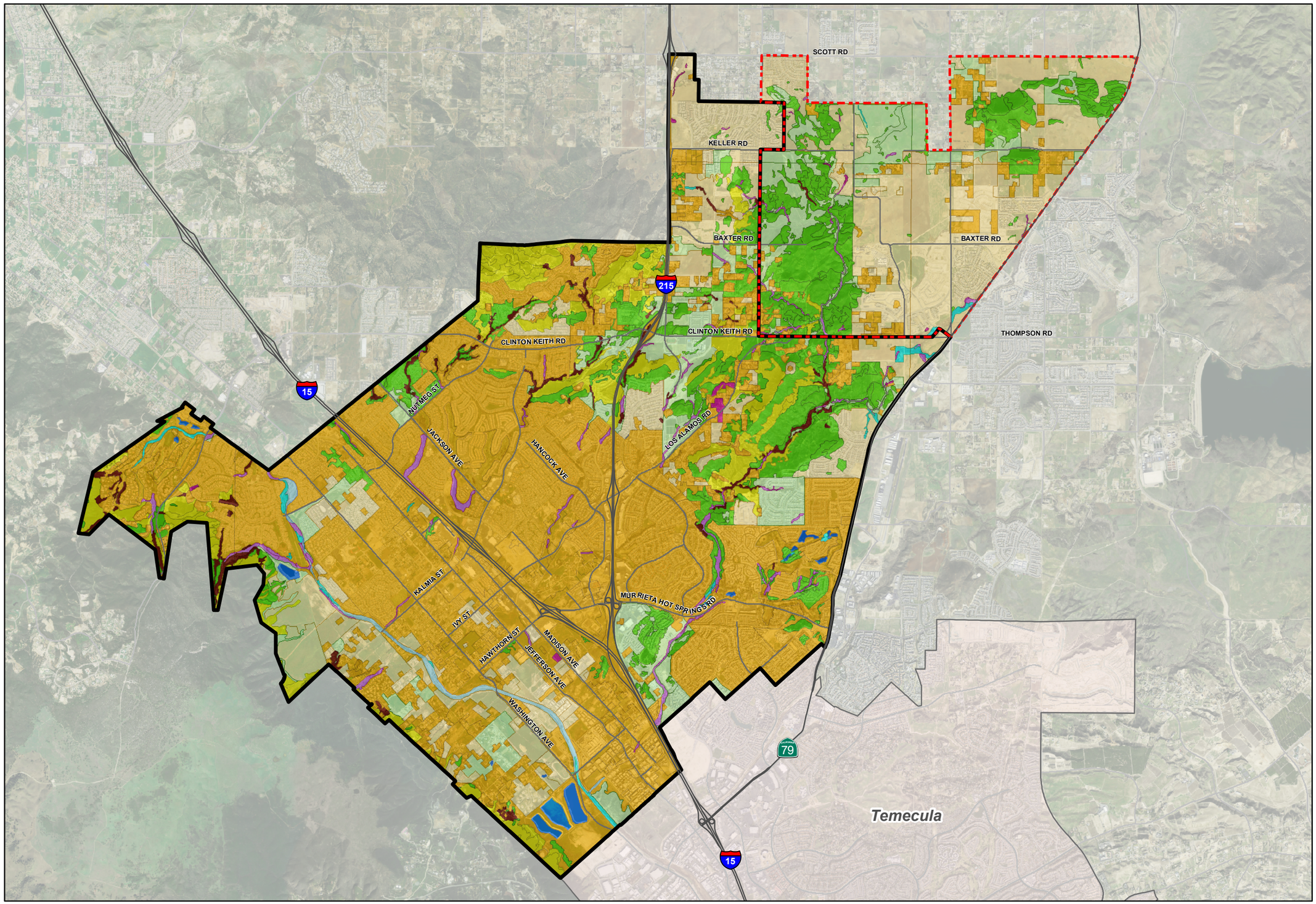
Currently, the City has approximately 8,374 acres of undeveloped land with potential wildlife habitat within the existing City limits and sphere of influence study area. This total excludes agricultural land. The City of Murrieta General Plan Update study area is 26,852 acres.

The County of Riverside has used the Wildlife Habitat Relationship (WHR) system of vegetation classification to map land cover and land use (CDFG 1998). The WHR is a standardized habitat classification scheme for California containing 59 habitats, structural stages for most habitats, and 124 special habitat elements (CDFG 2009b). The plant communities in the City include annual grassland, coastal sage scrub, chaparral, oak woodland, riparian, and wetlands. Table B lists more specific categories and acreages of the plant communities within the City. A description of the wildlife habitats found in the City follows the table. Exhibit 3 provides a color graphic of the potential wildlife habitat areas in the study area.

Table B: Wildlife Habitats with the City of Murrieta General Plan Update Study Area

Wildlife Habitat Relationship Habitats	Wildlife Habitat Relationship Mapping Units (Common Name)	Area (acres)
Annual Grassland	California annual grassland alliance	2,340
Coastal Oak Woodland	Five different plant associations	303
Coastal Scrub	Sixteen different plant associations	3,372
Cropland, Orchard, Vineyard	Agricultural Land Use	5,662
Eucalyptus	Eucalyptus Alliance	35
Fresh Emergent Wetland	Bulrush-cattail	107
Lacustrine	Water mapping unit	128
Mixed Chaparral	Twelve different plant associations	1,636
Riverine/Lacustrine	Sandbars, mud flats, riparian shrubs and trees associated with a river	137
Urban	Five different mapping units	12,816
Valley Foothill Riparian	Nine different plant associations	316
TOTAL		**26,852**

Annual Grassland. Introduced annual grasses are dominant plant species in this habitat. These include wild oats, soft chess, rip-gut brome, red brome, and foxtail fescue. Many wildlife species use annual grasslands for foraging along with other habitat features necessary for nesting or roosting or escape cover. Species commonly found in this habitat are western fence lizard, garter snake, western rattlesnake, black-tailed jackrabbit, California ground squirrel, Botta's pocket gopher, coyote, burrowing owl, horned lark, turkey vulture, kestrel, and red-tailed hawk.



Legend

- Sphere of Influence
- City Boundary

Vegetation and Land Use (2006)

- Annual Grassland
- Coastal Oak Woodland
- Coastal Scrub
- Cropland, Orchard - Vineyard
- Eucalyptus
- Fresh Emergent Wetland
- Lacustrine
- Mixed Chaparral
- Riverine, Lacustrine
- Urban
- Valley Foothill Riparian

January 13, 2010

0 0.5 1

Miles

Source:
SoilDataMart 2003;
County of Riverside, 2005.
City of Murrieta, 2009

LSA

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Vegetation and Land Use

Biological Resources
Exhibit 3

Coastal Oak Woodland. Oak woodlands can be deciduous and evergreen hardwoods, either dense with closed canopy or widely spaced in a savannah-like setting. Understory may be absent or may be dense coastal scrub and chaparral. Dominant species are Engelmann oak, coast live oak, interior live oak, and California walnut. Over 60 species of mammals and 110 bird species use oak habitats.

Coastal Scrub. Plant associations in coast scrub are of low to moderately sized shrubs with semi-woody stems, woody bases, and shallow root systems known to grow in a moderate moisture climate. Species composition, diversity, and density vary greatly with change in geographic location. California sage brush, California buckwheat, deerweed, brittlebush, black sage, and white sage are common coastal scrub species in the City. The California gnatcatcher, a song bird federally listed as threatened, is found exclusively in coastal scrub habitat.

Cropland, Orchard, Vineyard. Croplands in association with orchards and vineyards are established on the most fertile soils in California, which historically supported high wildlife diversity and abundance. Some wildlife species have adapted to agricultural activities, but may be considered agricultural pests, thus their presence in agricultural areas can be managed to reduce loss of crop production.

Eucalyptus. Eucalyptus habitats are usually single species thickets, rows of individual trees, or stands of closed canopy mature trees. These trees provide roosting and nesting habitat for many raptors, such as red-tailed hawk and barn owls, along with crows and ravens. The eucalyptus groves also serve as resting places for migratory song birds, such as tanagers and orioles, and monarch roosting.

Fresh Emergent Wetland. An emergent wetland is dominated by erect perennial and herbaceous water-loving plants and one of the most productive wildlife habitats in California. Numerous bird species, reptiles, and amphibians use wetlands as their primary habitat.

Lacustrine. Lacustrine habitat is distinguished by the presence ponded water in depressions or dammed streambeds with standing water, either present year-round or intermittent and seasonal. Submerged, floating, or emergent vegetation would be present depending upon the depth of the water. Numerous mammals, birds, reptiles, amphibians, crustaceans, and insects use lakes and ponds for food, water, cover, and reproduction.

Mixed Chaparral. Chaparral is a homogenous brushland dominated by thick, stiff shrubs with evergreen leaves in a nearly impenetrable thicket. Chaparral habitat can have numerous species of woody plants. Chaparral supports many species known to occur in coastal shrub and forest habitats.

Riverine. This habitat is influenced by intermittent or perennial running water. The habitat includes open water, riffle-pool complexes, emergent water-loving plants, and adjacent riparian terrestrial

habitat. Waterfowl, eagles, herons, swallows, and flycatchers forage in riverine habitat. Beavers occupy the streams within the City.

Urban. Vegetation in urban settings includes tree groves, street strips, shade trees, lawns, and shrubs. Other classifications can be trees in between buildings, parks, open spaces, and ornamental gardens. Common species are mockingbird, scrub jay, acorn woodpecker, house finch, black phoebe, raccoon, opossum, and striped skunk. Suburban areas with large tracts of adjacent natural vegetation have increased wildlife diversity due to readily available water from landscape irrigation.

Valley Foothill Riparian. This habitat is known for statuesque cottonwoods, sycamores, and willows with either open understory or with shade-tolerant herbaceous or shrub species. Riparian habitats provide food, water, migration and dispersal corridors, escape cover, thermal protection, and reproductive sites.

WESTERN RIVERSIDE COUNTY MULTIPLE SPECIES HABITAT CONSERVATION PLAN

Currently, 988 acres are dedicated to wildlife habitat conservation based on 2003 permittee annual report data (County of Riverside 2005). Land parcels are set aside as Conservation Land to the meet the MSHCP land acquisition goals.

The Riverside County Board of Supervisors adopted the MSHCP on June 23, 2003. The City approved the MSHCP and is a Permittee under the MSHCP. The U.S. Fish and Wildlife Service (USFWS) and CDFG issued take permits under the Federal Endangered Species Act (16 U.S.C. 1531 et seq.) Section 10(a)(1)(b) and California Natural Community Conservation Planning Act (NCCP) (California Fish and Game Code, Section 2800 et seq.) in June 2004. The City now has the authority to meet the federal and state endangered species and conservation planning obligations for its jurisdiction (Western Riverside County Regional Conservation Authority 2007).

The City Department of Planning ensures development is consistent with the MSHCP Species Conservation Guidelines and Area Plan Conservation Criteria. The MSHCP, Permits, and Implementation Agreement serve as guiding documents for the implementation of the conservation goals and land use planning parameters now required by the local Permittees (cities).

The Western Riverside County Regional Conservation Authority (RCA), a joint powers authority, was established to assist the local permittees with MSHCP implementation. The RCA duties include administration of acquisitions and conservation easement dedication, land management, biological resource monitoring, and MSHCP fee collection and accounting.

The MSHCP Implementation Agreement lists the specific obligations required by the cities in order to be active participants in the MSHCP implementation process (RCA 2003). One of those obligations includes amending General Plans to implement the requirements of the MSHCP for public and private development projects. Other obligations are listed below.

1. City representation on the RCA Board of Directors and Reserve Management Oversight Committee (MSHCP Sections 6.6.2 and 6.6.4).
2. Collect Local Development Mitigation Fees and Long-term Stephens' Kangaroo Rat Habitat Conservation Plan (SKR HCP) fees, and transmit to RCA quarterly (MSHCP Section 8.5).
3. Meet the local Reserve Assembly contribution obligations through the Habitat Acquisition and Negotiation Strategy (HANS) for private development projects (MSHCP Section 6.1.1), for public projects at least 1:1 habitat mitigation ratio, and payment of Local Development Mitigation Fees for commercial and industrial development (MSHCP Section 7.0).
4. Comply with Joint Project Review process and annually transmit information on all projects within Criteria Cells (MSHCP 6.6.2).
5. Siting and Design Guidance and Best Management Practices for Covered Activities (MSHCP Section 7.0 and MSHCP Appendix C).
6. Riparian/Riverine and Fairy Shrimp Habitat (MSHCP Section 6.1.2), Narrow Endemic Plants (MSHCP Section 6.1.3), Criteria Area Survey Species (MSHCP Section 6.3.2), and Urban/Wildlands Interface Guidelines (MSHCP Section 6.1.4).
7. Enforce terms of project approvals for public and private projects using applicable land use permit enforcement procedures and practices to ensure compliance with MSHCP, Permits, and Implementation Agreement.
8. Manage MSHCP Conservation Area property and conservation easements owned or leased by the City (MSHCP Sections 5.0 and 8.0).

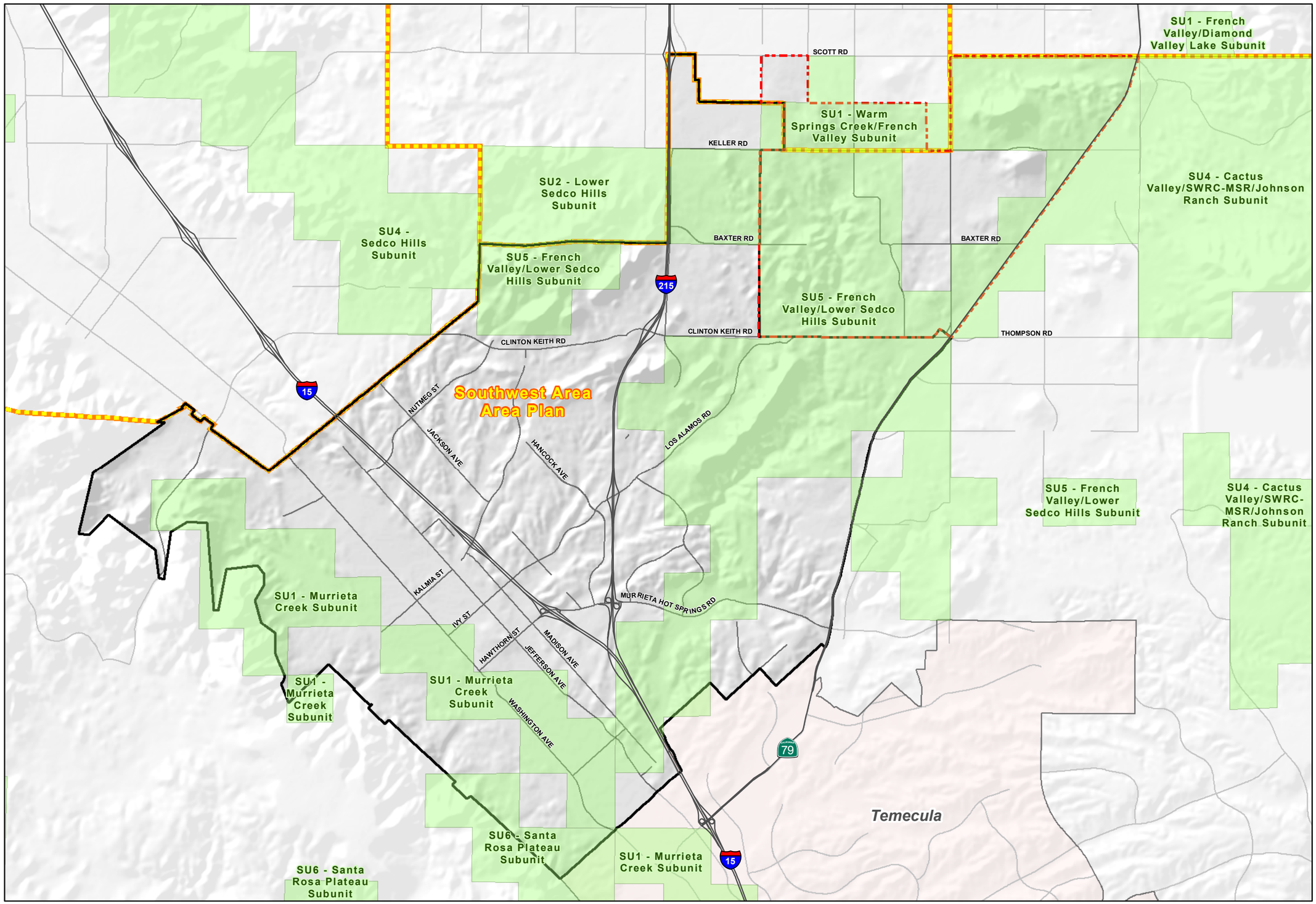
Exhibit 4 shows the existing Conserved Land along with Public/Quasi Public Land and dedicated conservation easements. The conceptual conservation scenario for the MSHCP Reserve Area is based on existing public lands, undeveloped land (Core Areas), and identified potential Linkages between the Core Areas. In order to describe and implement the proposed conservation objectives efficiently, the Reserve Area is subdivided into ¼ quadrants (or 160-acre Cells) based on USGS topographic map sections. The Cells are grouped into Area Plans and Subunits for ease of discussion and planning. See Exhibit 5.

The City encompasses the northern half of the Southwest Area Plan Subunit 1: Murrieta Creek and the majority of Subunit 5: French Valley/Lower Sedco Hills. Subunit 6: Santa Rosa Plateau Cells 6658, 6659, 6779, 6780, and 6781 are within the City limits. A portion of the sphere of influence includes Sun City/Menifee Area Plan Subunit 1: Warm Springs Creek/French Valley (Cells 5066, 5163, 5167, and 5168).

Conservation Goals

The Conservation Goals within the City and the sphere of influence (Antelope Valley) focus on Core Areas and wildlife movement Linkages. These are:

1. Proposed Core 2: Antelope Valley.
2. Proposed Linkage 8: Sedco Hills/Wildomar.



Legend

- Sphere of Influence
- City Boundary
- Area Plan Boundary
- Area Plan Sub Units

January 12, 2010

0 0.5 1

Miles

Source:
AirPhotoUSA, 2008;
County of Riverside, 2006;
City of Murrieta, 2009

LSA

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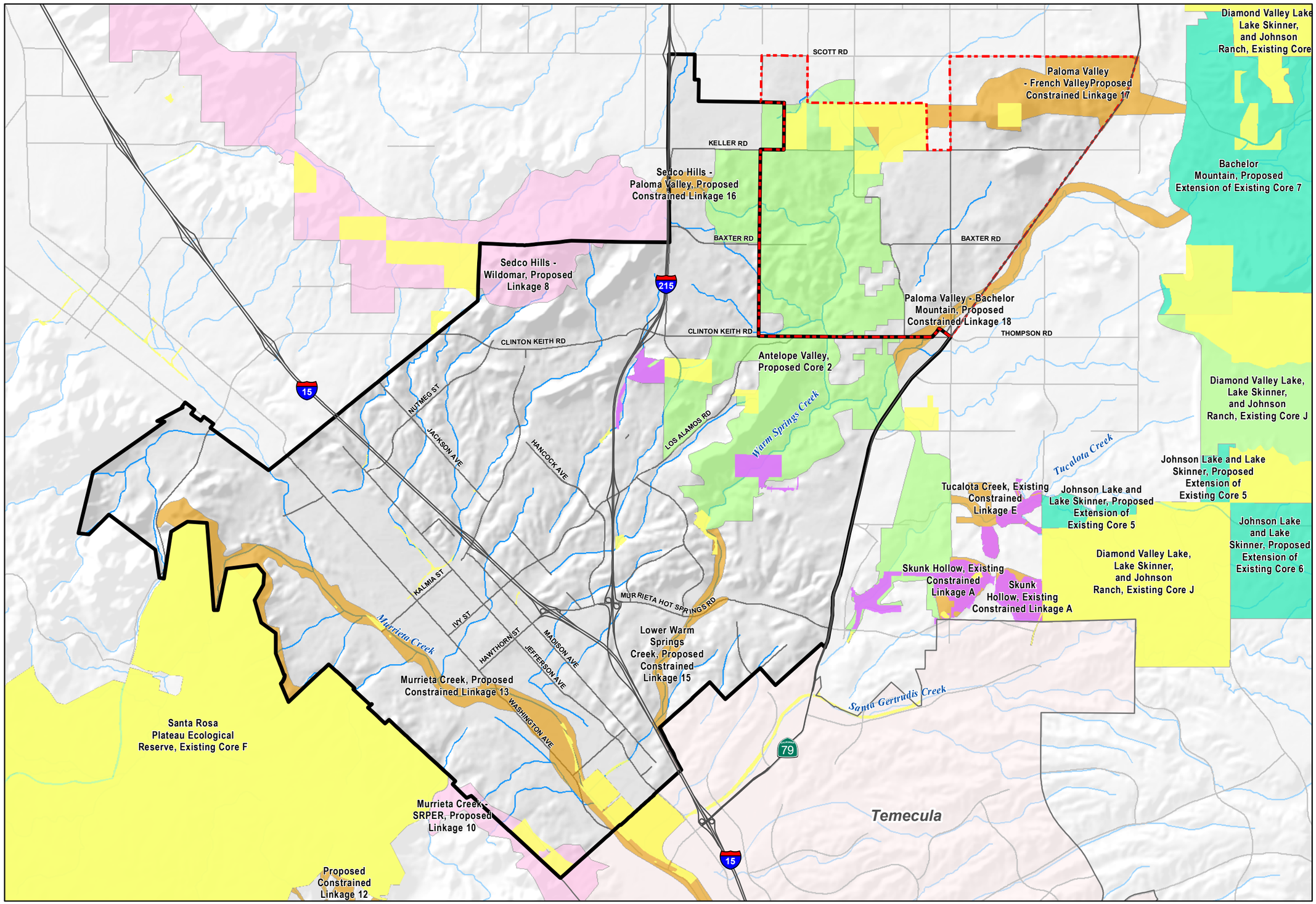
MSHCP Area Plans and Subunits

Biological Resources
Exhibit 4



Murrieta
the future of southern california
General Plan Update

Legend

- Sphere of Influence
- City Boundary

Conserved Lands

- PQP Conserved Lands (2003)
- Pre-existing Conservation Agreements (2003)

Proposed Linkages and Cores

- Constrained Linkage
- Linkage
- Core
- Extension of Existing Core

January 14, 2010

0 0.5 1

Miles

Source:
County of Riverside, 2003 & 2005;
City of Murrieta, 2009

LSA

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MSHCP Proposed and Existing Conservation Land

Biological Resources
Exhibit 5

3. Proposed Constrained Linkages.
    a. 13: Murrieta Creek.
    b. 15: Lower Warm Springs Creek.
    c. 16: Sedco Hills-Paloma Valley.
    d. 17: Paloma Valley-French Valley.
    e. 18: Paloma Valley-Bachelor Mountain.

Biological Issues and Considerations

Biological Issues and Considerations for the Southwest (SW) and Sun City/Menifee (SCM) Area Plan Subunits within the City and the sphere of influence are as follows.

1. **Murrieta Creek (SW1)** and **Santa Rosa Plateau (SW6)** maintain habitat function as riparian and aquatic species live-in habitat and large mammal movement linkage.
2. **French Valley/Lower Sedco Hills (SW5)** and **Warm Springs Creek/French Valley (SCM1)** maintain habitat Core for narrow endemic plants (saline/alkali and clay), Quino checkerspot butterfly, Riverside fairy shrimp, Los Angeles pocket mouse, western pond turtle, and habitat linkages through the City limits (east-west and north-south) for wildlife movement and plant dispersal.

Planning Species

Table C lists planning species used to focus conservation efforts and land acquisitions relevant to the City. Conservation goals focus on species associated with unusual soil types such as heavy clays, strongly saline-alkali loams, and soils with impenetrable layer that provide conditions required to form vernal pools. Listed species associated with specific soil types are Munz's onion, San Diego ambrosia, spreading navarretia, California Orcutt grass, and Quino checkerspot butterfly. Coastal scrub and chaparral habitat areas are important for the Quino checkerspot butterfly and California gnatcatcher. Annual grassland and coastal scrub habitat is important to listed Stephens' kangaroo rat. Riparian, lacustrine, and emergent wetland habitats are important to listed least Bell's vireo and southwestern willow flycatcher.

Table C: Species of Importance in the City of Murrieta General Plan Study Area (Western Riverside County Multiple Species Habitat Conservation Plan)

Species	Status	Habitat and Description	Activity Period
Plants			
Allium munzii **Munz's onion**	US: FE CA: ST CNPS: 1B MSHCP: S	On clay soils in openings within coastal sage scrub, pinyon juniper woodland, and grassland; 300 to 1,070 meters (1,000 to 3,500 feet) elevation. Known only from western Riverside County in Temescal Canyon, Gavilan Plateau, Bachelor Mountain, and Skunk Hollow areas. Clay soils on mesic exposures or seasonally moist microsites in grassy openings of coastal sage scrub, chaparral, juniper woodland, or valley and foothill grassland.	Blooms April through May (Perennial bulb)

Table C: Species of Importance in the City of Murrieta General Plan Study Area (Western Riverside County Multiple Species Habitat Conservation Plan)

Species	Status	Habitat and Description	Activity Period
Ambrosia pumila **San Diego ambrosia**	US: FE CA: SP CNPS: 1B MSHCP: S	Occurs in open habitats, usually near drainages or vernal pools, usually in sandy loam or on clay (including upland clay slopes) from 20 to 487 meters (70 to 1,600 feet) elevation. Known from western Riverside and western San Diego Counties. Also occurs in Mexico. Open floodplain terraces on Garretson gravelly fine sandy loams, or in the watershed margins of vernal pools or alkali playas on Las Posas loam in close proximity to Willow silty alkaline soils. Occurs in sparse annual vegetation.	Generally non-flowering (perennial herb)
Atriplex parishii **Parish's brittlescale**	US: – CA: SP CNPS: 1B MSHCP: S	Alkali meadows, vernal pools, chenopod scrub, and playas. Usually on drying alkali flats with fine soils. In California, known from Riverside, San Diego, and Orange Counties. Also occurs in Mexico. Believed extirpated from Los Angeles and San Bernardino Counties. Domino, Willows, and Traver soils in alkali vernal pools, alkali annual grassland, alkali playa, and alkali scrub components of alkali vernal plains.	Blooms June through October (annual herb)
Atriplex serenana var. *davidsonii* **Davidson's saltscale**	US: – CA: SP CNPS: 1B MSHCP: S	Alkaline soils in scrub and herbaceous communities from 10 to 460 meters (30 to 1,500 feet) elevation. In California, known only from Los Angeles (?), Orange, Riverside, San Diego, San Luis Obispo, and Ventura Counties. Believed extirpated from Santa Barbara and perhaps Los Angeles Counties. Also occurs in Mexico. Domino, Willows, and Traver soils in alkali vernal pools, alkali annual grassland, alkali playa, and alkali scrub components of alkali vernal plains.	Blooms April through October (annual herb)
California macrophylla (*Erodium macrophyllum)* **Round-leaved filaree**	US: – CA: SP CNPS: 1B MSHCP: S	Clay soils in woodland, scrub, and grassland communities from 15 to 1,200 meters (50 to 4,000 feet) elevation. Known from central and south coastal areas and the Central Valley in California. Also occurs in Oregon and Mexico. Clay soils in open cismontane woodland (e.g., oak, juniper woodlands) and valley and foothill grassland. The MSHCP account for this species states that it is restricted to "very friable clay soils...Within the Plan Area, two of the mapped localities occur on Bosanko clay soils" and that "this species tends to be associated primarily with wild oats (*Avena fatua*)."	Blooms March through May (annual herb)
Centromadia pungens ssp. *laevis* **Smooth tarplant**	US: – CA: SP CNPS: 1B MSHCP: S	Alkaline areas in chenopod scrub, meadows, playas, riparian woodland, valley and foothill grassland below 480 meters (1,600 feet) elevation. Known from Riverside and San Bernardino Counties, extirpated from San Diego County. Primarily alkaline soils in alkali scrub, alkali playas, riparian woodland, watercourses, and alkaline grasslands. The MSHCP account for this species states that "Suitable habitat for the smooth tarplant includes alkali scrub, alkali playas, and grasslands with alkaline affinities...smooth tarplant is restricted to clay and alkaline, silty-clay soils."	Blooms April through November (annual herb)

Table C: Species of Importance in the City of Murrieta General Plan Study Area (Western Riverside County Multiple Species Habitat Conservation Plan)

Species	Status	Habitat and Description	Activity Period
Dudleya multicaulis **Many-stemmed dudleya**	US: – CA: SP CNPS: 1B MSHCP: S	Heavy, often clay soils or around granitic outcrops in chaparral, coastal sage scrub, and grassland below 790 meters (2,600 feet) elevation. Known only from Los Angeles, Orange, Riverside, San Bernardino, and San Diego Counties. Clay soils in barrens, rocky places, ridgelines, and thinly vegetated openings in chaparral, coastal sage scrub, and southern needlegrass grasslands. Visible population size varies considerably year-to-year depending on rainfall patterns. The MSHCP account for this species states that "Many-stemmed dudleya is associated with openings in chaparral, coastal sage scrub, and grasslands underlain by clay and cobbly clay soils of the following series: Altamont, Auld, Bosanko, Claypit, and Porterville."	Blooms April through July (perennial herb)
Lasthenia glabrata ssp. *coulteri* **Coulter's goldfields**	US: – CA: SP CNPS: 1B MSHCP: S	Usually alkaline soils in marshes, playas, vernal pools, and valley and foothill grassland below 1,400 meters (4,600 feet) elevation. Known from Colusa, Merced, Tulare (?), Orange, Riverside, Santa Barbara, San Diego, San Luis Obispo, and Ventura Counties. Believed extirpated from Kern, Los Angeles, and San Bernardino Counties. Also occurs in Mexico. Traver, Domino or (usually) Willows soils in alkali scrub, alkali playas, vernal pools, and alkali grasslands. The MSHCP account for this species states that "Coulter's goldfields is restricted to clay and alkaline, silty-clay soils."	Blooms February through June (annual herb)
Myosurus minimus ssp. *apus* **Little mousetail**	US: – CA: SP CNPS: 3 MSHCP: S	Alkaline areas in vernal pools at 20 to 640 meters (70 to 2,100 feet) elevation. Known only from the Central Valley of California and the coastal and inland areas of Southern California. Alkaline soils in vernal pools and vernal plains. The MSHCP account for this species states that "little mousetail is found in areas that have semiregular inundation."	Blooms March through June (annual herb)
Navarretia fossalis **Spreading navarretia**	US: FT CA: SP CNPS: 1B MSHCP: S	In vernal pools, playas, shallow freshwater marshes and similar sites at 30 to 1,310 meters (100 to 4,300 feet) elevation. In California, known only from Los Angeles, San Luis Obispo, Riverside, and San Diego Counties. Also occurs in Mexico. Alkaline soils and southern basaltic claypan in vernal pools. The MSHCP account for this species states that, in Riverside County, it "is found in southern basaltic claypan vernal pools at the Santa Rosa Plateau, and alkaline vernal pools as at Skunk Hollow and at Salt Creek west of Hemet."	Blooms April through June (annual herb)
Orcuttia californica **California Orcutt grass**	US: FE CA: SE CNPS: 1B MSHCP: S	Vernal pools from 15 to 660 meters (50 to 2,200 feet) elevation. In California, known from Los Angeles, Ventura, Riverside, and San Diego Counties. Also occurs in Mexico.	Blooms April through August (annual grass)

Table C: Species of Importance in the City of Murrieta General Plan Study Area (Western Riverside County Multiple Species Habitat Conservation Plan)

Species	Status	Habitat and Description	Activity Period
Trichocoronis wrightii var. *wrightii* **Wright's trichocoronis**	US: – CA: SP CNPS: 2 MSHCP: S	Alkali meadows, river beds, vernal pools, and lakes at 5 to 435 meters (20 to 1,430 feet) elevation. In California, known from the Central Valley and Riverside County. Also occurs in Texas and Baja California. Alkali soils in alkali playa, alkali annual grassland, and alkali vernal pools. The MSHCP account for this species states that "Wright's trichocoronis is restricted to highly alkaline, silty-clay soils in association with Traver, Domino, and Willows soils..."	Blooms May through September (annual or perennial herb)
Insects			
Euphydryas editha quino **Quino checkerspot butterfly**	US: FE CA: SA MSHCP: C	Meadows or openings within coastal sage scrub or chaparral below about 5,000 feet where food plants (*Plantago erecta* and/or *Orthocarpus purpurascens*) are present. Historically known from Santa Monica Mountains to northwest Baja California; currently known only from southwestern Riverside County, southern San Diego County, and northern Baja California.	January through late April
Reptiles			
Actinemys marmorata (pallida) **Western pond turtle**	US: – CA: CSC MSHCP: C	Inhabits permanent or nearly permanent water below 1,830 meters (6,000 feet) from central California, west of the Sierra-Cascade crest south to north-western Baja California. Absent from desert regions, except in the Mojave Desert along the Mojave River and its tributaries. Requires basking sites such as partially submerged logs, rocks, or open mud banks.	Year-round with reduced activity November through March
Birds			
Accipiter cooperii (nesting) **Cooper's hawk**	US: – CA: SA MSHCP: C	Forages in a wide range of habitats, but primarily in forests and woodlands. These include natural areas as well as human-created habitats such as plantations and ornamental trees in urban landscapes. Usually nests in trees 20–60 feet in height in extensive forested areas (generally woodlots of 4–8 hectares with canopy closure of greater than 60%). Occasionally nests in isolated trees in more open areas.	Year-round
Aimophila ruficeps canescens **Southern California rufous-crowned sparrow**	US: – CA: SA MSHCP: C	Steep, rocky coastal sage scrub and open chaparral habitats, particularly scrubby areas mixed with grasslands. From Santa Barbara County to northwestern Baja California.	Year-round, diurnal activity
Ammodramus savannarum (nesting) **Grasshopper sparrow**	US: – CA: CSC MSHCP: P	Grasslands, agricultural fields, prairie, old fields, and open savanna. Uncommon and very local summer resident on grassy slopes and mesas west of the deserts. Only rarely in migration and in winter. Coastal Southern California.	Coastal: Year-round; only casually in migration elsewhere

Table C: Species of Importance in the City of Murrieta General Plan Study Area (Western Riverside County Multiple Species Habitat Conservation Plan)

Species	Status	Habitat and Description	Activity Period
Amphispiza belli belli **Bell's sage sparrow**	US: – CA: CSC MSHCP: C	Occupies chaparral and coastal sage scrub from west central California to northwestern Baja California.	Year-round, diurnal activity
Athene cunicularia (burrow sites) **Burrowing owl**	US: – CA: CSC MSHCP: S	Open country in much of North and South America. Usually occupies ground squirrel burrows in open, dry grasslands, agricultural and range lands, railroad rights-of-way, and margins of highways, golf courses, and airports. Often utilizes man-made structures, such as earthen berms, cement culverts, cement, asphalt, rock, or wood debris piles. They avoid thick, tall vegetation, brush, and trees, but may occur in areas where brush or tree cover is less than 30 percent.	Year-round
Buteo swainsoni (nesting) **Swainson's hawk**	US: – CA: ST MSHCP: C	Grassland and agricultural areas; large trees for nesting. Breeds and nests in western North America; winters in South America; in California nesting is essentially restricted to Central Valley and Modoc Plateau.	Spring and fall (in migration)
Dendroica petechia brewsteri (nesting) **California yellow warbler**	US: – CA: CSC MSHCP: C	Riparian woodland while nesting in the western U.S. and northwestern Baja California; more widespread in brushy areas and woodlands during migration and winter, when occurring from western Mexico to northern South America. Migrants belonging to other subspecies are widespread and common.	Summer, winter, or year-round, depending on locale
Empidonax traillii extimus **Southwestern willow flycatcher**	US: FE CA: SE MSHCP: S	Rare and local breeder in extensive riparian areas of dense willows or (rarely) tamarisk, usually with standing water, in the southwestern U.S. and northwestern Mexico. Winters in Central and South America.	May through September
Eremophila alpestris actia **California horned lark**	US: – CA: SA MSHCP: C	Open grasslands and fields, agricultural area, open montane grasslands. This subspecies is resident from northern Baja California northward throughout non-desert areas to Humboldt County, including the San Joaquin Valley and the western foothills of the Sierra Nevada (north to Calaveras County). Prefers bare ground such as plowed or fall-planted fields for nesting, but may also nest in marshy soil. During the breeding season, this is the only subspecies of horned lark in non-desert southern California; however, from September through April or early May, other subspecies visit the area.	Year-round interior (inland areas)
Lanius ludovicianus (nesting) **Loggerhead shrike**	US: – CA: CSC MSHCP: C	Open fields with scattered trees or shrubs, open country with short vegetation, pastures, old orchards, cemeteries, golf courses, riparian areas, and open woodlands. Found in open country in much of North America.	Year-round

Table C: Species of Importance in the City of Murrieta General Plan Study Area (Western Riverside County Multiple Species Habitat Conservation Plan)

Species	Status	Habitat and Description	Activity Period
Polioptila californica californica **Coastal California gnatcatcher**	US: FT CA: CSC MSHCP: C	Inhabits coastal sage scrub in low-lying foothills and valleys in cismontane southwestern California and Baja California.	Year-round
Tachycineta bicolor **Tree swallow**	US: – CA: – MSHCP: C	Riparian scrub, woodland and forest, water, oak woodlands and forest. Nests in older trees and snags.	Year-round
Vireo bellii pusillus **Least Bell's vireo**	US: FE CA: SE MSHCP: S	Riparian forests and willow thickets. The most critical structural component of least Bell's vireo habitat in California is a dense shrub layer 2 to 10 feet (0.6–3.0 meter) above ground. Nests from central California to northern Baja California. Winters in southern Baja California.	April through September
Mammals			
Dipodomys stephensi **Stephens' kangaroo rat**	US: FE CA: ST MSHCP: C	Found in plant communities transitional between grassland and coastal sage scrub, with perennial vegetation cover of less than 50%. Most commonly associated with *Artemesia tridentata, Eriogonum fasciculatum,* and *Erodium.* Requires well-drained soils with compaction characteristics suitable for burrow construction. Not found in soils that are highly rocky, less than 20 inches deep, or heavily alkaline or clay, or in areas exceeding 25% slope. Occurs only in western Riverside County, northern San Diego County, and extreme southern San Bernardino County, below 915 meters (3,000 feet) elevation. In northwestern Riverside County, known only from east of Interstate 15. Reaches its northwest limit in south Norco, southeast Riverside, and in the Reche Canyon area of Riverside and extreme southern San Bernardino Counties.	Year-round
Lynx rufus **Bobcat**	US: – CA: – MSHCP: C	Chaparral, coastal sage scrub, desert scrub, montane coniferous forest, riparian scrub, woodland and forest, Riversidean alluvial fan sage scrub	Year-round
Perognathus longimembris brevinasus **Los Angeles pocket mouse**	US: – CA: CSC MSHCP: S	Prefers sandy soil for burrowing, but has been found on gravel washes and stony soils. Found in coastal sage scrub in Los Angeles, Riverside, and San Bernardino Counties.	Nocturnal. Active late spring to early fall.

LEGEND	
US: Federal Classifications	
FE	Taxa listed as Endangered.
FT	Taxa listed as Threatened.
CA: State Classifications	
SE	Taxa State-listed as Endangered.

ST	Taxa State-listed as Threatened.
CSC	California Species of Special Concern. Refers to animals with vulnerable or seriously declining populations.
SA	Special Animal. Refers to any other animal monitored by the Natural Diversity Data Base, regardless of its legal or protection status.
SP	Special Plant. Refers to any other plant monitored by the Natural Diversity Data Base, regardless of its legal or protection status.
CNPS: California Native Plant Society Classifications	
1B	Plants considered by CNPS to be rare, threatened, or endangered in California and elsewhere.
2	Plants considered by CNPS to be rare, threatened, or endangered in California, but more common elsewhere.
3	Plants suggested by CNPS for consideration as endangered but about which more information is needed.
MSHCP: Western Riverside County MSHCP Status	
S	Species is adequately conserved under the MSHCP, but surveys are required within indicated habitats and/or survey areas.
C	Species is adequately conserved under the MSHCP.
P	Species is covered but not considered adequately conserved pending completion of MSHCP specified requirements.

CRITICAL HABITAT

Currently, there is no designated or proposed critical habitat in the City of Murrieta. "Critical Habitat" is a term applied to areas designated by the USFWS to be of biological importance to federally listed species (2000). It is a specific geographic area that is essential for the conservation of a threatened or endangered species and that may require special management and protection. Critical habitat may include an area that is not currently occupied by the species but that will be needed for its recovery. An area is designated as "critical habitat" following publication of a proposed federal regulation in the Federal Register and receipt and consideration of public comments on the proposal. The final boundaries of the critical habitat area are also published in the Federal Register.

Federal agencies are required to consult with the USFWS on actions they carry out, fund, or authorize to ensure that their actions will not destroy or adversely modify critical habitat. In this way, a critical habitat designation protects areas that are necessary for the conservation of the species. A critical habitat designation has no effect on situations where a federal agency is not involved (e.g., a landowner undertaking a project on private land that involves no federal funding or permit).

WATERS OF THE U.S., WETLANDS AND STREAMS

The U.S. Army Corps of Engineers (ACOE) typically regulates as *waters of the United States*; that is, any body of water displaying an ordinary high water mark (OHWM). ACOE jurisdiction over non-tidal waters of the United States extends laterally to the OHWM or beyond the OHWM to the limit of any adjacent wetlands, if present (33 CFR 328.4). The OHWM is defined as "that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding area" (33 CFR 328.3). Jurisdiction typically extends upstream to the point where the OHWM is no longer perceptible.

The CDFG, through provisions of the California Fish and Game Code (Sections 1601–1603), is empowered to issue agreements for any alteration of a river, stream or lake where fish or wildlife resources may be adversely affected. Streams (and rivers) are defined by the presence of a channel bed and banks, and at least an intermittent flow of water. The CDFG regulates wetland areas only to the extent that those wetlands are part of a river, stream, or lake as defined by the CDFG.

The Federal Clean Water Act and California Fish and Game Code Section 1600 et seq. still apply to projects within the City even though the MSHCP is approved and certain guidelines apply to riparian, riverine, and aquatic habitats and vernal pools. Any proposed impacts to permanent or seasonally ponded water bodies and ephemeral, intermittent, or perennial streambeds in the City of Murrieta will continue to require a delineation report and jurisdictional determination by the ACOE, Regional Water Quality Control Board (RWQCB), and the CDFG.

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Appendix I:

Cultural Resources Existing Conditions Report

CULTURAL RESOURCES ASSESSMENT

CITY OF MURRIETA GENERAL PLAN UPDATE

RIVERSIDE COUNTY, CALIFORNIA

LSA

January 2010

CULTURAL RESOURCES ASSESSMENT

CITY OF MURRIETA GENERAL PLAN UPDATE

RIVERSIDE COUNTY, CALIFORNIA

Prepared for:

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LSA Project No. RBF0906

LSA

January 2010

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APPENDIX A: RECORDS SEARCH LETTER

MANAGEMENT SUMMARY

Under contract to the City of Murrieta and RBF Consulting, LSA Associates, Inc. (LSA) conducted a cultural resources assessment to provide planning constraints and possible mitigation measures as part of the City of Murrieta General Plan Update. The planning area consists of approximately 23,936 acres, approximately 18,176 acres within City limits and 5,760 acres within the City's sphere of influence. A records search was performed to determine the number, type, and significance of recorded cultural resources and potential cultural resources that future development within the planning area could potentially impact. The mitigation measures were developed to comply with the guidelines of the California Environmental Quality Act (CEQA).

The records search indicated that a great deal of the planning area had been previously surveyed for cultural resources. The results of the records search indicate that 330 cultural resource studies have been conducted within the planning area, resulting in the identification of 199 documented cultural resources. The previous studies within the planning area are mainly cultural resource assessments, survey reports, and archaeological test excavations. The documented resources within the planning area include more than 75 bedrock milling sites, 36 milling artifacts, 53 sites with lithic artifacts (flakes, points, debitage), 5 sites with rock art, 9 possible prehistoric campsites or habitation sites, 3 possible prehistoric quarries, 7 built resources, and 11 historic archaeological sites (trash scatters, habitation remains).

INTRODUCTION

LSA Associates, Inc. (LSA) is under contract to the City of Murrieta and RBF Consulting to prepare a cultural resources assessment for the Murrieta General Plan Update. Cultural resources are prehistoric and historic archaeological resources, buildings, objects, and structures that are 50 years and older. It is intended to provide guidance for compliance with the California Environmental Quality Act (CEQA), Public Resources Code (PRC) Chapter 2.6, Section 21083.2 and 21084.1, and California Code of Regulations (CCR) Title 14, Chapter 3, Article 5, Section 15064.5.

PROJECT LOCATION AND DESCRIPTION

The City of Murrieta is located in southwestern Riverside County, with an area that surrounds the junction of Interstate 215 (I-215) and Interstate 15 (I-15). The planning area consists of approximately 23,936 acres, approximately 18,176 acres within City limits and 5,760 acres within the City's sphere of influence. The City is roughly bordered by the Cleveland National Forest to the west, the Cities of Wildomar and Menifee to the north, unincorporated County land to the east (mostly within the spheres of influence of Murrieta and Temecula), and the City of Temecula to the south. The planning area is located in Townships 6 and 7 South, Ranges 2, 3, and 4 West, San Bernardino Baseline and Meridian, as shown on the U.S. Geological Survey (USGS) *Murrieta, Winchester, Romoland,* and *Wildomar, California* 7.5-minute topographic quadrangles (see Figure 1).

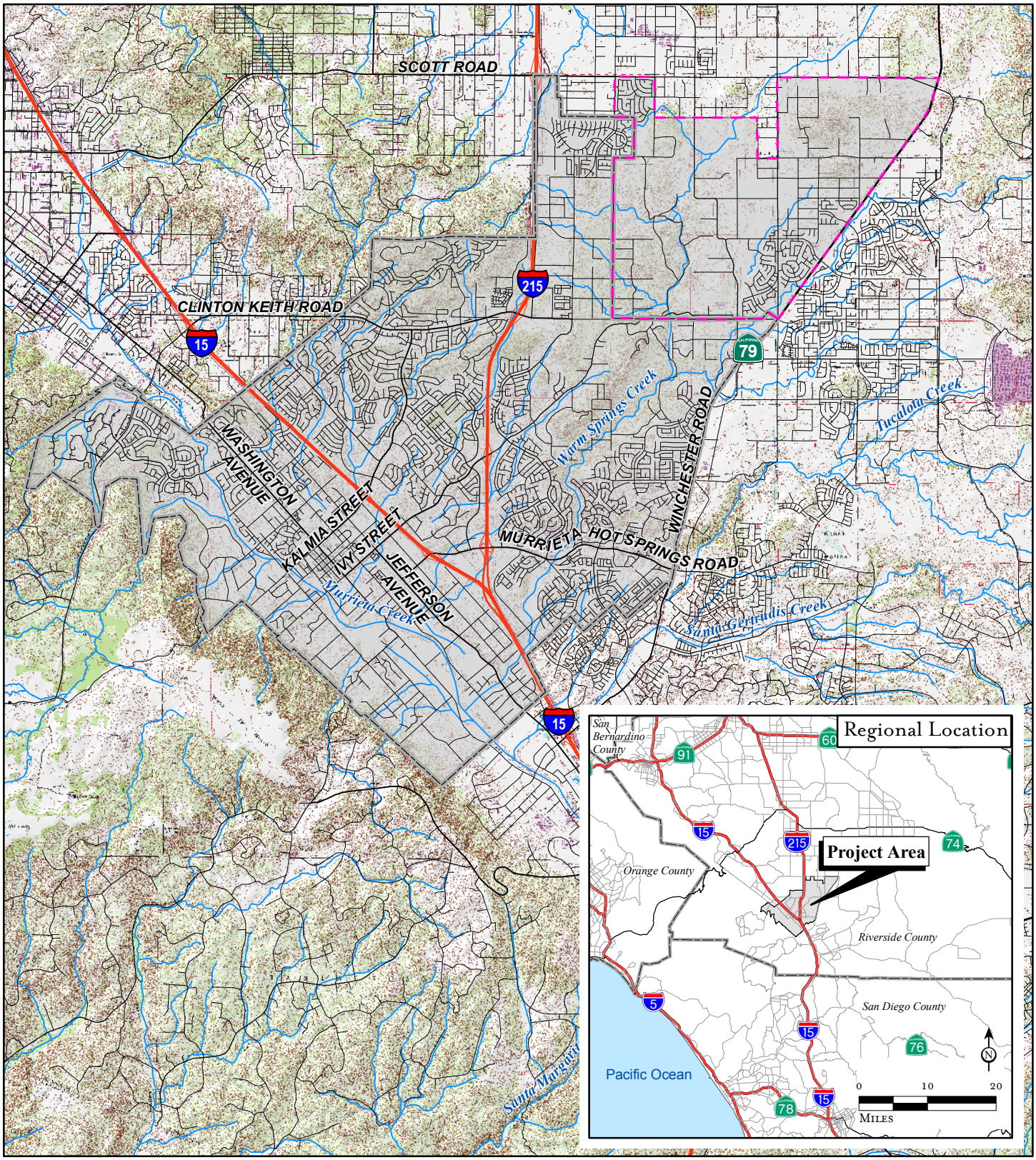
REGULATORY CONTEXT

California Environmental Quality Act

CEQA (PRC Chapter 2.6, Section 21083.2 and CCR Title 145, Chapter 3, Article 5, Section 15064.5) calls for the evaluation and recordation of historic and archaeological resources. The criteria for determining the significance of impacts to cultural resources are based on Section 15064.5 of the *CEQA Guidelines* and Guidelines for the Nomination of Properties to the California Register of Historical Resources (California Register). Properties eligible for listing in the California Register and subject to review under CEQA are those meeting the criteria for listing in the California Register, National Register of Historic Places (National Register), or designation under a local ordinance.

California Register of Historical Resources. The California Register program encourages public recognition and protection of resources of architectural, historical, archeological and cultural significance, identifies historical resources for state and local planning purposes, determines eligibility for state historic preservation grant funding, and affords certain protections under CEQA. According to Technical Assistance Bulletin #3, to become a historical resource, a site must be significant at the local, state, or national level under one or more of the following four criteria:

1. It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States; or
2. It is associated with the lives of persons important to local, California, or national history; or
3. It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or



LSA

N

0 4,500 9,000

Feet

Study Area

City Boundary

Sphere of Influence Boundary

FIGURE 1

City of Murrieta
General Plan Update

Regional and Project Location

SOURCE: USGS 7.5' Quads: Lake Elsinore (88), Romoland (79), Winchester (79), Wildomar (88), Murrieta (79), Bachelor Mtn (73), Fallbrook (88), Temecula (75), Pechanga (88), CA; Thomas Bros., 2009; National Hydrography Dataset, 1999.

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4. It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

In addition to having significance, resources must have integrity for the period of significance. The period of significance is the date or span of time within which significant events transpired, or significant individuals made their important contributions. Integrity is the authenticity of a historical resource's physical identity as evidenced by the survival of characteristics or historic fabric that existed during the resource's period of significance. Alterations to a resource or changes in its use over time may have historical, cultural, or architectural significance. Simply, resources must retain enough of their historic character or appearance to be recognizable as historical resources, and to convey the reasons for their significance.

City Cultural Resource Preservation Ordinance (Murrieta Municipal Code §16.26)

The City of Murrieta added a cultural resource preservation ordinance to its Municipal Code in 2001 for the purpose of, "establish[ing] a mechanism by which community resources such as buildings, structures and sites within the city of Murrieta, which are of pre-historic and historic interest or value or which exhibit special elements of the city's architectural, cultural or social heritage may be identified, protected, enhanced, perpetuated and used in the interest of the public's health, safety, welfare and enrichment" (MMC §16.26.010). The cultural resource preservation ordinance was also established to implement the provisions of the conservation and open space element of the general plan. The ordinance requires that a "Certificate of Appropriateness" be granted by the City Council prior to the demolition or relocation of any designated cultural resource or contributing resource (MMC §16.26.080).

Murrieta Municipal Code §16.26.050: Designation Criteria For Cultural Resources Archaeological Districts And Historic Districts. For the purposes of the ordinance codified in this section, an improvement or natural feature may be designated a cultural resource by the city council and any area within the City may be designated as an archaeological district or historic preservation district by the City Council if it meets any of the following criteria:

- **Individual Resource Designation**
    1. It exemplifies or reflects special elements of the city's cultural, architectural, aesthetic, social, economic, political, artistic and/or engineering heritage;
    2. It is identified with persons, a business use or events significant in local, state or national history;
    3. It embodies distinctive characteristics of style. type, period or method of construction or is a valuable example of the use of indigenous materials or craftsmanship;
    4. It is representative of the notable work of a builder, designer or architect; or
    5. Its unique location or singular physical characteristic represents an established and familiar visual feature of a neighborhood, community or the city.
- **Local District Designation**

A geographic area may be designated as a local archaeological district or historic preservation district if the city council, after hearing(s) finds that all of the requirements set forth below are met. Concurrent with the designation of a historic preservation district, design guidelines shall be developed and shall apply to all properties within the historic preservation district.

- **Archaeological District**

  a. The area is a geographically definable area.

  b. The area possesses either:

     1. A significant concentration or continuity of archaeological resources; or

     2. The area is associated with the prehistory of Murrieta.

  c. The designation of the geographic area as an archaeological district is reasonable, appropriate, and necessary to protect, promote and further the goals and purposes of the ordinance codified in this chapter and is not inconsistent with other goals and policies of the City.

- **Historic Preservation District**

  a. The area is a geographically definable area:

  b. The area possesses either:

     1. A significant concentration or continuity of buildings unified by past events or aesthetically by plan or physical development; or

     2. The area is associated with an event, person, or period significant or important to Murrieta history.

  c. The designation of the geographic area as a historic preservation district is reasonable, appropriate, and necessary to protect, promote, and further the goals and purposes of the ordinance codified in this chapter and is not inconsistent with other goals and policies of the City.

  d. Determining Factors: In determining whether to designate a historic preservation district, the following factors shall be considered:

     1. District should have integrity of design, setting, materials, workmanship, and association; and

     2. The collective value of the buildings and structures in a district taken together may be greater than the value of each individual building or structure.

National Register of Historic Places

The National Register is the nation's official list of cultural resources worthy of preservation. According to National Register Bulletin 15, in order to qualify for the National Register, a resource must meet the criteria for evaluation. Properties are significant under the following criteria:

a. The property is associated with events that have made a significant contribution to the broad patterns of our history; or

b. The property is associated with the lives of persons significant in our past; or

c. The property embodies the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

d. The property has yielded, or may be likely to yield, information important in prehistory or history.

Criteria Considerations. Ordinarily, cemeteries, birthplaces, or graves of historical figures, properties owned by religious institutions or used for religious purposes, structures that have been moved from their original locations, reconstructed historic buildings, properties primarily commemorative in nature, and properties that have achieved significance within the past 50 years shall not be considered eligible for the National Register. However, such properties will qualify if they are integral parts of districts that do meet the criteria or if they fall within the following categories:

- A religious property deriving primary significance from architectural or artistic distinction or historical importance; or
- A building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or
- A birthplace or grave of a historical figure of outstanding importance if there is no appropriate site or building directly associated with his or her productive life; or
- A cemetery which derives its primary significance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events; or
- A reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived; or
- A property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own exceptional significance; or
- A property achieving significance within the past 50 years if it is of exceptional importance.

Integrity. Integrity is the ability of a property to convey its significance. To be listed in the National Register, a property must not only be shown to be significant under the National Register criteria, but it also must have integrity. The evaluation of integrity is sometimes a subjective judgment, but it must always be grounded in an understanding of a property's physical features and how they relate to its significance. Historic properties either retain integrity (this is, convey their significance) or they do not. Within the concept of integrity, the National Register criteria recognize seven aspects or qualities that, in various combinations, define integrity. To retain historic integrity, a property will always possess several, and usually most, of the aspects. The retention of specific aspects of integrity is paramount for a property to convey its significance. Determining which of these aspects is most important to a particular property requires knowing why, where, and when the property is significant.

The seven aspects of integrity:

1. Location is the place where the historic property was constructed or the place where the historic event occurred.
2. Design is the combination of elements that create the form, plan, space, structure, and style of a property.
3. Setting is the physical environment of a historic property.
4. Materials are the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.
5. Workmanship is the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory.
6. Feeling is a property's expression of the aesthetic or historic sense of a particular period of time.
7. Association is the direct link between an important historic event or person and a historic property.

Riverside County Landmarks

To be eligible for consideration as a Riverside County Historic Landmark, a historic resource must be nominated through the following application and approval process.

A. Historical resources that may be considered by nomination include:

- Historical resources found as eligible for local, state, or national landmark status during CEQA cultural review.
- Historical resources found as eligible for local, state, or national landmark status during a historic resource survey.
- A historic resource or district already so designated under a municipal or county preservation or landmark ordinance. (Riverside County Historic Preservation Districts are established by a different set of criteria under Riverside County Ordinance 578 and are not established under the criteria and procedures contained in this document.)
- Nominations for historic resources not already having some level of landmark designation, or found to be eligible for such, will be reviewed under criteria established below in Section VI, Types of Historical Resources and Criteria for Listing.

VI. Types of Historic Resources and Criteria for Listing: The typology and criteria listed below are consistent with those developed by the California Office of Historic Preservation but have been modified for local application at the county level.

A. Types of resources eligible for nomination:

- Building: A resource, such as a house, barn, church, factory, hotel, or similar structure created principally to shelter or assist in carrying out any form of human activity.

- Site: A site is the location of a significant event, a prehistoric or historic occupation or activity, or a building or structure, whether standing, ruined, or vanished, where the location itself possessed historical, cultural, or archaeological value. A site need not be marked by physical remains if it is the location of a prehistoric or historic event. Nor is it required that a building, structure, or object marked the site at the time of it is historic significance, occupation, or activity. Examples include trails, landscapes features, battlefields, habitation sites, Native American ceremonial areas, and rock art.
- Structure: The term "structure" is used to describe a construction made for a functional purpose rather than creating human shelter. Examples include mines, flumes, roads, bridges, and tunnels.
- Object: The term "object" is used to describe those constructions that are primarily artistic or commemorative in nature, relatively small in scale, and associated with a specific setting or environment. Objects that are located in museums are not eligible for landmark listing. Examples include fountains, monuments, maritime resources, sculptures, and boundary markers.
- Historic Districts: A geographic area designated as containing multiple historic resources that collectively have a special character or value—historical, cultural, architectural, archaeological, community, or aesthetic. A district must meet at least one of the criteria discussed below in Section B.

B. Criteria for evaluating the significance of historic resources: To be considered a historic resource eligible for landmark listing, the resource must be at least 45 years of age at the time of nomination. A historic resource must be significant under one or more of the following criteria in order to qualify for listing as a Riverside County Historic Landmark.

1. It is associated with events that have made a significant contribution to the broad patterns of Riverside County's history and cultural heritage.
2. It is associated with the lives of persons important to the history of Riverside County or its communities.
3. It embodies the distinctive characteristics of a type, period, Riverside County region, or method of construction, or represents the work of an important creative individual or possesses high artistic values.
4. It has yielded or may be likely to yield, information important in Riverside County, state of California, or national prehistory or history.

Integrity: Historical resources that have been preserved, rehabilitated, or restored according to the U.S. Secretary of Interior's standards for integrity will be given the highest consideration in the approval process.

Reconstructed buildings will not be considered for landmark status unless they are more than 45 years old and embody traditional building methods and techniques or they exhibit high artistic values in the execution of the reconstruction.

California Historical Resource (CHR) Status Codes

To be significant, a resource must meet at least one of the above-listed criteria and also retain enough integrity to convey its period of significance and association with an important historic context. Once a significance evaluation has been made, the resource is assigned a CHR status code. The CHR status codes are a standardized, shorthand method for identifying the significance level of a resource and include the following general categories:

1. Properties listed in the National Register or the California Register.
2. Properties determined eligible for listing in the National Register or California Register.
3. Appears eligible for National Register or California Register through survey evaluation.
4. Appears eligible for National Register or California Register through other evaluation.
5. Properties recognized as historically significant by local government.
6. Not eligible for listing or designation as specified.
7. Not evaluated for National Register or California Register or needs re-evaluation.

Generally, properties which have been given a 6 in its status code have been determined to be ineligible for designation under any criteria, and are not considered historical resources for the purposes of CEQA or the Murrieta Cultural Resource Preservation Ordinance. It should be noted that there are several subcategories within each of these that allow for various nuances, such as whether or not a resource is a contributor to a Historic District.

EXISTING CONDITIONS

Natural Setting

The City of Murrieta is located on the eastern margin of Temecula Valley, south of the Hogbacks Ridge. It has an average elevation of approximately 1,110 feet above mean sea level (AMSL). The project region is characterized by a semi-arid climate, with dry, hot summers, and moderate winters. Rainfall ranges from 12 to 16 inches annually (Beck and Haase 1974). Precipitation usually occurs in the form of winter rain, with occasional warm monsoonal showers in late summer. The nearest source of water is Warm Springs Creek, which is located in the eastern portion of the project.

The project is situated within the Lower Sonoran Life Zone, which ranges from below sea level to 3,500 feet AMSL (Bean 1977) and is represented in cismontane valleys and low mountain slopes covered with chaparral (Jaeger and Smith 1971). Common plants in the Murrieta area include oak, scrub oak, California buckwheat, cacti, chaparral, tule, mustard, hare oats, and various grasses. Common animals include coyotes, rabbits, rodents, raptors, vultures, reptiles, and insects. The natural biology of the project has been extensively disrupted by historical development. Most of the surface of the project has been disturbed by historic construction of the hot springs in the 1930s along with periodic flooding of Warm Springs Creek.

Geology. The project area is located in the Peninsular Range geologic province of California that encompasses western Riverside County. Crystalline rocks in the Murrieta area include gabbro and

granodiorite of the southern California batholith. These resistant rocks weather to form dark- or light-colored, boulder-covered conical buttes and hills. These granitic rocks have intruded and metamorphosed the Bedford Canyon Formation to form gneissic and schistose rocks (Rogers 1965). The crystalline rocks in the project area are covered by Older Pleistocene alluvium (Kennedy 1977) that, in turn, is covered by a thin horizon of Holocene soils and recent stream sediments in channels (Rogers 1965). Pedogenic carbonate (caliche or hardpan) is a depositional product associated with the Holocene soils and invades the Pleistocene sediments.

The southern tip of the Northern Peninsular Range has a number of igneous rocks utilized by Native American for food processing and tool manufacture. Granodiorites, quartz monzonites, and breccias are indigenous to the project. Metamorphosed sedimentary rocks, such as metamorphosed quartzite, are also found near the project in the Bedford Canyon formation. Olivine basalt, found near the project, was utilized as prehistoric tool material.

Cultural Setting

Prehistory. The description of various prehistoric stages, or chronologies, synthesizing cultural evolution in southern California has been attempted numerous times. Several of these chronologies have been combined in Moratto (1984:158) and illustrate that no single description is universally accepted. The varying chronologies are primarily based on changes in artifact styles, the introduction of new artifact types, and innovations in the use of raw materials. The presence of trade artifacts or raw material from distant sources is also used as temporal indicators. Variation exists among the chronologies due primarily to the differences in material items recovered from sites. Small differences occur over time and space, which combine to form patterns that are variously interpreted. The stages outlined in Table A serve to show a general relationship between the chronologies.

Table A: Cultural Chronology of Riverside County

Mojave and Colorado Desert			Western Riverside County		
Period	**Chronological Range**	**Diagnostic Artifacts**	**Period Name**	**Chronological Range**	**Diagnostic Artifacts/Features**
Proto-historic	AD 1200–1850	Desert Side-notched	Late Prehistoric	AD 500–Historic	Ceramics, Cottonwood Triangular and Desert side-notched projectile points (arrow points), cremations
Saratoga Springs	AD 500–1200	Rosegate series; pottery	Intermediate	2000 BC–AD 500	Mortars, pestles, discoidals, abundant (dart) projectile points, land and sea mammal bone
Gypsum	2000 BC–AD 500	Elko, Gypsum, Humboldt series; T-shaped drills, occasional large scraper planes, mortar and pestle	Milling Stone	6500–2000 BC	Metates, manos, cogstones, discoidals, core tools, paucity of projectile points, inhumations

Table A: Cultural Chronology of Riverside County

Mojave and Colorado Desert			Western Riverside County		
Period	**Chronological Range**	**Diagnostic Artifacts**	**Period Name**	**Chronological Range**	**Diagnostic Artifacts/Features**
Pinto	5000–2000 BC	Pinto series; large keeled-scrapers, flat milling stones	Early Man	9000 BC?–6500 BC	Large, often fluted, points, such as Clovis and Folsom types in association with extinct fauna
Lake Mojave	7000–5000 BC	Lake Mojave series; well-made bifacial knives and other cutting tools, large domed or keeled scrapers	—	—	—

Sources: Wallace 1955, 1962; Warren 1984, 1986.

The simplest of the chronologies generally divides prehistory into two major time periods: Early and Late (Meighan 1959; also Strudwick and Gallegos 1994:1.4). These chronologies are oversimplifications that have come to be replaced with other, more detailed sequences that more accurately reflect what actually existed.

Two primary regional culture chronology syntheses for southern California are commonly referenced in the archaeological literature. The first, advanced by Wallace (1955) delineated four cultural horizons, each with characteristic local variation. These include the Early Man, Milling Stone, Intermediate, and Late Prehistoric Horizons. Subsequently the term "Period" came to replace the term "Horizon," although both terms are intended to describe periods of time. In 1978, Wallace slightly revised and more clearly defined this chronology and applied radiocarbon dates, unavailable in 1955, to provide absolute dates (Wallace 1978:25-36). Currently, Wallace's chronology (1955, 1978) is among the most widely used prehistoric cultural chronology for southern California.

The second commonly used cultural chronology, based broadly on southern California prehistoric cultures, including those of the inland desert areas, San Diego, and Santa Barbara, was proposed by Warren (1968). This chronology was later revised (Warren 1984; Warren and Crabtree 1986) and utilizes five periods in southern California prehistory: Lake Mojave, Pinto, Gypsum, Saratoga Springs, and Protohistoric periods. Warren views cultural continuity and change in terms of various significant environmental shifts, marked by changing artifact assemblages and utilizes the cultural ecological approach. In this chronology, changes in settlement patterns and subsistence focus are viewed as cultural adaptations to a changing environment, beginning with the gradual environmental warming in the late Pleistocene, the desiccation of the desert lakes during the early Holocene, the short return to pluvial conditions during the middle Holocene, and the general warming and drying trend, with periodic reversals, that continues to this day (Warren 1986).

Early Period (Pre-5750 BC). Initial human occupation of prehistoric southern California is labeled "Early Man" or "Horizon I" by Wallace (1955). Elsewhere this "Paleo Indian" or "Early

Period" covers the time period from the first presence of humans in southern California until post-glacial times. Moratto (1984:104) uses the term *Paleo-Coastal*, which was first proposed by Davis et al. (1969) to identify specific components of coastal California sites dated between 11,000 and 8000 BP. Wallace (1978:25-28) renames this period the "Hunting" Period, and states that the terminal portion of the Early Period was approximately 6000–5000 BC. For purposes of this discussion, the Early Period nomenclature is retained and it designates a time period predating 5750 BC.

Although coastal Early Period cultures in California have been interpreted as diversified foraging economies (Moratto 1984:79-88; Erlandson 1994:44-45), Early Period artifacts and cultural activities from inland sites such as the California high desert (Warren 1984) suggest a predominantly hunting culture (Wallace 1955). Social structure from these cultures appears to have been based on hunting of now extinct megafauna, including large animals such as bison and mammoth. The occurrence of extremely large and occasionally fluted bifaces characterize this period (Moratto 1984:81). Large bifaces are associated with use of the spear and *atlatl*, also known as the spear thrower, and indicate big game hunting activities.

In the California desert, the Lake Mojave Period (7,000 to 5,000 BC) is associated with now-dry pluvial lakes. The material culture of the Lake Mojave Period is dominated by stylized dart points of the Lake Mojave and Silver Lake series, well-made bifacial knives and other cutting tools, large domed or keeled scrapers, and other characteristic artifact types (Wallace 1962). Ground stone tools are rare or absent at most sites from this time period.

In much of California, a Western Pluvial Lakes Tradition (WPLT) has been proposed as a concept to "… bring order to some of the taxonomic chaos …" in an effort to organize the "… terminological jungle that has obscured basic archaeological patterns and relationships" in California (Moratto 1984:92).

In general, the WPLT toolkit commonly includes crescentics, large flake and core scrapers, choppers, scraper planes, hammerstones, different core types, drills, gravers, and diverse types of flakes (Moratto 1984:93). A primary characteristic of WPLT sites is their location on the shores of pluvial lakes. The WPLT is thought to have manifestations at sites on the shores of pluvial lakes from northern central California to southern California (Moratto 1984:81, 103). The Lake Mojave Complex is one of the best known expressions of the WPLT.

None of the previous surveys and excavations in the City of Murrieta General Plan area has encountered artifacts from this period.

Milling Stone Period (5750–3000 BC). Wallace's (1955, 1978) "Horizon II" or "Milling Stone" follows the Early Period in time. Wallace (1955) suggests that cultures of the Milling Stone were generally hunter-gatherers who collected and processed plants. Wallace (1978:28-30) renames this period the "Food Collecting" Period, although he continues to use the Milling Stone Horizon in discussions. Some researchers have included the Milling Stone Period in other traditions and regional variants (Moratto 1984:125-133; Erlandson 1994:45). Milling Stone cultures are well represented in southern California and are also common from inland areas (True 1958; Strudwick and Bergin 1999). Milling Stone Period cultures are termed "Pinto" in the inland deserts (Warren

1984; Warren and Crabtree 1986); "Encinitas" in the San Diego and Orange County areas (Warren 1968); "Sayles" in the interior mountain region of San Bernardino County (Moratto 1984); "Topanga" along the coast in the Los Angeles area (Treganza and Bierman 1958); "La Jolla" along the San Diego Coast (M. Rogers 1939, 1945, 1966); and "Oak Grove" in the Santa Barbara area (D.B. Rogers 1929).

In the Peninsular Ranges of northern San Diego County, True (1958) identified a culture complex similar to the San Dieguito. The "Pauma Complex" was assigned to designate a series of sites containing crescentics and leaf-shaped points or knives of San Dieguito origin, associated with La Jolla Complex milling stones, core scrapers, and discoidals (Moratto 1984:151). The Pauma Complex was named after the Pauma Valley where some of the sites were found. The Pauma Complex appears to be an inland variant of the La Jolla Complex, located in and near areas that subsequently became Luiseño territory.

Wallace originally ended the Milling Stone period at approximately 1000 BC (Wallace 1955:223), but later placed the Milling Stone Period between 6000 and 3000 BC (Wallace 1978:28). However, Wallace stressed that the earliest known dates for the Santa Barbara and San Diego areas along the coast were only 5500 BC. For this report, a time period of 5750–3000 BC is taken to represent the Milling Stone Period.

Milling Stone traditions enjoyed a long history along the coast during the early Holocene. In the desert, the Pinto Period (5000–2000 BC) succeeded the Lake Mojave Period, and appears to have been a time of climatic stress, with resultant changes in environment and staple resources which affected cultural adaptations. As lakes and rivers dried up, plant and animal resources changed. Warren (1984) postulated that populations adjusted to hostile arid conditions by moving to oases in the deserts or to the edges of the desert. This dry period was followed by a moister period in which people returned to the deserts and more plant resources were utilized (Wallace 1962; Warren 1984).

The Milling Stone site characteristics include burial beneath rock or milling stone cairns. Milling Stone Period bifaces are rare and when found are usually large and likely used in conjunction with the atlatl. Bone is also rare at sites from this period. Milling Stone Period sites typically contain an abundance of ground stone artifacts including manos and metates. Crescentics, or crescentically-shaped bifacially flaked stone artifacts that are shaped liked curved knives, are commonly found on sites along the shoreline of pluvial lakebeds (Warren and Crabtree 1986:184), although they also occur on later sites. Occasionally, crescentics appear to be representations of animals. It is possible that cogged stones and crescentics are both, at least in part, material representations associated with spiritual beliefs. Cogged stones are shaped much like discoidals, but they have grooves or dogs, giving them an appearance similar to gears with teeth; what these objects represent is unknown. Although discoidals are also found into later times, both cogged stones and discoidals are found on Milling Stone Period sites (Wallace 1955), and most date from 4000–1000 BC (Moratto 1984:149).

In the inland deserts, milling implements are also found in large quantities on Milling Stone Period sites. Similar to the preceding Lake Mojave Period, dart points, especially Pinto series points, still dominated the material culture, and heavy keeled scrapers, flat millingstones, and manos are still found associated with sites from this period. The Milling Stone Period is

considered to be a wet period followed by a dry spell, which resulted in decreased desert populations; it subsequently led into the Little Pluvial at about 2000 BC (Warren 1984). Sites in the Mojave Desert associated with the Pinto Period are generally small and usually limited to surface debris, leading to the hypothesis that these sites are related to seasonal occupation by smaller groups (Warren 1984).

Although there is an overall lack of distinctively temporal artifacts from previous surveys, the majority of the sites and artifacts recovered from previous surveys and excavations in the City of Murrieta General Plan area probably date from this period (cf. Hoover and Dailey 2006; Cooley and Patterson 2008).

Intermediate Period (3000 BC–AD 500). The Intermediate Period is named because it falls midway between the Milling Stone Period and the Late Prehistoric Period. These three time periods were originally thought to be the only ones to exhibit a significant record of human occupation and use. The terms "Middle Period" (Warren 1968; King 1981) and "Diversified Subsistence" (Wallace 1978:28) have also been used. In southern California, the Intermediate Period has been referred to as "Gypsum" in the inland deserts (Warren 1984; Warren and Crabtree 1986), "Hunting" in the Santa Barbara area (D.B. Rogers 1929), and "Campbell" in the Santa Barbara and Ventura areas (Warren 1968). Wallace (1955:223) identifies "Horizon III" or the "Intermediate Horizon" as occurring between 1000 BC and AD 1000. Wallace (1978) later placed the Intermediate Period between 3000 BC and AD 500. Koerper and Drover (1983:11) report the Intermediate Period in Orange County from 1000 BC to approximately AD 650 (3000–1300 YBP).

The Intermediate Period is characterized by a diversification in subsistence strategies and an increased emphasis on exchange and interregional trade as ameliorating factors contributing to cultural stability. Inland populations centered around pluvial lakes created by runoff from melting glaciers. The use of the mortar and pestle increased dramatically during the Intermediate Period, marking the beginning of this period according to Wallace (1955, 1978). The mortar and pestle represent an important innovation in seed processing technology, and probably reflect a diversification in seed foraging and processing. It is possible that the mortar began to be preferred over the metate, which has a flat grinding surface, because the bowl-like shape of the mortar acted to contain small seeds during grinding. It is also possible that the mortar and pestle represent an increased reliance on acorns as a food resource (Glassow et al. 1988). The basket hopper-mortar was also used during the Intermediate Period.

The start of the Little Pluvial and Gypsum Periods (2,000 BC to AD 500) coincide with Elko series points as the diagnostic artifact. Manos and milling stones are commonly found at Gypsum Period sites. Flake scrapers were more widely used, although the occasional large scraper plane is also found (Warren 1984). Limited trade goods reaching the desert from the coast, such as *Haliotis* and *Olivella* shell beads and ornaments, are found associated with Gypsum Period sites (Warren 1968). Minor (1975) suggests that the first of the pit and groove petroglyphs were produced during the latter half of the Gypsum Period. Coso area petroglyphs, thought to have been made prior to the Intermediate Period, reflect a change in tool choice: from atlatl to bow-and-arrow which coincides with the use of the atlatl at the beginning of the Gypsum Period, and with an increased use of the bow-and-arrow into the Late Holocene (Warren 1984).

Sites from this period have also been recorded from surveys and excavations in the City of Murrieta General Plan area (cf. PCR Services Corporation 2007; Jones and Lerch 2006; Hoover 2006; Keller 2006).

Late Prehistoric Period (AD 500–1769). Wallace's "Horizon IV," the "Late Prehistoric Horizon," otherwise known at the "Late Prehistoric Period" or simply the "Late Period," begins roughly at AD 500 (Bean and Smith 1978). At this time, Late Prehistoric Period cultures represented in the archaeological record in southern California became increasingly complex and diverse. Changes in tool types, representing a new artifact technology, reflect other changes in cultural patterns, such as subsistence strategy and ceremonial practices. Changes in these cultural traits have been linked to a proposed Uto-Aztecan (Takic), or Shoshonean, cultural migration from the Great Basin to the Pacific Coast. Although there is some variation on when the Late Prehistoric Period occurred, it is generally assumed that the period began approximately AD 500–750, and its termination is widely accepted as AD 1769, the date of the beginning of permanent European occupation of California.

In desert areas, the cultural designation assigned to the Late Prehistoric Period includes the Saratoga Springs Period (AD 500–1200), followed by the Shoshonean Period, or Protohistoric Period (AD 1200 to historic times, and as late as 1850 in some locales) (Warren 1984). During the Saratoga Springs Period, groups continued a successful hunting and gathering adaptation to the desert environment through increasingly complex subsistence strategies. Distinguishing characteristics of the Saratoga Springs culture include the presence of pottery and projectile point types associated with use of the bow-and-arrow. Ceramic vessel technology, appearing first on the lower Colorado River approximately AD 800, and begins to spread west into the southern California deserts by AD 900. Brown Ware and Buff Ware ceramics both occur at Saratoga Springs Period sites. Associated with the use of ceramics are Desert Side-notched and Cottonwood triangular projectile points, both small projectile points associated with use of the bow-and-arrow. Increased use of steatite for ornaments, beads, and pendants is also characteristic of this period (Warren 1984).

In the subsequent Shoshonean, or Protohistoric Period, there was a strong reliance on plant food gathering and hunting of small game, and a decreased reliance on large game (Warren 1984; Warren and Crabtree 1986). Seasonal movement, transhumance, was common and resulted in a diverse array of site types. Technology in desert areas was greatly influenced by Hakatayan Culture of the lower Colorado River area (Warren 1984). Shoshonean Period sites contain flaked stone assemblages made almost exclusively of pressure flaked cryptocrystalline silicates, such as chert, chalcedony, and obsidian. Few bifaces, an increase in the quantity of flake cores and large flake blanks, and a decrease in flaked stone density characterize most Shoshonean Period sites.

Generally, in southern California during the Late Prehistoric Period, projectile points become smaller, indicating use of the bow-and-arrow for hunting. Studies indicate that Late Period projectile points begin to weigh, on average, less than 3.5 grams (Fenenga 1953). The use of steatite for arrow shaft straighteners, cooking, containers, and effigies such as pendants (Koerper and Drover 1983:20) becomes more common during the Late Prehistoric Period. Natural asphaltum, otherwise known as bitumen or tar, was more commonly used. Bone tools became

more common and varied. Ornaments of shell, bone, and stone were also more common. Koerper and Drover (1983) also state that pecten shell (*Argopecten* spp.) rattles are highly concentrated on Late Prehistoric Period sites. According to current literature, interment practices during this time are primarily cremation, except in the Santa Barbara area and on the Channel Islands where burial was still the preferred method of interment. Elaborate mortuary customs become widespread and abundant grave goods become common. In addition, there is evidence of an increase in land and sea mammal hunting.

By AD 1000, ceramic smoking pipes and pottery began to appear (Meighan 1954; Warren 1984). Within Luiseño territory, Meighan (1954) postulated two relatively distinguishable phases of the Late Period. One, an earlier pre-ceramic phase termed the San Luis Rey I, dates from approximately AD 1400 to 1750; the other, termed the San Luis Rey II, dates from approximately AD 1750 to 1850 and includes the presence of ceramics. Additionally, Meighan lists ceramic smoking pipes, cremation urns, red and black pictographs, and grooved steatite arrow shaft straighteners as indicators of the San Luis Rey II period. The introduction of ceramics to the Luiseño area was subsequently estimated by True et al. (1974:97) to have occurred approximately AD 1500–1600.

Ceramic vessels occur only sporadically within Gabrielino territory, and ceramic vessel technology appears to have remained in a vestigial stage in the Orange County area. Some researchers believe that utilitarian ceramic vessel technology, although known in what is now the Orange County area, was not practiced by the native population there until after European contact (McLean 2001). Prehistoric ceramic vessel technology is well documented in western Riverside County, and also from nearby San Diego County to the south (Meighan 1954; True 1958, 1966, 1970).

Late Prehistoric Period sites in the southern California area are also identified by the increased frequency of Salton Sea (Obsidian Butte) obsidian, which was used sporadically in southern California until after circa AD 1000. Obsidian Buttes obsidian is thought to have been made available by the receding shore of prehistoric Lake Cahuilla, its last two stands occurring from approximately AD 900 to 1500 (Wilke 1978:57). Other Late Prehistoric Period traits include the presence of Grimes Canyon fused shale, a semi-vitreous lithic material similar in appearance to obsidian that originates in Ventura County (Demcak 1981; Hall 1988). Artifacts made from fused shale are rare in Riverside County.

Wallace's Late Prehistoric Period (Horizon IV) is contemporaneous with the influx of native groups and sudden changes in material culture, subsistence focus, and burial practices thought to have originated in the deserts to the east. These cultural changes coupled with a group migration are thought to have occurred in approximately AD 500. This migration was formerly termed the *Shoshonean Intrusion* or *Shoshonean Wedge* and has been identified as such in a number of cultural chronologies. For the most part, use of the term "Shoshonean" to indicate a Uto-Aztecan (Takic) language has been dropped from the anthropological literature due to potential confusion with modern Shoshonean tribes who are Numic (Bergin and Ferraro 1999:24), another division of the obsolete Shoshonean language-group terms (Shipley 1978:90). The ethnographically recorded Luiseño, Juaneño, and Gabrielino are thought to be the descendants of prehistoric Takic populations that settled along the coast during the Late Prehistoric Period, or possibly earlier. The Serrano and Cahuilla, more distant from the coast, are also Takic-speaking tribes.

The term *Takic Wedge* is intended to imply the wedge of Takic culture groups that moved to the coast, displacing tribes of the Hokan language stock to the north and south. Displaced Hokan groups on the California coast include the Chumash and Salinan language families to the north, and the Yuman language family (Diegueño language) to the south. Kroeber (1925:578-580) first described what he terms as the "Shoshonean Intrusion" when he identified the narrow southwestern extension of the Shoshonean language family that existed throughout a large portion of the American Southwest and Great Basin. Kroeber describes an increasing number of dialects within the narrow southeastern extension stretching toward the California coast. Kroeber's original map (Kroeber 1925:578) depicting this wedge shows an enormous area of Shoshonean speakers in the Great Basin and American Southwest, with individual languages more numerous and the area narrowing as the wedge nears the Pacific Coast. Koerper (1979:78-79) includes information from many sources in a summary of this theory. Kroeber (1925) believed that the split between the Takic "wedge group" languages and the Hokan language groups that could have taken as long as 1,000 to 1,500 years to develop. Wallace (1962:178) and Rogers (1966:140) both place Takic incursions into the southern California deserts at approximately AD 1000.

Actual differences between the Takic language groups within the wedge, and the Hokan language groups outside of and separated by the wedge, include differences in cordage weave pattern (Rozaire 1967:330), human skull morphology (Titus 1987; Vellanoweth and Altschul 2002:102-104; Kerr et al. 2002), distinct language-group differences (Kroeber 1925:551), and differences in fishhook shank style that coincide with linguistic differences on the coast (Strudwick 1986:286). The migration may have occurred in successive waves over a period of time and it may have originated with trade between culture groups. Cultural familiarity would eventually lead to the knowledge of adjacent culture areas and could eventually result in cultural assimilation if one group was forced to emigrate from its culture area into an adjoining culture area, due to subsistence hardship or some other reason. Based on evidence from artifacts and human morphology distinguishable between Takic and Hokan groups, there is reason to believe that differences in what eventually became Takic-language areas were identifiable from the Hokan language areas much earlier than the 1,000–1,500 years that Kroeber (1925:578-580) and others had originally assumed. Although the nature and the timing of the *Takic Wedge* is currently a topic of some debate, it appears that people were entering coastal areas from desert regions as early as the middle Holocene (Grenda and Altschul 2002:145). What is unclear is when this incursion began, how long it continued, and if it was a series of successive waves of migration or a single immigration into the southern California area.

In the San Diego area, the most recent portion of the Late Prehistoric Period is referred to as the "San Luis Rey I and II" (Meighan 1954), while inland it is referred to as the "Cuyamaca Complex" (True 1958, 1966, 1970). The San Luis Rey phases gave way to the ethnohistorically described Luiseño, while the Cuyamaca Complex resulted in what we now call the Diegueño. In the Orange County area, the Late Prehistoric cultures are ethnohistorically recorded as the Gabrielino, except for a small group in the vicinity of Mission San Juan Capistrano known as the Juaneño.

The lack of Obsidian Butte obsidian and prehistoric ceramics at previously recorded sites in the Murrieta General Plan area suggests that the general plan area was little occupied during the Late Prehistoric Period.

Ethnography. The City of Murrieta is located within the traditional lands of the Luiseño. Prior to Spanish occupation of California, the territory of the Luiseño extended along the coast south to Agua Hedionda Lagoon, northwestward to Aliso Creek just north of San Juan Capistrano, and eastward to the Elsinore Valley and Palomar Mountain. These territorial boundaries changed over time, but they are generally southward of Gabrielino territory and westward of Cahuilla territory. As with the Cahuilla, they encompassed an extremely diverse environment that included coastal beaches, lagoons and marshes, inland river valleys and foothills, and mountain groves of oaks and evergreens (Bean and Shipek 1978). Kroeber (1925:648) describes the Luiseño as a hill people rather than a mountain people and states that they "…scarcely anywhere reached the summit of the watershed."

As previously stated, the Luiseño were named because they lived within the ecclesiastical jurisdiction of Mission San Luis Rey de Francia. Mission San Luis Rey was founded on June 13, 1798 (Hoover et al. 1962:47; Lowman 1993:2) by Father Fermín Francisco de Lasuén, Father Presidente of the missions after Father Junípero Serra's death on August 28, 1784 (McGroarty 1911:365). Mission San Luis Rey, known as the "King of the Missions," was the last of the southern missions to be founded. It was considered one of the most productive missions, with an enormous pasturage and many thousands of sheep, cattle, and horse, plus fields of wheat and grapes.

Like other Native American groups in southern California, the Luiseño caught and collected seasonally available food resources and led a semi-sedentary lifestyle. The geographical-political unit used by the Spanish to describe individual groups of Luiseño and Juaneño was the *rancheria* (White 1963:104). This term was also used for other California tribes. The term *rancheria* is generally equivalent with the term town or village. White (1963:115, 117) states that the average Luiseño village included approximately 30 square miles of territory, although Oxendine (1983:57) believes that the size of the village was less than 30 square miles. Average population of the Luiseño village was approximately 60 individuals, with a documented range of about 14 to 100 individuals (Oxendine 1983:57).

Luiseño villages were commonly located in valley bottoms, along streams, along coastal strands near mountains ranges, or sheltered in coves and canyons near a fresh water source that contained diverse resources. Village sites were commonly situated on elevated landforms. As described by Oxendine (1983:4, 178–179), the prehistoric Luiseño village exhibits certain attributes and environmental characteristics. These include midden sediment, bedrock milling features, ceramic pottery sherds, and usually pictographs and Cottonwood series projectile points. Specifically, the village site was located along the edge of a valley, at the interface of two or more plant communities, and at a location containing a spring or creek, sandy loam sediment, a slope of approximately 9 percent or less, and bedrock outcrops with horizontal or slightly sloping faces useful for milling purposes (Oxendine 1983:4, 178–179). Village locations could include both sides of a creek, but the village was always located within 100 m (328 ft) of water (Oxendine 1983:172).

As stated by Kroeber (1925:616), the time for creating an accurate map of Gabrielino villages was already past; and this statement is also more or less true for the Luiseño. Luiseño villages known to occur in and near Murrieta include *Avaa'ax* (meaning Cottonwood or Alamo), *Paashuku* (Gonzales Adobe) and *Toatwi* (Oxendine 1983:141-143). Another major Luiseño village, *Temeku*, is known from the Temecula area (McCown 1955). It is possible that another village existed in the area near Glen Ivy Hot Springs, less than 1.0 mile (1.6 km) from where Don Leandro Serrano built the first

house in Riverside County. That an early occupant of Riverside County constructed a residence in an area suggests that the locale possessed a native population and village, since settlers of southern California used native populations for labor.

The Luiseño took advantage of the various available resources. At any given time, individuals from the village would have been away from the village site procuring food such as seeds from local grasses, manzanita, sunflower, sage, chía, pine nuts, and acorns. Seeds were dried, ground, and cooked into a mush. In the historic period, acorns accounted for 10–25 percent of the food supply of coastal Luiseño, while acorns accounted for as much as 50 percent of the food supply of inland Luiseño (White 1963:121–122). Each autumn, the majority of a village camped near oak groves for a few weeks while collecting acorns that were stored and eaten over the course of the next year (Oxendine 1983:57). For the Luiseño and other native populations, however, there is some indication that the high percentage of acorn consumption may have reflected post-Mission dietary stress and does not represent continuity of a pre-Mission subsistence pattern.

Game animals such as deer, rabbit, jackrabbit, wood rat, mice, antelope, and many types of birds were regularly hunted (Bean and Shipek 1978). The Luiseño utilized fire for communal rabbit drives, as well as for crop management (Bean and Shipek 1978). Small seasonal habitation sites associated with these hunting activities would contain a paucity of artifacts, including fire-affected rock (FAR), some burned bone, and small amounts of ground and flaked stone tools. They might be found as open sites atop knolls or ridges, or in protected areas near streams, or even in rock shelters.

The Luiseño community was the focus of family life. Patrilineally linked, extended families occupied each village (Kroeber 1925; Bean and Shipek 1978). The Luiseño had a well-developed sense of ownership (White 1963:122), and their concept of property rights included the idea of private property. Property rights covered items and land owned by the village as well as items such as houses, gardens, ritual equipment, trade beads, eagle nests, and songs that were owned by individuals; trespass against any property was punished (Bean and Shipek 1978). Luiseño villages were politically independent and were administered by a chief, who inherited his position from his father.

The Luiseño conducted an elaborate toloache ritual related to the god *Chinigchinich*, including the ceremonial ingestion of Jimson weed (*Datura meteloides*), or datura, a hallucinogenic substance used to induce visions (Kroeber 1925:666; Bean and Shipek 1978). This cult, also referred to as the datura, or Jimson weed cult, was associated with the deity *Chinigchinich.* The cult of the culture hero, creator-god, and spiritual being *Chinigchinich*, was observed and recorded by Franciscan Friar Gerónimo Boscana during his residences at Missions San Juan Capistrano and San Luis Rey (Harrington 1933; Boscana 1933). The Luiseño also practiced ground or sand painting (DuBois 1908:87–91; Kroeber 1925:661), which was a significant ritual-cosmological component associated with most of their rituals (Bean and Shipek 1978:556). Although known to have been made by the Juaneño, Gabrielino, Diegueño, and Cupeño, sand painting has been best documented for the Luiseño and is not known for most Hokan language groups such as the Chumash, or Yuma, or by nearby Penutian language groups such as the Central Valley Yokuts. As such, Kroeber (1925:661) states that sand painting in prehistoric California was a development of the coastal Shoshonean, or Takic, language groups and was connected with similar paintings made by the Navajos and Pueblo groups of the Southwest. Furthermore, Kroeber (1925:661) stated that Luiseño sand painting was conducted in relation to the ingestion of datura during the toloache ritual.

History. In California, the historic era is generally divided into three periods: the Spanish Period (1769 to 1821), the Mexican Period (1821 to 1848), and the American Period (1848 to present). Early exploration of the Riverside County area began slowly until Lieutenant Pedro Fages, then the military governor of San Diego, crossed through the San Jacinto Valley in 1772.

On January 8, 1774, the Juan Bautista de Anza expedition crossed the Colorado River and entered California. Bautista de Anza's second excursion into Riverside County included 29 soldiers and their wives and children, who would form the new community at the Presidio of San Francisco (Beattie 1925). With the Spanish intrusion of the late 18th century came a drastic change in lifestyle for the natives of southern California. Incorporation of the indigenous populations into the mission system generally led to the disruption of native cultures and changes in subsistence and land use practices (Harley 1988). In 1821, Mexico overthrew Spanish rule, and the missions began to decline. By 1833, the Mexican government passed the Secularization Act, and the missions, reorganized as parish churches, lost their vast land holdings, and released their neophytes. In 1834, a prominent group of Californians, including the Lugos, the Vallejos, the Picos, and the Ortegas, coerced Governor Figueroa to create the "Provisional Regulations." These regulations made mission lands available for their occupation (Beattie and Beattie 1939). Sixteen ranchos were granted in Riverside County during the Mexican Period (1821 to 1848). They were predominantly devoted to cattle, with great tracts of land used for grazing. Until the Gold Rush of 1848, livestock and horticulture dominated the economics of California (Ingersoll 1904; Beattie 1925; Beattie and Beattie 1951).

As travel along the Santa Fe Trail and Southern Emigrant trails during the early American Period brought more settlers, the pattern of settlement developed along the Santa Ana and San Jacinto waterways. The Southern Pacific Railroad completed its line from Los Angeles through the San Gorgonio Pass in 1876. In 1883, the California Southern Railway opened up travel through the Cajon Pass and down to San Diego through western Riverside County. The trains were eventually used to transport settlers into the area, creating a period of agricultural and land development, ultimately resulting in the establishment of Riverside County in 1893. Transportation, agriculture, and the control of water have continued to be central themes in the settlement, development, and growth of Riverside County (Robinson 1979).

Murrieta. Murrieta's land area was originally included in Mission San Luis Rey's lands as part of Rancho Temecula. After secularization, other ranchos were carved out of the Temecula Rancho, including the Pauba, La Laguna, and Little Temecula Ranchos. By the mid-19th century, Murrieta's land area was bisected by the Southern Emigrant Trail, which ran through western Riverside County in a similar alignment to the current I-15. The trail, which also served as the route of the Butterfield stage, went through a major stop called "Alamos," which was located near the present-day intersection of Cherry and Jefferson Avenues in Murrieta. Another branch of the Southern Emigrant Trail turned northward from Temecula to Box Springs near present-day Moreno Valley roughly along the current route of I-215 (Lech 2004).

Murrieta was named after Don Juan Murrieta, a Spaniard who had come with his brothers to California in 1863. They originally settled in the Merced region of the San Joaquin Valley, but Don Juan Murrieta eventually drove his herds of sheep southward to southern California. After bringing 100,000 sheep to southwestern Riverside County, Murrieta (along with several business

partners) purchased 52,000 acres of the Temecula and Pauba ranchos from Vincent de Laveaga of San Francisco in 1873. Juan and his brother Ezekiel Murrieta deeded a right-of-way to the California Southern Railway in 1882, and soon thereafter announced their plans to subdivide a town called "Murrietaville" along the railroad (Garrison 1963; Lech 2004).

In 1884, before they could make their plans a reality, the Murrieta brothers were bought out by the Temecula Land and Water Company. The company immediately subdivided a portion of its new holdings near the Alamo stage stop, which had in the previous year also become a stop along the new California Southern Railway. The subdivided lands included 14,500 lots that were mostly 40 acres each, as well as some larger tracts ranging from 200 to 4,000 acres each for large-scale agriculture (Garrison 1963). At the heart of the subdivision was the Murrieta town site, which consisted of 160 acres divided into 537 lots near the railroad depot. The original grid layout of streets included Kalmia, Juniper, and Ivy Streets, which ran northeast to southwest; and Washington, Clay, and Hayes Streets, which ran northwest to southeast. The town increased rapidly during the boom years that affected many railroad-adjacent towns in southern California in the late 1880s (Lech 2004).

By 1886, the town included a post office, depot, large hotel, restaurant, newspaper, two general stores, a hardware and furniture store, school, livery stable, lumber yard, butcher shop, laundry, blacksmith shop, a church, a newspaper called *The Era*, and two physicians. By 1890, the town had a population of 800 (Garrison 1963). When Riverside County was formed in 1893, Murrieta was designated one of 12 original judicial townships and 40th election precinct (Gunther 1984).

The Santa Fe Railroad acquired California Southern Railway after a wet winter in 1883–1884 had ruined a large stretch of their newly-created railway through the Temecula Valley. They rebuilt the connection, but their purchase was never particularly profitable. After they completed their own line through the San Jacinto Valley, the California Southern alignment became somewhat redundant as well. In 1891, after another wet winter flooded and washed out the California Southern tracks in Temecula Valley, Santa Fe drastically curtailed rail service through Murrieta. Instead of repairing the flood-prone line through Fallbrook, Elsinore, and Corona, they realigned their route through the Pechanga Valley and connected it with the Santa Fe line up through Perris. Murrieta became the end of a rail spur from Corona and not a stop along any major thoroughfare (Garrison 1963). This, in addition to the broader southern California real-estate bust in the 1890s dampened Murrieta's growth as a town. After a short-lived attempt in the 1890s to attract "gentleman planters" to the area with an irrigation district aimed at supporting widespread groves of deciduous fruits, the area settled into a more bucolic existence (Lech 2004). Daily train service continued into Murrieta until 1935, after automobile use had become a well-established alternative to train travel in southern California (Garrison 1963).

From the 1890s through the late 20th century, Murrieta's land use and local economy focused on dry-farming grains (barley, wheat, and oats). According to a community history of Murrieta, "[Murrieta's] identity was shaped by the farms of vast rolling fields of the seasonal grasses, first green and then golden. Temecula was a town of cattlemen; Murrieta, of grain farmers that drove huge teams of horses pulling combine harvesters over the fields of the Antelope Valley, the Santa Rosa Plateau, and the Alamos district." Murrieta farmers also grew potatoes, alfalfa, vegetables, and grape vineyards, as well as orchards of olive, cherry, pear, apple, fig, and nectarine trees (Alter et al. 2005).

One exception to the community's dominant agricultural identity was the regionally-popular Murrieta Hot Springs. Located along present Murrieta Hot Springs Road just east of I-215, the mineral-rich springs have been used by people for thousands of years. The Luiseño called the springs *Cherukanukna Hakiwuna* and their extensive use of the springs is reflected in the numerous habitation sites and artifacts found nearby. Non-Indian visitors in the late 19th century determined that the springs had healing properties, and Murrieta Hot Springs became part of a rapidly growing network of Southern California destinations for health-seekers. In 1887, a Pasadena syndicate bought the hot springs, along with over a thousand acres of land. After several years of new owners, Murrieta Hot Springs was purchased by Fritz Guenther in 1902. It prospered under the family's ownership for nearly 70 years, expanding from 200 acres of ranch land and a few decrepit buildings into over 500 acres of prime resort spa, complete with bathhouses, tiled pools, hotels, great halls, stables, gardens, and hiking trails. However, by 1969 profits were down due to laws prohibiting gambling and affordable air travel enticed families to take their vacations elsewhere. Murrieta Hot Springs was sold again, continuing its decline over the years until the spa was closed in 1990 and the resort was auctioned off (Boyce 1995).

Renewed residential growth in Murrieta began in the 1980s with the improvement of I-15 and I-215 and subsequent migration of thousands of San Diego and Orange County residents farther inland in search of affordable suburban housing. The 1980 Census recorded only about 2,200 residents in Murrieta, but by 1990, the population had soared to over 24,000 residents. This rapid residential growth between 1980 and 1990 led Murrieta to incorporate as a general law City in 1991. Since incorporation, residential growth has continued to skyrocket, to 44,282 people in 2000 and to about 85,000 in 2005, making Murrieta the fifth largest city in Riverside County (City of Murrieta 2009).

FINDINGS

Records Search Methods and Results

In November 2009, a records search was conducted at the Eastern Information Center (EIC), located in the Department of Anthropology at the University of California, Riverside. This included a review of all recorded historic and prehistoric archaeological sites, as well as a review of known cultural resource surveys and excavation reports generated from projects located within the planning area. In addition, a review was conducted of the National Register, and documents and inventories from the California Office of Historic Preservation including the lists of the California Register, California Historical Landmarks, California Points of Historical Interest, and the Inventory of Historic Structures. LSA also reviewed historic maps, conducted online and secondary source research, and contacted the EIC for additional information on cultural resources within the planning area.

The results of the records search indicate that 330 cultural resource studies have been conducted within the planning area, resulting in the identification of a total of 199 documented cultural resources. The previous studies within the planning area are mainly cultural resource assessments, survey reports, and archaeological test excavations. The documented resources within the planning area include more than 75 separate milling features in bedrock, 36 milling artifacts, 53 sites with lithic artifacts (flakes, points, debitage), 5 sites with rock art, 9 possible prehistoric campsites or

habitation sites, 3 possible prehistoric quarries, 7 built resources, and 11 historic archaeological sites (trash scatters, habitation remains).

Of the documented resources, none of these are listed on the National and California Registers, and/or none are designated State Historic Landmarks and Points of Historic Interest.

Evaluated Resources in the Historic Properties Directory

A review of the Historic Properties Directory (HPD) revealed that an additional 73 properties have been documented and evaluated (see Table B). Several of these resources have been demolished or were otherwise not relocated by subsequent surveys. Eleven of them are part of the Murrieta Hot Springs complex, which was incorporated into a Christian conference center in 1995.

Table B: Evaluated Resources in the Historic Properties Directory

Address	Name	Date of Construction	CHR Status Code
24695 1st Avenue	Old Cheney Place, Holiness Parsonage	1900	5S2
24903 1st Avenue	Bradford Place/Houston Place	1890 (demolished)	5S2
24995 1st Avenue	Freeman House	1915	5S2
24628 2nd Avenue		1920	5S2
24646 2nd Avenue		1930 (demolished)	5S2
24675 2nd Avenue	Murrieta Elementary School	1920 (ruins)	3S
24790 2nd Avenue		1922	3S
24770 2nd Avenue	R.W. Bollen Place, Chrisman Place	1910	3S
42011 A Street	Methodist Parsonage/MT Auto Parts	1910	5S2
24260 Adams Avenue	Jake Lambert House Site	1900	7R
24370 Adams Avenue	Deering Home, Sawyer House	1930	7R
24460 Adams Avenue	Judge Thorn House, Curtis Thompson	1900	5S2
25549 Adams Avenue	Brown House	1885	3S
25701 Adams Avenue	Roy Southard Place	1894 (demolished)	3S
41919 C Street	Frank Lloyd House	1920	5S2
42086 C Street	Frank Thorn House	1898	3S
24711 Clay Avenue	Lambert House	1900 (demolished)	7R
24737 Clay Avenue	Fountain House Hotel Site	1936	7R
42036 D Street	Cora Stoller House	1910	5S2
24120 Hayes Avenue	Sykes House	1905 (demolished)	5S2
24916 Hayes Avenue	Williams Ranch/Mefferd	1920	5S2
41833 Ivy Street		1920	5S2
41950 Ivy Street	Hedges House/Rail House	1900	5S2

Table B: Evaluated Resources in the Historic Properties Directory

Address	Name	Date of Construction	CHR Status Code
42835 Ivy Street	Matteson Ranch/Olive Hill Ranch	1930	7R
Jefferson Avenue	Burnham House/Drucker Ranch	1932	5S2
25679 Jefferson Avenue	Merrill House/Provolt House	1900	5S2
25751 Jefferson Avenue	Raleigh Brown Place	1910 (demolished)	5S2
41958 Juniper Street	Doolittle House/Cruz House	1885	5S2
41539 Kalmia Street	Austin Warner House, Hite House	1913 (demolished)	5S2
37100 Los Alamos Road		1947 (demolished)	7R
37201 Los Alamos Road	James Place	1915 (demolished)	5S2
40851 Los Alamos Road	Yoder Ranch	1900 (demolished)	5S2
41301 Los Alamos Road	Ross Rail House	1916 (demolished)	7R
41621 Magnolia Street	Cornwell Place, Morrow Place	1920 (demolished)	5S2
39401 Murrieta Hot Springs Road	Murrieta Hot Springs, Hotel	1915	3B
39401 Murrieta Hot Springs Road	Murrieta Hot Springs, Bungalows	1905	3B
39401 Murrieta Hot Springs Road	Murrieta Hot Springs, California	1908	3B
39401 Murrieta Hot Springs Road	Murrieta Hot Springs, Alive Polari	1908	3S
39401 Murrieta Hot Springs Road	Murrieta Hot Springs, Steam Plants	1925	3D
39401 Murrieta Hot Springs Road	Murrieta Hot Springs, Offices	1928	3D
39401 Murrieta Hot Springs Road	Murrieta Hot Springs, Bath House	1929	3B
39401 Murrieta Hot Springs Road	Murrieta Hot Springs, Plunge	1929	3B
39401 Murrieta Hot Springs Road	Murrieta Hot Springs, New Hotel	1926	3B
39401 Murrieta Hot Springs	Murrieta Hot Springs, Landscape	1910	3D
39401 Murrieta Hot Springs Road	Murrieta Hot Springs, Dining Room	1910	3B
39405 Murrieta Hot Springs	Guenther's Murrieta Hotsprings	1926	7J
40030 Murrieta Hot Springs Road	Temecula Hot Springs		5S2
92362 Murrieta Hot Springs Road	Murrieta Hot Springs, Memorial Hall	1913	3B

Table B: Evaluated Resources in the Historic Properties Directory

Address	Name	Date of Construction	CHR Status Code
39755 Murrieta Hot Springs Road			6Y
New Clay Avenue	Grain Elevator	1919	3S
24721 Clay Avenue	Manse House	1931	5S2
24912 Plum Avenue	B.W. Tarwater House	1888	3S
42670 Tenaja Road	McCool House	1920 (demolished)	5S2
10250 Verdugo Road	Wheeler Ranch, Ranch Home	1910 (demolished)	3B
10250 Verdugo Road	Wheeler Ranch, Rancho Viejo de Car	1910 (demolished)	3S
10250 Verdugo Road	Wheeler Ranch, Root Cellar	1910 (demolished)	3B
10250 Verdugo Road	Wheeler Ranch, Barn	1910 (demolished)	3B
10250 Verdugo Road	Wheeler Ranch, Bunk House #1	1910 (demolished)	3D
10250 Verdugo Road	Wheeler Ranch, Bunk House #2	1910 (demolished)	3D
24190 Washington Avenue	Schupe's Log Cabin, Anderson's Café	1920 (demolished)	3S
24264 Washington Avenue	Paul Thompson Place	1937	5S2
24280 Washington Avenue	U.S. Soil Conservation Office	1934 (demolished)	5S2
24490 Washington Avenue	Thompson House	1914	5S2
24629 Washington Avenue	George Cocking House, Kane House	1920 (demolished)	5S2
24641 Washington Avenue	Sam Barnes House	1920 (demolished)	5S2
24770 Washington Avenue	Lakeman's Restaurant/Ray's Café	1900	5S2
24792 Washington Avenue	Lakeman House/Bezanson House	1885 (demolished)	5S2
24854 Washington Avenue	Hamilton House	1925	5S2
24890 Washington Avenue		1930	5S2
24973 Washington Avenue	Cliff Thompson House	1917 (demolished)	5S2
25190 Washington Avenue	Dodd House, Stoner House	1885	5S2
25229 Washington Avenue	Buchanan House	1885	5S2
25440 Washington Avenue	Hutchison House	1885	3S
92362 Washington Avenue	Thompson House, A.K. Small House	1900	5S2

Properties Listed in the City Historic Resources Inventory

As shown in Table C, another 59 historic resources were included in the 2005 Murrieta Historic Resources Survey Update (Alter et al. 2005). Many of these resources were initially documented by the Riverside County Historical Commission in a 1982 survey. This 1982 survey was submitted to the

EIC and added to the Riverside Historic Properties Directory, but the 2005 survey was not submitted. Therefore, some of the properties listed below also appear in the HPD list above.

Table C: Properties Listed in the City Historic Resources Inventory

Address	Name	Date of Construction	CHR Status Code
24635 1st Street	H.P. Zimmerman Property	1920	6Z
24643 1st Street	I.O. and Marion O. Rail Property/ Gagnon House	1930	6Z
24695 1st Avenue	Old Cheney Place, Holiness Parsonage	1900	5S2
24757 1st Street	Lotta Matteson Property/Westrem House	1950	6Z
24903 1st Avenue	Bradford Place/Houston Place	1890 (demolished)	5S2
24920 1st Street	Frank G. Thorne Property/Steely House	1925	6Z
24995 1st Avenue	Freeman House	1915	5S2
24620-24646 2nd Street		1910	5S2
24628 2nd Avenue		1920	5S2
24646 2nd Avenue		1930 (demolished)	5S2
24675 2nd Avenue	Murrieta Elementary School	1920 (ruins)	3S
24770 2nd Avenue	R.W. Bollen Place, Chrisman Place	1910	3S
24790 2nd Avenue		1922	3S
24815 2nd Street	Fred & Cora Cooper Property/ Boyd/Jones House	1930	6Z
24993 2nd Street	Charles Provost Property/ Alvarado-Luz House	1920	6Z
42011 A Street	Methodist Parsonage/MT Auto Parts	1910	5S2
24260 Adams Avenue	Jake Lambert House Site	1900	7R
24370 Adams Avenue	Deering Home, Sawyer House	1930	7R
24460 Adams Avenue	Judge Thorn House, Curtis Thompson	1900	5S2
24960 Adams Avenue			
25549 Adams Avenue	Brown House	1885	3S
41919 C Street	Frank Lloyd House	1920	5S2
41940 C Street	Fire Station No. 1	1948	5S2
42086 C Street	Frank Thorn House	1898	3S
24711 Clay Avenue	Lambert House	1900	7R
24721 Clay Avenue	Manse House	1931	5S2
24737 Clay Avenue	Fountain House Hotel Site	1936	7R
42036 D Street	Cora Stoller House	1910	5S2
24120 Hayes Avenue	Sykes House	1905 (demolished)	5S2
24916 Hayes Avenue	Williams Ranch/Mefferd	1920	5S2

Table C: Properties Listed in the City Historic Resources Inventory

Address	Name	Date of Construction	CHR Status Code
41529 Ivy Street		(demolished)	
41541 Ivy Street			
41763 Ivy Street	Nancy Lee Gossett Property	1940	6Z
41833 Ivy Street		1920	5S2
41950 Ivy Street	Hedges House/Rail House	1900	5S2
24413 Jefferson Avenue	Bessie Wickerd Property	1930	5S2
24831 Jefferson Avenue		1920	5S2
25580 Jefferson Avenue	Charles Charnock Property	1930	5S2
41810 Juniper Street			
41958 Juniper Street	Doolittle House/Cruz House	1885	5S2
41539 Kalmia Street	Austin Warner House, Hite House	1913 (demolished)	5S2
37100 Los Alamos Road	George Hind/ Gentry Family Property	1945	5S2
37201 Los Alamos Road	James Place	1915 (demolished)	5S2
40798 Los Alamos Road		1930	6Z
40851 Los Alamos Road	Yoder Ranch	1900 (demolished)	5S2
41223 Madison Avenue		1930	5S2
41886 Magnolia Street	H.B. Lashlee Property/ Railroad Workers Dormitory	1942	5S2
41908 Magnolia Street	H.B. Lashlee Property	1906	5S2
New Clay Avenue	Grain Elevator	1919	3S
24901 New Clay Street	Norma Jean Cunnington Property/ Isham House	1978	6Z
21945 Plum Street		1935	5S2
24912 Plum Avenue	B.W. Tarwater House	1888	3S
24980 Plum Street	D.H. and Sarah J. Turnbeaugh Property	1930	6Z
24264 Washington Avenue	Paul Thompson Place	1937	5S2
24280 Washington Avenue	U.S. Soil Conservation Office	1934 (demolished)	5S2
24490 Washington Avenue	Thompson House	1914	5S2
24629 Washington Avenue	George Cocking House, Kane House	1920 (demolished)	5S2
24641 Washington Avenue	Sam Barnes House	1920 (demolished)	5S2
24741 Washington Avenue			
24770 Washington Avenue	Lakeman's Restaurant/Ray's Café	1900	5S2
24785-24791 Washington Avenue			
24792 Washington Avenue	Lakeman House/Bezanson House	1885 (demolished)	5S2
24854 Washington Avenue	Hamilton House	1925	5S2
24861 Washington Avenue			

Table C: Properties Listed in the City Historic Resources Inventory

Address	Name	Date of Construction	CHR Status Code
24890 Washington Avenue		1930	5S2
24935 Washington Avenue			
24973 Washington Avenue	Cliff Thompson House	1917 (demolished)	5S2
25069 Washington Avenue			
25190 Washington Avenue	Dodd House, Stoner House	1885	5S2
25229 Washington Avenue	Buchanan House	1885	5S2
25440 Washington Avenue	Hutchison House	1885	3S

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APPENDIX A

RECORDS SEARCH LETTERS

Appendix J:

Riverside County Planning Department – Permitted Surface Mines

General Information

Surface Mining - Links

- Surface Mining Information
- Surface Mines List
- Ordinance No. 555
- California Dept. of Conservation
- Public Resources Code (SMARA)

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Riverside, CA 92502-1629

Permitted Surface Mines List

NOTE: Click the column header name to sort by that category

MINE OPERATOR	MINE NAME	PERMIT NUMBER	STATE MINE ID	LOCATION	MINE STATUS
Riverside Co. Trans.	Black Rock Pit	RCL00158	91-33-0058		Reclaimed
Yeager/Skanska	Avalon	SMP00171R1	91-33-0002		Expired
Shamrock Sand & Rock LLC	Shamrock Mine	SMP00145	91-33-0042	Aguanga	Expired
Superior Ready Mix (Owl Rock)	Wilson Creek	SMP00185	91-33-0081	Aguanga	Expired

Riverside Co. Trans.	Terwilliger Road Pit	RCL00148	91-33-0047	Anza	Active
County of Riverside	Brookside Materials Yard	RCL00162	91-33-0094	Beaumont	Active
Riverside Co. Trans.	Beaumont Pit	RCL00143	91-33-0056	Beaumont	Reclaimed
Crawford & Associates	Tom's Quarry	SMP00195	91-33-0078	Blythe	Expired Under Reclamtion
Crawford Associates	Crawford's Mine	RCL00160	91-33-0091	Blythe	Active
Palo Verde Irrigation District	PVID North Gravel Pit	RCL00161	91-33-0089	Blythe	Active
Richard Ringer	Blackstone Mine	RCL00165	91-33-0097	Blythe	Active
Riverside Co. Trans.	Bradshaw Pit	RCL00144	91-33-0046	Blythe	Active
Riverside Co. Trans.	Midland Pit	RCL00147	91-33-0051	Blythe	Active
Shepwells	Midland Pit	SMP00199	91-33-0080	Blythe	IMP
Shepwells Inc.	Williams Pit	RCL00156	91-33-0088	Blythe	IMP
Robertson's Ready Mix	Cabazon Quarry	SMP00162R1/S2	91-33-0008	Cabazon	Active
Riverside Co. Trans.	Mtn. View Rd. Pit	RCL00139	91-33-0048	Cathedral City	Active
Chandler Aggregates	Sierra Plant (Pao Verde)	SMP00202	91-33-0011	Corona	Active
Dan Copp Crushing	Prado Pit	RCL00113	91-33-0043	Corona	IMP
Murdock Development Co.	CISCO Mine	SMP00109R1	91-33-0017	Corona	Reclaimed
Kaiser Resources	Eagle Mtn Mine	RCL00107R1	91-33-0060	Desert Center	Active
Riverside Co. Trans.	Little Lake Pit	RCL00145	91-33-0055	Hemet	Active
Cemex	Juniper Flats Mine	RCL00124	91-33-0040	Homeland	IMP
Riverside Co. Trans.	Juniper Flat Pit	RCL00142	91-33-0053	Homeland	Active
A-1 Aggregates	A-1's Dillon Rd. Mine	RCL00159	91-33-0093	Indio	Active
Coronet Concrete	Palm Desert Rock	RCL00155	91-33-0028	Indio	Active
Coronet Concrete Products	Fargo Canyon Mine	SMP00200	91-33-0092	Indio	Active
Gary Butler	Mesa Blanca Mine	SMP00205	Not Issued Yet	Indio	Approved Not Active
Granite Const. Co.	Indio Mine	SMP00176R1	91-33-0030	Indio	Active
James E. Simon Co.	Simon's Sand & Gravel Mine	SMP00211	Not Issued Yet	Indio	Applied Status
James Rue Construction	Vista Mine	SMP00204	91-33-0095	Indio	Active
James Simon Co.	Simon Mine	RCL00152R1	91-33-0063	Indio	Active
Werner Corp.	Coachella Valley Aggreates	SMP00193	91-33-0084	Indio	Active
West Coast Aggregates	R Bar C	SMP00161R3	91-33-0072	Indio	Active
Yeager/Skanska	Yeager's Dillon Road	SMP00194	91-33-0066	Indio	Idle
Delilah Properties Inc. (MCA)	MCA's Alberhill Shale Clay mine	SMP00173	91-33-0018	Lake Elsinore	Active
Dennis Younger Co.	Younger Mine	SMP00105	91-33-0065	Lake Elsinore	Reclaimed
Elsinore Ready Mix	Mountain Ave Pit # 2	LE-2	91-33-0021	Lake Elsinore	IMP
Pacific Aggregates Inc.	Mtn. Ave. Pit 2	RCL00110/S1	91-33-0020	Lake Elsinore	Active
Pacific Clay Products	Pacific Clay Pits	SMP00108	91-33-0006	Lake Elsinore	Active
Pacific Clay Products	Murdock Alberhill Ranch	LE-3	91-33-0073	Lake Elsinore	Under Reclamation
Pacific Clay Products	Murdock Ranch Mine	RCL00112	91-33-0073	Lake Elsinore	Active
Pacific Clay Products	Alberhill Mine	LE-4	91-33-0022	Lake Elsinore	IMP
Riverside Co. Trans.	Bundy Canyon Pit	RCL00141	91-33-0049	Lake Elsinore	Active
WYROC Inc.	WYROC - Lake Street	LE-1	91-33-0015	Lake Elsinore	IMP
County of Riverside	Markham Materials Yard	RCL00164	91-33-0054	Mead Valley	Active
Riverside Co. Trans.	Markham Pit	RCL00140	91-33-0054	Mead Valley	Active
Riverside Co. Trans.	Mecca Pit	RCL00146	91-33-0057	Mecca	Reclaimed
Pacific Gypsum Products	Standard Gypsum Mine	SMP00102	91-33-0076	Midland	Active
Plyley Enterprises Inc.	Philadelphia Recycling Mine	SMP00170R1	91-33-0029	Mira Loma	Active

Kennedy Hills Ent. LLC	Kennedy Hills Materials	SMP00159R1	91-33-0019	Moreno Valley	Active
Vulcan Materials	Jack Rabbit Canyon	SMP00153	91-33-0009	Moreno Valley	Reclaimed
KEC Corp.	River Road Sand Removal	RCL00151	91-33-0083	Norco	Active
Caltrans	Travertine	Cal Trans - 2	91-33-0044	Oasis/Salton Sea	Reclaimed
Granite Construction Co.	Garnet Rock Pit	RCL00129	91-33-0031	Palm Springs	Active
Paul Hubbs Construction	Pyrite Quarry	RCL00123/S1	91-33-0062	Riverside	Active
Yeager/Skanska	Avalon Mine	SMP00206	91-33-0002	Riverside	Applied Status
Asphalt & Concrete Recycling	Romoland Quarry	SMP00190	91-33-0087	Romoland	Expired
Granite Construction Co.	Liberty Quarry	SMP00213	Not Issued Yet	Temecula	Applied Status
Riverside Co. Trans.	E. Benton Pit	RCL00138	91-33-0052	Temecula	Active
CEMEX	Mayhew Canyon Quarry	RCL00106	91-33-0039	Temescal Canyon	Active
3M Corp.	3M Corona	RCL00136/S1/S2	91-33-0016	Temescal Cyn	Active
CEMEX	Dawson Canyon Mine	SMP00165R1	91-33-0041	Temescal Cyn	Reclaimed
CEMEX	Mayhew Canyon Quarry	SMP00139	91-33-0039	Temescal Cyn	Active
Chandler Aggregates Inc.	Coldwater Plant	SMP00133/S1	91-33-0014	Temescal Cyn	Active
Cleo Owens	Cleo Owens	SMP00208	Not Issued Yet	Temescal Cyn	Applied Status
Corona Clay Co.	Corona Clay Mine	SMP00197	Not Issued	Temescal Cyn	Applied Status
Gail Materials	Mobile Sand & Gravel	SMP00119R2/S1	91-33-0007	Temescal Cyn	Active
Hanson Aggregates	Eagle Valley Quarry	SMP00152	91-33-0035	Temescal Cyn	Active
Mission Clay Products	Ben's Mine	RCL00135	91-33-0034	Temescal Cyn	Active
Paul Hubbs Construction	Harlow Quarry	RCL00118	91-33-0061	Temescal Cyn	Expired/DRT
RENTRAC	Corona Clay Pit	RCL00121	91-33-0023	Temescal Cyn	Active
RENTRAC	Liston Clay Pit	SMP00107	91-33-0025	Temescal Cyn	Active
Synagro	Recyc. Mine	SMP00175	91-33-0074	Temescal Cyn	Active
Waste Management Inc.	US Tile #6	RCL00125	91-33-0013	Temescal Cyn	Under Reclamtion
Werner Corp.	Glen Ivy #2	SMP00150R1	91-33-0010	Temescal Cyn	Active
Werner Corp.	Glen Ivy #1	SMP00143R1	91-33-0001	Temescal Cyn	Active
Werner Corp.	Glen Ivy #3	SMP00182/S1	91-33-0075	Temescal Cyn	Active
Caltrans	Thermal Wash	Cal Trans - 1	91-33-0045	Thermal	Reclaimed
Channel & Basin Reclamation Inc.	Mecca Hills	SMP00192	91-33-0085	Thermal	Expired
Channel & Basin Reclamation Inc.	Mecca Hills Mine #2	SMP00209	Not Issued Yet	Thermal	Applied Status
Granite Construction Co.	Thermal Pit	SMP00196	91-33-0033	Thermal	IMP
Riverside Co. Trans.	Thermal Canyon Pit	RCL00149	91-33-0068	Thermal	Reclaimed
Riverside Co. Trans.	New Thermal Pit	RCL00154	91-33-0090	Thermal	Active
West Coast Aggregates	Valley Rock & Sand	SMP00129	91-33-0071	Thermal	Active
Sam Jones Mining Co.	Sam Jones Mine	SMP00147R1	91-33-0082	Thousand Palms	IMP
Yeager/Skanska	Thousand Palms	SMP00198	91-33-0086	Thousand Palms	Active
Yeager/Skanska	BLM Thousand Palms	RCL00150	91-33-0067	Thousand Palms	Expired Under Reclamtion
MWD	Whitewater Pit	RCL00130	91-33-0032	Whitewater	Mining Complete
Rio Stone Products	Rio Stone Mine	SMP00207	None Issued	Whitewater	Withdrawn
Whitewater Rock & Supply	Painted Hills Quarry	DHS-1	91-33-0003	Whitewater	Active

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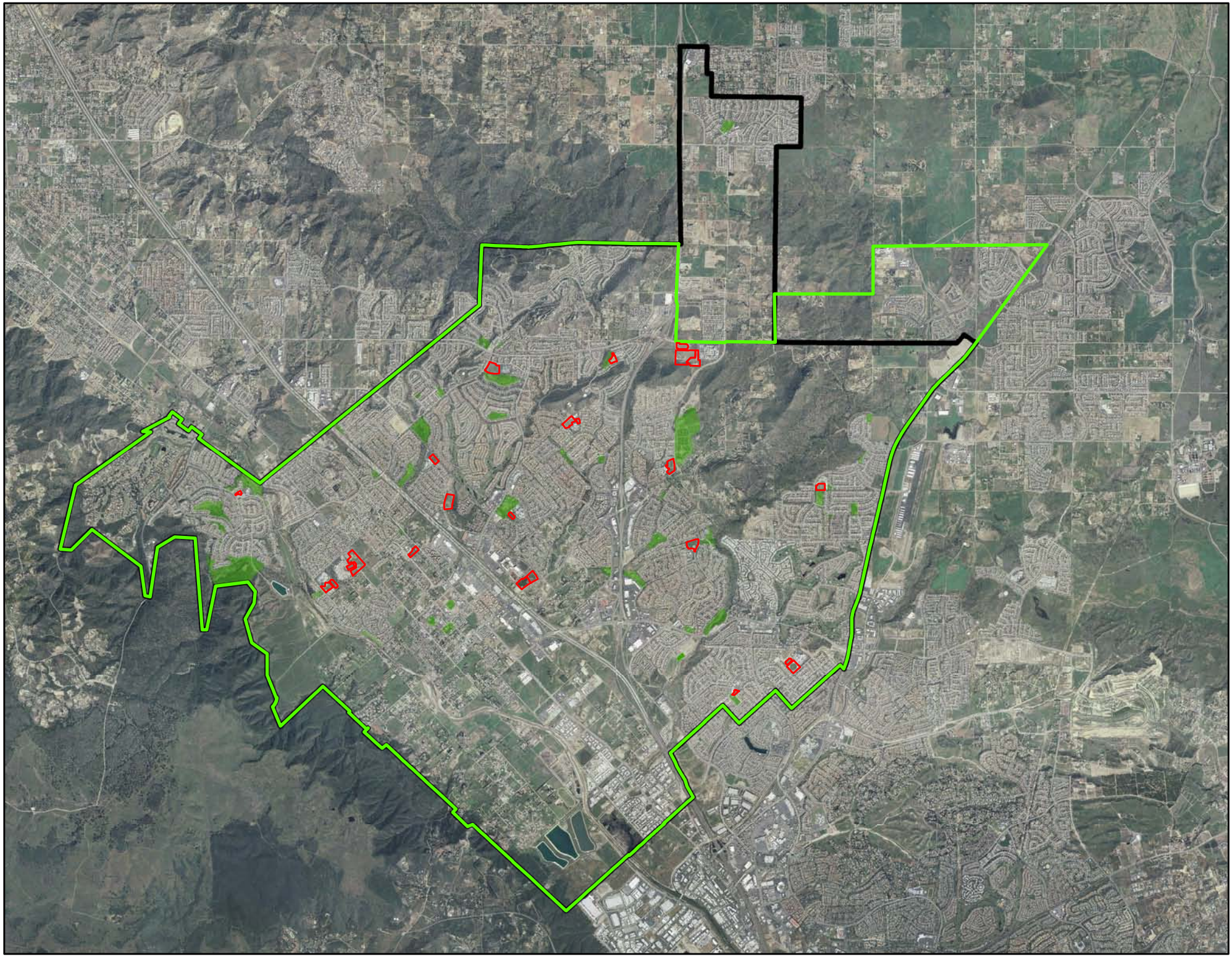
Appendix K:

Parks & Open Space Available on School Sites



Murrieta General Plan
School Parks

Area	Acres	SchoolName
270,383.58	6.21	Murrieta Mesa High
681,377.54	15.64	Vista Murrieta High School
331,083.75	7.60	Calvary Murrieta Christian
39,174.62	0.90	Cole Canyon Elementary
553,619.50	12.71	Murrieta Valley High School
182,682.52	4.19	Creekside High School
77,031.82	1.77	Murrieta Valley High School
99,223.96	2.28	Creekside High School
130,024.61	2.98	The Oak Grove Center
125,096.32	2.87	E. Hale Curran Elementary
68,300.94	1.57	Shivela Middle
216,639.60	4.97	Murrieta Mesa High
261,460.16	6.00	Avaxat Elementary
341,743.73	7.85	Tovashal Elementary
115,206.01	2.64	Antelope Hills Elementary
316,816.83	7.27	Vista Murrieta High School
254,192.25	5.84	Rail Ranch Elementary
268,962.56	6.17	Alta Murrieta Elementary
154,834.74	3.55	Monte Vista Elementary
254,816.99	5.85	Warm Springs Middle
68,916.11	1.58	Warm Springs Middle
48,902.83	1.12	Daniel L. Buchanan Elementary
169,772.26	3.90	Vista Murrieta High School

Total	**5,030,263.23**	**115.48**

Appendix L:

Eastern Municipal Water District Reference Materials

Appendix L1:

2005 Urban Water Management Plan

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Section 1 - Introduction

Urban Water Management Planning Act

Water Code Section 10620 (a) of the Urban Water Management Act, states "Every urban water supplier shall prepare and adopt an urban water management plan in the manner set fourth in Article 3 (commencing with section 10640). These plans are to be updated every five years and submitted to the Department of Water Resources (DWR). Urban water management plans for 2005 are due to DWR on December 31, 2005.

Requirement for the urban water management plans include:

- Assessment of current and projected water supplies
- Evaluation of Demand and Customer Types
- Evaluation of the reliability of water supplies
- Description of conservation measures implemented by the urban water supplier
- Response plan for in the event of water shortage
- Comparison of demand and supply projections.

This report has been prepared to comply with the Urban Water Planning Act. In addition to meeting the requirements of the Act, this report will be used to support water supply assessment and verification required by Senate Bills 610 and 221 of 2001. These bills require that water supply information be provided to counties and cities for projects of a certain size prior to project approval. Both bills allow an Urban Water Management Plan to be used as a source document that may be used to fulfill these legislative requirements.

Public Participation

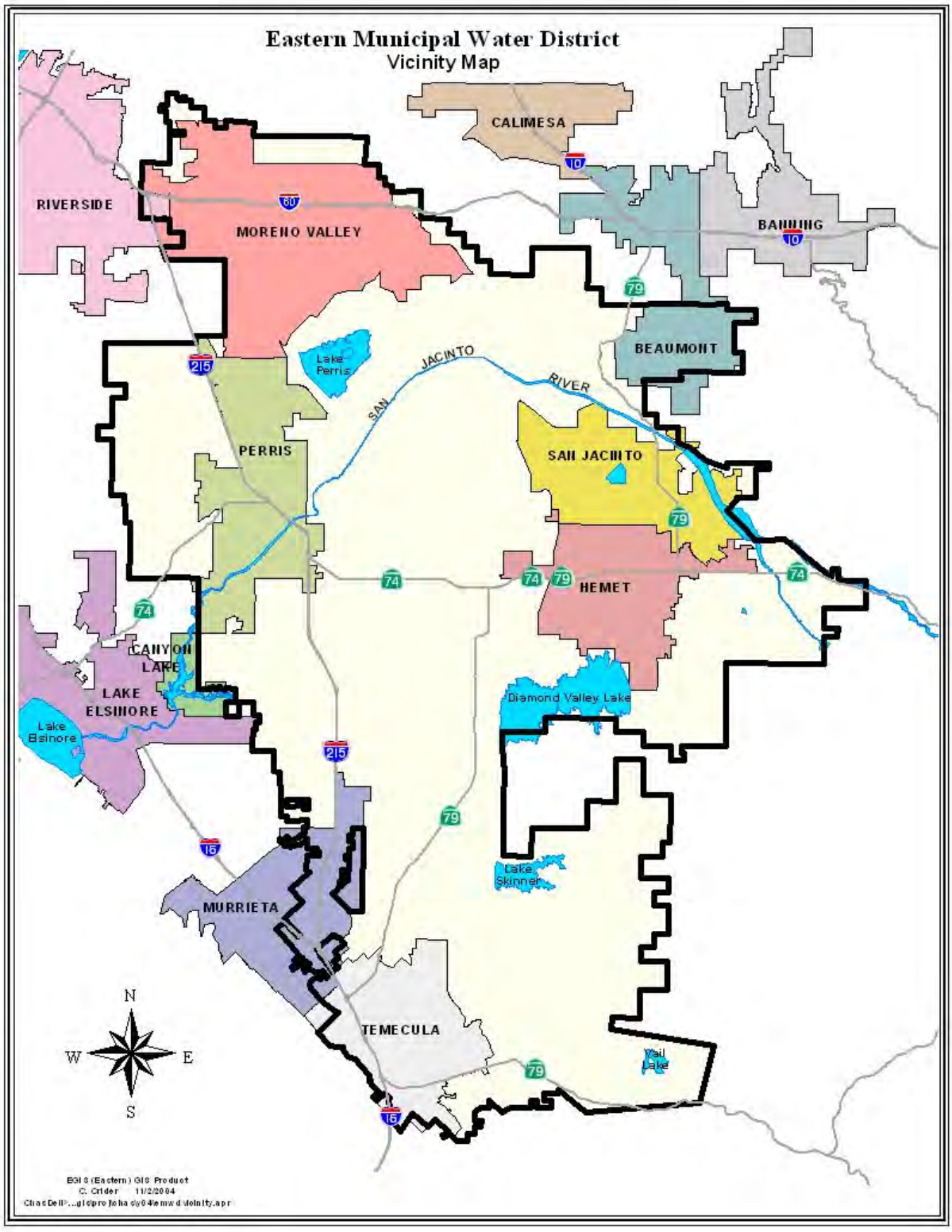
Article 3, Section 10642 of the Urban Water Management Plan Act requires that each urban water supplier shall encourage the active involvement of diverse social, cultural and economic elements of the population within the service area. EMWD has encouraged the participation of sub agencies, cities and the County of Riverside and other public groups. Public participation and coordination efforts are detailed in Appendix A.

Eastern Municipal Water District

Eastern Municipal Water District (EMWD, District) is a public water agency formed in 1950 by popular vote. In 1951, it was annexed into the Metropolitan Water District of Southern California (MWD) and gained a supply of imported water from the Colorado River Aqueduct (CRA). Today, EMWD remains one of MWD's twenty-six member agencies and receives water from Northern California through the State Water Project (SWP) in addition to its deliveries through the CRA.

EMWD's initial mission was to deliver imported water to supplement local groundwater for a small, mostly agricultural, community. Over time, EMWD has evolved to include groundwater production, desalination, water filtration, wastewater collection and treatment, and regional water recycling to the list of products and services it offers to its over 100,000 customers. Located in one of the most rapidly growing regions in the

Figure 1.1 Areas Within EMWD Boundaries



Nation, EMWD has a mission "to provide safe and reliable water and wastewater management services to our community in an economical, efficient, and responsible manner, now and in the future."

A five-member Board of Directors governs EMWD. Each director serves an area of equivalent population size within EMWD's boundaries and is elected to office every four years. As a member agency of MWD, EMWD also has a board member appointed to the MWD Board of Directors.

EMWD is located in western Riverside County, approximately 75 miles east of Los Angeles. The 555 square mile service area includes six incorporated cities in addition to the unincorporated areas of the County of Riverside.

The areas within EMWD's boundary are:

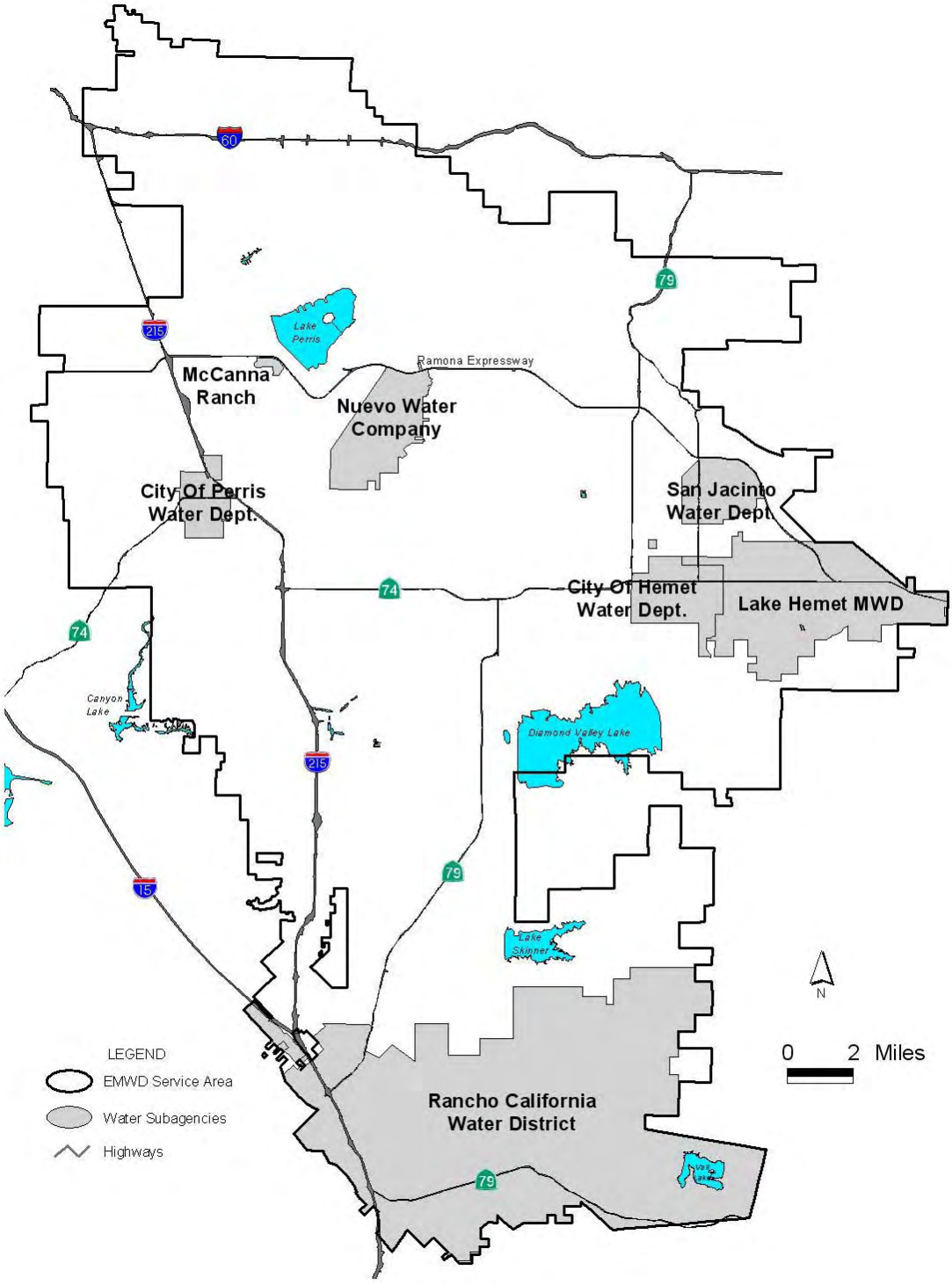
City of Hemet
City of Moreno Valley
City of Murrieta
City of Perris
City of San Jacinto
City of Temecula
Homeland
Lakeview
Murrieta Hot Springs
Nuevo
Quail Valley
Romoland
Sun City
Valle Vista
Winchester

In most of the listed areas, EMWD provides both water and sewer service. However in some places, EMWD provides only sewer or water service, or provides wholesale water to a sub agency.

EMWD is a wholesale provider to the following sub agencies:

City of Hemet Water Department
City of Perris Water Department
City of San Jacinto Water Department
Lake Hemet Municipal Water District (LHMWD)
McCanna Ranch Water Company
Nuevo Water Company
Rancho California Water District (RCWD)

Figure 1.2 - EMWD Sub Agencies



Several of these agencies have or will prepare their own Urban Water Management Plan (UWMP). With the exception of RCWD and McCanna Ranch Water Company, EMWD has discussed and reviewed the supplemental water demand required by each agency

with representatives of that agency. The demand requirements and water supply are discussed in this plan. RCWD, while an EMWD sub agency, receives water directly from a connection to MWD. RCWD is preparing its own UWMP that will address their water supply issues. RCWD's population, demand and supply is not analyzed nor discussed in this plan. McCanna Ranch Water Agency depends on EMWD for emergency purposes and does not have any annual projected demand. The Murrieta Water Company was a subagency at the beginning of 2005, but merged with Western Municipal Water District in November and is not anticipated to demand water form EMWD after 2005.

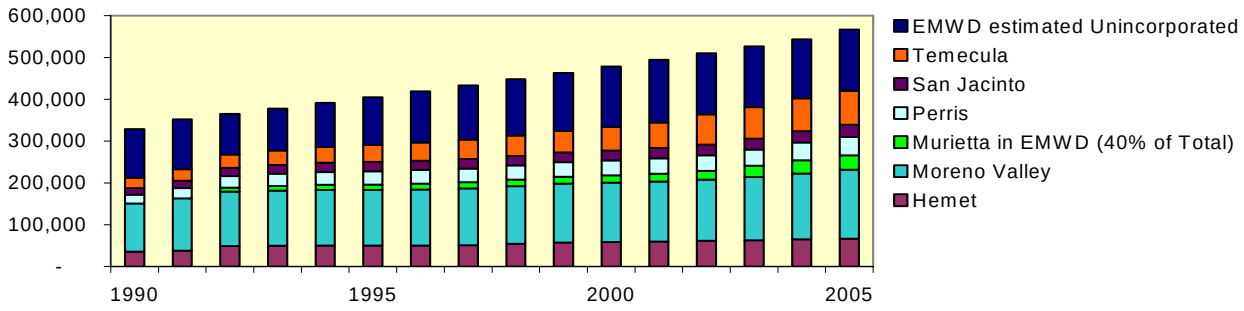
Population

EMWD is located in one of the most rapidly growing regions in the United States. Since 1990, over 230,000 people have been added to the service area of EMWD, nearly doubling the population. Table 1.1 and Figure 1.3 show the estimated population of various EMWD areas from 1990 to 2005. These estimates are taken from the California Department of Finance Report 90-E4, Population Estimated for California State and Counties.

Table 1.1 - Population Within EMWD's Boundary

	1-1-90	1-Apr-90	1-Jan-95	1-Jan-00	1-Jan-05
Population		CENSUS		CENSUS	
Hemet	35,350	36,094	50,100	58,500	66,455
Moreno Valley	115,500	118,779	132,700	142,000	165,328
Murrieta in EMWD (40% of Total)	-	-	13,040	17,540	34,041
Perris	21,050	21,500	32,050	35,900	44,594
San Jacinto	15,500	16,210	22,250	23,400	28,437
Temecula	25,300	27,099	40,850	56,600	81,397
Total EMWD Cities	212,700	219,682	290,990	333,940	420,252
EMWD Estimated Unincorporated	UNK	120,075	114,033	144,716	146,483
Estimated EMWD Total Population	UNK	339,757	405,023	478,656	566,735

Figure 1.3 - Population Growth Within EMWD Boundary Population Projections



Growth Projections

EMWD uses several tools to assist in planning for new development and the new demand for water that comes with them. A database of proposed projects, regional projections, socioeconomic studies and the Riverside County Integrated Plan are all used to develop growth projections.

To track new construction in the District, EMWD developed a Geographic Information Systems (GIS) database of new developments. This database contains information about size, location and status of new projects within EMWD's boundaries. New projects are tracked from the initial planning stage until construction is complete and new meters are installed. This database allows the District to anticipate where new demand for water will be concentrated and estimate when new projects will require water and sewer service. Projects that have engineered design plans in plan check or where construction is initiated are anticipated to impact the District within one to five years. For projects still in the planning stages, anticipating a construction date can be difficult. Planned projects can be delayed or expedited based on the economy, environmental constraints, infrastructure requirements or any number of additional factors.

To insure that planning efforts for future growth are comprehensive, EMWD incorporates regional projections to calculate future growth. Projections from the Southern California Association of Governments (SCAG) 2004 Transportation Plan are used as a guideline to approximate what the long-term growth rates will be for EMWD.

In addition to the new project information collected by EMWD and projections by SCAG, EMWD uses an economic consultant to develop housing projections. In May of 2003, Empire Economics completed a socioeconomic study that resulted in a most probable demand projection for new homes for each of the 1990 Census Tracts in the District. Since EMWD did not have a comprehensive database of new projects in 2003, that study was based largely on SCAG projections published in 2000. In 2004 and 2005, the same consultant returned performing a detailed analysis of growth in several small portions of the District. By doing field studies and economic analysis of the study area, the consultant was able to develop most probable demand projections for new homes within each of 30 sub areas covering much of EMWD's service area.

Using these housing projections, SCAG projections and persons per household data, EMWD has developed its population projection as seen in Table 1.2. The projection provided does not include the population of any portion of the District served water through Rancho California Water District including Temecula.

Table 1.2 - Current and Projected Population

	2005	2010	2015	2020	2025	2030
Service Area Population	493,960	583,050	674,550	759,155	830,020	889,230

Climate

EMWD has a semi-arid climate characterized by hot, dry summers and cooler winters. The average rainfall is between 11 and 12 inches occurring mostly in December through March. The region experiences wide variation in rainfall and periodic local drought. Table 1.3 has a summary of temperature and precipitation for EMWD's service area taken from local climate stations.

Table 1.3 - EMWD Climate

	Jan	Feb	Mar	Apr	May	June
Standard Monthly Average Et^o	2.47	2.65	3.79	5.05	5.78	11.50
Average Rainfall (inches)	2.54	3.16	2	0.68	0.32	0.05
Average Max. Temperature (Fahrenheit)	66.1	38.4	69.6	76.7	82.1	91.9
Average Min. Temperature (Fahrenheit)	36.3	38.7	41.1	44.4	49.6	54

Table 1.3 - EMWD Climate (Continued)

	July	Aug	Sept	Oct	Nov	Dec	Annual
Standard Monthly Average Et^o	6.89	6.68	5.29	4.01	3.01	2.46	54.56
Average Rainfall (inches)	0.03	0.24	0.15	0.25	0.66	1.02	11.09
Average Max. Temperature (Fahrenheit)	97.4	98	92.6	84.2	73.8	67.6	80.7
Average Min. Temperature (Fahrenheit)	58.9	59.4	57.5	39.8	34.5	34.5	46.9

In dry years, potable water demand increases slightly during the months when rainfall usually occurs, but peak demand during hot summer months remains fairly constant. Even in wet years, the demand may decrease during winter months, but still remains high during peak summer months.

The recycled water system, which serves agricultural and landscape demand, is slightly more sensitive to climate fluctuation. In dry years, there may be a small increase in demand during typically wet months to make up for the lack of rainfall, but summer's demand remains consistent. Wet years actually cause greater concern than dry years for the operation of the recycled water system. Excessive rainfall reduces the demand of customers during the rainy season and increases the supply of recycled water. This forces EMWD to find other means of disposing excess recycled water.

Other Demographic Factors

As the population within EMWD continues to grow, the characteristics of the service area are continually changing. District-wide, tract homes, commercial centers and new industrial warehouses are replacing acres of agriculture and open space. The average household size is becoming smaller and the medium income is increasing. Over the next 25 years, EMWD's population is projected to grow by over 400,000 people, nearly doubling its current population.

The area has a history of rapid growth followed by major declines in the housing market. From the mid-1980's to 1990, population growth in EMWD routinely exceeded 10% per year. In the early 1990's, growth slowed during an economic recession. During the late 1990's, growth began to steadily increase, and the first five years of the 2000's brought accelerated growth in the housing market. This growth has challenged EMWD to develop new sources of supply and construct new facilities and infrastructure to bring water to hundreds of new customers each month.

Some indicators suggest that growth within EMWD's service area may have reached its peak rate in 2004, but others suggest that 2005 may see just as much growth as the past year. However, what is certain is that EMWD is still a growing water agency. Ultimate demand estimates indicate that before EMWD reaches build out, the population

will nearly triple its current size. Land will continue to be developed in western Riverside County as more and more people are added. Just as it has in the past, EMWD will continue to meet the challenges of new development with innovation, efficiency and responsibility.

Section 2 – Water Sources

EMWD has three sources of water supply: imported water from MWD, local groundwater production, and recycled water. Water sources can be divided into two types - potable and non-potable. Sources of potable water supply, suitable for all uses including human consumption, include:

- Groundwater within the San Jacinto Watershed
- Desalination plants that treat groundwater with a high salt content through reverse osmosis until it is acceptable for drinking
- Microfiltraion plants owned and operated by EMWD, filtered water from the Colorado River or State Water Project (SWP) through membranes to remove particulate contaminants to potable water standards
- The Henry J. Mills Filtration Plant (Mills), owned and operated by MWD, which treats water from northern California and provides it for sub agency purchase
- The Robert F. Skinner Filtration Plant (Skinner), owned and operated by MWD. This plant treats a blend of Colorado River Water (CRW) and water from northern California for potable use.

See Table 2.1 for the amount of potable water projected to be supplied by each source for 2005 to 2030.

In addition to potable water supplies, EMWD has several sources that supply water that may not be suitable for drinking but can be used for agriculture, landscape irrigation and industrial processes. These sources include:

- Recharge water from MWD. This untreated water from MWD is percolated into the ground through the soil, adding water to the aquifer below. EMWD and others can extract this water at a later date for beneficial uses.
- Untreated water from MWD for agricultural purposes. Water imported from MWD does not often need additional filtration to be used to irrigate crops.
- Recycled water. This highly treated wastewater can be used for many purposes including agriculture, landscape irrigation, and industrial use.

The projected amount of non-potable water supplied by each source from 2005 to 2030 is summarized in Table 2.2.

The location of each potable water source can be seen in Figure 2.1. Groundwater is the major supply of water in the Hemet/San Jacinto area portion of EMWD. This area includes the Cities of both Hemet and San Jacinto as well as surrounding unincorporated areas. The desalination plant serves the middle portion of the District including Menifee, Sun City, north Canyon Lake and Quail Valley. The micro filtration plant in Perris currently serves Perris, Romoland, Lakeview and Nuevo. The Hemet Micro filtration Plant will supplement supply to the Hemet/San Jacinto area. Mills serves Moreno Valley, Menifee, Perris, Sun City, Good Hope, Mead Valley, Lakeview, Nuevo, Romoland, north Canyon Lake, and Quail Valley, while Skinner in the southeast, serves Murrieta, Murrieta Hot Springs, and, occasionally, Menifee, and southern Sun City. In times of peak demand, Skinner is also available to serve demand in the Hemet/San Jacinto area. The limits of services for each source of supply often vary due to demand level and operation procedures and constraints.

Table 2.1 - Potable Water Supply by Source (AFY)

	2005	2010	2015	2020	2025	2030
EMWD Groundwater Production in the San Jacinto Basin						
West San Jacinto Area	6,000	6,000	6,000	6,000	6,000	6,000
Hemet/San Jacinto Basin Area – Native Groundwater	12,000	7,200	7,200	7,200	7,200	7,200
Hemet/San Jacinto Recovery of Recharged Groundwater		5,600	6,600	6,400	6,200	6,200
EMWD Groundwater Desalination Program in the San Jacinto Basin						
Menifee	1,600	3,000	3,000	3,000	3,000	3,000
Perris	2,000	4,500	4,500	4,500	4,500	4,500
Perris II		-	4,500	4,500	4,500	4,500
EMWD Micro-filtration Plants (MWD Full Service Untreated EM –4 & 14)						
Perris FP	8,000	10,900	16,000	16,000	16,000	16,000
Hemet FP		5,400	8,000	8,000	8,000	8,000
MWD Full Service Treated Water Deliveries (EM 12 & 17)						
Mills	55,900	58,600	62,200	76,700	86,800	94,800
Skinner	18,000	14,000	16,000	18,000	20,000	22,000
Total	103,500	115,200	134,000	150,300	162,200	172,000

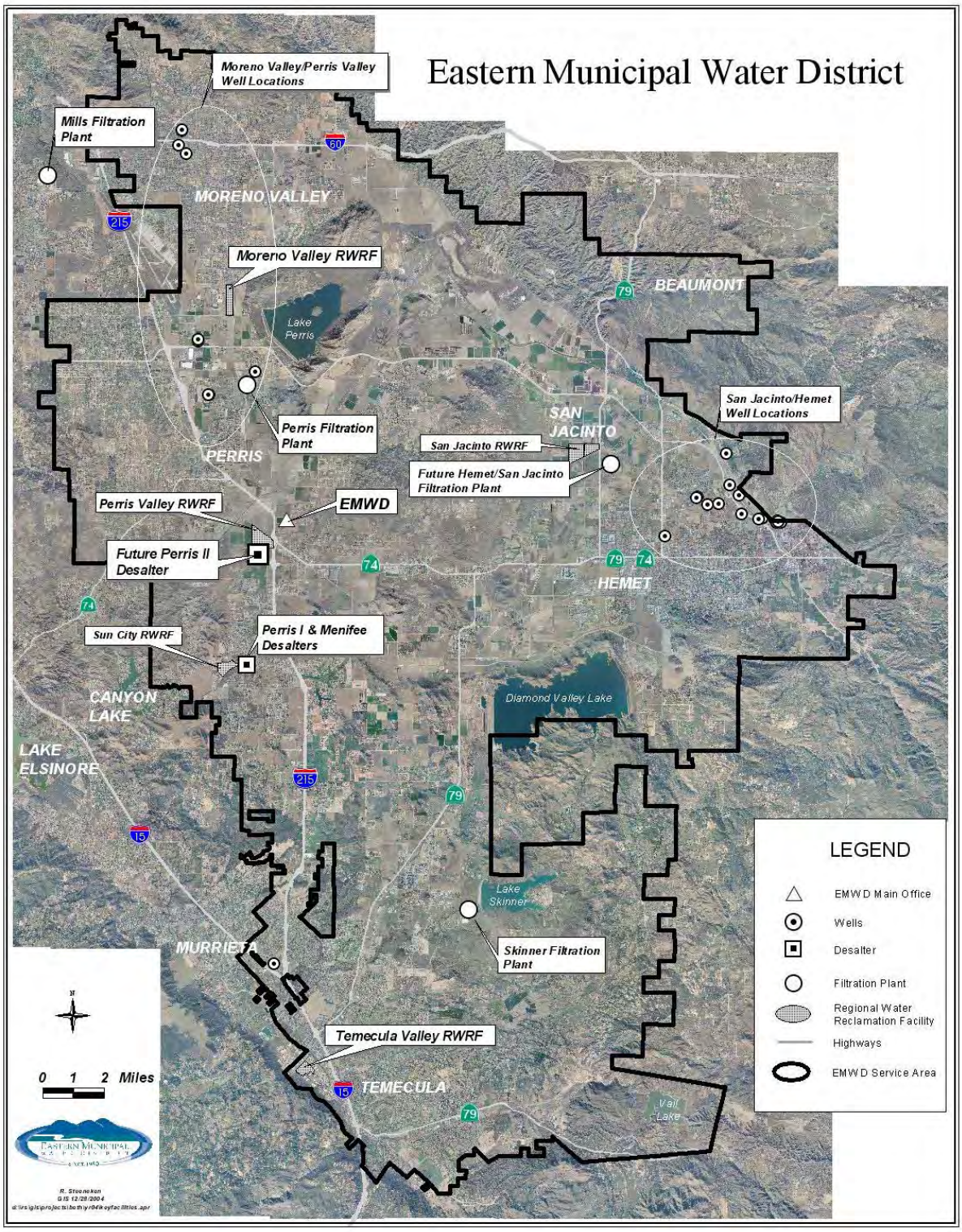
Table 2.2 - Non-Potable Water Supply by Source (AFY)

	2005	2010	2015	2020	2025	2030
Groundwater Recharge (MWD Untreated EM-14)						
Recharge Water into the San Jacinto Basin	8,000	20,000	22,200	22,600	22,600	22,500
MWD Untreated Agricultural Water Deliveries (EM 14)						
MWD Untreated AG	2,500	1,200	2,100	2,600	3,100	3,500
Recycled Water						
Recycled M&I Use	3,500	7,700	10,950	13,300	15,750	17,500
Industrial Enterprise & Aesthetic Improvement	0	7,000	8,250	9,500	10,750	12,000
Recycled Water – Agricultural Use/Wildlife Habitat	21,500	17,700	17,500	17,500	17,500	17,500
RW Total	25,000	32,400	36,700	40,300	44,000	47,000
Total	35,500	53,600	61,000	65,500	69,700	73,000

Table 2.3 - Total Water Supply (AFY)

	2005	2010	2015	2020	2025	2030
Total	139,000	168,800	195,000	215,800	231,900	245,200

Figure 2.1 - Location of Supply Sources



Imported Water

EMWD relies on MWD for 80% of its potable water supply. Treated water ready for potable use is supplied from two sources through separate MWD water treatment facilities. The two sources of water are the SWP and the Colorado River. The two water treatment facilities are Mills and Skinner.

The SWP is California's state-built water and power development and conveyance system. It includes pumping and power plants; reservoirs, lakes, and storage tanks; and canals, tunnels, and pipelines—that capture, store, and convey water from northern California to southern California. Water from the Colorado River is delivered into MWD's service area via the Colorado River Aqueduct (CRA). The water treated at Mills is SWP water and the water treated at Lake Skinner is a blend of Colorado River water and SWP water.

In addition to treated water, EMWD utilizes untreated or non-potable water imported from MWD. This water needs purification and further treatment before it is available for potable use. This water is imported by MWD through the SWP pipeline running through EMWD's service area. Currently, EMWD treats raw water at a single microfiltration plant in Perris. That plant currently has an expansion under construction. In Hemet, construction has begun on another microfiltration plant to add a supply source in that portion of EMWD. These small micro filtration plants allow EMWD to meet the needs of local customers when MWD's treated water resource may be stretched to their limit, especially during peak summer months. Raw water from MWD is also used for agricultural customers and for recharging the groundwater basins EMWD and others rely on.

Groundwater

In an effort to reduce dependency on imported water supplied by MWD, EMWD has developed several programs designed to take advantage of local resources. High-quality groundwater has long been a source of water supply for local customers in the Hemet/San Jacinto area. In Perris, groundwater is blended with imported water for use in the western portion of EMWD. Protecting and developing local groundwater resources to reduce dependency on imported water, is an important objective in EMWD's Strategic Plan.

EMWD's service area encompasses all or part of two different watersheds. The southern portion of the District is tributary to the Santa Margarita River Watershed. The use of all surface and sub-surface waters within the watershed of the Santa Margarita River is under the jurisdiction of the United States District Court for the Southern District of California. The court appointed a Watermaster and Steering Committee to provide recommendations to the court regarding the watershed. EMWD is represented on the Steering Committee. Currently, EMWD does not produce any groundwater in the Santa Margarita Watershed and there are no plans to do so in the future.

The northern part of EMWD's service area covers the San Jacinto Watershed. To the west, the West San Jacinto Groundwater Management Plan was adopted in 1995 under the auspices of Assembly Bill 3030 now codified in the California Water Code. Annual reports on the status of groundwater and water resources efforts in the area have been published since 1996. To the east, the Hemet/San Jacinto Water Management plan is in process. EMWD is working with other agencies, the cities, and private groundwater

producers in the area to develop and implement a management plan that should be complete and adopted in the coming year. The first annual report for the Hemet/San Jacinto Water Management Plan area was published in June 2005. The groundwater EMWD produces and is considered in this Urban Water Management Plan, is pumped from the San Jacinto Watershed.

Part of the plan being developed for the Hemet/San Jacinto Groundwater Management area will expand the current use of raw or untreated water from MWD to recharge portions of the San Jacinto basin. In 2004 and 2005, EMWD, LHMWD and the Cities of Hemet and San Jacinto addressed deteriorating groundwater levels in the area and reduced the historical impact of overdraft caused by past groundwater production by implementing a cooperative groundwater recharge program. In 2004, 6,000 AF of SWP water was recharged at two existing recharge pond sites in the San Jacinto riverbed and, for 2005, the recharge goal is 8,000 AF. EMWD is now developing the Hemet/San Jacinto Recharge and Recovery Program – a groundwater replenishment and recovery program that will be implemented in two phases. The first phase will entail construction of six recharge basins in the San Jacinto riverbed. Phase II involves nine additional recharge basins and a 7.7 mile pipeline. Both phases include construction of recovery or extraction wells as well as monitoring wells. This regional effort, funded partially by a $5 million grant from the California Department of Water Resources, is expected to cost $13.7 million and will protect and optimize the use of local resources.

EMWD constructed the Menifee Desalter to recover and treat high total dissolved solids (TDS) groundwater and manages the salinity in the West San Jacinto Groundwater Basin Management Plan area. This facility treats high TDS groundwater from the Menifee and south Perris areas and produced 1,441 AF of potable water in 2004. Construction of a second desalter, the Perris I Desalter next to the Menifee Desalter is complete and the new plant will expand the capacity of desalinated water production from 3 to 7 MGD. Test wells are being drilled for a third desalter, and an iron and manganese removal facility, initiated in 2004, will be constructed at the Sun City Regional Water Reclamation Facility next to the existing and planned desalters.

Recycled Water

In addition to groundwater and imported water, EMWD is dedicated to expanding and maximizing the use of recycled water produced at four regional water reclamation facilities. Demographic changes in EMWD's service area are increasing the amount of recycled water available while reducing the traditional demand by agricultural customers. This has challenged EMWD to improve reliability and provide recycled water to a growing market of commercial, industrial and institutional customers.

Section 3 - Groundwater

EMWD's only locally produced potable water is the groundwater extracted from the basins below the San Jacinto Watershed. This water accounts for approximately 20% of EMWD's supply and with the use of new technology and in partnership with others in the region; EMWD is working to ensure the quality and reliability of the basins for now and into the future.

Basin Description

San Jacinto Watershed - Groundwater Management Zones in EMWD's Service Area

The San Jacinto Watershed covers an area of approximately 728 square miles, measured above a point just downstream from Railroad Canyon Dam. All of the streams and rivers in the watershed are ephemeral; they flow only when precipitation occurs and much of this flow infiltrates to groundwater. When storms are unusually intense and prolonged, the ground saturates quickly and most of the precipitation runs off to streams. The San Jacinto River rises in and drains the western slopes of the San Jacinto Mountains. Waterways tributary to the river include the North and South Forks, Strawberry, Indian, Poppet, and Bautista Creeks. The river recharges the groundwater basin in the area southeast of the City of San Jacinto. It then flows northwest past the Lakeview Mountains before turning southwest to flow across the Perris Valley floor. The San Jacinto River ultimately flows into Lake Elsinore via Railroad Canyon and Canyon Lake. Lake Elsinore, when full, overflows into Temescal Wash, which joins the Santa Ana River near Prado Dam.

The San Jacinto groundwater basin lies within alluvium-filled valleys carved into the elevated bedrock plateau of the Perris Block. Collectively, the basins are nearly surrounded by impermeable bedrock mountains and hills. Internally, island-like masses of granite and metamorphic bedrock rise above the valley floor.

The San Jacinto and Casa Loma fault zones are the major geologic features that bound and/or crosscut many of the groundwater basins, and typically are effective barriers to groundwater flow. The area between the San Jacinto and Casa Loma faults is a deep, alluvium-filled graben of tectonic origin, commonly referred to as the San Jacinto Graben. The effective base of freshwater in the graben is known to be quite deep but has not been precisely determined. The San Jacinto Graben consists of a fore bay area in the southeast where surface water recharge primarily occurs and a pressure area in the northwest where deep aquifers exist under confined conditions. To the east, the San Jacinto mountain range is the dominant geographic feature of the region, rising to a height of 10,805 feet.

Groundwater management zones were delineated based on major impermeable boundaries, constrictions in impermeable bedrock, groundwater divides, and internal flow systems. The eight-groundwater management zones in the San Jacinto Watershed within EMWD's service area are:

1. Canyon
2. San Jacinto Upper Pressure
3. San Jacinto Lower Pressure
4. Lakeview/Hemet North
5. Hemet South

6. Perris South
7. Perris North
8. Menifee

Canyon Management Zone - The Canyon, San Jacinto Upper Pressure, and San Jacinto Lower Pressure Management Zones lie along a northwest to southeast axis in the northern part of the San Jacinto Valley. The boundaries of the Canyon Management Zone include the San Jacinto Mountains to the east and the San Jacinto fault to the west. The San Jacinto Mountains are composed of consolidated crystalline bedrock and semi-consolidated sedimentary rocks. These rocks are virtually impermeable and bound the water-bearing, alluvium-filled canyons within this management zone.

San Jacinto Upper Pressure Management Zone - The San Jacinto Upper Pressure Management Zone is bounded by the San Jacinto fault to the northeast, the Casa Loma and Bautista Creek fault zones to the southwest, and the flow system boundary with the San Jacinto Lower Pressure Management Zone to the northwest. The San Jacinto fault is a known barrier to groundwater flow, and separates the San Jacinto Graben from the San Timoteo Badlands and the San Jacinto Mountains. East of the City of San Jacinto, a branch of the San Jacinto fault zone cuts the alluvial fill by extending southeast across the San Jacinto River and along the channel of Bautista Creek until it intersects the Park Hill fault. This branch of the San Jacinto fault zone separates the San Jacinto Upper Pressure Management Zone from the Canyon Management Zone.

A branch of the San Jacinto fault zone extends southeast along the channel of Bautista Creek until it intersects the Park Hill fault. In the early 1900s, the barrier effect of the fault resulted in rising groundwater within the San Jacinto River upstream of the fault. This area is known as the Cienega and is an area of significant municipal groundwater production. The Casa Loma and Bautista Creek fault zones are known barriers to groundwater flow. However, groundwater leaks across the fault zones as underflow to the Hemet South and Lakeview/Hemet North Management Zones.

San Jacinto Lower Pressure Management Zone - Boundaries of the San Jacinto Lower Pressure Management Zone include the San Jacinto fault to the northeast; the Casa Loma fault and its northwestward extension; various crystalline bedrock outcrops to the north and west; and the flow system boundary with the San Jacinto Upper Pressure Management Zone to the southeast.

Lakeview/Hemet North Management Zone - Boundaries of the Lakeview/Hemet North Management Zone include the Casa Loma fault zone to the east; the groundwater divide near Esplanade Avenue to the south; the Lakeview Mountains to the west and south; the Bernasconi Hills to the north; and a bedrock constriction/saddle to the west. The Casa Loma fault zone is a known barrier to groundwater flow. However, groundwater leaks across the fault zone as underflow from the Upper San Jacinto Management Zone. Impermeable, crystalline bedrock outcrops that compose the Bernasconi Hills and the Lakeview Mountains to the north and south, respectively, are hard rock barriers to groundwater flow. To the west, the gap between the Bernasconi Hills and the Lakeview Mountains becomes narrow and the buried bedrock surface forms a saddle. This area of constriction in the water-bearing alluvium is the boundary between the Perris South and Lakeview/Hemet North Management Zones.

Hemet South Management Zone - The boundaries include the Casa Loma and Bautista Creek fault zones to the east; the groundwater divide near Esplanade Avenue

to the north; the groundwater divide in the Winchester area to the west; and various crystalline bedrock outcrops to the south. The Casa Loma and Bautista Creek fault zones are known barriers to groundwater. However, groundwater leaks across the fault zones as underflow from the San Jacinto Upper Pressure Management Zone.

Perris South Management Zone - Boundaries of the Perris South Management Zone include a groundwater divide in the Winchester area; bedrock constrictions/saddles bordering the Menifee Management Zone; a bedrock constriction/saddle bordering the Lakeview/Hemet North Management Zone; a bedrock constriction bordering the Perris North Management Zone; and the surrounding bedrock mountains and hills. A groundwater high exists in the Winchester area near Highway 79. The divide is likely an artifact of natural and artificial recharge and groundwater production patterns. As such, the position (or the very existence) of this groundwater divide may vary with changing artificial recharge and/or production patterns.

Southwest of EMWD's Winchester Ponds, a narrow constriction in the bedrock coincides with a buried bedrock saddle surface. This area of constriction in the water-bearing alluvium is a boundary between the Perris South and Menifee Management Zones. Groundwater can flow through this bedrock gap from the Winchester area into the Menifee Management Zone; this is especially true during times of high groundwater levels. Southeast of Sun City, a similar narrow constriction in the bedrock coincides with a buried bedrock saddle surface. This area of constriction in the water-bearing alluvium also is a boundary between the Perris South and Menifee Management Zones. Groundwater flows through this bedrock gap from the Sun City area into the Menifee Management Zone.

To the northeast, the gap between the Bernasconi Hills and the Lakeview Mountains becomes narrow and the buried bedrock surface forms a saddle. This area of constriction in the water-bearing alluvium is the boundary between the Perris South and Lakeview Management Zones. Under original flow conditions, groundwater flowed westward from Lakeview into Perris South. However, groundwater now flows from Perris South eastward into Lakeview toward a “pumping depression” in the groundwater table.

Perris North Management Zone - North of the San Jacinto River in the Perris area, the gap between the Bernasconi Hills and the bedrock hills to the west narrows. This area of constriction in the water-bearing alluvium is a boundary between the Perris South and the Perris North Management Zones.

Impermeable, crystalline bedrock outcrops that compose the surrounding mountains and hills are hard rock barriers to groundwater flow.

Menifee Management Zone - Boundaries of the Menifee Management Zone include the bedrock constrictions/saddles bordering the Perris South Management Zone, a bedrock constriction to the east, and the surrounding bedrock mountains and hills. Southwest of the Winchester Ponds, a narrow constriction in the bedrock coincides with a buried bedrock saddle surface. This area of constriction in the water-bearing alluvium is a boundary between the Perris South and Menifee Management Zones. Groundwater can flow through this bedrock gap from the Winchester area into the Menifee Management Zone, especially during times of high groundwater levels.

Southeast of Sun City, a similar narrow constriction in the bedrock coincides with a buried bedrock saddle surface. This area of constriction in the water-bearing alluvium also is a boundary between the Perris South and Menifee Management Zones. Groundwater flows through this bedrock gap from the Sun City area into the Menifee Management Zone.

Groundwater Management

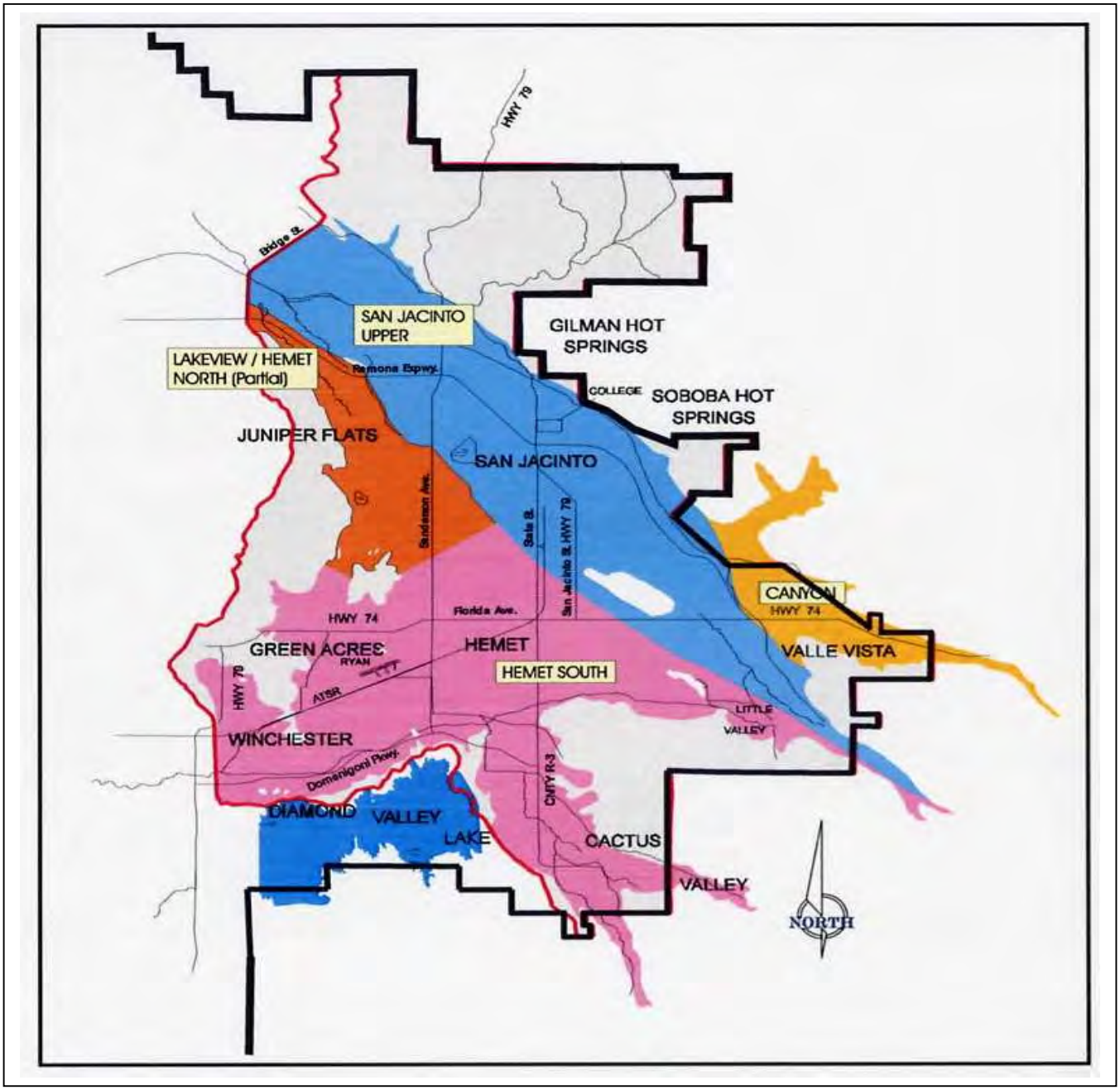
EMWD extracts groundwater from multiple management zones in the San Jacinto Watershed. These zones are covered by one of two groundwater management plans. The Hemet South, Canyon, San Jacinto Upper Pressure, and the Hemet North part of the Lakeview/Hemet North Management Zones are covered by the Hemet/San Jacinto Water Management Plan. This plan is currently being developed and should be finalized in 2005 or early 2006. The Perris North, Perris South, San Jacinto Lower Pressure, and Menifee Management Zones, and the Lakeview portion of the Lakeview/Hemet North Management Zone are covered by the West San Jacinto Groundwater Basin Management Plan. That Plan has been in place since 1995 and a copy is attached as Appendix B.

Hemet/San Jacinto Water Management Area

History of the Hemet/San Jacinto Basin Water Management Plan

Developing and implementing comprehensive water resources management programs to protect, optimize, and enhance the use of all available resources is a strategic goal at EMWD. Groundwater levels in the Hemet and San Jacinto sub-basins steadily declined during a 40-year span from the early 1940's to the end of the 1970's. The 1987-1992 drought quickly followed with similar impact. Recent years with below average rainfall and increased groundwater production have caused water levels to continue to decline. Therefore, groundwater resources need to be responsibly managed and protected. EMWD and local municipal and private groundwater producers are working together to develop and implement a groundwater management plan for the eastern portion of the Hemet/San Jacinto area.

Figure 3.1 - Hemet/San Jacinto Water Management Area



In 1995, the Soboba Band of Luiseno Indians (Tribe) entered into negotiations with EMWD and the Lake Hemet Municipal Water District (LHMWD) to settle groundwater claims. In 2000, the Tribe filed a lawsuit against MWD alleging MWD interfered with Tribal water rights when it constructed the San Jacinto Tunnel along the Colorado River Aqueduct. Since then, negotiations and numerous discussions have lead to the development of the Principles of Settlement. One of the main provisions of the Principles of Settlement is the development of a groundwater management plan.

In June of 2001, the Department of Water Resources (DWR) and local agencies executed a Memorandum of Understanding (MOU) to formulate a groundwater management plan for the Hemet/San Jacinto area. A groundwater policy committee was formed with elected officials from the Cities of Hemet and San Jacinto, LHMWD, EMWD and representatives of private groundwater producers. DWR acts as an impartial mediator to the policy committee. Since it was formed, the policy committee has discussed and resolved several controversial issues, including San Jacinto Tunnel seepage water, the Fruitvale Judgment, export of groundwater from the basins, and how to maximize the use of reclaimed water. It has formed a technical committee to provide guidance and has participated in public outreach meant to share information and encourage cooperation.

In September of 2003, an agreement was made between EMWD, LHMWD and the cities of Hemet and San Jacinto to develop a groundwater monitoring program. Under this agreement monitoring began in 2004, and the first report was published in June of 2005. EMWD, LHMWD and the Cities of Hemet and San Jacinto are all participating in the funding and implementation of the monitoring program. Once the groundwater management plan is in place, future annual reports will be submitted to the Watermaster.

EMWD, LHMWD and the Cities of Hemet and San Jacinto also agreed on the Interim Principles of Groundwater Management in 2003 and then the Principles of Groundwater Management in February 2004. These principles establish the framework for a Water Management Plan for the Hemet/San Jacinto area.

There were two additional MOU's in 2004. The first addressed the deteriorating situation in the sub-basins by providing interim stabilization through recharge and was executed in April. The second, executed in June, describes the funding mechanism for developing the groundwater management plan.

Successful implementation of the Hemet/San Jacinto Water Management Plan will help insure that:

- The Hemet/ San Jacinto area will have a reliable and adequate source of future water supply.
- The settlement claims by the Soboba Band of Luiseno Indians are facilitated and accommodated.
- Existing water production and water services system will be expanded to meet future urban growth.
- Water quality in the management plan area will be protected and/or enhanced.
- Cost-effective water supplies and treatment by the public agencies is supported.
- Groundwater overdraft is eliminated and basin yield enhanced.
- A monitoring program is implemented to promote and provide for best management and engineering principles to protect water resources.

The final Water Management Plan will be a part of a Stipulated Judgment that should be approved by the courts in 2005 or early 2006. The plan should be finalized and implemented in 2006. It will limit the amount of water being extracted from the basin to a sustainable yield and implement continued recharge of the basin using imported water. The Cooperative Agreements for the Water Management Plan are available in Appendix G of this plan.

Water Quality

In 2007, 137 wells were sampled for water quality. One hundred and eleven of the wells were sampled by EMWD while others sampled 26 wells and reported the results to EMWD. In general, the best quality of water occurs in the Canyon Management Zone in the Cienega area and along the river. There is significant municipal production there. Table 3.1 shows the high and low TDS and NO_3 –N concentrations for each management zone. Water quality can be effected by mineral content of sediments, recharge and drainage patterns, historic land use factors, screening intervals and depth of wells sampled and other factors. Water quality monitoring will continue as part of the water management plan and results will be submitted to the Watermaster.

Table 3.1 - TDS and NO_3 –N by Management Zone for 2004

Management Zone	No. of Wells	TDS (mg/L)		NO_3 –N (mg/L)	
		High	Low	High	Low
Canyon	19	1,410	210	10.0	<0.1
S.J.U.P.	66	1,500	200	25.0	<0.1
Hemet North	25	1,010	360	5.4	<0.1
Hemet South	27	1,490	220	30.0	0.6
Total	137				

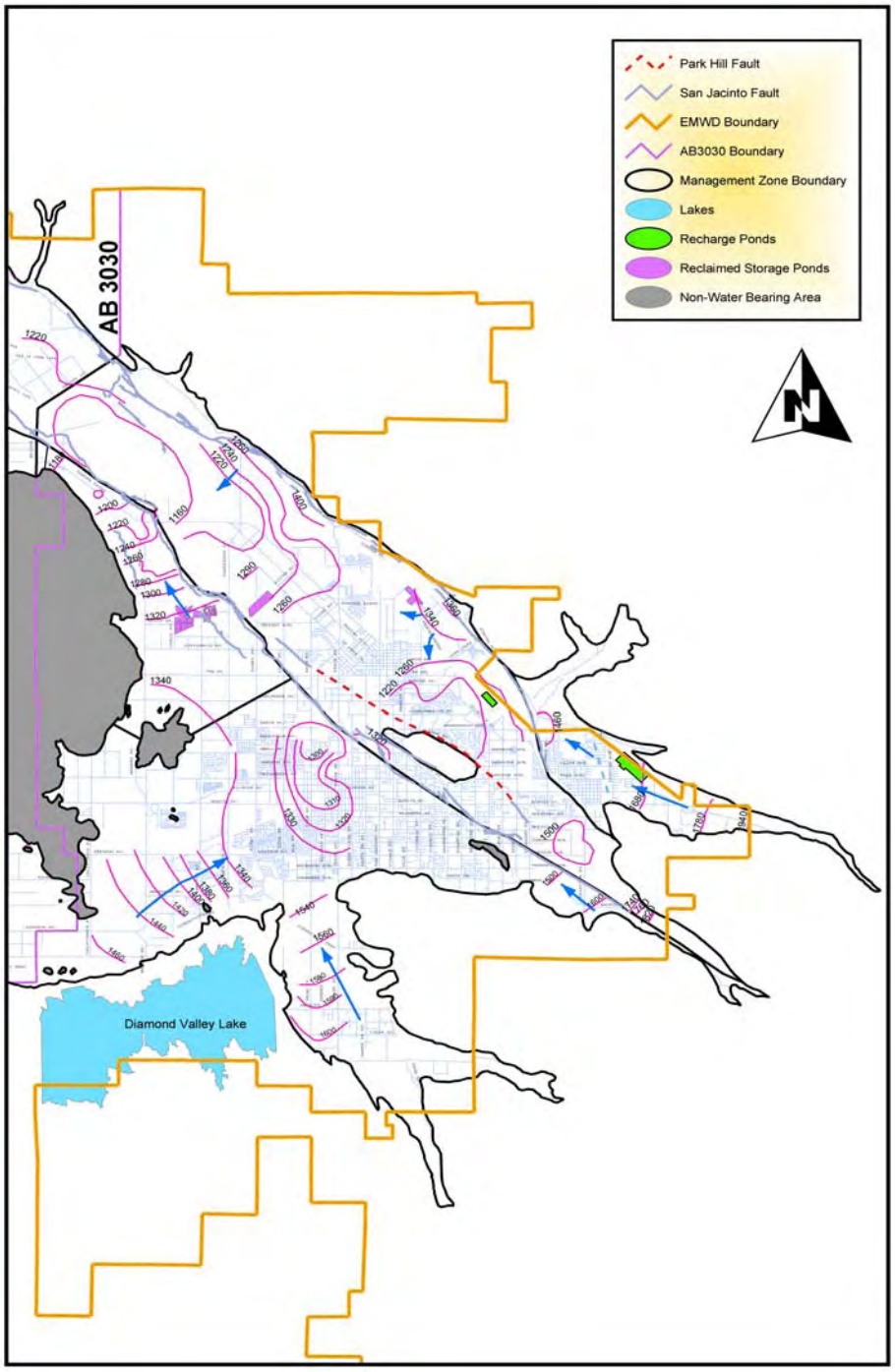
Water Levels

EMWD and others measured over 170 wells in both the spring and fall of 2004. These measures were used to help determine the direction of flow. Water levels taken in the fall of 2004 were also compared to levels measured in fall of 2003 to determine the change in storage. In three out of the four management zones, there was a decrease in groundwater storage, only in Hemet North portion of the Lakeview/Hemet Management Zone showed an increase in groundwater storage. Table 3.2 gives the average change in groundwater storage for 2003 to 2004. Figure 3.2 shows the water level contours for the Hemet/San Jacinto Water Management Area.

Table 3.2 - Average Changes in Groundwater in Storage, 2003 to 2004

Management Zone	Change	Acre Feet
Canyon	Decrease	-1,700
San Jacinto Upper Pressure	Decrease	-3,000
Hemet North (partial)	Increase	600
Hemet South	Decrease	-5,900
Total		-10,000

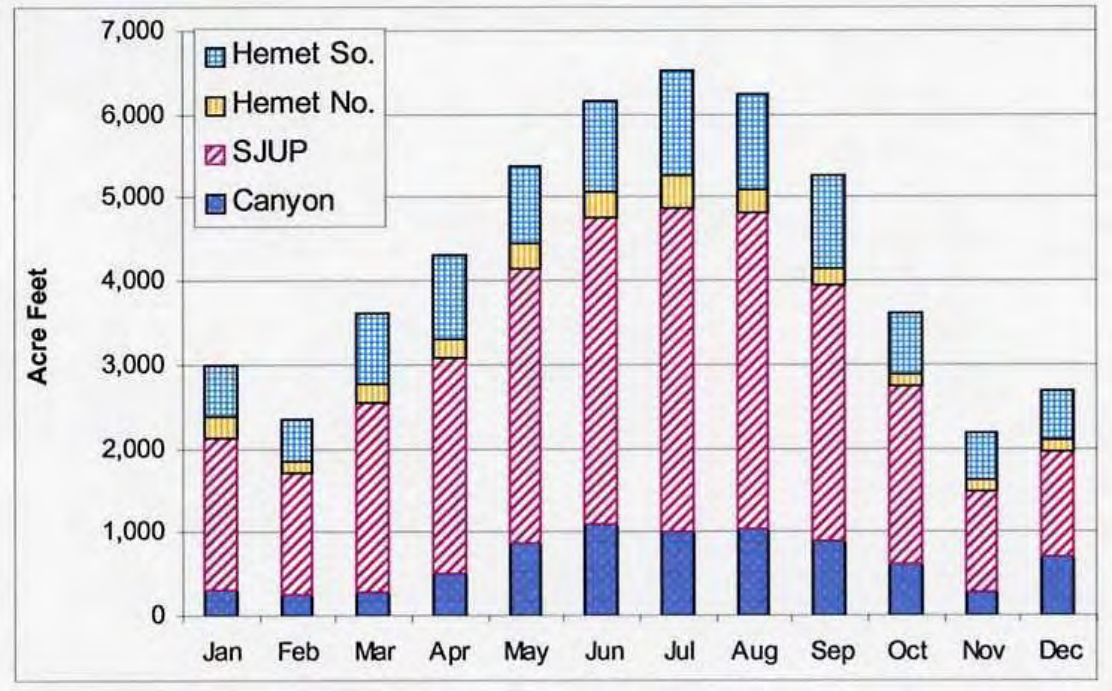
Figure 3.2 – Hemet/San Jacinto Water Management Area Water Level Contour Map



Water Extraction

One hundred and eighty-two wells have been identified in the Hemet/San Jacinto Water Management area. One hundred and forty-nine of these wells are metered, the remaining are estimated based on land use, size, or the number of cows in the case of dairies. In 2004, 51,387 AF of water was produced by all of the users in the basin area. Of the total, nearly 60% of the water was produced between May and September. The water production by month is summarized in the chart below.

Figure 3.3 - Monthly Production by Management Zone



Operational Yield

According to *the Operational Yield Study, Hemet/San Jacinto Groundwater Management Area* (WRIME, Inc., 2003), the operational yield of the groundwater system ranges from approximately 30,000 AFY to 64,000 AFY, with an average of about 41,000 AFY. The operational yield is the long-term withdrawal from the groundwater system not exceeding natural and artificial recharge to the system. From 1958 - 2001 there was an average production of about 50,000 AFY. However, production from 1994 to 2001 was about 68,000 AFY. This is about 27,000 AFY above the average long-term yield estimate. As part of the groundwater management plan, imported water will be added to the basin and the production will be limited to the operational yield.

Recharge

In April of 2004, EMWD, LHMWD and the Cities of Hemet and San Jacinto executed a MOU for an Interim Water Supply Plan. The purpose of the plan was to address the deteriorating situation in the Hemet/ San Jacinto area by providing about 6,000 AF of recharge during the 2004 calendar year. Then, between January 20 and October 24 of 2004, 5,998 AF of imported water from the State Water Project (SWP) was recharged

into the basin at two sites – the Conjunctive Use Ponds in the Intake portion of the San Jacinto Upper Pressure Management Zone and the Grant Avenue Ponds in the Canyon Management Zone.

In November of 2004, a second recharge effort was initiated with the goal of recharging 8,000 AF in 2005. For the 2004 recharge effort, EMWD, LHMWD, and the City of Hemet contributed funding to the purchase and recharge of the SWP, and the City of San Jacinto agreed to reduce groundwater production from the basin to help offset recharge costs. For the 2005 recharge effort, all parties are contributing funds to the program. Under the Water Management Plan, any future conjunctive use projects will be done with the approval of the Watermaster.

Currently, preparation is underway to implement the Hemet/San Jacinto Recharge and Recovery Program. This project will involve 100 acres of ponds, eight recovery wells, and a 60-inch diameter pipeline from EMWD's EM-14 connection to the ponds. The objectives of the project:

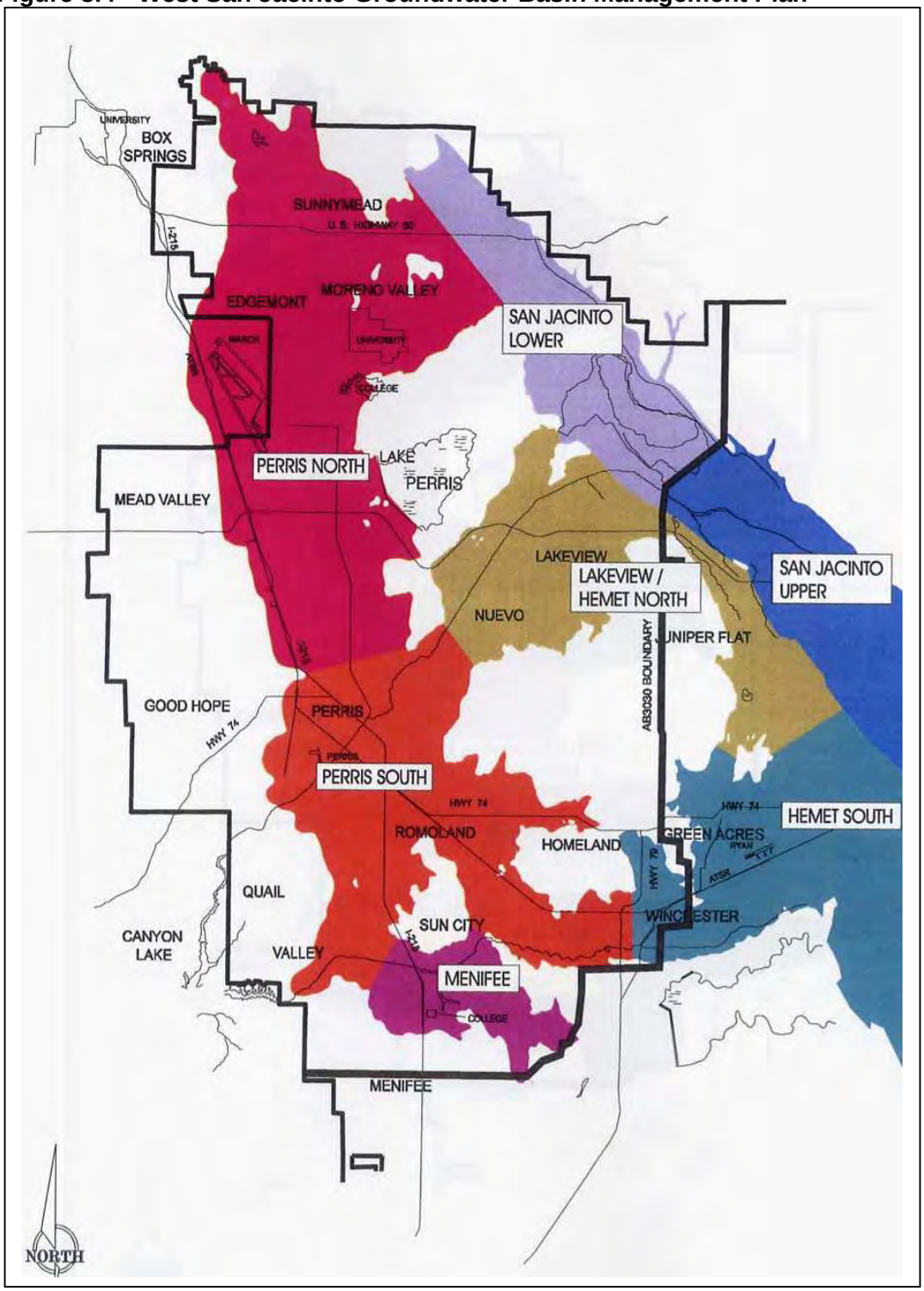
- Provide Tribal Settlement Water - 7,500 AFY
- Elimination of Groundwater Overdraft – 10,000 AFY
- Additional Long-term Supply – 15,000 AFY
- Water Storage for Drought Years – 45,000 AFY

EMWD is currently working with the US Army Corp of Engineers to complete a federal Environment Impact Statement (EIS) in order to obtain a Section 404 Permit and a Section 7 Permit under the Endangered Species Act. The EIS and permitting are both scheduled to be complete in November of 2005. EMWD will also be required to obtain a Streambed Alteration Permit from the California Department of Fish and Game and a 401 Certificate from the Regional Water Quality Control Board.

In addition to the recharge of SWP, there is some incidental recharge of recycled water from a storage pond EMWD has in the area and the MWD San Jacinto Reservoir.

EMWD also has the right to divert surface water from the San Jacinto River to recharge the Canyon sub-basin. Because the San Jacinto River is an ephemeral river, the river does not flow every year. During 2004, flows were insufficient for EMWD to divert water.

Figure 3.4 - West San Jacinto Groundwater Basin Management Plan



History of the West San Jacinto Groundwater Basin Management Plan

In the west San Jacinto area, a cooperative groundwater management plan is already in place to insure the reliability and quality of the water supply. In June 1995, EMWD adopted the West San Jacinto Groundwater Basin Management Plan in accordance with the statutes in the State Water Code resulting from the passage of Assembly Bill 3030

(AB 3030). The plan was adopted after extensive public outreach and meetings with interested individuals and agencies. Implementation of the plan began directly after its adoption. Initial efforts to implement the plan included establishing an advisory committee; prioritizing the sub-basins; evaluating groundwater resources including establishing groundwater quality, level, and extraction monitoring programs; and conducting hydro-geophysical investigations. There have been nine annual reports resulting from the West San Jacinto Groundwater Management Plan, each documenting the implementation of the plan and activities in the sub-basins.

The most recent report was published in April of 2005. It has a thorough accounting of the status of the sub-basins or management zones. Topics covered by the report include the results from EMWD's groundwater quality, water level, and extraction monitoring programs, progress in capping and sealing inactive wells, development of a Regional Water Resources Database, existing and proposed desalters, and other activities in the sub-basins.

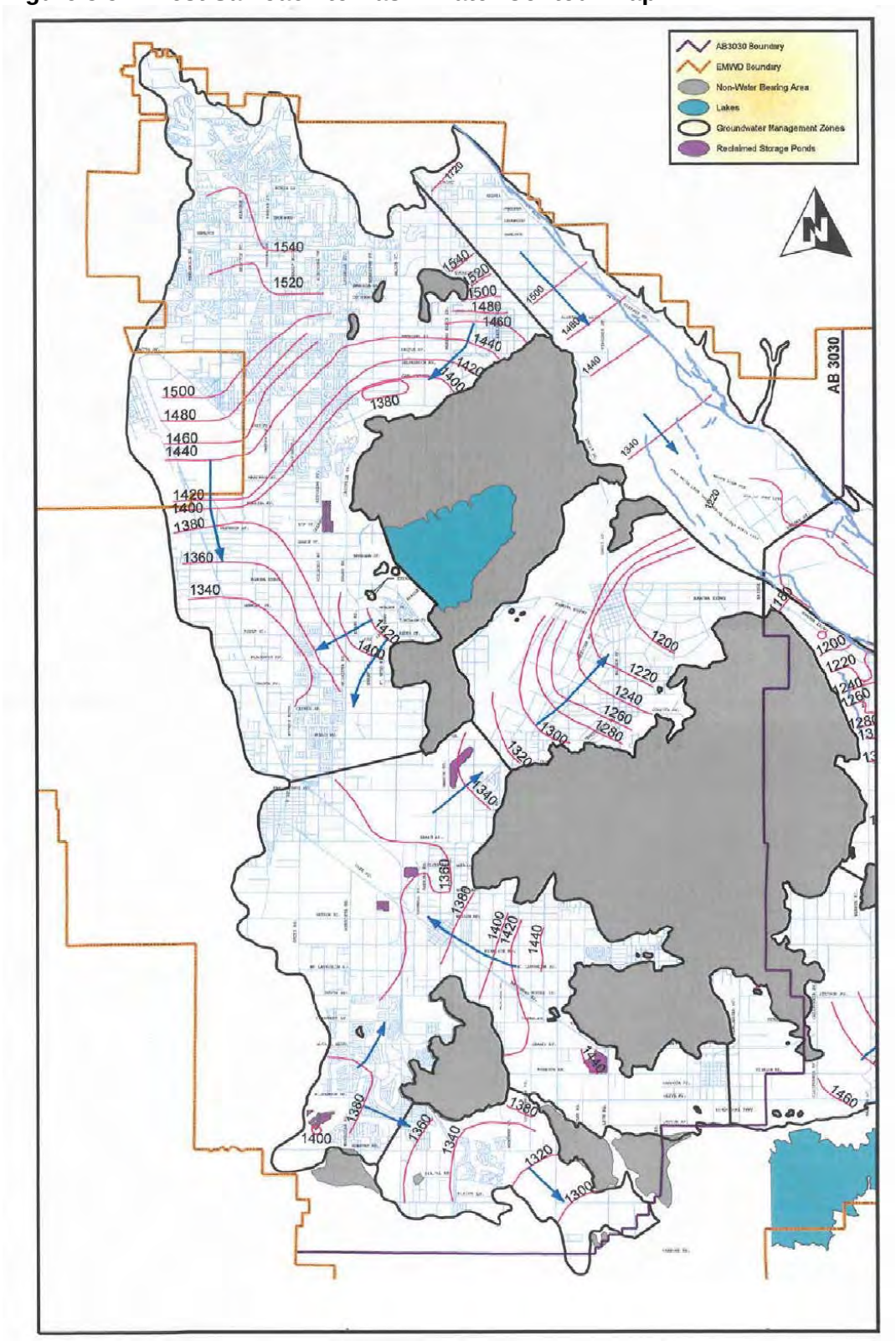
Water Quality

During 2004, as part of the groundwater monitoring efforts, 115 water quality samples were taken from wells in the West San Jacinto Groundwater Management Plan area. The water with the highest TDS level was found in the southwest portion of the Perris South Management Zone. The highest level was 10,300 mg/L. The lowest TDS level of 270 mg/L was found in the northwest portion of Perris North Management Zone. Measurements from 135 wells were sampled and in 2003 and 2004 were used to calculate the statistical volume weighted averages for TDS and NO_3 –N in mg/L for each management zone in 2003 and 2004. The Lakeview portion of the Lakeview/Hemet North Management Zone and in the Perris North and Menifee Management zones show an increase in volume weighted average TDS concentrations. The Perris South Management Zone showed a significant decrease in the volume-weighted average NO_3 –N. Water quality and the character of groundwater are determined by a number of factors including: type and mineral content of sediments; recharge and drainage patterns; historic land use patterns; and screening interval and depth of wells sampled. Fluctuation in high and low values for water quality can also occur because the same wells are not sampled each year. See Chapter 3 of the West San Jacinto Groundwater Basin Management Plan 2004 Annual Report for more information about the water quality of the basin.

Water Levels

In spring 2004, water levels were measured in 150 wells. In addition to giving information on the water levels from year to year, these measurements provide information on the direction of flow. The direction of flow has remained fairly consistent from year to year in the West San Jacinto Basin. There were 135 wells with groundwater level measurement in both 2003 and 2004. These measurements are used to estimate the changes in storage from year to year. In 2004, the Lakeview Portion of the Lakeview/Hemet North Management Zone showed a significant increase in groundwater storage. The Perris North Management Zone showed a minor increase, while the Perris South and Menifee Management Zone showed a slight increase in groundwater shortage. The San Jacinto Lower Pressure Management Zone displayed a slight decrease in groundwater storage. See Figure 3.5 for a water level contour map.

Figure 3.5 – West San Jacinto Basin Water Contour Map



In addition to monitoring water quality and water levels, the basin management plan monitors groundwater production in the basin. Groundwater production in the basin totaled 18,742 AF in 2004 only 13 feet more than in 2003. This production is measured in 54 wells and estimated in 21 wells as part of the Groundwater Extraction Monitoring Program. Table 3.3 shows the extraction from the basin from 2000 to 2004. This extraction accounts for all of the groundwater extracted from the basin, not just the extraction by EMWD.

Table 3.3 - Groundwater Extraction West San Jacinto Groundwater Management Area

Management Zone	No. of Wells Metered	No. of Wells Estimated	Total No. of Wells	GW (AF) Production Metered	GW (AF) Production Estimated	Total GW Production (AF)
Lakeview/Hemet North (partial)	22	1	23	3,923	20	3,943
Perris North	14	8	22	5,609	1,900	7,509
Perris South	10	1	11	2,286	30	2,316
S.J. Lower Pressure	3	3	6	275	70	345
Menifee	4	7	11	719	3,820	4,539
Hemet South (partial)*	1	1	2	80	10	90
Total	54	21	75	12,892	5,850	18,742

*Only a small portion of the Hemet South Management Zone is within the West San Jacinto Groundwater management Area. The remaining portion is within the Hemet/San Jacinto Management Zone and included in figure 3.2.

Desalters

As part of the West San Jacinto Groundwater Management Plan, EMWD has implemented a Groundwater Salinity Management Program. This program consists of three desalination facilities, two that are constructed and one that is in planning and design. These facilities recover high TDS water in the Menifee and Perris South Groundwater Management Zones for potable use. In addition to being a source of water, the main role of the desalter is to play a part in managing the groundwater sub-basins by addressing the migration of brackish groundwater into areas of good quality groundwater.

The Menifee Desalter was the first of three desalters to be built. This facility began producing potable water in 2003. In 2004, the Menifee Desalter produced 1,441 AF of potable water using water from two production wells. A third well began production and will increase the output of the desalter in 2005.

The second desalter, the Perris Desalter, is located next to the Menifee Desalter at the Sun City Regional Water Reclamation Facility. This plant was completed in spring of 2005 and will increase production of desalinated water from 3 to 7 MGD.

The final desalter, currently under design, is the Perris II Desalter. As part of design, four test wells have been drilled. Initial tests of the wells indicate production rates between 750 and 1,000 GPM with TDS concentrations between 2,000 and 3,000 mg/L. It is anticipated that the test wells and transmission lines for the Perris II Desalter will be completed in spring of 2006.

Groundwater Pumping Rights

In the eastern portion of the Hemet/San Jacinto area, EMWD's groundwater production is currently constrained by the 1954 Fruitvale Judgment and Decree. Under that Judgment and Decree, EMWD, as successor-in-interest to the Fruitvale Mutual Water Company, may extract the subsurface waters of the Canyon Basin for use over or outside the Entire Basin without restriction as long as the static water level in a specific well is not over 25 feet below a specific elevation. If the water level in the well is more than 25 feet below the specified elevation, EMWD's extraction is limited to 4,500 AFY. The District may extract from the entire basin a total of not more than 12,000 AFY for use outside the basin for use over the entire basin, subject to the 4,500 AFY Canyon Basin extraction limit. The perimeters of the areas of the Canyon and entire basins are defined in the Judgment and Decree. The Hemet/San Jacinto area contains good quality water and is a major source of municipal as well as private production, although water levels are in serious decline. Once the Hemet/San Jacinto Stipulated Judgment is in effect, it will supercede the Fruitvale Judgment and Decree.

West of the Hemet/San Jacinto area, the West San Jacinto Groundwater Basin Management Plan was adopted in 1995. This 250 square mile area is experiencing increasing water levels due to high TDS groundwater and decreased production. The high TDS groundwater is migrating into the Lakeview portion of the Lakeview/Hemet North management zone, an area of good quality groundwater. Lowering groundwater levels and removal of saline groundwater is an integral element in the West San Jacinto Groundwater Basin Management Plan. Continued operation of the Menifee Desalter and construction of the Perris I and Perris II Desalters was recommended in the West San Jacinto Groundwater Basin Management Plan 2003 Annual Report on the Status of the Sub Basins. Increasing production of usable groundwater, and production of brackish groundwater for desalination, and blending continue to be elements of the management plan.

EMWD is committed to maintaining the stability of the basins through cooperative groundwater management programs that provide a forum and mechanism whereby local groundwater producers may jointly work to ensure basin quality and quantity.

Past Production
Water Code 10910 (f)(3)

Table 3.4 depicts the total potable groundwater pumped by EMWD from 2000 to 2004. The majority of EMWD's groundwater is pumped from the Hemet and San Jacinto area. The remaining groundwater is pumped from the area covered by the West San Jacinto Groundwater Basin Management Plan. Production from the desalter did not begin until 2003. The location of wells used to pump groundwater and the desalters can be seen on Figure 2.1

Table 3.4 - Amount of Groundwater Pumped – AFY

Basin Names	2000	2001	2002	2003	2004
Hemet/San Jacinto Basin EMWD	17,458	17,717	15,126	15,370	12,516
Hemet/San Jacinto Basin Watermaster	0	0	0	0	0
West San Jacinto Basin	3,381	3,262	3,487	3,880	4,049
West San Jacinto Basin Desalters	0	0	0	282	1,441
Total	20,839	20,979	18,613	19,532	18,006

Projected Production
Water Code 10910 (f) (4)

Table 3.5 lists the amount of potable groundwater that EMWD is projecting will be supplied. Groundwater production in the San Jacinto Valley, some of which is currently covered by the Fruitvale Judgment and Decree, will decrease when the water management plan is put into place. The Perris/Moreno Valley wells are projected to continue to produce 6,000 AF. The desalters will decrease salinity in the basin with the added benefit of providing a source of potable water. The well locations shown in Figure 2.1 should remain consistent in the future.

Table 3.5 - Amount of Groundwater Projected to be Pumped - AFY

Basin Names	2005	2010	2015	2020	2025	2030
Hemet/San Jacinto Basin EMWD	12,000	7,200	7,200	7,200	7,200	7,200
Hemet/San Jacinto Basin Recovered Water	0	5,600	6,600	6,400	6,200	6,200
West San Jacinto Basin	6,000	6,000	6,000	6,000	6,000	6,000
West San Jacinto Basin Desalters	3,600	7,500	12,000	12,000	12,000	12,000
	23,605	28,310	33,815	33,620	33,425	33,430
Total	**17%**	**17%**	**17%**	**15%**	**14%**	**13%**

Section 4 – Reliability of Supply

EMWD delivers water to its customers from three sources; imported water from MWD, groundwater from the San Jacinto Basin and recycled water. The Regional Urban Water Management Plan developed by MWD assures the reliability of imported water supply to its member agencies through a multiple-year drought or single dry year through 2030. The management plans and recharge efforts help insure that the San Jacinto basin remains reliable, and the supply of recycled water will only grow as the population increases. The tables below display the anticipated available water supply in normal, dry and multiple dry years.

Table 4.1 - Supply Reliability Average Year - AFY

	2005	2010	2015	2020	2025	2030
Current Supplies						
Local Water Sources						
Groundwater- Hemet/San Jacinto Basin Native Groundwater	12,000	7,200	7,200	7,200	7,200	7,200
Groundwater -West San Jacinto	6,000	6,000	6,000	6,000	6,000	6,000
Groundwater Desalter –Menifee	1,600	3,000	3,000	3,000	3,000	3,000
Groundwater Desalter –Perris	2,000	4,500	4,500	4,500	4,500	4,500
Recycled Water - M& I Use	3,500	7,700	10,950	13,300	15,750	17,500
Recycled Water - Agricultural Use	21,500	17,700	17,500	17,500	17,500	17,500
Imported Water Sources						
Perris FP	8,000	8,000	8,000	8,000	8,000	8,000
Mills and Skinner	73,900	72,600	78,200	94,700	88,800	116,800
MWD Untreated AG	2,500	1,200	2,100	2,600	3,100	3,500
Supplies Under Development						
Local Water Sources						
Groundwater Desalter -Perris II	0	0	4,500	4,500	4,500	4,500
Recycled Water - Industrial Enterprise and Aesthetic Improvement	0	7,000	8,250	9,500	10,750	12,000
Hemet/San Jacinto Watermaster	0	5,600	6,600	6,400	6,200	6,200
Imported Water Sources						
Hemet FP -MWD Raw Water Treated by EMWD	0	5,400	8,000	8,000	8,000	8,000
Perris FP Expansion -MWD Raw Water Treated by EMWD	0	2,900	8,000	8,000	8,000	8,000
Recharge Water into the San Jacinto Basin	8,000	20,000	22,200	22,600	22,600	22,500
Total	139,000	168,800	195,000	215,800	213,900	245,200
% of Normal	100%	100%	100%	100%	100%	100%

Table 4.2 - Supply Reliability Single Dry Year (AFY)

	2005	2010	2015	2020	2025	2030
Local Water Sources						
Groundwater- Hemet/San Jacinto Basin Native Groundwater	12,000	7,200	7,200	7,200	7,200	7,200
Groundwater -West San Jacinto	6,000	6,000	6,000	6,000	6,000	6,000
Groundwater Desalter –Menifee	1,600	3,000	3,000	3,000	3,000	3,000
Groundwater Desalter –Perris	2,000	4,500	4,500	4,500	4,500	4,500
Recycled Water - M& I Use	3,500	7,800	11,100	13,400	15,900	17,700
Recycled Water - Agricultural Use	23,700	19,500	19,300	19,300	19,300	19,300
Imported Water Sources	0	0	0	0	0	0
Perris FP	8,000	8,000	8,000	8,000	8,000	8,000
Mills and Skinner	74,700	73,700	79,500	96,100	108,300	118,400
MWD Untreated AG	2,800	1,300	2,300	2,900	3,400	3,900
Supplies Under Development						
Local Water Sources						
Groundwater Desalter -Perris II	0	0	4,500	4,500	4,500	4,500
Recycled Water - Industrial Enterprise and Aesthetic Improvement	0	7,100	8,300	9,600	10,900	12,100
Hemet/San Jacinto Watermaster	0	5,600	6,600	6,400	6,200	6,200
Imported Water Sources	0	0	0	0	0	0
Hemet FP -MWD Raw Water Treated by EMWD	0	5,400	8,000	8,000	8,000	8,000
Perris FP Expansion -MWD Raw Water Treated by EMWD	0	2,900	8,000	8,000	8,000	8,000
Recharge Water into the San Jacinto Basin	6,900	20,000	22,200	22,600	22,600	22,500
Total	141,100	171,900	198,400	219,400	235,800	249,200
% of Normal	101%	102%	102%	102%	102%	102%

Table 4.3 - Multiple Dry Years Supply Reliability (AFY)

Ending in	2005	2010	2015	2020	2025	2030
Current Supplies						
Local Water Sources						
Groundwater- Hemet/San Jacinto Basin Native Groundwater	12,000	7,200	7,200	7,200	7,200	7,200
Groundwater -West San Jacinto	6,000	6,000	6,000	6,000	6,000	6,000
Groundwater Desalter –Menifee	1,600	3,000	3,000	3,000	3,000	3,000
Groundwater Desalter –Perris	2,000	4,500	4,500	4,500	4,500	4,500
Recycled Water - M& I Use	3,500	7,800	11,100	13,400	15,900	17,700
Recycled Water - Agricultural Use	23,700	19,500	19,300	19,300	19,300	19,300
Imported Water Sources						
Perris FP	8,000	8,000	8,000	8,000	8,000	8,000
Mills and Skinner	74,700	73,700	79,500	96,100	108,300	118,400
MWD Untreated AG	2,800	1,300	2,300	2,900	3,400	3,900
Supplies Under Development						
Local Water Sources						
Groundwater Desalter -Perris II	0	0	4,500	4,500	4,500	4,500
Recycled Water - Industrial Enterprise and Aesthetic Improvement	0	7,100	8,300	9,600	10,900	12,100
Hemet/San Jacinto Watermaster	0	5,600	6,600	6,400	6,200	6,200
Imported Water Sources	0	0	0	0	0	0
Hemet FP -MWD Raw Water Treated by EMWD	0	5,400	8,000	8,000	8,000	8,000
Perris FP Expansion -MWD Raw Water Treated by EMWD	0	2,900	8,000	8,000	8,000	8,000
Recharge Water into the San Jacinto Basin	5,600	20,000	22,200	22,600	22,600	22,500
Total	139,800	171,900	198,400	219,400	235,800	249,200
% of Normal	101%	102%	102%	102%	102%	102%

Imported Water

As EMWD prepares its 2005 UWMP, MWD is preparing a Regional UWMP (RUWMP). This document provides information about MWD supply reliability and demand calculations. The information supplied in the RUWMP provides assurance that MWD will have a reliable water supply available to deliver to EMWD through 2025, even during dry periods mimicking historical patterns. The RUWMP is available through contacting MWD or on MWD's website.

MWD's Board of Directors has developed the following mission statement **"***To provide its service area with adequate and reliable supplies of high quality water to meet present and future needs in an environmentally and economically responsible way."* To fulfill their mission, MWD has taken a coordinated approach to regional planning through the Integrated Resources Plan (IRP). The IRP 2003 Update is available through contacting MWD or on MWD's website.

The IRP was first implemented in 1996. MWD and member agencies worked together to first gather and analyze data to determine demand and supply alternatives, then to use the information gathered to develop a diverse mix of resources. The plan ensured MWD and member agencies would meet all full-service demands without interruption through 2020. It set targets for conservation, local supplies, SWP supplies, CRA supplies, groundwater banking, and water transfers. Using a diverse mix of resources, MWD and its agencies reduced dependency on any single water supply resource.

In 2001, MWD began the process of updating its IRP. The goal was to review and measure achievements since 1996, to identify changed conditions and make adjustments and to extend the planning period to 2025. After extensive cooperation with member agencies and other organizations, the plan was adopted in July of 2004. The update found several changed conditions and extended the reliability to 2025.

Significantly changed conditions listed in the 2003 Update were higher conservation savings, Board-revised goals for the SWP and the CRA, more stringent water quality laws and risk in resource implementation. Two areas of concern are the increasingly stringent water quality regulations and the risk associated with implementing planned projects. To manage those and other areas of concern, the IRP Update institutes a planning buffer of up to 10% of regional demands. This buffer calls for MWD to develop 500,00 AF of supply in addition to resource targets by 2025. This supply buffer is developed through increased targets for local supply and an increase of supply from Central Valley transfers. The supply buffer is part of MWD's practice of developing supply at least ten years in advance of need. More information on the IRP is included in Section II.1 of the RUWMP.

To evaluate the reliability of the supply, MWD has developed a computer model named IRPSIM. This model uses historic hydrologic data from 1922 to 1991 to develop estimates of water surplus and shortage over a 20-year planning horizon. The model assists staff in developing a strategy that balances risk and cost and allows them to manage water supplied from multiple sources. There are two basic types of supply. Core supplies include recycled water projects, safe-yield groundwater extraction, and CRA base supplies. These sources supply water to MWD every year. Flexible supplies only provide water when needed. Examples of flexible supplies are voluntary water transfers and storage. Tables 4.4 to 4.6 summarize the results from the IRPSIM model studies performed to test the supply reliability of the resources mix adopted in the IRP. The results are given for a multiple dry year's scenario using hydraulic data from 1990-92, a single worst case dry year using 1977 historic hydraulic data, and for an average year. The IRPSIM analyze shows that MWD is 100% reliable under dry conditions for the period from 2010 to 2030.

More information on the IRPSIM Modeling is Section 2 of the IRP Update. Water supply reliability is also discussed in Section II.3 and appendix A-3 of the RUWMP.

Table 4.4 – Basis of Water Year Data

Water Year Type	Base Year	Historical Sequence
Normal Water Year		1992-2004
Singe-Dry Water Year	1977	
Multiple –Dry Water Year	1990-1992	

Table 4.5 – Average Supply Capability & Projected Demands (AFY)

	2005	2010	2020	2025	2030
Current Supplies					
Colorado River Aqueduct	711,000	678,000	677,000	677,000	677,000
California Aqueduct	1,772,000	1,772,000	1,772,000	1,772,000	1,772,000
In-Basin Storage	0	0	0	0	0
Supplies Under Development					
Colorado River Aqueduct	0	0	0	0	0
California Aqueduct	185,000	185,000	240,000	240,000	240,000
In-Basin Storage	0	0	0	0	0
Transfers to Other Agencies	0	(35,000)	(35,000)	(35,000)	(35,000)
Metropolitan Supply Capability	2,668,000	2,600,000	2,654,000	2,654,000	2,654,000
Metropolitan Supply Capability w/CRA Maximum of 1.25 MAF	2,668,000	2,600,000	2,654,000	2,654,000	2,654,000
Firm Demands on Metropolitan	2,040,000	2,053,000	1,989,000	2,115,000	2,249,000
Potential Reserve & Replenishment Supplies	628,000	547,000	665,000	539,000	405,000

Table 4.6 - Dry Year Supply Capability & Projected Demands (AFY)

	2005	2010	2020	2025	2030
Current Supplies					
Colorado River Aqueduct	722,000	699,000	699,000	699,000	699,000
California Aqueduct	777,000	777,000	777,000	777,000	777,000
In-Basin Storage	840,000	838,000	808,000	784,000	784,000
Supplies Under Development					
Colorado River Aqueduct	95,000	460,000	400,000	400,000	400,000
California Aqueduct	330,000	259,000	350,000	350,000	350,000
In-Basin Storage	78,000	103,000	103,000	103,000	103,000
Transfers to Other Agencies	0	(35,000)	(35,000)	(35,000)	(35,000)
Metropolitan Supply Capability	2,842,000	3,101,000	3,102,000	3,078,000	3,078,000
Metropolitan Supply Capability w/CRA Maximum of 1.25 MAF	2,842,000	3,033,000	3,002,000	2,970,000	2,970,000
Firm Demands on Metropolitan	2,293,000	2,301,000	2,234,000	2,363,000	2,489,000
Potential Reserve & Replenishment Supplies	549,000	732,000	768,000	607,000	481,000

Table 4.7 - Multiple Dry Year Supply Capability & Projected Demands (AFY)

	2005	2010	2020	2025	2030
Current Supplies					
Colorado River Aqueduct	722,000	699,000	699,000	699,000	699,000
California Aqueduct	912,000	912,000	912,000	912,000	912,000
In-Basin Storage	482,000	480,000	463,000	449,000	449,000
Supplies Under Development					
Colorado River Aqueduct	95,000	460,000	400,000	400,000	400,000
California Aqueduct	330,000	215,000	299,000	299,000	299,000
In-Basin Storage	78,000	103,000	103,000	103,000	103,000
Transfers to Other Agencies	0	(35,000)	(35,000)	(35,000)	(35,000)
Metropolitan Supply Capability	2,619,000	2,834,000	2,841,000	2,827,000	2,827,000
Metropolitan Supply Capability w/CRA Maximum of 1.25 MAF	2,619,000	2,741,000	2,741,000	2,719,000	2,719,000
Firm Demands on Metropolitan	2,376,000	2,389,000	2,317,000	2,454,000	2,587,000
Potential Reserve & Replenishment Supplies	243,000	377,000	424,000	265,000	132,000

In April of 1999, MWD adopted the Water Surplus and Drought Management Plan (WSDM Plan). This plan provides guidelines for managing water resources to achieve the reliability goals of the IRP. The guiding principle of the WSDM Plan is to manage MWD's water resources and programs to maximize management of supplies in wet years and minimize adverse impacts of water shortages to retail customers. MWD does this, in part, through encouraging efficient water use and economical local resource programs, coordinating with sub agencies to make surplus water available in dry years, pursuing transfer and banking options, and increasing public awareness about water supply issues. MWD fully expects to be 100% reliable for delivery of non-discounted, non-interrupted demands through 2025. If any allocations should become necessary, those allocations will be based on need, as opposed to any historical purchases. Further discussion of the WSDM Plan is included in Section 11.4 of the RUWMP.

EMWD participates and supports MWD's efforts to ensure reliability. One of the resource programs EMWD is constructing, Reach 16, is co-funded by MWD. Reach 16 is a recycled water pipeline that will remove 720 AF of potable water demand from the system and replace it with recycled water. EMWD is also using surplus SWP water to recharge the San Jacinto Basin so that there will be groundwater available to meet demands during dry years.

Based on the information detailed in MWD's RUWMP, EMWD is confident that MWD will provide EMWD with enough non-discounted, non-interrupted water supplies to meet demands through 2030. EMWD's only interruptible supply is discounted agricultural water, which accounts for approximately 4% of the District total supply, and the recharge water used for the San Jacinto Basin. It is anticipated that recharge water may not be available in one out every five years. If there is a shortage of imported water that cannot be supplemented by local supplies, EMWD will make up the deficiency by implementing the water shortage contingency plan.

Groundwater

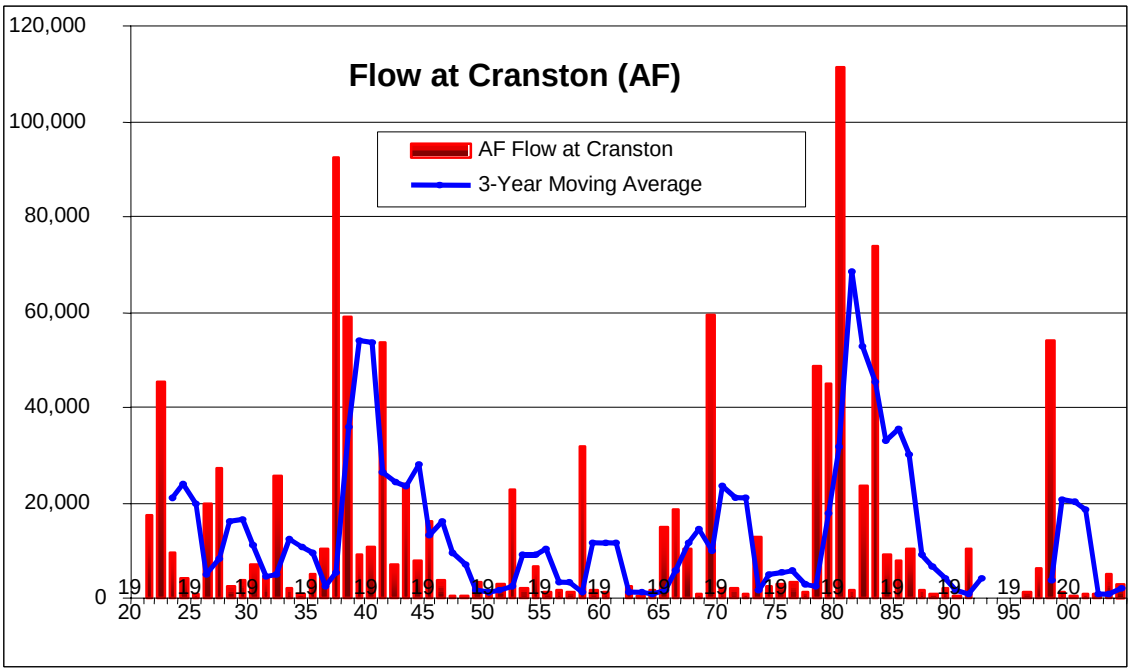
EMWD's 550-square mile service area spans two watersheds, the San Jacinto in the north and the Santa Margarita River in the south. In the San Jacinto Watershed, the Hemet/San Jacinto area to the east occupies about 23% of the District, and the West San Jacinto Groundwater Management Plan area to the west occupies approximately 49% of the District. The Santa Margarita River watershed portion of the District to the south covers approximately 28%.

Hemet/San Jacinto Area

Groundwater is, and historically has been, the primary source of supply in the Hemet/San Jacinto area. In 2004, 83% of EMWD's demand in the area was supplied by groundwater, while 17% was supplied by imported water. Twelve of sixteen active wells in the Hemet/San Jacinto area produced more than 12,500 AF of water during 2004.

Groundwater supplies are dependent upon precipitation locally, as well as in the mountains, to provide flow in the San Jacinto River to recharge the basins. The U.S. Geological Survey has maintained a gauging station at Cranston Ranger Station on the San Jacinto River for all but four years since 1920. The following figure shows annual San Jacinto River flow along with a three-year moving average.

Figure 4.1: - Annual San Jacinto River Flow



Based on data from the USGS gauging station, the following have been identified and defined:

Table 4.8 - Normal, Single-Dry, and Multiple-Dry Years

Term	Definition	Year(s)	Flow (AF)
Normal Year	Median Runoff Level (1920 through 2004)	1946	3,775.53
Single-dry Year	Lowest Annual Runoff for Watershed	1920	73.19
Multiple-dry Year Period	Lowest Average Runoff for three Consecutive Years	2000/02	714.69

During both Single- and Multiple-dry years, EMWD met customer demands without interruption of service.

An analysis of hydrologic reliability was conducted based on the 2000-2002 Multiple-Dry Year Period using data from three EMWD production wells in the Canyon and three in the Intake portion of San Jacinto Upper Pressure Management Zone. The results are shown in the following table:

Table 4.9 - Results of Hydrologic Reliability Analysis
(Decline in Water Levels is in Feet and
Depths to Water or Screens are in Feet Below Ground Surface)

	Area:	Canyon			SJUP Intake		
	Well:	# 17	# 26	# 34	# 18	# 27	# 28
1	Decline in Water Levels (Depth to Water) following 2000/02 Dry Period	142	152	144	85	64	86
2	Depth to Water as of June 2005	194	196	198	419	359	430
3	Projected Depth to Water Following Another Dry Period Similar to 2000/02	336	348	342	504	423	516
4	Depths of Lower Limit of Well Screens	1,122	1,460	1,050	1,000	1,676	1,480

Given current conditions, even if another multiple-dry year period produces a decline in water levels similar to that produced in 2000-2002, the wells will still be operable and capable of producing. The basin may become over drafted, but production would continue.

Groundwater management is an important element in maintaining water reliability. In the Hemet/San Jacinto area, the water purveyors and local groundwater producers have been working to put a water management plan in place. In the Principles for Water Management, each agency - EMWD, Lake Hemet Municipal Water District, and the Cities of Hemet and San Jacinto - agreed to a methodology for determining their base production rights. It is the goal of the Management Plan to adjust base production rights over time to a level consistent with the calculation of the agencies' share of safe-yield for the management area. After plan implementation, the agencies will be subject to replenishment of water pumped in excess of their adjusted base production right.

In the meantime, prior to plan implementation, the agencies agreed to address the deteriorating situation in the sub-basins and to reduce the historical impact of overdraft caused by past groundwater production. The Interim Groundwater Recharge Program involved the application of approximately 6,000 AF of SWP recharge during 2004 at two existing recharge pond sites located in the San Jacinto Riverbed. The water was recharged and funded under the 2004 Interim Water Supply Plan. An additional 778 AF was recharged in 2004 in anticipation of the execution of a similar MOU for 2005. That MOU was executed and provides for up to 8,000 AF of recharge, which is currently underway.

West San Jacinto Groundwater Management Plan Area

Groundwater plays a lesser role in the West San Jacinto Groundwater Management Plan area. In addition, groundwater supplies in the West San Jacinto area are not dependent upon San Jacinto River flows. Imported water accounted for 53,000 AF or more than 90% of the area's demands. During 2004, five production wells produced 4,050 AF of water and three desalter wells produced 1,990 AF of brackish groundwater for the desalination plant. If, due to drought or some other cause, groundwater supplies were not available, EMWD would first try to meet its customer's demands through imported water. If imported water were not available, then the Water Shortage Contingency Plan would be implemented.

Santa Margarita Watershed

EMWD serves and wholesales imported water in the portion of the Santa Margarita River Watershed that falls within District boundaries. Groundwater does not play a role in EMWD's efforts in this area.

Recycled Water

EMWD operates and maintains four regional water reclamation facilities and all are currently undergoing or planning an expansion. These facilities treat water collected in EMWD's wastewater system for use as recycled water. As the service area population grows, the supply of recycled water continues and as land becomes less available for agriculture, there is a greater supply of recycled water available for municipal and industrial purposes. EMWD's recycled water supply is not dependent on weather patterns and may actually increase slightly in dry years. Wet years, at times, will pose a greater operational challenge as storage facilities fill and customer demand decreases.

Section 5 - Transfers and Exchanges

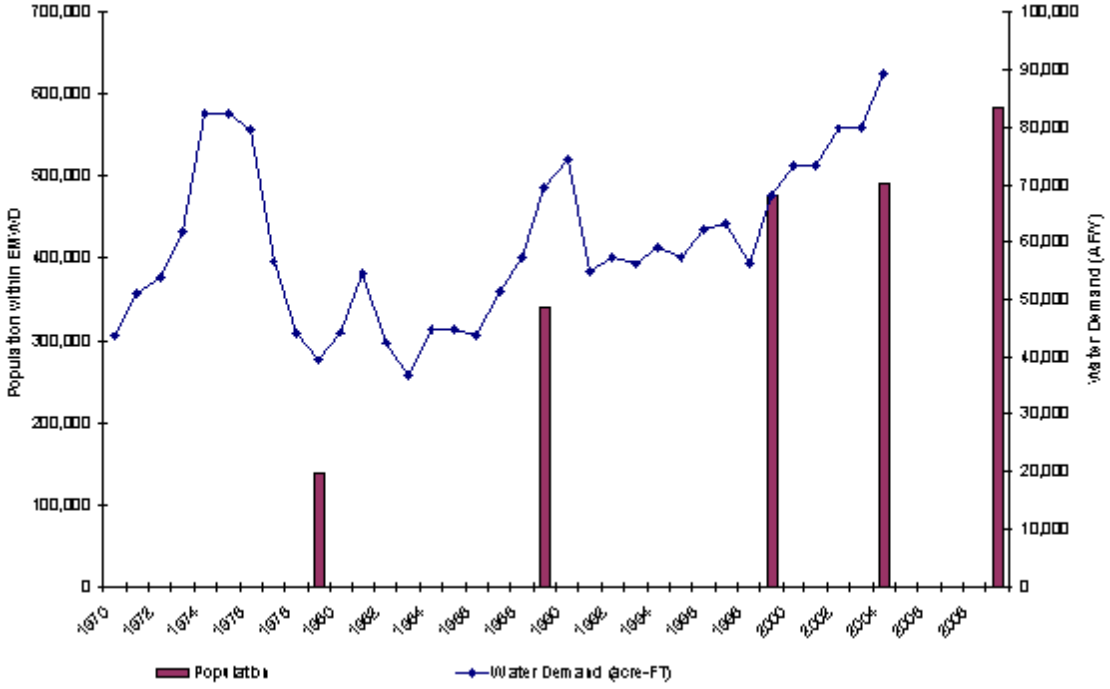
EMWD currently relies on Metropolitan Water District of Southern California (MWD) for any transfers or exchanges. As a member agency, EMWD benefits from MWD's efforts to improve supply reliability through transfers and exchanges detailed in the 2005 Regional Urban Water Management Plan.

In addition to relying on MWD, EMWD is investigating opportunities for independent transfers and exchanges. A consultant has been hired and is actively researching the possibility of cost-effective transfers and exchanges for EMWD. Since there is no guarantee that exchanges or transfers will be feasible for EMWD, and its impossible to quantify the amount of water that could be made available, transfers and exchanges are not listed as part of EMWD water supply.

Section 6 - Water Use by Customer Type

Since the last UWMP published in 2000, EMWD has experienced a period of accelerated growth. The number of customer meters has jumped to over 100,000, the majority of them in new single-family homes. In the past, water demand has remained relatively constant despite large jumps in population growth. Declining agricultural demand has offset the increasing domestic demand. Now, agricultural demand is relatively stable and the domestic market continues to grow. Even the recycled market is starting to shift from agricultural to other uses. For the last five years, population growth has driven up water use and it is expected to do so for the foreseeable future. The chart below tracts water sales compared to population from 1970 to 2004.

Figure 6.1 – Population Growth vs. Water Demand



More and more of the land in EMWD's service area is shifting away from open space and agriculture. EMWD maintains a Database of Proposed Projects (DOPP). This data base tracts major developments from planning through construction. The database is continually updated and revised as projects reach different stages of development. Currently, there are approximately 651 proposed projects on over 56 thousand acres within EMWD's service area. These projects would create nearly 150,000 new residential units and over 10,000 acres of commercial, industrial, institutional, parks, open space or other non-residential development. This database contains projects that may not be developed for years or even decades. EMWD uses population projections from the Southern California Association of Governments 2004 Transportation Analysis study to determine local absorption studies and information contained in the DOPP to determine its population growth from 2005 to 2025.

Retail Market Segments

EMWD has several different water markets. EMWD's primary customers are retail purchasers of potable water. These customers can be divided into residential, commercial, industrial, institutional and landscape sectors. Although the residential section is by far EMWD's largest customer segment, each market segment plays a role in the growth and development of EMWD's service area. See table below for the water use by various customer types.

Table 6.1 - Water Use by Customer Type-AFY

Year	Water Use Sectors	Single Family	Multi-Family	Com-mercial	Indus-Trial	Instit-Gov	Land-scape	Agri-Cultural	Total
2000	# of accounts	82,459	831	978	101	229	1041	413	86,051
	Deliveries	45,536	4,458	3,018	433	2,250	5,675	7,029	68,399
2005	# of accounts	108,956	1,098	1,292	133	302	1,375	185	113,341
	Deliveries	65,951	6,456	4,372	627	3,,258	8,220	3,152	92,036
2010	# of accounts	128,575	1,312	1,525	157	357	1,623	165	133,715
	Deliveries	74,764	7,414	4,957	710	3,695	9,321	2,776	103,637
2015	# of accounts	149,105	1,548	1,768	182	413	1,881	143	155,039
	Deliveries	87,419	8,814	5,792	830	4,317	10,891	2,403	120,466
2020	# of accounts	166,950	1,754	1,974	203	461	2,101	122	173,565
	Deliveries	98,535	10,058	6,512	933	4,853	12,244	2,048	135,183
2025	# of accounts	180,753	1,917	2,131	219	498	2,268	122	187,907
	Deliveries	106,503	10,970	7,017	1,006	5,230	13,194	2,048	145,968
2030	# of accounts	191,804	2,052	2,255	232	527	2,400	122	199,392
	Deliveries	112,958	11,737	7,423	1,064	5,533	13,957	2,048	154,720

In addition to potable sales to retail customers, EMWD also sells water to agricultural customers and wholesales water to other agencies. Although agricultural sales have greatly declined from historical numbers, agriculture remains an important part of EMWD's market. Water sales to other agencies are one of EMWD's most volatile demands. The need for EMWD's water can fluctuate every year due to a number of factors.

In addition to potable water sales, EMWD has an active and growing recycled water market. Using recycled water for landscaping and agricultural uses whenever possible allows EMWD to reduce its dependence on imported potable water.

Although their needs and size vary, EMWD is committed to providing water to support the people living and working within the District's 555 square mile service area.

Retail Sales of Potable Water

Residential

Residential use is, and will continue to be, the dominant demand for EMWD. According to the Riverside County Integrated Plan (RCIP), the ultimate land use will be primarily residential. Residential land use can be divided between low, medium and high residential development. Land use with between 0.05 and 3 structures per acre is considered low-density. Low-density residential accounts for over half of the residential land use. Low-density is focused in areas with steep terrain and geographical limitations to higher density land use. Although low-density accounts for over half of the residential land use, it only accounts for 20% of the total demand for water.

Medium-density residential is the second highest residential land use. Medium-density land use has between 4 and 8 dwelling units per acre and will account for more than half of the water demand at build out. Although there is less land dedicated for medium-density residential use in EMWD, the higher rate of water use per acre leads to higher water demand for medium-density residential customers. Much of the development currently occurring in EMWD's boundary is medium-density residential. Large tracts and specific plans are replacing rows of agricultural crops with rows of new housing throughout EMWD.

High-density residential accounts for the smallest area of residential land use. High-density residential has more that eight dwellings per acre and is usually multi-family. High-density residential includes apartments, town homes and condominiums. EMWD is starting to see an increase in the number of high-density projects being built in areas that are already densely populated. As land use within EMWD's services area continues to move from open space and agriculture, high-density residential development will continue to grow.

Commercial Sector

The commercial sector will also continue to grow as the population increases, according to the RCIP. Commercial development will be focused along the major transportation highways through EMWD's boundary - Interstate Highway 15, Interstate Highway 215, Highway 79, and Highway 74. Currently, commercial demands account for about 5% of EMWD's retail sales. According to the RCIP, ultimately, commercial demand will account for 8% of retail sales. This indicates that the commercial sector will continue to grow at nearly the same rate as the population.

Industrial Sector

EMWD has a very small industrial sector, less then 1% of retail demand. As the District grows, there may be a higher rate of industrial growth. The RCIP indicates that ultimate industrial demand may account for up to 4% of EMWD's retail market. Industrial growth will be focused mainly around Interstate Highway 215, when it occurs. As much as possible, EMWD will try to meet the needs of any industrial customers with a very high demand for water using recycled water.

Institutional/Governmental Sector

EMWD has a stable institutional sector that will grow with the population. Currently, the demand from institutional customers accounts for about 4% of retail demand for potable water. The RCIP predicts about 3% of the ultimate water demand will be for public facilities. Whenever possible, recycled water is used for landscape irrigation for schools and other government facilities.

Agricultural Sales – Potable Water

When EMWD was formed, it was primarily to serve the agricultural community with imported water from MWD. Since then, the District has gone through a major transformation from a farming community to a residential community. Currently, agricultural sales account for only about 4% of EMWD's potable water market. This is expected to remain relatively stable for the next twenty years with some fluctuations from year to year due to changes in weather or crop rotations.

Reduction of Retail Demand through Conservation

As EMWD's demographics change and the population grows it is important that every effort is made to reduce water demand through conservation. Already the amount of water needed for the thousands of new homes being built is reduced through plumbing codes implemented in the early 1990's. Low flow toilets and showerheads are mandatory in all new construction. As seen in table 6.2 below, this passive conservation through plumbing codes has already reduced EMWD's demand significantly and will continue to do so in the future. In addition to passive programs, EMWD has implemented all of the California Urban Water Conservation Council (CUWCC) Best Management Practices (BMP). The BMPs and other active conservation programs also reduce EMWD's current demand and will continue to decrease it in the future. These existing practices and laws allow EMWD to project demand lower then it would without these conservation measures.

The demand projected in Table 6.1 assumes that existing conservation laws and programs will remain in place or be replaced with similar efforts. However, EMWD is not content to rely on the existing conservation programs and law. One of EMWD's strategic objectives is to "Promote efficient use of water and implement a structured conservation plan." EMWD is currently developing a conservation plan to reduce water consumption per capita and participating in pilot protects and programs. The continued promotion of conservation through new rebates, programs and education will only continue to reduce demand.

Table 6.2 – Conservation Savings – AFY

	2000	2005	2010	2015	2020	2025	2030
Retail Demand	61,400	92,000	10,3600	120,500	135,200	146,000	154,700
Active Conservation	1,100	1,800	2,600	3,300	4,000	4,700	5,000
Passive Conservation	600	2,800	5,000	7,200	9,200	10,600	11,300
Demand without Conservation	63,100	96,700	111,200	131,000	148,300	161,300	171,000

Wholesale to Other Agencies

EMWD wholesales water to six different agencies. The demand for each agency differs based on its need each year. These demands can be unstable at times as other water districts use water from EMWD to supplement their system when local facilities are inadequate or fail. The majority of wholesale water is delivered to agencies in the Hemet/San Jacinto area. This demand should decrease while needs are met through the recharge and recovery plan. As the population continues to grow and native groundwater production is curtailed, imported water through EMWD will become the supplemental supply for all new growth.

A portion of the water EMWD wholesales to Lake Hemet Municipal Water District is raw water for agricultural uses. This water is needed especially when surface water is not available in dry years. Planning is underway to meet a portion of these agricultural needs with recycled water in the future. See the table below for water sales to other agencies.

Table 6.3 - Sales to Other Agencies – AFY

Sales to Other Agencies	2000	2005	2010	2015	2020	2025	2030
Lake Hemet MWD Ag Water	1,667	2,545	1,200	2,100	2,600	3,100	3,384
Lake Hemet MWD		300	0	0	0	0	0
City of Hemet Water Dept.	591	259	0	0	0	0	0
San Jacinto Water Dept.	0	222	0	0	0	0	0
City of Perris	1,977	2,500	2,641	2,722	2,757	2,769	2,773
Murrieta Water County Dist.	0	300	0	0	0	0	0
Nuevo Water Company	36	775	1,002	1,457	1,745	1,903	1,979
Total Untreated AG	1,667	2,545	1,200	2,100	2,600	3,100	3,384
Total Potable	2,604	4,578	3,643	4,179	4,502	4,672	4,752

Other Water Uses

EMWD has several additional water uses, water used for recharge, recycled water use and water losses. See Table 6.4, for the projected use of water by each type.

Table 6.4 - Other Water Uses - AFY

	2000	2005	2010	2015	2020	2025	2030
Recharge Water	0	8,000	20,000	22,200	22,600	22,600	22,500
Recycled - Industrial Enterprise and Aesthetic Improvement			7,000	8,250	9,500	10,750	12,000
Recycled – Municipal	3,500	3,500	7,700	10,950	13,200	15,750	17,500
Recycled – Agriculture/Wildlife Habitat		21,500	17,700	17,500	17,500	17,500	17,500
System Losses	3,959	6,930	7,900	9,400	10,600	11,600	12,700
Total	7,459	39,930	60,300	68,300	73,500	78,200	82,200

Recharge Water

Under the Hemet/San Jacinto Water Management Plan, EMWD will be responsible for transporting raw water from EM-14 to ponds in the San Jacinto riverbed to recharge the groundwater basin. The SPW imported through MWD will meet the requirements of the Soboba Settlement and improve the reliability of groundwater in the area. After the water is added to the basin, individual agencies including EMWD will extract their allotted amount of water from the basin using wells already in place and new wells yet to be constructed.

Recycled Water

There are three main types of recycled water; 1) municipal customers, 2) agricultural/wildlife habitat customers, and 3) customers using recycled for industrial purposes or aesthetic impoundments. Municipal customers use recycled water for irrigating landscaping. These customers have made a financial investment in the landscape or process that requires water. Without recycled water available, these customers would pay for imported potable water or pump groundwater to protect their investment. It is anticipated that the demand from these customers will increase with population growth and system expansion. Each customer will have a fairly consistent demand each year, with minor fluctuations due to weather. Recycled water use by these customers reduces the amount of potable water that needs to be extracted from groundwater or imported through MWD.

Some agricultural customers often use recycled water to grow short-term row crops. Using potable water would not be cost-effective for these customers. Their profitability is based on the availability of low-cost recycled water and low-cost land available for lease. The location of these customers frequently changes each year depending on where there is land available. As more residential development takes place and the population grows, land is becoming less accessible. As time goes by, EMWD expects to have fewer and fewer of these types of customers. Other agricultural customers use recycled water to irrigate crops that require a long-term investment such as citrus trees. These customers would use potable water if needed to protect their investment. Because potable water has a prohibitive cost, recycled water is also used to support the San Jacinto Wildlife Area.

One final type of recycled water customer is the customer using recycled water for industrial processes or aesthetic impoundment. These customers would not use potable water either because it is not economically feasible or because EMWD policy would not allow it.

The future of EMWD's recycled water market is with municipal customers, customers using recycled water for industrial processes or aesthetic impoundment and long-term agriculture customers. To meet the needs of these customers, EMWD is taking steps to improve the reliability and quality of the recycled water system.

EMWD also sells water to the California Department of Fish and Game for the San Jacinto Wildlife Area. This wildlife refuge was one of the first in the state to use recycled water for habitat creation and recycled water is used to help maintain, enhance and improve this environmental preserve. EMWD is working with the Department of Fish and Game and other interested parties to expand and enhance the use of recycled water for environmental benefits at the San Jacinto Wildlife Area.

Water Losses

EMWD's final water use type is water losses. Water losses account for less than 7% of total water use. Through leaky pipe tracking and replacement, EMWD is continually trying to decrease the water loss rate.

All Use

The sum use of EMWD's water use is seen in the table below.

Table 6.5 - Total Water Use - AFY

	2005	2010	2015	2020	2025	2030
Total Water Use	139,000	168,800	195,000	215,800	231,900	245,200

Section 7 – Conservation

Under EMWD's Strategic Plan, the District is seeking to "*Promote efficient use of water and implement a structured conservation program*." To do this, EMWD is actively working with other agencies and its customers to reduce the amount of water demand placed on groundwater and imported sources. The goal is to reduce our per capita water use rate by 25% over the next twenty years through promoting programs, offering rebates, educating customers and minimizing water loss from EMWD facilities. Two groups that EMWD works closely with to improve conservation efforts are Metropolitan Water District of Southern California (MWD) and the California Urban Water Conservation Council (CUWCC).

Metropolitan Water District of Southern California

EMWD's work with MWD on conservation savings is important for two reasons. First, MWD uses projected conservation savings as part of its calculations when determining supply reliability. Second, MWD is a funding source for many of the conservation programs EMWD implements. Additional information about MWD's conservation program is included in Section II.2 of the RUWMP.

Projected Water Savings

A core element of MWD's water supply plan is conservation. One of the changed conditions in the 2003 Integrated Resource Plan (IRP) update was an increase in conservation savings causing a drop in demand compared to the 1996 IRP. The 2003 update to the IRP had a target for conservation of 1,107,000 AF of savings in 2025. This target was developed using specially designed computer models created to tackle the complex measurement of conservation savings.

In MWD's model, four types of conservation savings are considered:

1) **Active conservation savings** are a result of agency funded or sponsored programs.
2) **Passive conservation savings** are the result of the 1992 California Plumbing code.
3) **Price-effect conservation savings** are due to increases in retail water rates since 1990.
4) **Pre-1990 conservation savings** are from the 1980 California Plumbing code and from price effects from 1980 to 1990.

For "active" conservation savings, MWD takes a regional approach for any conservation that may be implemented in the future. There is not a specific target for each agency but MWD works with all of the sub agencies within its service area to meet conservation goals. Much of EMWD's conservation program has received supplemental funding from MWD and EMWD is continually working with MWD to find new opportunities for water use efficiency.

Because EMWD experienced so much growth after 1992, the majority of the MWD projected conservation savings in EMWD's service area is due to pre-1990 savings, price effects and passive savings from the plumbing codes. Only about 7% of the total projected conservation savings are achieved through the active conservation programs already in place. Since MWD's savings projections are based on savings from plumbing

codes and programs already in place, any additional conservation activities EMWD undertakes will only decrease the reliance on the imported water supply from MWD.

California Urban Water Conservation Council

The CUWCC was created to increase efficient water use throughout the State of California through partnership with urban water agencies, public interest organizations and private entities. The goal of the council is to integrate urban water best management practices (BMPs) into the planning and management of California's water resources. In 1992, EMWD signed CUWCC's Memorandum of Understanding Regarding Water Conservation in California (MOU). By signing the MOU, EMWD committed to developing and implementing fourteen comprehensive BMP's for urban water management. EMWD submits a biennial report to CUWCC describing the status of each BMP. Included as Appendix C are the CUWCC BMP Reports for 2002/2003 and 2003/2004. The BMP's correspond to the fourteen Demand Management Measures listed in Water Code Section 10631 (f).

Best Management Practices

Water Survey Programs for Single – Family Residential and Multi-Family Customers

EMWD has offered free residential water use surveys of its customers since 1991. These surveys examine both indoor and outdoor water uses. They measure flow rates in showers and toilets, check for leaks, recommend water saving devices, check landscape areas and review or develop irrigation schedules. At the end of the survey, customers are provided survey results and water saving recommendations. From 1993 to 2004, over 2,000 water surveys were completed. Funding for the residential surveys comes from EMWD and through MWD's Conservation Credits Program. This program meets the requirements of BMP 1.

Plumbing Retrofits

Plumbing retrofits for residential customers are often recommended or installed as part of the residential surveys. In 2004, low flow showerheads, toilet displacement devices, toilet flappers and faucet aerators were distributed to EMWD customers to increase indoor water use efficiency. In addition to indoor water saving devices, several types of irrigation devices were distributed. MWD is a partner in funding retrofits. This program meets the requirements for BMP 2.

Distribution System Water Audits, Leak Detection and Repair

EMWD continually tracks the amount of water sold and the supply entering the system. Every customer has a service meter. This allows EMWD to determine the amount of water that goes unaccounted for each year. The rate of water loss is currently less than 7%; however, EMWD is continually making an effort to reduce those losses. As part of normal operation and maintenance procedures, all leaks reported are investigated and repaired if they are part of EMWD's system. Pipes with numerous leaks are tracked and replaced as part of the Capital Improvement Plan. Pipe inspection is also routinely conducted by maintenance personnel, in order to determine where leaks are occurring. Grant funding opportunities are pursued to assist in funding leaky pipe replacement when possible. This program meets the requirements for BMP 3.

Metering with Commodity Rates

EMWD is fully metered for all customer sectors and all customers pay the sector rate for each billing unit consumed. Irrigation meters are required for all Commercial, Industrial and Institutional (CII) customers with a landscaped area over 3,000 square feet. EMWD also has separate meters for recycled water meters. As new services are added, meters are installed and read. Older meters are calibrated and replaced as needed. Metered accounts may result in a 20% reduction of water demand compared to non-metered rates. This program meets the requirements for BMP 4.

Large Landscape Water Audits and Incentives

EMWD has over 1,300 dedicated landscape meters. Of these meters, nearly 400 are metered accounts with water budgets. The accounts with budgets have 3,000 square feet or more of dedicated landscaping areas. Each account receives a monthly report and graph indicating account status. If a landscaping customer's water use exceeds its budgeted limit, a fine is levied on the customer. It is estimated that approximately 500 AFY are saved through the large landscape program. This program meets the requirements for BMP 5.

High-Efficiency Wash Machine Rebates

EMWD offers its customers a rebate for purchasing high-efficiency washing machines. From 2001 through 2004, EMWD facilitated rebates for 1,079 high efficiency washing machines. In 2004, 553 rebates were issued for eligible washers purchased. Currently, a rebate of $110 is offered for applicable machines. Since July 2005, only washing machines with a water use factor of 6.0 or less are eligible for this rebate. MWD currently contributes $100 towards each washing machine rebate. This program meets the requirements for BMP 6.

Public Information

Public information is an important part of EMWD's conservation program. Information on water conservation is offered through workshops, bill inserts, EMWD's web site, brochures, community speakers, paid advertising and special events every year. EMWD is developing a survey program to track the effectiveness of its public information campaign. Although the benefits of a public information campaign may not be easily measured, EMWD believes it is in the public's best interest. A portion of the public information program is funded through MWD, especially landscape workshops. This program meets the requirements for BMP 7.

School Education

School education is an integral part of EMWD's conservation efforts. Programs are available for students in kindergarten through the twelfth grade. Full-time staff members are employed to reach out to students through educational tours of EMWD facilities, water conservation theater programs presented in an assembly, distributing free water education materials, administrating a "water-wise" poster contest, making classroom presentations and other educational programs. Over 100,000 students were reached in 2004. As the District continues to grow, so will the number of students reached. This program meets the requirements for BMP 8.

Commercial, Industrial, and Institutional Water Conservation

EMWD encourages conservation by commercial, industrial and institutional water customers in several ways. Rebates are a major part of EMWD's outreach to these water customers. Rebates are offered for ultra-low and dual-flush toilets, and urinals up to $140. There is a $100 rebate for water brooms. In addition to the water broom rebate program, EMWD donated a water broom to every school within its service area, 125 brooms in total. There is also a rebate of $500 for cooling tower conductivity controllers that will cut water use up to 40%. Replacing a kitchen sprayer with one that can save water is eligible for a $50 rebate. High-efficiency washing machines receive a rebate of $100 and an X-ray film processor recycling system that reduces water use up to 98% has a rebate of $2,000. Information about all of these rebate programs is readily available to customers on EMWD's web site.

EMWD also offers free guest towel and bed linen placards for hotels and motels, and offers water use surveys to commercial, industrial and institutional customers. For outdoor conservation, any commercial, industrial and institutional customer with landscaped areas larger than 3,000 square feet is part of the large landscape program and on a water budget. MWD provides much of the funding for the rebate offered to commercial, industrial and institutional customers and conducts periodic marketing campaigns for the program. This program meets the requirements for BMP 9.

Wholesale Agency Programs

BMP 10 concerns the actions of wholesale agencies. As a wholesale agency, EMWD encourages each of its sub agencies to participate in rebate programs, and in the past, has worked with individual agencies to promote water conservation in the region. Currently, LHMWD is receiving MWD funds through EMWD for ultra-low flush toilets and washing machines programs.

Conservation Pricing

EMWD has meters for each customer and charges a volumetric rate for water use. By charging each customer for the volume of water used, EMWD encourages customers to reduce water use and therefore the amount paid for water. This rate system meets the requirements of BMP 11.

Conservation Coordinator

BMP 12 concerns a conservation coordinator. EMWD does not have a dedicated conservation coordinator at this time. Instead, a team of three full-time and two part-time employees work together to coordinate conservation programs and BMP implementation, prepare and submit the Council BMP Implementation Report, and communicate and promote water conservation issues to senior staff.

Water Waste Prohibition

EMWD has an Ordinance that provides for special water conservation provisions. Ordinance 72.19 limits the use of potable water for golf courses and aesthetic impoundments. It also has several provisions for conservation ethics for all EMWD customers. Ordinance 72.19 meets the requirements of BMP 13.

Ultra-Low Flush Toilet Replacements

Ultra-low flush toilet replacement has occurred in EMWD since 1993. EMWD offers rebates with funding through MWD, and more than 15,742 toilets were replaced from 1993 to 2004 resulting in approximately 546.5 AF of water saved annually. Recent surveys have found that there is still a significant market for toilet replacement, and EMWD will continue to offer replacement toilets each year. This program meets the requirements of BMP 14.

Demand Management Measures (DMM)

The fourteen best management practices encouraged by CUWCC correspond to the fourteen demand management measures advocated by the State of California. EMWD's actions are detailed in the included CUWCC Reports and these reports meet the requirements set forth by law.

Evaluation of DMMs Not Implemented

EMWD has worked to implement each of the DMMS or BMPs. As detailed in the attached CUWCC reports, all of the DMMs are implemented, and in some cases EMWD has gone beyond the requirements of CUWCC and the Water Code.

Section 8 – Planned Water Supply, Projects and Programs

Proposed Supply Projects and Programs

As the population in EMWD's service area continues to increase, EMWD is planning for the future by aggressively pursuing the completion of new facilities and sources of supply. Not content to depend on MWD for potable water delivered to our boundary lines, EMWD's Capital Improvement Plan (CIP) includes projects for treating raw water and desalting groundwater. EMWD has also taken steps to increase the reliability and the output of the groundwater basins in a safe and responsible manor through integrated recharge and recovery. EMWD is also planning, or already in the process of, expanding each of its regional water reclamation facilities to treat the increased wastewater generated by the growing population thereby supplying additional recycled water. Table 8.1 shows the AFY each proposed project will supply, Table 8.2 gives the schedule for water supply expansion projects from EMWD's CIP.

Table 8.1 - Future Water Supply Projects -AFY

			Multiple Dry Years Supply		
Project Name	Normal Year Supply (AF)	Single Dry Year Supply (AF)	Year 1	Year 2	Year 3
Water					
Perris Desalter II	4,500	4,500	4,500	4,500	4,500
Hemet Microfiltration Plant	8,800	8,800	8,800	8,800	8,800
Perris Microfiltration Plant Expansion	8,800	8,800	8,800	8,800	8,800
IRRP Phase 1	7,500	7,500	7,500	7,500	7,500
IRRP Phase 2	15,000	15,000	15,000	15,000	15,000
Recycled Water					
San Jacinto Valley RWRF Expansion to 14 MGD	3,400	3,400	3,400	3,400	3,400
San Jacinto Valley RWRF Expansion to 18 MGD	4,500	4,500	4,500	4,500	4,500
Moreno Valley RWRF Expansion to 21 MGD	9,000	9,000	9,000	9,000	9,000
Temecula Valley RWRF Expansion to 18 MGD	6,700	6,700	6,700	6,700	6,700
Temecula Valley RWRF Expansion to 22 MGD	4,500	4,500	4,500	4,500	4,500
Perris Valley RWRF Expansion to 22 MGD	12,300	12,300	12,300	12,300	12,300
Perris Valley RWRF Expansion to 30 MGD	9,000	9,000	9,000	9,000	9,000

Table 8.2 - Water Supply Projects Timeline

Project Name	Projected Start Date	Projected Completion Date
Water		
Perris Desalter II	Aug. 2005	Sept. 2008
Hemet Microfiltration Plant	Jan. 2003	Aug. 2006
Perris Microfiltration Plant Expansion	Sept. 2003	Nov. 2006
IRRP PHASE 1	Jan. 2004	Sept. 2006
Recycled Water		
San Jacinto Valley RWRF Expansion to 14 MGD	Oct. 2004	Dec. 2011
San Jacinto Valley RWRF Expansion to 18 MGD	Nov. 2019	June 2024
Moreno Valley RWRF Expansion to 21 MGD	Nov. 2006	Nov. 2009
Temecula Valley RWRF Expansion to 18 MGD	Nov. 2002	June 2006
Temecula Valley RWRF Expansion to 22 MGD	Feb. 2010	March 2015
Perris Valley RWRF Expansion to 22 MGD	Jan. 2005	Feb 2013
Perris Valley RWRF Expansion to 30 MGD	Aug. 2014	Oct. 2018

Desalters

EMWD currently has one desalter producing potable water from high TDS groundwater threatening to contaminate the potions of the West San Jacinto area, and has finished construction and is preparing to begin production at a second desalter. The completion of a third desalter in 2006 will put EMWD at the sustainable capacity of groundwater desalination and supply an increased supply of 4,500 AFY. Currently, the Perris II Desalter is in design and completion is anticipated for April of 2006.

Because the groundwater levels in the basins that supply groundwater for the desalter are rising, a single or even multiple-dry year event would have insignificant effects on the desalter production. Production is projected to remain at the 4,500 AFY rate.

Hemet Microfiltration Plant

In the Hemet/San Jacinto area, the population has outgrown the ability of groundwater alone to meet demand. To offset that demand, EMWD is in the process of constructing a microfiltration plant that will treat unfiltered raw water from the State Water Project (SWP) for potable use in the area. This 8,800 AF plant will depend on MWD for a source of water to treat. MWD has assured its member agencies of its ability to meet demand even during multiple dry years through 2020 and therefore, the production rate of the microfiltration plant will be unaffected by dry weather patterns.

Perris Microfiltration Plant Expansion

Currently, the microfiltration plant in Perris is undergoing an expansion from a capacity of 8,800 AFY to 17,600 AFY. This expansion is expected to be completed in November of 2006. Like the Hemet plant, the Perris microfiltration plant is not dependent on weather patterns and will not be limited in dry years.

Integrated Recharge and Recovery Project

Currently, EMWD uses untreated water from MWD for groundwater recharge in the Hemet/San Jacinto area. To expand that effort and as part of the Hemet/San Jacinto Water Management Plan, EMWD is developing a program of replenishment and recovery that will be implemented in two phases. The first phase will result in the ability to recover 7,500 AFY of water from the basin by 2010. Work on the integrated replenishment and recovery program has been initiated. Since much of the recharge will take place within the San Jacinto River, EMWD is working with the Army Corps of Engineers to prepare an Environmental Impact Statement for the project.

Recycled Water

EMWD owns, operates and maintains four regional water reclamation facilities (RWRF) throughout the District. Each one of these plants will be expanded over the next twenty years to meet the demand of the increasing population. Although the treatment capacity of each plant will be increased, the supply of recycled water will only increase as the population grows. In addition, due to the fluctuation in demand for recycled water throughout the year and the year-round consistent supply of recycled water, there is more recycled water available in the winter than is needed. This leads to seasonal discharges. Therefore, in estimates of available water supply, only the treated recycled water available and used to meet demand is listed as a source of supply, and not the entire capacity of the treatment plants.

San Jacinto Valley Regional Water Reclamation Facility

The San Jacinto Valley RWRF is currently under design for an expansion from secondary to tertiary treatment. This expansion will allow the recycled water from this plant to be used for more purposes than secondary treated water. The expansion to tertiary treatment will be completed in spring of 2008. In addition to the current expansion, this plant will be expanded again to increase capacity to meet new demands. Outlined in EMWD's Year 2025 Regional Water Reclamation Facilities Capital Improvement Plan (RWRF-CIP) the first expansion will take the plan from 11 MGD of capacity to 14 MGD. This expansion should be completed in 2011. The next expansion will take the plant to 18 MGD capacity and will begin in 2020 and be completed by 2024.

Moreno Valley RWRF

In April of 2005, planning began for the expansion of the Moreno Valley RWRF. This plant will be expanded from 13 MGD capacity to 21 MGD by 2009 according to the RWRF-CIP.

Temecula Valley RWRF

Located in one of the most rapidly growing areas of EMWD, the Temecula Valley RWRF just completed an expansion in 2005 and has two more scheduled before 2020. The expansion from 12 to18 MGD is in construction and is scheduled to be complete in June of 2006, and the expansion to 22 MGD will begin in 2010 and be completed in 2018.

Perris Valley RWRF Expansion

The Perris Valley Expansion to 22 MGD is in final design and will be completed in 2007. This expansion will double the capacity of the current treatment facilities. Another expansion to 30 MGD is scheduled to begin in 2013 and be completed by 2019.

Section 9 – Desalinated Water

As discussed previously, EMWD's Groundwater Desalination Program will construct three desalters, providing up to 12,000 AFY of low salinity potable water. The first two desalters are on line, and the third desalter is in the preliminary design stage.

The single greatest impediment to expanding EMWD's desalination plan is the high cost of brine disposal. As an inland agency, EMWD must purchase brine disposal capacity in a regional disposal system operated by the Santa Ana Watershed Project Authority (SAWPA). The costs of brine disposal are increasing extremely rapidly, threatening the economic viability of EMWD's program. Additionally, recent increased interest in desalination by other agencies in the region has led to a shortfall in available capacity that will limit EMWD's ability to expand its program in the future.

Because of the increased costs and limited availability of brine disposal capacity in SAWPA's regional system, EMWD has initiated several research projects to evaluate the feasibility of reducing brine volumes, including a research proposal with the U.S. Bureau of Reclamation to examine "zero-liquid discharge."

If EMWD can develop a strategy to minimize brine volumes and reduce the cost of brine disposal, expanded desalination of recycled water will become feasible. EMWD has developed groundwater management plans which call for up to 20,000 AFY of groundwater recharge using imported State Water Project water purchased from MWD. This imported water could be replaced (up to 10,000 AFY) by desalted recycled water, improving overall supply reliability and reducing EMWD's dependence upon imported water.

EMWD's preliminary research and feasibility studies into brine volume reduction will be completed late in 2007.

Table 9.1 - Opportunities for Desalinated Water

Source	Yield AFY	Start Date	Type of Use
Recycled Water	10,000	Unknown	Groundwater Recharge

Section 10 – Wholesale Water

Bringing Imported Water to EMWD

The Metropolitan Water District of Southern California (MWD) is a public agency organized in 1928 by a vote of electorates of thirteen Southern California cities. The agency was created by the original Metropolitan Water District Act (Metropolitan Act) by the California Legislature "for the purpose of developing, storing, and distributing water" to the residents of Southern California.

The first function of MWD was to build the Colorado Aqueduct bringing Colorado River water to Southern California. As MWD was constructing the San Jacinto Tunnel Portion of the project, a great amount of seepage was encountered. As the seepage began to affect local water resources, residents began to organize to protect their water supply. About the same time, the region experienced years of dry weather and the underground basin began to experience overdraft. It became clear that a source of imported water was necessary. EMWD was formed in 1950 to bring imported water into the area. In 1951, it was annexed into MWD and the first major sale of Colorado River water within EMWD, began in July of 1952.

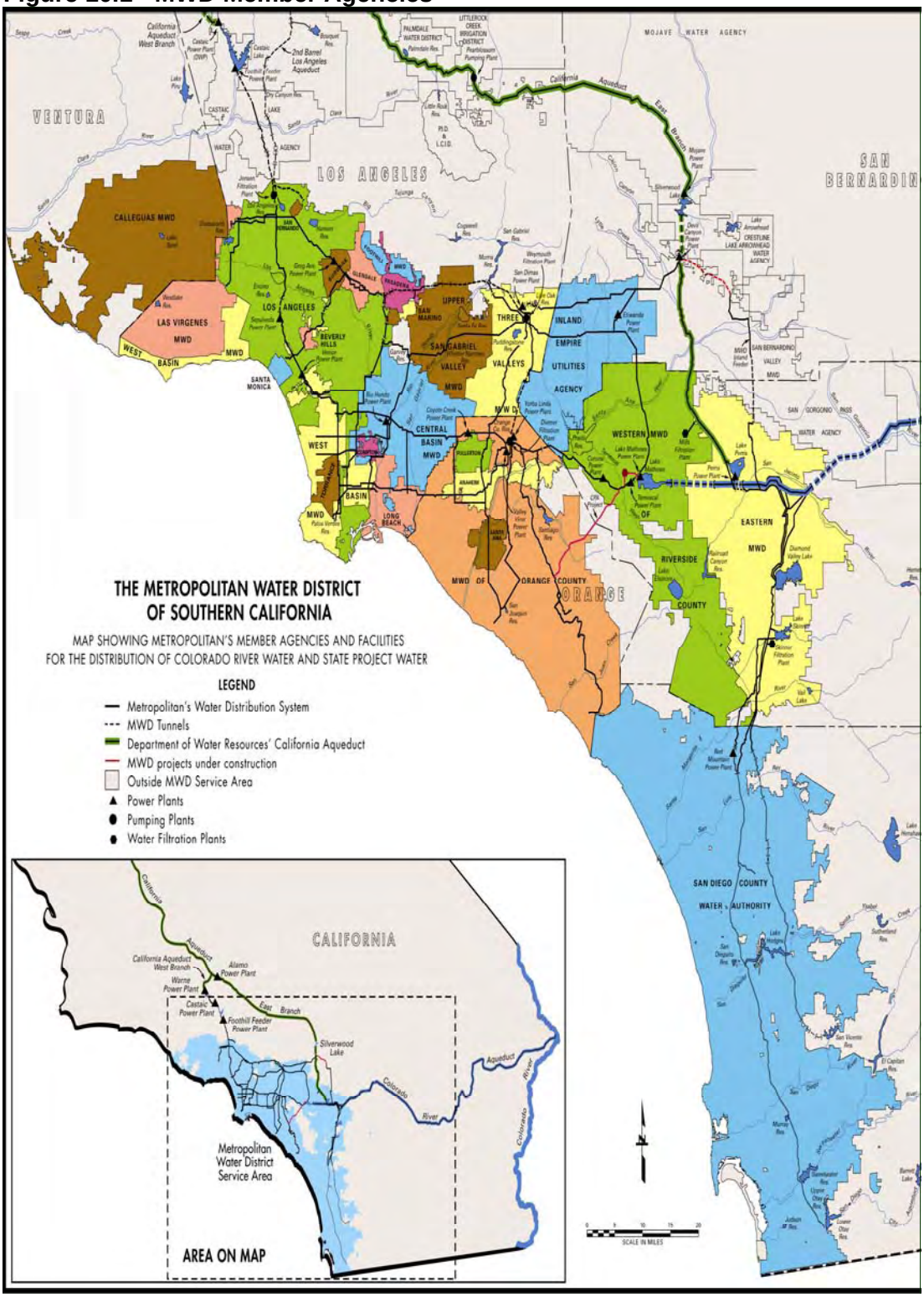
In 1960, MWD contracted for additional water supplies from the State Water Project (SWP) operated by the State of California Department of Water Resources (DWR). In 1972, the SWP began bringing water from the wet climate of northern California to the dry climate of southern California. Through the 1980's, EMWD built facilities to take advantage of the SWP water available, and today, 75% of EMWD's water supply is provided from Northern California.

Member Agencies

In addition to EMWD, MWD is composed of 25 other member agencies, including fourteen cities, ten other municipal water districts and one county water authority. MWD's service area includes the Southern California coastal plain. It extends about 200 miles along the Pacific Ocean from the City of Oxnard in the north to the Mexican Border on the south, and it reaches more than 70 miles inland. The service area includes potions of Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura counties. Approximately 90% of the population within these counties is within MWD's boundaries. MWD member agencies serve more than 143 cities and 89 unincorporated areas. Figure 10.1 shows a map of MWD's service area.

Member agencies receive deliveries at different points in the system and pay for the service through a rate structure made up of multiple components. Each year member agencies advise MWD how much water they anticipate they will need during the next five years. MWD also works with member agencies to develop a forecast of future water demand.

Figure 10.1 - MWD Member Agencies



MWD is a wholesale provider only, and has no retail customers. It provides treated and untreated water directly to its member agencies. The 26 member agencies then deliver to their customers a blend of groundwater, surface water, desalinated water, recycled water and imported water from MWD. MWD has provided between 45% and 60% of the municipal and agricultural water used in its nearly 5,200-square mile service area. The remaining water is provided through local resources and imported water from other sources. More information about MWD is summarized in Section I.2 of the RUWMP.

Board of Directors

MWD's Board of Directors consists of thirty-seven directors. Each member agency is allotted at least one director with each agencies assessed value determining it's additional representation and voting rights. Currently, EMWD Board of Director's President, Randy Record, represents EMWD on MWD's Board.

Planning for the Future

MWD takes a comprehensive and proactive approach to planning for the future. Through coordination with member agencies, MWD has developed regional targets to accommodate growth and face the challenges to supply reliability. Through the past decade, MWD has undertaken several planning initiatives including the Integrated Resources Plan (IRP), the Water Surplus and Drought Management Plan (WSDMP), and the Strategic Plan and Rate Structure. Together these programs and plans provide a framework and guidelines for the future. Section II of the provides aditional information about MWD's planning efforts.

Integrated Resources Plan

In the 1990's, several years of drought and regulations requirements began to affect the reliability of MWD water supply. In response to this challenge, MWD and its member agencies began an Integrated Resource Plan (IRP) process level of supply reliability needed and to find a cost-effective way to meet the goals establish. The IRP was a collective effort drawing input from several groups including MWD's Board of Directors, an IRP workgroup (comprised of MWD staff, member agency and sub agency managers, as well as groundwater basin managers), and representatives from the environmental, agricultural, business and civic communities. It was important that the IRP process was collaborative because its viability was contingent on the success of local projects and local plans in achieving their individual target goals for resource management and development.

The outcome of the IRP process was a "Preferred Resource Mix" which would ensure MWD and its member agencies reliability through 2020. The MWD Board of Directors adopted the first IRP in January of 1996. In November of 2001, the MWD Board of Directors adopted a plan to update the IRP. The update focused on changed conditions, updated resource targets, and extending the planning horizon to 2025 and beyond. Again the process was a collaborative effort. The 2003 IRP Update was adopted in July of 2004

MWD's resource mix depends on a blend of improving the reliability and availability of imported water supplies into the region, increasing local storage and developing local resources. The 2003 IRP update demonstrated that MWD and its member agencies

have moved the region toward the goal of long-term water reliability. Major achievements have been made in:

- Conservation
- Water recycling and groundwater recovery
- Storage and groundwater management programs within the Southern California region
- Storage programs related to the SWP and the Colorado River
- Other water supply management programs outside of the region.

The 2003 IRP Update includes information about programs and resources developed or identified as part of the IRP process. Below is a table from the update summarizing each program and its status.

Table 10.1 – IRP Targets

Target	Programs and Status
• Conservation	Current – Conservation Credits – 1992 Plumbing Code – Southern California Heritage Landscape Program * In Development or Identified – Innovative Conservation Program – Innovative Supply Program
• Recycling • GW Recovery • Desalination	Current – LRP Program In Development or Identified – Additional LRP Requests or Proposal – Seawater Desalination Program
• SWP	Current – SWP Deliveries – San Luis Carryover Storage (Monterey Agreement) – Environmental Water Account In Development or Identified – Sacramento Valley Water Management Agreement – CALFED Delta Improvement Program
• CRA	Current – Base Apportionment – IID/MWD Conservation Program – Coachella and All American Canal Lining Program (to SDWCA & San Luis Rey) – Hayfield Storage Program** – PVID Land Management Program In Development or Identified – Lower Coachella Storage Program – Chuckwalla Storage Program – Central Arizona Banking Program – QSA Programs & Interim Surplus Guidelines
• In Region Dry-Year Storage	Current – Diamond Valley Lake, Lake Matthews, Lake Skinner – SWP Terminal Reservoirs (Monterey Agreement)
• In Region Groundwater Conjunctive Use	Current – North Las Posas – Cyclic Storage – Replenishment Deliveries

	– Proposition 13 Programs (short-listed) In Development or Identified – Raymond Basin GSP – Proposition 13 Programs (wait-listed) – Expanding existing programs – New groundwater storage programs
Target	Programs and Status
• CVP/SWP Storage and Transfers • Spot Transfers and Options	Current – Arvin Edison Program – Semi-tropic Program – San Bernardino Valley MWD Program – Kern Delta Program – Desert Water/Coachella Valley Advanced Storage – Spot Market transfers and options – Mojave Storage Demonstration Program (pilot) In Development or Identified – San Bernardino Valley MWD Conjunctive Use Program – Kern Water Banking Program – Other San Joaquin Valley Programs

* Program savings not currently quantified

** Program has been implemented with approximately 72,000 AF in storage and extraction facilities are under construction.

Through the development and expansion of these programs, MWD has been able to insure reliable water deliveries through 2025. The 2003 IRP Update is available through MWD or on its website.

Water Surplus and Drought Management Plan

In order to insure that water needs will be met during years of drought, surplus water must be managed during years of surplus. To accomplish this task, MWD developed the Water Surplus and Drought Management Plan (WSDM). Adopted in April of 1999, this plan provides policy guidance for management of regional water to achieve the reliability goal of the IRP. The guiding principle of the WSDM plan is to "Manage Metropolitan's water resources and management programs to maximize adverse impacts of water shortage to retail customers." Should mandatory import water allocations be necessary, those allocations would be calculated based on need, as opposed to any type of historical purchases.

MWD has several stages from surplus to shortage and a planned response for each stage. The following section discusses the management activities to be taken, depending on the level of available supplies, starting with a large amount of surplus to extreme shortage. Under MWD's current IRP, the measures listed for extreme shortage should not have to be implemented for the next 20 years.

Surplus Stages

Surplus Stage 5 - MWD makes deliveries to all available in-region and out of region storage resources.

Surplus Stage 4 - MWD may curtail or temporarily suspend deliveries under the Conjunctive Use and Cyclic Storage programs.

Surplus Stage 3 - MWD may curtail or temporarily suspend deliveries under the Conjunctive Use and Cyclic Storage programs; and deliveries to Semi tropic and Arvin-Edison groundwater storage programs.

Surplus Stage 2 - MWD may curtail or temporarily suspend deliveries under the Conjunctive Use and Cyclic Storage programs; deliveries to Semi tropic and Arvin-Edison groundwater storage programs and deliveries of SWP carryover water to SWP reservoirs.

Surplus Stage 1 - MWD may curtail or temporarily suspend deliveries under the Conjunctive Use and Cyclic Storage programs; deliveries to Semi tropic and Arvin-Edison groundwater storage programs; deliveries of SWP carryover water to SWP reservoirs and contractual groundwater storage deliveries.

Shortage Stages

Shortage Stage 1 - MWD may make withdraws from Diamond Valley Lake.

Shortage Stage 2 - MWD will continue Shortage Stage 1 action and may draw from out-of-region groundwater storage.

Shortage Stage 3 - MWD will continue Shortage Stage 2 actions and may curtail or temporarily suspend deliveries to Long-term Seasonal and Replenishment programs in accordance with discount rates.

Shortage Stage 4 - MWD will continue Shortage Stage 3 actions and may draw from conjunctive use groundwater storage and the SWP terminal reservoirs.

Severe Shortage Stages

Shortage Stage 5 – MWD will continue Shortage Stage 4 actions. MWD's Board of Directors may call for extraordinary conservation, may curtail Interim Agricultural Water Program Deliveries.

Shortage Stage 6 - MWD will continue Shortage Stage 5 actions and may exercise any and all water supply option contracts and/or buy water on the open market for consumptive use or for delivery to regional storage facilities for use.

Section II.4 of the RUWMP has additional information about the WSDM Plan.

EMWD Demand

MWD does not provide supply projections for each member agency. Instead MWD uses a regional approach to developing projections. MWD calculates the demand for the entire region as discussed in Appendix A.1 of the RUWMP and then using information about existing and proposed local projects, determines the amount of imported water. Through out 2005, EMWD has provided to MWD information about local supply and projects, clarification on boundary information and population projects. Based on this information and information provided by other member agencies, MWD feels it is able to meet the demands of all member agencies through 2030. Table 10.2 shows the projected water information provided to MWD by EMWD in August of 2005. The demand

estimated for MWD is slightly higher than the final projections shown in Sections 2 and 6. The final projections were refined after this earlier estimation.

Table 10.2 EMWD Imported Water Demand -AFY

	2005	2010	2015	2020	2025	2030
Water for Direct Consumption (Raw and Potable)	86,630	91,300	106,500	123,900	137,000	147,500
Replenishment Water	8,000	20,000	22,200	22,600	22,600	22,500

Section 11 – Water Shortage Contingency Plan

The mission of EMWD is to provide safe and reliable water and wastewater management services to its community in an economical, efficient, and responsible manner now and in the future. Part of accomplishing that mission is to plan for the unplanned. EMWD has two tools that assist in that planning 1) the Water Shortage Contingency Plan (WSCP), included in Appendix D, and 2) the Water System Emergency Operation Procedures (WSEOP). The WSCP will guide EMWD in advising and enforcing conservation during times of water shortage, while the WSEOP is an operational guide created to avert water shortages in the EMWD service area during emergency conditions.

Stages of Action

The WSCP for EMWD was adopted in July of 2005. This plan limits water demand during times of shortage in four stages. These stages can be triggered when there is water deficiency caused by limitations on supply or limitations on EMWD's delivery system. The plan shall be implemented in case of a long or short-term water deficiency, or in case of an emergency water shortage. The stages are summarized in the table below:

Table 11.1 -Water Shortage Contingency Plan Stages of Action

Stage No.	Water Supply Conditions	% Shortage
1	Anticipated or existing water demand exceeds available supply due to any of the following: – Shortfall at MWD's water treatment plants (Skinner or Mills) – Reduction in availability of MWD's raw water supply – Shortfall at EMWD microfiltration plants or desalination plants – Reduction in availability of water from EMWD wells. – Limitations on delivery system	**5-10**
2		**10–20**
3		**25-50**
4		**>50**

When implementation of the plan is triggered by anticipated limitations in supply or delivery, the Board of Directors, at the request of the General Manager, has the ability to implement appropriate water shortage contingency measures to limit the impact on EMWD customers as much as possible. When a water shortage emergency occurs, the General Manager has the authority to implement the plan if necessary.

Estimate of Minimum Supply

Metropolitan Water District of Southern California (MWD) has multiple sources of water supply. Most of them are imported, some of them are local and some of them are both (imported water treated locally). As EMWD's mission is to provide safe and reliable water, EMWD strives to ensure that customer demand can be met in all circumstances. Even under the driest three-year cycle, EMWD supply is anticipated to meet demand. With the groundwater management plans in place, the West San Jacinto area has rising water levels and wells are not anticipated to decrease production, and the Hemet/San Jacinto area will be recharged in years of surplus to prepare or recover from dry years. Since local water supplies are stable and fixed, the small increase in demand during dry years will be met through imported water form MWD. Under the Integrated Resources Plan (IRP) and Water Surplus and Drought Management Plan (WSDM) water, imported

by MWD, will be available to meet 100% of member agencies' demands even during dry periods. Therefore, as seen in the table below, the available supply will be determined by the amount of water required to meet demands. In the event the next three years are not dry, surplus water supplies will be stored for future use under the guidelines the WSDM plan provides.

Table 11.2 - Three- Year Estimated Dry Year Supply AFY
(1990-1992 Hydrology)

	2006	2007	2008
Current Supplies			
Local Water Sources			
Groundwater-Hemet/San Jacinto Basin Native Groundwater	11,040	10,080	9,120
Groundwater – West San Jacinto	6,000	6,000	6,000
Groundwater Desalter – Menifee	2,000	3,000	3,000
Groundwater Desalter – Perris	2,000	4,500	4,500
Recycled Water – M&I Use	4,383	5,232	6,080
Recycled Water – Agricultural Use	22,814	21,978	21,142
Imported Water Sources			
Perris FP	8,800	8,800	8,800
Mills and Skinner	75,033	73,938	69,043
MWD Untreated AG	2,504	2,208	1,912
Supplies Under Development			
Local Water Sources			
Groundwater Desalter – Perris II	0	0	0
Recycled Water – Industrial Enterprise and Aesthetic Improvement	1,414	2,828	4,242
Hemet/San Jacinto Watermaster	2,800	3,500	4,200
Imported Water Sources			
Hemet FP – MWD Raw Water Treated by EMWD			4,400
Perris FP Expansion – MWD Raw Water Treated by EMWD			2,900
Recharge Water into the San Jacinto Basin	8,496	11,372	14,248
Total	147,284	153,436	159,587
% of Normal	100%	100%	101%

Catastrophic Supply Interruption

EMWD is dependent on MWD for the majority of its supply. As described in section 11.5 of the RUWMP, MWD has prepared for emergencies through storage, facility design and redundant power sources. Half of the capacity of Diamond Valley Lake, located within EMWD's service area, is reserved for emergency supply. Diamond Valley Lake Reservoir is designed to gravity feed in the case of an electrical failure. In addition to Diamond Valley Lake, MWD has other storage programs that are detailed in Appendix A.3-3 of the RUWMP. For treatment plants MWD has back up generators in place in case of electrical outage.

To protect EMWD customers in the case of an emergency, EMWD has developed the Water Shortage Emergency Operations Plan (WSEOP). This plan determines the operation response to any emergency. An emergency is defined as any time MWD or EMWD facilities are incapable of supplying potable water. An emergency could be caused by a natural disaster such as an earthquake or through facility failures. The operational describes the coordination required between operational staff, management, community involvement staff and other EMWD employees. In addition communication and cooperation will be required with the community and other agency such as the Department of Health Services and MWD. In the event that one or more water supply

source is unavailable, remaining sources of supply will be maximized to meet demand. If needed the WSCP could be implemented to conserve water and reduce demand. If an electrical or gas power outage occurs, some of EMWD's booster facilities have back up generators. Facilities without redundant power sources may be served on a priority basis by portable generator.

Prohibition, Penalties and Consumption Reduction Methods

In order to reduce demand by EMWD customers in the case of deficiency in water supply, EMWD has developed several prohibitions and consumptive reduction methods. These methods are targeting outdoor water use, and under the most extreme deficiencies would reduce demand more than 50%.

The WSCP prohibitions and reduction methods are organized by customer groups with different limitations on each group. Stage 1 starts with voluntary measures. In the past, voluntary conservation that is the result of intense public relations costs has led to a 10% reduction in demand. As the water deficiency increases, measures become mandatory and will lead to the needed reduction in water demand. The tables below list limitations placed on customers in the event the WSCP is implemented.

Table 11.3 - Prohibitions

Prohibitions	Stage When Prohibition is Implemented
Do not hose down driveways or any other hard surfaces except for health or sanitary reasons. Use a broom or blower instead.	Voluntary Stage 1 Mandatory Stage 2
Do not allow hoses to run while washing vehicles. Use a bucket or a hose with an automatic shutoff valve.	Voluntary Stage 1 Mandatory Stage 2
No replacement water will be provided for ponds, lakes, etc.	Mandatory Stage 2
Washing of autos, trucks, trailers, motor homes, boats, airplanes or other types of mobile equipment is prohibited. However, such washings are exempted from these regulations for municipalities or commercial entities where the health, safety and welfare of the public is contingent upon frequent vehicle cleaning such as garbage trucks or vehicles used to transport food and perishables.	Mandatory Stage 3
No replacement water provided for pools and spas until such time as Stage 4 restrictions are deemed no longer in effect.	Mandatory Stage 4
No one shall cause the emptying or refilling of existing pools or spas for cleaning purposes. Current water levels will be maintained.	Mandatory Stage 4
No new lawns/turf, whether by seed or sod, shall be permitted.	Mandatory Stage 4
No person or entity shall be required to implement any new landscaping requirements of any association, developer or governing agency until the termination of Stage 4.	Mandatory Stage 4
Based on interruptible agriculture water from MWD, field and row crops may be discontinued.	Mandatory Stage 4

Table 11.4 - Consumption Reduction Methods

Consumption Reduction Method	Projected Reduction	Stage When Consumption Reduction Method is Implemented
Irrigate lawns and landscape only between midnight and 6:00 a.m. (unless hand watering).	5% of external use	Voluntary Stage 1 Mandatory Stage 2
Adjust and operate all landscape irrigation systems in a manner that will maximize irrigation efficiency and avoid over watering or watering of hardscape and the resulting runoff.	10% of external use	Voluntary Stage 1 Mandatory Stage 2
Where possible, install pool and spa covers to minimize water loss due to evaporation.	90% of water loss in pools	Voluntary Stage 1 Mandatory Stage 2
Refrain from using decorative fountains unless they are equipped with a recycling system.		Voluntary Stage 1 Mandatory Stage 2
Water used on a one-time basis for purposes such as construction and dust control shall be limited to that quantity identified in a plan submitted by the user describing water use requirements. The plan shall be submitted to the District for approval.	Varies	Mandatory Stage 3
The use of water from fire hydrants shall be limited to fire fighting and related activities.	Varies	Mandatory Stage 3
Water for municipal purposes shall be limited to activities necessary to maintain the public health, safety and welfare.	Varies	Mandatory Stage 3
Outdoor irrigation by sprinklers will only be allowed every other day.	50% of external use	Mandatory Stage 3
Irrigation of landscaping is only allowed twice per week with hand-held hose only.	72% of external use	Mandatory Stage 4
All new landscaping shall be limited to drought-tolerant plantings as determined by the District.	30% of eternal use for all new homes	Mandatory Stage 4
Use of water by all types of commercial car washes shall be reduced in volume by 50%.	50%	Mandatory Stage 4
Reference evapotranspiration (ET) factors for individually metered landscape projects will be reduced from 1.0 (100% of ET) to 0.8 (80% of ET).	20%	Voluntary Stage 1 Mandatory Stage 2
Landscape meters to 75% of ET	25%	Mandatory Stage 3
Landscape meters to 60% of ET	40%	Mandatory Stage 4

The WSCP gives EMWD the right to impose penalties for the unreasonable use or waste of water while the plan is in effect. It also allows EMWD to impose fines for individual events violating the plan, or to impose a tiered rate system that will provide for charges and/or penalties for higher consumption of water over and above the requirements for Stages 1 through 4 of the plan. The event based penalties and charges are detailed in Table 11.5.

All of EMWD's customers are metered with meters usually read once a month. If the WSCP is implemented, EMWD could monitor water use for comparison with historical data to determine water savings. EMWD could also use meter readers to report violation of the WSCP or excessive water use.

Table 11.5 - Penalties and Charges

Penalty and Charges	Stage When Penalty Takes Effect
For the first monthly violation of the provisions of the water shortage contingency plan, the District shall issue a written notice of fact of such violation to the customer.	Any stage in which the measure or provision intentionally ignored or violated is mandatory.
For the second and third month violations, a surcharge of 100% of current charges.	Any stage in which the measure or provision intentionally ignored or violated is mandatory.
For the fourth and succeeding month(s) violation, a surcharge of 200% of current water bill commodity charge shall be added to the customer's water bill.	Any stage in which the measure or provision intentionally ignored or violated is mandatory.
Thereafter, the District may install a flow restricting device of one gallon per minute (1 GPM) capacity for services up to 1 ½" size and comparatively sized restrictors for larger services.	Any stage in which the measure or provision intentionally ignored or violated is mandatory.
The District may also terminate a customer's irrigation/landscape meter service.	Any stage in which the measure or provision intentionally ignored or violated is mandatory.

Analysis of Revenue

As a result of a water shortage or emergency situation, there may be a reduction of revenue from water sales. To protect EMWD from financial hardship in such a situation, a financial reserve account has been established to meet the fixed cost associated with water delivery that may not be met in the case of reduced water sales. In the tables below, the revenue impacts of implementing the WSCP are analyzed.

Table 11.6 - Actions and Conditions that Impact Revenue

Type	Anticipated Revenue Reduction
Reduced Water Sales	Water sales are approximately 40% of EMWD's annual revenue. A reduction in the demand of water by 50% would also mean a reduction in revenue from water sales of 50% leaving a shortfall of approximately 20% of EMWD annual revenue.

Table 11.7 - Actions and Conditions that Impact Expenditures

Category	Anticipated Cost
Increased Staff Cost	Staff costs for implementing the WSCP could vary depending on the stage trigger by a deficiency in water supply. Stage 1 and 2 would probably be implemented with only current staff members. Stage 3 or 4 of the plan may require additional staff to implement. The amount and level of staff will vary greatly depending on the public's response to the plan.
O & M Cost	Operations and maintenance cost may be minimally impacted by the implementation of the WSCP, but these costs are projected to have minimal impact on EMWD's total revenue.
Cost of Supply and Treatment	Cost of supply would decrease due to a decrease in demand and would offset some of the costs associated with reduced water sales.
Public Outreach Costs	Costs associated with informing the public about implementing the WSCP will vary based on the public's response and the stage of the plan implemented.

Table 11.8 - Proposed Measures to Overcome Revenue Impacts and Increased Expenditures

Name of Measure	Summary of Effect
Rate Adjustment	Part of the WSCP is the ability to implement a tiered rate. This may offset some of the lost revenue due to a decrease in water sales.
Reserve Policy	EMWD, as a matter of policy, keeps a reserve of funds equivalent to 90 days of operational expenses. This reserve fund could be used to mitigate revenue shortfalls.
Rate Stabilization Fund	EMWD also has a rate stabilization fund with approximately $7 million available to offset increased costs and decreased sales.

Section 12 - Water Recycling

Planning Coordination

As a full-spectrum provider of water, wastewater collection, and treatment and recycled water services, EMWD has been active in developing local and regional plans for expanded water recycling in its service area. EMWD's first Recycled Water Facilities Master Plan was developed in 1990 and formally updated in 1997. EMWD's local water recycling plan is also incorporated into the Integrated Regional Water Management Plan developed by the Santa Ana Watershed Planning Authority for the San Jacinto and Santa Ana Watersheds.

The District has worked closely with the Santa Ana Regional Water Quality Control Board in updating local basin plans and developing a long-term salinity management plan to support and ensure compliance with local basin objectives for salinity and nitrogen. EMWD is also participating in the development of a Total Maximum Daily Load (TMDL) analysis for impacted surface waters in the Santa Ana Watershed.

EMWD has been involved with a variety of local agencies and public interest groups in recycled water planning efforts:

Table 12.1 – Participating Agencies

Group/Agency	Role
1) Santa Ana Watershed Planning Authority	Regional Cooperative Planning
2) Santa Ana Regional Water Quality Control Board	Basin Planning/Salinity Mgmt
3) Rancho California Water District	Facility Planning/Market Dev.
4) West San Jacinto Groundwater Management Plan Advisory Board	Plan Review/Public Oversight
5) Hemet/San Jacinto Groundwater Management Plan Policy Committee (Cities of Hemet, and San Jacinto and Lake Hemet Municipal Water District)	Plan Review/Public Oversight
6) Elsinore Valley Municipal Water District	Facility Planning/Market Dev.
7) EMWD Recycled Water Adv. Comm.	Plan Review/public Oversight
8) San Jacinto Watershed Council	Plan Review/Public Oversight
9) Lake Elsinore/San Jacinto Watershed Authority	Plan Review/Water Quality
10) Metropolitan Water District of Southern California	Regional Urban Water Mgmt. Planning

Wastewater Quantity, Quality and Current Uses

The District is responsible for all wastewater collection and treatment in its service area. Wastewater collection and treatment facilities include:

- 1,534 miles of gravity sewer
- 53 sewage lift stations
- 5 regional water reclamation facilities (RWRF)

Inter-connections between the local collections systems serving each treatment plant allow for operational flexibility, improved reliability, and expanded deliveries of recycled water.

Table 12.2 - EMWD Treatment Facilities – AFY

Treatment Plant	Level of Treatment	Capacity	*2000* Flow	*Current* Flow
San Jacinto Val. RWRF	Secondary	12,300	7,800	9,400
Moreno Valley RWRF	Tertiary	17,900	12,200	14,200
Perris Valley RWRF	Tertiary	12,300	8,600	12,200
Sun City RWRF	Tertiary	3,400	Not in Service	Not in Service
Temecula Valley RWRF	Tertiary	15,700	8,500	14,200
Total System		61,600	37,100	50,000

With the exception of the San Jacinto Valley RWRF, all of EMWD's RWRF's produce tertiary effluent, suitable for all Department of Health Services permitted uses, including irrigation of food crops and full-body contact. The secondary effluent produced by the San Jacinto Valley RWRF is used locally for the irrigation of fodder, feed, and seed crops. However, tertiary treatment capacity will be added to the plant in 2006.

EMWD's recycled water delivery system includes:

- 135 miles of large diameter transmission pipeline,
- 6,000 AF of surface storage reservoirs (10 separate sites),
- 4 regional pumping plants.

EMWD currently has 91 recycled water customers and sells up to 26,000 AFY of recycled water. The majority of recycled water sold is used for agricultural irrigation. However, sales to municipal customers are increasing rapidly as residential and urban development replaces irrigated farmland. EMWD also sells recycled water to the California Department of Fish and Game for habitat creation and environmental enhancement at the San Jacinto Wildlife Area.

EMWD is able to sell 90% - 100% of the recycled water produced by its treatment plants during the peak demand months (June – September). During the cooler, wetter parts of the year, surplus recycled water is stored in unlined surface impoundments, resulting in extensive groundwater recharge. If storage capacity is full, surplus recycled water is disposed through a regional outfall pipeline to Temescal Creek and the Santa Ana River.

Table 12.3 - Wastewater Collected and Treated – AFY

	2000	2005	2010	2015	2020	2025
Wastewater Collected & Treated	36,572	49,976	61,051	69,817	78,177	85,785
Quantity Meeting Recycling Standards	36,572	49,976	61,051	69,817	78,177	85,785

Table 12.4 - Disposal of Wastewater (Non-Recycled) – AFY

Name of Disposal	Treatment	2000	2005	2010	2015	2000	2025
Livestream Discharge	Tertiary	0	9,976	13,651	18,117	22,977	26,785

Table 12.5 - Recycled Water Uses – Projected AFY

Type of Use	Treatment Level	2005 AFY
Agriculture	Secondary/Tertiary	17,037
Landscape	Tertiary	3,500
Wildlife Habitat	Secondary/Tertiary	2,000
Wetlands/Lake	Tertiary	2,463
Industrial	Tertiary	0
Groundwater Recharge *	Secondary/Tertiary	15,000
Total		40,000

* Note – From a regulatory viewpoint, this recharge is permitted as being incidental to storage.

Potential and Projected Use, Optimization Plan with Incentives

As mentioned previously, EMWD's extensive water recycling distribution system will maintain the current high level of operation as agricultural customers are replaced by municipal customers. EMWD is planning additional pipelines that will expand municipal use of recycled water over time and is planning several innovative projects to provide recycled water to long-term agricultural customers (citrus orchards) in-lieu of over drafted groundwater. The District will maintain current levels of groundwater recharge to sustain project yields for the Perris Basin Desalination Program, and will work with the California Department of Fish and Game to expand the use of recycled water at the San Jacinto Wildlife Area.

Table 12.6 - Recycled Water Use Potential - AFY

Type of Use	Treatment Level	2010	2015	2020	2025
Agriculture	Tertiary	13,400	13,200	13,200	13,200
Landscape	Tertiary	7,700	10,950	13,200	15,750
Wildlife Habitat	Tertiary	4,300	4,300	4,300	4,300
Wetlands/Lakes/Supply Augmentation	Tertiary	2,000	3,250	4,500	5,750
Industrial	Tertiary	5,000	5,000	5000	5,000
Groundwater Recharge	Tertiary	15,000	15,000	15,000	15,000
Total		47,400	51,700	55,200	59,000

EMWD is committed to maximizing recycled water uses wherever possible. Within the framework of known and potential projects, Table 12.7 lists potential recycled water use also includes projections for future recycled water use.

EMWD's year 2000 projection for recycled water use in 2005 was based upon the following assumptions:

- Continued strong agricultural sales
- Rapid expansion of municipal markets
- Stable habitat sales
- Expanded sales to Elsinore Valley Municipal Water District

A comparison of projected reclaimed water use versus actual sales for 2005 shows that the projections were fairly accurate.

Table 12.7 - Recycled Water Use – 2000 Projection Compared to 2005 Actual-AFY

Type of Use	2000 Projections for 2005	2005 Actual Use
Agriculture	19,495	17,037
Landscape	10,680	3,500
Wildlife Habitat	2,213	2,180
Wetlands/Lake Supply Augmentation	2,000	2,463
Industrial	0	0
Groundwater Recharge	8,726	15,118
Total	43,114	40,298

Due to land use changes and wet winter conditions, 2005 agricultural sales were lower than projected. Municipal sales were lower than projected due to operational issues, which limited the connection of new customers in portions of EMWD's service area. These problems have been corrected and growth in municipal sales should increase sharply over the next five years.

Methods to Encourage Recycled Water Use

EMWD uses a variety of methods to expand the use of recycled water within its service area. These methods include:

Mandatory Recycled Water Use Ordinance – The District has adopted an ordinance requiring new and existing customers to use recycled water for appropriate permitted uses when it is available. This ordinance provides a basis for denying potable water service to customers refusing to utilize available recycled water for permitted uses.

Rate Incentives – Tertiary recycled water is currently priced at approximately one third of the cost of potable water for municipal use and at one quarter of the cost of potable agricultural deliveries for crop-irrigation.

Water Supply Assessments – EMWD's SB 610 and 221 Water Supply Assessments condition all major new developments to use recycled water as a condition of service where it is available and permitted.

Public Education – EMWD actively promotes the public use of recycled water in several elements of its water education program. EMWD also places prominent signage at public recycled water use sites promoting the benefits of water recycling.

Market Surveys – EMWD periodically hires market firms to survey businesses in its service area in order to identify potential recycled water customers.

Facilities Financing – EMWD will work with private parties to arrange or provide financing for construction of facilities needed to convert existing customers from potable water to recycled water.

EMWD does not have any data to support a projection of how much increased recycled water sales will result from each of the listed methods of encouraging recycled water use. Historically, the low cost of recycled water was the primary inducement for agricultural customers to use recycled water in-lieu of groundwater. However, as municipal customers continue to replace agriculture, it is reasonable to assume that the mandatory provisions of the District's Recycled Water Use Ordinance will play a major role in program expansion.

Section 13 - Water Quality Reliability

Water quality is large part of EMWD's strategic goal to "Provide a safe and reliable supply of water at a reasonable cost." Planning and monitoring for water quality are important for protecting public health, controlling costs and insuring reliability for the future. EMWD has identified eleven contaminants that do not currently meet public health guidelines and several other concerns that may limit EMWD supplies in the future. Tables 13.1 and 13.2 list these areas of concern and give information about each one.

In addition to EMWD's concerns, MWD has identified several areas of regional concern in the 2005 MWD Regional Urban Water Management Plan. Although MWD anticipates no significant reduction in water supply reliability for the next 20 years, water quality affecting local water supplies may increase demand on MWD's water supply beyond what had been projected.

Public Heath Goals

A Public Health Goal (PHG) is the level of a contaminant in drinking water, which there is no known or expected risk to health. The California Office of Environmental Health Hazard Assessment (OEHHA) based these goals on the best available toxicological data in the scientific literature. These are goals and not regulations.

The Maximum Contaminant Level (MCL) is the highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs as is economically and technologically feasible. If MCLs are lowered for the eleven contaminants listed in Table 13.1, further treatment or blending may be required. If the MCL cannot be met using blending or treatment, a portion of EMWD's water supply may be unavailable.

Other Concerns

Table 13.2-3.4 lists future regulations that may affect EMWD's water supply and the risk it may pose to EMWD's water supply reliability. These are regulations that will be in place or may be in place in the future.

MWD Water Quality

As part of the Integrated Resource Plan, MWD has concentrated on maintaining the quality of source water and developing management programs that protect and enhance water quality. MWD has two water supply sources and each one has water quality issues. To date, MWD has not identified any water quality issues that cannot be mitigated. Salinity may decrease the amount of water available if membrane treatment is required. MWD could experience a loss of up to 15 percent of the water processed. Since only a small portion of the total water supply would be treated and blended with the remaining unprocessed water, there is no significant risk to MWD's water supply availability. Additional information and analysis of water quality is included in Section IV of the RUWMP.

Table 13.1 – EMWD Present PHG Violations

Contaminant	Bromate	Chromium	Coliform	Copper
Year(s)	2003	1998-2000	2001-2003	2002-2003
Units	Ug/L	ug/L	monthly percent	ug/L
PHG (MCLG)	(0)	2.5	(0)	170
MCL	10	50	5	AL = 1300
Source	Mills	Well 44 Well 56 Well 57	Distribution system samples	Distribution system samples
% of Potable Water Supply in 2005	54.0%	0.7% 0.1% 1.1%	Unknown	Unknown
Range	4.5 - 10.4	1.1-10	0 - 2.1	90th % = 230
Range Category of risk to public health	Carcinogenicity (Cancer)	Carcinogenicity (Cancer)	Unknown: coliforms are not harmful in of themselves, but an indicator of poor water quality	Acute Toxicity (Gastrointestinal effects in children, Human data)
Cancer Risk @ PHG or MCLG	0	1×10^{-6}	NA	NA
Best Available Treatment	Optimize Ozone treatment	Reverse Osmosis	Optimize chlorine residuals, programs for flushing, cross connections, monitoring,	Optimize Corrosion Control
Cost estimate per 1000 gallons (in dollars)*	NA		NA	0.008
Action taken by EMWD	EMWD supports MWD to optimize the Ozone treatment at the Mills Plant.	These wells blend in the distribution system, and no chromium has been detected downstream.	EMWD has programs for flushing, cross connection, extensive monitoring for coliform, chlorine residuals and HPCs. EMWD also works toward the optimal use of chlorine to reduce the formation of disinfection by products.	East Valley has 48% of Cu problem, EMWD is looking into altering addition of polyphosphates for Fe and Mn sequestration to enhance corrosion control.

Table 13.1 – EMWD Present PHG Violations Continued

Contaminant	Dibro-mochloro-propane (DBCP)	Lead	Nickel			Nitrate
Year(s)	2001-2002	2002-2003	2003			2001-2003
Units	ng/L (ppt)	Ug/L	ug/L			mg/L
PHG (MCLG)	1.7	2	12			10
MCL	200	AL = 15	100			10
Source	Well 44	Distribution system samples	Well 11	Well 34	Well 56	Well 44**
			Well 28	Well 35	Well 76	Well 49**
			Well 33	Well 55		

Table 13.1 – EMWD Present PHG Violations Continued

Contaminant	Dibro-mochloro-propane (DBCP)	Lead	Nickel			Nitrate
Percent of Potable Water Supply in 2005	0.7%	Unknown	0.0%	0.4%	0.8%	0.7%
			1.0%	1.6%	1.7%	0.3%
			0.9%	0.7%		
Range	ND - 70	90th percentile = 7	48	38	62	12.9 - 16
			11-14	20	16 - 88	21 - 24
			40	53		
Range Category of risk to public health	Carcinogenicity (Cancer)	Chronic Toxicity (Neurobehavioral effects in children, Hypertension in adults) and Carcinogenicity (Cancer)	Developmental Toxicity (Increased Neonatal Deaths)			Acute Toxicity (Methemoglobinemia)
Cancer Risk @ PHG or MCLG	1×10^{-6}	NA	NA			NA
Best Available Treatment	Granular Activated Carbon	Optimize Corrosion Control	Ion Exchange, Lime softening, Reverse Osmosis			Blending, Ion Exchange, Reverse Osmosis, Electrodialysis
Cost estimate per 1000 gallons (in dollars)*	0.43	Unknown	0.43 - 0.56			0
Action taken by EMWD	EMWD blends at this well to reduce nitrates, therefore the actual numbers at POE are less, although not less than the PHG. No further action has been taken.	Continue to investigate corrosion control in system.	None			EMWD blends at these wells to reduce nitrates to less than MCL

Table 13.1 – EMWD Present PHG Violations Continued

Contaminant	Tetrachloroethylene (PCE)	Trichloroethylene (TCE)	Uranium
Year(s)	2001-2003	2001-2003	2001-2003
Units	ug/L	ug/L	pCi/L
PHG (MCLG)	0.06	0.8	0.5
MCL	5	5	20
Source	Well 44 Well 49	Well 56	Skinner San Jacinto West Portal Well 75
Percent of Potable Water Supply in 2005	0.7% 0.3%	0.8%	17.4% 0.2%
Range	1.4 - 1.5 2.5 - 2.7	0.5 - 1.9	ND – 3.18 ND - 3.92 8.96

Table 13.1 – EMWD Present PHG Violations Continued

Contaminant	Tetrachloroethylene (PCE)	Trichloroethylene (TCE)	Uranium
Range Category of risk to public health	Carcinogenicity (Cancer)	Carcinogenicity (Cancer)	Carcinogenicity (Cancer)
Cancer Risk @ PHG or MCLG	1×10^{-6}	1×10^{-6}	1×10^{-6}
Best Available Treatment	Granular Activated Carbon, Packed Tower Aeration	Granular Activated Carbon, Packed Tower Aeration	Ion Exchange, Enhanced coagulation/ filtration, Lime softening, RO
Cost estimate per 1000 gallons (in dollars)*	0.43	0.43	0.43 - 0.56
Action taken by EMWD	EMWD blends at these wells to reduce nitrates, therefore the actual numbers at POE are less. No further action has been taken.	None	Skinner plant uses enhanced coagulation/filtration, Well 75 feeds the Menifee Desalter using RO. Water from the San Jacinto Portal is treated at the Perris WFP by ultrafiltration.

Table 13.2 – EMWD Potential PHG & MCL Violations

Constituent	Arsenic	Groundwater Rule
Year(s) sampled	2004	
Units	ug/L	
PHG (MCLG)	NA	
MCL	10	
Source	Well 17	all EMWD wells are absent for E. coli
Percent of Potable Water Supply in 2005	0.7%	17.4%
Range	5-10	
Risk to public health	Cancer risk	
Status of Constituent or Rule	Arsenic Rule is promulgated and will start in June, 2005	Groundwater Rule due by end of 2005: fecal contamination
Risk to EMWD water supply	May lose this source if arsenic rises to >10 ug/L unless EMWD treats at the wellhead.	Low level of risk, if contamination is found, EMWD will have to prove 4 log virus inactivation.

Table 13.3 – EMWD Potential PHG & MCL Violations, UCMR

Constituent	Perchlorate	Radon	1,2,3-TCP, Trichloro-propane	Chromium VI	CCL microbes
Year(s) sampled	2004	2002-03 2002 2002 2002 2003	2003	2003	Adenovirus, Aeromonas hydrophila, Calciviridae, Coxsackievirus, Cyannobacteria, Echovirus, Helicobacter pylori, Microsporidia, Mycobacterium avium Complex
Units	ug/L	pCi/L	ug/L	ug/L	
PHG (MCLG)	6	>300 proposed	NL= 0.005 ug/L		
MCL	NA		NA		
Source	Well 44 Well 49 Well 57	Well 44 Well 49 Well 56 Well 57 Well 76	Well 23	Well 35	Unknown levels in wells
Percent of Potable Water Supply in 2005	0.7% 0.3% 1.4%	0.7% 0.3% 0.8% 1.4% 1.7%	0.0%	1.6%	17.4%
Range	ND-5 9.6-11 ND	1250-1440 606 778-914 918-1090 361	0.053	1.5	
Risk to public health	Possible endocrine disruptor	cancer risk	cancer risk	Cancer risk	Gastrointestinal disease, meningitis, Hand, foot and mouth disease, conjunctivitis, unspecified febrile illness, dermatitis, hepatitis, respiratory illness, peptic ulcer, gastric cancer, wasting syndrome
Status of Constituent or Rule	PHG promulgated in 2004, MCL is pending	Radon Rule is pending	No action at this time, future regulation possible	No action at this time, future regulation possible, needs a PHG to determine MCL which was due in 2004	No action at this time, future regulation possible
Risk to EMWD water supply	Low risk, since these three wells are already treated for nitrates by blending	Rule is pending, no PHG or MCL has been established	Well 23 is off line due to other water quality and operational problems	Level of 1.5 ug/L is very low, probably not going to be regulated at this level.	Unknown

Table 13.4 – EMWD Potential PHG & MCL Violations, Contaminant Candidate List (CCL) Chemicals

Constituent	Fluoride	Tetrachloroethylene (PCE)	Trichloroethylene (TCE)
Year(s) sampled	2004	2004	2004
Units	mg/L	ug/L	ug/L
PHG (MCLG)	2	0.06	0.8
MCL	1	5	5
Source	All EMWD wells and surface waters are <= 0.7 mg/L	Well 44 Well 49	Well 56
Percent of Potable Water Supply in 2005		0.8% 0.3%	0.8%
Range		1.2-2 3.6-7.9	1.5-1.7
Risk to public health	fluoridosis	cancer risk	cancer risk
Status of Constituent or Rule	On CCL, EPA will request NAS to update the Risk Assessment	On CCL, EPA has requested NAS to update the Risk Assessment	On CCL, EPA has requested NAS to update the Risk Assessment
Risk to EMWD water supply	Probably a low risk, since all of our waters are below the recommended level of fluoride to prevent dental caries.	These wells are already blended to treat nitrate, however the blended waters are still above the PHG. EPA will continue to reassess this chemical until the PHG equals the MCL. If this happens, treatment will be required.	EPA will continue to reassess this chemical until the PHG equals the MCL. If this happens, treatment will be required.

Colorado River

The most serious threat to the Colorado River supplies is salinity levels. Colorado River supplies must be blended with State Water Project (SWP) water to meet the adopted salinity standards. MWD is working to reduce current salinity level and protect salinity levels from rising in the Colorado River. In addition, MWD is also working to protect the Colorado River from uranium, perchlorate and hexavalent chromium. MWD fully expects its source protection efforts to be successful. Therefore, the only water quality constraint on the use of Colorado River Water is salinity levels.

State Water Project

The water quality issues on the SWP include total organic carbon, bromides and salinity. MWD is working to protect the water quality of this source, but has also seen the need for upgraded treatment to deal adequately with water quality concerns. Total organic carbon and bromide levels are producing disinfection byproducts that current water treatment plants may be inadequate to deal with. MWD expects this treatment limitation to be overcome over the next few years by implementing ozone as the primary

disinfectant, and does not expect water quality to limit SWP supplies over the RUWMP study period.

Regional Water Quality

New standards for contaminants may add cost to the use of groundwater storage and may affect reliability of local agency groundwater sources. These standards are not expected to effect MWD's water supply, but may increase dependence on MWD. MWD has not analyzed the effect local water quality issues may have on total supply reliability.

The major water quality concerns MWD has identified for the region are:

- Salinity
- Perchlorate
- Total Organic Carbon and Bromide
- Methyl Teriary Butyl Ether (MTBE) and Tertiary Butanol (TBA) in groundwater and local surface reservoirs
- Arsenic
- Radon
- Uranium
- N-nitrsodimethylamine (NDMA) in groundwater and treated surface waters
- Hexavalent chromium in groundwater
- Pharmaceuticals and personal care products

Salinity

High salinity can reduce operational flexibility and increase the cost of water. Membrane treatment can result in water losses of up to 15 percent of the treated water. High total dissolved solids (TDS) in water also leads to high TDS in wastewater and therefore, recycled water, limiting the use of recycled water. Imported water with high salinity could also limit use of local groundwater basins for storage because of water quality standards set for the basin. For all of these reasons, MWD's Board of Directors approved a Salinity Management Policy that set a specified salinity objective and identified the need to manage both imported and local water sources comprehensively.

For EMWD, salinity management is part of groundwater management. Included in efforts to control salinity in the groundwater basins used to supply water, is the construction of EMWD's desalination plants. Other efforts to control or reduce salinity levels included monitoring of recharge source water salinity levels and recycled water use in the basins. At this time, EMWD does not expect salinity levels to reduce local water source reliability, and the desalination efforts will actually improve and protect the quality of the groundwater.

Perchlorate

Ammonium perchlorate has also been identified as a regional water quality concern. Perchlorate has been found in MWD's Colorado River water supply, and has contaminated groundwater basins, limiting local supply. In response to concerns over perchlorate in drinking water, MWD adopted a Perchlorate Action Plan in 2002. Today,

the concentrations of perchlorate in Colorado River Water are less than California's detection limit.

Assessing the impact of perchlorate in local groundwater basins is part of the Perchlorate Action Plan. Total well production lost to well closures because of perchlorate is 57,000 AFY. Although treatment is available for perchlorate, it can be costly. Local agencies may not pursue treatment because of cost considerations.

EMWD had detected perchlorate in three potable production wells located adjacent to the March Air Reserve Base. Positive test values range from 5-11 ug/L. Regulatory agencies have not characterized a perchlorate plume associated with EMWD wells. These wells also show elevated levels of nitrate and trace levels of Dichlorobromophenol (DCB), a nematocide. These contaminants likely result from past agricultural use of the surrounding properties. The combined output of these wells is approximately 2.4% of EMWD's total water supply. Production from the wells is blended with imported water from MWD Mills Filtration Plant under permit by the State Department of Health Services. Treatment is not required, and monitoring indicates no increase in contaminant levels over time.

Total Organic Carbon and Bromide

When source water containing high levels of total organic carbon (TOC) and bromide is treated with disinfectants such as chlorine or chloramines, disinfection byproducts (DBP) form. In studies, DBPs have been linked to cancer and chlorinated water has been associated with reproductive and developmental effects. In 1998, the Environmental Protection Agency adopted more stringent regulations for DBPs and is expected to promulgate even more stringent requirements in the near future.

The existing levels of TOC and bromide in SWP water present concerns for MWD's ability to maintain safe drinking water supplies. Although CALFED has adopted water quality goals for TOC and bromide and called for a wide arrangement of actions to improve SWP water quality, MWD would like CALFED to adopt more stringent water quality improvement milestones.

In addition to efforts to protect source water, MWD has committed to installing ozone treatment systems in each of MWD's treatment plants by 2011. Currently TOC levels can be managed by blending.

EMWD has treated 100% SWP water at the existing microfiltration plant in Perris. Since conventional methods to treat water were not used, instead, membrane technology was employed. DBP's were not over the limit. It is anticipated that the proposed plant at Hemet/San Jacinto will see similar results. Therefore, DBP's are not anticipated to be a threat to EMWD's water supply.

Methyl Tertiary Butyl Ether and Tertiary Butanol

Until recently, Methyl Tertiary Butyl Ether (MTBE) was the primary oxygenate in nearly all of the gasoline used in California. MTBE, used to reduce air pollution, has caused a serious water contaminant. MTBE is very soluble in water and has a low affinity for soil particles allowing the chemical to move quickly in groundwater. MTBE is also resistant to chemical and microbial degradation, making contamination treatment difficult.

MWD monitors its water supply for MTBE and other oxygenates contamination regularly. MTBE testing results have ranged from non-detectable to 3.9 ug/L, below the primary PHG of 12 ug/L. At Diamond Valley Lake and Lake Skinner, MWD has limited recreational use to reduce the potential for MTBE.
MTBE presents a problem to local groundwater basins. A gallon of gasoline (11% MTBE by volume) can contaminate 16.5 million gallons of water at 5 ug/L. Within MWD's service area, local groundwater producers have been forced to close some wells. Although improved underground storage requirements and monitoring and the phasing out of MTBE as a fuel additive, which should decrease the contamination of groundwater, it is difficult to determine how large the MTBE problem may be. Treatment methods have been found to reduce contaminant levels 80 to 90 percent, but increasing the use of imported water may prove to be more cost effective to some agencies.

EMWD has not found MTBE or TBA contamination in any local sources of water.

Arsenic

The new federal MCL for arsenic in domestic water supplies is 10 ug/L with an effective date of 2006. MWD water supplies have low levels of arsenic and will not require treatment to comply with this new standard. However, some member agencies may face greater problems with arsenic compliance. The cost of arsenic removal may cause some member agencies to increase use of imported water.

EMWD has a well that has arsenic detected in it, and may exceed the arsenic regulations and have to be taken out of service if treatment is not put in place at the wellhead.

Radon

The United States Environmental Agency has proposed a radon MCL of 300 pCi/L. MWD's water supplies have a radon level less than the proposed level, but some sub agencies may need to treat local water sources. Since there is a cost-effective method of treating radon, water supply reliability may not be affected by radon regulations.

EMWD has five wells that violate the 300 pCi/L levels for radon and may require further treatment.

Uranium

There is a 10.5 million ton pile of uranium mine tailings at Moab, Utah that lies 600 feet from the Colorado River. Rainwater has seeped through the pile and contaminated the local groundwater, causing contaminants to flow into the river. There is also a threat that million of tons of material containing uranium will be washed into the Colorado River by a flood. Currently, operations and maintenance activities include intercepting some of the groundwater before it discharges into the river, and the Department of Energy has agreed to move the tailings. Remediating the site will require Congressional appropriations, and maintaining Congressional support for a cleanup will require close coordination and cooperation with other Colorado River users.

Uranium levels in at MWD's intake range from 1 to 5 pCi/L, below the California drinking water standard which is 20 pCi/L. EMWD has found levels close to 9 pCi/L at Well 75 that will be treated with reverse osmosis at the Menifee Desalter.

N-nitrosodimethylamine

N-nitrosodimethylamine (NDMA) is a by-product of water and wastewater treatment and has been detected in MWD's water supply system. MWD's RUWMP states that some NDMA control measures, or removal may be required to avoid impacting Southern California's water supply.
NDMA has not been detected in EMWD's local water sources.

Hexavalent Chromium

Hexavalent Chromium or Chromium VI is a possible contaminant in groundwater and surface water. Chromium VI enters water sources through industrial discharges, leaching form hazardous waste sites and erosion of natural deposits. The California OEHHA is currently reviewing a maximum contaminant level for total chromium and has not determined a MCL for Chromium VI.

There are no proven technologies for reducing Chromium VI in water supplies to low levels. However, the American Water Works Association Research Foundation has initiated a research program in Chromium VI removal.

EMWD has very low levels of Chromium VI detected in one well.

Pharmaceuticals and Personal Care Products

Pharmaceuticals and personal care products are a source of concern in both source and recycled water. Monitoring and treatment of these contaminants would have an unknown effect on the cost of water and wastewater treatment. It is difficult to predict the effect pharmaceuticals and personal care products will have on water supply reliability based on the limited information available.

MWD's RUWMP

Additional information on water quality issues and concerns and mitigation efforts can be found in MWD's RUWMP in Section IV..

Section 14 - Water Service Reliability - Normal Water Year

As discussed previously in this report, EMWD has the supply needed to meet the demand of its customers through 2030. This conclusion is based on the assurances of MWD that it will be able to supply member agency demands, the reliability of local groundwater supplies achieved through groundwater management plans and the development of recycled water resources. Tables 14.1 through 14.3 compare the water supply and demand for normal water years through 2030.

Tables 14.1 through 14.3

Table 14.1 – Projected Normal Water Year Supply – AFY

	2010	2015	2020	2025	2030
Supply	168,800	195,000	215,800	231,900	245,200
% of Normal Year	100%	100%	100%	100%	100%

Table 14.2 – Projected Normal Water Year Demand – AFY

	2010	2015	2020	2025	2030
Demand	168,800	195,000	215,800	231,900	245,200
% of Normal Year	100%	100%	100%	100%	100%

Table 14.3 – Projected Normal Water Year Supply and Demand Comparison - AFY

	2010	2015	2020	2025	2030
Supply Total	168,800	195,000	215,800	231,900	245,200
Demand Total	168,800	195,000	215,800	231,900	245,200
Difference	0	0	0	0	0
Difference % of Supply	0%	0%	0%	0%	0%
Difference % of Demand	0%	0%	0%	0%	0%

Section 15 - Water Service Reliability - Single Dry Water Year

In addition to meeting the demand for a normal dry year, the law requires that water suppliers meet the need of its customers during a single dry year. For EMWD, meeting the small increase in demand due to a dry winter is accomplished through increasing imports from MWD and utilizing groundwater production. MWD assures its member agencies that, even in dry years, their needs will be met. The groundwater management plans assure that water recharged into the basins in wet years will be available in dry years. Tables 15.1 through 15.3 compare the water supply and demand for single dry water years through 2030.

Tables 15.1 through 15.3

Table 15.1 – Projected Single Dry Water Year Supply – AFY

	2010	2015	2020	2025	2030
Supply	171,900	198,400	219,400	235,800	249,200
% of Normal Year	102%	102%	102%	102%	102%

Table 15.2 – Projected Single Dry Water Year Demand – AFY

	2010	2015	2020	2025	2030
Demand	171,900	198,400	219,400	235,800	249,200
% of Normal Year	100%	100%	100%	100%	100%

Table 15.3 – Projected Single Dry Water Year Supply and Demand Comparison – AFY

	2010	2015	2020	2025	2030
Supply Total	171,900	198,400	219,400	235,800	249,200
Demand Total	171,900	198,400	219,400	235,800	249,200
Difference	0	0	0	0	0
Difference % of Supply	0%	0%	0%	0%	0%
Difference % of Demand	0%	0%	0%	0%	0%

Section 16 - Water Service Reliability - Multiple Dry Water Years

In the case of multiple dry years, resource planning by EMWD and MWD insures that consumer demands for water will be met. Since local resources are stable during a multiple dry year event and MWD resources are affected by weather fluctuations, the 1990-1992 hydrology was considered. These are the dry years considered by MWD in planning for the worst case multiple dry year scenarios.

Tables 16.1 through 16.3 compare the water supply and demand for multiple dry years ending in 2010.

Tables 16.1 through 16.3

Table 16.1 – Projected Supply During a Multiple Dry Year Period Year Ending in 2010 - AFY

	2006	2007	2008	2009	2010
Supply	147,200	153,400	159,600	165,700	171,900
% of Normal Year	102%	102%	102%	102%	102%

Table 16.2 – Projected Demand During a Multiple Dry Year Period Year Ending in 2010 – AFY

	2006	2007	2008	2009	2010
Demand	147,200	153,400	159,600	165,700	171,900
% of Normal Year	102%	101%	101%	101%	101%

Table 16.3 – Projected Supply & Demand Comparison During a Multiple Dry Year Period Year Ending in 2010 – AFY

	2006	2007	2008	2009	2010
Supply Total	147,200	153,400	159,600	165,700	171,900
Demand Total	147,200	153,400	159,600	165,700	171,900
Difference	0	0	0	0	0
Differences % of Supply	0%	0%	0%	0%	0%
Differences % of Demand	0%	0%	0%	0%	0%

Tables 16.4 through 16.6 compare the water supply and demand for multiple dry years ending in 2015.

Tables 16.4 through 16.6

Table 16.4 – Projected Supply During a Multiple Dry Year Period Year Ending in 2015 - AFY

	2011	2012	2013	2014	2015
Supply	211,000	215,200	219,400	222,700	226,000
% of Normal Year	102%	102%	102%	102%	102%

Table 16.5 – Projected Demand During a Multiple Dry Year Period Year Ending in 2015 – AFY

	2011	2012	2013	2014	2015
Demand	177,200	182,500	187,800	193,100	198,400
% of Normal Year	102%	101%	101%	101%	101%

Table 16.6 – Projected Supply & Demand Comparison During a Multiple Dry Year Period Year Ending in 2015 – AFY

	2011	2012	2013	2014	2015
Supply Total	211,000	215,200	219,400	222,700	226,000
Demand Total	177,200	182,500	187,800	193,100	198,400
Difference	0	0	0	0	0
Differences % of Supply	0%	0%	0%	0%	0%
Differences % of Demand	0%	0%	0%	0%	0%

Tables 16.7 through 16.9 compare the water supply and demand for multiple dry years ending in 2020.

Tables 16.7 through 16.9

Table 16.7 – Projected Supply During a Multiple Dry Year Period Year Ending in 2020 - AFY

	2016	2017	2018	2019	2020
Supply	20,600	206,800	211,000	215,200	219,400
% of Normal Year	102%	102%	102%	102%	102%

Table 16.8 – Projected Demand During a Multiple Dry Year Period Year Ending in 2020 – AFY

	2016	2017	2018	2019	2020
Demand	20,260	20,600	211,000	215,200	219,400
% of Normal Year	102%	101%	101%	101%	101%

Table 16.9 – Projected Supply & Demand Comparison During a Multiple Dry Year Period Year Ending in 2020 – AFY

	2016	2017	2018	2019	2020
Supply Total	202,600	206,800	211,000	215,200	219,400
Demand Total	202,600	206,800	211,000	215,200	219,400
Difference	0	0	0	0	0
Differences % of Supply	0%	0%	0%	0%	0%
Differences % of Demand	0%	0%	0%	0%	0%

Tables 16.10 through 16.12 compare the water supply and demand for multiple dry years ending in 2025.

Tables 16.10 through 16.12

Table 16.10 – Projected Supply During a Multiple Dry Year Period Year Ending in 2025 - AFY

	2021	2022	2023	2024	2025
Supply	222,700	226,000	229,200	232,500	235,800
% of Normal Year	102%	102%	102%	102%	102%

Table 16.11 – Projected Demand During a Multiple Dry Year Period Year Ending in 2025 – AFY

	2021	2022	2023	2024	2025
Demand	222,700	226,000	229,200	232,500	235,800
% of Normal Year	102%	101%	101%	101%	101%

Table 16.12 – Projected Supply & Demand Comparison During a Multiple Dry Year Period Year Ending in 2025 – AFY

	2021	2022	2023	2024	2025
Supply Total	222,700	226,000	229,200	232,500	235,800
Demand Total	222,700	226,000	229,200	232,500	235,800
Difference	0	0	0	0	0
Differences % of Supply	0%	0%	0%	0%	0%
Differences % of Demand	0%	0%	0%	0%	0%

Tables 16.13 through 16.15 compare the water supply and demand for multiple dry years ending in 2030.

Tables 16.13 through 16.15

Table 16.13 – Projected Supply During a Multiple Dry Year Period Year Ending in 2030 - AFY

	2026	2027	2028	2029	2030
Supply	238,400	241,100	243,800	246,500	249,200
% of Normal Year	0%	101%	101%	101%	101%

Table 16.14 – Projected Demand During a Multiple Dry Year Period Year Ending in 2030 – AFY

	2026	2027	2028	2029	2030
Demand	238,400	241,100	243,800	246,500	249,200
% of Normal Year	0%	101%	101%	101%	101%

Table 16.15 – Projected Supply & Demand Comparison During a Multiple Dry Year Period Year Ending in 2030 – AFY

	2026	2027	2028	2029	2030
Supply Total	238,400	241,100	243,800	246,500	249,200
Demand Total	238,400	241,100	243,800	246,500	249,200
Difference	0	0	0	0	0
Differences % of Supply	0%	0%	0%	0%	0%
Differences % of Demand	0%	0%	0%	0%	0%

With the assurance of MWD and the reliability of EMWD's groundwater and recycled water, EMWD is confident of its ability to meet demand through 2030.

Appendix A

Public Outreach and Participation

Appendix A

Public Involvement

Coordination with Appropriate Agencies

EMWD has worked with several agencies and organizations in preparing the Urban Water Management Plan. These agencies include all of EMWD's sub agencies and MWD.

	Participated in developing the plan	Commented on the draft	Attended public meetings	Was contacted for assistance	Was sent a copy of the draft plan	Was sent a notice of intention to adopt	Not Involved / No Information
Sub Agencies of EMWD				x	x	x	
Metropolitan Water District				x	x	x	
Relevant public agencies					x	x	

Coordination with MWD

Over the past year EMWD has worked with MWD to provide information regarding population, local supply and demands. MWD projects demand on a regional basis and does not project sales for individual agencies. The 2005 RUWMP contains information about total projected sales to other agencies including EMWD. Included in MWD supply projections are existing and committed local projects.

Coordination with Sub- Agencies

EMWD staff met with each sub agency early in the year to discuss supply and demand projects. In addition to early meeting, EMWD has sent information and draft copies of the UWMP to sub agencies. EMWD has also requested information from subagencies regarding expected supply. When a subagency has provided demand projections, EMWD staff compared the projection with the EMWD projection for the agency and used the larger of the two projections. In the event that demand and supply projections were not available from a subagency, EMWD used method to project demand as was used in the retail portions of EMWD.

County of Riverside and Local Cities

In addition to meeting with the cities that are subagencies of EMWD, EMWD staff sent copies of the draft plan with information about the public hearing held December 7, 2005.

Public Outreach

Public Outreach efforts include:

- Article in the November 2005 customer newsletter (distribution to 111,000 accounts).
- Draft Urban Water Management Plan posted on the website since September 30,2005 with contact information.
- Fliers distributed to:
  - Hemet-SJ Valley Chamber Luncheon
  - Valley Economic Development Corp. Board members
  - Southwest County Economic Development Corp. Board members
  - Attendees of the State Water Project inspection trip
- EMWD lobbies
- Presentations at the Slawson-Record Director Advisory Committee and Record-Siems Director Advisory Committee
- Public Notice published November 6 and 16, 2005.

Public Commentary

EMWD received comments on the Urban Water Management Plan from the Friends of the Northern San Jacinto Valley, the San Gorgonio Chapter of the Sierra Club, Moreno Valley Group, and the San Bernardino Valley Audubon Society represented by Sue Nash and the City of Hemet.

On the following pages is a schedule of meetings and copies of letters sent to agencies and cities. Included at the end of this appendix are the comments made and EMWD's response.

2005 Urban Water Management Plan
Public Involvement Schedule

Dec. 1 – 31, 2004	**Finalize Preliminary Supply and Demand Projections**
Jan 11, 2005	**Meet with MWD Staff**
Jan 26, 2005	**Present UWMP to Board Planning Committee**
Jan. 20-28, 2005	**EMWD Staff Briefing** A) Present Strategy and Schedule B) Discuss Assignments (Involved Work Groups)
Feb. 1, 2005	**DWR Workshop**
Feb. 2 – March 8, 2005	**Sub Agency Technical Staff Briefing** A) Present Strategy and Schedule B) Discuss Preliminary Projections C) Solicit Sub Agency Input D) Dates Feb 4, 2005 City of Perris Feb 9, 2005 City of Hemet Feb 8, 2005 Lake Hemet Municipal Water District Feb 28, 2005 City of San Jacinto March 8, 2005 Nuevo Water Company
May 23, 2005	**MWD RUWMP Workshop**
Aug 12, 2005	**Release Preliminary Draft UWMP for Comments**
Sept 23-Oct 28	**Public Presentations of Draft UWMP**
Sept 30, 2005	**Draft Available on EMWD Website**
Nov 3, 2005	**Letters and Draft Sent to County and Cities**
Nov 6 and 16, 2005	**Public Notice Published**
December 7, 2005	**Public Hearing**
December 21,2005	**Adoption**

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February 15, 2005

Mr. Wayne Spencer
General Manager
Murrieta County Water District
P. O. Box 949
Murrieta, CA 92564

Subject: Urban Water Management Plan

Dear Wayne:

Eastern Municipal Water District (EMWD) is beginning preparations of its 2005 Urban Water Management Plan (UWMP). Over the next several months we will be documenting our plan to provide reliable, quality water to our customers both retail and wholesale. EMWD's UWMP will discuss the sources of water that we provide and the demand for water in our rapidly growing service area. A comprehensive and accurate UWMP is required to fulfill EMWD's legal obligation to provide documentation of our ability to meet projected service demands and to insure eligibility in future state funded grant programs. It is also a very important tool used in preparing the water supply assessments required by Senate Bills 2210 and 610. As demand on EMWD's water supply continues to grow, it is imperative that the local communities we serve participate in the development of future demand projections and understand EMWD's strategy for meeting those demands.

State law requires EMWD to coordinate the development of its UWMP with the local agencies that may depend on EMWD to provide water either currently or within the next twenty years. We would like to ensure that projections of demand and growth that will be included in the UWMP accurately reflects what is occurring or expected to occur within Murrieta County Water District (MCWD). In order to share information, we have set up a meeting with you on February 25, 2005 at 2:00 PM at MCWD. We look forward to working with you at this meeting and throughout the process of preparing EMWD's UWMP. EMWD staff will provide information about growth projections and demand projections that we are anticipating from your agency, in order to receive your feedback. We would also like to discuss the schedule for plan preparation and providing information from EMWD that MCWD may need to prepare your UWMP should you decide to complete one.

A vital part of insuring reliability for EMWD's water supply is a continued effort to increase conservation. Conservation will play a major role in our UWMP and we would like to take this opportunity to discuss our goals and ideas about expanding conservation. As the population continues to grow, it is important that all existing and future development utilize conservation methods. Metropolitan

Mailing Address: Post Office Box 8300 Perris, CA 92572-8300 Telephone: (951) 928-3777 Fax: (951) 928-6177
Location: 2270 Trumble Road Perris, CA 92570 Internet: www.emwd.org

Water District of Southern California (MWD) requires any area requesting an annexation into MWD comply with "Best Management Practices" conservation measures be applied in all new and existing developments within the annexed area. MWD also uses conservation as a source of supply in their Integrated Resources Plan, which will be the source for their Regional UWMP. EMWD will be relying heavily on MWD's Regional UWMP to complete our own UWMP. Since water is such a precious resource for all of us we hope to work with you in expanding the role of conservation within this region.

If you have any questions or concerns, please contact Elizabeth Lovsted at (951) 928-3777, Ext 4307. We look forward to working with you and your staff.

Sincerely

Anthony J. Pack
General Manager

AJP:EL:lar

Cc: Director Randy A. Record
Director Rodger D. Siems
Director Ronald W. Sullivan

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Legal Counsel
Redwine and Sherrill

February 15, 2005

Mr. Daniel Delao
President, Board of Directors
Nuevo Water Company
30427 11th Street
Nuevo, CA 92567

Subject: Urban Water Management Plan

Dear Mr. Delao:

Eastern Municipal Water District (EMWD) is beginning preparations of its 2005 Urban Water Management Plan (UWMP). Over the next several months we will be documenting our plan to provide reliable, quality water to our customers both retail and wholesale. EMWD's UWMP will discuss the sources of water that we provide and the demand for water in our rapidly growing service area. A comprehensive and accurate UWMP is required to fulfill EMWD's legal obligation to provide documentation of our ability to meet projected service demands and to insure eligibility in future state funded grant programs. It is also a very important tool used in preparing the water supply assessments required by Senate Bills 2210 and 610. As demand on EMWD's water supply continues to grow, it is imperative that the local communities we serve participate in the development of future demand projections and understand EMWD's strategy for meeting those demands.

State law requires EMWD to coordinate the development of its UWMP with the local agencies that may depend on EMWD to provide water, either currently or within the next twenty years. We would like to ensure that projections of demand and growth that will be included in the UWMP, accurately reflects what is occurring or expected to occur within Nuevo Water Company (NWC). In order to share information, EMWD will be setting a meeting with NWC staff in the coming weeks. We look forward to working with NWC at this meeting and throughout the process of preparing EMWD's UWMP. EMWD staff will provide information about growth projections and demand projections that we are anticipating from your agency, in order to receive your feedback. We would also like to discuss the schedule for plan preparation and providing information from EMWD, which NWC may need to prepare a UWMP should you decide to complete one.

A vital part of insuring reliability for EMWD's water supply is a continued effort to increase conservation. Conservation will play a major role in our UWMP and we would like to take this opportunity to discuss our goals and ideas about expanding conservation. As the population continues to grow, it is important that all existing and future development utilize conservation methods. Metropolitan Water District of Southern California (MWD) requires any area requesting an

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annexation into MWD comply with "Best Management Practices" conservation measures be applied in all new and existing developments within the annexed area. MWD also uses conservation as a source of supply in their Integrated Resources Plan, which will be the source for their Regional UWMP. EMWD will be relying heavily on MWD's Regional UWMP to complete our own UWMP. Since water is such a precious resource for all of us, we hope to work with you in expanding the role of conservation within this region.

If you have any questions or concerns, please contact Elizabeth Lovsted at (951) 928-3777, Ext 4307. We look forward to working with you and your staff.

Sincerely

Anthony J. Pack
General Manager

AJP:EL:lar

Cc: Mr. Ed Piester, Nuevo Water Company
Director Randy Record
Director Rodger Siems
Director Ron Sullivan

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Redwine and Sherrill

February 15, 2005

Mr. Hector Apodaca, City Manager
City of Perris
101 North "D" Street
Perris, CA 92570

Subject: Urban Water Management Plan

Dear Mr. Apodaca:

Eastern Municipal Water District (EMWD) is beginning preparations of its 2005 Urban Water Management Plan (UWMP). Over the next several months we will be documenting our plan to provide reliable, quality water to our customers both retail and wholesale. EMWD's UWMP will discuss the sources of water that we provide and the demand for water in our rapidly growing service area. A comprehensive and accurate UWMP is required to fulfill EMWD's legal obligation to provide documentation of our ability to meet projected service demands and to insure eligibility in future state funded grant programs. It is also a very important tool used in preparing the water supply assessments required by Senate Bills 2210 and 610. As demand on EMWD's water supply continues to grow, it is imperative that the local communities we serve participate in the development of future demand projections and understand EMWD's strategy for meeting those demands.

State law requires EMWD to coordinate the development of its UWMP with the local agencies that may depend on EMWD to provide water either currently or within the next twenty years. We would like to ensure that projections of demand and growth that will be included in the UWMP, accurately reflects what is occurring or expected to occur within the City of Perris. In order to share information, EMWD has already met with Kirk Cloyd from the City. We provided our information about growth projections and demand projections that we are anticipating from your agency, in order to receive your feedback. We also discussed the schedule for plan preparation and providing information from EMWD, which the City may need to prepare a UWMP, should you decide to complete one. In the coming month, we will be working with representatives from all of our agencies to prepare a draft document. In June of 2005 we hope to release the draft for comments and review.

A vital part of insuring reliability for EMWD's water supply is a continued effort to increase conservation. Conservation will play a major role in our UWMP. As the population continues to grow, it is important that all existing and future development utilize conservation methods. Metropolitan Water District of Southern California (MWD) requires any area requesting an annexation into MWD, comply with "Best Management Practices" conservation measures be

Mailing Address: Post Office Box 8300 Perris, CA 92572-8300 Telephone: (951) 928-3777 Fax: (951) 928-6177
Location: 2270 Trumble Road Perris, CA 92570 Internet: www.emwd.org

applied in all new and existing developments within the annexed area. MWD also uses conservation as a source of supply in their Integrated Resources Plan, which will be the source for their Regional UWMP. EMWD will be relying heavily on MWD's Regional UWMP to complete our own UWMP. Since water is such a precious resource for all of us we hope to work with you in expanding the role of conservation within this region.

We appreciate the effort the City of Perris has made in meeting with us. We anticipate your feedback on the information we provided and encourage any comments or questions you may have about EMWD's UWMP. If you have any questions or concerns, please contact Elizabeth Lovsted at (951) 928-3777, Ext 4307. We look forward to working with you and your staff.

Sincerely

Anthony J. Pack
General Manager

AJP:EL:lar

Cc: Mr. Kirk Cloyd, City of Perris
Director Randy Record
Director Rodger Siems
Director Ronald Sullivan

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Mr. Steve Temple, City Manager
City of Hemet
445 E. Florida Avenue
Hemet, CA 92543

Subject: Urban Water Management Plan

Dear Steve:

Eastern Municipal Water District (EMWD) is beginning preparations of its 2005 Urban Water Management Plan (UWMP). Over the next several months we will be documenting our plan to provide reliable, quality water to our customers both retail and wholesale. EMWD's UWMP will discuss the sources of water that we provide and the demand for water in our rapidly growing service area. A comprehensive and accurate UWMP is required to fulfill EMWD's legal obligation to provide documentation of our ability to meet projected service demands and to insure eligibility in future state funded grant programs. It is also a very important tool used in preparing the water supply assessments required by Senate Bills 2210 and 610. As demand on EMWD's water supply continues to grow, it is imperative that the local communities we serve participate in the development of future demand projections and understand EMWD's strategy for meeting those demands.

State law requires EMWD to coordinate the development of its UWMP with the local agencies that may depend on EMWD to provide water either currently or within the next twenty years. We would like to ensure that projections of demand and growth that will be included in the UWMP accurately reflects what is occurring or expected to occur within the City of Hemet. In order to share information, EMWD met with Linda Nixon from the City. We provided to her, our information about growth projections and demand projections that we are anticipating for your agency in order to receive your feedback. We also discussed the schedule for plan preparation and provided information from EMWD, which the City will need to prepare your UWMP. In the coming months we will continue to work with representatives from all of our agencies to prepare a draft document. In June of 2005, we hope to release the draft for comments and review.

A vital part of insuring reliability for EMWD's water supply is a continued effort to increase conservation. Conservation will play a major role in our UWMP. As the population continues to grow, it is important that all existing and future development utilize conservation methods. Metropolitan Water District of Southern California (MWD) requires any area requesting an annexation into MWD comply with "Best Management Practices" conservation measures be

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applied in all new and existing developments within the annexed area. MWD also uses conservation as a source of supply in their Integrated Resources Plan, which will be the source for their Regional UWMP. EMWD will be relying heavily on MWD's Regional UWMP to complete our own UWMP. Since water is such a precious resource for all of us, we hope to work with you in expanding the role of conservation within this region.

We appreciate the effort the City of Hemet has made in meeting with us. We anticipate your feedback on the information we provided and encourage any comments or questions you may have about EMWD's UWMP. If you have any questions or concerns, please contact Elizabeth Lovsted at (951) 928-3777, Ext. 4307. We look forward to working with you and your staff.

Sincerely

Anthony J. Pack
General Manager

AJP:EL:lar

Cc: Ms. Linda Nixon, City of Hemet
Director Randy Record
Director Rodger Siems
Director Ron Sullivan

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Mr. Rob Lindquist
General Manager
Lake Hemet Municipal Water District
P. O. Box 5039
Hemet, CA 92544-5039

Subject: Urban Water Management Plan

Dear Rob:

Eastern Municipal Water District (EMWD) is beginning preparations of its 2005 Urban Water Management Plan (UWMP). Over the next several months we will be documenting our plan to provide reliable, quality water to our customers both retail and wholesale. EMWD's UWMP will discuss the sources of water that we provide and the demand for water in our rapidly growing service area. A comprehensive and accurate UWMP is required to fulfill EMWD's legal obligation to provide documentation of our ability to meet projected service demands and to insure eligibility in future state funded grant programs. It is also a very important tool used in preparing the water supply assessments required by Senate Bills 2210 and 610. As demand on EMWD's water supply continues to grow, it is imperative that the local communities we serve participate in the development of future demand projections and understand EMWD's strategy for meeting those demands.

State law requires EMWD to coordinate the development of its UWMP with the local agencies that may depend on EMWD to provide water either currently or within the next twenty years. We would like to ensure that projections of demand and growth that will be included in the UWMP accurately reflects what is occurring or expected to occur within Lake Hemet Municipal Water District (LHMWD). In order to share information, EMWD will be meeting with staff from LHMWD on February 17, 2005 at 1:00 PM at LHMWD. We encourage you and your staff to participate in this meeting and the process of preparing EMWD's UWMP. EMWD staff will provide information about growth projections and demand projections that we are anticipating from your agency, in order to receive your feedback. We would also like to discuss the schedule for plan preparation and providing information from EMWD that LHMWD may need to prepare your UWMP.

A vital part of insuring reliability for EMWD's water supply is a continued effort to increase conservation. Conservation will play a major role in our UWMP and we would like to take this opportunity to discuss our goals and ideas about expanding conservation. As the population continues to grow it is important that all existing and future development utilize conservation methods. Metropolitan

Water District of Southern California (MWD) requires any area requesting an annexation into MWD comply with "Best Management Practices" conservation measures be applied in all new and existing developments within the annexed area. MWD also uses conservation as a source of supply in their Integrated Resources Plan, which will be the source for their Regional UWMP. EMWD will be relying heavily on MWD's Regional UWMP to complete our own UWMP. Since water is such a precious resource for all of us, we hope to work with you in expanding the role of conservation within this region.

If you have any questions or concerns, please contact Elizabeth Lovsted at 951-928-3777 Ext. 4307. We look forward to working with you and your staff.

Sincerely

Anthony J. Pack
General Manager

AJP:EL:lar

Cc: Mr. John Loncar, LHMWD
Director Randy Record
Director Rodger Siems
Director Ronald Sullivan

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Legal Counsel
Redwine and Sherrill

Mr. Peter Cosentini, City Manager
City of San Jacinto
P.O. Box 488
San Jacinto, CA 92581

Subject: Urban Water Management Plan

Dear Peter:

Eastern Municipal Water District (EMWD) is beginning preparations of its 2005 Urban Water Management Plan (UWMP). Over the next several months we will be documenting our plan to provide reliable, quality water to our customers both retail and wholesale. EMWD's UWMP will discuss the sources of water that we provide and the demand for water in our rapidly growing service area. A comprehensive and accurate UWMP is required to fulfill EMWD's legal obligation to provide documentation of our ability to meet projected service demands and to insure eligibility in future state funded grant programs. It is also a very important tool used in preparing the water supply assessments required by Senate Bills 2210 and 610. As demand on EMWD's water supply continues to grow, it is imperative that the local communities we serve participate in the development of future demand projections and understand EMWD's strategy for meeting those demands.

State law requires EMWD to coordinate the development of its UWMP with the local agencies that may depend on EMWD to provide water either currently or within the next twenty years. We would like to ensure that projections of demand and growth that will be included in the UWMP, accurately reflects what is occurring or expected to occur within the City of San Jacinto. In order to share information, EMWD will be setting a meeting with city staff in the coming weeks. We encourage the participation of you and your staff at this meeting and throughout the process of preparing EMWD's UWMP. EMWD staff will provide information about growth projections and demand projections that we are anticipating from your agency, in order to receive your feedback. We would also like to discuss the schedule for plan preparation and providing information from EMWD, which the City may need to prepare a UWMP should you decide to complete one.

A vital part of insuring reliability for EMWD's water supply is a continued effort to increase conservation. Conservation will play a major role in our UWMP and we would like to take this opportunity to discuss our goals and ideas about expanding conservation. As the population continues to grow, it is important that all existing and future development utilize conservation methods. Metropolitan Water District of Southern California (MWD) requires any area requesting an

annexation into MWD comply with "Best Management Practices" conservation measures be applied in all new and existing developments within the annexed area. MWD also uses conservation as a source of supply in their Integrated Resources Plan, which will be the source for their Regional UWMP. EMWD will be relying heavily on MWD's Regional UWMP to complete our own UWMP. Since water is such a precious resource for all of us, we hope to work with you in expanding the role of conservation within this region.

If you have any questions or concerns, please contact Elizabeth Lovsted at (951) 928-3777, Ext 4307. We look forward to working with you and your staff.

Sincerely

Anthony J. Pack
General Manager

AJP:EL:lar

Cc: Mr. Tim Hults
Director Randy Record
Director Rodger Siems
Director Ronald Sullivan

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EASTERN MUNICIPAL WATER DISTRICT
SINCE 1950

Board of Directors

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Randy A. Record

Vice President
David J. Slawson

Richard R. Hall
Rodger D. Siems
Ronald W. Sullivan

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General Manager
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Director of the Metropolitan Water District of So. Calif.
Randy A. Record

Treasurer
Joseph J. Kuebler, CPA

Legal Counsel
Redwine and Sherrill

February 15, 2005

Mr. Wayne Spencer
General Manager
Murrieta County Water District
P. O. Box 949
Murrieta, CA 92564

Subject: Urban Water Management Plan

Dear Wayne:

Eastern Municipal Water District (EMWD) is beginning preparations of its 2005 Urban Water Management Plan (UWMP). Over the next several months we will be documenting our plan to provide reliable, quality water to our customers both retail and wholesale. EMWD's UWMP will discuss the sources of water that we provide and the demand for water in our rapidly growing service area. A comprehensive and accurate UWMP is required to fulfill EMWD's legal obligation to provide documentation of our ability to meet projected service demands and to insure eligibility in future state funded grant programs. It is also a very important tool used in preparing the water supply assessments required by Senate Bills 2210 and 610. As demand on EMWD's water supply continues to grow, it is imperative that the local communities we serve participate in the development of future demand projections and understand EMWD's strategy for meeting those demands.

State law requires EMWD to coordinate the development of its UWMP with the local agencies that may depend on EMWD to provide water either currently or within the next twenty years. We would like to ensure that projections of demand and growth that will be included in the UWMP accurately reflects what is occurring or expected to occur within Murrieta County Water District (MCWD). In order to share information, we have set up a meeting with you on February 25, 2005 at 2:00 PM at MCWD. We look forward to working with you at this meeting and throughout the process of preparing EMWD's UWMP. EMWD staff will provide information about growth projections and demand projections that we are anticipating from your agency, in order to receive your feedback. We would also like to discuss the schedule for plan preparation and providing information from EMWD that MCWD may need to prepare your UWMP should you decide to complete one.

A vital part of insuring reliability for EMWD's water supply is a continued effort to increase conservation. Conservation will play a major role in our UWMP and we would like to take this opportunity to discuss our goals and ideas about expanding conservation. As the population continues to grow, it is important that all existing and future development utilize conservation methods. Metropolitan

Mailing Address: Post Office Box 8300 Perris, CA 92572-8300 Telephone: (951) 928-3777 Fax: (951) 928-6177
Location: 2270 Trumble Road Perris, CA 92570 Internet: www.emwd.org

Water District of Southern California (MWD) requires any area requesting an annexation into MWD comply with "Best Management Practices" conservation measures be applied in all new and existing developments within the annexed area. MWD also uses conservation as a source of supply in their Integrated Resources Plan, which will be the source for their Regional UWMP. EMWD will be relying heavily on MWD's Regional UWMP to complete our own UWMP. Since water is such a precious resource for all of us we hope to work with you in expanding the role of conservation within this region.

If you have any questions or concerns, please contact Elizabeth Lovsted at (951) 928-3777, Ext 4307. We look forward to working with you and your staff.

Sincerely

Anthony J. Pack
General Manager

AJP:EL:lar

Cc: Director Randy A. Record
Director Rodger D. Siems
Director Ronald W. Sullivan

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EASTERN MUNICIPAL WATER DISTRICT

SINCE 1950

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Ronald W. Sullivan

Board Secretary
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General Manager
Anthony J. Pack

Director of the Metropolitan Water District of So. Calif.
Randy A. Record

Treasurer
Joseph J. Kuebler, CPA

Legal Counsel
Redwine and Sherrill

August 12, 2005

Nick Larkin
P&D Consultants
8954 Rio San Diego Drive, Suite 610
San Diego, CA 92108

Subject: Draft Urban Water Management Plan for Eastern Municipal Water District

Dear Mr. Larkin,

Per your request, enclosed is a draft copy of Eastern Municipal Water District's (EMWD) Urban Water Management Plan (UWMP). This is the first draft of this document and should not be considered final for any purpose. The information contained in the draft is considered preliminary and subject to change.

EMWD is accepting comments on this draft through August 31, 2005 and will publish a subsequent draft after September 16, 2005 for public review and comment. The final Plan is expected to be submitted to EMWD's Board of Directors at the end of November.

Please send any comments or questions on this draft to me by e-mail at lovstede@emwd.org or contact me by phone at 951-928-3777 Ext. 4307.

Sincerely,

Linda Robbins

for,

Elizabeth Lovsted
Facilities Planner/Engineer
Resource Development

EL:lar

Enclosure

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EASTERN MUNICIPAL WATER DISTRICT

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Board of Directors

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General Manager
Anthony J. Pack

Director of the Metropolitan Water District of So. Calif.
Randy A. Record

Treasurer
Joseph J. Kuebler CPA

Legal Counsel
Redwine and Sherrill

August 12, 2005

Jim Blanke
WRIME
1451 Riverbank Drive, Suite 142
Sacramento, CA 95815

Subject: **Draft Urban Water Management Plan for Eastern Municipal Water District**

Dear Mr. Blanke,

Per your request, enclosed is a draft copy of Eastern Municipal Water District's (EMWD) Urban Water Management Plan (UWMP). This is the first draft of this document and should not be considered final for any purpose. The information contained in this draft is considered preliminary and subject to change.

EMWD is accepting comments on this draft through August 31, 2005 and will publish a subsequent draft after September 16, 2005 for public review and comment. The final Plan is expected to be submitted to EMWD's Board of Directors at the end of November.

Please send any comments or questions on this draft to me by e-mail at lovstede@emwd.org or contact me by phone at 951-928-3777 Ext. 4307.

Sincerely,

Linda Robbins

for

Elizabeth Lovsted
Facilities Planner/Engineer
Resource Development

EL:lar

Enclosure

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EASTERN MUNICIPAL WATER DISTRICT

SINCE 1950

August 12, 2005

Board of Directors

President
Randy A. Record

Vice President
David J. Slawson

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General Manager
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Director of the Metropolitan Water District of So. Calif.
Randy A. Record

Treasurer
Joseph J. Kuebler, CPA

Legal Counsel
Redwine and Sherrill

Jenny Arevalo
861 Village Oaks Drive, Ste. 100
Covina, CA 91724

Subject: **Draft Urban Water Management Plan for Eastern Municipal Water District**

Dear Ms. Arevalo:

Per your request, enclosed is a draft copy of Eastern Municipal Water District's (EMWD) Urban Water Management Plan (EMWD). This is the first draft of this document and should not be considered final for any purpose. The information contained in this draft is considered preliminary and subject to change.

EMWD is accepting comments on this draft through August 31, 2005 and will publish a subsequent draft after September 16, 2005 for public review and comment. The final Plan is expected to be submitted to EMWD's Board of Directors at the end of November.

Please send any comments or questions on this draft to me by e-mail at lovstede@emwd.org or contact me by phone at 951-928-3777 Ext. 4307.

Sincerely,

Linda Robbins

for Elizabeth Lovsted
Facilities Planner/Engineer
Resource Development

EL:lar

Enclosure

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EASTERN MUNICIPAL WATER DISTRICT

SINCE 1950

August 10, 2005

Board of Directors

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David J. Slawson

Richard R. Hall
Rodger D. Siems
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General Manager
Anthony J. Pack

Director of the Metropolitan Water District of So. Calif.
Randy A. Record

Treasurer
Joseph J. Kuebler, CPA

Legal Counsel
Redwine and Sherrill

Tim Hulte
Community Development Director
City of San Jacinto
201 E. Main Street
San Jacinto, CA 92583

Subject: **Draft Urban Water Management Plan for Easter Municipal Water District**

Dear Mr. Hulte;

Enclosed is a copy of Eastern Municipal Water District's (EMWD) Urban Water Management Plan (UWMP). This Plan has been prepared in response to Water Code Sections 10610 through 10656 of the Urban Water Management Planning Act. Please review the Plan and return any comments by August 31, 2005 for incorporation into the final draft.

In addition to comments on EMWD's Urban Water Management Plan, EMWD would also like to request the following information about your agency:

1) Retail municipal and industrial demands for normal, dry and multiple dry years;
2) Total agricultural demands for normal, dry and multiple dry years;
3) Demands for EMWD supplies for normal, dry and multiple dry years, for the following:
    a. Basic demands
    b. Agricultural Water Demands
4) Brief descriptions of the assumptions underlying the projections, if available.

This information should meet the requirements of Water Code Section 10631 (k) and allow EMWD to compare EMWD projections to sub agency projections. The information received will be attached as an appendix to the 2005 UWMP.

We are intending to make a revised draft of the Plan available to the public on EMWD's website after September 16, 2005. At that time, we would like to schedule a presentation of the Plan at your work site, if requested.

If you have any questions, please contact me at (951) 928-3777, Ext. 4307. Thank you for your assistance.

Sincerely,

Elizabeth Lovsted
Facilities Planner/Engineer
EL:lar
Attachments

EASTERN MUNICIPAL WATER DISTRICT

SINCE 1950

August 10, 2005

Board of Directors

President
Randy A. Record

Vice President
David J. Slawson

Richard R. Hall
Rodger D. Siems
Ronald W. Sullivan

Board Secretary
Rosemarie V. Howell

General Manager
Anthony J. Pack

Director of the Metropolitan Water District of So. Calif.
Randy A. Record

Treasurer
Joseph J. Kuebler, CPA

Legal Counsel
Redwine and Sherrill

Mitch Freeman
Lake Hemet Municipal Water District
2480 East Florida Avenue
P.O. Box 5039
Hemet, CA 92544

Subject: **Draft Urban Water Management Plan for Easter Municipal Water District**

Dear Mr. Freeman;

Enclosed is a copy of Eastern Municipal Water District's (EMWD) Urban Water Management Plan (UWMP). This Plan has been prepared in response to Water Code Sections 10610 through 10656 of the Urban Water Management Planning Act. Please review the Plan and return any comments by August 31, 2005 for incorporation into the final draft.

In addition to comments on EMWD's Urban Water Management Plan, EMWD would also like to request the following information about your agency:

1) Retail municipal and industrial demands for normal, dry and multiple dry years;
2) Total agricultural demands for normal, dry and multiple dry years;
3) Demands for EMWD supplies for normal, dry and multiple dry years, for the following:
    a) Basic demands
    b) Agricultural Water Demands
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This information should meet the requirements of Water Code Section 10631 (k) and allow EMWD to compare EMWD projections to sub agency projections. The information received will be attached as an appendix to the 2005 UWMP.

We are intending to make a revised draft of the Plan available to the public on EMWD's website after September 16, 2005. At that time, we would like to schedule a presentation of the Plan at your work site, if requested.

If you have any questions, please contact me at (951) 928-3777, Ext. 4307. Thank you for your assistance.

Sincerely,

Elizabeth Lovsted
Facilities Planner/Engineer
EL:lar
Attachments

EASTERN MUNICIPAL WATER DISTRICT

SINCE 1950

August 10, 2005

Board of Directors

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Randy A. Record

Vice President
David J. Slawson

Richard R. Hall
Rodger D. Siems
Ronald W. Sullivan

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Rosemarie V. Howell

General Manager
Anthony J. Pack

Director of the Metropolitan Water District of So. Calif.
Randy A. Record

Treasurer
Joseph J. Kuebler, CPA

Legal Counsel
Redwine and Sherrill

Ed Piester
Nuevo Water Company
30427 11th Street
Nuevo, CA 92567

Subject: Draft Urban Water Management Plan for Easter Municipal Water District

Dear Mr. Piester;

Enclosed is a copy of Eastern Municipal Water District's (EMWD) Urban Water Management Plan (UWMP). This Plan has been prepared in response to Water Code Sections 10610 through 10656 of the Urban Water Management Planning Act. Please review the Plan and return any comments by August 31, 2005 for incorporation into the final draft.

In addition to comments on EMWD's Urban Water Management Plan, EMWD would also like to request the following information about your agency:

1) Retail municipal and industrial demands for normal, dry and multiple dry years;
2) Total agricultural demands for normal, dry and multiple dry years;
3) Demands for EMWD supplies for normal, dry and multiple dry years, for the following:
    a) Basic demands
    b) Agricultural Water Demands
4) Brief descriptions of the assumptions underlying the projections, if available.

This information should meet the requirements of Water Code Section 10631 (k) and allow EMWD to compare EMWD projections to sub agency projections. The information received will be attached as an appendix to the 2005 UWMP.

We are intending to make a revised draft of the Plan available to the public on EMWD's website after September 16, 2005. At that time, we would like to schedule a presentation of the Plan at your work site, if requested.

If you have any questions, please contact me at (951) 928-3777. Ext. 4307. Thank vou for your assistance.

Sincerely,

Elizabeth Lovsted
Facilities Planner/Engineer

EL:lar
Attachments

EASTERN MUNICIPAL WATER DISTRICT

SINCE 1950

August 10, 2005

Board of Directors

President
Randy A. Record

Vice President
David J. Slawson

Richard R. Hall
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Ronald W. Sullivan

Board Secretary
Rosemarie V. Howell

General Manager
Anthony J. Pack

Director of the Metropolitan Water District of So. Calif.
Randy A. Record

Treasurer
Joseph J. Kuebler, CPA

Legal Counsel
Redwine and Sherrill

Kirk Cloyd
Public Works Superintendent
City of Perris
1015 S. "G" Street
Perris, CA 92570-2410

Subject: Draft Urban Water Management Plan for Easter Municipal Water District

Dear Mr. Cloyd;

Enclosed is a copy of Eastern Municipal Water District's (EMWD) Urban Water Management Plan (UWMP). This Plan has been prepared in response to Water Code Sections 10610 through 10656 of the Urban Water Management Planning Act. Please review the Plan and return any comments by August 31, 2005 for incorporation into the final draft.

In addition to comments on EMWD's Urban Water Management Plan, EMWD would also like to request the following information about your agency:

1) Retail municipal and industrial demands for normal, dry and multiple dry years;
2) Total agricultural demands for normal, dry and multiple dry years;
3) Demands for EMWD supplies for normal, dry and multiple dry years, for the following:
    a) Basic demands
    b) Agricultural Water Demands
4) Brief descriptions of the assumptions underlying the projections, if available.

This information should meet the requirements of Water Code Section 10631 (k) and allow EMWD to compare EMWD projections to sub agency projections. The information received will be attached as an appendix to the 2005 UWMP.

We are intending to make a revised draft of the Plan available to the public on EMWD's website after September 16, 2005. At that time, we would like to schedule a presentation of the Plan at your work site, if requested.

If you have any questions, please contact me at (951) 928-3777, Ext. 4307. Thank you for your assistance.

Sincerely,

Elizabeth Lovsted
Facilities Planner/Engineer

EL:lar
Attachments

Mailing Address: Post Office Box 8300 Perris, CA 92572-8300 *Telephone:* (951) 928-3777 *Fax:* (951) 928-6177
Location: 2270 Trumble Road Perris, CA 92570 *Internet:* www.emwd.org

EASTERN MUNICIPAL WATER DISTRICT

SINCE 1950

August 10, 2005

Board of Directors

President
Randy A. Record

Vice President
David J. Slawson

Richard R. Hall
Rodger D. Siems
Ronald W. Sullivan

Board Secretary
Rosemarie V. Howell

General Manager
Anthony J. Pack

Director of the Metropolitan Water District of So. Calif.
Randy A. Record

Treasurer
Joseph J. Kuebler, CPA

Legal Counsel
Redwine and Sherrill

Linda Nixon
Management Assistant
City of Hemet
Public Works/Engineering
510 E Florida Ave.
Hemet, CA 92543

Subject: Draft Urban Water Management Plan for Easter Municipal Water District

Dear Ms. Nixon,

Enclosed is a copy of Eastern Municipal Water District's (EMWD) Urban Water Management Plan (UWMP). This Plan has been prepared in response to Water Code Sections 10610 through 10656 of the Urban Water Management Planning Act. Please review the Plan and return any comments by August 31, 2005 for incorporation into the final draft.

In addition to comments on EMWD's Urban Water Management Plan, EMWD would also like to request the following information about your agency:

1) Retail municipal and industrial demands for normal, dry and multiple dry years;
2) Total agricultural demands for normal, dry and multiple dry years;
3) Demands for EMWD supplies for normal, dry and multiple dry years, for the following:
   a) Basic demands
   b) Agricultural Water Demands
4) Brief descriptions of the assumptions underlying the projections, if available.

This information should meet the requirements of Water Code Section 10631 (k) and allow EMWD to compare EMWD projections to sub agency projections. The information received will be attached as an appendix to the 2005 UWMP.

We are intending to make a revised draft of the Plan available to the public on EMWD's website after September 16, 2005. At that time, we would like to schedule a presentation of the Plan at your work site, if requested.

If you have any questions, please contact me at (951) 928-3777, Ext. 4307. Thank you for your assistance.

Sincerely,

Elizabeth Lovsted
Facilities Planner/Engineer
EL:lar
Attachments

Mailing Address: Post Office Box 8300 Perris, CA 92572-8300 Telephone: (951) 928-3777 Fax: (951) 928-6177
Location: 2270 Trumble Road Perris, CA 92570 Internet: www.emwd.org

Eastern Municipal Water District

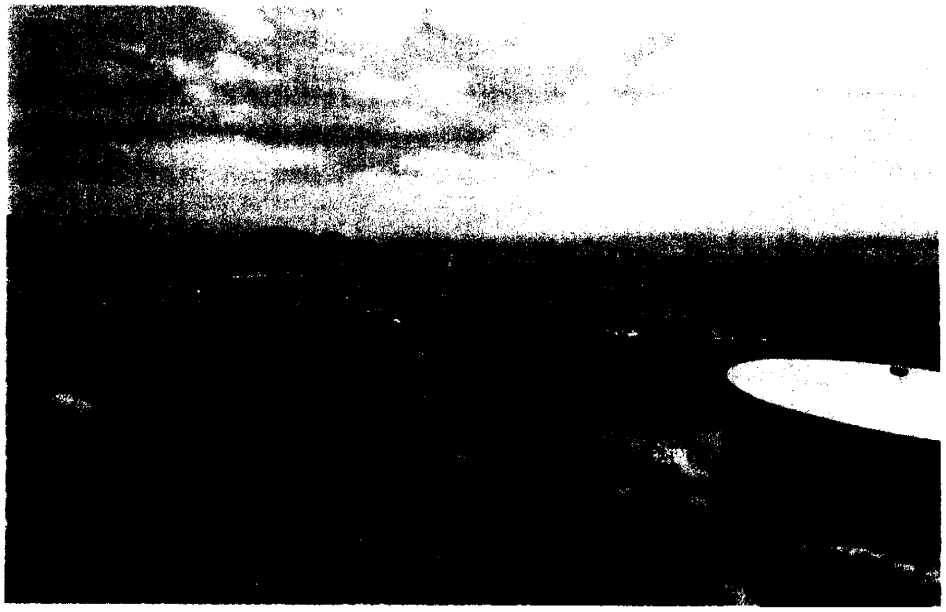
Urban Water Management Plan

EASTERN MUNICIPAL WATER DISTRICT
SINCE 1950

To request a copy of the draft plan or if you have any comments or questions about the Urban Water Management Plan, please contact Elizabeth Lovsted at lovstede@emwd.org or 951-928-3777, ext. 4307. In addition, the draft UWMP for 2005 will be available on EMWD's web site, emwd.org, by September 31, 2005 for review and comments.

P.O. Box 8300, Perris, CA 92572
2270 Trumble Road, Perris, CA 92570

951-928-3777, ext. 4307
www.emwd.org



Eastern Municipal Water District (EMWD) is located in one of the fastest growing regions in the nation, and with a growing population comes a growing demand for water. Over the next 25 years, demand for water within EMWD's service area will increase more than 75 percent. EMWD has a mission to provide safe and reliable fresh water, wastewater management services and recycled water to our community in an economic, efficient, and responsible manner, now and in the future.

To meet the needs of the growing population, EMWD has developed a plan to supply water using imported water, local groundwater and recycled water. In addition to supplying more water, EMWD encourages efficient water use through rebates for water saving devises, education and other conservation practices.

EMWD has prepared a draft of the ***2005 Urban Water Management Plan*** (UWMP). The plan is an update to the 2000 UWMP and has been prepared in response to Water Code Sections 10610 through 10656 of the Urban Water Management Planning Act. Included in the plan is detailed information about EMWD's water demand, supply and reliability for the next 25 years.

To request a copy of the draft plan or if you have any comments or questions about the UWMP, please contact Elizabeth Lovsted at lovstede@emwd.org or (951) 928-3777, ext. 4307. In addition, the draft UWMP for 2005 will be available on EMWD's web site, www.emwd.org, by September 31, 2005 for review and comments.

EASTERN MUNICIPAL WATER DISTRICT
SINCE 1950

AGENDA

BOARD PLANNING COMMITTEE
September 26, 2005
Conf. Rm. 217 – 10:00 a.m.

COMMITTEE MEMBERS:

Rodger D. Siems, Board Member
Randy A. Record, Board Member
Ronald W. Sullivan, Board Member
Tony Pack, General Manager
P. Ravishanker, Deputy General Manager
Charlie Bachmann, Assistant GM of Engineering
Mike Luker, Assistant GM of Operations and Maintenance
Mike Garner, Assistant General Manager of Resource Development and Planning

PUBLIC COMMENT - Any subject within the jurisdiction of Eastern Municipal Water District (EMWD). Speakers are requested to limit comments to 3 minutes.

Guest: *None anticipated*

I. Item(s) from the General Manager

II. Water Supply Assessment for Spec 212, Tract Map 30037

III. Urban Water Management Plan

IV. Ethanac Commercial / Business Connection

V Other Item(s)

VI. Tentative date for next meeting: October 27, 3:00 p.m.

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EASTERN MUNICIPAL WATER DISTRICT

SINCE 1950

Board of Directors

President
Randy A. Record

Vice President
David J. Slawson

Richard R. Hall
Redger D. Siems
Ronald W. Sullivan

Board Secretary
Rosemarie V. Howell

General Manager
Anthony J. Pack

Director of the Metropolitan Water District of So. Calif.
Randy A. Record

Treasurer
Joseph J. Kuebler, CPA

Legal Counsel
Redwine and Sherrill

TRANSMITTAL COVER LETTER

Resource Development

DATE: **October 14, 2005**

TO: **Charolette Fox, Director**
League of Women Voters California

FROM: **Beth Lovsted**

SUBJECT: **EMWD - Draft Urban Water Management Plan**

Please Review & Provide Comments _____

For Your Review _____

Per Your Request X

Please Sign & Return _____

If you have any questions, please call (951) 928-3777, Ext. **4307**

Beth Lovsted
Facilities/Planner Engineer

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EASTERN MUNICIPAL WATER DISTRICT

SINCE 1950

November 3, 2005

Mr. Jack McGee
Director of Planning
City of Murrieta
26442 Beckman Ct.
Murrieta, CA 92562

Board of Directors

President
Randy A. Record

Vice President
David J. Slawson

Richard R. Hall
Rodger D. Siems
Ronald W. Sullivan

Board Secretary
Rosemarie V. Howell

General Manager
Anthony J. Pack

Director of the Metropolitan Water District of So. Calif.
Randy A. Record

Treasurer
Joseph J. Kuebler, CPA

Legal Counsel
Redwine and Sherrill

Dear Mr. McGee:

Eastern Municipal Water District (EMWD) has prepared a draft of the 2005 Urban Water Management Plan (UWMP). This plan is an update to the 2000 UWMP for EMWD and has been prepared in response to Water Code Sections 10610 through 10656 of the Urban Water Management Planning Act. Included in the plan is detailed information about EMWD's water demand, supply and reliability for the next twenty-five years.

EMWD has a mission to provide safe and reliable water and wastewater management services to our community in an economic, efficient, and responsible manner, now and in the future. Over the next twenty-five years the demand for water in EMWD's service area will increase by over 100,000 acre-feet per year. That is a more than 75 percent increase in water demand. To meet the growing demand, EMWD has to supply water with innovation, reliability and efficiency. EMWD has three water supply sources; water imported through Metropolitan Water District of Southern California from Northern California and the Colorado River, local groundwater, and recycled water. Imported water supplies include both potable water treated by MWD and non-potable water. Non-potable water is either treated by EMWD for potable use, used for agricultural that does not require potable water, or percolated down into the groundwater basins for future groundwater extraction. Groundwater supplies consist of potable quality groundwater used for direct customer consumption and desalinated, low-quality ground water treated for potable use. Recycled water is also an important water supply for non-potable purposes. In addition to supplying more water, EMWD is determined to encourage efficient water use through rebates for water saving devises, education and other conservation practices described in the UWMP.

Please review the enclosed copy of the EMWD 2005 Draft Urban Water Management Plan. The final plan will be used to support any water supply assessments and verifications required after its adoption. There will be a public meeting to consider the approval of the 2005 Urban Water Management Plan on December 7, 2005 at 1:00 p.m. or as soon thereafter as possible, in Eastern Municipal Water District's Board Room. EMWD staff is also available to meet with you individually to discuss the UWMP upon request. Please send any comment or concerns you would like addressed in the UWMP to Elizabeth Lovsted at lovstede@emwd.org or 951-928-3777, Ext. 4307 by December 7, 2005.

Sincerely,

Elizabeth Lovsted
Facilities Planner/Engineer

EL:lar
Enclosure

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Mailing Address: Post Office Box 8300 Perris, CA 92572-8300 Telephone: (951) 928-3777 Fax: (951) 928-6177
Location: 2270 Trumble Road Perris, CA 92570 Internet: www.emwd.org

EASTERN MUNICIPAL
WATER DISTRICT

SINCE 1950

November 3, 2005

Ms. Debbie Ubnoske
Director of Planning
City of Temecula
43174 Business Park Dr.
Temecula, CA 92591

Dear Ms. Ubnoske:

Eastern Municipal Water District (EMWD) has prepared a draft of the 2005 Urban Water Management Plan (UWMP). This plan is an update to the 2000 UWMP for EMWD and has been prepared in response to Water Code Sections 10610 through 10656 of the Urban Water Management Planning Act. Included in the plan is detailed information about EMWD's water demand, supply and reliability for the next twenty-five years.

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Sincerely,

Elizabeth Lovsted
Facilities Planner/Engineer

EL:lar
Enclosure

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Board of Directors

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Richard R. Hall
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Randy A. Record

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Joseph J. Kuebler, CPA

Legal Counsel
Redwine and Sherrill

Mailing Address: Post Office Box 8300 Perris, CA 92572-8300 Telephone: (951) 928-3777 Fax: (951) 928-6177
Location: 2270 Trumble Road Perris, CA 92570 Internet: www.emwd.org

EASTERN MUNICIPAL WATER DISTRICT

SINCE 1950

November 3, 2005

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Legal Counsel
Redwine and Sherrill

Mr. Robert Johnson
Planning Director
Planning Department
County of Riverside
4080 Lemon Street
Riverside, CA 92502-1629

Dear Mr. Johnson:

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Sincerely,

Elizabeth Lovsted
Facilities Planner/Engineer
EL:lar
Enclosure

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EASTERN MUNICIPAL
WATER DISTRICT
SINCE 1950

November 3, 2005

Ms. Olivia Barnes
Director of Community Development
City of Perris
101 N. "D" Street
Perris, CA 92572

Board of Directors

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General Manager
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Director of the Metropolitan Water District of So. Calif.
Randy A. Record

Treasurer
Joseph J. Kuebler, CPA

Legal Counsel
Redwine and Sherrill

Dear Ms. Barnes:

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Sincerely,

Elizabeth Lovsted
Facilities Planner/Engineer

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Location: 2270 Trumble Road Perris, CA 92570 Internet: www.emwd.org

EASTERN MUNICIPAL WATER DISTRICT

SINCE 1950

November 3, 2005

Mr. John Terell
Planning Official
City of Moreno Valley
14177 Frederick Blvd.
Moreno Valley, CA 92555

Dear Mr. Terell:

Eastern Municipal Water District (EMWD) has prepared a draft of the 2005 Urban Water Management Plan (UWMP). This plan is an update to the 2000 UWMP for EMWD and has been prepared in response to Water Code Sections 10610 through 10656 of the Urban Water Management Planning Act. Included in the plan is detailed information about EMWD's water demand, supply and reliability for the next twenty-five years.

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Sincerely,

Elizabeth Lovsted
Facilities Planner/Engineer

EL:lar
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Randy A. Record

Treasurer
Joseph J. Kuebler, CPA

Legal Counsel
Redwine and Sherrill

Mr. Richard Masyczek
Director of Planning
City of Hemet
445 E. Florida Avenue
Hemet, CA 92543

Dear Mr. Masyczek:

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Sincerely,

Elizabeth Lovsted
Facilities Planner/Engineer

EL:lar
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EASTERN MUNICIPAL WATER DISTRICT

SINCE 1950

November 3, 2005

Mr. Tim Hults
Community Development Director
City of San Jacinto
201 E. Main Street
San Jacinto, CA 92583

Board of Directors

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Randy A. Record

Vice President
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Richard R. Hall
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Elizabeth Lovsted
Facilities Planner/Engineer

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Location: 2270 Trumble Road Perris, CA 92570 Internet: www.emwd.org

Ad Number:B06/B06766137 Operator:tmillard
Customer:EMWD
Purge:03-02-06 SalesPerson:CASTRO MV45
Size:A 3.00 X 7.50 RunDate:11-06-05

EASTERN MUNICIPAL WATER DISTRICT
SINCE 1950

NOTICE OF A PUBLIC HEARING TO CONSIDER APPROVAL OF THE EASTERN MUNICIPAL WATER DISTRICT'S 2005 URBAN WATER MANAGEMENT PLAN

Eastern Municipal Water District (EMWD) is located in one of the fastest growing regions in the nation, and with a growing population, comes a growing demand for water. Over the next 25 years, demand for water within EMWD's service area will increase more than 75 percent. EMWD has a mission to provide safe and reliable fresh water, wastewater management services and recycled water to our community in an economic, efficient, and responsible manner, now and in the future.

EMWD has prepared a draft of the 2005 Urban Water Management Plan (UWMP). The plan is an update to the 2000 UWMP for EMWD and has been developed in response to Water Code Sections 10610 through 10656 of the Urban Water Management Planning Act. Included in the plan is detailed information about EMWD's water demand, and supply and reliability for the next twenty-five years. The UWMP is available for review on EMWD's web site, www.emwd.org.

A public meeting of the EMWD Board of Directors to consider the approval of EMWD's 2005 Urban Water Management Plan, will be held on December 7, 2005 at 1:00 p.m. or as soon thereafter as possible, in the Board Room at EMWD's headquarters:

Eastern Municipal Water District
2270 Trumble Road
Perris, CA 92572

Public input is encouraged, appreciated and will be considered during finalization of the 2005 UWMP. Any comments on the UWMP or requests for more information should be sent to:

Eastern Municipal Water District
Attention: Ms. Elizabeth Lovsted
lovstede@emwd.org
P.O. Box 8300
Perris, CA 92572-8300

E-mail or written comments are due by December 7, 2005.

Comments from the City of Hemet

-----Original Message-----
From: Linda Nixon [mailto:LNixon@cityofhemet.org]
Sent: Wednesday, December 07, 2005 4:37 PM
To: Lovsted, Elizabeth
Subject: EMWD 2005 Draft UWMP

Hi Elizabeth -

We have reviewed the EMWD 2005 Draft UWMP (dated 07-15-2005) and have the following comments:

1. Page 18 - Water Levels -

Reference to Figure 3.3, should be changed to 3.4.

2. Page 18 - Table 3.2 - Average Changes in Groundwater Storage, 2003-2004

Decrease of -5,900 AF in Hemet South subbasin seems too high. Would like to see data recorded in terms of change in static well levels included in this chart in addition to AF.

3. Page 24 - Table 3.3 - Groundwater Extraction West San Jacinto Groundwater Management

Total GW Production for Hemet South is listed at 90 AF and a notation indicates this is a partial figure. However the paragraph immediately above the chart indicates "This extraction accounts for all of the groundwater extracted from the basin, not just the extraction by EMWD." If this is true, 90 AF does not appear to be an accurate figure. Please
clarify.

4. Page 25 - Groundwater Pumping Rights

In first and third paragraphs of this section, we question the accuracy of statements concerning "appropriative rights." Please clarify.

Thanks for the opportunity to comment.

Linda Nixon
City of Hemet
Public Works Engineering Department
510 E. Florida Avenue
Hemet, CA 92543

Response to the City of Hemet

Linda,
In response to your comments:

1. Page 18 - Water Levels -

Reference to Figure 3.3, should be changed to 3.4.

There was some changes to the order of the figures Figure 3.2 is the Hemet/San Jacinto Water Management Area Water level Contour Map and Figure 3.5 is the West San Jacinto Basin Water Contour Map. The references have been changed.

2. Page 18 - Table 3.2 - Average Changes in Groundwater Storage, 2003-2004

Decrease of -5,900 AF in Hemet South sub basin seems too high. Would like to see data recorded in terms of change in static well levels included in this chart in addition to AF.

This table was copied from the annual report and calculated using the static level from several wells input into a three dimensional model. Fakhri Manghi at MWD makes the estimation on a GIS model and would be glad to give you additional information. You can contact him at manghhif@emwd.org. The annual report is available for review at EMWD.org

3. Page 24 - Table 3.3 - Groundwater Extraction West San Jacinto Groundwater Management

Total GW Production for Hemet South is listed at 90 AF and a notation Indicates this is a partial figure. However the paragraph immediately above the chart indicates "This extraction accounts for all of the groundwater extracted from the basin, not just the extraction by EMWD." If this is true, 90 AF does not appear to be an accurate figure. Please clarify.

Table 3.3 is for the West San Jacinto Groundwater Management Area, which only contains a small portion of the Hemet South Basin. I have added notation to clarify this.

4. Page 25 - Groundwater Pumping Rights

In first and third paragraphs of this section, we question the accuracy of statements concerning "appropriative rights." Please clarify.

The Groundwater pumping rights section has been revised and no longer refers to appropriative rights.

I hope this addresses your concerns. I am attaching a copy of the revised UWMP Section 3 for your information. The entire document including appendices will be available on emwd.org in the coming weeks and of course we will be sending the city a copy of the document as well.

Thank you for your assistance,
Elizabeth Lovsted, P.E.
Facilities Planner/Engineer
Eastern Municipal Water District
951.928.3777 ext. 4307

Comments from Sue Nash

This letter was presented to the Board on December 7,2005

December 7, 2005
Susan Nash
PO Box 253
Nuevo CA 92567
951-928-3698
snash22@earthlink.net

Board of Directors
Eastern Municipal Water District
P.O. Box 8300
Perris CA 92572-8300

Re: Urban Water Management Plan (draft) 2005

The Friends of the Northern San Jacinto Valley, the San Gorgonio Chapter of the Sierra Club, Moreno Valley Group, and the San Bernardino Valley Audubon Society submit these concerns regarding compliance of the 2005 UWMD prepared by EMWD with the California Urban Water Management Plan (Water Code section 10610 et. Seq.)

There was no apparent involvement of diverse social, cultural and economic elements of the population within the service area prior to and during the preparation of the plan. There was one newspaper ad, but we believe the law requires that more than one announcement be placed in the paper as to the time and place of comments and meetings to discuss and adopt the plan. The San Jacinto River Watershed Council (with whom EMWD allegedly cooperated on the recycling plan) was not noticed. Many important documents mentioned were not listed as being in an appendix. Appendix A and D which were mentioned in the text are not in the document. Where are Appendix B and C? Are there any more?

There were two Integrated Regional Water Management Plans mentioned (MWD and Santa Ana) but neither was attached, or even a web page mentioned where one could check them out. Many other documents were mentioned regarding the groundwater management plans and other matters; however, no web page or other information on how the public might read these documents is given.

There is no record of who was contacted and given copies for review or when. Like me, they may not have been told when comments were due and when meetings were to be held, without making phone calls.

The document does not give year by year historical data on how much water has been received from the State Water Project, the Colorado River, from MWD overflow to recharge and from groundwater.

The entire groundwater discussion is extremely difficult to decipher. The management plan for one basin is in a missing appendix, the management plan for the other is simply not there yet, and there is no way to locate all the supporting documents mentioned. Maybe in those documents there is a discussion of the analysis of the groundwater by Dr. Tien C. Lee, University of California, Riverside, CA. It is important that the public know the basis for the groundwater supply projections being made.

The reliability of supply is stated, but not discussed. There is no analysis of how often the supply from MWD has fallen short and by how much. There is no mention (as there was in the California State Water Plan draft) of the impacts of Global Warming causing rising ocean levels and the

permanent flooding of the Bay-Delta levees with saltwater; "peak oil" causing rising energy prices and reducing the affordability of potable water; and the complete lack of northern California Water for many months in the event of a major earthquake in northern California.

Water use by customer type is confusing. The plan seems to first indicate farming is going away, and then it says farming use will stay the same. It is not clear which kind of farming is being discussed—citrus? dairy?

It appears that EMWD does not really want to encourage conservation because it reduces revenue. This is especially true for the reluctance to use conservation measures in case of a complete shut off, such as an earthquake in the Bay Area. The State Water Plan is quite clear that its goal is to provide AFFORDABLE POTABLE water to all Californians and spends a considerable amount of time discussing the high number of Californians without potable water. Over 47% of the residents of the San Jacinto River Watershed live below the poverty level. Instead of demanding that developers use less water, EMWD provides water for sod farmers in the San Jacinto Valley and does not mind that most of the City of Moreno Valley's landscaping water ends up in the streets.

Although desalinization is said to be a reliable source of water, this is contradicted because of the high cost of disposing of the brine water. The elimination of brine is a speculative technology.

The current and projected supply of wholesale water is missing. The contracts with MWD regarding how much water they can supply from each source could not be found. There is apparently no information regarding how much water MWD has promised in the past and failed to deliver. We could find no indication of what the contracts with MWD look like and how they have been fulfilled in the past. This information would have to include the issues of global warming, peak oil and contamination of water.

Most obviously missing is any chart which shows how much water is going to be needed, given the projected growth by SCAG and EMWD's own experts, and how those figures match up with the amount of water MWD is promising to deliver each year. Even if MWD could actually deliver, we could not find any charts or text indicating how demand and supply for the next 20 years match up.

The water shortage contingency plan does not indicate in detail how water is going to be supplied. For instance, if there is an earthquake in the Bay Area, how long will we be without imported water? How much groundwater will have to be shared among how many people? How long will that last? How will industry be affected? And what will happen to food prices when water to agriculture is cut off?

The recycled water plan does not include the documents mentioned, so it is hard to tell what the status actually is.

The water quality impacts on reliability are without any basis. The documents indicate there are serious problems and task forces, but no details about what the extent of the problems are, how much water supply could be reduced and what is or can be done to solve these problems. (see Friends of the Santa Clara River v. Castaic Lake Water Agency, 2004)

There are a lot of charts, but no text on where EMWD's water is coming from and how. These "assurances" of plenty of water are inconsistent with both the State Water Plan (draft) and the Open Space Water Supply element of the Riverside County General Plan. In which case, there are "assurances" with no reliable basis and which do not meet the requirements of the UWMP Act.

In order for the public to read this document with any understanding and to have any assurance that it complies with the UWMP Act and that it can meet the requirements of Senate Bills 610 and

221, it should be organized according to the "Guidebook to Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan (January 18, 2005). The 2005 Urban Water Management Plan "Review for Completeness" Form for DWR Review Staff Use, with all references and page numbers, should be provided to the public. Only in this way can the public have any confidence that EMWD's "rosy" projections of "affordable potable" water for the next twenty years have any basis in fact.

December 19, 2005
Susan Nash
PO Box 253
Nuevo CA 92567
951-928-3698
snash22@earthlink.net

Board of Directors
Eastern Municipal Water District
P.O. Box 8300
Perris CA 92572-8300

Re: Urban Water Management Plan (draft) 2005

The Friends of the Northern San Jacinto Valley, the San Gorgonio Chapter of the Sierra Club, Moreno Valley Group and the San Bernardino Valley Audubon Society submit these additional concerns regarding compliance of the 2005 UWMD prepared by EMWD with the California Urban Water Management Plan (Water Code section 10610 et. Seq.)

After we received a copy of the Metropolitan Water District of Southern California Regional Urban Water Management Plan (2005) and the updated Eastern Municipal Water District Urban Water Management Plan (2055), we still find significant deficiencies in compliance with the Urban Water Management Plan Act in both documents.

Eastern states that it relies on MWD for 80% of its potable water supply. However, an unknown portion of its groundwater supply is based on recharge using surplus MWD water. Eastern states this surplus will be available for 4 out of 5 years, but gives no basis whatsoever for this assertion. (page 12)

Eastern states:
"Based on the information detailed in MWD's RUWMP, EMWD is confident that MWD will provide EMWD with enough non-discounted, non-interrupted water supplies to meet demands through 2030. EMWD's only interruptible supply is discounted agricultural water, which accounts for approximately 4% of the District total supply, and the recharge water used for the San Jacinto Basin. It is anticipated that recharge water may not be available in one out of every five years. If there is a shortage of imported water that cannot be supplemented by local supplies, EMWD will make up the deficiency by implementing the water shortage contingency plan." (p. 35, italics added)

However, EMWD's Water Shortage Contingency Plan states:
"Even under the driest three-year cycle, EMWD supply is anticipated to meet demand. With the groundwater management plans in place, the West San Jacinto area has rising water levels and wells are not anticipated to decrease production, and the Hemet/San Jacinto area will be recharged in years of surplus to prepare or recover from dry years. Since local water supplies are stable and fixed, the small increase in demand during dry years will be met through imported water from MWD. Under the Integrated Resources Plan (IRP) and Water Surplus and Drought Management Plan (WSDM) water, imported by MWD, will be available to meet 100% of member agencies demands, even during dry periods." (p. 64-65, italics added)

Eastern cannot have their cake and eat it too. They cannot say both that if there is a shortage of imported water, they will rely on the water shortage contingency plan; and at the same time have the water shortage contingency plan state that if there is a shortage of local groundwater, they will rely on imported water. This is certainly one of the most significant faults of the EMWDS UWMP!

Eastern refers to MWD's regional planning and allocation of water and refers the reader to Appendix A.1 of the RUWMP. (p. 62) However, when one looks to Appendix A.1, there is no assurance from MWD that the projected demands of MWD for water will be met. There is no indication of how much of Eastern's demands for imported water are also committed as a wholesale provider to subagency water departments, districts or companies: City of Hemet; City of Perris; City of San Jacinto; Lake Hemet; McCann Ranch; Nuevo; Rancho California.

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MWD's Appendix A.1-8 is in fact only a demand forecast. MWD's demand projections do not seem to be consistent with the demand forecast by Eastern. But since MWD is calculating the demand for the entire region and Eastern is looking only to the demand within its service area (excluding its sub agencies?) it is impossible to compare the two sets of figures. However, MWD does state that "demands in Riverside County are expected to increase at the fastest rate (73 percent between 2005 and 2030) (p. A.1-8).

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" The amount of entitlement DWR approves for delivery varies annually with contractor demands and projected water supplies from tributary sources to the Delta, based on snowpack in the Sierra Nevada, reservoir storage, operational constraints, and demands of other water users. Historically, the SWP has been able to meet all contractors' requests for entitlement water except during the drought years of 1977, 1990-92 and 1994." (A.2-13)

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Each source of supply listed by MWD has similar constraints and is therefore unreliable. Notably, MWD does not even mention the reduced storage capacity of Lake Perris due to the recent partial emptying of the lake pending seismic repairs, which may not be feasible.

Existing and Committed Local Projects (Appendix A.5) do not total the amount of water MWD expects to have available for Eastern and other agencies, some amounts are blank, and the totals for operation and construction are likewise not given. It appears from the body of the report that many of MWD's projects to assure water supply reliability are only in the feasibility study stage.

As to future water supplies to Eastern, in MWD's "2005 RUWMP only existing projects and projects with firm contracts for LRP funding were included. The resulting gap between projected local supplies and IRP targets were assigned to the region as a whole as the remaining IRP Local Resource Program target and not be allocated to particular agencies." (II-7).

"For the purpose of analysis, 'foreseeable hydrologic conditions' is understood to mean under 'historical hydrology' which presently covers the range of historical hydrology spanned from 1922 through 2004" (p. II-7) This analysis completely ignores the long discussion of expected increased drought conditions due to global warming elsewhere in the document.

This analysis also ignores the ability of MWD to receive or deliver "affordable" water when energy costs inevitably rise. If the water is not affordable then it is not "available" to the consumer and cannot be counted as a reliable source of water for purposes of UWMP Act compliance.

"At shortage stage 7 Metropolitan will develop a plan to allocate available supply fairly and efficiently to full-service customers. The allocation plan will be based on the Board-adopted principles for allocation. Metropolitan intends to enforce these allocations using rate surcharges." (p. II-17) First, the board adopted principles for allocation are not included, so that Eastern has no basis for determining what it's allocation under shortage stage 7 conditions might be. Second, Eastern has not determined whether the surcharge for all water above its allotment will make water not affordable to which of its customers; without this analysis, Eastern cannot give any assurances of future water supply in its UWMP.

Although Eastern does not discuss this important topic in any way, MWD has a section on Climate Change which indicates that catastrophic impacts on Eastern's imported and local water supplies are likely and unavoidable. (p. II-21 through II-23)

MWD states that "Global climate models predict that by the end of the century, average winter temperatures could increase by more than 7 degrees Fahrenheit and summer temperatures by as much as 18 degrees Fahrenheit." Precipitation predictions range from a slight increase in precipitation to decreases of up to 30 percent. (II-21) MWD does not, however, indicate the predicted temperature increases and precipitation levels for the next 25 years which they are supposed to be studying in their document. The lack of this information is unconscionable as it gives neither the public or Eastern any idea as to possible decreases or increases in available water caused by global warming. As global warming is a "wild card" which is increasing in geometric terms (described as an avalanche which has already begun and is beyond stopping by some climate scientists), no assurances of water supply to southern California, let alone Eastern's, have any validity.

Potential impacts to MWD's and therefore Eastern's water supply include:

- Reduction of Sierra Nevada snowpack
- Increased intensity and frequency of extreme weather events
- Rising sea levels resulting in
- Increased risk of damage from storms, high-tide events and the erosion of levees
- Potential pumping cutbacks on the State Water Project and Central Valley Project
- Effects on local supplies such as groundwater
- Changes in urban and agricultural demand levels and patterns
- Impacts to human health from water-borne pathogens and water quality degradation
- Declines in ecosystem health and function

- Alterations to power generation and pumping regimes

Ultimately, MWD's only long-term solution is its "hope to see improvements in climate change science and modeling techniques and/or technology that will enable us to make sound policy and practical decisions in the future." (p. II-23)

This hope is what we all hope, but it does not meet the requirements of either MWD or Eastern under the UWMP Act and does not justify "assurances" under SB 610 and 221 for water supplies for future development.

Desalinization and recycling are both unreliable sources of potable water and questionable sources for non-potable water and therefore cannot be relied upon in calculating supply and demand for the next 20 years.

Of all the water quality concerns listed by MWD and Eastern (salinity; perchlorate; organic carbon and bromide; methyl tertiary butyl ether and tertiary butanol; arsenic; radon; uranium; NDMA; chromium IV; pharmaceuticals and personal care products) none have an action plan which clearly shows that they will cease to be a problem immediately and therefore that the water supply in the next 20 years will not be comprised in its quality because of these water quality issues.

For instance, Eastern indicates that perchlorate has been detected in three of its wells. (p. 81) There is no indication of the level of perchlorate or its source. Is this a source/plume which is likely to contaminate more wells? Will the level of contamination increase to the level where it cannot be blended? If so, will Eastern be able to afford the costs of treatment?

None of the above questions, and many others which need to be asked and answered, are addressed by either Eastern or MWD.

Neither Eastern's nor MWD's UWMP is consistent with the State Water Plan and the County of Riverside General Plan Multipurpose Open Space Element. The County, reflecting the information found in the California Water Plan and water budgets produced by the California Department of Finance population projections, show that "demand for water will exceed supply in 2020 whether or not a drought conditions exists at that time." (p.OS-7) Because neither UWMP projects a water supply and demand problem, they have failed to prepare for this problem and are giving false assurances to the County regarding available water supply for future development.

For all of the above reasons, Eastern's UWMP does not comply with the UWMP Act and cannot be used for compliance with SB 610 and 221 of 2001.

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Response to Sue Nash

EASTERN MUNICIPAL WATER DISTRICT

SINCE 1950

Board of Directors

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December 22, 2005

Ms. Susan Nash
PO Box 253
Nuevo, CA 92567

Subject: **Urban Water Management Plan for Easter Municipal Water District**

Dear Ms. Nash;

Thank you for your interest in EMWD's Urban Water Management Plan. Enclosed is our initial response to your concerns expressed in the letters you sent on December 7 and December 21, 2005 representing the Friends of the Northern San Jacinto Valley, the San Gorgonio Chapter of the Sierra Club, Moreno Valley Group, and the San Bernardino Valley Audubon Society.

In addition to this response, I would like to set a time to meet with you at your earliest convenience to discuss EMWD's water supply and reliability. EMWD believes it would be of mutual benefit to insure that any concerns you have are not the result of any misunderstanding.

Thank you again, for your interest in the Urban Water Management Plan. Planning for water supply in California is a complex and difficult task and the participation of the public is a valuable component. I look forward to clearing up any concerns you may have.

Sincerely,

Elizabeth Lovsted
Facilities Planner/Engineer
EL:lar

December 7, 2005
Susan Nash
PO Box 253
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snash22@earthlink.net

Board of Directors
Eastern Municipal Water District
P.O. Box 8300
Perris CA 92572-8300

Re: Urban Water Management Plan (draft) 2005

The Friends of the Northern San Jacinto Valley, the San Gorgonio Chapter of the Sierra Club, Moreno Valley Group, and the San Bernardino Valley Audubon Society submit these concerns regarding compliance of the 2005 UWMD prepared by EMWD with the California Urban Water Management Plan (Water Code section 10610 et. Seq.)

There was no apparent involvement of diverse social, cultural and economic elements of the population within the service area prior to and during the preparation of the plan. There was one newspaper ad, but we believe the law requires that more than one announcement be placed in the paper as to the time and place of comments and meetings to discuss and adopt the plan.
The public involvement has been detailed in Appendix A along with both dates the public notice was published.

The San Jacinto River Watershed Council (with whom EMWD allegedly cooperated on the recycling plan) was not noticed. Many important documents mentioned were not listed as being in an appendix. Appendix A and D which were mentioned in the text are not in the document. Where are Appendix B and C? Are there any more?

There were two Integrated Regional Water Management Plans mentioned (MWD and Santa Ana) but neither was attached, or even a web page mentioned where one could check them out. Many other documents were mentioned regarding the groundwater management plans and other matters; however, no web page or other information on how the public might read these documents is given.

There is no record of who was contacted and given copies for review or when. Like me, they may not have been told when comments were due and when meetings were to be held, without making phone calls.

The document does not give year by year historical data on how much water has been received from the State Water Project, the Colorado River, from MWD overflow to recharge and from groundwater.

The entire groundwater discussion is extremely difficult to decipher. The management plan for one basin is in a missing appendix, the management plan for the other is simply not there yet, and there is no way to locate all the supporting documents mentioned. Maybe in those documents there is a discussion of the analysis of the groundwater by Dr. Tien C. Lee, University of California, Riverside, CA. It is important that the public know the basis for the groundwater supply projections being made.

The reliability of supply is stated, but not discussed. There is no analysis of how often the supply from MWD has fallen short and by how much. There is no mention (as there was in the California State Water Plan draft) of the impacts of Global Warming causing rising ocean levels and the permanent flooding of the Bay-Delta levees with saltwater; "peak oil" causing rising energy prices and reducing the affordability of potable water; and the complete lack of northern California Water for many months in the event of a major earthquake in northern California.

Water use by customer type is confusing. The plan seems to first indicate farming is going away, and then it says farming use will stay the same. It is not clear which kind of farming is being discussed—citrus? dairy?

It appears that EMWD does not really want to encourage conservation because it reduces revenue. This is especially true for the reluctance to use conservation measures in case of a complete shut off, such as an earthquake in the Bay Area. The State Water Plan is quite clear that its goal is to provide AFFORDABLE POTABLE water to all Californians and spends a considerable amount of time discussing the high number of Californians without potable water. Over 47% of the residents of the San Jacinto River Watershed live below the poverty level. Instead of demanding that developers use less water, EMWD provides water for sod farmers in the San Jacinto Valley and does not mind that most of the City of Moreno Valley's landscaping water ends up in the streets.

Although desalinization is said to be a reliable source of water, this is contradicted because of the high cost of disposing of the brine water. The elimination of brine is a speculative technology.

The current and projected supply of wholesale water is missing. The contracts with MWD regarding how much water they can supply from each source could not be found. There is apparently no information regarding how much water MWD has promised in the past and failed to deliver. We could find no indication of what the contracts with MWD look like and how they have been fulfilled in the past. This information would have to include the issues of global warming, peak oil and contamination of water.

Most obviously missing is any chart which shows how much water is going to be needed, given the projected growth by SCAG and EMWD's own experts, and how those figures match up with the amount of water MWD is promising to deliver each year. Even if MWD could actually deliver, we could not find any charts or text indicating how demand and supply for the next 20 years match up.

The water shortage contingency plan does not indicate in detail how water is going to be supplied. For instance, if there is an earthquake in the Bay Area, how long will we be without imported water? How much groundwater will have to be shared among how many people? How long will that last? How will industry be affected? And what will happen to food prices when water to agriculture is cut off?

MWD has emergency storage within the region including Diamond Valley Lake within EMWD's service area. If allocations are necessary, they will be made using the WSDM Plan and principles based on needs at the time. The Water Shortage Contingency Plan requires EMWD customers to reduce water use up to 50% in the case of an emergency.

The recycled water plan does not include the documents mentioned, so it is hard to tell what the status actually is.

The water quality impacts on reliability are without any basis. The documents indicate there are serious problems and task forces, but no details about what the extent of the problems are, how much water supply could be reduced and what is or can be done to solve these problems. (see Friends of the Santa Clara River v. Castaic Lake Water Agency, 2004).

There are a lot of charts, but no text on where EMWD's water is coming from and how. These "assurances" of plenty of water are inconsistent with both the State Water Plan (draft) and the Open Space Water Supply element of the Riverside County General Plan. In which case, there are "assurances" with no reliable basis and which do not meet the requirements of the UWMP Act.

In order for the public to read this document with any understanding and to have any assurance that it complies with the UWMP Act and that it can meet the requirements of Senate Bills 610 and 221, it should be organized according to the "Guidebook to Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan (January 18, 2005). The 2005 Urban Water Management Plan "Review for Completeness" Form for DWR Review Staff Use, with all references and page numbers, should be provided to the public. Only in this way can the public have any confidence that EMWD's "rosy" projections of "affordable potable" water for the next twenty years have any basis in fact.

December 19, 2005
Susan Nash
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951-928-3698
snash22@earthlink.net

Board of Directors
Eastern Municipal Water District
P.O. Box 8300
Perris CA 92572-8300

Re: Urban Water Management Plan (draft) 2005

The Friends of the Northern San Jacinto Valley, the San Gorgonio Chapter of the Sierra Club, Moreno Valley Group and the San Bernardino Valley Audubon Society submit these additional concerns regarding compliance of the 2005 UWMD prepared by EMWD with the California Urban Water Management Plan (Water Code section 10610 et. Seq.)

After we received a copy of the Metropolitan Water District of Southern California Regional Urban Water Management Plan (2005) and the updated Eastern Municipal Water District Urban Water Management Plan (2055), we still find significant deficiencies in compliance with the Urban Water Management Plan Act in both documents.

Eastern states that it relies on MWD for 80% of its potable water supply. However, an unknown portion of its groundwater supply is based on recharge using surplus MWD water.
Table 2.1.1 splits the groundwater supply of the Hemet/San Jacinto Basin Area into native and recovery of recharged groundwater. Eastern states this surplus will be available for 4 out of 5 years, but gives no basis whatsoever for this assertion. (page 12)
Surplus water will not be available at a consistent rate. The quantities used in the UWMP are

Eastern states:
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Eastern cannot have their cake and eat it too. They cannot say both that if there is a shortage of imported water, they will rely on the water shortage contingency plan; and at the same time have the water shortage contingency plan state that if there is a shortage of local groundwater, they will rely on imported water. This is certainly one of the most significant faults of the EMWD'S UWMP!

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Ultimately, MWD's only long-term solution is its "hope to see improvements in climate change science and modeling techniques and/or technology that will enable us to make sound policy and practical decisions in the future." (p. II-23)

This hope is what we all hope, but it does not meet the requirements of either MWD or Eastern under the UWMP Act and does not justify "assurances" under SB 610 and 221 for water supplies for future development.

As described in Section 1 of the RUWMP, MWD has prepared the RUWMP in compliance with Water Code Sections 10610 through 10656 of the Urban Water Planning Management Act, using the guidance of DWR. EMWD believes that the RUWMP addresses the demand for and the reliability of water supplies as required by the law. Any concerns you have beyond what is

Desalinization and recycling are both unreliable sources of potable water and questionable sources for non-potable water and therefore cannot be relied upon in calculating supply and demand for the next 20 years.

MWD believes that desalination and water recycling are reliable sources of water supply

Of all the water quality concerns listed by MWD and Eastern (salinity; perchlorate; organic carbon and bromide; methyl tertiary butyl ether and tertiary butanol; arsenic; radon; uranium; NDMA; chromium IV; pharmaceuticals and personal care products) none have an action plan which clearly shows that they will cease to be a problem immediately and therefore that the water supply in the next 20 years will not be comprised in its quality because of these water quality issues.

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[illegible] Air Reserve Base. Positive test values range from 5-11 ug/L. Regulatory agencies [illegible] characterized a perchlorate plume associated with EMWD wells. These wells [illegible] elevated levels of [illegible] and trace levels of [illegible] [illegible] contaminants likely result from past agricultural use of the surrounding properties. The combined output of these wells is approximately [illegible] of EMWD's total water supply. [illegible] from the wells is blended with imported water from MWD Mills Filtration Plant under permit by the State Department of Health Services. Treatment is not required, and monitoring indicates no increase in contaminant levels over time.

None of the above questions, and many others which need to be asked and answered, are addressed by either Eastern or MWD.

Neither Eastern's nor MWD's UWMP is consistent with the State Water Plan and the County of Riverside General Plan Multipurpose Open Space Element. The County, reflecting the information found in the California Water Plan and water budgets produced by the California Department of Finance population projections, show that "demand for water will exceed supply in 2020 whether or not a drought conditions exists at that time." (p.OS-7) Because neither UWMP projects a water supply and demand problem, they have failed to prepare for this problem and are giving false assurances to the County regarding available water supply for future development.

For all of the above reasons, Eastern's UWMP does not comply with the UWMP Act and cannot be used for compliance with SB 610 and 221 of 2001.

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Appendix B - Groundwater Management Plan - West San Jacinto Groundwater Basin

GROUNDWATER MANAGEMENT PLAN
WEST SAN JACINTO GROUNDWATER BASIN

EASTERN MUNICIPAL WATER DISTRICT

JUNE 8, 1995

ADDENDUM

GROUNDWATER MANAGEMENT PLAN
WEST SAN JACINTO GROUNDWATER BASIN
Draft September 1994

MAY 1995

Eastern Municipal Water District

GROUNDWATER MANAGEMENT PLAN
WEST SAN JACINTO GROUNDWATER BASIN
September 1994 Draft

ADDENDUM - May 1995

(~~Strikeout~~ indicates deletion and
underline indicates insertion.)

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Page iii — Last item under Section 7: ~~TRANSFER~~ **EXCHANGE OF AGRICULTURAL AND OTHER NON-POTABLE ~~USERS~~ USES FROM GROUNDWATER TO RECLAIMED WATER.**

Section 1 - Executive Summary

Page 1-1 — 1st ¶, 3rd bullet item: • ~~structural adequacy~~ capacity of the delivery system is limited;

Last ¶, last sentence: One such action that could adversely affect EMWD's local water resources is a claim recently filed by a neighboring water district ~~Orange County Water District,~~ which underscored the urgent need for action by EMWD to protect the water resources within its service area for use by EMWD consumers.

Page 1-3 — 2nd ¶, last line: ... ~~Edgemont Gardens~~ Moreno Valley Mutual Water Company ...

Page 1-4 — 2nd ¶, 2nd and 3rd sentences: Water requirements by these subagencies ~~varies~~ vary depending on development and the availability of local supplies. These entities and public agencies include the Brownlands Mutual Water Company, ~~city~~ City of Perris, ~~Edgemont Gardens~~ Moreno Valley Mutual Water Company and Nuevo Water Company.

Page 1-5 — 2nd ¶: **Local Planning and Regulatory Agencies.** Other local agencies that may have a significant influence on groundwater management include:

Riverside County Flood Control and Water Conservation Agency. This agency plans, constructs and operates flood control and water

conservation facilities in Riverside County. The construction of ... significant impact. This agency issues the following permits:

a. Separate Application for Flood Plain Management (County Ordinance No. 458)

b. Encroachment Permits

Same ¶, last section: ~~Riverside County Health Department.~~ County of Riverside Department of Environmental Health. The County of Riverside Department of Environmental Health will review NPDES and solid waste facility permits and compatibility of well construction policies and well abandonment and destruction programs with County Ordinance No. 682. EMWD fully intends to coordinate with the County when development of well construction policies and development of a well abandonment and destruction program are developed as part of Plan implementation. ~~The Riverside County Health Department will review water supply and wastewater plans that could be embodied in the groundwater management plan.~~

Page 1-6 4th ¶: Groundwater production estimates for 1993 were estimated from annual reports of groundwater production on file at the State Water Resources Control Board and from Southern California Association of Governments (SCAG) ~~SCAG~~ land use.

Page 1-7 1st ¶, add to end of ¶: Non-irrigated, vacant land will accommodate most of the urbanization growth in the area.

Page 1-8 2nd ¶, 12th line: ... such as SWP water, and demineralization.

3rd ¶, 1st line: ... water distribution ~~plan~~ system ...

Page 1-9 1st ¶, 5th line: 3,360 acre-ft/yr of potable water.

Page 1-14 3rd ¶, **Ultimate Plan Description.** The groundwater management plan consists of a series of elements that, when implemented, will achieve the management plan goal stated above within the constraints of this plan. Involuntary groundwater production assessments and groundwater pumping restrictions are not authorized as part of this management plan except as necessary to prevent unauthorized production of water stored by EMWD.

Page 1-15 2nd ¶, **Monitoring of Groundwater Level and Quality**, 3rd sentence: EMWD will measure groundwater levels and quality from select private wells. EMWD's measurements will not interfere with the well owners' use of the wells. EMWD's measurements will be provided to participating well owners free of charge upon request.

3rd ¶, **Development of Well Construction Policies**, last sentence: These policies will be related to water quality and health protection only and will not limit, or suspend, or unreasonably increase the cost of current or future groundwater production by ~~existing groundwater producers~~ private landowners for use within the plan boundary.

Page 1-16 2nd ¶, **Exchange of Agricultural and Other Non-potable Groundwater Production to Municipal Use**, 1st sentence: The intent of this element is to increase the groundwater yield available for municipal use by either ~~retiring~~ voluntary retirement of agricultural and non-potable demands or by voluntarily substituting reclaimed water for groundwater used for agricultural and other non-potable uses.

Page 1-17 Top of page, 4th bullet item: • Administration and Monitoring of Well Construction, Abandonment and Destruction

Page 1-20 2nd ¶, **Financing the Groundwater Management Plan**: The cost of implementing and operating the West San Jacinto Groundwater Basin management plan ~~should~~ shall be borne by municipal water users in the management area... There could be some cost to local groundwater producers if groundwater replenishment is necessary due to groundwater overdraft and groundwater producers choose to participate in the groundwater replenishment program in order to access supplemental water supplies instead of curtailing their own groundwater production or enjoining the groundwater production of others in the affected subbasin. In the event of continued overdraft, an equitable cost sharing plan should be developed to allocate costs among EMWD, other benefitted municipal water suppliers, and participating groundwater producers to correct the overdraft.

Page 1-21 1st ¶, last line: The following tasks will be completed in Phase ~~I~~ 1.

2nd ¶, last 2 sentences under **Phase 2 Refine the Ultimate Groundwater Management Plan**: ... management plan. The complexity and ...

Page 1-22 Last ¶, Schedule and Cost. The cost to complete Phases 1 and 2 is estimated to range between 3 to 5 million dollars. The cost to complete Phase 3 cannot be estimated until the ultimate plan is described at the conclusion of Phase 2. The cost to implement and operate the Groundwater Management Plan is estimated to be between $50 million and $70 Million. Estimates at this time are very rough and they will be refined when the specific projects are identified and designed.

Section 2 - Introduction

Page 2-1 — 1st ¶, 3rd bullet item: • ~~structural adequacy~~ capacity of the delivery system is limited;

Last ¶, last sentence: One such action that could adversely affect EMWD's local water resources is a claim recently filed by a neighboring water district ~~Orange County Water District,~~ which underscored the urgent need for action by EMWD to protect the water resources within its service area for use by EMWD consumers.

Page 2-4 — 2nd ¶ under **Approach to Development of Groundwater Management Plan**, second sentence: These goals can be modified during the plan development process within the constraints of this plan. These goals will determine the magnitude of the plan, beneficiaries of the plan, and will guide the technical work that shapes the plan. Involuntary groundwater production assessments and groundwater pumping restrictions are not authorized as part of this management plan except as necessary to prevent unauthorized production of water stored by EMWD.

Page 2-5 — Mid-page, 3rd bullet item: ... plan goals; ~~and~~

Page 2-6 — Last ¶, last line: ~~Dr.~~ Mr. P. Ravishanker.

Section 3 - Existing Water Resources Framework

Page 3-2 — 2nd ¶, 5th line: ... ~~Edgemont Gardens~~ Moreno Valley Mutual Water Company, ...

5th ¶, 1st line: ~~Edgemont Gardens~~ Moreno Valley Mutual Water Company.

Page 3-3 — Substitute section titled "**Colorado River Water**" with the following:
MWD has water delivery contracts for Colorado River water with the U.S. Department of the Interior for 1.212 million acre-feet per year (MAF/Y) and an additional 180,000 acre-feet per year (AF/Y) of surplus water. The capacity of MWD's Colorado River Aqueduct is 1,800 cubic feet per second or 1.3 MAF/Y. However, as a result of the 1964 U.S. Supreme Court decree in Arizona v. California, MWD's dependable supply of Colorado River water was reduced to less than 550,000 AF/Y. This reduction in dependable supply occurred with the commencement of Colorado River deliveries by the Central Arizona Project.
MWD has a priority to divert 550,000 AF/Y of California's 4.4 MAF/Y basic apportionment under its water delivery contract with the Secretary of the

Interior. In addition, MWD has entered into agreements with other agencies serving Colorado River Water for agricultural purposes in the California desert to increase its dependable supplies. Water use by holders of present perfected rights (Indian reservations, towns, and other individuals along the Colorado River that predate MWD's rights) is estimated to reduce dependable diversions by about 30,000 AF/Y. Conveyance losses along the Colorado River Aqueduct of 10,000 AF/Y further reduce the amount of Colorado River water received in the coastal plain. MWD's dependable Colorado River supplies are projected to total 626,000 acre-feet upon completion of a cooperative water conservation program with Imperial Irrigation District.

Based on an annual determination, the Secretary of the Interior has allowed MWD in recent years to divert Colorado River water apportioned to, but unused, by Arizona and Nevada. Arizona and Nevada are not expected to use their full apportionments until the years 2036 and 2005, respectively. MWD is pursuing several projects to increase the reliability of its Colorado River supplies.

Page 3-4 Substitute the section titled **"State Project Water"** with the following:

SWP water comes from Northern California, is transported through the Sacramento-San Joaquin Delta, and is delivered to MWD through the California Aqueduct. MWD, one of 29 agencies that have contracted with the State for SWP supplies, holds a contract for entitlement to 2.01 MAF/Y, or nearly half of the total contracted entitlement of 4.23 MAF/Y. Initial SWP facilities completed in the early 1970s have produced yields adequate to meet just over half of the total contracted entitlement on a dependable basis. While it was intended that addition SWP facilities would be constructed to meet contractor demands as they increased, this has not occurred. In addition, constraints placed on SWP operations in the Delta under State and federal Endangered Species acts have reduced available SWP supplies. However, the December 1994 consensus agreement on interim standards for Delta flows and water quality brings more certainty to SWP supply availability during the next three years, and is the foundation for immediate initiation of a process for identifying a long-term solution to water supply and fishery problems in the Delta. In the future, if additional facilities are not completed, availability of water from the SWP is expected to decrease due to increased use of water in Northern California, and increasing allocations of water for environmental needs in the Bay-Delta.

Page 3-9 1st ¶, 3rd line: The proposed regulations are included in Appendix A-2 ~~A-1~~.

Page 3-10 4th ¶, 1st line: A summary of existing and proposed water quality standards is presented in Appendix A-3 ~~A-2~~.

Last ¶, 1st section: **Riverside County Flood Control and Water Conservation Agency.** This agency ... Riverside County. The construction of ... significant impact. This agency issues the following permits:

a. Separate Application for Flood Plain Management (County Ordinance No. 458)

b. Encroachment Permits

Last ¶, last section: ~~Riverside County Health Department.~~ County of Riverside Department of Environmental Health. The County of Riverside Department of Environmental Health will review NPDES and solid waste facility permits and compatibility of well construction policies and well abandonment and destruction programs with County Ordinance No. 682. EMWD fully intends to coordinate with the Department when development of well construction policies and development of a well abandonment and destruction program are developed as part of Plan implementation. ~~The Riverside County Health Department will review water supply and wastewater plans that could be embodied in the groundwater management plan.~~

Section 4 - Groundwater Resources in the West San Jacinto Basin

Page 4-5 — 1st ¶, insert after 1st sentence: ... on the north. The San Jacinto River flows through this subbasin include tributary flows from Potrero Creek and Laborde Canyon.

2nd ¶, 3rd line: San Jacinto ~~Creek~~ River

Table 4-2 — 10th line of data is a duplicate: ~~0 0 0 0 800 1,200 2,000~~

Page 4-9 — 5th ¶: The total outflow in the basin, from all sources, ranges from a low of zero ~~1,300~~ acre-ft/yr from the Menifee ~~San Jacinto Lower Pressure~~ subbasin, to a high of 4,000 ~~4,600~~ acre-ft/yr for the Lakeview ~~Menifee~~ subbasin. The total outflow for the management area is about 10,200 ~~14,800~~ acre-ft/yr.

Page 4-10 — 3rd ¶, 5th line: San Jacinto ~~Creek~~ River

Page 4-14 — 2nd ¶, 1st sentence: The principle sources of groundwater in this basin are underflow from the San Jacinto Lower Pressure, Perris South I, Perris South II subbasins, storm flow percolation in the San Jacinto River ~~Creek~~ which includes flow from Potrero Creek and Laborde Canyon tributaries, and runoff from the Lakeview Mountains and Bernasconi Hills.

2nd ¶, insert: Most of the groundwater in the basin is sodium chloride in character. Potentially contaminated surface water flows from Potrero Creek and Laborde Canyon may impact groundwater quality in the basin. The Casa Loma fault ...

Page 4-16 1st ¶, last sentence under **Future Groundwater Quality**: ... These estimates, however, are based on a model that:

- has not been calibrated for TDS or nitrate;
- has each subbasin ~~is~~ represented by only one node and thus the resolution of the analysis is crude; and
- has future water supply and wastewater plans ~~that were~~ used in these studies that are not representative of ~~the~~ future plans.

Last ¶, last sentence: The planning tool would consist of groundwater flow and simulation models similar to those models ~~that were~~ developed and ~~that are~~ in current use in other basins. ~~to develop the Chino Basin Water Resources Management Plan (Montgomery Watson & Wildermuth, Mark J., 1992; Montgomery Watson & Wildermuth, Mark J., 1993).~~

Section 5 - Future Water Supply and Wastewater Flows

Page 5-1 1st ¶, Reclamation Plant List: ~~Temescal~~ Temecula Valley

1st ¶, add following last sentence: Non-irrigated, vacant land will accommodate most of the urbanization growth in the area.

Last ¶, 1st line: seasonal discount are~~:~~ to: achieve ...

Page 5-5 2nd ¶, 2nd sentence: ~~All agricultural demands would be satisfied with reclaimed water by the year 2010.~~

Section 6 - Groundwater Management Goals

Page 6-1 3rd ¶, 2nd sentence: Much of the r~~R~~emaining agricultural water demand will be converted to reclaimed water.

Page 6-2 2nd sentence: The negative impacts, if any, of a groundwater management plan on these users must be minimized; and the ability of these groundwater producers to continue producing groundwater for beneficial use must be preserved ~~or equitably replaced~~.

Section 7 - Elements of Groundwater Management Plan

Page 7-2 — 2nd ¶, 2nd sentence: The monitoring of groundwater quality includes the collection and review of groundwater quality data that can be used to assess current and future trends in groundwater quality, and to evaluate groundwater quality response to groundwater management activities and climate. EMWD's monitoring activities will not interfere with the well owners' use of the wells. EMWD's monitoring data will be provided to participating well owners free of charge upon request.

Page 7-3 — Insert new ¶ following 3rd bullet item: EMWD will coordinate with the County of Riverside Department of Environmental Health when development of well construction policies and development of a well abandonment and destruction program are developed as part of the Groundwater Management Plan implementation.

Page 7-8 — 3rd ¶, last sentence: ... Reclaimed water can be recharged in the San Jacinto Lower Pressure, Menifee and Winchester subbasins by injection. Recharge of reclaimed water will be implemented in a manner that avoids adverse impacts to construction, operation and use of wells by private landowners. Where reclaimed water recharge interferes with such construction, operation, or use of a well, suitable arrangements will by made for EMWD to provide alternative water supplies to meet both the short-term and long-term needs of the impacted landowner, or for EMWD to provide monetary compensation for the interference caused by EMWD's reclaimed water recharge activities.

Page 7-9 — Last bullet item: Water harvesting in the Lakeview subbasin. Storm water captured in ~~EMWD's~~ Mystic Lake ~~project~~ could be ~~captured and~~ conveyed to test recharge basins in the Lakeview subbasin.

1st ¶ under **Recovery of Contaminated Groundwater**: ... Other treatment technologies may be required if water quality conditions change or new types of contamination are discovered.
Recovery of contaminated groundwater will be implemented in a manner that avoids adverse impacts to construction, operation and use of wells by private landowners. Where groundwater recovery activities interfere with such construction, operation or use of a well, suitable arrangements will be made for EMWD to provide alternative water supplies to meet both the short-term and long-term needs of the impacted landowner, or for EMWD to provide monetary compensation for the interference caused by EMWD's groundwater recovery activities.

Page 7-14 3rd ¶: ... Limited conjunctive use in these subbasins could be done in conjunction with groundwater treatment.
Conjunctive use activities will be implemented in a manner that avoids adverse impacts to construction, operation and use of wells by private landowners. Where conjunctive use activities interfere with such construction, operation, or use of a well, suitable arrangements will be made for EMWD to provide alternative water supplies to meet both the short-term and long-term needs of the impacted landowner, or for EMWD to provide monetary compensation for the interference caused by EMWD's conjunctive use activities.

Page 7-15 2nd ¶, **EXCHANGE OF AGRICULTURAL AND OTHER NON-POTABLE ~~USERS~~ USES FROM GROUNDWATER TO RECLAIMED WATER.** The exchange of agricultural and other non-potable groundwater production to municipal uses can occur through

- Voluntary retirement of agricultural lands, that is, the conversion of agricultural lands to non-agricultural uses; and
- by voluntarily substituting other supplies such as reclaimed water.

Section 8 - Groundwater Management Plan

Page 8-3 4th ¶, 3rd line: ... ~~city~~ City of Perris ...

4th ¶, 4th line: ... ~~Edgemont Gardens~~ Moreno Valley Mutual Water Company, ...

2nd ¶, **ULTIMATE PLAN DESCRIPTION**, 1st sentence: The groundwater management plan consists of a series of elements that, when implemented, will achieve the management plan goal stated above within the constraints of this plan: Involuntary groundwater production assessments and groundwater pumping restrictions are not authorized as part of this management plan except as necessary to prevent unauthorized production of water stored by EMWD.

Page 8-4 2nd ¶, **Monitoring of Groundwater Level and Quality**, beginning with 3rd sentence: EMWD will measure groundwater levels and quality from select private wells. EMWD's measurements will not interfere with the well owners' use of the wells. EMWD's measurements will be provided to participating well owners free of charge upon request.

3rd ¶, 2nd line: ... Riverside County ~~Health Department~~ Department of Environmental Health ...

Last ¶, 2nd line: ... Riverside County ~~Health Department~~ Department of Environmental Health ...

Last ¶, last sentence: These policies will be related to water quality and health protection only and will not limit, or suspend, or unreasonably increase the cost of current or future groundwater production by ~~existing groundwater producers~~ private landowners for use within the plan boundary.

Page 8-5 1st ¶, 5th line: ... Riverside County ~~Health Department~~ Department of Environmental Health ... (Riverside Co. Dept. Environmental Health)

3rd ¶, **Exchange of Agricultural and Other Non-Potable Groundwater Production to Municipal Use**, 1st sentence: The intent of this element is to increase the groundwater yield available for municipal use by either ~~retiring~~ voluntary retirement of agricultural and non-potable demands or by voluntarily substituting reclaimed water for groundwater used for agricultural and other non-potable uses.

Page 8-11/12 2nd ¶ of **Financing the Groundwater Management Plan**: The cost of implementing and operating the West San Jacinto Groundwater Basin management plan ~~should~~ shall be borne by municipal water users in the management area... There could be some cost to local groundwater producers if groundwater replenishment is necessary due to groundwater overdraft and groundwater producers choose to participate in the groundwater replenishment program in order to access supplemental water supplies instead of curtailing their own groundwater production or enjoining the groundwater production of others in the affected subbasin. In the event of continued overdraft, an equitable cost sharing plan should be developed to allocate costs among EMWD, other benefitted municipal water suppliers, and participating groundwater producers to correct the overdraft.

Page 8-12 3rd ¶: The benefits and costs associated with the groundwater management plan should be accounted for locally, that is, by subbasin or some other geographic unit, to insure the benefits and costs are equitably distributed among municipal water users and other voluntary participants.

Page 8-15 2nd ¶, 3rd line: Prepare Project Specific Environmental ~~Impact Report~~ Reviews.

3rd ¶: **Task 2-2 Prepare Project Specific Environmental** ~~Impact Reports (EIR)~~ **Reviews**. ~~EIR's will be prepared~~ CEQA reviews will be performed for the implementation of specific groundwater management ~~elements~~ projects that are developed in Phase 1. This Task consists of the following subtasks.

~~Prepare and Distribute Notice of Preparation (NOP). The NOP will be prepared based on the results of initial environmental study prepared in Task 1-5 and the facility and operational plans developed in Task 2-1. The final scope of work for the EIR studies will be based on the NOP and comments received on the NOP.~~

Initial Study. CEQA reviews will be done on each project proposed under the Groundwater Management Plan. An Initial Study will be done such that the need for either a Negative Declaration or an EIR can be determined, based on project-specific design parameters and project site characteristics.

Estimate Environmental Impacts and Develop Mitigation Plans. This work ~~will~~ could include: biological assessments, archaeological assessments, impact assessments and development of mitigation plans as needed on a project-specific basis.

Page 8-16 3rd line: Prepare and Distribute ~~Draft EIR(s)~~ CEQA Documents and Notices.

4th line: ~~Conduct Meetings, Public Hearings and Respond to Comments.~~

5th line: ~~Finalize EIR(s).~~

Page 8-19 Last ¶: The cost to complete Phases 1 and 2 is estimated to range between 2 to 3 million dollars. The cost to complete Phase 3 cannot be estimated until the ultimate plan is described at the conclusion of Phase 2. The cost to implement and operate the Groundwater Management Plan is estimated to be between $50 million and $70 million. Estimates at this time are very rough and they will be refined when the specific projects are identified and designed.

References

~~Montgomery Watson, Wildermuth, Mark J., "Final Task 4 Memorandum, New Planning Model Implementation Plan", prepared for Santa Anna Watershed Project Authority, May 1992~~

~~Montgomery Watson, Wildermuth Mark J., "Draft task 6 Memorandum, Develop Three Dimensional Groundwater Model, prepared for Santa Anna Watershed Project Authority, November 1993~~

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DRAFT
GROUNDWATER MANAGEMENT PLAN
WEST SAN JACINTO GROUNDWATER BASIN

Prepared for

EASTERN MUNICIPAL WATER DISTRICT

SEPTEMBER 1994

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SECTION 1

SECTION 1
EXECUTIVE SUMMARY

THE NEED FOR GROUNDWATER MANAGEMENT

EMWD, together with the majority of water purveyors in Southern California, have been heavily relying on imported supplies from Metropolitan Water District of Southern California (Metropolitan). Recently, Metropolitan's ability to supply the ever-growing needs of Southern California has become increasingly unreliable due to the following reasons:

- demand for water is continuing to increase;
- environmental constraints at the point of origin may limit the water available for export;
- structural adequacy of the delivery system is limited;
- climatological uncertainties can limit delivery; and
- inadequate local storage facilities.

EMWD could purchase imported water from Metropolitan to meet these projected municipal demands. Metropolitan's sources, however, are not reliable and will be very expensive in the future. Metropolitan, with its current planning and future projects, will experience shortages in four of five years, with shortages reaching as high as 30 percent. The cost of imported water from Metropolitan is currently (July 1994) $412 per acre-ft for treated water and is projected to reach about $1,100 per acre-ft by 2010. These rising costs and lack of water to meet all of the demands has encouraged some local agencies in Southern California to claim water rights in the service areas of other agencies. One such action that could adversely affect EMWD's local water resources is a claim recently filed by Orange County Water District, which underscores the urgent need for action by EMWD to protect the water resources within its service area for use by EMWD consumers.

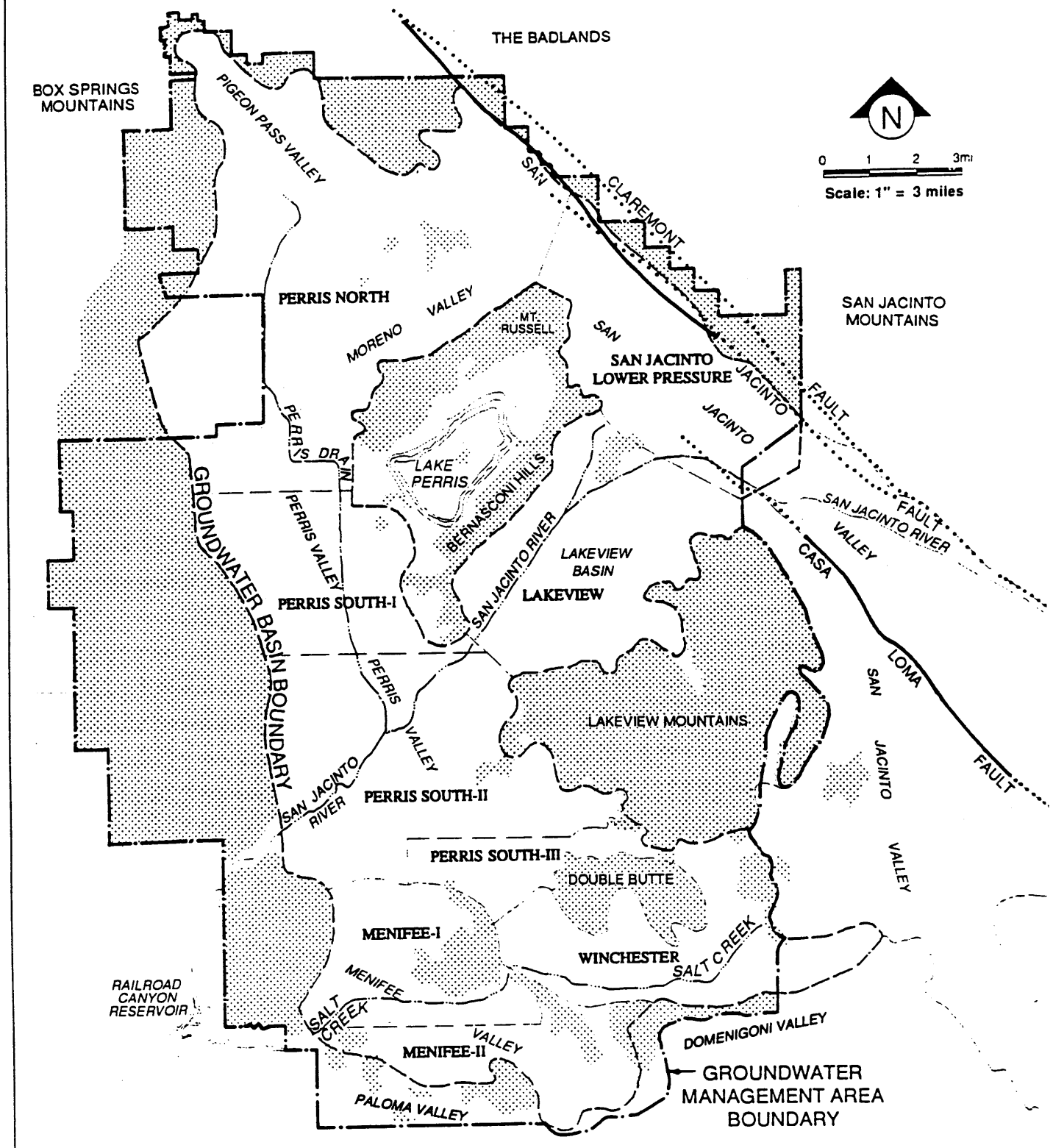
The West San Jacinto Groundwater Basin underlies a large portion of the Eastern Municipal Water District (EMWD). The West San Jacinto Groundwater Basin includes the Perris North, Perris South, Menifee, Winchester, Lakeview and the San Jacinto Lower Pressure subbasins. The location of these subbasins is shown in Figure 1-1. This area is experiencing rapid land use conversion from agriculture to urban uses. Total municipal water demands are expected to increase from 47,000 acre-ft/yr in 1995, to 112,000 acre-ft/yr in 2010.

Three sources of water supply for these demands can be considered: groundwater, imported water and reclaimed water. Groundwater in the West San Jacinto Groundwater Basin, for the most part, is of poor quality due to natural causes and irrigated agriculture. Most of the groundwater resources cannot be used as municipal supply due to poor quality - the groundwater quality either violates drinking water standards or is too high in total dissolved solids (TDS) or other water quality constituents to be discharged after municipal use. To meet increasing demands, EMWD could purchase imported water from Metropolitan. However, availability and costs might limit this alternative. EMWD has reclaimed water resources that could be used to meet agricultural demands and non-potable municipal demands. Reclaimed water cannot be directly used for potable demand unless, after groundwater recharge and dilution, it meets Title 22 requirements (State Department of Health Services Reclaimed Water Regulations). Additionally, groundwater treatment practices can convert non-potable water supplies to potable supplies.

The availability and reliability of the total water supply can be improved through the joint, optimized (conjunctive) management of all the water supply sources. It is the intent of Assembly Bill AB 3030, which was incorporated into the Water Code in 1992 (Part 2.75 commencing with Section 10750 of Division 6) with amendments by AB 1152 of 1993, to encourage local agencies to work cooperatively to manage groundwater resources within their jurisdictions. Authorization to adopt and implement a plan is contained in the following section of AB 3030:

> "§10753 (a) Any local agency, whose service area includes a groundwater basin, or a portion of a groundwater basin, that is not subject to groundwater management pursuant to other provisions of law or a court order, judgment, or decree, may, by ordinance, or by resolution if the local agency is not authorized to act by ordinance, adopt and implement a groundwater management plan pursuant to this part within all or a portion of its service area."

The components of a groundwater management plan may include the following:



LEGEND:

- NONWATER-BEARING PORTION
- KNOWN FAULTS
- INFERRED OR CONCEALED FAULTS

Figure 1-1
LOCATION MAP

REFERENCE: DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1977.

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"§10753.7 (a) The control of saline water intrusion.
(b) Identification and management of wellhead protection areas and recharge areas.
(c) Regulation of the migration of contaminated groundwater.
(d) The administration of a well abandonment and well destruction program.
(e) Mitigation of conditions of overdraft.
(f) Replenishment of groundwater extracted by water producers.
(g) Monitoring of groundwater levels and storage.
(h) Facilitating conjunctive use operations.
(i) Identification of well construction policies.
(j) The construction and operation by the local agency of groundwater contamination cleanup, recharge, storage, conservation, water recycling, and extraction projects.
(k) The development of relationships with state and federal regulatory agencies.
(l) The review of land use plans and coordination with land use planning agencies to assess activities which create a reasonable risk of groundwater contamination."

EMWD's Board of Directors adopted resolution No. 3039 to develop a Groundwater Management Plan for the West San Jacinto Groundwater Basin and published a Notice of Intent on August 25, 1993. The groundwater management plan for the West San Jacinto Groundwater Basin is being developed under the authority of Assembly Bill 3030 (AB 3030), which allows a local water agency to take the lead in development of a plan. Up to two years can be taken for development of a plan. Local water purveyors, both public and private, have been involved in development of the plan. There are approximately forty-five (45) pumpers in the area. Public meetings, workshops and hearings were held during the preparation of the draft plan. Cooperative agreements with EMWD have already been signed by Nuevo Water Company, Edgemont Gardens Mutual Water District and the City of Perris.

EXISTING WATER RESOURCES FRAMEWORK

Eastern Municipal Water District

EMWD encompasses over 540 square miles in the western portion of Riverside County as shown on Figure 1-2. It is bounded on the west by Western Municipal Water District, on the north by mountains which approximately parallel the San Bernardino County boundary, on the east by the San Jacinto Mountains, and on the south by mountains which parallel the San Diego County line. Only about half of the area within EMWD's boundary receives water service at this time. EMWD is the only wastewater treatment entity in the West San Jacinto groundwater management area.

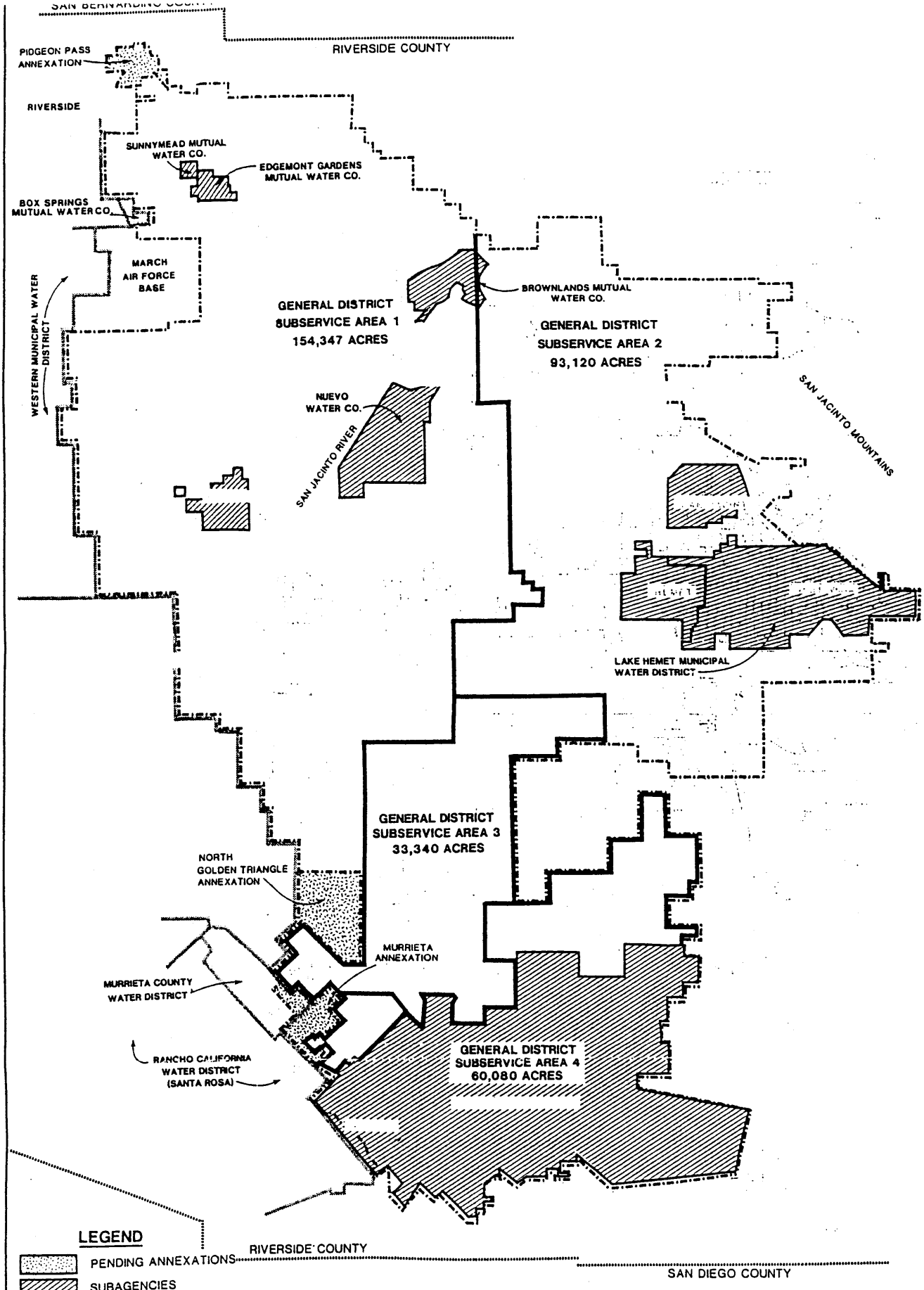


FIGURE 1-2
DISTRICT BOUNDARY MAP
EASTERN MUNICIPAL WATER DISTRICT

SOURCE: VOL II, EMWD WATER FACILITIES MASTER PLAN; BLACK & VEATCH, JMM; OCT, 1990

EMWD has divided its service area into four subservice areas for the distribution of water as shown on Figure 1-2. The boundary of the groundwater management area is approximately the same as EMWD Service Area 41, which is supplied by Metropolitan's Mills and Skinner treatment plants. The management area includes the cities of Moreno Valley and Perris, and the unincorporated areas in western Riverside County such as the communities of Lakeview, Nuevo, Sun City and Winchester.

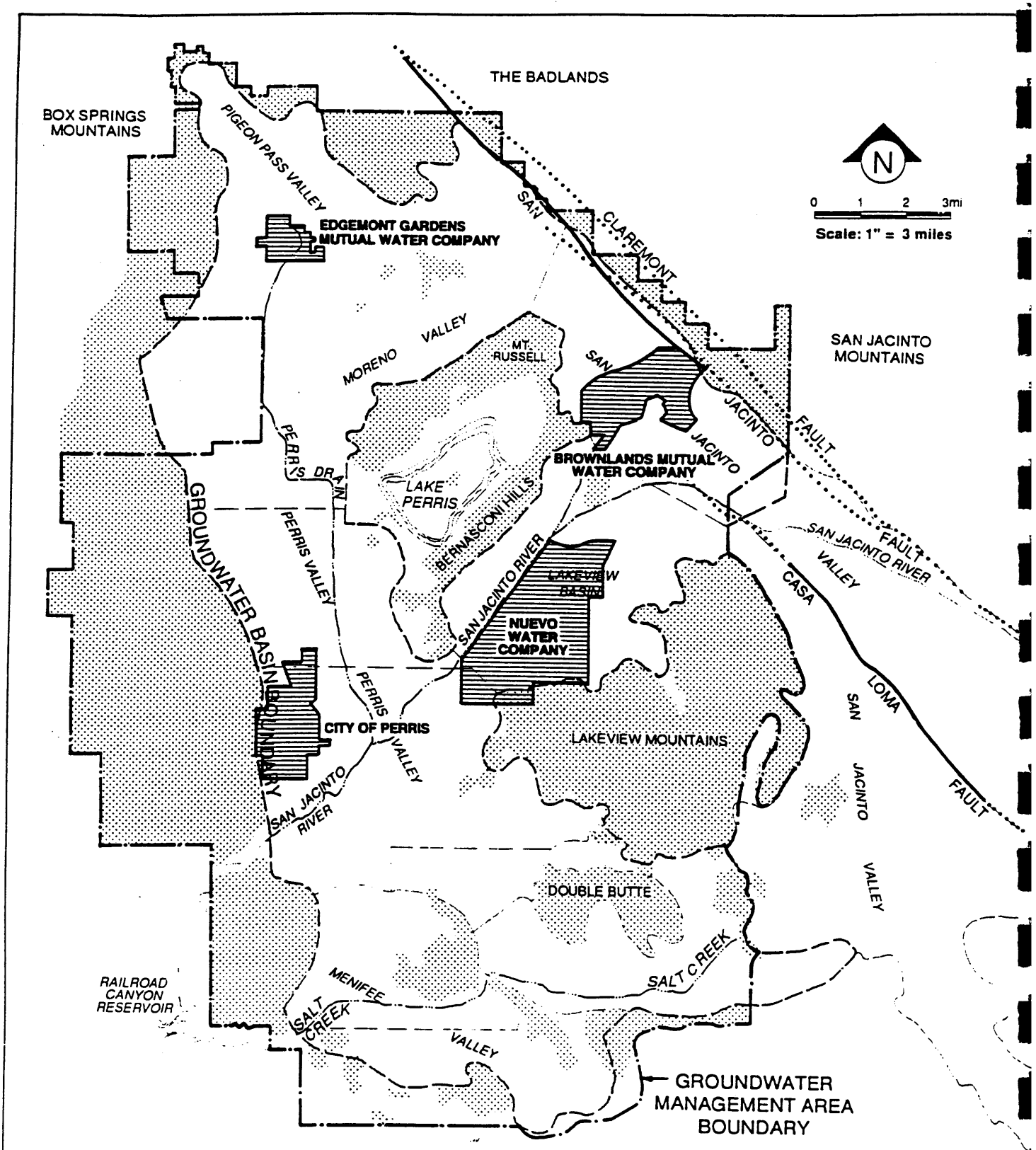
EMWD has agreed to supply water on a wholesale basis to eight public entities and companies, four of which are in the West San Jacinto Groundwater Management area. Water requirements by these subagencies varies depending on development and the availability of local supplies. These entities and public agencies include the Brownlands Mutual Water Company, city of Perris, Edgemont Gardens Mutual Water Company and Nuevo Water Company. The location of these entities within the West San Jacinto Groundwater Management area are shown in Figure 1-3.

Metropolitan Water District of Southern California

Metropolitan Water District of Southern California (Metropolitan) is a wholesale water agency serving supplemental imported water to 27 member cities and water agencies in portions of Los Angeles, Orange, Riverside, San Bernardino, San Diego and Ventura counties. This service area has a current population of about 15 million people. Approximately one-half of the total water used throughout the entire Metropolitan service area is imported water purchased from Metropolitan to supplement the local water supplies of the study area. Metropolitan obtains imported supplies from the Colorado River and the State Water Project (SWP). Figure 1-4 shows the locations of Metropolitan's, state and EMWD imported water facilities.

Regulation of Wastewater

The West San Jacinto Groundwater Management plan will be influenced by the plans and policies of the Federal Environmental Protection Agency, State Water Resources Control Board, California Regional Water Quality Control Board, Santa Ana Region as well as the state and local health departments.



LEGEND:

NONWATER-BEARING PORTION

KNOWN FAULTS

INFERRED OR CONCEALED FAULTS

Figure 1-3
SUBAGENCIES

REFERENCE: VOL. II, EMWD WATER FACILITIES MASTER PLAN; BLACK & VEATCH, JMM; OCT, 1990.

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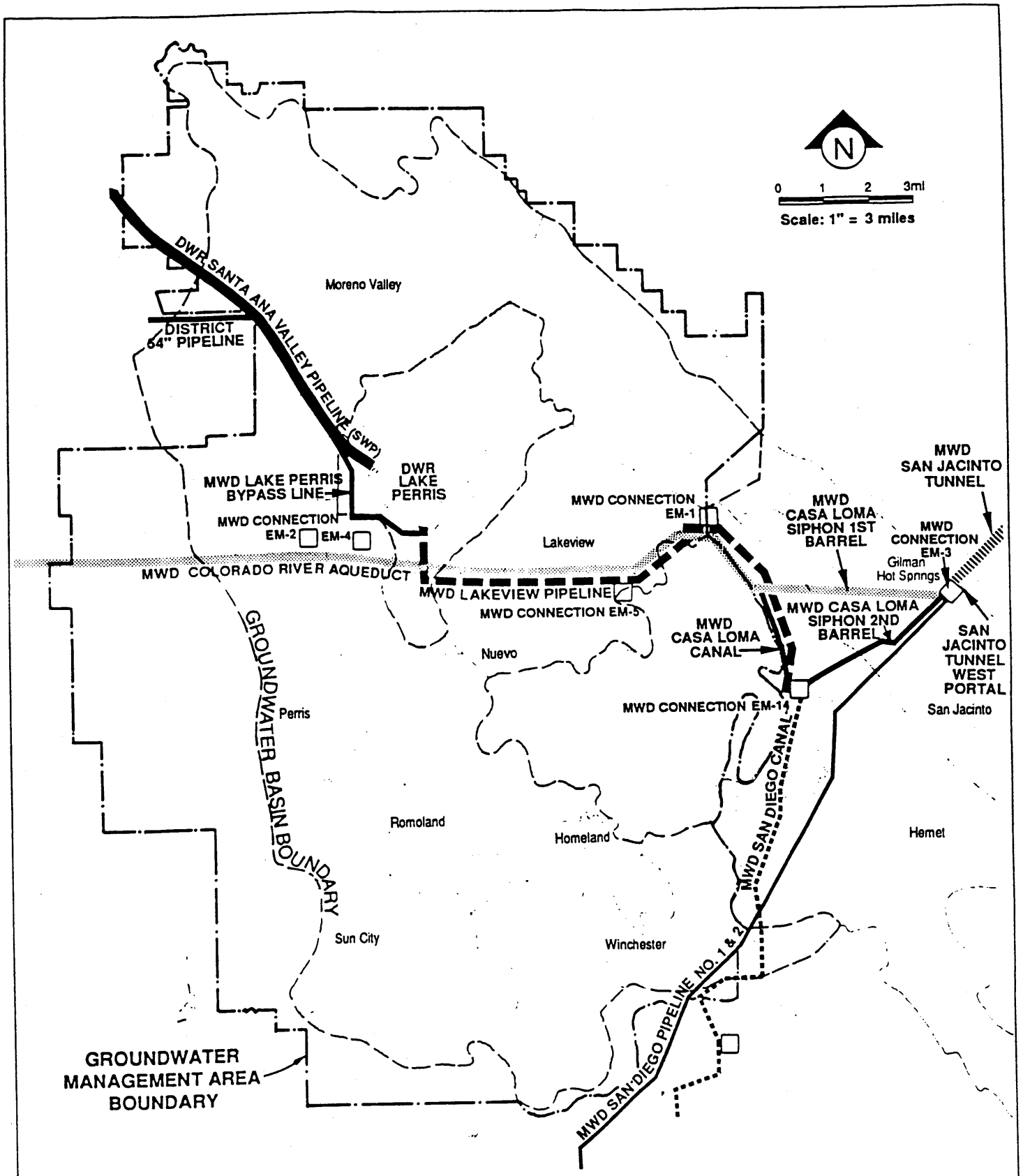

Figure 1-4
IMPORTED WATER FACILITIES

REFERENCE: EMWD WATER FACILITIES MASTER PLAN, *FIG. 4-3: SOURCES OF SUPPLY MAP*, OCTOBER, 1990.

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Regulation of Drinking Water

Drinking water quality standards are enforced in California by California Department of Health Services (DHS). Groundwater developed in the groundwater management plan for municipal uses must satisfy the standards described in Title 22 of California Code of Regulations.

Local Planning and Regulatory Agencies

Other local agencies that may have a significant influence on groundwater management include:

Riverside County Flood Control and Water Conservation District. This agency plans, constructs and operates flood control and water conservation facilities in Riverside County. The construction of flood control and water conservation facilities affects the volume of recharge to groundwater and thus, has a potentially significant impact.

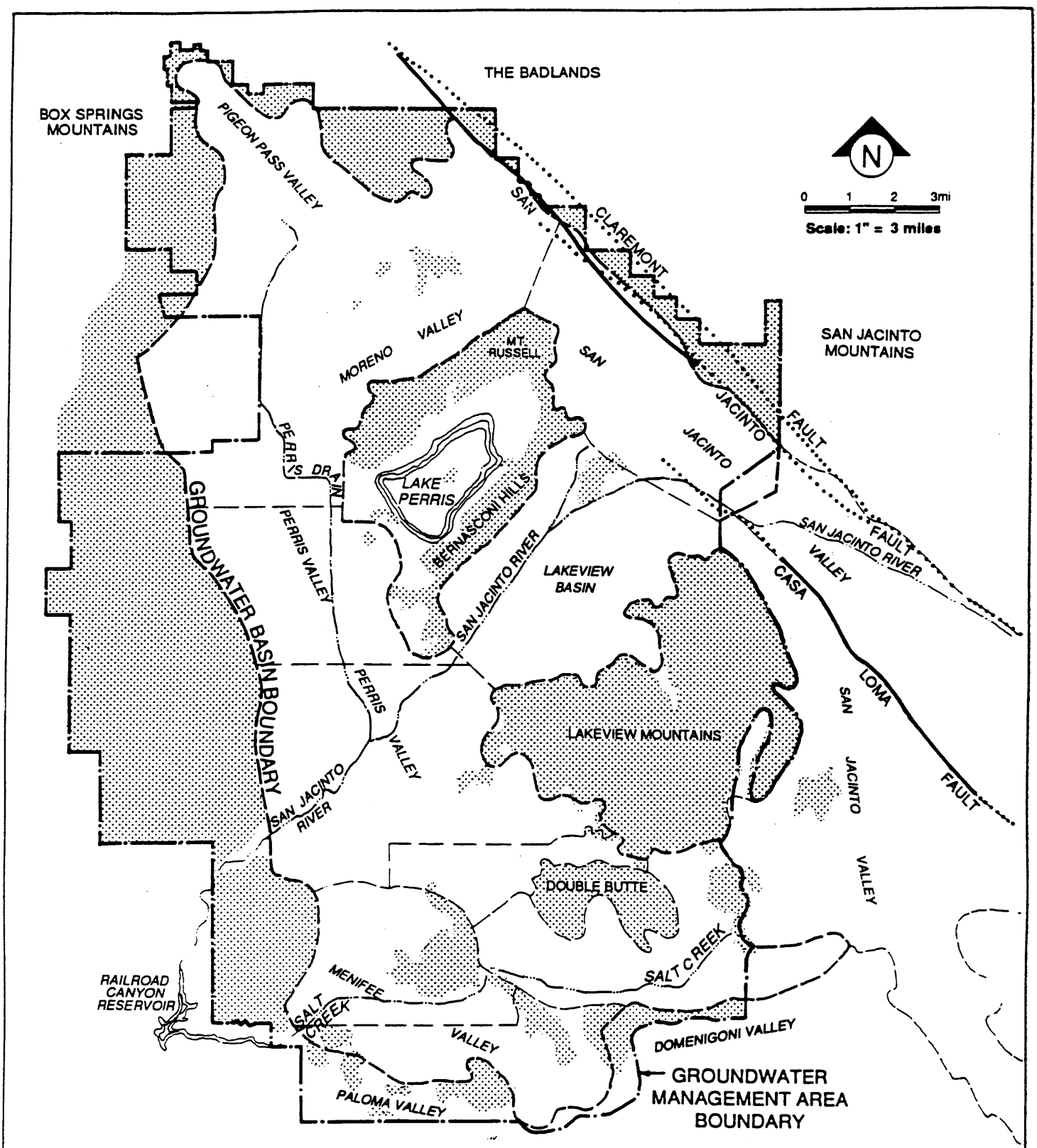
Riverside County Planning Department. Riverside County Planning Department develops and reviews general plans for all unincorporated areas in the county. Thus, this agency will review the groundwater management plan for consistency with general plans under their jurisdiction.

Riverside County Health Department. The Riverside County Health Department will review water supply and wastewater plans that could be embodied in the groundwater management plan.

GROUNDWATER RESOURCES IN THE WEST SAN JACINTO BASIN

Figure 1-5 shows the major physical features, waterbearing and non-waterbearing areas of the groundwater management area. The major physical features in the study area include the San Jacinto mountains, the Badlands, the San Jacinto River, Salt Creek, Perris Valley Drain, the San Jacinto and Casa Loma faults, the Lakeview mountains, the Bernasconi Hills, and Double Butte. The management area groundwater basins are shown in Figure 1-6 and include Perris South I, II and III, Menifee I and II, Lakeview, the San Jacinto Lower-Pressure and portions of Perris North and Winchester subbasins.

The safe yield, volume of groundwater in storage, storage capacity, and water quality characteristics in the subbasins are summarized in Table 1-1. The safe yield of the individual subbasins ranges from about 1,600 for the Winchester subbasin to about 13,700 acre-ft/yr for the Perris North subbasin. The total safe yield of the West San Jacinto Groundwater Basin is about 36,200 acre-ft/yr. The safe yield increases if the volume of other planned groundwater recharge



LEGEND:

NONWATER-BEARING PORTION

KNOWN FAULTS

INFERRED OR CONCEALED FAULTS

Figure 1-5

MAJOR PHYSICAL FEATURES

REFERENCE: DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1977.

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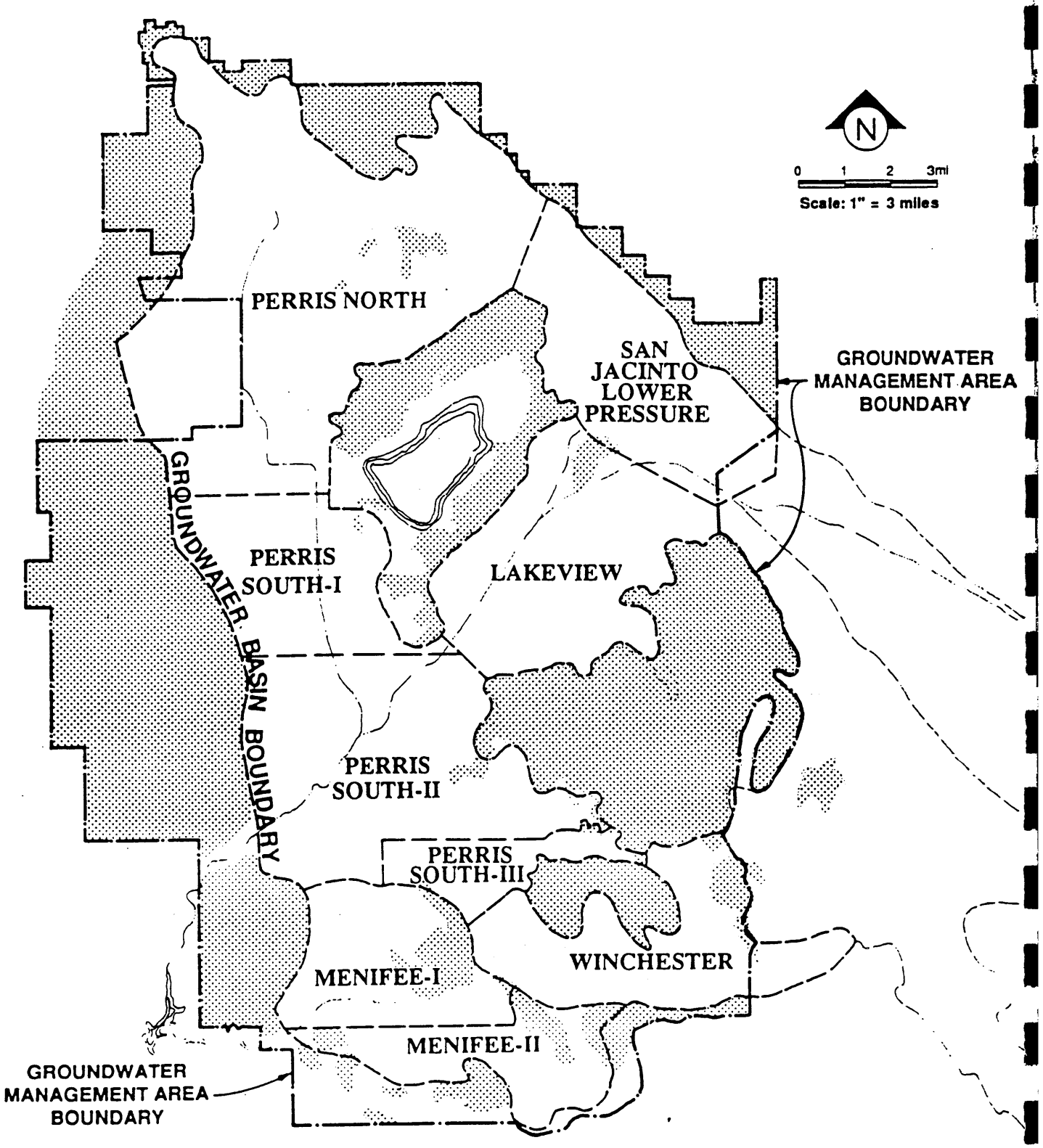

Figure 1-6
GROUNDWATER SUBBASINS

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TABLE 1-1
AVAILABILITY OF GROUNDWATER IN THE WEST SAN JACINTO BASIN

Subbasin	Volume in Storage (acre-ft)	Storage Capacity (acre-ft)	Fraction of Groundwater in West San Jacinto Basin	Natural Safe Yield (acre-ft/yr)	Safe Yield with Wastewater Recharge (acre-ft/yr)	Fraction of Yield in West San Jacinto Basin	Average TDS Concentration (mg/L)	Average Nitrate Concentration (as Nitrogen) (mg/L)
Perris North	123,000	347,000	11%	13,700	19,500	41%	450	7
Lakeview	283,000	515,000	25%	6,800	6,800	14%	500	3
Perris South	248,000	402,000	22%	8,300	12,800	27%	920	5
San Jacinto Lower Pressure	382,000	391,000	34%	2,500	2,500	5%	1,000	4
Winchester	36,000	41,000	3%	1,600	1,800	4%	2,000	8
Menifee	56,000	101,000	5%	3,300	4,700	10%	2,250	6
Totals	1,128,000	1,797,000	100%	36,200	48,100	100%		
Average							891	5

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water is included in the safe yield estimate. The safe yield, including reclaimed water percolation for the West San Jacinto Groundwater Basin, is about 48,100 acre-ft/yr.

The volume of groundwater in storage ranges from about 36,000 acre-ft for the Winchester subbasin to about 382,000 acre-ft for the San Jacinto Lower Pressure subbasin. The total volume of groundwater in storage in West San Jacinto Groundwater Basin is about 1,128,000 acre-ft. The volume of existing groundwater in storage that can economically be extracted is less than half the current volume in storage. On the other hand, all the water that is added to groundwater storage above the existing levels of groundwater storage can be recovered

Groundwater storage capacity ranges from about 41,000 acre-ft for the Winchester subbasin to about 515,000 acre-ft for the Lakeview subbasin. The total storage capacity for West San Jacinto Groundwater Basin is about 1,797,000 acre-ft.

Groundwater production estimates for 1993 were estimated from annual reports of groundwater production on file at the State Water Resources Control Board and from SCAG land use. Using reported groundwater production data, the total groundwater production from the West San Jacinto Groundwater Basin is about 8,200 acre-ft/yr. Combining reported groundwater production from municipal agencies, groundwater production estimates based on agricultural land uses and deducting agricultural use of reclaimed water yields a basin wide production estimate of about 26,100 acre-ft/yr.

Groundwater quality in most areas renders the groundwater marginal to unacceptable for direct use as a municipal supply. Groundwater from the Lakeview, Perris North, and parts of Perris South I can be used directly for municipal supply. Groundwater from parts of the Perris South I, Perris South II and Perris South III, and San Jacinto Lower Pressure subbasins could be blended with state project water and then used directly. Groundwater from Menifee, parts of Perris South II and Perris III, and the Winchester subbasins will need to be demineralized before use as a municipal supply.

FUTURE WATER DEMANDS AND WASTEWATER FLOWS

Projected Municipal Water demands for the West San Jacinto Groundwater Management area are listed in Table 1-2 and shown graphically in Figure 1-7. These estimates are based on land use and population projections and projected water use rates. Municipal demands in the West

TABLE 1-2
PROJECTIONS OF MUNICIPAL AND AGRICULTURAL DEMANDS
WEST SAN JACINTO GROUNDWATER BASIN

Year	Municipal Demands(1) (acre-ft/yr)	Agricultural Demands (acre-ft/yr)
1995	47,000	33,000
2000	63,000	32,000
2005	84,000	31,000
2010	112,000	31,000

Sources: (1) EMWD Projections 8/94

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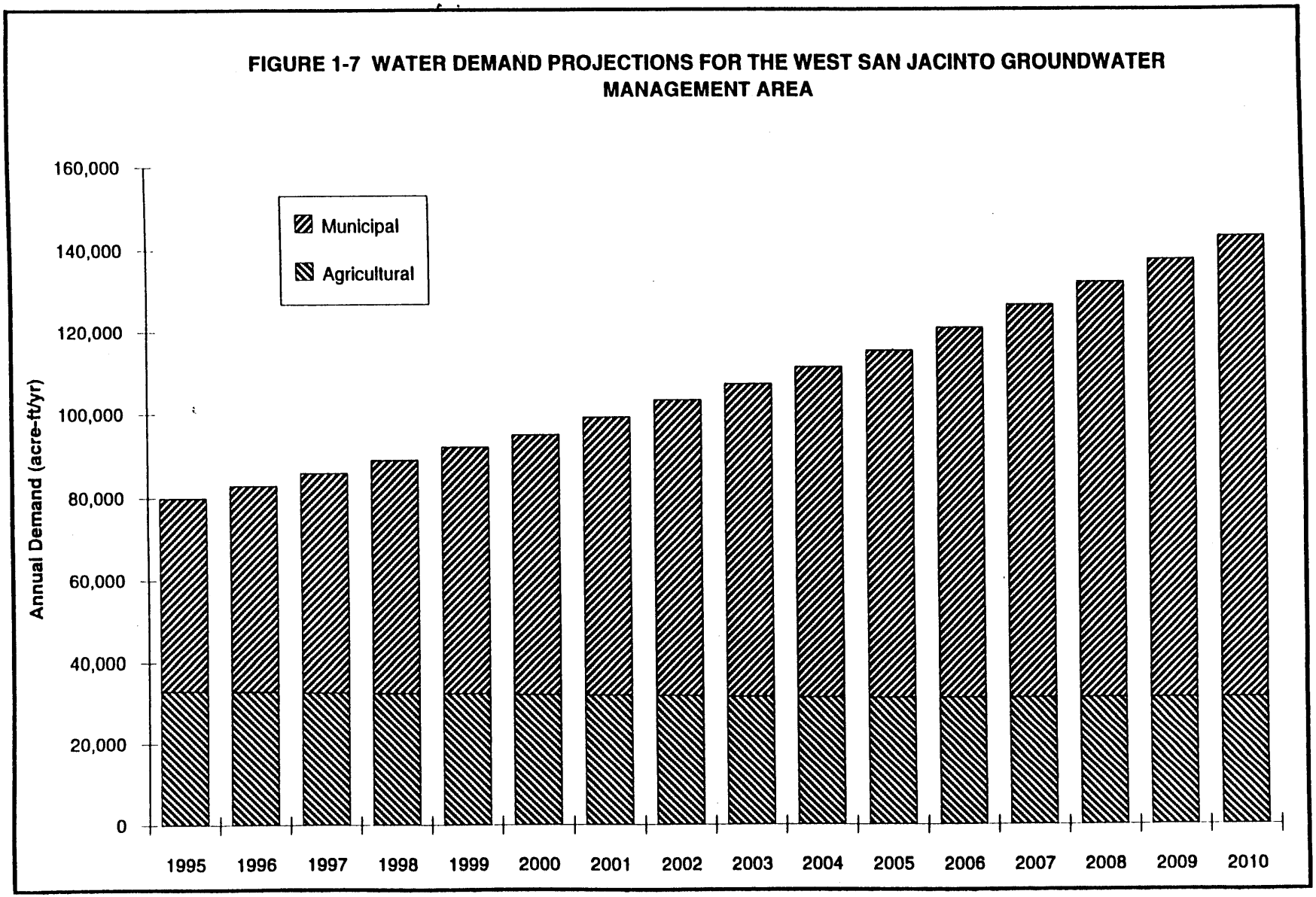
FIGURE 1-7 WATER DEMAND PROJECTIONS FOR THE WEST SAN JACINTO GROUNDWATER MANAGEMENT AREA



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San Jacinto Groundwater Management Area range from 47,000 acre-ft/yr in 1995, to 112,000 acre-ft/yr in 2010. Agricultural demands are projected to decline from about 33,200 acre-ft/yr in 1995, to 31,000 acre-ft/yr in 2010.

The sources of supply to the West San Jacinto Groundwater Management area include imported water from Metropolitan, groundwater, and reclaimed water.

Imported Water from Metropolitan. The quality of treated imported water is generally excellent and meets all drinking water regulations. Metropolitan adopted a schedule of projected water rate increases in 1991. The water rates established included:

- a base (non-interruptible) rate;
- a treatment surcharge to be added to the base rate for purchases of treated water; and
- a seasonal discount for water produced from October 1 through April 30, to be subtracted from the base rate.

The goals of the seasonal discount are: to achieve greater conjunctive use of imported supplies and local supplies; encourage the construction of additional local production facilities; and reduce member agencies' dependence on Metropolitan deliveries during the summer months. Recently, Metropolitan announced water prices for 1993 and forecasted rates for the following ten years. The projected cost of imported water purchased from Metropolitan is shown graphically in Figure 1-8.

Metropolitan is currently evaluating supply reliability for its service area (Metropolitan Water District of Southern California, 1994). Metropolitan is projecting that with year 2000 demands, shortages in retail supplies will occur at least four out of five years, with shortages up to 30 percent. By the year 2020, shortages will occur on average once in five years, with shortages up to 20 percent. The frequency and magnitude of retail shortages will be comparable to Metropolitan shortages for areas that depend heavily on Metropolitan.

Groundwater. Groundwater is available throughout the management area in that most of the management area overlies the West San Jacinto Basin. However, the quality of groundwater precludes the use of some of the management area groundwater for municipal supply. TDS and nitrate are the water quality constituents that limit the use of groundwater. TDS is regulated as a secondary standard. Secondary standards are for those substances that are not hazardous to

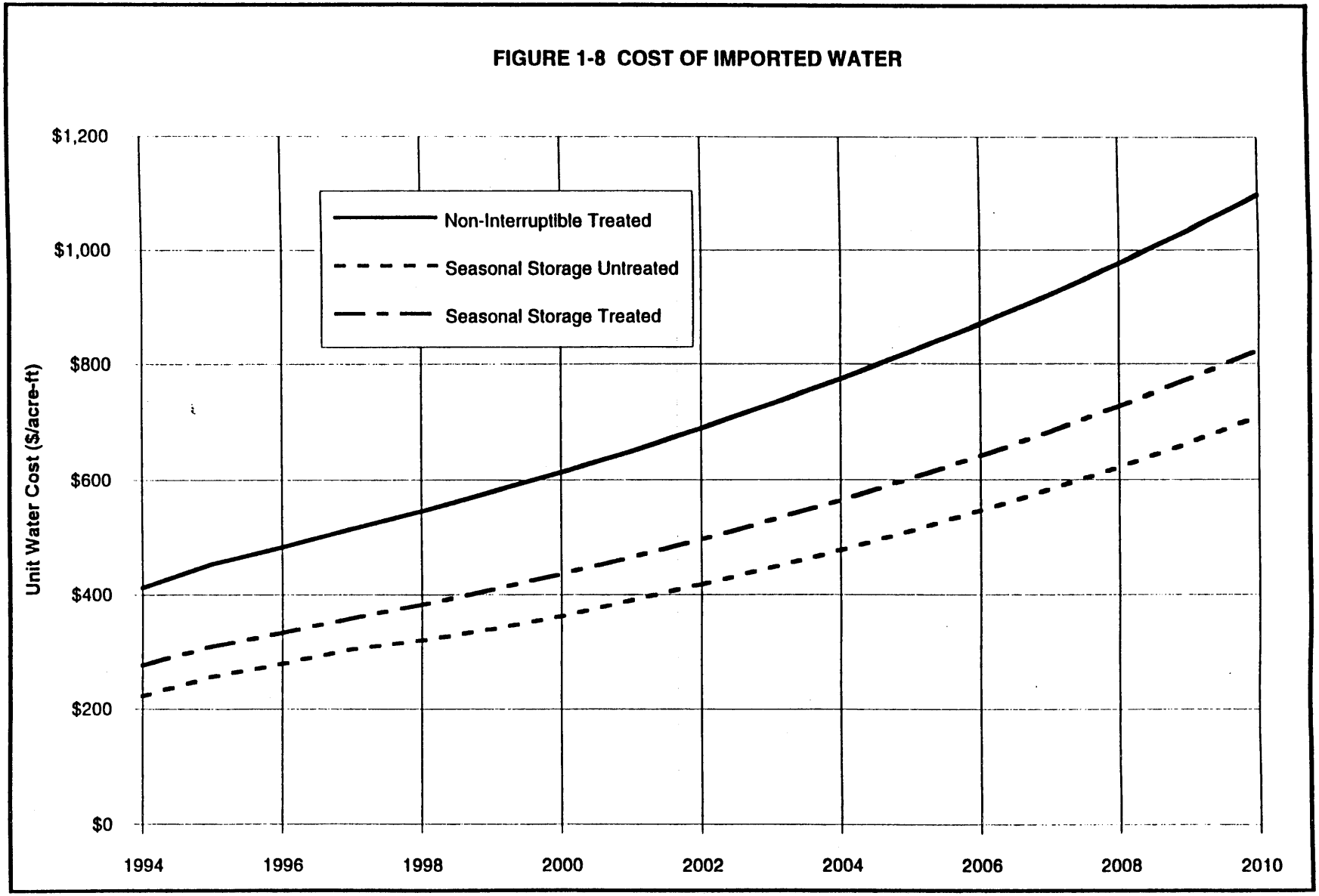

Figure 1-8

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health, but may cause taste, order, color, staining or other conditions that adversely affect the aesthetics of drinking water. The maximum contaminant level (MCL) for TDS is expressed as follows:

> *Recommended MCL* - 500 mg/L. TDS concentrations less than or equal to the *Recommended MCL* are desirable for a higher level of consumer acceptance.
>
> *Upper MCL* - 1,000 mg/L. TDS concentrations ranging up to the *Upper MCL* are acceptable if it is neither reasonable nor feasible to provide more suitable waters.
>
> *Short Term MCL* - 1,500 mg/L. TDS concentrations ranging up to the *Short Term MCL* are acceptable only for existing systems on a temporary basis, pending the construction of treatment facilities or the development of acceptable new water sources.

Nitrate is regulated under primary standards. The MCL for nitrate is 10 mg/L (as nitrogen). Table 1-1 lists the average TDS and nitrate concentrations for each groundwater subbasin in the management area. The subbasins are ranked in Table 1-1 from lowest to highest in TDS. From a drinking water perspective, approximately 36 percent of the yield of the West San Jacinto Basin could be developed from the Lakeview and Perris North subbasins for direct use, without additional treatment for TDS and nitrate. Some groundwater in the Perris South-I subbasin could also be used without treatment and San Jacinto Lower Pressure, Perris South-II and Perris South-III groundwater could be used if blended with SWP water. Groundwater from the Menifee-I, Menifee-II, Winchester and parts of the Perris South-II and Perris South-III subbasins will require treatment if groundwater from these subbasins is to be used as a municipal drinking water supply. The treatment processes that would make these basins useful as a water supply source are blending with low TDS supplies such as SWP water, and demineralization. The cost to produce groundwater, exclusive of treatment, is estimated at about $68 per acre-ft.

Reclaimed Water. EMWD is constructing a reclaimed water distribution plan that will make reclaimed water available throughout the management area. The reclaimed water system consists of five reclamation plants and about 79 miles of backbone distribution pipelines. The use of reclaimed water replaces non-potable demand on groundwater and imported supplies.

Water Supply Plan without a Groundwater Management Plan

The water supply plan for the management area, in the absence of a groundwater management plan, consists of the use of imported water for all new municipal uses and a combination of groundwater and reclaimed water for agricultural uses. All agricultural demands would be satisfied with groundwater and reclaimed water. The Menifee desalter would be operational in 1997, producing about 3,360 acre-ft/yr. The water supply plan for the management area is listed in Table 1-3.

The cost of this water supply plan is described in Table 5-6 in Section 5 of this report. Table 5-6 shows the annual demand, supplies by source and cost of each source in terms of annual cost, total annual cost and present value of all cost over the 1995 to 2010 planning period. The fractions of total supply and total supply cost by source are listed below.

Source	Fraction of Total Supply	Fraction of Total Supply Cost
Imported Water	64%	91%
Reclaimed Water	10%	2%
Menifee Desalter	3%	4%
Groundwater	23%	3%

The present value cost of future water supplies in the management area for the period 1995 to 2010 is about $557,000,000.

GROUNDWATER MANAGEMENT GOALS

The mission statement of EMWD is:

> ***The mission of the Eastern Municipal Water District is to deliver a dependable supply of safe, quality water and provide sewage collection services to its customers in an economical, efficient and publicly responsible manner.***

The water supply part of EMWD's mission statement is a goal shared by all purveyors of water in the West San Jacinto Groundwater Basin management area. The safe yield of the West San

TABLE 1-3
WATER SUPPLY PLAN IN THE ABSENCE OF
A GROUNDWATER MANAGEMENT PLAN
(acre-ft/yr)

Year	1995		2000		2005		2010	
	Volume	Fraction	Volume	Fraction	Volume	Fraction	Volume	Fraction
Municipal Demand	47,000	100%	63,000	100%	84,000	100%	112,000	100%
Imported Water	44,500	95%	56,140	89%	76,140	91%	103,140	92%
Menifee Desalter	0	0%	3,360	5%	3,360	4%	3,360	3%
Reclaimed Water	0	0%	1,000	2%	2,000	2%	3,000	3%
Groundwater	2,500	5%	2,500	4%	2,500	3%	2,500	2%
Agricultural Demand	33,000	100%	32,000	100%	31,000	100%	31,000	100%
Reclaimed Water	8,900	27%	8,900	28%	8,900	29%	8,900	29%
Groundwater	24,100	73%	23,100	72%	22,100	71%	22,100	71%
Total Demand	80,000	100%	95,000	100%	115,000	100%	143,000	100%
Imported Water	44,500	56%	56,140	59%	76,140	66%	103,140	72%
Menifee Desalter (1	0	0%	3,360	4%	3,360	3%	3,360	2%
Reclaimed Water	8,900	11%	9,900	10%	10,900	9%	11,900	8%
Groundwater (2)	26,600	33%	25,600	27%	24,600	21%	24,600	17%

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Jacinto Basin is about 36,200 acre-ft/yr. Projections of groundwater usage in the management area range from about 26,600 acre-ft/yr in 1995, to 24,600 acre-ft/yr in 2010.

Agricultural groundwater use will decrease slightly in the future, from about 24,100 acre-ft/yr to 22,100 acre-ft/yr, as agricultural lands are converted to urban uses. The majority of this agricultural water demand will be satisfied by reclaimed water. The need for potable water will increase dramatically in the future. Potable water demands in the management area will range from 47,000 acre-ft/yr in 1995, to 112,000 acre-ft/yr by 2010.

In the absence of a groundwater management plan, most of the new potable demand will be met from treated imported water purchased from Metropolitan. Metropolitan's supplies are projected to increase in cost about 142 percent over the 1995 to 2010 planning period, from $454 per acre-ft in 1995, to about $1,100 per acre-ft in 2010. Metropolitan's supply is also not entirely reliable. For year 2000 demands, Metropolitan has projected shortages in four years out of five years, ranging from 10 to 30 percent.

There are many private groundwater producers in the management area that do not rely on EMWD for water supply. The negative impacts, if any, of a groundwater management plan on these users must be minimized; and the ability of these groundwater producers to continue producing groundwater for beneficial use must be preserved.

The goal of the groundwater management plan is to

> ***maximize the use of groundwater for potable demands in such a way as to lower the cost of water supply and to improve the reliability of the <u>total</u> water supply for <u>all water users in the West San Jacinto Groundwater Basin Management area</u>.***

ELEMENTS OF A GROUNDWATER MANAGEMENT PLAN

The groundwater management plan consists of four elements that include adoption of groundwater management policies, development of groundwater yield enhancement programs, conjunctive use with imported supplies and the exchange of groundwater from agricultural and other non-potable uses with reclaimed water.

Groundwater Management Policies

Management policy elements consist of developing and implementing policies, regulations and coordinated activities among the groundwater producers. Currently, there is no routine monitoring of groundwater production, groundwater level and groundwater quality in the management area. There are no programs or institutions that routinely collect and review these data. There are no management tools available to forecast the impact of existing and future groundwater management practices. There is no coordination or oversight of well construction in the management area. There is no systematic plan to manage unused and obsolete wells. The management plan needs to include policies to manage well construction and to ensure their destruction when wells become obsolete. The following management policy elements should be included in the groundwater management plan.

- ❑ Establishment of Groundwater Basin Manager
- ❑ Groundwater Production Monitoring
- ❑ Groundwater Level and Quality Monitoring
- ❑ Development of Well Construction Policies.
- ❑ Development of Well Abandonment and Destruction Policies
- ❑ Monitoring of Well Construction, Abandonment and Destruction
- ❑ Groundwater Quality Protection

Yield Enhancement Elements

Yield enhancement refers to increasing the useful yield of the groundwater resource. In the West San Jacinto Groundwater Management area there are two yield enhancement elements that could be incorporated in the groundwater management plan -- artificial recharge and recovery of contaminated groundwater.

Artificial recharge can be done in spreading basins, injection wells and exchange. Groundwater storage capacity and favorable hydrogeologic conditions favor artificial recharge in the Lakeview, Perris North and parts of Perris South I and Perris South II subbasins. The other subbasins are full and have poor hydrogeologic characteristics for recharge. The source water

for artificial recharge would consist of small quantities of local runoff and significantly larger quantities of state project water from Metropolitan and reclaimed water from EMWD.

Recovery of contaminated groundwater consists of the pumping and treatment of contaminated groundwater. The types of treatment that are included in this element include demineralization and blending; although other types of treatment may be required depending on water quality conditions. Demineralization will be necessary to remove salt accumulating in groundwater and to develop municipal supplies from parts of the Perris South II and Perris South III, and the Winchester subbasins. Blending could be used to recover degraded groundwater from parts of the Perris South I, Perris South II and Perris South III, and San Jacinto Lower Pressure subbasins. This assessment is based on limited water quality data and therefore the type of treatment necessary to recover contaminated groundwater may change when better data becomes available.

Conjunctive Use

Conjunctive use is an operational strategy that combines the operations of multiple sources of water and storage resources in such a way that the combined yield is greater than the yield that would occur from the sum of independent, uncoordinated operations of the sources. The same definition would apply if other objectives could be achieved by coordinated operation and the yield remained at an acceptable level. Other objectives might include reduced cost, more reliable supply, and the attainment of environmental objectives. In most cases, conjunctive use results in increased yield and lower cost. Conjunctive use is commonly associated with storing of imported water in groundwater basins for use during periods of shortage. The more general definition could involve EMWD reclamation and municipal distribution facilities, Metropolitan facilities and resources, state project facilities and resources, groundwater basins within EMWD, and, potentially, groundwater basins outside of EMWD. Conjunctive use can operate seasonally, over-year, or both. Seasonal conjunctive use would bank water during seasonal period(s) of over-supply or abundance for use during dry times of the year. Over-year conjunctive use would bank water during years of over-supply or abundance for use during drought periods and imported water shortages.

Based on current knowledge of groundwater conditions, EMWD could bank local runoff, imported water purchased from Metropolitan and reclaimed water in the Lakeview, Perris North and Perris South subbasins during the period of October 1 through April 30, for use either during

the summer, during periods of imported water shortages, or both. The unused storage capacity of the Lakeview, Perris North and Perris South subbasins is about 600,000 acre-ft. EMWD could use up to half (and possibly more) of this unused storage capacity for seasonal and over-year storage, thereby reducing the cost of imported water purchases and providing an additional source of water during periods of imported supply shortage. Recharge would be accomplished with a combination of new spreading basins and injection wells. Recovery of recharge will be through existing and new production wells. Reclaimed water could be a source of recharge in a conjunctive use program for augmentation of potable supplies. EMWD should be able to shift about 30,000 to 50,000 acre-ft year of non-interruptible rate purchases to off-peak with conjunctive use projects in the Lakeview, Perris North and Perris South subbasins. The reduction in cost would be much more substantial if a blend of reclaimed water and imported water were recharged during the winter.

Based on current knowledge of groundwater conditions, conjunctive use with imported supplies and local runoff in the San Jacinto Lower Pressure, Menifee and Winchester subbasins appears to be more difficult to implement and of less benefit. Limited conjunctive use in these subbasins could be done in conjunction with groundwater treatment.

GROUNDWATER MANAGEMENT PLAN

Contents of the Management Plan

The management plan described herein is a program to achieve the management plan goals and includes conceptual descriptions of elements of the plan, and a description of the process to define and implement these elements consistent with the management plan goal. The groundwater management program includes: the development and implementation of policies, engineering investigations, facilities construction and operation, and other management activities. There are significant deficiencies in the knowledge of the groundwater resources of the West San Jacinto Groundwater Basin management area. These deficiencies preclude the definitive descriptions for some of the physical and institutional elements of the groundwater management plan. The groundwater management program includes studies to obtain additional information that is necessary to develop all the institutional and physical elements described in the plan.

The goal of the management plan is:

> ***maximize the use of groundwater for potable demands in such a way as to lower the cost of water supply and to improve the reliability of the total water supply for all water users in the West San Jacinto Groundwater Basin management area***

This goal extends to all groundwater users. Groundwater users that are not dependent on EMWD should benefit from the groundwater management plan. Adverse impacts, if any, from the groundwater plan will be minimized or mitigated. The rights of private groundwater producers will be protected. Groundwater producers who extract 10 acre-ft/yr or less would be exempt from the operation and implementation of the groundwater management plan.

Ultimate Plan Description

The groundwater management plan consists of a series of elements that, when implemented, will achieve the management plan goal stated above within the constraints. The management plan includes implementation of new policies, institutional arrangements, and physical projects. EMWD will be the agency responsible for implementation of the groundwater management plan. Based on the information developed in this study and presented in the previous sections, the ultimate groundwater management plan should include the following elements.

Establishment of a Groundwater Basin Manager. EMWD will implement the groundwater management plan. EMWD Board of Directors will be the decision-making body responsible for directing the implementation of the groundwater management plan. EMWD staff will serve as the staff to assist the EMWD Board of Directors in implementing the plan.

Upon adoption of the groundwater management plan, EMWD Board of Directors will appoint an Advisory Committee. The Advisory Committee will be composed of seven members, with one member each from city of Moreno Valley, city of Perris, Nuevo Mutual Water Company, Edgemont Gardens Mutual Water Company, and EMWD; and two members representing agricultural producers. The Advisory Committee will study, review and provide comments on all groundwater management plan activities directly to the EMWD Board of Directors.

EMWD staff, will prepare an annual engineering report describing the operation of the management plan for review by the EMWD board of directors, Advisory Committee and groundwater producers. EMWD, in consultation with the Advisory Committee and participating groundwater producers, will develop a coordinated operating strategy on an annual basis, based on the management plan and the findings of the annual report.

Monitoring of Groundwater Production. EMWD, in cooperation with the Advisory Committee, will implement a groundwater production monitoring program. Detailed estimates of the safe yield will be developed during the first year of the program. Groundwater production estimates will be developed by EMWD based on totalizing meters, energy usage and land use. EMWD will produce a groundwater production report and estimates of overdraft (if any). These data will be included in the annual report provided to the management committee. The production monitoring program will not limit or suspend groundwater production by existing groundwater producers.

Monitoring of Groundwater Level and Quality. EMWD, in cooperation with the Advisory Committee, will implement a groundwater level and quality monitoring program. Groundwater level and quality data will be collected from well owners. EMWD will measure groundwater levels and quality from select private wells. Groundwater levels and quality data from agencies' wells will be provided to EMWD by the agencies. EMWD will compile these data and develop estimates of the groundwater in storage, change in storage, overdraft and groundwater quality conditions. These data will be included in the annual report provided to the management committee.

Development of Well Construction Policies. EMWD, in cooperation with the Advisory Committee, the Department of Health Services and the Riverside County Health Department, will develop well construction policies that are specific to the West San Jacinto Groundwater Basin management area. These policies will be updated continuously based on new regulatory requirements and data. These policies will not limit or suspend groundwater production by existing groundwater producers.

Monitoring of Well Construction. EMWD has compiled and digitized most, if not all the well construction information that is available for existing wells. EMWD, in cooperation with other groundwater producers, will collect well construction data for new wells. EMWD will provide comments and suggestions to supplement design criteria that will be required by other agencies, including the Department of Health Services and the Riverside County Health Department.

Development of a Well Abandonment and Destruction Program. EMWD, in cooperation with the Advisory Committee, the Department of Health Services and the Riverside County Health Department, should develop well abandonment and destruction policies that are specific to the West San Jacinto Groundwater Basin management area. These policies should be updated continuously based upon new regulatory requirements and data.

Groundwater Quality Protection. EMWD, in cooperation with the Advisory Committee and parties responsible for groundwater quality degradation, should develop cooperative plans to prevent further degradation of groundwater and to integrate the solution of existing water quality problems to maximize the beneficial use of groundwater. The known areas of concern are the high TDS groundwater in the Perris South II (Ski Land area) and Winchester subbasins, and the groundwater contamination associated with March Air Force Base. The existing efforts undertaken by EMWD to rehabilitate the Menifee subbasins (the Menifee desalter project) will be completed independent of the groundwater

management plan. Additional degraded groundwater areas could be discovered through groundwater monitoring.

Exchange of Agricultural and Other Non-potable Groundwater Production to Municipal Use. The intent of this element is to increase the groundwater yield available for municipal use by either retiring agricultural and non potable demands or by substituting reclaimed water for groundwater used for agricultural and other non-potable uses. Incentives should be developed to encourage the exchange of agricultural groundwater production to municipal use.

Maximize Yield Augmentation with Local Resources - Local Runoff and Reclaimed Water. Yield augmentation through the recharge of runoff (water harvesting) and through the recharge of reclaimed water should be implemented where consistent with water quality objectives and other elements of the groundwater management plan. The Lakeview, Perris North and Perris South subbasins appear to be the most feasible areas for this element.

Maximize Conjunctive Use. Conjunctive use should be implemented in the West San Jacinto Groundwater Basin management area. The unused storage capacity in the West San Jacinto Groundwater Basin management area is about 670,000 acre-ft, with about 600,000 acre-ft or 90 percent in the Lakeview, Perris North and Perris South subbasins. The yield from conjunctive use, exclusive of safe yield, could range from 30,000 to 50,000 acre-ft, or perhaps larger. Conjunctive use will improve overall water supply reliability, groundwater quality, and will lower water supply cost. These benefits will be realized by all groundwater users.

The specifics of recharge, extraction, conveyance and treatment facilities will be developed after a thorough groundwater resources evaluation is performed and planning studies are done to develop and evaluate conjunctive use alternatives.

Groundwater Treatment. Groundwater treatment in the form of blending and demineralization should be done in the West San Jacinto Groundwater Basin management area to recover contaminated groundwater for municipal use. The specifics of treatment facilities will be developed after a thorough groundwater resources evaluation is performed and planning studies are done to evaluate groundwater treatment feasibility.

Groundwater Management Plan Alternatives

Four groundwater management alternatives were developed to evaluate the economic benefits to all water users in the groundwater management area from increasingly complex and capital-intensive groundwater management plans. All four of these alternatives include the following management elements:

- Establishment of a Groundwater Basin Manager
- Monitoring of Groundwater Production

- ❑ Monitoring of Groundwater Level and Quality
- ❑ Development of Well Construction Policies
- ❑ Development of Well Abandonment and Destruction Policies
- ❑ Monitoring of Well Construction, Abandonment and Destruction.
- ❑ Groundwater Quality Protection

Alternative 1 - Agricultural Exchange and Blending. Alternative 1 consists of the above-mentioned common elements plus the exchange of agricultural groundwater production, of which 2,000 acre-ft/yr are permanent transfers from land use conversions and about 17,500 acre-ft/yr of exchange of groundwater production for reclaimed water. Seven thousand one hundred acre-ft/yr of poor quality groundwater will be pumped from the San Jacinto Lower Pressure and Perris South subbasins and blended with imported water for municipal use.

Alternative 2 - Agricultural Exchange, Blending and Demineralization. Alternative 2 consists of the above-mentioned common elements plus the exchange of agricultural groundwater production, of which 2,000 acre-ft/yr are permanent transfers from land use conversions and about 21,700 acre-ft/yr of exchange of groundwater production for reclaimed water. Seven thousand one hundred acre-ft/yr of poor quality groundwater will be pumped from the San Jacinto Lower Pressure and Perris South subbasins and blended with imported water for municipal use. Five thousand three hundred acre-ft/yr of highly mineralized groundwater from the Perris South and Winchester subbasins will be pumped and demineralized to produce about 4,200 acre-ft of drinking water.

Alternative 3 - Agricultural Exchange, Blending, Demineralization and 30,000 acre-ft/yr Conjunctive Use. Alternative 3 includes all the elements of Alternative 2, plus conjunctive use. Conjunctive use will be implemented in the Perris North, Perris South I, Perris South II and Lakeview subbasins. Recharge would occur in spreading basins. Source water is state project water and reclaimed water. Average annual increase in recharge and extraction from conjunctive use will be about 30,000 acre-ft/yr.

Alternative 4 - Agricultural Exchange, Blending, Demineralization and 50,000 acre-ft/yr Conjunctive Use.. Alternative 4 is identical to Alternative 3 except that the conjunctive use element has been expanded to 50,000 acre-ft/yr.

Economic Evaluation of the Groundwater Management Plan Alternatives

Tables 8-1 through 8-4 in Section 8 illustrate the economic benefits that water users in the West San Jacinto Groundwater Basin management area would realize if a groundwater management plan were implemented. Each table lists the projected total demand for water and shows how that demand would be satisfied with each groundwater management plan alternative. For economic evaluation purposes, the plan elements are assumed on line in 1999, that is, all elements would be implemented in five years. Actual implementation could take place over a

longer period of time ranging from five to fifteen years. The groundwater management plan alternatives are compared to the *no groundwater management plan case* in Table 1-4. The difference in costs between the *with management plan* cases and *without management plan* case occurs in years 1999 through 2010.

Alternative 1 - Agricultural Exchange and Blending groundwater management plan case has a present value savings of about $108,000,000 over the no groundwater management plan case. The saving comes from the exchange of up to 17,500 acre-ft/yr of agricultural groundwater production to municipal uses and the reduction in the use of a like amount of imported water.

Alternative 2 - Agricultural Exchange, Blending and Demineralization groundwater management plan is identical to Alternative 1 except that the agricultural exchange of groundwater production to municipal uses has been expanded to about 21,700 acre-ft/yr and municipal groundwater production has been expanded by about 4,200 acre-ft/yr through construction of a demineralization facility. Alternative 2 has a present value savings of about $104,000,000 over the *no groundwater management plan case* and is comparable to the cost of Alternative 1. The cost savings over the *no groundwater management plan case* come from the exchange of up to 21,600 acre-ft/yr of agricultural groundwater production to municipal uses and the reduction in the use of a like amount of imported water. The cost of Alternative 2 is slightly higher than Alternative 1 because the demineralization costs are higher than the cost of imported water prior to 2010. After 2010 demineralization costs will be less than imported water. Alternative 2 would have costs savings greater than Alternative 1 if the economic analysis were extended beyond 2010.

Alternative 3 - Agricultural Exchange, Blending, Demineralization and 30,000 acre-ft/yr Conjunctive Use management plan has all the elements contained in Alternative 2 plus the incorporation of 30,000 acre-ft/yr of conjunctive use. The source water for conjunctive use is 20,000 acre-ft of state project water and 10,000 acre-ft/yr of reclaimed water. The demand for treated non-interruptible water from Metropolitan has dropped from 64 percent for the *no management plan case* to 26 percent. The demand for untreated seasonal water has risen to 14 percent. Treated non-interruptible and seasonal untreated imported water make up 40 percent of municipal supplies. Alternative 3 has a present value savings of about $172,000,000 over the *no groundwater management plan case* illustrated in Table 5-6 and about $66,000,000 over Alternatives 1 and 2. About 62 percent of the cost savings comes from the agricultural exchange,

TABLE 1-4 (revised 9/7/94)
COMPARISON OF GROUNDWATER MANAGEMENT PLAN ALTERNATIVES

Alternative	Percentage of Total Supply			Size of Groundwater Management Plan Elements				Present Value Cost of Supply	Reduction in Present Value Cost of Supply from Groundwater Management Plan
	Non Interruptible Treated Imported Water	Seasonal Treated Imported Water	Seasonal Untreated Imported Water	Agricultural Exchange (acre-ft/yr)	Blending (acre-ft/yr)	Demineralization (acre-ft/yr)	Conjunctive Use (acre-ft/yr)		
No Groundwater Management Plan	64%	0%	0%	0	0	0	0	$557,000,000	na
1 Agricultural Exchange and Blending	49%	0%	0%	17,510	7,100	0	0	$449,000,000	$108,000,000
2 Agricultural Exchange, Blending and Demineralization	46%	0%	0%	21,690	7,100	4,180	0	$453,000,000	$104,000,000
3 Agricultural Exchange, Blending, Demineralization and 30,000 acre-ft/yr Conjunctive Use (all recharge through spreading)	26%	0%	14%	21,690	7,100	4,180	30,000	$385,000,000	$172,000,000
4 Agricultural Exchange, Blending, Demineralization and 50,000 acre-ft/yr Conjunctive Use (80 recharge through spreading, 20 % through injection)	18%	4%	18%	21,690	7,100	4,180	50,000	$371,000,000	$186,000,000

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blending and demineralization elements included in Alternatives 1 and 2; the remaining cost savings are due to conjunctive use.

Alternative 4 - Agricultural Exchange, Blending, Demineralization and 50,000 acre-ft/yr Conjunctive Use management plan has all the elements contained in Alternative 3 except that conjunctive use has been expanded from 30,000 to 50,000 acre-ft. The source water for conjunctive use is 40,000 acre-ft of state project water and 10,000 acre-ft/yr of reclaimed water. The demand for treated non-interruptible water from Metropolitan has dropped from 64 percent for the no management plan case to 18 percent. Untreated seasonal water has risen to 18 percent and treated seasonal water to 4 percent. Treated non-interruptible, treated seasonal and seasonal untreated imported water make up 40 percent of municipal supplies. Treated seasonal water would be used for recharge by injection. Alternative 4 has a present value savings of about $186,000,000 over the *no groundwater management plan case* illustrated in Table 5-6 and about $80,000,000 over Alternatives 1 and 2. About 57 percent of the cost savings comes from the agricultural exchange, blending and demineralization elements included in Alternatives 1 and 2; the remaining cost savings are due conjunctive use.

The groundwater management plan development costs and the costs of recharge of basins and blending facilities have not been included in these analyses. These costs could have a present value ranging from $50,000,000 to $70,000,000. The cost savings from implementation of any of these alternatives far exceed the cost of implementation. The projected cost savings from the groundwater management plan illustrated in Tables 8-1 through 8-4 are for the 15-year period of 1999 to 2010 in which the capital-intensive facilities, such as spreading basins, have been in operation (and amortized) for 11 years. If these analyses were extended to the period of time over which capital-intensive facilities were to be financed, say 20 years, the cost saving would be significantly greater.

There are two additional significant benefits from a groundwater management plan. First, imported water for direct use has been reduced by half, which will improve overall water supply reliability. The volumetric impact of water shortages in the imported water supply could be reduced by half. Second, the recharge of state project water into the Lakeview, Perris North and Perris South subbasins will improve the quality of the groundwater in these subbasins.

Financing the Groundwater Management Plan

The primary beneficiaries of the plan are municipal water users in the West San Jacinto Groundwater Basin management area. Private groundwater producers such as farmers, dairy operators and individuals with small domestic wells will either be beneficially impacted or have no impacts. It is the intent of the plan to mitigate all significant adverse groundwater impacts to private groundwater producers. The types of beneficial impacts that private well owners could experience will be stabilized or increased groundwater levels where overdraft is occurring, such as the Lakeview subbasin, and reduced supply cost for those groundwater producers that can use reclaimed water in lieu of groundwater.

The cost of implementing and operating the West San Jacinto Groundwater Basin management plan should be born by municipal water users in the management area. The cost savings experienced by the local private groundwater users should be their incentive to participate in the groundwater management plan. There could be some cost to local groundwater producers if groundwater replenishment is necessary due to groundwater overdraft. In the event of overdraft, an equitable cost sharing plan should be developed to correct the overdraft.

Some of the elements of the management plan are capital intensive such as recharge facilities, wells, treatment plants, pipelines, etc. EMWD will need to develop a plan to finance these elements of the groundwater management plan with cost recovery based on the sale of water developed by the plan, or some other method as appropriate. Economic analyses show that the management plan should easily pay for itself.

Implementation of the Groundwater Management Plan

Upon adoption of the groundwater management plan, EMWD will form the Advisory Committee and begin implementation of the policy and physical elements of the management plan. The implementation of the groundwater management plan will occur in a phased process and consist of the following:

Phase 1	Short Term Implementation
Phase 2	Refine the Ultimate Groundwater Management Plan
Phase 3	Ultimate Groundwater Management Plan Implementation

Phase 1 Short Term Implementation. The goals of the short term implementation phase are to: implement those elements of the groundwater management plan that are easy to implement; where existing information is adequate for implementation; and to develop and implement demonstration projects that will provide engineering information necessary for design of management elements in the ultimate plan. The following tasks will be completed in Phase I.

- ❑ Groundwater Resources Evaluation
- ❑ Develop Groundwater Management Policies
- ❑ Construct and Operate Demonstration Projects for Blending, Demineralization and Conjunctive Use
- ❑ Develop Water Resources Planning Model
- ❑ Develop and Evaluate Feasibility Level Plans for physical elements of the Management Plan

Phase 2 Refine the Ultimate Groundwater Management Plan. *Phase 1 Short Term Implementation* will develop policies and data necessary for defining the ultimate groundwater management plan. Phase 2 consists of the detailed engineering, environmental and financial work to describe and implement the ultimate management plan The complexity and cost for the tasks listed below are dependent on the management plan elements included in the management plan.

- ❑ Prepare Facility and Operation Plans
- ❑ Prepare Financial Plan
- ❑ Prepare Project Specific Environmental Impact Reports
- ❑ Prepare Engineering Report for a Planned Recharge Project
- ❑ Institutional Planning

Phase 3 Ultimate Groundwater Management Plan Implementation. The facility plans, environmental documentation and draft agreements developed in Phase 2 will be converted to construction documents, project-specific environmental documentation and final agreements. These projects will then be constructed and operated. The sequencing and sizing of the management elements will depend on actual future water demands and the availability of funds for construction. It is premature to speculate on the magnitude of the effort required by most of these tasks because of uncertainties in what facilities and operating plans will be included in the groundwater management plan and the timing of the tasks.

Management and Monitoring

The management and monitoring of the groundwater management plan will occur while the elements of the ultimate groundwater management plan are being implemented. The management and monitoring activities developed in Phase 1 will be adopted by EMWD board action. Future modifications to management and monitoring programs will be incorporated as warranted by changing conditions.

Schedule and Cost

The Phase 1 work should take about two years to complete. Phase 2 will take about two years to complete and will overlap Phase 1 by about one year. The cumulative time required to complete phases 1 and 2 will be about three to four years. Phase 3 could take up to 10 years to complete with some projects (e.g., blending) coming on line within a couple of years and other projects (e.g., large scale surface recharge) taking 5 years to implement.

The cost to complete Phases 1 and 2 is estimated to range between 3 to 5 million dollars. The cost to complete Phase 3 cannot be estimated until the ultimate plan is described at the conclusion of Phase 2.

SECTION 2

SECTION 2
INTRODUCTION

THE NEED FOR GROUNDWATER MANAGEMENT

EMWD, together with the majority of water purveyors in Southern California, have been heavily relying on imported supplies from Metropolitan Water District of Southern California (Metropolitan). Recently, Metropolitan's ability to supply the ever-growing needs of Southern California has become increasingly unreliable due to the following reasons:

- demand for water is continuing to increase;
- environmental constraints at the point of origin may limit the water available for export;
- structural adequacy of the delivery system is limited;
- climatological uncertainties can limit delivery; and
- inadequate local storage facilities.

EMWD could purchase imported water from Metropolitan to meet these projected municipal demands. Metropolitan's sources, however, are not reliable and will be very expensive in the future. Metropolitan, with its current planning and future projects, will experience shortages in four of five years, with shortages reaching as high as 30 percent. The cost of imported water from Metropolitan is currently (July 1994) $412 per acre-ft for treated water and is projected to reach about $1,100 per acre-ft by 2010. These rising costs and lack of water to meet all of the demands has encouraged some local agencies in Southern California to claim water rights in the service areas of other agencies. One such action that could adversely affect EMWD's local water resources is a claim recently filed by Orange County Water District, which underscores the urgent need for action by EMWD to protect the water resources within its service area for use by EMWD consumers.

The West San Jacinto Groundwater Basin underlies a large portion of the Eastern Municipal Water District (EMWD). The West San Jacinto Groundwater Basin includes the Perris North, Perris South, Menifee, Winchester, Lakeview and the San Jacinto Lower Pressure subbasins. The location of these subbasins is shown in Figure 2-1. This area is experiencing rapid land use conversion from agriculture to urban uses. Total municipal water demands are expected to increase from 47,000 acre-ft/yr in 1995, to 112,000 acre-ft/yr in 2010.

Three sources of water supply for these demands can be considered: groundwater, imported water and reclaimed water. Groundwater in the West San Jacinto Groundwater Basin, for the most part, is of poor quality due to natural causes and irrigated agriculture. Most of the groundwater resources cannot be used as municipal supply due to poor quality - the groundwater quality either violates drinking water standards or is too high in total dissolved solids (TDS) or other water quality constituents to be discharged after municipal use. To meet increasing demands, EMWD could purchase imported water from Metropolitan. However, availability and costs might limit this alternative. EMWD has reclaimed water resources that could be used to meet agricultural demands and non-potable municipal demands. Reclaimed water cannot be directly used for potable demand unless, after groundwater recharge and dilution, it meets Title 22 requirements (State Department of Health Services Reclaimed Water Regulations). Additionally, groundwater treatment practices can convert non-potable water supplies to potable supplies.

The availability and reliability of the total water supply can be improved through the joint, optimized (conjunctive) management of all the water supply sources. It is the intent of Assembly Bill AB 3030, which was incorporated into the Water Code in 1992 (Part 2.75 commencing with Section 10750 of Division 6) with amendments by AB 1152 of 1993, to encourage local agencies to work cooperatively to manage groundwater resources within their jurisdictions. Authorization to adopt and implement a plan is contained in the following section of AB 3030:

> "§10753 (a) Any local agency, whose service area includes a groundwater basin, or a portion of a groundwater basin, that is not subject to groundwater management pursuant to other provisions of law or a court order, judgment, or decree, may, by ordinance, or by resolution if the local agency is not authorized to act by ordinance, adopt and implement a groundwater management plan pursuant to this part within all or a portion of its service area."

The components of a groundwater management plan may include the following:

> "§10753.7 (a) The control of saline water intrusion.
> (b) Identification and management of wellhead protection areas and recharge areas.
> (c) Regulation of the migration of contaminated groundwater.
> (d) The administration of a well abandonment and well destruction program.
> (e) Mitigation of conditions of overdraft.
> (f) Replenishment of groundwater extracted by water producers.
> (g) Monitoring of groundwater levels and storage.
> (h) Facilitating conjunctive use operations.
> (i) Identification of well construction policies.
> (j) The construction and operation by the local agency of groundwater contamination cleanup, recharge, storage, conservation, water recycling, and extraction projects.
> (k) The development of relationships with state and federal regulatory agencies.
> (l) The review of land use plans and coordination with land use planning agencies to assess activities which create a reasonable risk of groundwater contamination."

EMWD's Board of Directors adopted resolution No. 3039 to develop a Groundwater Management Plan for the West San Jacinto Groundwater Basin and published a Notice of Intent on August 25, 1993. The groundwater management plan for the West San Jacinto Groundwater Basin is being developed under the authority of Assembly Bill 3030 (AB 3030), which allows a local water agency to take the lead in development of a plan. Up to two years can be taken for development of a plan. Local water purveyors, both public and private, have been involved in development of the plan. There are approximately forty-five (45) pumpers in the area. Public meetings, workshops and hearings were held during the preparation of the draft plan. Cooperative agreements with EMWD have already been signed by Nuevo Water Company, Edgemont Gardens Mutual Water District and the City of Perris.

APPROACH TO DEVELOPMENT OF GROUNDWATER MANAGEMENT PLAN

EMWD's approach to developing a groundwater management plan consists of the following elements:

- Establishing a clear set of management goals;
- Resolving major uncertainties in the knowledge of the groundwater resources;
- Integration of the planning activities and goals of all interested entities;
- Evaluation of the benefits, costs and impacts to interested entities; and
- Providing an environment that obtains consensus at key decision points in the plan development.

A set of management goals must be established early in the plan development process. These goals can be modified during the plan development process. These goals will determine the magnitude of the plan, beneficiaries of the plan, and will guide the technical work that shapes the plan.

There are many uncertainties regarding hydrogeology, hydrology and water quality of the West San Jacinto Groundwater Basin (management area). The entities having an interest in the groundwater management plan have different interpretations of the management area groundwater resources and management issues affecting these resources. Therefore, one of the first steps in the planning process is to develop a complete description of groundwater resources that is understood and accepted by the entities having an interest in the plan.

The water development and wastewater management activities of the entities having an interest in the management area must be integrated into the groundwater management plan. This does not mean that these activities will be included in the plan; rather, these activities will be accommodated in the plan. The plan development process must identify and describe all relevant water development and wastewater planning activities in the management area.

The benefits, costs and other impacts must be evaluated for entities having an interest in the management area. Equity among these entities must be incorporated into the plan in order for the plan to be accepted and implemented. Therefore, the plan development process must include steps to identify and evaluate the benefits, costs and other impacts to the interested entities.

The plan development process will succeed only if there is consensus among the interested entities. Therefore, the process must provide an environment conducive to consensus. The first step to gaining consensus is to invite all the potentially interested entities in the management area to participate in the plan development process. Workshops and meetings were held to inform interested parties during the plan development process. EMWD took the leadership role in the plan development and in disseminating information regarding the plan to all interested parties.

PURPOSE OF THIS REPORT

The purpose of this report is to:

- document what is known about the groundwater resources and water supply needs;
- develop management goals;
- describe the elements of a groundwater management plan consistent with plan goals; and
- describe the management plan; and
- describe what additional information will be required to develop and implement the groundwater management plan.

This report describes the types of groundwater management practices that are being used in other groundwater basins and their applicability to the West San Jacinto Groundwater Basin. The types of information necessary to implement these groundwater management elements are also described. This report presents groundwater management practices in the context of the future water demands and the water resources of the management area. Finally, this report describes a groundwater management plan for the West San Jacinto Groundwater Basin and a program to implement the management plan.

Implementation of the groundwater management plan will occur over the next 20 to 40 years. As mentioned above, information describing the groundwater basins is inadequate to definitively describe the groundwater management plan. New information will need to be developed during plan implementation. Over the course of the next 20 to 40 years, new technologies, water quality standards and operating concepts will be developed. Therefore the management plan must have

alternatives to achieve the management plan goals and be flexible to accommodate future changes.

ORGANIZATION OF THIS REPORT

This report consists of eight sections and two appendices. The remaining seven sections of this report are:

Section 1 Executive Summary

Section 3 Existing Water Resources Management Framework

Section 4 Groundwater Resources in the West San Jacinto Basin

Section 5 Future Water Demands and Wastewater Flows

Section 6 Groundwater Management Goals

Section 7 Elements of the Groundwater Management Plan

Section 8 Description of the Groundwater Management Plan

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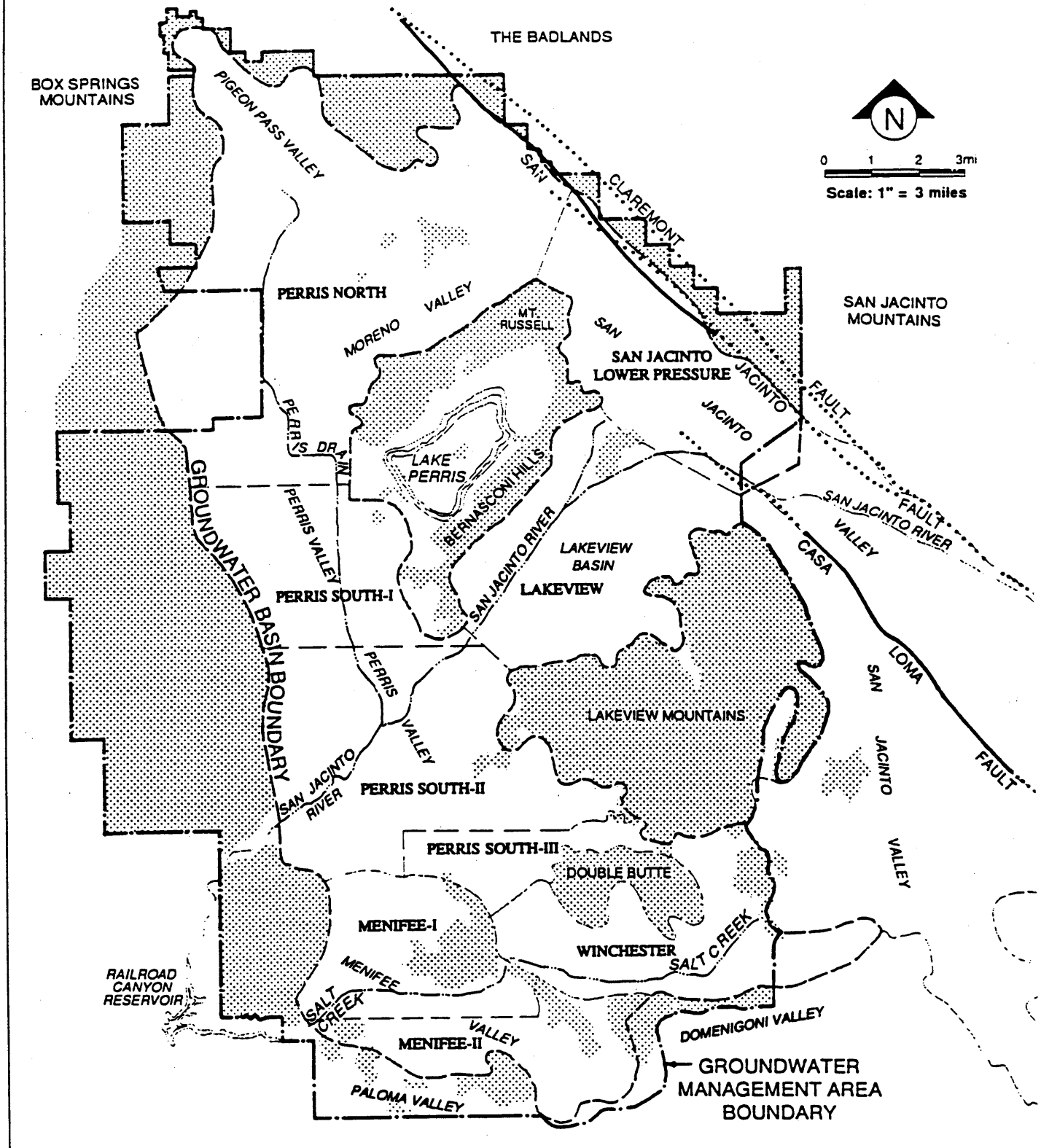

LEGEND:

NONWATER-BEARING PORTION

KNOWN FAULTS

INFERRED OR CONCEALED FAULTS

Figure 2-1
LOCATION MAP

REFERENCE: DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1977.

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SECTION 3

SECTION 3
EXISTING WATER RESOURCES FRAMEWORK

This section describes the existing institutional and regulatory framework for the groundwater management plan. First, the agencies that sell, import and otherwise provide water for the management area are listed and described. The regulatory constraints for the management of wastewater and drinking water are also described.

WATER SUPPLY AND WASTEWATER AGENCIES

Eastern Municipal Water District

EMWD encompasses over 540 square miles in the western portion of Riverside County as shown on Figure 3-1. It is bounded on the west by Western Municipal Water District, on the north by mountains which approximately parallel the San Bernardino County boundary, on the east by the San Jacinto Mountains, and on the south by mountains which parallel the San Diego County line. Only about half of the area within EMWD's boundary receives water service at this time. Other areas will receive service by EMWD as they develop. EMWD is the only wastewater treatment entity in the West San Jacinto groundwater management area. EMWD's sphere of influence extends easterly to the San Jacinto and Santa Margarita watershed boundaries.

EMWD has divided its service area into four subservice areas for the distribution of water as shown on Figure 3-2. The divisions are based on location, local water resources, existing water deliveries, and proximity to sources of imported water. Water can be transferred from one subservice area to another. Each subservice area encompasses a specific section of EMWD. Service Area 41, which is mainly supplied by MWD's Mills Filtration Plant, includes Moreno Valley, Perris and the community of Sun City. The area including the cities of Hemet and San Jacinto and unincorporated Winchester is supplied mainly by well water and is in Subservice Area 42. Subservice Area 43 encompasses the Antelope-French-Domenigoni Valley and the

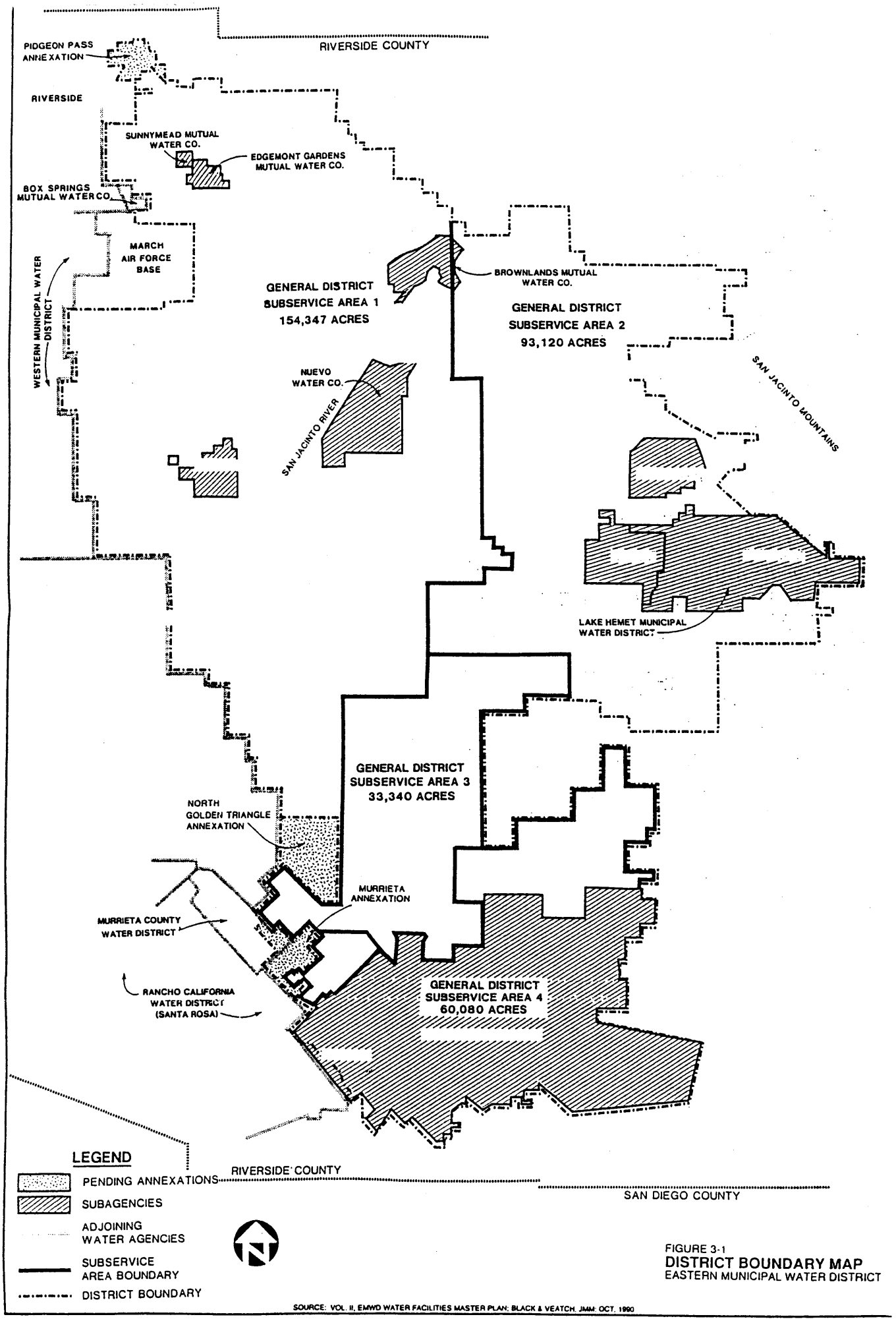
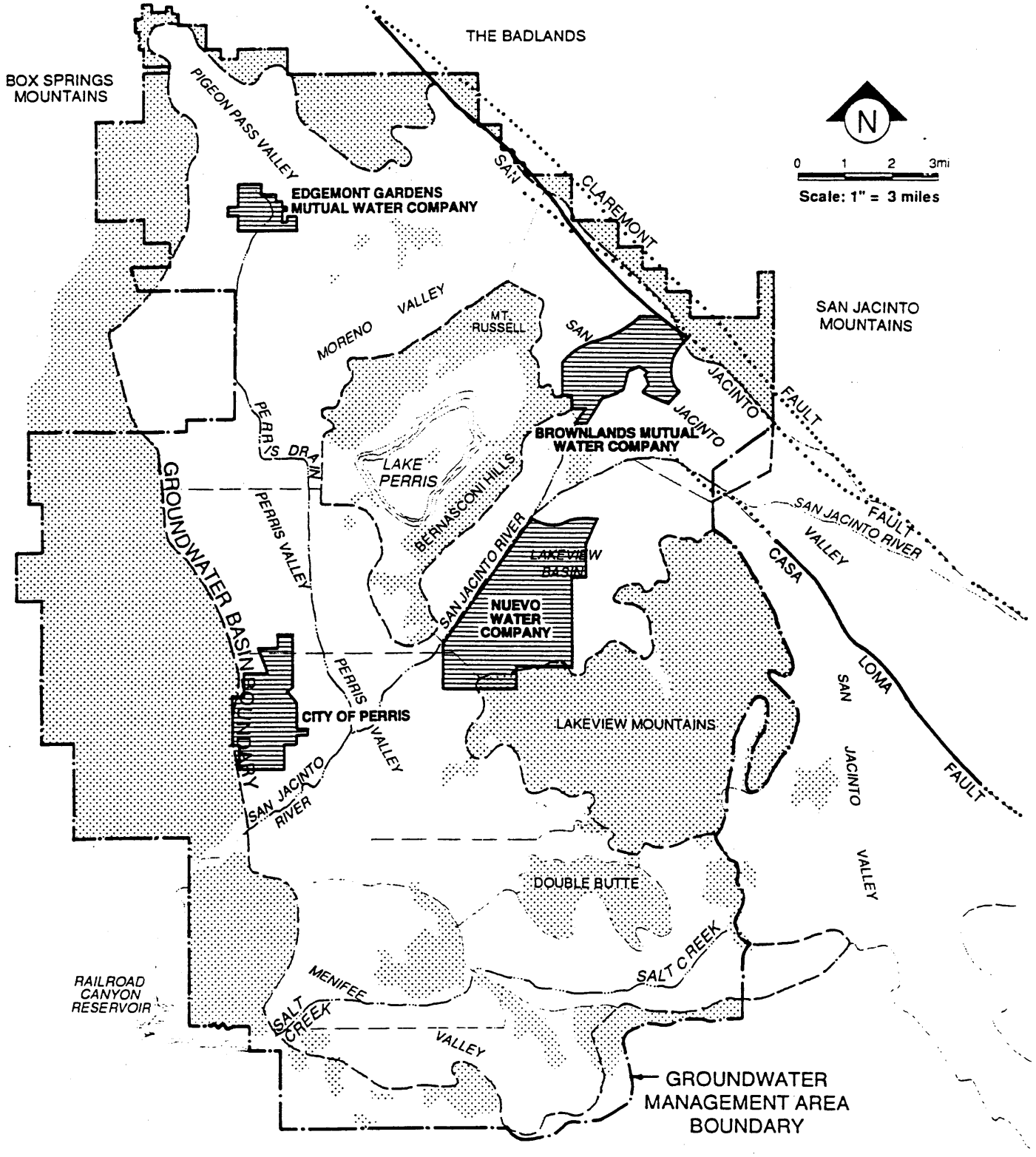


FIGURE 3-1
DISTRICT BOUNDARY MAP
EASTERN MUNICIPAL WATER DISTRICT

SOURCE: VOL. II, EMWD WATER FACILITIES MASTER PLAN; BLACK & VEATCH, JMM: OCT. 1990



LEGEND:

NONWATER-BEARING PORTION

KNOWN FAULTS

INFERRED OR CONCEALED FAULTS

Figure 3-2
SUBAGENCIES

REFERENCE: VOL. II, EMWD WATER FACILITIES MASTER PLAN; BLACK & VEATCH, JMM; OCT, 1990.

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Murrieta Hot Springs Region of EMWD. The Golden Triangle and Dutch Village developments are also located in this subservice area and will eventually receive almost their entire supply from MWD's Skinner Filtration Plant. At the extreme southern end of EMWD is the historic town of Temecula and surrounding Rancho California which is a rapidly developing, planned 87,500 acre, agricultural, industrial, commercial and residential community which is bisected by Interstate 15. Temecula and the eastern 41,000 acres of Rancho California are located in Subservice Area 44. The water supply to this area is from the Rancho California Water District, which is a subagency of EMWD. The supply for the area is well water supplemented with water from MWD's Skinner Filtration Plant.

EMWD has agreed to supply water on a wholesale basis to eight public entities and companies, four of which are in the West San Jacinto Groundwater Management area. Water requirements by these subagencies varies depending on development and the availability of local supplies. These entities and public agencies include the Brownlands Mutual Water Company, city of Hemet, city of Perris, city of San Jacinto, Edgemont Gardens Mutual Water Company, Lake Hemet Municipal Water District, Nuevo Water Company, and Rancho California Water District. EMWD also supplies water, wholesale, to Elsinore Valley Municipal Water District and March Air Force Base, in accordance with contracts with Western Municipal Water District. The entities and public agencies within the West San Jacinto Groundwater Management area are shown in Figure 3-2 and are described below.

City of Perris. The city of Perris relies entirely on EMWD for its supply since local well water is high in TDS and chlorides. Water is supplied directly through three connections to EMWD's 1627 (Perris) pressure zone, and is provided on a demand basis. The city has water storage facilities consisting of a 1.0 MG and a 1.25 MG steel tank which have high water elevations of 1,595 feet.

Nuevo Water Company. Nuevo Water Company encompasses approximately 4,064 acres and supplies approximately 1,260 connections. The company has two wells with capacities of 1.01 mgd (700 gpm) and 0.58 mgd (400 gpm) and a 12-inch connection to EMWD's system. District water is used only as a supplemental supply to meet total maximum day summer demands of approximately 2.3 mgd.

Edgemont Gardens Mutual Water Company. Edgemont Gardens Mutual Water Company serves 661 acres and approximately 950 connections in the city of Moreno Valley. Their supply is provided by two 350-gpm wells and three connections to EMWD. Water from EMWD is used

to supplement their normal supply and to provide fire protection since their system does not have water storage facilities.

Brownlands Mutual Water Company. Brownlands Mutual Water Company encompasses 2,042 acres east of Lake Perris near the Badlands. The company does not have a water system and consequently, does not provide water service. A connection to EMWD's system has never been constructed for this subagency. In the future these areas will probably be supplied directly by EMWD.

Metropolitan Water District of Southern California

Metropolitan Water District of Southern California (Metropolitan) is a wholesale water agency serving supplemental imported water to 27 member cities and water agencies in portions of Los Angeles, Orange, Riverside, San Bernardino, San Diego and Ventura counties. This service area has a current population of about 15 million people. Approximately one-half of the total water used throughout the entire Metropolitan service area is imported water purchased from Metropolitan to supplement the local water supplies of the study area. Metropolitan obtains imported supplies from the Colorado River and the State Water Project (SWP). Figure 3-3 shows the locations of Metropolitan's, state and EMWD imported water facilities.

Colorado River Water. The Colorado River Aqueduct, owned and operated by Metropolitan, transports water from Lake Havasu on the Colorado River, 242 miles to its terminus at Lake Matthews in Riverside County. Construction of the Colorado River Aqueduct began in 1931 and the first deliveries of water to member agencies took place in 1941.

Metropolitan's total entitlement to Colorado River water is approximately 1.39 million acre-ft/yr. This entitlement consists of a fourth priority right to 550,000 acre-ft/yr, a fifth priority right of 662,000 acre-ft/yr and surplus contract rights of 180,000 acre-ft/yr. Several irrigation districts hold higher priority rights to 3.85 million acre-ft/yr. Certain Indian reservations, towns and individuals also hold present perfected rights that predate Metropolitan's rights. In 1964, the United States Supreme Court limited California's diversions on a dependable basis to 4.4 million acre-ft/yr in the case *Arizona v. California*. As such, Metropolitan's diversions from the Colorado River on a dependable basis were limited to less than 550,000 acre-ft/yr. During declarations of surplus, Metropolitan has the highest priority of any California contractor to divert these surplus waters.

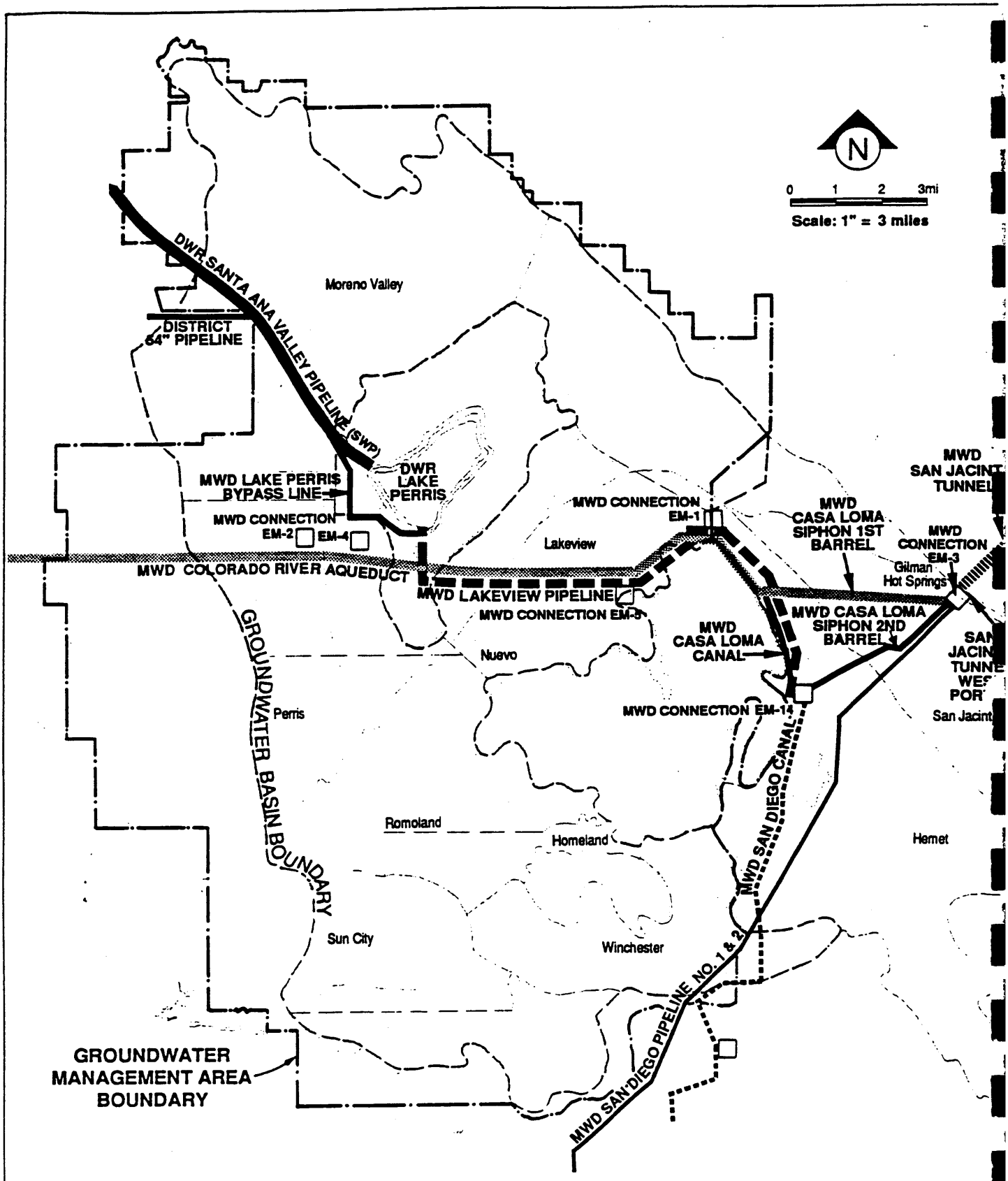

Figure 3-3
IMPORTED WATER FACILITIES

REFERENCE: EMWD WATER FACILITIES MASTER PLAN, *FIG. 4-3: SOURCES OF SUPPLY MAP*, OCTOBER, 1990.

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The Secretary of the Interior has the discretion to allow California to use any water that Arizona and Nevada have available from the Colorado River, but do not use. It is difficult to predict the criteria the Secretary will use in determining whether to release unused water to California. If the agricultural agencies in California do not use the entire supply available to them, Metropolitan has the right to divert the unused portion. Although agricultural use was less than 3.85 million acre-ft/yr throughout much of the mid 1980's, there was no unused agricultural priority water available in 1989.

Metropolitan is actively seeking additional water supplies from the Colorado River. Metropolitan recently signed a long-term agreement with the Imperial Irrigation District that will yield 106,110 acre-ft/yr of Colorado River water from implementation of specific water-saving measures. Metropolitan is pursuing several other projects to obtain increased Colorado River supplies including:

- ❑ Additional water conservation measures with Imperial Irrigation District
- ❑ Lining of the All-American and Coachella Canals to stop water seepage losses
- ❑ Groundwater storage project on the East Mesa of Imperial County
- ❑ Land fallowing program with Palo Verde Irrigation District

If all of these projects are implemented, Metropolitan's total Colorado River supplies could be about 1,000,000 acre-ft/yr by the year 2000 (Montgomery Watson, 1993).

State Project Water. Metropolitan's second source of water is the State Water Project (SWP). The SWP is owned by the State of California and operated by the California Department of Water Resources (DWR). This project transports water from the Sacramento-San Joaquin Delta via the California Aqueduct to thirty contract agencies in the state. The total length of the California Aqueduct is 444 miles.

Metropolitan has an entitlement to SWP water of 2,011,500 acre-ft/yr out of a total maximum contractual entitlement of 4.23 million acre-ft/yr for the 30 contractors. As currently developed, and under current Delta water quality standards, the SWP has an average yield during extended dry periods of approximately 2.4 million acre-ft/yr. Requested deliveries for 1993 totaled 3.6 million acre-ft/yr (agricultural contractors have had a 100 percent deficiency applied against them). Initial deliveries were estimated to be ten percent of the requests before the recent wet

period. Demands for SWP water are expected to increase to 4.15 million acre-ft/yr by the year 2010.

Metropolitan's water supply from the SWP also faces potential limitations in the future. The current firm yield of the SWP can currently supply only about one-half of the contract entitlements due to capacity limitations of existing facilities. The State Department of Water Resources is developing a program to increase the firm yield of the SWP through a combination of additional pumping facilities at the Delta, improved water management in the Delta, new surface reservoirs, and groundwater storage. These projects are expected to increase the dry period yield to 3.2 million acre-ft/yr by the year 2010 [DWR, Bulletin 132-89]. Metropolitan is pursuing its own program of groundwater storage and water transfers from other SWP contractors to increase its firm supplies.

The State Water Resources Control Board (SWRCB) has been conducting hearings and other proceedings in an on-going process to review the water quality objectives for the San Francisco Bay/Sacramento-San Joaquin Delta estuary. The SWRCB recently proposed more stringent water quality requirements for the Delta through its draft Decision D-1630. If adopted in its current form, D-1630 is expected to reduce deliveries to the SWP, the Central Valley Project and other Delta diverters by as much as 1.2 million acre-ft/yr depending on water supply conditions in the Delta. The impact of this decision on Metropolitan is still under study; however, preliminary estimates indicate a reduction on the order of 200,000 acre-ft/yr (Montgomery Watson, 1993).

REGULATION OF WASTEWATER

The West San Jacinto Groundwater Management plan will be influenced by the plans and policies of the Federal Environmental Protection Agency, State Water Resources Control Board, California Regional Water Quality Control Board, Santa Ana Region as well as the state and local health departments. A summary of the more important regulations of these agencies is presented in the following paragraphs.

Federal Environmental Protection Agency

On October 18, 1972, Congress passed the Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500). Those amendments have been acclaimed as "one of the most significant, most comprehensive, most thoroughly debated pieces of environmental legislation

ever to be considered by the Congress." The 1972 Act has been amended several times. The 1977 Amendments included a change in name to the Clean Water Act; however, the Act's goals and policy remain the same. Section 101(a) of the Act states:

> The objective of this Act is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. In order to achieve this objective it is hereby declared that, consistent with the provisions of this Act--
>
> (1) it is the national goal that the discharge of pollutants into the navigable waters be eliminated by 1985;
>
> (2) it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection of and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water be achieved by July 1, 1983;
>
> (3) it is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited;
>
> (4) it is the national policy that Federal financial assistance be provided to construct publicly owned waste treatment works;
>
> (5) it is the national policy that area wide waste treatment management planning processes be developed and implemented to assure adequate control of sources of pollutants in each State; and
>
> (6) it is the national policy that a major research and demonstration effort be made to develop technology necessary to eliminate the discharge of pollutants into the navigable waters, waters of the contiguous zone, and the oceans.

To reach these goals, the Act requires that a discharge of waste or waste-containing water be of a specified, improved quality before its release from a point source to the receiving water, or in some cases, that the discharge be prohibited. To assure that the improved quality is attained, the Act provides a new authority to the Federal and State governments to continue and fully develop a basin plan program as well as a national permit system. These two programs are discussed later in this Section under the California Regional Water Quality Control Board, Santa Ana Region.

State Water Resources Control Board

California's Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) establishes the responsibilities and authorities of the State Water Resources Control Board and the nine Regional Water Quality Control Boards. That Act names the Boards "...the principal state agencies with primary responsibility for the coordination and control of water quality."

In carrying out this responsibility, the State Water Resources Control Board coordinates a oversees the activities of the nine Regional Boards. It has also adopted several statewide poli controlling specific aspects of water quality. These policies which apply to the San Jacin Water Reclamation Program include:

Nondegradation Policy (1968). This is the single most important statewide water qua control policy (CRWQCB, SAR, 1984). It was adopted as SWRCB Resolution No. 68-1 "Statement of Policy with Respect to Maintaining High Quality Waters in California". T policy requires that high quality water be maintained and protected unless: (1) allowing so degradation is clearly in the best interests of the people of California as a whole, (2) that s allowable degradation does not preclude an identified (present or future) beneficial use, and that the applicable Basin Plan or some statewide policy takes note of the change in question a concedes that it is appropriate.

Reclamation Policy (1977). The "Policy and Action Plan for Water Reclamation in Califor recognizes the present and future need for increased amounts of water in California, primarily support growth. This policy commits both the State Board and the nine Regional Boards support reclamation and reclamation projects which are consistent with sound principles a demonstrated needs.

California Regional Water Quality Control Board, Santa Ana Region

The California Regional Water Quality Control Board, Santa Ana Region, controls water quali within its region by adoption and implementation of a basinwide water quality control p (Basin Plan) and waste discharge requirements for individual dischargers within its regio These two programs, as they relate to the West San Jacinto Groundwater Management Plan, discussed in the following paragraphs.

Basin Plan. The Porter-Cologne Act directs each Regional Board to "...formulate and ad water quality control plans for all areas within the region." A water quality control plan defined as having three components: beneficial uses which are to be protected, water qua objectives which protect those uses, and an implementation plan which accomplishes tho objectives. For the Santa Ana Region, the original basin plan was adopted in 1975 and amen in 1983. As required, that plan is again being reviewed and updated where necessary.

The objective of that plan entitled: "Water Quality Control Plan for the Santa Ana River Basin (8)" is to show how the quality of the surface and ground waters in the Santa Ana Region should be controlled to provide the maximum benefit possible. As stated in that plan:

> The uses made of water and the benefits derived from it are varied, and the quality of the water is an important factor. For example, drinking water has to be of higher quality than water used to irrigate pastures. Both are legitimate uses, but the quality requirements for irrigation are different from those for domestic use. The plan recognizes such variations. First, it lists the uses to which the various waters are put (Beneficial Uses, Chapter 3). Second, it describes the water quality which must be maintained to allow those uses (Water Quality Objectives, Chapter 4). Federal terminology is somewhat different, in that beneficial uses and water quality objectives are combined and the combination is called Water Quality Standards. Chapter 5, the Implementation Plan, then describes the programs, projects and other actions which are necessary to achieve the goals of this plan. Chapter 6, Monitoring and Assessment, discusses the impacts the plan will have.

Applicable sections of the 1994 Basin Plan are summarized in the following paragraphs.

Beneficial uses. Beneficial uses that are to be protected in the West San Jacinto Groundwater Management Plan are shown in Tables 3-1 and 3-2.

Water Quality Objectives. The narrative objectives below apply to all inland surface waters, including bays and estuaries, and to groundwaters, as noted within the region. In addition, specific numerical objectives are listed in Tables 3-3 and 3-4. Where more than one objective is applicable, the stricter shall apply.

Trace constituents. The concentrations of trace constituents in groundwaters designated MUN shall not exceed the values listed immediately below.

Arsenic	0.05 mg/l	Iron	0.3 mg/l
Barium	1.0 mg/l	Lead	0.05 mg/l
Cadmium	0.01 mg/l	Manganese	0.05 mg/l
Chromium	0.05 mg/l	Mercury	0.002 mg/l
Cobalt	0.2 mg/l	Selenium	0.01 mg/l
Cyanide	0.2 mg/l	Silver	0.05 mg/l
Fluoride	1.0 mg/l		

California Department of Health Services

Recharge of reclaimed water can occur through surface spreading, direct injection and by over irrigation. Recharge by percolation and injection is subject to regulatory approval. The Department of Health Services (DHS) has released proposed regulations for planned recharge projects that recharge reclaimed water. If the proposed regulations are adopted, strict criteria

TABLE 3-1
BENEFICIAL USES OF SURFACE WATERS

Water Body	Municipal and Domestic Supply	Industrial Service Supply	Agricultural Supply	Groundwater Recharge	Water Contact Recreation	Non-contact Water Recreation	Warm Freshwater Habitat	Wildlife Habitat	Cold Freshwater Habitat
San Jacinto River					I		I		
Reach 3	I		I	I	I	I	I	I	
Reach 4	I		I	I	I	I	I	I	
Canyon Lake *	X	X	X	X	X	X	X	X	X
Lake Elsinore					X	X	X	X	

I = Intermittent Beneficial Use
X = Present or Potential Beneficial Use
*Note - Canyon Lake is Reach 2

TABLE 3-2
GROUNDWATER BENEFICIAL USES

Groundwater Subbasin	Municipal and Domestic Supply	Agricultural Supply	Industrial Service Supply	Industrial Process Supply
San Jacinto - Lower Pressure	X	X	X	
Lakeview	X	X	X	X
Perris North	X	X	X	X
Perris South I	X	X		
Perris South II	X	X		
Perris South III		X		
Winchester	X	X		
Menifee I	X	X	X	
Menifee II	X	X	X	

I = Intermittent Beneficial Use

X = Present or Potential Beneficial Use

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TABLE 3-3
SURFACE WATER QUALITY OBJECTIVES
(mg/l)

Water body	Total Dissolved Solids	Total Hardness	Sodium	Chloride	Total Inorganic Nitrogen	Sulfate	Filtered Biochemical Oxygen Demand	Filtered Chemical Oxygen Demand
San Jacinto River								
Reach 3	820	400		250	6		7	15
Reach 4	500	220	75	125	5	65		
Canyon Lake*	700	325	100	90	8	290		

Note - Canyon Lake is Reach 2

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Water Resou[redacted]gineer

TABLE 3-4
GROUNDWATER QUALITY OBJECTIVES
(mg/l)

Groundwater Subbasin	Total Dissolved Solids	Total Hardness	Sodium	Chloride	NItrate as NItrogen	Sulfate
San Jacinto - Lower Pressure	800	380	120	100	3	330
Lakeview	500	190	80	160	2	25
Perris North	300	100	70	90	3	15
Perris South I	1000					
Perris South II	2000					
Perris South III	1500					
Winchester	1200					
Menifee I	2000					
Menifee II	1500					

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must be satisfied for a planned recharge project using reclaimed water. In the interim, the Regional Board and the DHS are requiring agencies interested in recharge of reclaimed water to follow the proposed regulations. The proposed regulations are included in Appendix A-1.

The proposed regulations define four categories of recharge projects:

> Project Category I - Surface spreading project that uses reclaimed water that has been oxidized (secondary treatment), filtered (tertiary treatment), disinfected and subjected to organics removal.
>
> Project Category II - Surface spreading project that uses reclaimed water that has been oxidized (secondary treatment), filtered (tertiary treatment) and disinfected.
>
> Project Category III - Surface spreading project that uses reclaimed water that has been oxidized (secondary treatment) and disinfected.
>
> Project Category IV - Direct injection project that uses reclaimed water that has been oxidized (secondary treatment), filtered (tertiary treatment), disinfected and subjected to organics removal.

For project categories I and IV, the maximum amount of reclaimed water that can be captured by any well is a function of the total organic carbon (TOC) in the reclaimed water. The maximum contribution of reclaimed water at a well for categories I and IV is 50 percent. Table 3-5 shows the maximum allowable contributions of reclaimed water in a well as a function of the TOC in the reclaimed water after organics removal. Table 3-6 summarizes other important operational criteria from the proposed recharge guidelines. The maximum allowable reclaimed water contributions in any well for categories II and III is 20 percent. With the exception of nitrogen compounds, reclaimed water quality used for planned recharge projects must meet Title 22 standards for drinking water quality (Title 22, Division 4, Chapter 15, Sections 64435, 64443, 64444.5 and 64473). The total nitrogen concentration of reclaimed water used in recharge projects shall not exceed 10 mg/L as nitrogen, unless the project sponsor can demonstrate that the standard can be consistently met prior to reaching the groundwater level. The minimum retention time in the groundwater prior to production shall be six months for categories I and II, and twelve months for categories III and IV. The minimum horizontal separation between the recharge facility and a producing domestic well is 500 feet for categories I and II; 1000 feet for category III and 2,000 feet for category IV. The project sponsor must have the authority to prevent the use of groundwater for drinking water within the area required to achieve the minimum retention time and minimum horizontal separation. The proposed regulations require rigorous groundwater and reclaimed water monitoring.

TABLE 3-5
MAXIMUM ALLOWABLE TOC AFTER
ORGANICS REMOVAL IN RECLAIMED WATER

	Maximum TOC Concentration (mg/L)	
Reclaimed water Contribution (%)	Surface Spreading Category I	Direct Injection Category IV
0 - 20	20	5
21 - 25	16	4
26 - 30	12	3
31 - 35	10	3
36 - 45	8	2
46 - 50	6	2

TABLE 3-6
KEY CRITERIA FOR RECLAIMED WATER RECHARGE PROJECT

Criterion	Category I	Category II	Category III	Category IV
Maximum Contribution of Reclaimed Water in Water at Domestic Wells (1)	50%	20%	20%	50%
Minimum Horizontal Separation Between Point of Recharge and Domestic Wells (feet)	500	500	1,000	2,000
Minimum Retention Time in Groundwater (months)	6	6	12	12

note - (1) see Table 7-1 for categories I and IV

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Direct Discharge into a Water System. A plan that involves direct discharge into a domestic water supply system or storage unit for the near future (within the next decade) is not acceptable because of the uncertain health implications. DHS will recommend against the element of a basin plan which contains such a proposal.

Where a plan requiring a near-term decision involves options or alternatives for the use or disposal of the wastewater, DHS will reject the domestic water reuse alternative and consider the remaining options as the proposals for evaluation.

Direct discharge into a water system may be presented in a plan as a future option which may be appraised as additional information becomes available and future needs and attitudes are clearer.

REGULATION OF DRINKING WATER

A summary of existing and proposed water quality standards is presented in Appendix A-2. Both primary Maximum contaminant Levels (MCLs) and Secondary Maximum Contaminant Levels (SMCLs) are shown as proposed, promulgated, and implemented by EPA and DHS. The more rigorous of the two standard MCLs for any contaminant must be satisfied.

LOCAL PLANNING AND REGULATORY AGENCIES

Other local agencies that may have a significant influence on groundwater management include:

Riverside County Flood Control and Water Conservation District. This agency plans, constructs and operates flood control and water conservation facilities in Riverside County. The construction of flood control and water conservation facilities affects the volume of recharge to groundwater and thus has a potentially significant impact.

Riverside County Planning. Riverside County Planning Department develops and reviews general plans for all unincorporated areas in the county. Thus this agency will review the groundwater management plan for consistency with general plans under their jurisdiction.

Riverside County Health Department. The Riverside County Health Department will review water supply and wastewater plans that could be embodied in the groundwater management plan.

SECTION 4

SECTION 4
GROUNDWATER RESOURCES IN THE WEST SAN JACINTO BASIN

PHYSICAL FEATURES

Figure 4-1 shows the major physical features, waterbearing and non-waterbearing areas of the groundwater management area. The major physical features in the study area include the San Jacinto mountains, the Badlands, the San Jacinto River, Salt Creek, Perris Valley Drain, the San Jacinto and Casa Loma faults, the Lakeview mountains, the Bernasconi Hills, and Double Butte. The management area groundwater basins are shown in Figure 4-2 and include the Perris North, Perris South I, II and III, Menifee I and II, Winchester, Lakeview and the San Jacinto Lower-Pressure subbasins.

The San Jacinto mountain range, which dominates the area, was formed about 130 million years ago when subsurface activity thrust the igneous (formed under extreme heat) rock upward. Continued erosion reduced the mountain range and its adjacent area, and the resulting sediments were deposited in the valleys of the management area. These are called alluviated valleys and the deposited sediments are termed alluvium (California Department of Water Resources, 1978). The aquifers in the management area consist of interbedded gravels, sands, silts, and clays. In general, coarser alluvium occurs near the sources of the alluvium and the finer alluvium occurs further away from the sources. The sources of alluvium include the mountains, hills and badland areas that border the management area. Coarser alluvium also occurs in the vicinity of significant streambeds grading to finer alluvium away from the streambeds.

The Perris Subbasins

The Perris Basin has been subdivided into Perris North, Perris South-I, Perris South-II and Perris South-III subbasins. This division is based on water quality variations and has no hydrologic

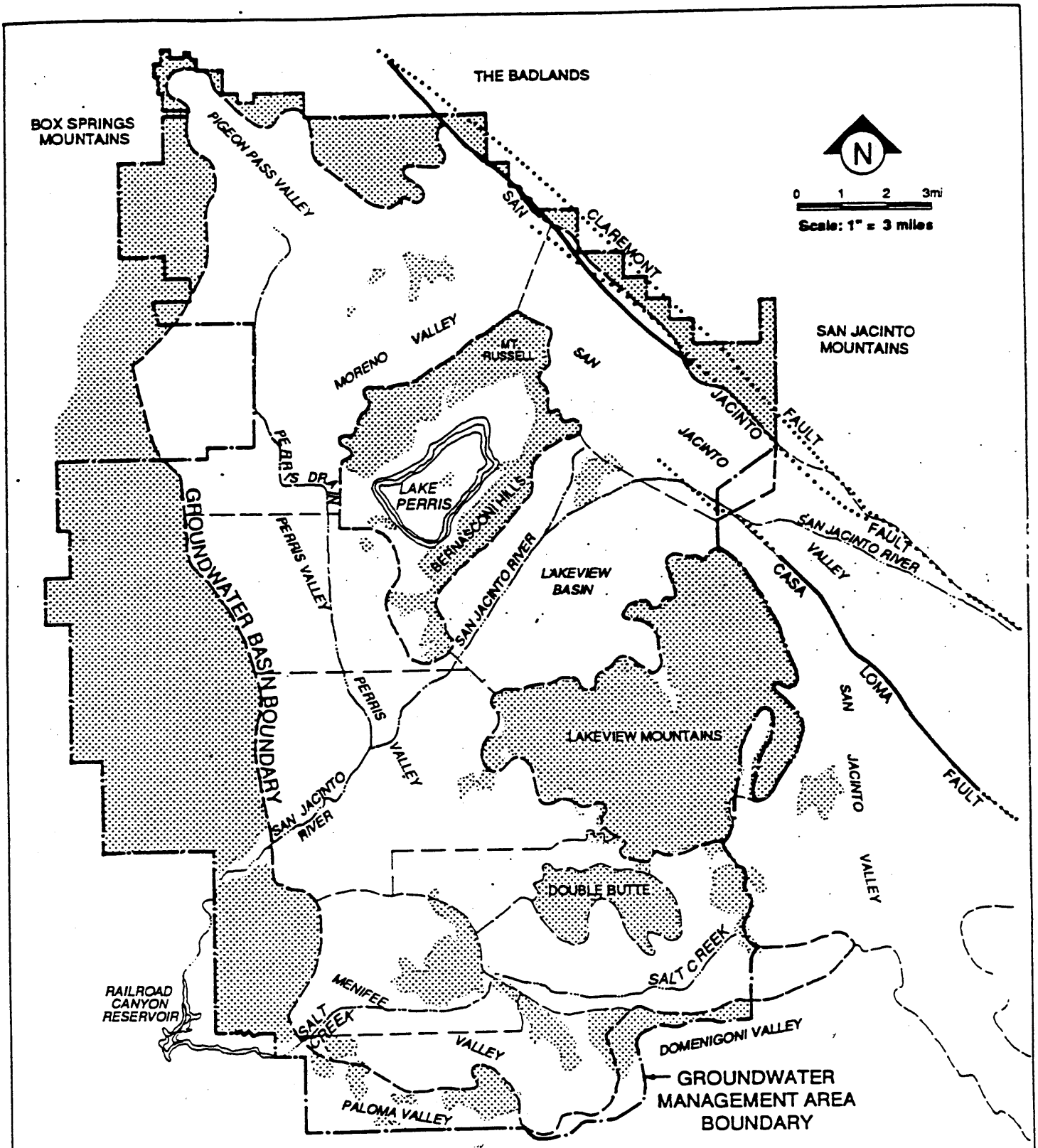

Figure 4-1
MAJOR PHYSICAL FEATURES

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REFERENCE: DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1977.

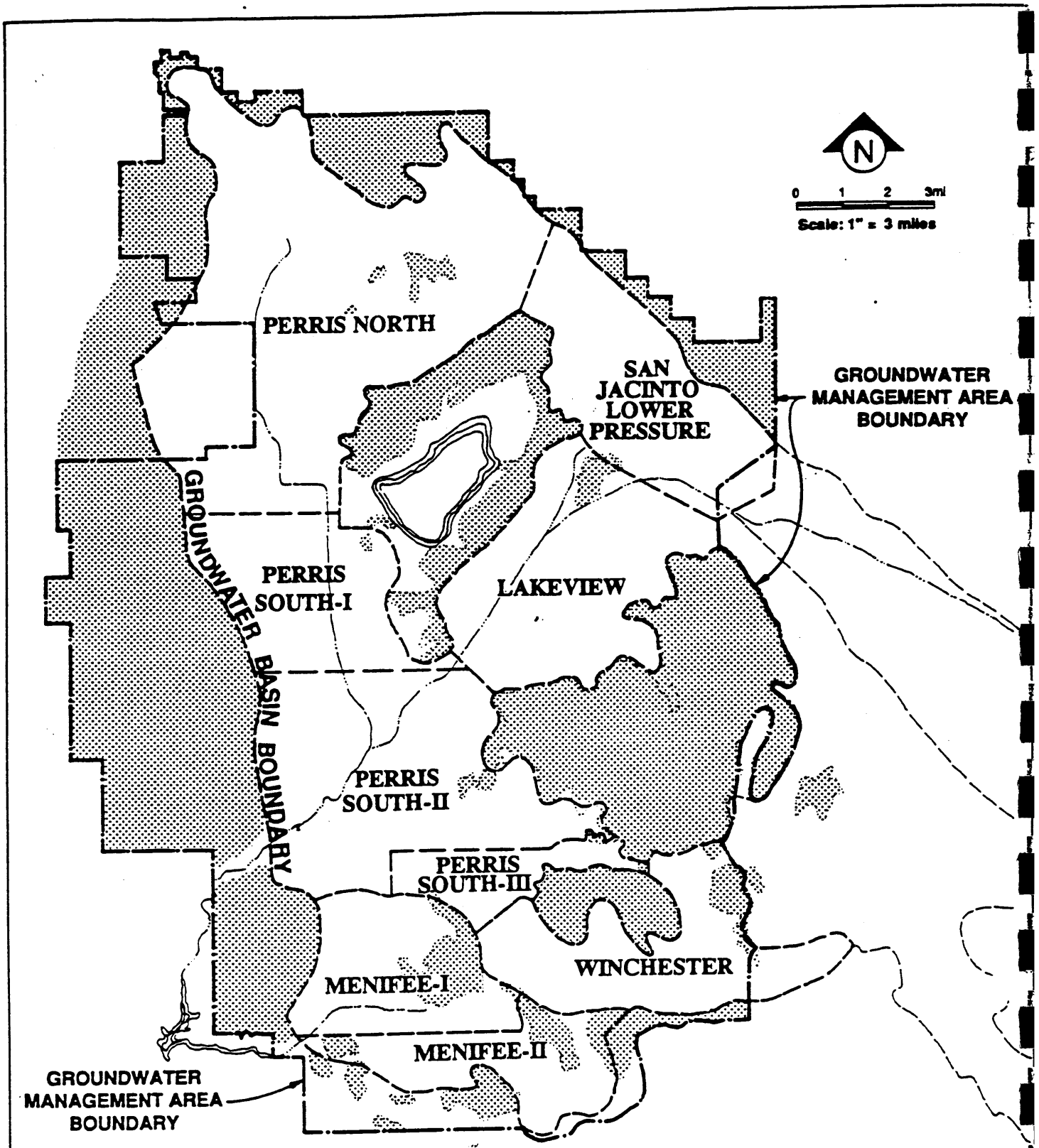

Figure 4-2
GROUNDWATER SUBBASINS

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significance. The Perris North subbasin is bounded on the north by Box Springs Mountains and the Badlands; on the east by San Jacinto Lower-Pressure subbasin and unnamed hills north of Lake Perris; on the south by the Perris South-I subbasin and on the west by a series of extensive non-waterbearing hills and plateaus.

The Perris South-I subbasin is bounded on the north by the Perris North subbasin; on the east by the southerly extension of the Bernasconi Hills; on the south by the Perris South-II subbasin and on the west by a series of extensive non-waterbearing hills and plateaus.

Perris South-II is bounded on the North by the Perris South-I subbasin, on the east by the Lakeview subbasins and the Lakeview mountains; on the south by the Menifee-I and Perris South-III subbasins; and on the west by a series of extensive non-waterbearing hills and plateaus.

The Perris South-III subbasin is bounded on the north and west sides by the Perris South-II subbasin; on the east by the Lakeview mountains and the Winchester subbasin; and on the south by the Double Butte hills, the Winchester subbasin and the Menifee-I subbasin.

The Perris subbasins are considered one hydrologic basin. The Perris North subbasin consists of tonalite and granodiorite mountains surrounding alluvium and older alluvium to 600 feet in depth, over tonalite and granodiorite basement rocks. The northeasterly section near Moreno consists of alluvium up to about 850 feet in depth, over undifferentiated granitic basement rocks.

The Perris South I and Perris South II subbasins consist of alluvium at depths ranging from a few hundred to 1,000 feet, extending southerly, through the mid Perris Valley and into the Menifee subbasin to the south. The base of the aquifer consists of tonalite and granodiorite basement rocks. Mountains composed of tonalite and granodiorite basement rocks bound the southwestern and southeastern area. Clays and gravels are in the central and southern sections, with waterbearing sediments beginning at a depth of 100 feet.

Table 4-1 summarizes available well test data and aquifer characteristics (California Department of Water Resources, 1978). The depth of wells in the Perris North and South subbasins is reported to range from 200 to 800 feet below ground surface (ft-bgs), with production rates ranging from 90 to about 1,000 gallons per minute (gpm). Based on interpretation of well efficiency tests, the transmissivity of these subbasins is estimated to range between 3,600 to 64,800 gallons per day, per foot (g/d/ft). Transmissivity is a measure of how well the aquifer

TABLE 4-1
AVAILABLE PUMP TEST DATA
WELL CHARACTERISTICS AND AQUIFER PROPERTIES

Basin	Number of wells	Depth of Wells (ft-bgs)			Production (gpm)			Transmissivity (gpm/ft/day)			Specific Yield		
		Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg
Perris	42	200	800	440	90	1,000	400	3,600	64,800	16,200	0.04	0.14	0.08
Lakeview	31	300	1,000	450	100	2,000	690	1,800	90,000	34,200	0.04	0.16	0.12
Winchester	9	200	600	450	100	850	300	3,600	14,400	10,800	0.04	0.11	0.09
Menifee	7	100	600	500	10	1,000	330	1,800	108,000	23,400	0.06	0.11	0.08

Source: Water Resources Evaluation of the San Jacinto Area, DWR, 1978; Plate 2, TIR 1335-11-A-2 Preliminary Evaluation of Storage Capacity and Specific Yield of Groundwater Basins in the San Jacinto Study by Area.

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transmits water. Transmissivities for large municipal wells usually exceed 30,000 g/d/ft, with larger values being better. Specific yield is a measure of the aquifer's ability to store water. Specific yield is numerically equal to the fraction of the water that, after saturation, can be drained by gravity from the unit volume of the aquifer. Larger values of specific yield imply greater storage capacity and less regional drawdown. Based on well construction logs, the specific yield in the Perris subbasins is estimated to range from .04 to .14.

The Menifee Subbasins

The Menifee basin has been subdivided into the Menifee-I and Menifee-II subbasins. As with the Perris subbasins, this division is based on water quality variations and has no hydrologic significance. The Menifee-I subbasin is bounded on the North by the Perris South-II and Perris South-III subbasins; on the east by unnamed hills and the Winchester subbasin; on the south by Menifee-II subbasin and on the west by a series of extensive non-waterbearing hills and plateaus.

The Menifee-II subbasin is bounded on the north by the Menifee-I and Winchester subbasins and unnamed hills; on the east by Domenigoni Valley; and on the south by a saddle-shaped feature consisting of unnamed hills and Paloma Valley.

Alluvium, up to 900 feet in the north, extends into the Railroad Canyon area in the west and toward the east and southeast boundaries. The base of the aquifer consists of tonalite and granodiorite basement rocks. Waterbearing sediments consist of coarse gravel and sandy disintegrated coarse granite. The base of the aquifer occurs at a depth of 800 feet in the center of the valley and reaches 1,200 feet in the northern and eastern portions of the valley.

Table 4-1 summarizes available well test data and aquifer characteristics. The depth of wells in the Menifee subbasins is reported to range from 100 to 600 ft-bgs, with production rates ranging from 10 to about 1,000 gpm. The transmissivity is estimated to range between 1,800 to 108,000 g/d/ft. The specific yield is estimated to range from .06 to .11.

Winchester Subbasin

The Winchester subbasin is bounded on the north by the Double Butte hills and Lakeview mountains; on the east by the Hemet subbasin; on the south by a line of unnamed hills that

separate the Winchester subbasin from Domenigoni and Menifee valleys; and on the west by Perris South-III.

The western and southern sections mainly consist of alluvium from depths of a few hundred to 1,000 feet. The base of the aquifer consists of tonalite and granodiorite along the western, southern and northern boundaries and to the north are tonalite and granodiorite basement rocks and the underlying basement tonalite and granodiorites of the surrounding mountains. Clay and gravel with uniform stratification prevail except for fine sands in the northern and southern borders. Salt Creek, a San Jacinto River tributary, crosses the subbasin from east to west, providing surface drainage.

Table 4-1 summarizes available well test data and aquifer characteristics. The depth of wells in the Winchester subbasin is reported to range from 200 to 600 ft-bgs with production rates ranging from 100 to about 850 gpm. The transmissivity is estimated to range between 3,600 to 14,400 g/d/ft. The specific yield is estimated to range from .04 to .11.

Lakeview Subbasin

The Lakeview subbasin is bounded on the northwest by the Bernasconi hills; on the northeast by the San Jacinto Lower Pressure subbasin; on the southeast by the Lakeview Mountains; and on the southwest by the Perris South-I and Perris South-II subbasins. The subsurface geology consists mainly of alluvium reaching over 1000 feet in depth.

In the northeast section near the base of the Badlands, waterbearing sediments are at about 100 feet in sandy shales. Elsewhere, in the north and northeast sections, waterbearing sediments are at depths over 150 feet or more, in relatively thin strata, with clay predominating. The central and southern sections are clays and gravels with waterbearing sediments occurring at 100-foot depths or more.

Table 4-1 summarizes available well test data and aquifer characteristics. The depth of wells in the Lakeview subbasin is reported to range from 300 to 1,000 ft-bgs with production rates ranging from 100 to about 2,000 gpm. The transmissivity is estimated to range between 1,800 to 90,000 g/d/ft. The specific yield is estimated to range from .04 to .16.

San Jacinto Lower Pressure Subbasin

The San Jacinto Lower Pressure subbasin is bounded by the San Jacinto Mountains on the east, Bridge Street on the south, the Casa Loma fault on the west, and the westerly line of Range 2 West on the north. This subbasin has alluvium to about 1,200 feet deep, is comprised mostly of clays and silt and produces little water. The transmissivity of the subbasin has not been characterized.

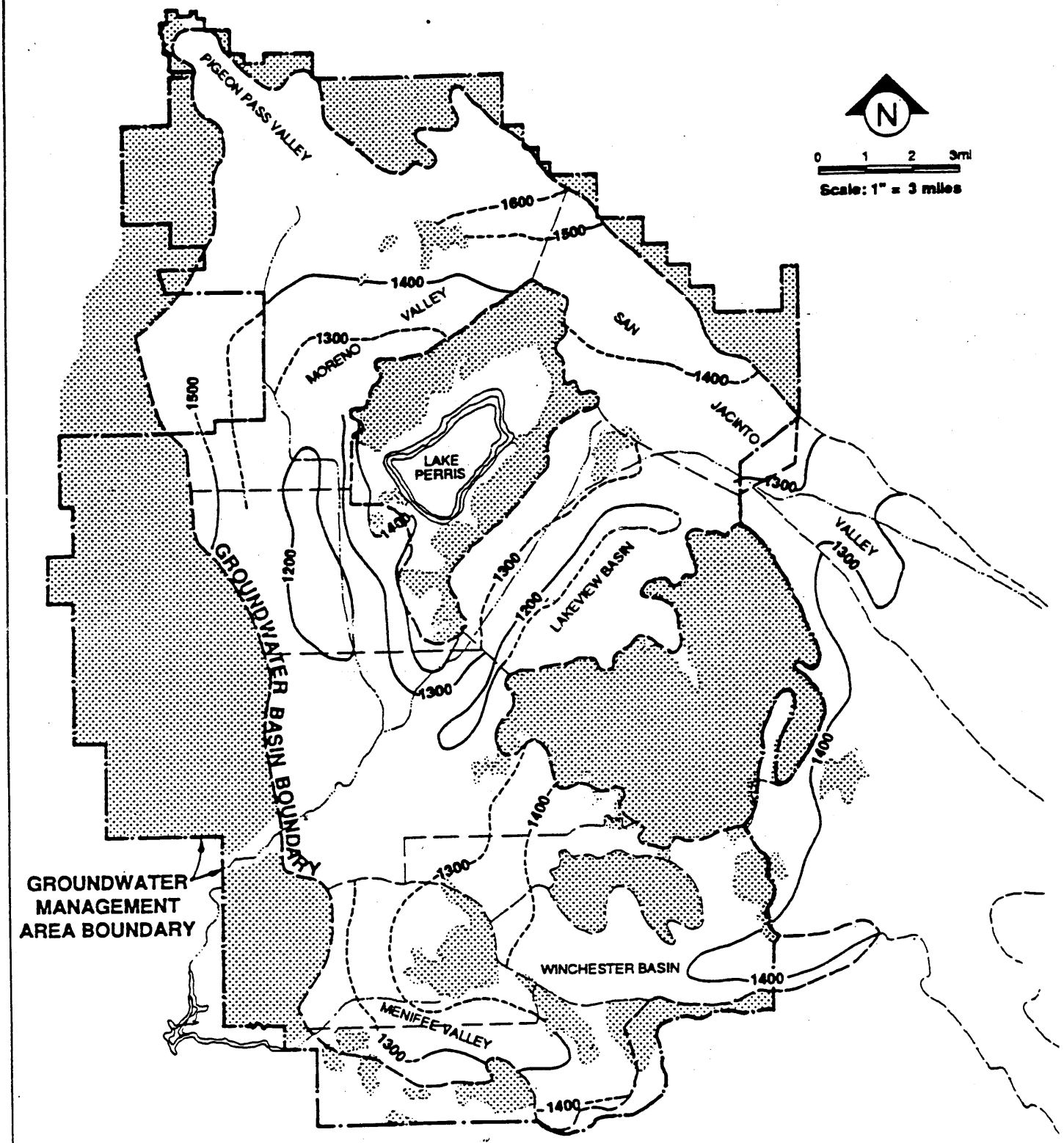
GROUNDWATER HYDROLOGY OF THE WEST SAN JACINTO BASIN

Groundwater Levels and Movement

Historically, the movement of groundwater generally followed the land surface profile toward and along the San Jacinto River and Salt Creek. Groundwater intersected the ground surface in San Jacinto Creek as the creek left the Perris South-II subbasin, and where Salt Creek exited the Menifee-I subbasin. The natural groundwater flow pattern has been altered by groundwater production.

Figure 4-3 is a groundwater elevation map for the West San Jacinto Groundwater basin area that corresponds to Spring 1974 conditions (California Department of Water Resources, 1978). Figure 4-4 is a comparable map for 1993. In 1974 there was subsurface flow from the San Jacinto Lower Pressure and Perris South I subbasins into Lakeview subbasin indicating that groundwater production in the Lakeview subbasin was large enough to reverse the historical groundwater flow direction from Lakeview to Perris South II subbasins. Groundwater originating in Perris North subbasin flowed into the San Jacinto Lower Pressure and Perris South subbasins. Groundwater in Perris South I flowed south to Perris South II. Groundwater in the Menifee subbasins and Winchester subbasin flowed north into Perris South II and Perris South III respectively. The groundwater from the Hemet subbasin flowed west into the Winchester subbasin.

Flow patterns have changed slightly in the intervening period of 1974 to 1993. Currently, groundwater continues to flow from the San Jacinto Lower Pressure and Perris South II subbasins into Lakeview subbasin; and from the Perris North subbasin into the Perris South I subbasin and continuing to Perris South II. The differences are as follows: there is a groundwater divide in the Menifee subbasin with some groundwater flowing north into Perris



LEGEND:

NONWATER-BEARING PORTION

1200 CONTOURS IN FEET BASED ON NEARBY DATA

INFERRED CONTOURS

Figure 4-3

GROUNDWATER ELEVATION MAP, 1974

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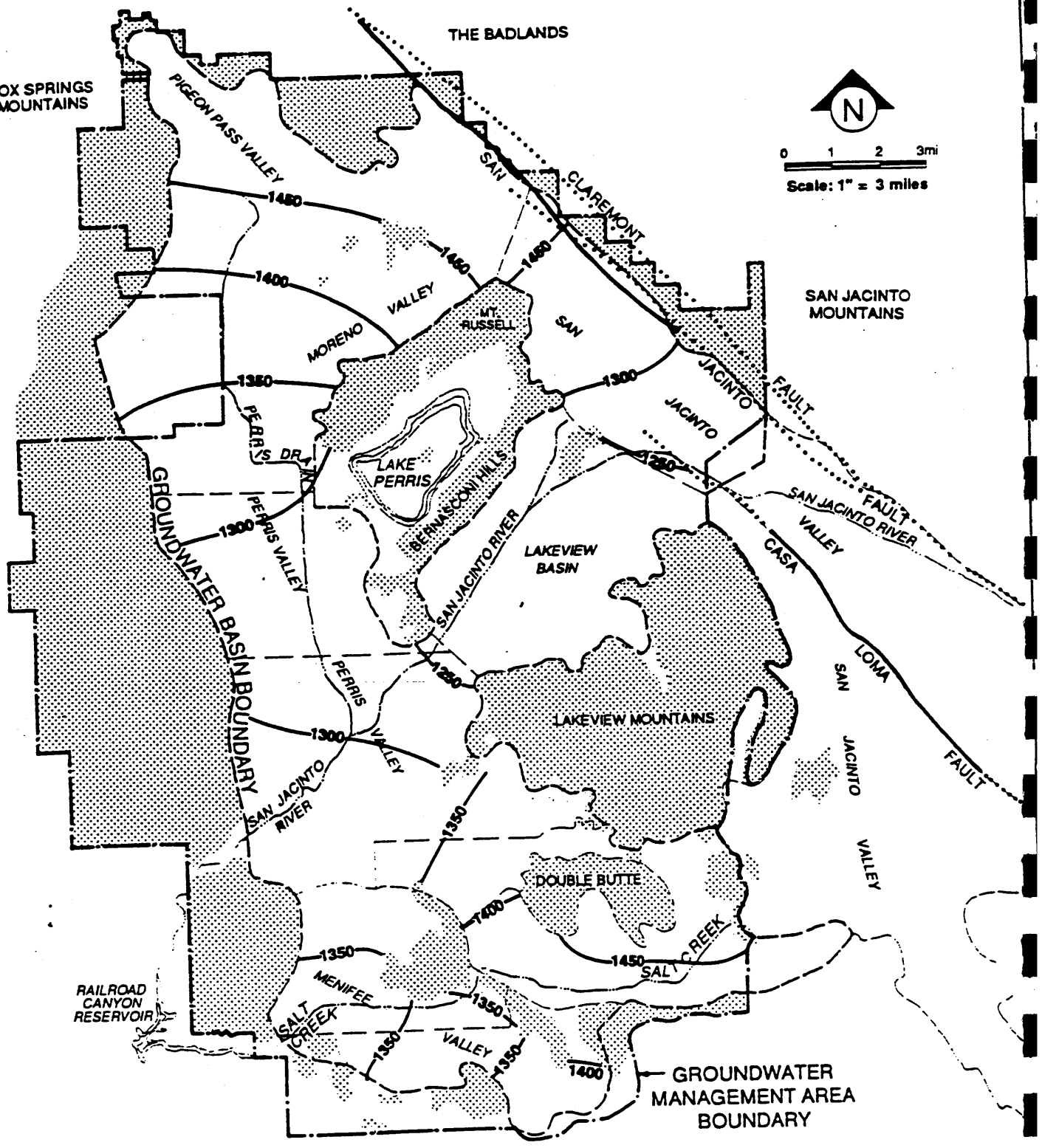
REFERENCE: DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1977.



LEGEND:

- NONWATER-BEARING PORTION
- KNOWN FAULTS
- INFERRED OR CONCEALED FAULTS
- —1450— CONTOURS IN FEET BASED ON NEARBY DATA

Figure 4-4

GROUNDWATER ELEVATION MAP, 1993

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South II subbasin, the remainder to a pumping depression in the Menifee II subbasin; groundwater in the Winchester subbasin flows northwest into the Perris South III subbasin and to the east into the Hemet subbasin.

The groundwater elevation changes between 1974 and 1993 are as follows:

San Jacinto Lower Pressure	-50 to -100 feet
Perris North	generally unchanged
Perris South I	+50 to +100 feet
Perris South II	+50 to +100 feet
Perris South III	+25 to +50 feet
Menifee I	+50 feet
Menifee II	+50 feet
Winchester	+25 to +50 feet
Lakeview	slightly less

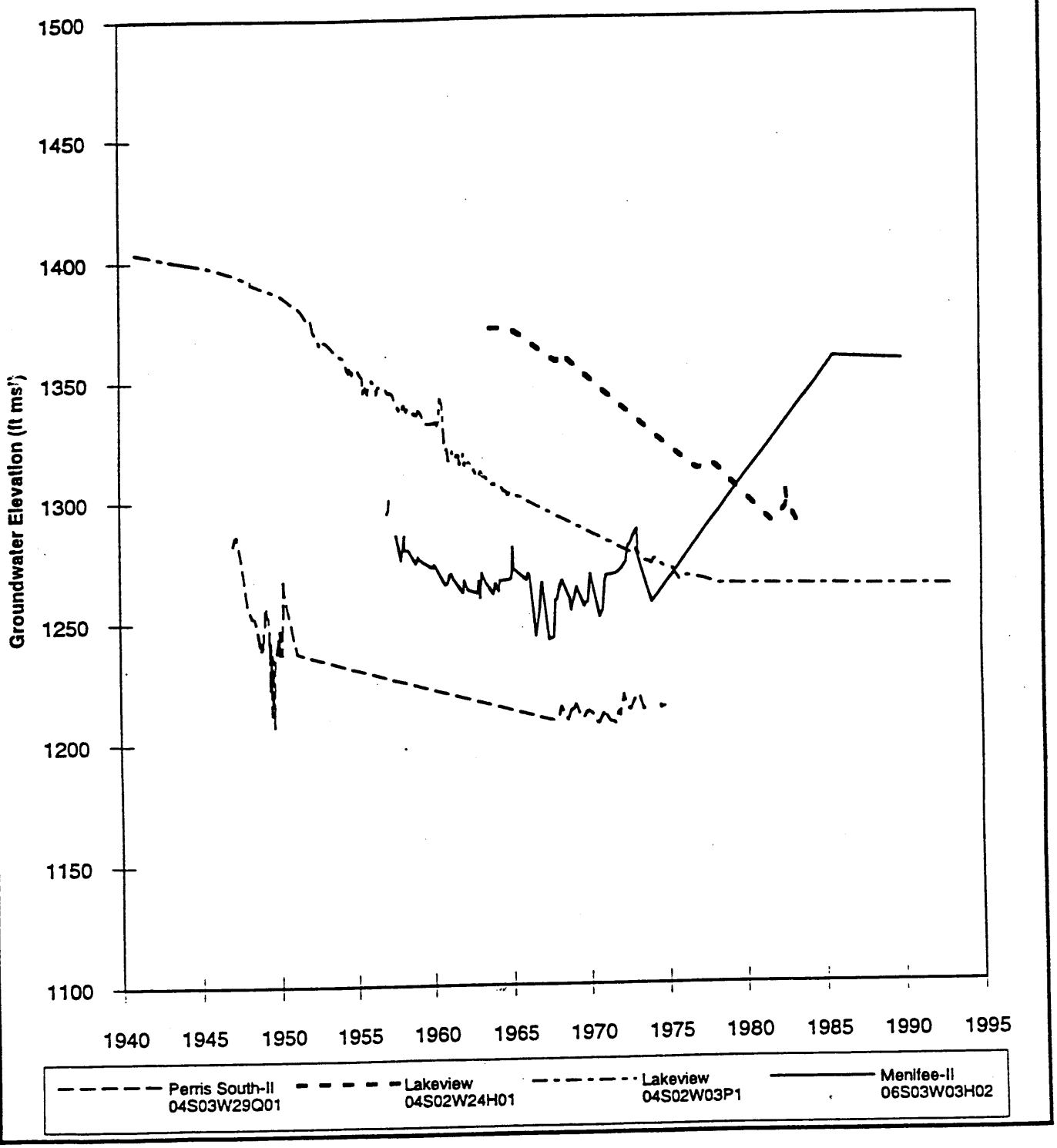
Generally, water levels will fluctuate both seasonally and on a long-term basis. Records of water levels in wells for the last 45 years generally indicate that the water table declined during the period of 1945 to the mid-seventies and recovered somewhat from the mid-1970's to the present. This long term trend was caused by a drought period that occurred from the mid 1940's to 1977, which was followed by an extremely wet period from 1978 to 1983. Agricultural use of groundwater has declined over the last twenty years without a concurrent increase in domestic groundwater usage.

Water levels are usually higher in the winter and spring months, when precipitation is greatest and there is less pumping than in the summer and fall months. When water levels in an area are declining from year to year, this indicates that more ground water is being removed from the area than is being replenished. Water levels were declining on a yearly basis through the mid 1970's. Groundwater elevation time-histories for selected wells are shown in Figure 4-5 for the Perris, Lakeview and Menifee subbasins; and Figure 4-6 for the Winchester and San Jacinto Lower Pressure subbasins. These hydrographs indicate the degree of groundwater level fluctuations that can occur in groundwater levels over the long term and seasonally.

Groundwater Hydrology

The occurrence and quality of groundwater in the West San Jacinto Basin groundwater management area are directly affected by the volume and quality of the water that recharges the area.

FIGURE 4-5 GROUNDWATER ELEVATION IN PERRIS, LAKEVIEW AND MENIFEE SUBBASINS



B&W Chart A
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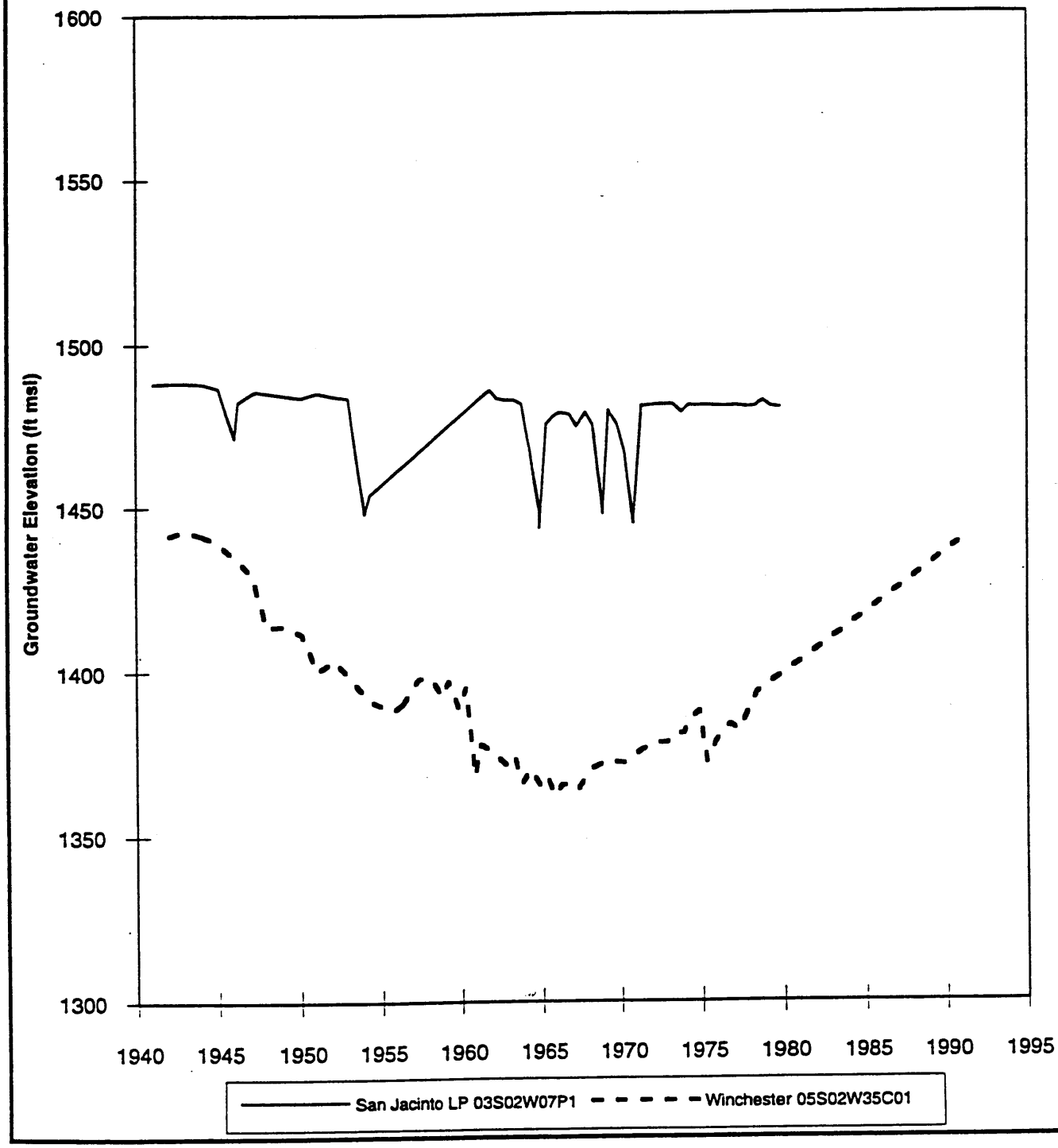
FIGURE 4-6 GROUNDWATER ELEVATION IN SAN JACINTO AND WINCHESTER SUBBASINS



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Recharge Components. Recharge in the management area consists of the following hydrologic components:

- ❑ deep percolation of stormflows
- ❑ deep percolation of precipitation
- ❑ deep percolation of applied water
- ❑ artificial recharge of imported water
- ❑ subsurface inflow from adjacent groundwater basins; and
- ❑ subsurface inflow from adjacent non-groundwater areas.

Estimates of these components were made by Water Resources Engineers in 1973 (Water Resources Engineers, 1973) and were updated in 1988 (Camp, Dresser & McKee, 1988). Table 4-2 lists the average annual value for each of these recharge components for year 2000 land use conditions for each subbasin. Values for Perris South-I, Perris South-II and Perris South-III are aggregated into Perris South. The Menifee subbasins have also been aggregated into one subbasin. These data were used in the 1994 Water Quality Control Plan (Basin Plan) developed by the Santa Ana Regional Water Quality Control Board (Regional Board). These components are described below.

Streambed Percolation. Stormflow percolation consists of percolation of stormflow in unlined channels and spreading grounds. The major unlined streams in the management area are the San Jacinto River, Perris Valley drain and Salt Creek. Table 4-2 contains estimates of stormflow percolation for each subbasin. Long term average stormflow percolation varies from about 300 acre-ft/yr for the Menifee subbasin, to a high of about 3,500 acre-ft/yr for the Perris North subbasin. The total stormflow percolation for the management area averages about 8,700 acre-ft/yr.

Percolation of Precipitation. Deep percolation of precipitation occurs when precipitation exceeds soil moisture demand. Soil moisture demand is the total water necessary to fully wet the soil and satisfy consumptive requirements of local vegetation. In most years, precipitation will not directly recharge groundwater unless the soil is kept wet from high precipitation and irrigation. Figure 4-7 shows the average annual precipitation in the management area. The average annual

TABLE 4-2
HYDROLOGIC COMPONENTS OF THE WEST SAN JACINTO BASINS
YEAR 2000 CONDITIONS PER BASIN PLAN
(acre-ft/yr)

Hydrologic Components	Subbasin						Total for West San Jacinto Basin
	Lakeview	Menifee	Perris North	Perris South	San Jacinto Lower Pressure	Winchester	
Inflow Components							
Stream Bed Percolation	1,200	300	3,500	1,600	1,000	1,100	8,700
Percolation of Precipitation	1,600	1,200	1,100	1,200	900	400	6,400
Imported Water Recharge	0	0	0	0	0	0	0
Local Stream Flow Diverted for Recharge	0	0	0	0	0	0	0
Subsurface Inflows from Mountain Boundaries	1,500	0	1,300	0	0	0	2,800
Deep Percolation of Applied Water	2,500	3,200	13,600	10,000	1,400	1,500	32,200
Municipal Wastewater	0	1,400	5,800	4,500	0	200	11,900
Irrigation	2,500	1,800	7,800	5,500	1,400	1,300	20,300
Subtotal Inflow	6,800	4,700	19,500	12,800	3,300	3,000	50,100
Outflow Components							
Subsurface Outflows to	0	0	0	0	800	1,200	2,000
Outside of WSJ Area	0	0	0	0	800	1,200	2,000
Groundwater Production(1)	4,000	0	2,300	1,400	500	0	8,200
Subtotal Outflow	4,000	0	2,300	1,400	1,300	1,200	10,200
Summary Statistics							
Approximate Net Inflow (natural safe yield)	6,800	3,300	13,700	8,300	2,500	1,600	36,200
Approximate Net Inflow plus Intentional Wastewater Recharge	6,800	4,700	19,500	12,800	2,500	1,800	48,100
Volume of Groundwater in Storage	283,000	56,000	123,000	248,000	382,000	36,000	1,128,000
Storage Capacity	515,000	101,000	347,000	402,000	391,000	41,000	1,797,000

Source - All hydrologic components from Basin Planning Model projections (JMM, 1991) except for groundwater production which was estimated from data in Table 4-3 and EMWD; and intentional wastewater recharge which came from EMWD (EMWD,1993).

(1) Excludes groundwater production from individual residences where production is less than 25 acre-ft/yr; groundwater production estimates based on land use are much higher and are projected to be about 26,600 acre-f/yr.

(2) Subtotal excludes subsurface flows between subbasins within the West San Jacinto Basin.

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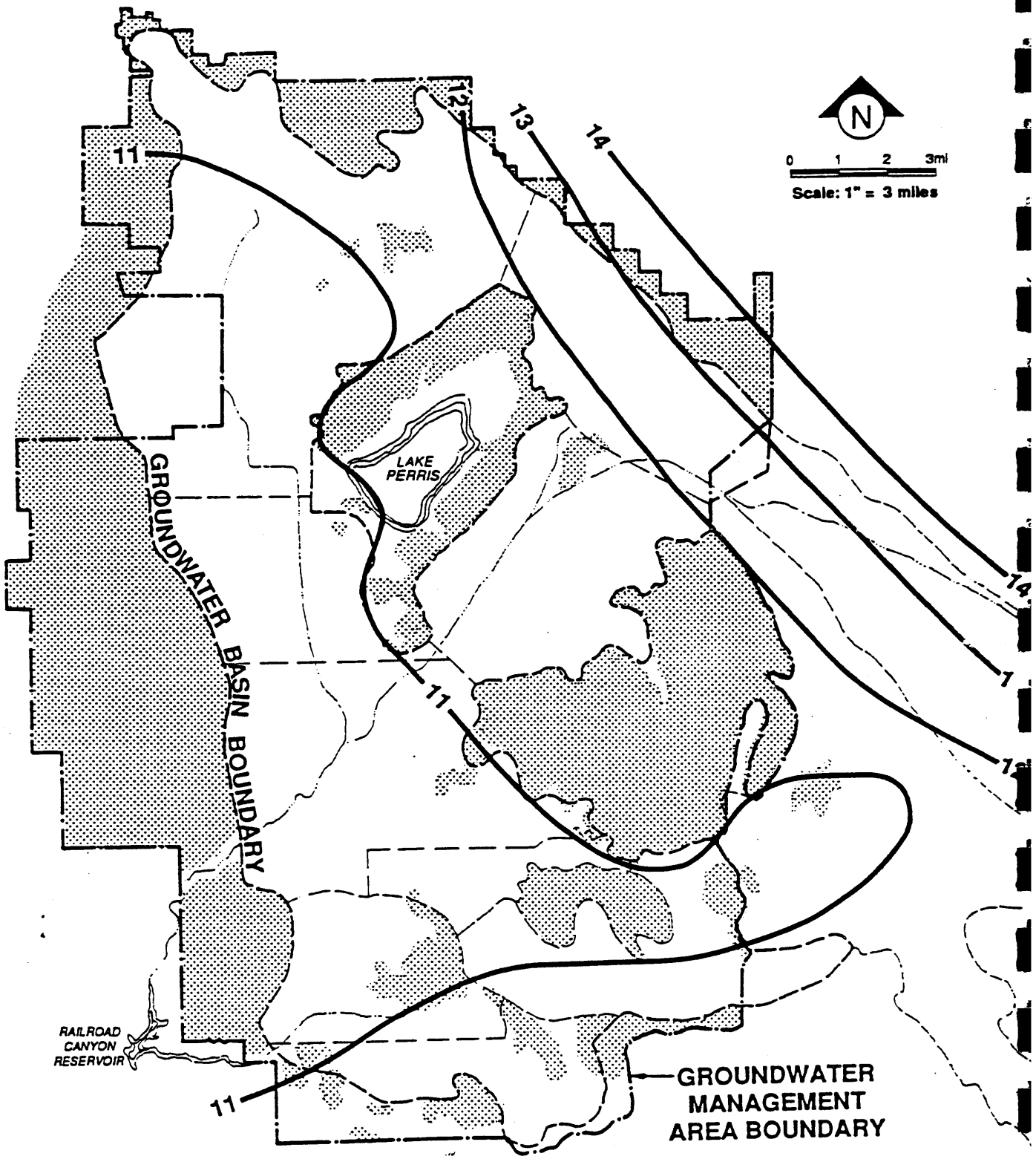

Figure 4-7

AVERAGE ANNUAL PRECIPITATION I GROUNDWATER MANAGEMENT ARE

LEGEND:

NONWATER-BEARING PORTION

—11— EQUAL PRECIPITATION IN INCHES (Snowfall Converted to Equivalent Rainfall)

REFERENCE: DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1977.

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precipitation in the management area ranges between 10 to 12 inches per year. By contrast, the potential evapotranspiration in the management area is about 50 inches (California Department of Water Resources, 1978). Deep percolation of precipitation will occur in wet years, during periods of very high precipitation. In the management area, deep percolation of precipitation varies from about 400 acre-ft/yr in the Winchester subbasin, to a high of about 1,600 acre-ft year in the Lakeview subbasin. The long term deep percolation of precipitation for the management area is about 6,400 acre-ft/yr.

Deep Percolation of Applied Water. The deep percolation of applied water includes recharge from percolation ponds at municipal water plants, septic and irrigation return flows. Recharge from municipal wastewater plants, in order of magnitude, occurs in Perris South (from the Sun City and Perris reclamation plants), Perris North (from the Moreno Valley reclamation plant), and Winchester subbasins (from the Rancho Temecula reclamation plant). The annual recharge of reclaimed water in the management area is projected to be about 11,900 acre-ft/yr (Eastern Municipal Water District, 1993).

The deep percolation of irrigation ranges from about 1,300 acre-ft/yr in the Winchester subbasin, to 7,800 acre-ft/yr in the Perris North subbasin. The long term deep percolation of irrigation and septic tank returns for the management area is about 20,300 acre-ft/yr.

The deep percolation of applied water from reclamation plants, irrigation returns and septic tank disposal ranges from about 1,400 acre-ft/yr for the San Jacinto Lower Pressure subbasin, to about 13,600 acre-ft/yr for the Perris South subbasin.

Subsurface Inflow . Subsurface inflow along mountain boundaries is defined as the sum of subsurface inflows from the mountain boundaries plus runoff that percolates to groundwater along the mountain - aquifer contact. Subsurface inflow is projected to be about 2,800 acre-ft/yr.

Subtotal Inflow. The total inflow or recharge to the management area ranges from a low of 3,000 acre-ft/yr for the Winchester subbasin, to a high of about 19,500 acre-ft/yr for the Perris South subbasin. The total of all recharge into the management area is about 50,200 acre-ft/yr.

Outflow Components. Outflow from the management area consists of the following hydrologic components:

- subsurface outflow to areas outside the management area;
- groundwater production; and
- consumptive use from riparian vegetation.

Table 4-2 lists the average value for each of these recharge components for year 2000 land use conditions for each subbasin. These components are described below.

Subsurface Outflow. Subsurface outflow to areas outside the management area ranges from a low of zero for the Lakeview Menifee, Perris North and Perris South subbasins, to a high of about 1,200 acre-ft/yr for the Winchester subbasin. The total water lost to subsurface outflow is about 2,000 acre-ft/yr in the management area.

Groundwater Production. Groundwater production data was obtained for the period 1987 through 1991, the last five year period for which the State Water Resources Control Board (SWRCB) had compiled records of reported groundwater production. These data are listed in Table 4-3. Actual groundwater production is significantly larger because some groundwater producers do not report their groundwater production to the SWRCB. Groundwater production, while a hydrologic component, is omitted from the table because it is unknown. The safe yield estimate shown in Table 4-2 is based on total inflows minus non pumping outflows.

Losses to Riparian Vegetation. Losses to riparian vegetation are negligible. In the predevelopment past, uptake of groundwater by riparian vegetation was probably large, but has dropped to insignificance because of agricultural land development and lower groundwater levels.

Subtotal Outflow. The total outflow in the basin, from all sources, ranges from a low of 1,300 acre-ft/yr for the San Jacinto Lower Pressure subbasin, to a high of 4,600 acre-ft/yr for the Menifee subbasin. The total outflow for the management area is about 14,800 acre-ft/yr.

Volume of Groundwater in Storage. The volume of groundwater in storage was estimated from the Basin Planning Model simulations used in the 1993 Basin Plan. These estimates are listed in Table 4-2 and correspond to the year 2000. The volume of groundwater in storage is estimated as the product of the thickness of saturated sediments, times the specific yield, times the area of saturated sediments. The volume of groundwater in storage ranges from about 36,000

TABLE 4-3
HISTORICAL GROUNDWATER PRODUCTION

User	State Well ID	Reported Groundwater Production (acre-ft/yr) 1987	1988	1989	1990	1991
		Lakeview Subbasin Production				
Hammerschmidt	4S/2W 07J	750	750	750		
Monte	4S/2W 10C		600.3	792	653.4	428.1
Monte	4S/2W 09A	579	600.4	201	507.2	26.8
Nuevo Water Co.	4S/2W 18A	527	580.5	780.6	720	382.7
Nuevo Water Co.	4S/2W 18B	522.6	568.3	520	407	777.5
Nutriline	4S/2W 08Q	83	100.1	102.4	124.8	70
Nutriline	4S/2W 08K	53.7	120.6	102.8	120	130
Nutriline	4S/2W 08	361.6	1199.2	1166.9	1132.1	980
Verger	4S/2W 10B	724		620	600	510
Verger	4S/02W 10A	440		430	420	350
Total Annual Production for Lakeview Subbasin		4,041	4,519	5,466	4,685	3,655
		Perris North Subbasin Production				
E.G.M.W.C.	3S/3W 06N	13.8	12.5	77.6	1.1	0.3
EMWD	3S/3W 6D	6176	763	613.8	601.5	231.3
Knox	3S/3W 30Q	200				3.6
Schori	3S/3W 31Q			750		
UCR	3S/3W 21C	39.9	56.5	71.5	34.1	61.8
UCR	3S/3W 22D	266.5	325.5	181.4	276.3	266.8
UCR	3S/3W 21A	35.9	71.4	30.9	42.3	46
Warmington	3S/3W 21 F1		847		845	
Total Annual Production for Perris North Subbasin		1,732	2,076	1,725	1,800	610
		Perris South-I Subbasin Production				
Smith	4S/3W 16N	94.8				
Total Annual Production for Perris South-I Subbasin		95	0	0	0	0
		Perris South-II Subbasin Production				
Monte	5S/3W 11M	556	558	716	318	421.2
Underwood Farms	5S/3W 14P	375	365	365	365	350
Total Annual Production for Perris South-II Subbasin		931	923	1,081	683	771
		Perris South-III Subbasin Production				
Agri-Empire	5S/3W 13A	455	442	496	441	381
Agri-Empire	5S/3W 13Q	205	168	170	164	148
Agri-Empire	5S/3W 13A1					165
Total Annual Production for Perris South-III Subbasin		660	610	666	605	694
		San Jacinto Lower Pressure Subbasin Production				
Agri-Empire	4S/2W 35D1	576		638	293	204
H. Welch	3S/2W 33R1	20.2				
Hill & Sooy	3S/2W 28Q	166	208	214	211	172
Total Annual Production for San Jacinto Lower Pressure Subbasin		762	208	852	504	376
Total Reported Groundwater Production West San Jacinto Groundwater Basin		13,721	8,336	9,790	8,277	6,106

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acre-ft for the Winchester subbasin, to about 380,000 acre-ft in the San Jacinto Lower Pressure subbasin. The total groundwater in storage in the management area is about 1,130,000 acre-ft.

The storage capacity of these subbasins is also shown in Table 4-2. The storage capacity is equal to the volume of groundwater that could be stored in the basin with a minimum 50 feet depth to water. The storage capacity of groundwater in storage ranges from about 41,000 acre-ft for the Winchester subbasin, to about 515,000 acre-ft for the Lakeview subbasin. The total storage capacity in the management area is about 1,800,000 acre-ft

Safe Yield. Two estimates of the safe yield are presented in Table 4-2. The natural safe yield of the groundwater basins is assumed equal to the net inflow and is numerically equal to the long term average inflow, minus subsurface outflow from the management area, minus the average annual percolation of reclaimed water. The natural safe yield ranges from a low of 1,600 acre-ft/yr for the Winchester subbasin, to a high of about 13,700 acre-ft/yr for the Perris North subbasin. The natural safe yield for the management area is about 36,200 acre-ft. If the percolation of reclaimed water is included in the yield, then the safe yield will range from 1,800 acre-ft/yr for Winchester subbasin, to 19,500 acre-ft/yr for the Perris North subbasin. The safe yield of the management area is about 48,100 acre-ft/yr.

GROUNDWATER QUALITY

The water quality trends in the West San Jacinto Groundwater Basin are typical of the arid southwest. There are three principle sources of water quality degradation in operation in the management area. Naturally occurring brackish groundwater occurs in the vicinity of Salt Creek in the Menifee and Winchester subbasins; and in the Perris South-II subbasin in the vicinity of San Jacinto Creek. Groundwater production patterns in these areas have caused the brackish groundwater to spread out and thus affect larger areas.

The second principle cause of water quality degradation is irrigated agriculture. The mineral content in irrigation return flows to groundwater is three to four times the mineral content of the irrigation source. The irrigation returns degrade the groundwater. If the groundwater is subsequently reused, the mineral content of the irrigation returns are further increased causing additional groundwater degradation. Groundwater will continuously degrade unless additional sources of high quality recharge are introduced to the basin.

Finally, elevated boron and fluoride levels in groundwater have been observed near faults, in particular near the Casa Loma and San Jacinto faults. Boron, fluoride and elevated groundwater temperatures are common near faults. The area degraded by these contaminants is near the Casa Loma and San Jacinto faults.

Groundwater quality descriptions are presented below for each subbasin. These descriptions are based on all groundwater quality data currently available for the management area. Most of the discussion is based on the groundwater quality descriptions developed by the DWR in *Water Resources Evaluation of the San Jacinto Area* (California Department of Water Resources, 1978). With the exception of the Menifee-I, Menifee-II and Winchester subbasins, very little new water quality data has been collected since the DWR prepared the above-mentioned report. Data collected after 1978, including a recent round of water quality sampling by the United States Geological Survey (USGS), were reviewed in detail and, where appropriate, modifications to the DWR's descriptions were developed and included herein.

The water quality discussion presented herein is limited to general minerals, nitrate and chloride due to the lack of data on heavy metals, organics and radionuclides. An inventory of the available water quality data at wells is included in Appendix B. The available water quality data base contains water quality data for about 300 wells. The average period of record for these wells is about 5 years, with 62 percent of the wells having only one water quality sample. On the average, about half of the water quality data is from before 1980 and about 72 percent before 1990. Most of the recent data was obtained from wells in the Menifee subbasins as part of EMWD's Menifee desalter studies, and groundwater quality sampling surveys by the USGS. It should be emphasized that there is practically no information on heavy metals, organics or radionuclides.

New groundwater quality data will need to be collected and a new water quality characterization of the West San Jacinto Groundwater Basin will need to be prepared in the implementation of the groundwater management plan. The need for new data will become obvious in the discussion of Sections 7 and 8. A plan to obtain these data has been incorporated into the management plan described in Section 8.

Perris North Subbasin

Figure 4-8 shows the distribution of TDS in the management area as interpreted by the DWR (DWR 1978). TDS, nitrate and the general inorganic chemistry for the Perris North subbasin is shown in Figure 4-9. Figure 4-9 is based on all available data and corresponds approximately to 1993 conditions. In the Perris North subbasin, TDS concentrations generally range from about 300 mg/L to 600 mg/L with some wells exceeding 800 mg/L. The chemical character of its water is mostly sodium chloride, probably because of the extensive irrigated agriculture. Evapotranspiration and the frequent application of irrigation water produce changes in the relative concentrations of the mineral constituents that leave more sodium and chloride in solution. Recycling of this water further concentrates these ions. The only source of dilution is the deep percolation of precipitation and stormflow which are small compared to total recharge in the subbasin (see Table 4-2).

Nitrate concentrations range from about 1 to 12 mg/L (as nitrogen) with most values between 4 mg/L to 9 mg/L. Nitrate concentrations have increased over the years as a result of fertilization practices in the valley. Figures 4-10, 4-11, and 4-12 show TDS, nitrate and chloride trends in the Perris North subbasin. Figure 4-11 suggests an increasing trend of nitrate concentration.

Most of the water ranges from soft to moderately hard. Fluoride and boron concentrations are relatively high in certain wells in the area, possibly indicating the presence of unmapped faults. For human consumption, water from some wells in the area may not meet Department of Health Services standards for nitrate and fluoride concentrations.

Perris South Subbasins

Figure 4-13 illustrates the TDS, nitrate and general inorganic chemistry of the Perris South I and Lakeview subbasins and Figure 4-14 shows the same interpretation for the Perris South II and Perris South III subbasins. Figures 4-13 and 4-14 are based on all available data and correspond approximately to 1993 conditions. The variations in TDS and nitrate concentrations in the Perris South subbasins are listed below (mg/L).

Subbasin	TDS	Nitrate (as N)
Perris South-I	500 to 1300	0.0 to 7.2
Perris South-II	640 to 14,000	0.0 to 9.0
Perris South-III	400 to 3,300	5.0 to 31

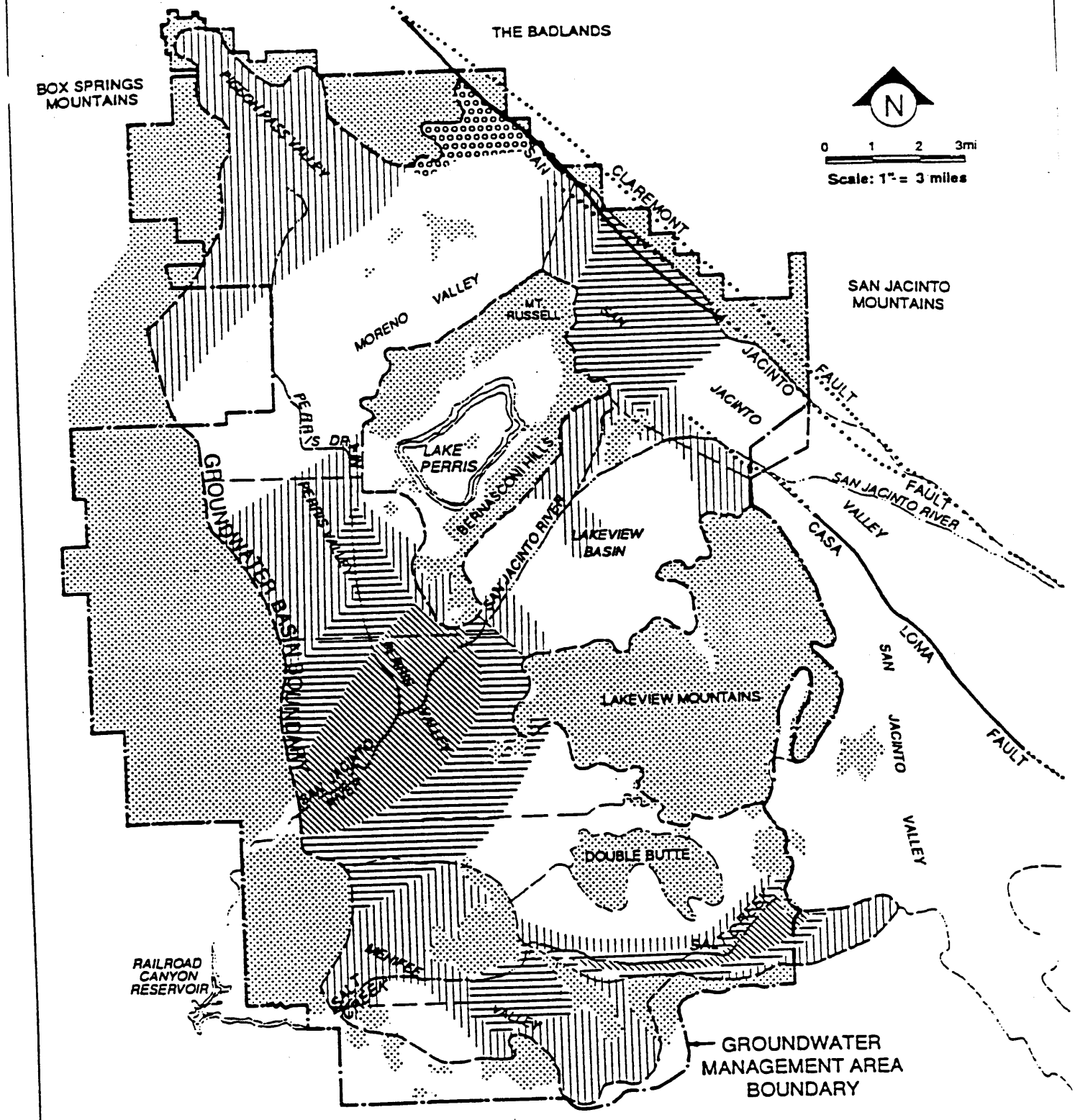

Figure 4-8
GENERAL TDS MAP, 1974

REFERENCE: DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1977.

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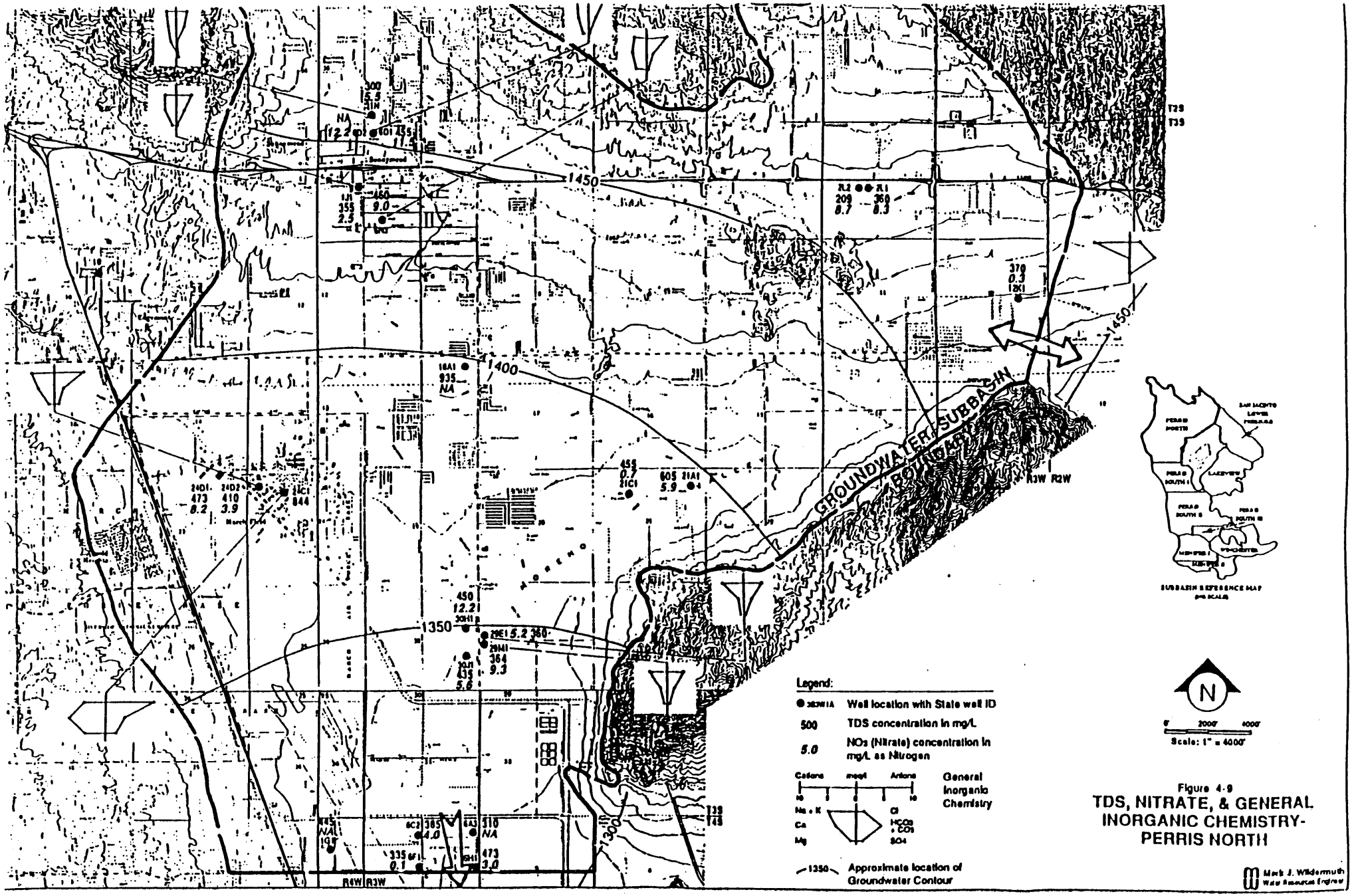
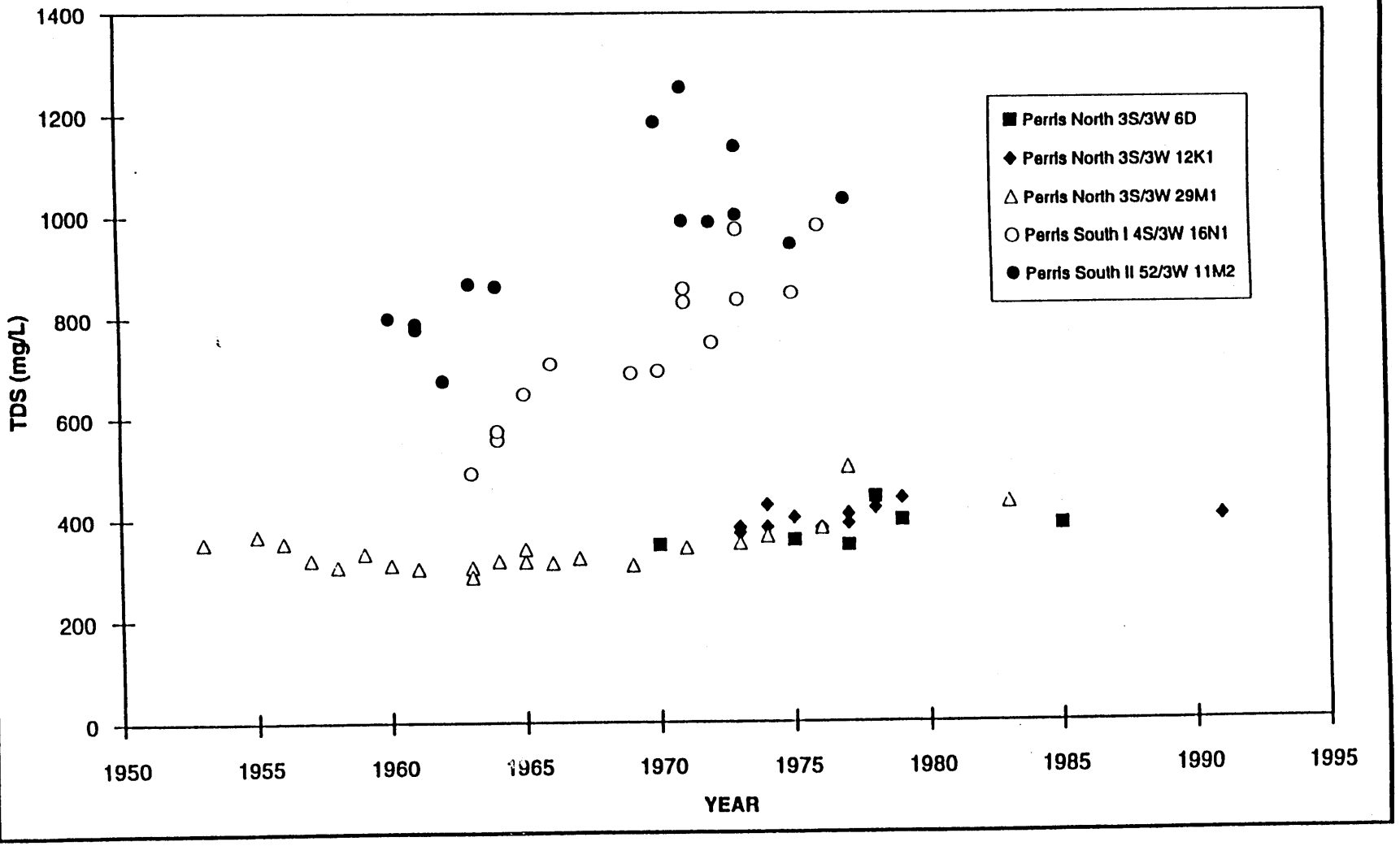


Figure 4-9
TDS, NITRATE, & GENERAL INORGANIC CHEMISTRY-PERRIS NORTH

FIGURE 4-10 TDS CONCENTRATION IN PERRIS NORTH AND SOUTH BASINS



TDS Plot Perris N&S
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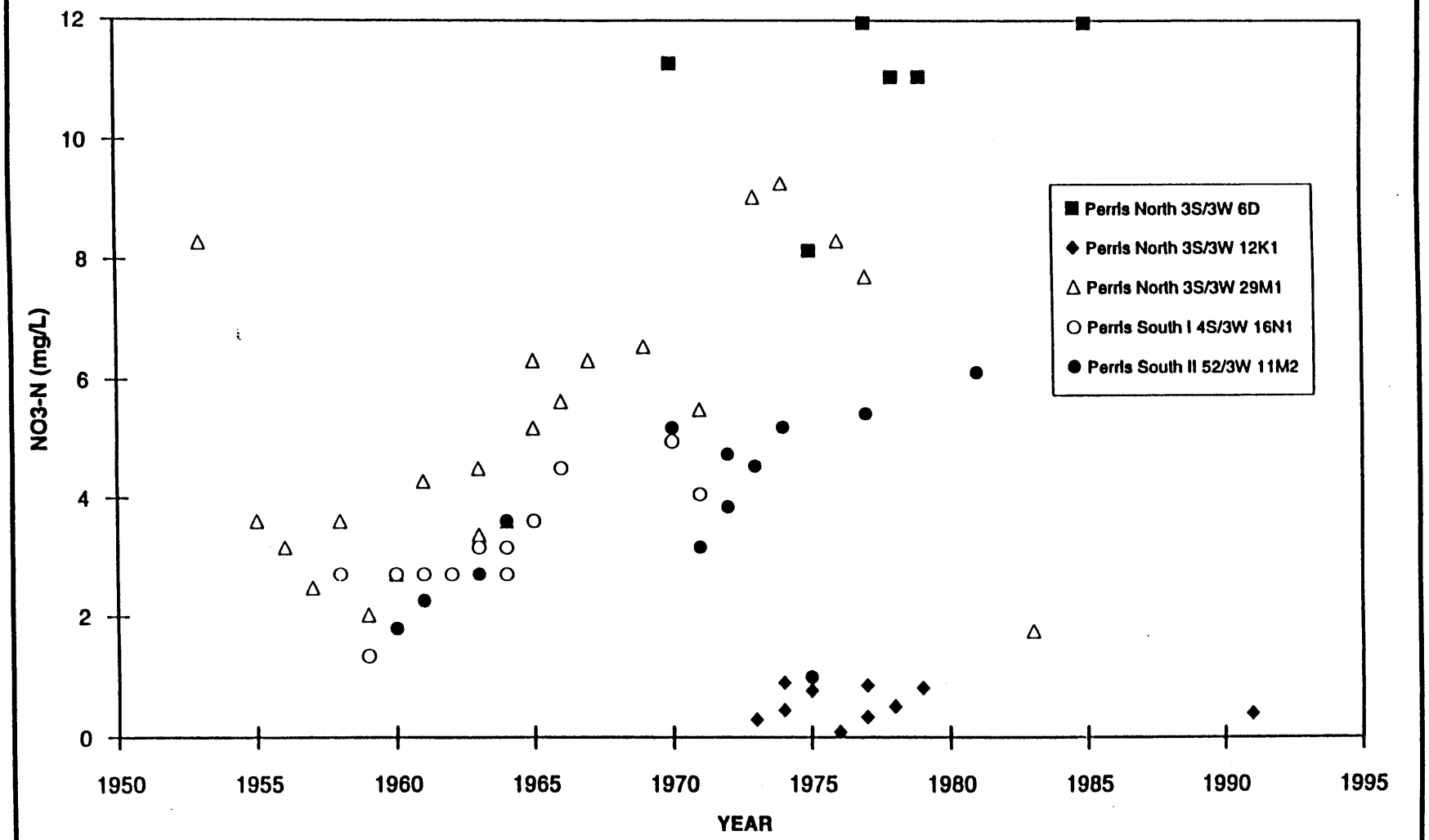
FIGURE 4-11 NITRATE-N CONCENTRATION PERRIS NORTH AND SOUTH BASINS



NO3 Plot Perris N&S
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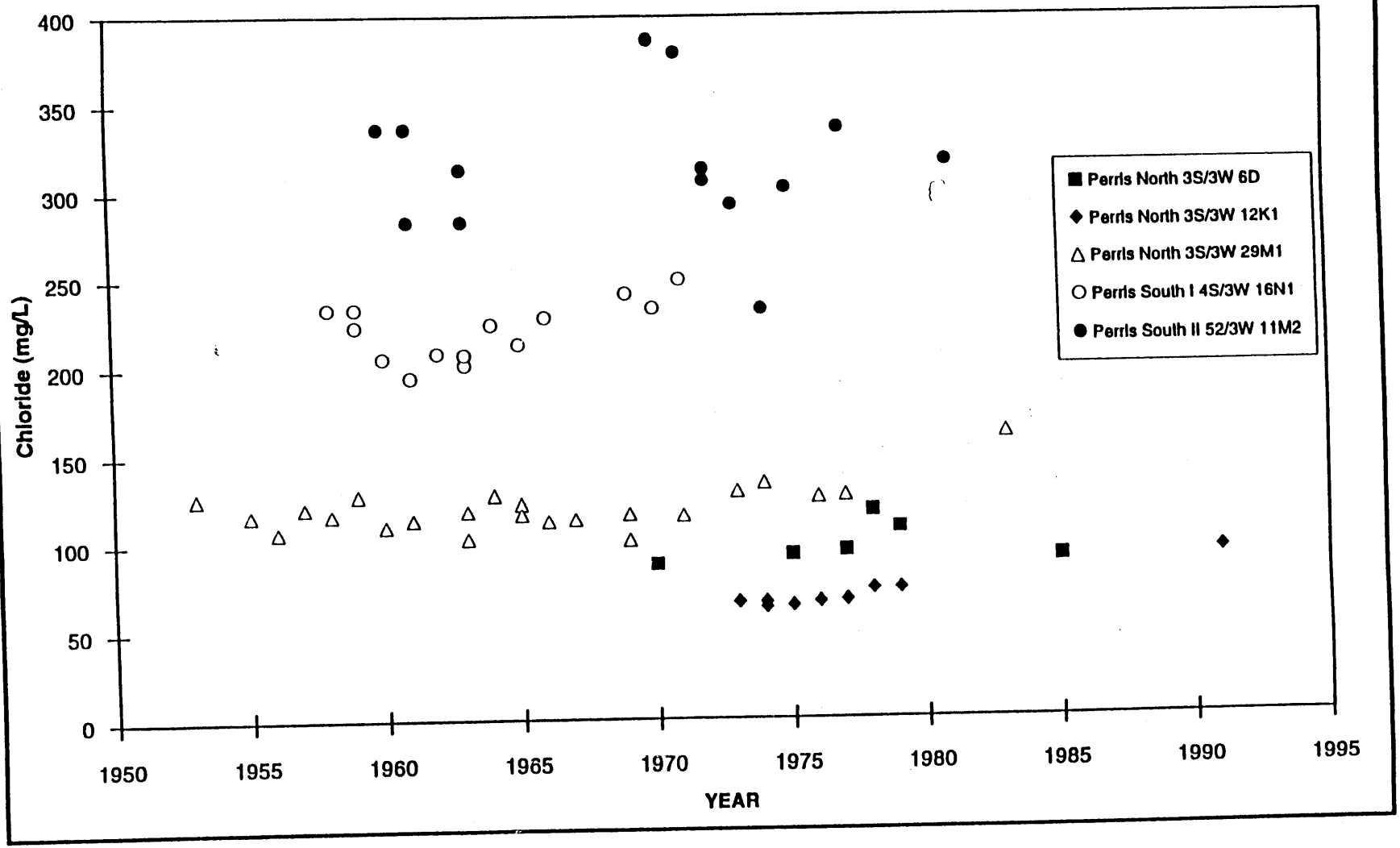
FIGURE 4-12 CHLORIDE CONCENTRATION PERRIS NORTH AND SOUTH BASINS



Chloride Plot Perris N&S
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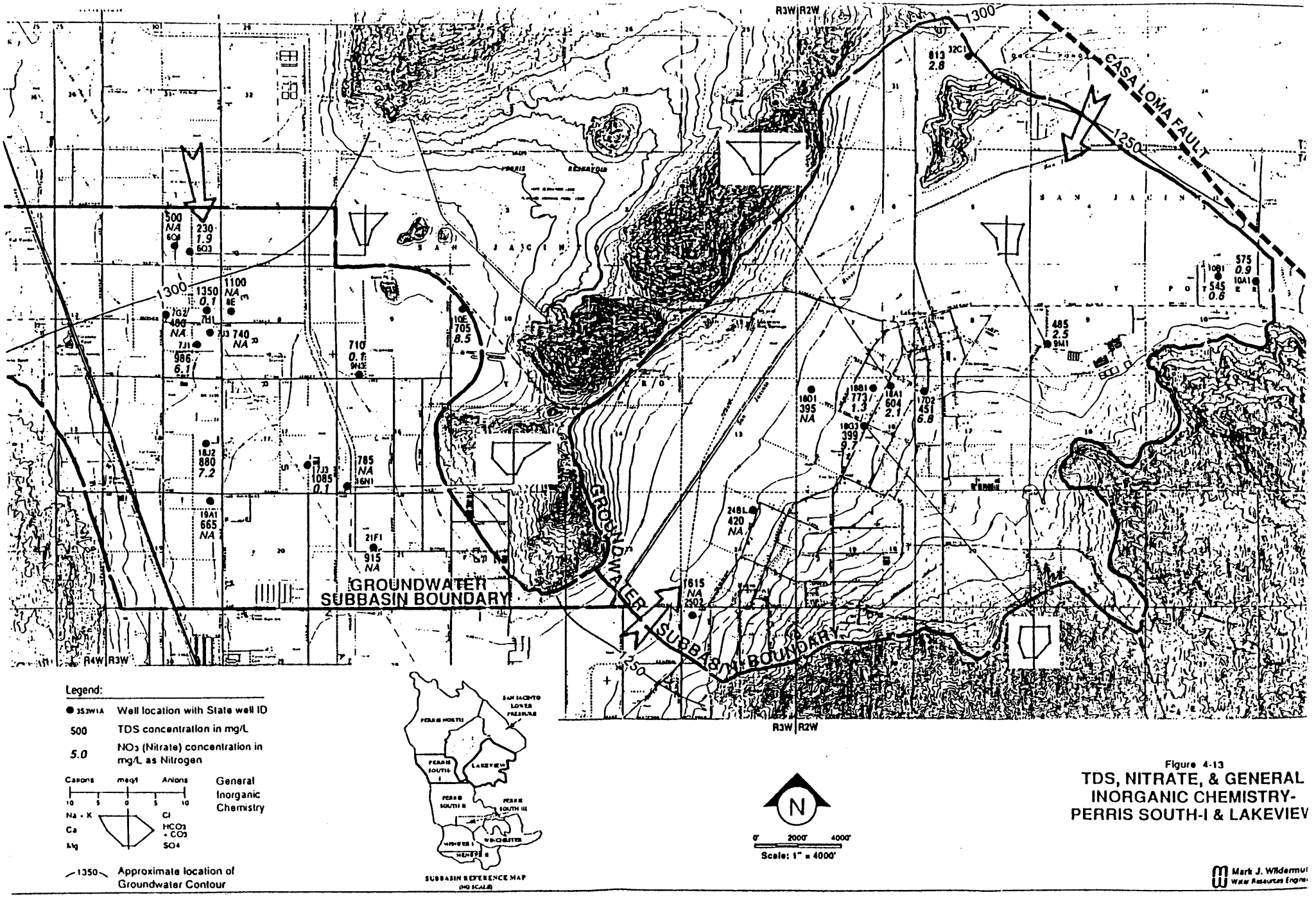

Figure 4-13
TDS, NITRATE, & GENERAL INORGANIC CHEMISTRY-PERRIS SOUTH-I & LAKEVIEW

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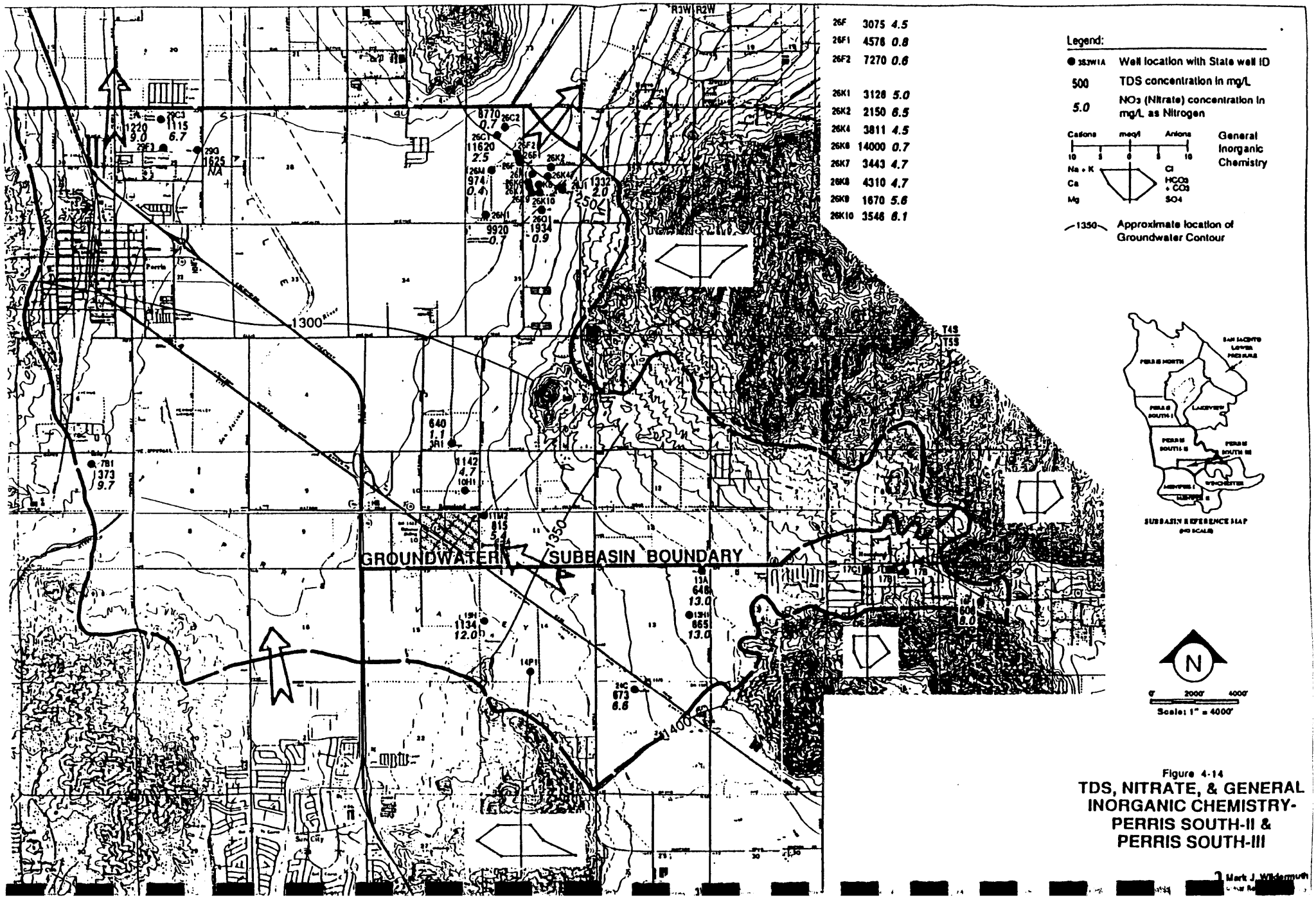

Figure 4-14

TDS, NITRATE, & GENERAL INORGANIC CHEMISTRY- PERRIS SOUTH-II & PERRIS SOUTH-III

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The poorest quality water is found near the San Jacinto River in the Perris South-II subbasin. This brackish water is believed to be the result of the large evapotranspiration losses incurred because of the high water table that existed in the past. As wells were abandoned because of this brackish water, pumping increased in the areas of better quality to the north and south. As a result, brackish water has spread out toward these areas. Thus, the TDS concentration of the groundwater has increased as water levels have declined in the areas north and south of the river. Figures 4-10, 4-11, and 4-12 illustrate TDS, nitrate and chloride trends in the Perris South subbasins. Figure 4-10 shows this increase in TDS concentration. The Ski Land area has anomalously high TDS concentrations ranging from 1,700 mg/L to 14,000 mg/L.

Menifee Subbasins

Figure 4-15 illustrates the TDS, nitrate and general inorganic chemistry of the Menifee-I and Menifee-II subbasins. Figure 4-15 is based on all available data and corresponds approximately to 1993 conditions.

Groundwater flow between Menifee and the adjacent subbasins is negligible. The volume of groundwater in storage for Menifee-I and Menifee-II is relatively small and is estimated at about 56,000 acre-ft (Table 4-2). Groundwater produced in these subbasins was, and is, used for agriculture and landscape irrigation. Returns from irrigation have contributed to increased mineral concentrations in these subbasins.

Under natural conditions, groundwater flowed toward Salt Creek from all directions and from Salt Creek westward, where high groundwater caused large evapotranspiration losses and concurrent salt buildup. In time, brackish water developed in these areas and, under normal conditions, remained close to the creek. TDS concentrations throughout the basin ranged from 300 to 1,500 mg/L in 1974, and have increased to range from 800 to 3,700 mg/L.

Most groundwater in the Menifee-I and Menifee-II subbasins cannot be used for domestic supply without demineralization or blending with imported water. Agricultural usage is somewhat limited due to high chloride and sodium concentrations.

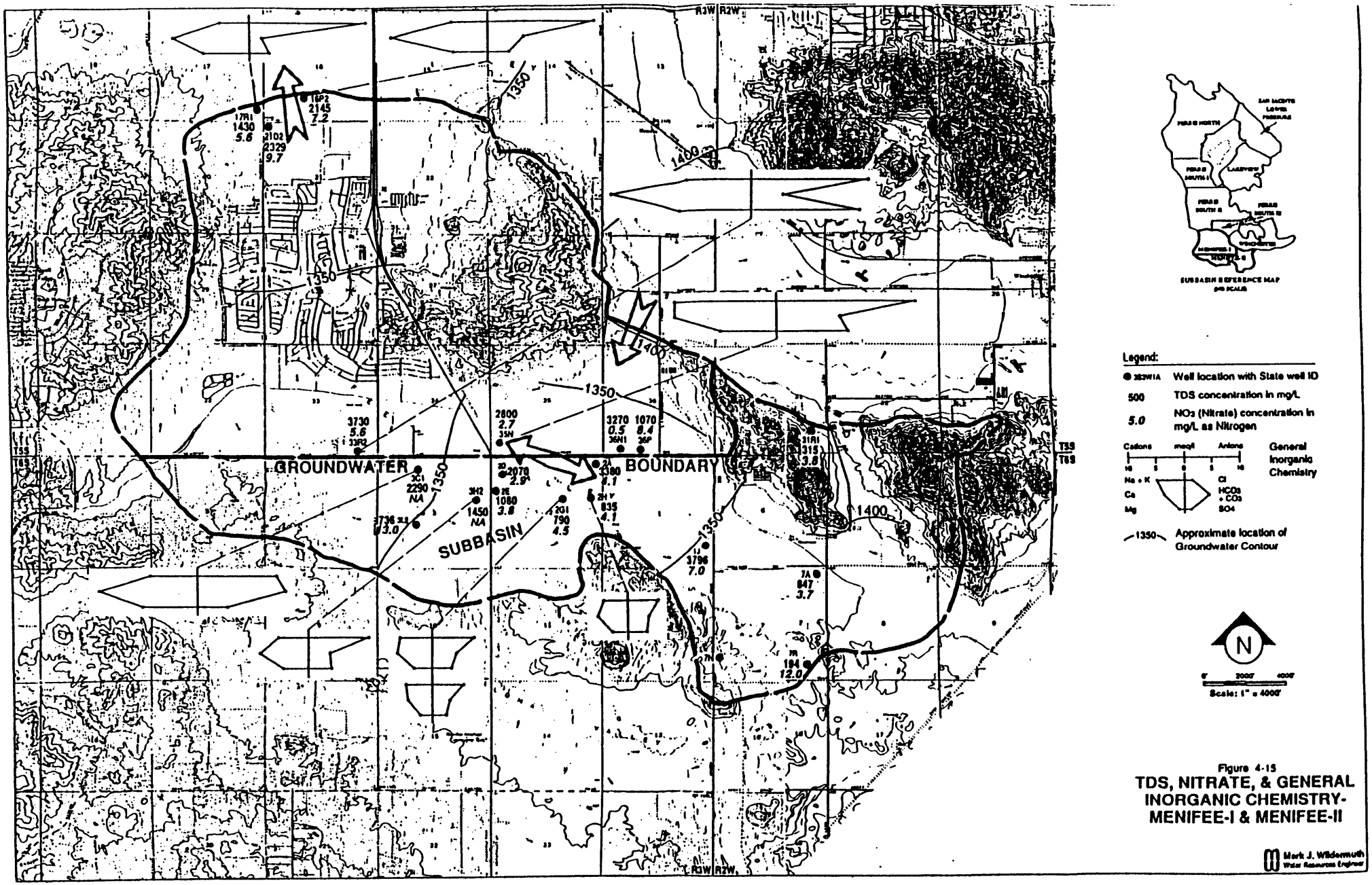

Figure 4-15

TDS, NITRATE, & GENERAL INORGANIC CHEMISTRY-MENIFEE-I & MENIFEE-II

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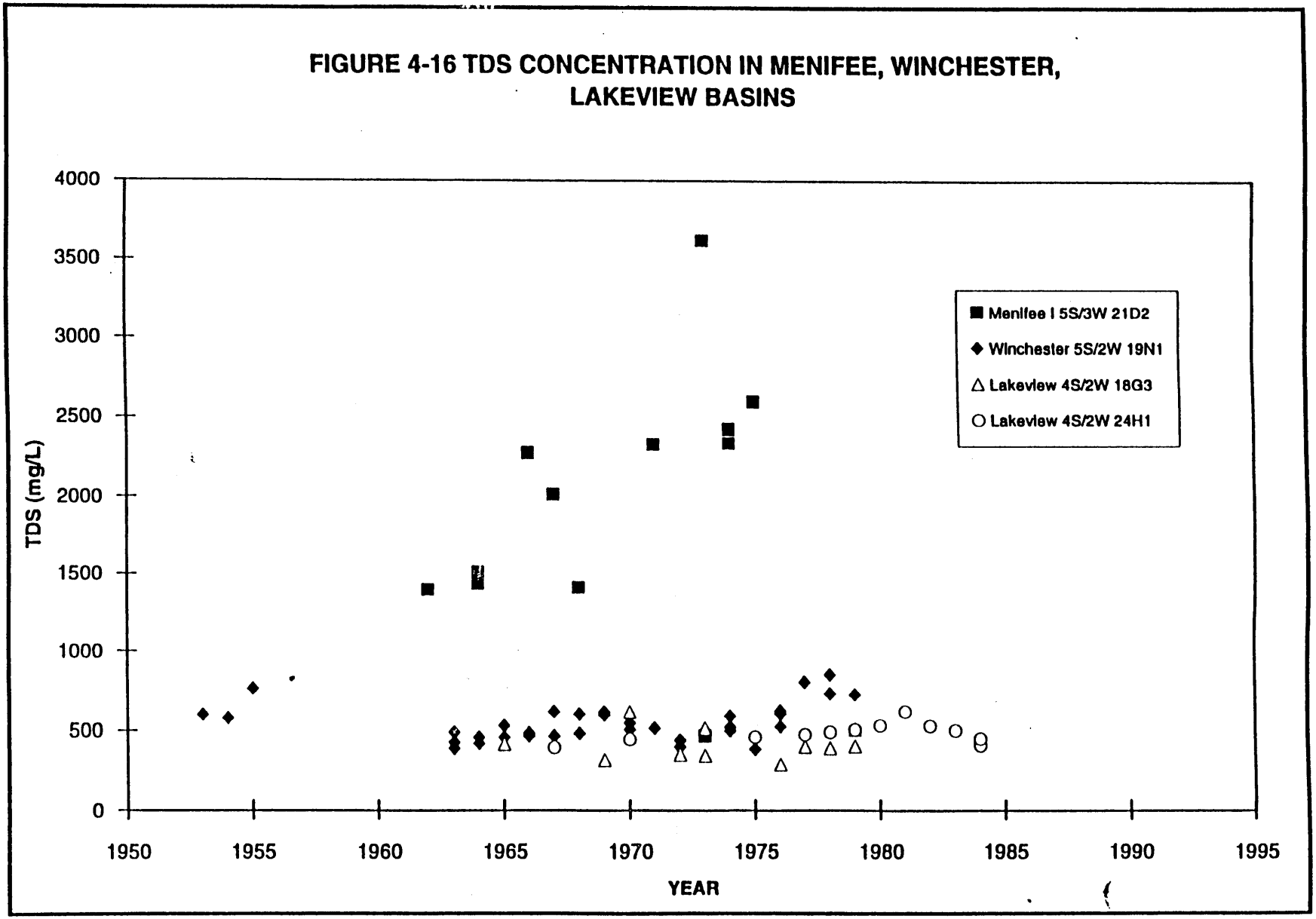
Lakeview Subbasin

Figure 4-13 illustrates the TDS, nitrate and general inorganic chemistry of the Lakeview subbasin. Figure 4-13 is based on all available data and corresponds approximately to 1993 conditions. Figures 4-16, 4-17 and 4-18 contain time histories for two wells in the Lakeview subbasin covering the period of 1957 to 1989.

The principle sources of groundwater in this basin are underflow from the San Jacinto Lower Pressure, Perris South I, Perris South II subbasins, stormflow percolation in San Jacinto Creek, and runoff from the Lakeview Mountains and Bernasconi Hills. Groundwater quality under natural conditions has been altered by a groundwater level drop of about 200 feet that has changed the direction of flow of groundwater. Groundwater flows toward Lakeview from all sides. Groundwater on the northwest and southeast sides of the basin has TDS concentrations of below 500 mg/L as a direct result of the recharge of the Bernasconi Hills and Lakeview Mountains, respectively. Brackish groundwater is entering from the Perris South-II subbasin because of lowered groundwater levels near Lakeview. The most conspicuous constituents of the brackish water are sodium and chloride. TDS concentrations range from 400 to 1,600 mg/L, with more typical values ranging from 400 to 600 mg/L. Nitrates range from 1 to 9 mg/L as nitrogen, with typical values less than 6 mg/L. Most of the groundwater in the basin is sodium chloride in character. The Casa Loma fault, which forms the eastern boundary of the basin, affects the quality of water in that area. Both boron and fluoride concentrations are relatively high near the fault and in a few other specific areas of the basin. Chloride is generally high and most of the groundwater is moderately hard.

With the exception of some instances of elevated fluoride, groundwater in the Lakeview subbasin is suitable for domestic and municipal supply. Agricultural usage is somewhat limited due to high boron and chloride concentrations.

FIGURE 4-16 TDS CONCENTRATION IN MENIFEE, WINCHESTER, LAKEVIEW BASINS



TDS Plot Men-Win-Lak
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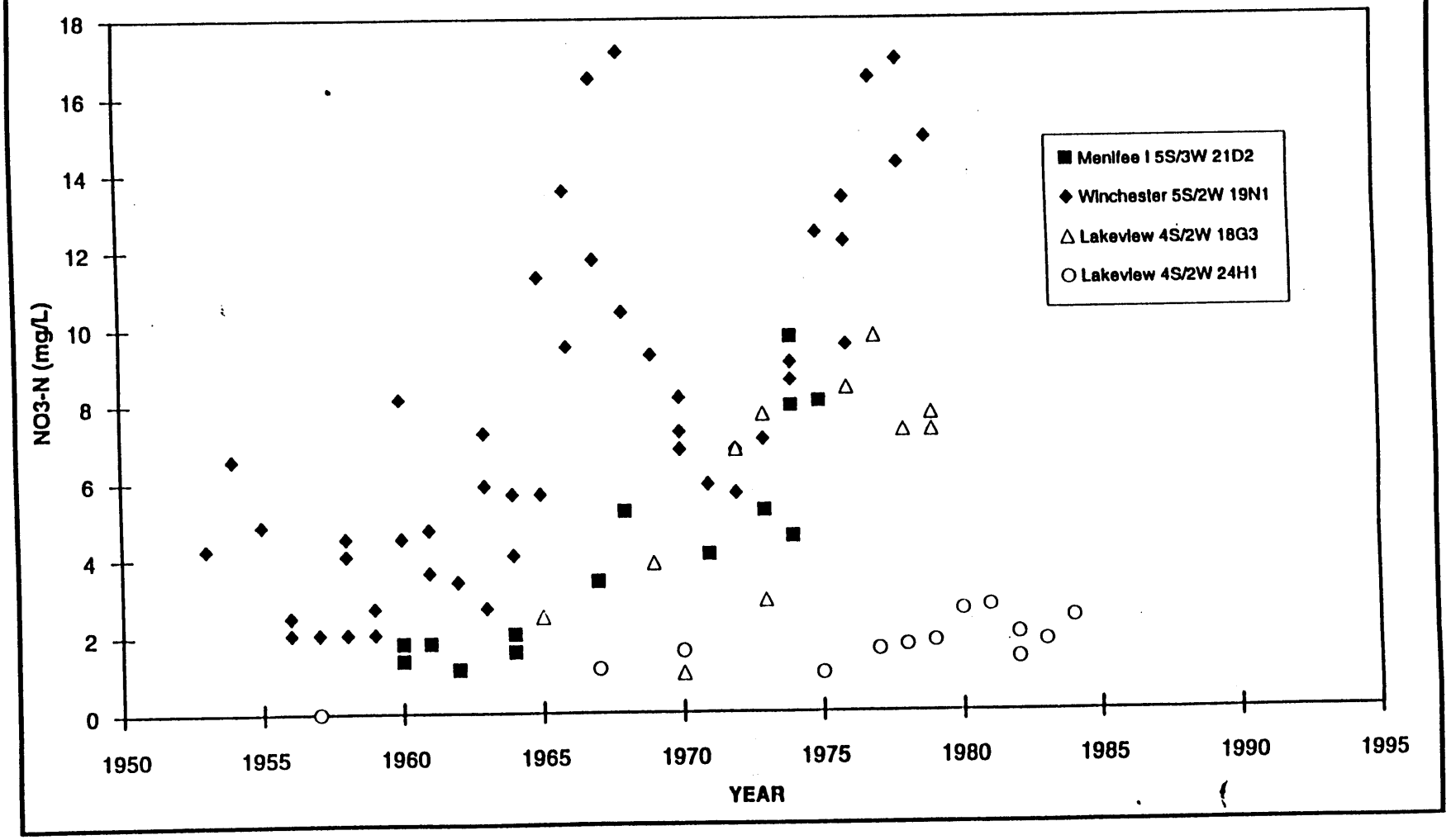
FIGURE 4-17 NITRATE-N CONCENTRATION MENIFEE I, WINCHESTER, AND LAKEVIEW BASINS



NO3 Plot Men-Win-Lak
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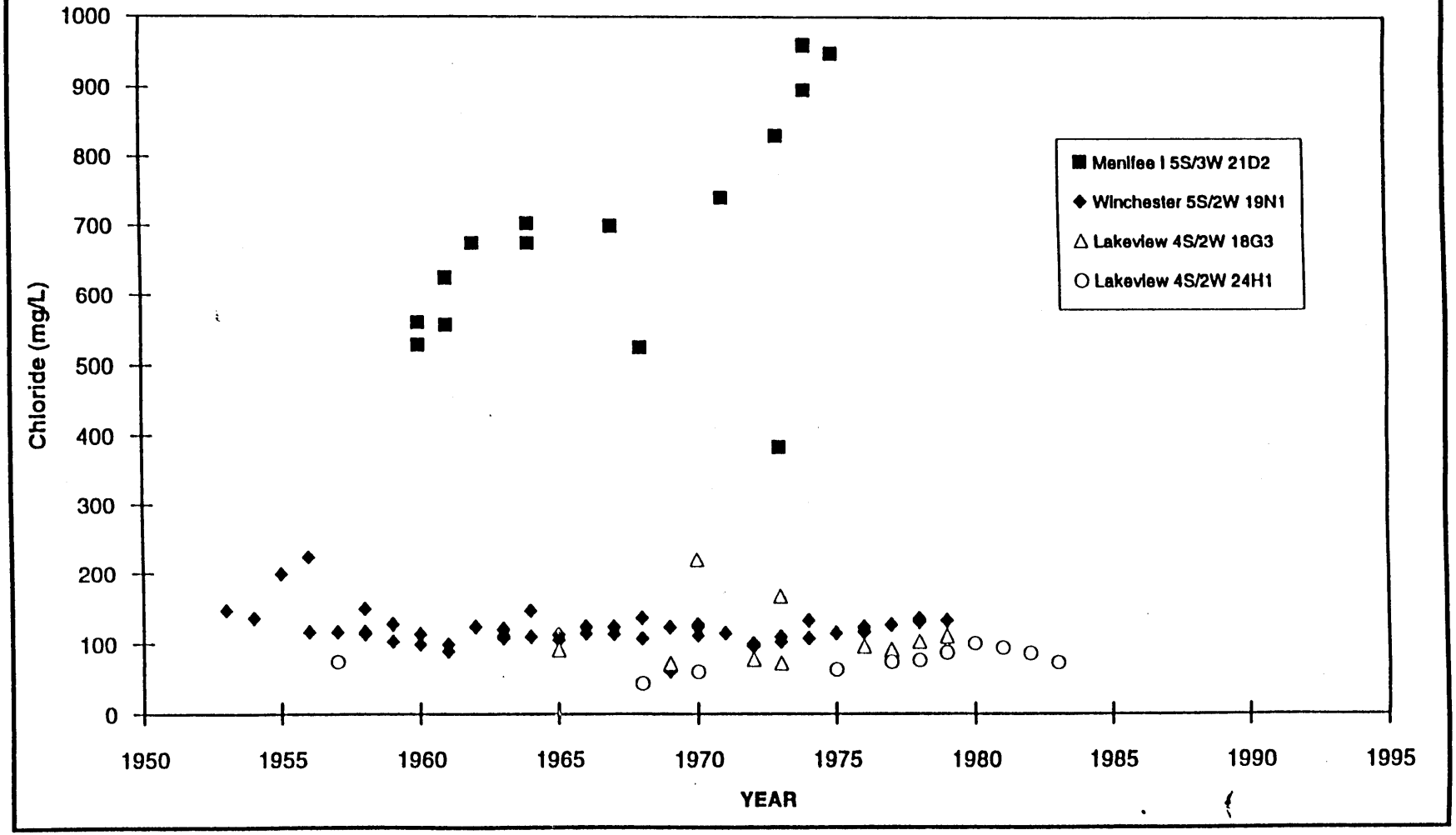
FIGURE 4-18 CHLORIDE CONCENTRATION IN MENIFEE, WINCHESTER, AND LAKEVIEW BASINS



Chloride Plot Men-Win-Lak
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Winchester Subbasin

Figure 4-19 illustrates the TDS, nitrate and general inorganic chemistry of the Winchester subbasin. Figure 4-19 is based on all available data and corresponds approximately to 1993 conditions. Winchester is the smallest of the groundwater basins, with about 36,000 acre-ft in storage and capacity of about 41,000 acre-ft. TDS concentrations range from 700 to 6,400 mg/L, with more typical values ranging from 1,000 to 3,000 mg/L. Nitrates range from 1 to 51 mg/L as nitrogen, with typical values ranging from 2 to 12 mg/L. TDS mapping in Figure 4-8 (California Department of Water Resources, 1978) indicates that brackish groundwater occurs in a half-mile-wide strip along the entire length of Salt Creek. This high TDS water is probably the result of evaporite deposits caused by past high-water-table conditions.

Under natural conditions, the primary source of recharge in the Winchester subbasin was subsurface inflow from the Hemet subbasin. The TDS in the subsurface inflow from the Hemet subbasin ranged from 500 to 1,000 mg/L. Currently, the Winchester subbasin flows into the Hemet subbasin causing groundwater degradation in that basin.

TDS, hardness and, occasionally, nitrate limit the use of Winchester groundwater for domestic purposes. Some groundwater in the Winchester subbasin cannot be used for municipal supply without demineralization. Agricultural usage is somewhat limited due to high boron and chloride concentrations.

San Jacinto Lower Pressure Subbasin

Figure 4-20 illustrates the TDS, nitrate and general inorganic chemistry of the San Jacinto Lower Pressure subbasin. Figure 4-20 is based on all available data and corresponds approximately to 1993 conditions. Water quality time histories could not be developed for this subbasin due to lack of data.

TDS concentrations in groundwater typically range from 500 to 1,500 mg/L. Nitrates range from near zero to 33 mg/L as nitrogen, with typical values less than 3 mg/L. Although data in the northwestern part of the subbasin are limited, the faults in the area appear to affect nearby groundwater because high boron and fluoride concentrations are found there.

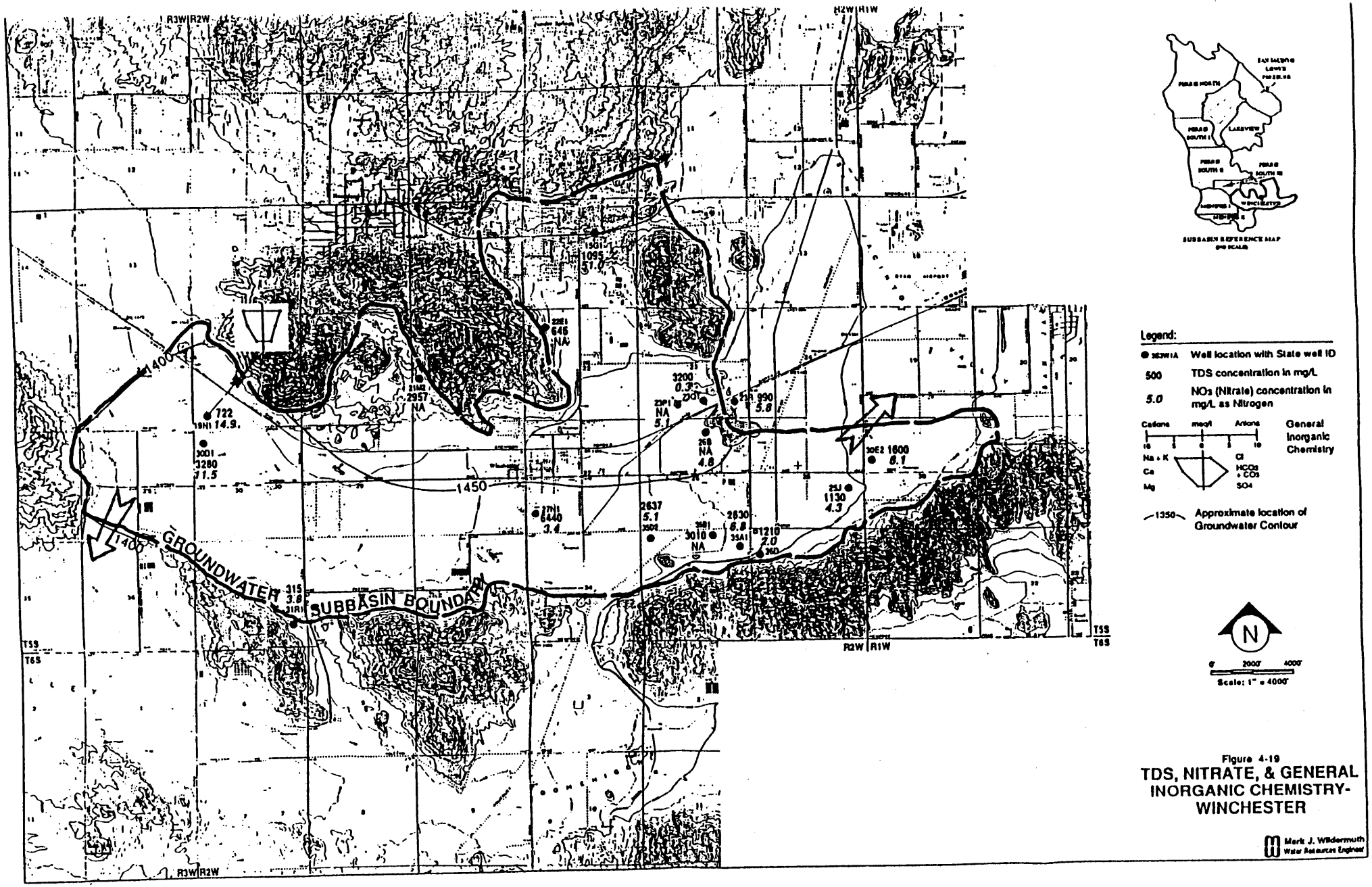

Figure 4-19

TDS, NITRATE, & GENERAL INORGANIC CHEMISTRY-WINCHESTER

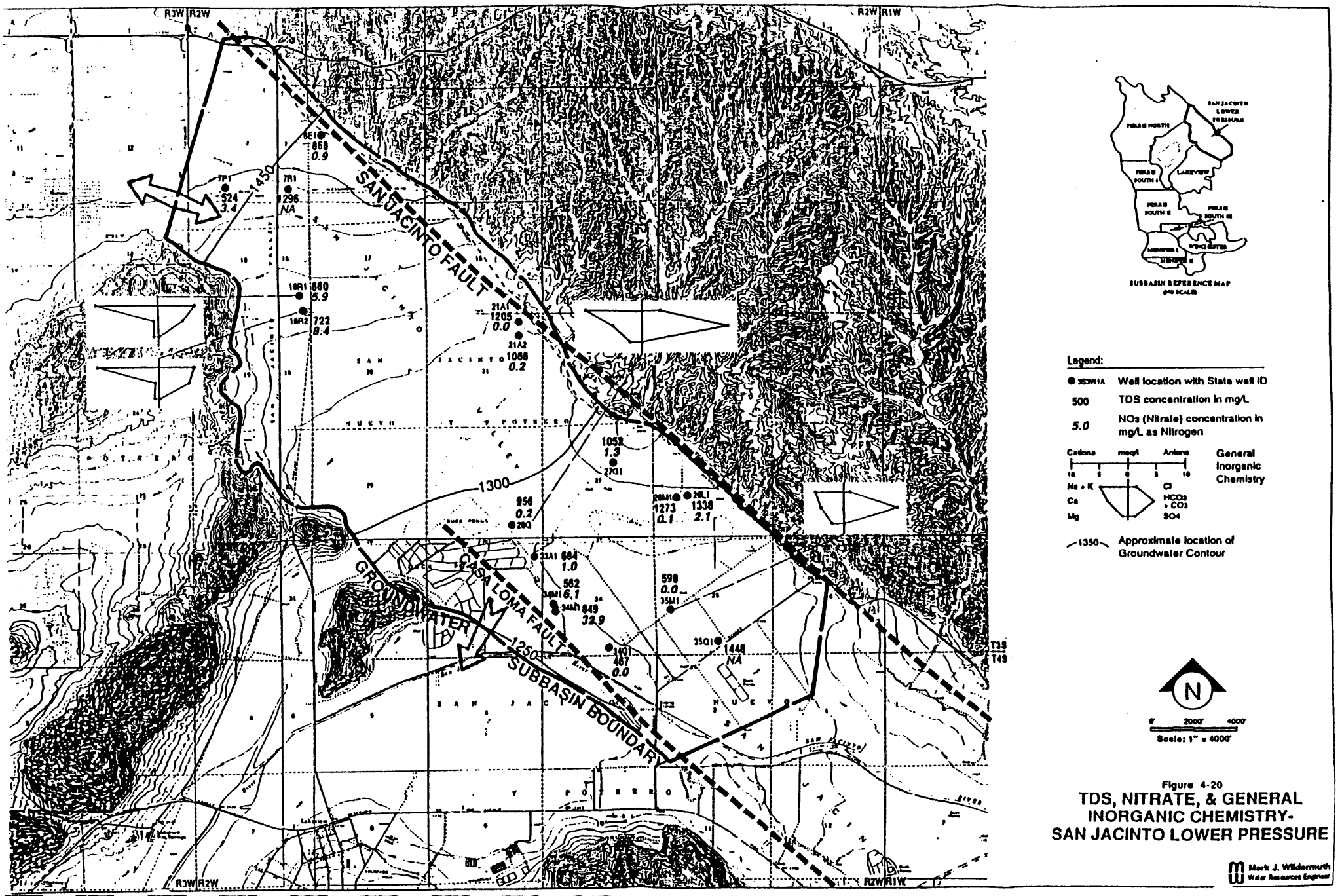

Figure 4-20

TDS, NITRATE, & GENERAL INORGANIC CHEMISTRY- SAN JACINTO LOWER PRESSURE

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FUTURE GROUNDWATER QUALITY

Future projections of groundwater quality in the West San Jacinto Groundwater basin were prepared by SAWPA as part of the *Nitrogen and TDS Studies, Santa Ana River Watershed* (James M. Montgomery, 1989). These studies developed future projections of TDS and nitrate by subbasin for the period 1990 through 2005. These estimates, however, are based on a model that:

- has not been calibrated for TDS or nitrate;
- each subbasin is represented by only one node and thus the resolution of the analysis is crude; and
- future water supply and wastewater plans that were used in these studies are not representative of the future.

Therefore, the results are questionable and not of much value as a management tool for the West San Jacinto Groundwater Basin.

There is a need for a planning tool to estimate the groundwater level and quality response to groundwater management practices. The planning tool would consist of groundwater flow and simulation models similar to those models that were developed and that are in current use to develop the Chino Basin Water Resources Management Plan (Montgomery Watson & Wildermuth, Mark J., 1992; Montgomery Watson & Wildermuth, Mark J., 1993).

SECTION 5

SECTION 5
FUTURE WATER DEMANDS AND WASTEWATER FLOWS

WATER DEMANDS AND SOURCES OF SUPPLY

Projected Demands

Projected Municipal Water demands for the West San Jacinto Groundwater Management area are listed in Table 5-1 and shown graphically in Figure 5-1. These estimates are based on land use and population projections and projected water use rates. The projections in Table 5-1 were developed by the planning staff of EMWD and represent an update of the water demand projections developed for the 1990 Water Facilities Master Plan (Black & Veatch, James M. Montgomery, Inc., 1990). Municipal demands in the West San Jacinto Groundwater Management Area range from 47,000 acre-ft/yr in 1995 (58 percent of total demand), to 112,000 acre-ft/yr in 2010.

Agricultural demands are based on land use and are projected to decline from about 33,200 acre-ft/yr in 1995, to 31,000 acre-ft/yr in 2010. In 1990, about eight percent of the imported water served by EMWD was delivered to agricultural users. Throughout the planning period we assumed that agricultural demands would be satisfied with groundwater and reclaimed water.

Sources of Supply

The sources of supply to the West San Jacinto Groundwater Management area include imported water from Metropolitan, groundwater, and reclaimed water.

Imported Water from Metropolitan. The quality of treated imported water is generally excellent and meets all drinking water regulations. TDS in Colorado River water and, occasionally, SWP water, causes TDS concentration in wastewater to exceed the TDS limit specified for wastewater plants. The TDS concentrations in water will increase from 200 to 300

TABLE 5-1
PROJECTIONS OF MUNICIPAL AND AGRICULTURAL DEMANDS
WEST SAN JACINTO GROUNDWATER BASIN

Year	Municipal Demands(1) (acre-ft/yr)	Agricultural Demands (acre-ft/yr)
1995	47,000	33,000
2000	63,000	32,000
2005	84,000	31,000
2010	112,000	31,000

Sources: (1) EMWD Projections 8/94

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FIGURE 5-1 WATER DEMAND PROJECTIONS FOR THE WEST SAN JACINTO GROUNDWATER MANAGEMENT AREA

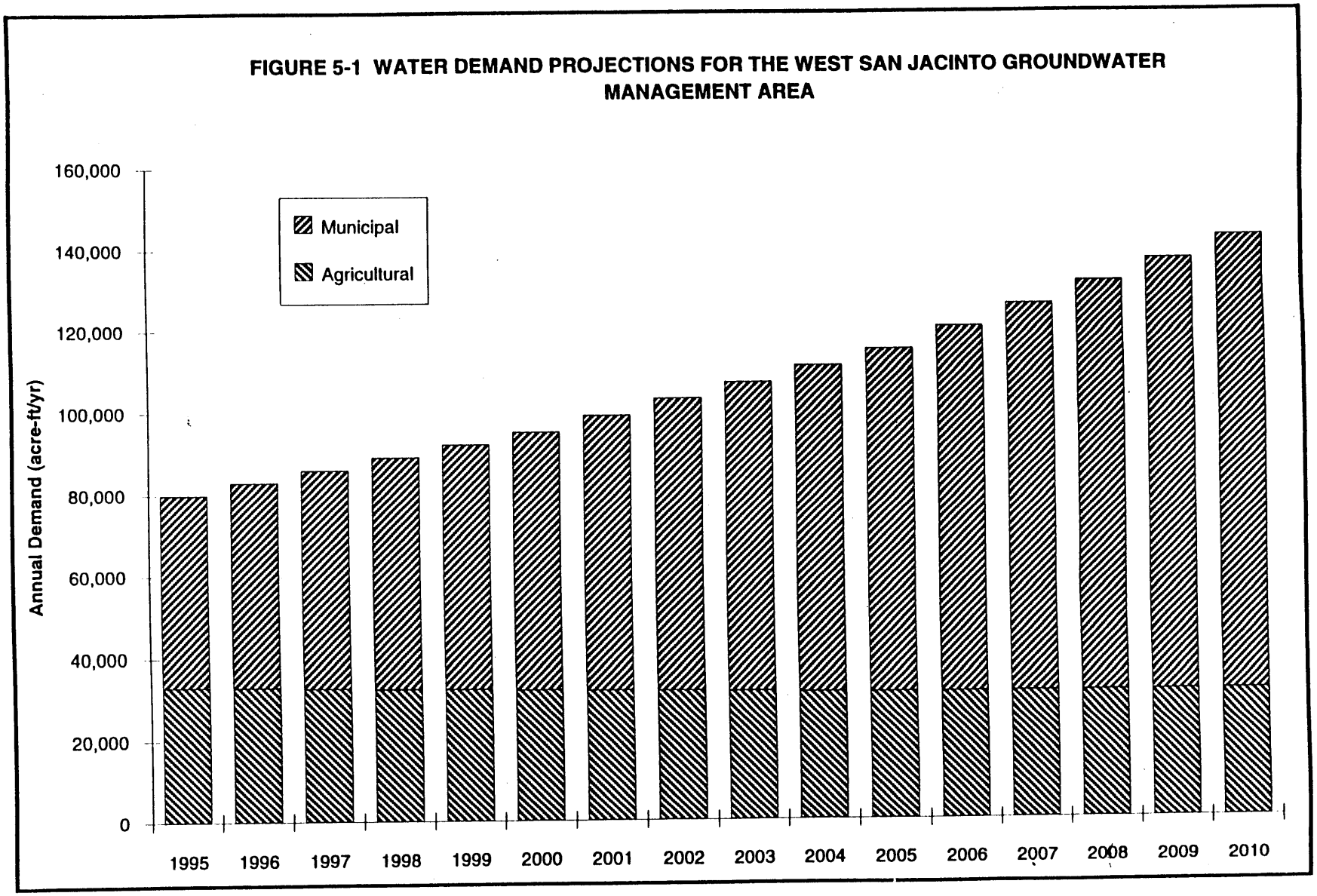

fig 5-1 Water Demands
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mg/L through typical municipal use. Thus, if the average TDS concentration in a water supply is 400 mg/L, the TDS concentration in the resulting wastewater will be about 600 to 700 mg/L. The TDS limits for EMWD's reclamation plants and the TDS required in the water supply to meet the TDS limits are listed below.

Reclamation Plant	TDS Limit (mg/L)	Water Supply TDS in the Tributary Area (mg/L)
Hemet-San Jacinto	575	325
Moreno Valley	550	300
Perris Valley	825	575
Sun City	950	700
Temescal	700	450

Figure 5-2 shows the TDS concentration of SWP water and Colorado River water available from Metropolitan in the management area. The average TDS concentration for SWP water is about 250 mg/L for the period shown in Figure 5-2. The comparable average for Colorado River water is about 660 mg/L. SWP water can be used in the areas tributary to all five reclamation plants listed above without causing violations, with the exception of the Moreno Valley plant that would have TDS concentrations in excess of the TDS limitations about 29 percent of the time. The use of Colorado River water or other sources with high TDS could cause TDS violations to occur at all five plants.

Metropolitan adopted a schedule of projected water rate increases in 1991. The water rates established included:

- a base rate;
- a treatment surcharge, to be added to the base rate for purchases of treated water; and
- a seasonal discount for water produced from October 1 through April 30, to be subtracted from the base rate.

The goals of the seasonal discount are: to achieve greater conjunctive use of imported supplies and local supplies; encourage the construction of additional local production facilities; and reduce member agencies' dependence on Metropolitan deliveries during the summer months. Recently, Metropolitan announced water prices for 1993 and forecasted rates for the following ten years. The projected cost of imported water purchased from Metropolitan is listed in Table 5-2 and is shown graphically in Figure 5-3. Imported water costs after 2002 are assumed to increase 6 percent per year.

FIGURE 5-2 TDS OF IMPORTED SUPPLIES

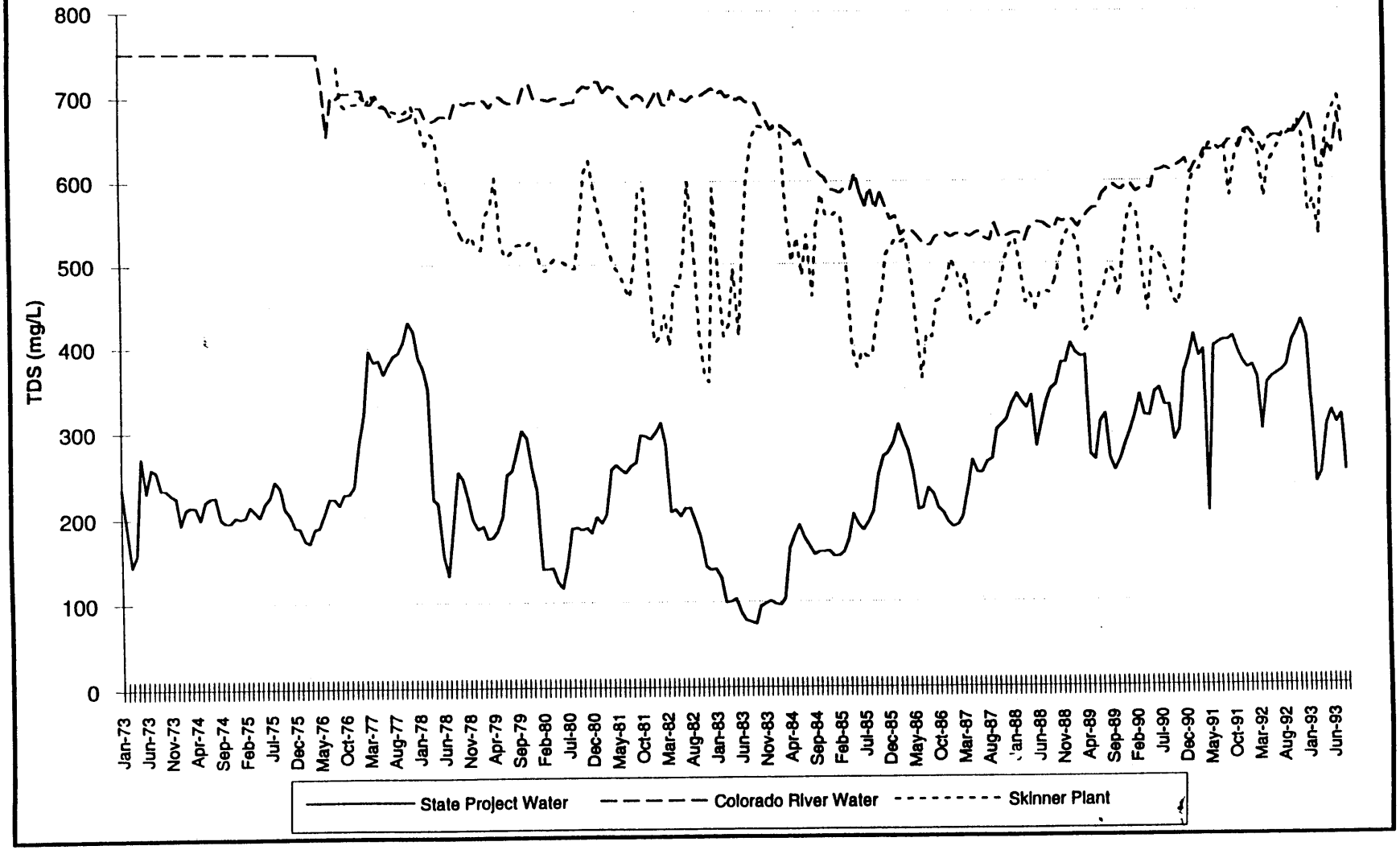

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TABLE 5-2
METROPOLITAN WATER RATE PROJECTIONS

4/2/94

Year	Treatment Surcharge	Base Rate	Base Treated	Seasonal Storage (1) Untreated	Seasonal Storage (1) Treated
1994	$77	$335	$412	$222	$275
1995	$77	$377	$454	$256	$256
1996	$78	$405	$483	$278	$279
1997	$78	$437	$515	$304	$304
1998	$89	$456	$545	$319	$328
1999	$98	$480	$578	$338	$345
2000	$104	$509	$613	$361	$366
2001	$105	$544	$649	$389	$390
2002	$109	$579	$688	$417	$420
2003	$114	$616	$730	$447	$451
2004	$119	$654	$773	$477	$481
2005	$124	$696	$820	$511	$515
2006	$130	$739	$869	$545	$550
2007	$136	$785	$921	$582	$587
2008	$142	$834	$976	$621	$626
2009	$148	$887	$1,035	$664	$669
2010	$154	$943	$1,097	$708	$713

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FIGURE 5-3 COST OF IMPORTED WATER

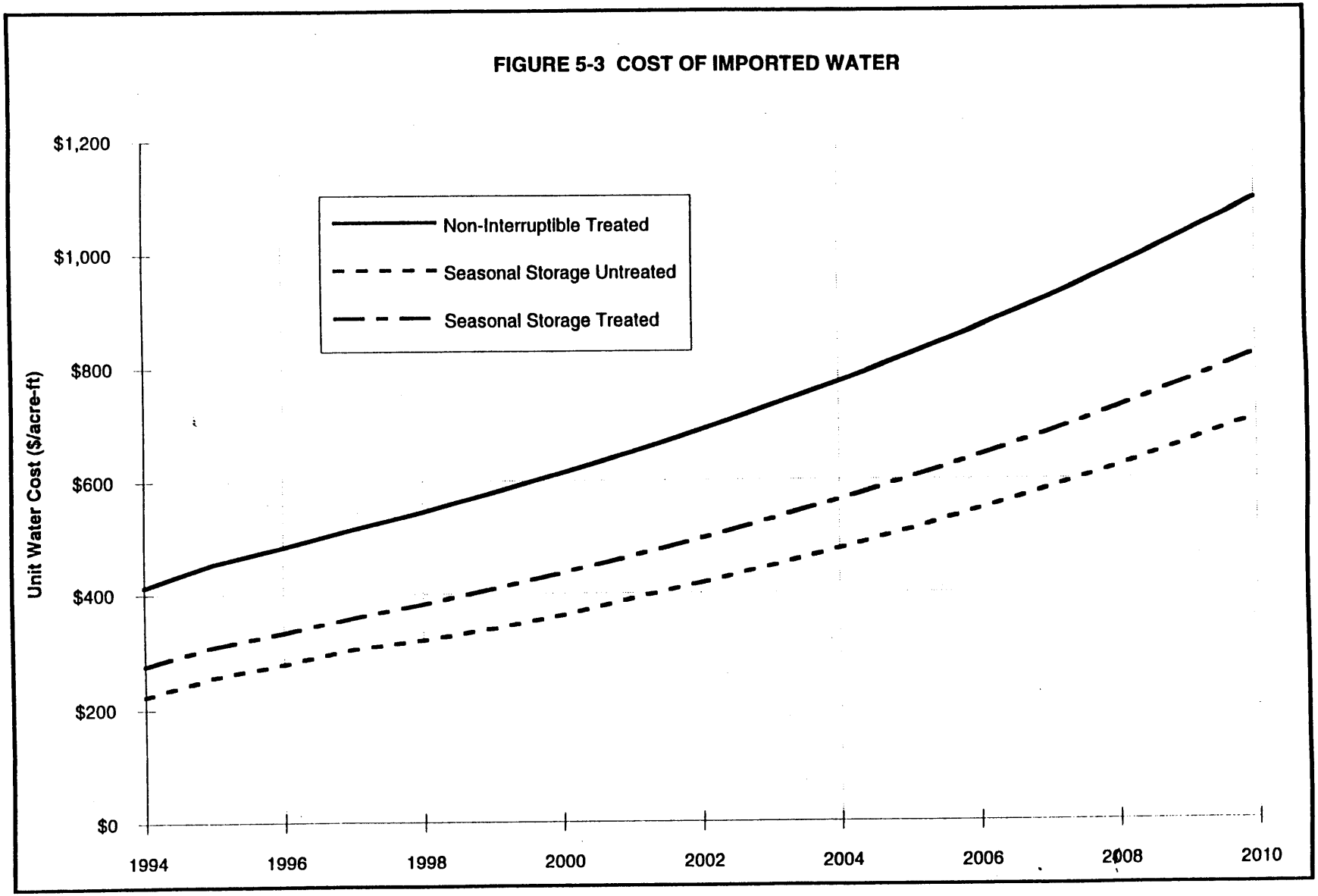

Figure 5-3
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Metropolitan is currently evaluating supply reliability for its service area (Metropolitan Water District of Southern California, 1994). Metropolitan is projecting that with year 2000 demands, shortages in retail supplies will occur at least four out of five years, with shortages up to 30 percent. By the year 2020, shortages will occur on average once in five years, with shortages up to 20 percent. The frequency and magnitude of retail shortages will be comparable for areas that depend heavily on Metropolitan.

Groundwater. Groundwater is available throughout the management area in that most of the management area overlies the West San Jacinto Basin. However, the quality of groundwater precludes the use of some of the management area groundwater for municipal supply. TDS and nitrate are the water quality constituents that limit the use of groundwater. TDS is regulated as a secondary standard. Secondary standards are for those substances that are not hazardous to health, but may cause taste, order, color, staining or other conditions that adversely affect the aesthetics of drinking water. The maximum contaminant level (MCL) for TDS is expressed as follows:

> *Recommended MCL* - 500 mg/L. TDS concentrations less than or equal to the *Recommended MCL* are desirable for a higher level of consumer acceptance.
>
> *Upper MCL* - 1,000 mg/L. TDS concentrations ranging up to the *Upper MCL* are acceptable if it is neither reasonable nor feasible to provide more suitable waters.
>
> *Short Term MCL* - 1,500 mg/L. TDS concentrations ranging up to the *Short Term MCL* are acceptable only for existing systems on a temporary basis, pending the construction of treatment facilities or the development of acceptable new water sources.

Nitrate is regulated under primary standards. The MCL for nitrate is 10 mg/L (as nitrogen). Table 5-3 lists the groundwater in storage, storage capacity, safe yield, and average TDS and nitrate concentrations for each groundwater subbasin in the management area. The subbasins are ranked in Table 5-3 from lowest to highest in TDS. From a drinking water perspective, approximately 36 percent of the yield of the West San Jacinto Basin could be developed from the Lakeview and Perris North subbasins for direct use, without additional treatment for TDS and nitrate. Some groundwater in the Perris South-I subbasin could also be used without treatment and San Jacinto Lower Pressure, Perris South-II and Perris South-III groundwater could be used

TABLE 5-3
AVAILABILITY OF GROUNDWATER IN THE WEST SAN JACINTO BASIN YEAR 2000 CONDITIONS

Subbasin	Volume in Storage (acre-ft)	Storage Capacity (acre-ft)	Fraction of Groundwater in West San Jacinto Basin	Natural Safe Yield (acre-ft/yr)	Safe Yield with Wastewater Recharge (acre-ft/yr)	Fraction of Yield in West San Jacinto Basin	Average TDS Concentration (mg/L)	Average Nitrate Concentration (as Nitrogen) (mg/L)
Perris North	123,000	347,000	11%	13,700	19,500	41%	450	7
Lakeview	283,000	515,000	25%	6,800	6,800	14%	500	3
Perris South	248,000	402,000	22%	8,300	12,800	27%	920	5
San Jacinto Lower Pressure	382,000	391,000	34%	2,500	2,500	5%	1,000	4
Winchester	36,000	41,000	3%	1,600	1,800	4%	2,000	8
Menifee	56,000	101,000	5%	3,300	4,700	10%	2,250	6
Totals	1,128,000	1,797,000	100%	36,200	48,100	100%		
Average							891	5

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if blended with SWP water. Groundwater from the Menifee-I, Menifee-II, Winchester and parts of the Perris South-II subbasins will require treatment if groundwater from these subbasins is to be used as a municipal drinking water supply. The treatment processes that would make these basins useful as a water supply source are blending with low TDS supplies such as SWP water, and demineralization. From a wastewater perspective, most of the groundwater in the West San Jacinto Basin would have to be treated prior to use as a municipal supply.

EMWD is currently designing a groundwater demineralization facility in the Menifee area. This facility will produce about 3 mgd (3,360 acre-ft/yr) of potable water for municipal use. The source water to the desalter will have a TDS of about 2,400 mg/L. The product water will have a TDS concentration of about 400 mg/L. This project will develop the full yield of the Menifee-I and Menifee-II subbasins for municipal use.

The cost to use groundwater, exclusive of treatment, includes capital cost and operations and maintenance costs. The capital cost for new municipal wells ranges from about $400,000 to $500,000. This is equivalent to about $32 per acre-ft, assuming a 1,500 gpm well (2,420 acre-ft/yr), six percent amortization rate, 20-year amortization period and 50% usage. Fixed operating and maintenance costs are about $6 per acre-ft. Power costs vary according to lift and pumping plant efficiency. The cost for a pumping lift of 200 feet and overall plant efficiency of 60 percent is about $30 per acre-ft. Thus, the total cost to produce groundwater for a 1,500-gpm well, operating year round with a total lift of 200 feet would be about $68 per acre-ft.

Reclaimed Water. Currently, EMWD is in a phased process of implementing a reclaimed water distribution plan that will make reclaimed water available throughout the management area. The reclaimed water system consists of five reclamation plants and about 79 miles of backbone distribution pipelines. Figure 5-4 shows the layout of the pipelines and the location of reclamation plants. Table 5-4 shows the projections of the availability of reclaimed water during the planning period. Reclaimed water sources include the discharge of up to 30 mgd or 33,600 acre-ft/yr of reclaimed water from the city of San Bernardino. The TDS of reclaimed water from San Bernardino is projected to range between 480 mg/L to 500 mg/L, which is lower than any of the reclaimed water generated in EMWD. The use of reclaimed water replaces non-potable demand on groundwater and imported supplies.

For this study, we have assumed the cost of producing and distributing reclaimed water in the EMWD service area to be a sunk cost. EMWD must treat and dispose of reclaimed water. The

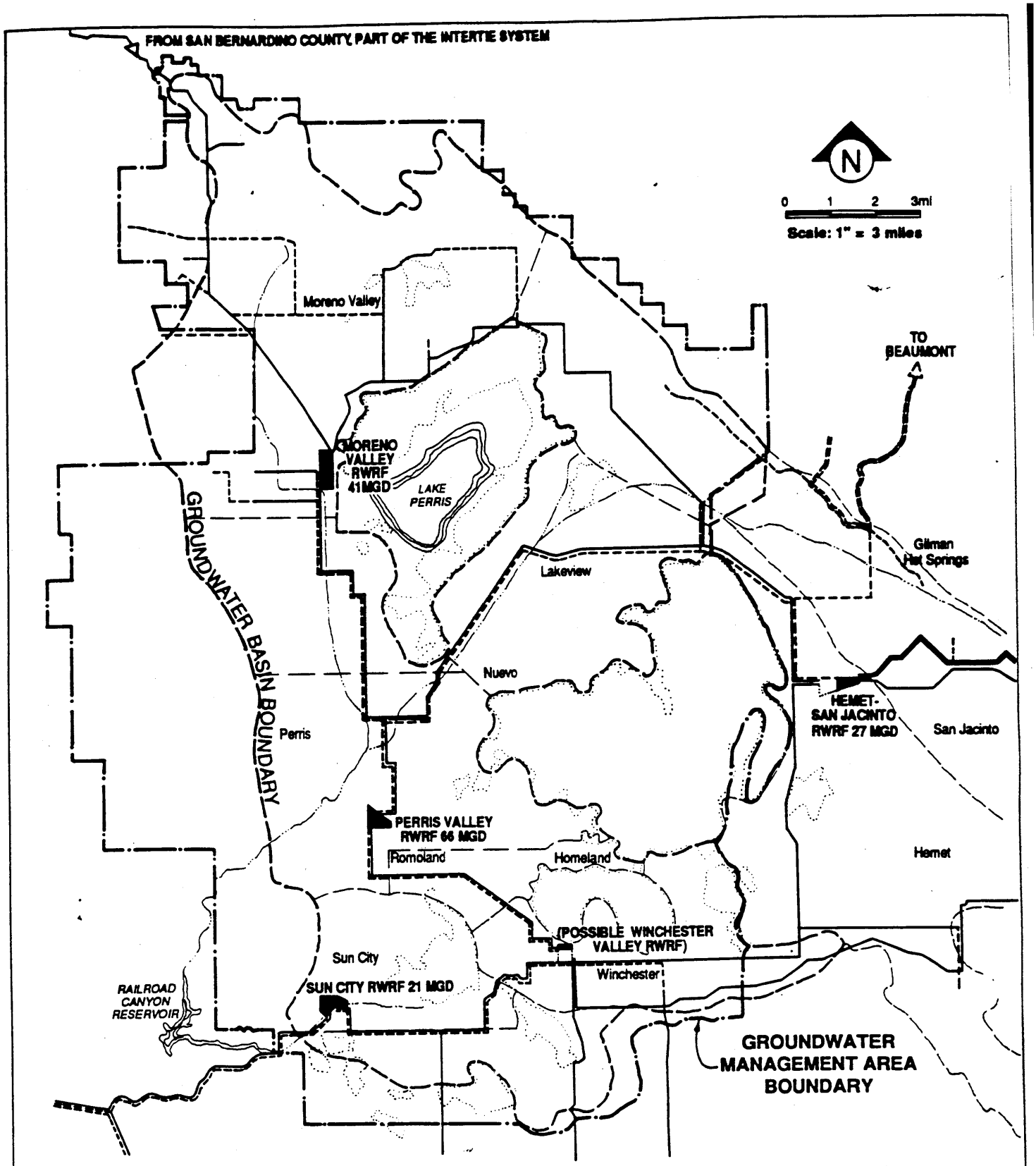

Figure 5-4

ULTIMATE RECLAIMED WATER SYSTEM

LEGEND:

——— EXISTING RECLAIMED WATER SYSTEM (CONSTRUCTED OR DESIGNED)

- - - - - ULTIMATE RECLAIMED WATER SYSTEM

■ RWRF LOCATION, WITH ULTIMATE CAPACITY

REFERENCE: EMWD RECLAIMED WATER FACILITIES MASTER PLAN, 1993. (DOCUMENT FILE NAME: DFILEOIN.DGN, REV. 8/93)

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TABLE 5-4
PROJECTED RECLAIMED WATER FLOWS
(acre-ft/yr)

Reclamation Plant	1995	2000	2005	2010
Moreno Valley	10,328	15,274	20,435	25,597
Perris Valley	8,110	11,994	16,041	20,089
Sun city	2,532	3,750	5,013	6,275
Temecula Valley (1)	5,332	7,897	10,558	13,219
Hemet-San Jacinto (1)	5,646	8,343	11,165	13,987
Subtotal	31,947	47,258	63,213	79,167
San Bernardino (2)	0	11,201	12,322	20,723
Totals	31,947	58,459	75,534	99,890

Sources: Wastewater Facilities Master Plan Black & Veatch and James M. Montgomery, 1990; Projected Water Demands and Planned Storage for the Years 1995 to 2005, Eastern Municipal Water District, 1993.

Note - (1) Reclaimed water from outside of West San Jacinto Groundwater Basin management area.
(2) Reclaimed water pumped to EMWD from city of San Bernardino.

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cost of the reclaimed water distribution system is the cost of disposal. The value of the reclaimed water as a resource to non-potable water users is equal to their next least costly source of water. For a farmer, the value of the reclaimed water is approximately the same as the cost to produce groundwater. A typical 1,000 gpm agricultural well cost would be about $250,000. Assuming the well is operated half the year, the amortization cost is about $27 per acre-ft. Total operation and maintenance costs would be about $36 per acre-ft for a total lift of 200 feet. The total cost of operating a well for an agricultural supply is about $63 per acre-ft. These costs would be about the same for industrial and large urban landscape users. These costs vary with depth to groundwater and location in the study area.

WATER SUPPLY PLAN WITHOUT GROUNDWATER MANAGEMENT PLAN

The water supply plan for the management area, in the absence of a groundwater management plan, consists of the use of imported water for all municipal uses and a combination of groundwater and reclaimed water for agricultural uses. All agricultural demands would be satisfied with reclaimed water by the year 2010. The Menifee desalter would be operational in 1997, producing about 3,360 acre-ft/yr. The water supply plan for the management area is listed in Table 5-5. Groundwater usage in 1995 is estimated to range from 26,600 acre-ft/yr (33 percent of total supply) in 1995, to 28,000 acre-ft/yr by 2010 (19 percent of total supply). The Menifee desalter will require about 4,200 acre-ft/yr of groundwater to produce 3,360 acre-ft/yr of product water.

Imported water use in the management area is projected to range from about 44,500 acre-ft/yr (56 percent of total supply) in 1995, to 103,000 acre-ft/yr (72 percent of total supply) by the year 2010. Imported water is used for municipal purposes only. Reclaimed water use in the management area is projected to range from about 8,900 acre-ft/yr (11 percent of total supply) in 1995, to 11,900 acre-ft/yr (8 percent of total supply) by the year 2010. Reclaimed water would be used for agricultural and non-potable municipal purposes.

The cost of this water supply plan, exclusive of the distribution costs, is summarized in Table 5-6. Table 5-6 shows the annual demand, supplies by source and cost of each source in terms of annual cost, total annual cost and present value of all cost over the 1995 to 2010 planning period. The fractions of total supply and total supply cost by source are listed below.

TABLE 5-5
WATER SUPPLY PLAN IN THE ABSENCE OF A GROUNDWATER MANAGEMENT PLAN
(acre-ft/yr)

Year	1995		2000		2005		2010	
	Volume	Fraction	Volume	Fraction	Volume	Fraction	Volume	Fraction
Municipal Demand	47,000	100%	63,000	100%	84,000	100%	112,000	100%
Imported Water	44,500	95%	56,140	89%	76,140	91%	103,140	92%
Menifee Desalter	0	0%	3,360	5%	3,360	4%	3,360	3%
Reclaimed Water	0	0%	1,000	2%	2,000	2%	3,000	3%
Groundwater	2,500	5%	2,500	4%	2,500	3%	2,500	2%
Agricultural Demand	33,000	100%	32,000	100%	31,000	100%	31,000	100%
Reclaimed Water	8,900	27%	8,900	28%	8,900	29%	8,900	29%
Groundwater	24,100	73%	23,100	72%	22,100	71%	22,100	71%
Total Demand	80,000	100%	95,000	100%	115,000	100%	143,000	100%
Imported Water	44,500	56%	56,140	59%	76,140	66%	103,140	72%
Menifee Desalter (1	0	0%	3,360	4%	3,360	3%	3,360	2%
Reclaimed Water	8,900	11%	9,900	10%	10,900	9%	11,900	8%
Groundwater (2)	26,600	33%	25,600	27%	24,600	21%	24,600	17%

note - (1) actual groundwater production for the Menifee desalter will be about 4,200 acre-ft/yr with 3,360 acre-ft/yr of potable water and 1,840 acre-ft/yr.

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TABLE 5-6
COST OF WATER SUPPLY FOR THE WEST SAN JACINTO GROUNDWATER BASIN MANAGEMENT AREA
WITHOUT A GROUNDWATER MANAGMENT PLAN

Year	Demand	Imported Water			Reclaimed Water			Groundwater										Total Cost of Groundwater Production	Total Cost	Composite Unit Cost of Supply
								Menifee Desalter			Agricultural Use			Municipal Use						
		Volume	Rate	Cost	Volume	Rate	Cost	Volume	Rate	Cost	Volume	Rate	Cost	Volume	Rate	Cost				
	(acre-ft/yr)	(acre-ft/yr)	($/acre-ft)	($)	(acre-ft/yr)	($/acre-ft)	($)	(acre-ft/yr)	($/acre-ft)	($)	(acre-ft/yr)	($/acre-ft)	($)	(acre-ft/yr)	($/acre-ft)	($)		($)	($)	($/acre-ft)
1995	80,000	44,500	$454	$20,203,000	8,900	$63	$560,700	0	$501	$0	24,100	$63	$1,518,300	2,500	$68	$170,000		$1,688,300	$22,452,000	$281
1996	83,000	47,500	$483	$22,942,500	9,100	$66	$596,232	0	$516	$0	23,900	$66	$1,565,928	2,500	$71	$176,800		$1,742,728	$25,281,460	$305
1997	86,000	47,140	$515	$24,277,100	9,300	$68	$633,709	3,360	$532	$1,787,520	23,700	$68	$1,614,937	2,500	$74	$183,872		$3,586,329	$28,497,138	$331
1998	89,000	50,140	$545	$27,326,300	9,500	$71	$673,231	3,360	$549	$1,844,640	23,500	$71	$1,665,361	2,500	$76	$191,227		$3,701,228	$31,700,759	$356
1999	92,000	53,140	$578	$30,714,920	9,700	$74	$714,901	3,360	$578	$1,942,080	23,300	$74	$1,717,235	2,500	$80	$198,876		$3,858,191	$35,288,012	$384
2000	95,000	56,140	$613	$34,413,748	9,900	$77	$758,826	3,360	$613	$2,059,752	23,100	$77	$1,770,595	2,500	$83	$206,831		$4,037,178	$39,209,752	$413
2001	99,000	60,140	$649	$39,030,784	10,100	$80	$805,122	3,360	$649	$2,180,716	22,900	$80	$1,825,476	2,500	$86	$215,104		$4,221,296	$44,057,202	$445
2002	103,000	64,140	$688	$44,128,240	10,300	$83	$853,908	3,360	$688	$2,311,760	22,700	$83	$1,881,914	2,500	$89	$223,708		$4,417,383	$49,399,531	$480
2003	107,000	68,140	$730	$49,742,115	10,500	$86	$905,308	3,360	$730	$2,452,885	22,500	$86	$1,939,947	2,500	$93	$232,657		$4,625,489	$55,272,912	$517
2004	111,000	72,140	$773	$55,764,130	10,700	$90	$959,454	3,360	$773	$2,597,370	22,300	$90	$1,999,611	2,500	$97	$241,963		$4,838,944	$61,562,528	$555
2005	115,000	76,140	$820	$62,434,704	10,900	$93	$1,016,484	3,360	$820	$2,755,296	22,100	$93	$2,060,944	2,500	$101	$251,642		$5,067,882	$68,519,069	$596
2006	120,600	81,540	$869	$70,858,158	11,100	$97	$1,076,540	3,360	$869	$2,919,942	22,100	$97	$2,143,382	2,500	$105	$261,707		$5,325,031	$77,259,729	$641
2007	126,200	86,940	$921	$80,071,632	11,300	$101	$1,139,775	3,360	$921	$3,094,668	22,100	$101	$2,229,117	2,500	$109	$272,175		$5,595,960	$86,807,367	$688
2008	131,800	92,340	$976	$90,123,726	11,500	$105	$1,206,346	3,360	$976	$3,279,474	22,100	$105	$2,318,282	2,500	$113	$283,062		$5,880,819	$97,210,890	$738
2009	137,400	97,740	$1,035	$101,160,779	11,700	$109	$1,276,419	3,360	$1,017	$3,417,239	22,100	$109	$2,411,013	2,500	$118	$294,385		$6,122,637	$108,559,835	$790
2010	143,000	103,140	$1,097	$113,144,452	11,900	$113	$1,350,167	3,360	$1,041	$3,497,882	22,100	$113	$2,507,454	2,500	$122	$306,160		$6,311,496	$120,806,115	$845
Total Volume	1,719,000	1,100,959			166,400			47,041			364,600			40,000						
Fraction of Total	100%	64%			10%			3%			21%			2%						
Total Cost				$866,336,287			$14,527,124			$36,141,224			$31,169,495					$951,884,301	
Fraction of Total				91%			2%			4%			3%							
Present Value																			$556,663,649.25	

Table 5-6
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Source	Fraction of Total Supply	Fraction of Total Supply Cost
Imported Water	64%	91%
Reclaimed Water	10%	2%
Menifee Desalter	3%	4%
Groundwater	23%	3%

The most expensive water in the supply plan is Menifee desalter water, ranging from $532 to $1,041 per acre-ft over the planning period. The second most expensive water in the supply plan is imported water, ranging from $454 to $1097 per acre-ft over the planning period. The cost of reclaimed water and groundwater are about one-tenth that of imported water, ranging from about $63 to $122 per acre-ft over the planning period. From a purely economic viewpoint, the cost of future supplies could be reduced if more groundwater and reclaimed water can be used for municipal supplies. The present value cost of future water supplies in the management area, exclusive of new pipelines, pump stations and reservoirs, is about $557,000,000 for the period of 1995 to 2010.

SECTION 6

SECTION 6
GROUNDWATER MANAGEMENT GOALS

The mission statement of EMWD is:

> ***The mission of the Eastern Municipal Water District is to deliver a dependable supply of safe, quality water and provide sewage collection services to its customers in an economical, efficient and publicly responsible manner.***

The water supply part of EMWD's mission statement is a goal shared by all purveyors of water in the West San Jacinto Groundwater Basin management area. Groundwater, as a potentially important part of the water supply in the management area, should be incorporated into the water supply plans of the management area. The safe yield of the West San Jacinto Basin is about 32,000 acre-ft/yr. Projections of groundwater usage in the management area range from about 30,000 acre-ft/yr in 1995, to 28,000 acre-ft/yr in 2010.

Agricultural groundwater use will decrease slightly in the future, from about 24,100 acre-ft/yr to 22,100 acre-ft/yr, as agricultural lands are converted to urban uses. Remaining agricultural water demand will be converted to reclaimed water. The need for potable water will increase dramatically in the future. Potable water demands in the management area will range from 69,600 acre-ft/yr in 1995, to 167,000 acre-ft/yr by 2010.

Most of the new potable demand will be met from treated imported water purchased from Metropolitan. Metropolitan's supplies are projected to increase in cost about 142 percent over the 1995 to 2010 planning period, from $454 per acre-ft in 1995, to $1097 per acre-ft in 2010. Metropolitan's supply is also not entirely reliable. For year 2000 demands, Metropolitan has projected shortages in four years out of five years, ranging from 10 to 30 percent.

There are many private groundwater producers in the management area that do not rely on EMWD for water supply. The negative impacts, if any, of a groundwater management plan on these users must be minimized; and the ability of these groundwater producers to continue producing groundwater for beneficial use must be preserved or equitably replaced.

Based on the above comments, the goal of the groundwater management plan is to

> ***maximize the use of groundwater for potable demands in such a way as to lower the cost of water supply and to improve the reliability of the total water supply for all water users in the West San Jacinto Groundwater Basin Management area.***

There are several elements that could go into the management plan to achieve this goal. The next section describes these elements.

SECTION 7

SECTION 7
ELEMENTS OF GROUNDWATER MANAGEMENT PLAN

This section describes the features or elements that can be used to build a groundwater management plan that is consistent with the management plan goal described in Section 6 and A.B. 3030. These elements include: new management policies, yield enhancement programs, conjunctive use, and the exchange of agricultural and other non-potable water users from groundwater to reclaimed water. These elements are described below.

MANAGEMENT POLICY ELEMENTS

Management policy elements consist of developing and implementing policies, regulations and coordinated activities among the groundwater producers. Currently, there is no routine monitoring of groundwater production, groundwater level and groundwater quality in the management area. There are no programs or institutions that routinely collect and review these data. There are no management tools available to forecast the impact of existing and future groundwater management practices. Consequently, there is little information available to site new groundwater recharge and extraction facilities.

Currently, there is no coordination or oversight of well construction in the management area. There is no systematic plan to manage unused and obsolete wells. The management plan needs to include policies to manage well construction and to ensure their destruction when wells become obsolete.

Monitoring of Groundwater Production, Groundwater Levels and Groundwater Quality

Groundwater Production. There is very little reported groundwater production data in the management area. The reported groundwater production volumes for the period ranged from 6,000 to 13,000 acre-ft/yr during the five-year period of 1987 to 1991 (see table 4-3). The 1991

estimate of agricultural demand in the management area, based on land use, is about 33,200 acre-ft/yr, of which about 27,000 acre-ft is estimated to be satisfied with groundwater. Groundwater production needs to be limited to the long term safe-yield of the management area and, locally, to the safe yield of the individual subbasins in the management area. Temporary overdraft could be allowed and, occasionally, encouraged during periods of imported supply shortages, as long as there is a way to replenish the overdraft. Uncontrolled overdraft, similar to that which occurred prior to the mid 1970's, will cause groundwater levels to drop, some wells to dry up, increase the cost of producing groundwater and lead to groundwater quality degradation. Therefore, it is important to obtain accurate information on groundwater production volume and to make a determination of the hydrologic balance for each subbasin in the management area.

Groundwater Level and Quality Monitoring. The monitoring of groundwater level (or storage) data includes the routine collection and review of groundwater level data to determine the hydraulic and volumetric response of the groundwater basin to groundwater management activities and climate. The monitoring of groundwater quality includes the collection and review of groundwater quality data that can be used to assess current and future trends in groundwater quality, and to evaluate groundwater quality response to groundwater management activities and climate.

Administration and Monitoring of Well Construction

Monitoring of Well Construction. The monitoring of well construction and location is extremely important to the understanding of current groundwater conditions and for future groundwater development. Well construction information includes the size and design of the well, lithology and aquifer test data. These data are necessary for the interpretation of groundwater production, level and quality data; and the evaluation of the aquifer as a source of supply. For the management plan, all these data should be collected, digitized and placed into a data base for future use. EMWD is in the process of completion of this data base for most of the existing wells in the management area. These data would be made available to all groundwater producers so that the producers can more reliably construct and operate new wells. These data would be used in future groundwater studies.

Administration of Well Construction Policies. Poor well construction can lead to groundwater contamination and excessive drawdown. Contamination can occur from inadequate sanitary seals, location of wells in, or near, contaminated groundwater, and cross contamination.

Excessive drawdown could be caused by over-extraction, interference from other adjacent wells or poor aquifer properties. Policies need to be developed that:

- Specify criteria that will be used to locate wells. Well location criteria would be established to ensure that new wells do not contribute to groundwater quality degradation. The intent of this policy is to minimize the redirection and acceleration of known contaminated groundwater to areas of potable supply.

- Develop minimum well construction standards. Minimum well construction standards would be developed based on existing state and county standards and additional standards that will be unique to the management area.

- Review and approval of proposed new well locations and well designs. The intent of the policy is to protect groundwater quality consistents with well siting criteria and construction standards.

Administration of Well Abandonment and Destruction Program

There are many obsolete and unused wells in the management area that are potentially useful for future production and monitoring of groundwater levels and quality. Unused wells could also be a source of contamination. Illegal disposal of wastes sometimes occurs in unused wells. Cross contamination between aquifers can occur through wells when contaminated groundwater in one aquifer flows into a well, vertically, through the casing and out of the well into an uncontaminated aquifer. The management plan should contain policies and regulations that will locate all obsolete and unused wells, and make a determination as to the most beneficial fate of each such well. Obsolete and unused wells that do not present a water quality contamination threat and have a potential use should be preserved. Otherwise, these wells should be properly destroyed.

Groundwater Quality Protection

Groundwater quality protection will maintain existing yield and reduce the future cost of water treatment. There are two parallel tracks to follow:

- prevention of pollution

- control and mitigation of existing groundwater quality problems.

EMWD should develop an aggressive groundwater pollution prevention program that, at a minimum, embodies the Basin Plan. Groundwater quality should be constantly monitored to assess spatial and time trends in groundwater quality in the groundwater management area. At a minimum, these efforts should include the monitoring of water quality data from municipal and agricultural wells, landfills, chemical and industrial operations, underground storage tanks, areas undergoing groundwater remediation such as March Air Force Base, sludge disposal areas and reclaimed water recharge areas. EMWD should consider obtaining authority to act proactively to prevent pollution and to take immediate action on new pollution threats when they occur.

The control and mitigation of existing groundwater quality problems consists of the containment and, potentially, the remediation of existing water quality problems, such that adjacent high quality groundwater resources are not degraded. Three major areas of concern in the West San Jacinto Groundwater Management Plan area are high TDS groundwater in the Perris South II subbasin (Ski Land area), migration of high TDS groundwater from the Winchester subbasin into the Hemet subbasin, and the organics contamination at March Air Force Base. The groundwater management plan should contain elements that will ensure that these three problems are controlled and mitigated.

EMWD has initiated a pollution prevention program in the Menifee subbasin. This program will intercept and treat saline groundwater that would otherwise migrate to areas with high quality groundwater and cause the abandonment of wells. This program will lead to the eventual recovery of the entire Menifee subbasin.

YIELD ENHANCEMENT ELEMENTS

Artificial Recharge

Artificial recharge is the recharge of water from sources that are not normally tributary to groundwater. There are three sources of water for artificial recharge in the West San Jacinto Groundwater Basin management area: local runoff, imported water and reclaimed water.

Artificial recharge with local runoff. There are several ways local runoff can be captured and recharged. The most common approach is to divert storm flows into spreading basins where the captured water can percolate into the underlying groundwater basin. Spreading basins can have

multiple uses including flood peak attenuation, water treatment, recharge of imported water and reclaimed water, wildlife habitat enhancement and recreational use.

Several factors must be considered for the development of a spreading basin. They include:

- ❑ Water rights
- ❑ Availability of recharge water
- ❑ Surface flow and flood hazard impacts
- ❑ Percolation rates
- ❑ Subsurface permeability and the presence of barriers or aquitards that hinder percolation
- ❑ Depth to groundwater
- ❑ Underlying groundwater quality
- ❑ Recharge water quality
- ❑ Proximity to major areas of groundwater production
- ❑ Creation of undesirable conditions such as high groundwater levels or vector problems
- ❑ Economic feasibility

Runoff generated on individual lots can be retained and recharged on individual lots. This would require special grading and drainage specifications on individual lots and is only practical for new development. The same considerations for spreading basins apply to artificial recharge through local retention and recharge.

Most of the precipitation for frequently occurring precipitation events that falls on undeveloped land is lost to evapotranspiration. Groundwater recharge occurred only during periods of heavy rainfall prior to the development of the land. About 60 to 80 percent of the land becomes impervious as land is developed for urban uses. The remaining land is irrigated and has relatively high soil moisture. Consequently, precipitation that falls on developed land is either:

- ❑ converted to runoff; or
- ❑ recharges the groundwater basin through presaturated soils.

New runoff due to developed land can be collected and recharged, a process referred to as water harvesting. EMWD has conducted studies of water harvesting in the San Jacinto and Hemet subbasins, but has not yet conducted such studies in the West San Jacinto Groundwater Management Area. EMWD is currently evaluating these studies and proceeding to implement water harvesting in these subbasins. EMWD has stated a goal of reaching 10,000 acre-ft/yr of additional yield in its service area using water harvesting.

Artificial recharge of runoff can occur anywhere in the management area where suitable recharge facilities can be sited. The DWR published a draft report in 1975, *TIR 1335-11-A-3 Preliminary Evaluation of Potential Artificial Recharge sites and Sink Sites in the San Jacinto Study Area* (California Department of Water Resources, 1975) that concluded that conditions conducive to artificial recharge through spreading basins exist in the Lakeview, Perris North and Perris South subbasins. In the Lakeview subbasin, there is a one mile-wide band of tight surface sediments along the San Jacinto River. The rest of the subbasin appears to have good recharge characteristics. Water quality in this subbasin is generally good and the unused storage capacity is about 230,000 acre-ft (see Table 5-3). Recharge in the Perris North subbasin could occur along a small creek that drains the Pigeon Pass Valley, in spreading basins located at the base of the hills on the south side of the subbasin and near major drainage features such as the Perris Valley drain. There may be other areas suitable for spreading basins. Water quality in the Perris North subbasin is good. The unused storage capacity in the Perris North subbasin is about 220,000 acre-ft.

Groundwater quality in the Perris South subbasins ranges from acceptable to poor. The soils and geology appear to favor recharge in spreading basins. However, due to existing groundwater quality conditions, it may not be possible to recover additional potable groundwater without groundwater treatment. The unused storage capacity in the Perris South subbasins is about 120,000 acre-ft. The San Jacinto Lower Pressure, Menifee I, Menifee II and Winchester subbasins have soil and geologic conditions that appear non-suitable for surface spreading.

Imported Water. Recharge of imported water can occur through surface spreading, direct injection and by in-lieu recharge. Surface spreading is done by conveying imported water to spreading basins for percolation. Untreated water can be used for surface spreading. Untreated off-peak water can be purchased at substantially lower rates if spreading is done between October 1 to April 30.

Conventional injection of imported water is accomplished by conveying treated water to wells and injecting the water into the saturated part of the groundwater basin. Imported water is discharged into the well below the standing water level in the well. The pressure in the well forces the water into the aquifer. Water used for injection into the saturated zone must be treated to drinking water standards prior to injection. Treatment consists of filtration and disinfection and can be obtained by either purchasing treated water from Metropolitan or by purchasing untreated water from Metropolitan and using other treatment facilities. Treated off-peak water can be purchased at substantially lower rates if injection is done between October 1 to April 30.

In-lieu recharge occurs when imported water is used in lieu of groundwater, allowing groundwater to accumulate in the groundwater basin. The basic premise is that imported water would be used when there is an abundance of imported water, allowing groundwater to accumulate. Groundwater production in excess of the normal extraction rates could occur when imported water is scarce due to drought or shortages in the imported water system.

The areas that are suitable for artificial recharge of imported water in spreading basins are identical to the areas described in *artificial recharge of runoff* above. Artificial recharge of imported water by injection can occur almost anywhere in the management area where groundwater production is practical. Considerations in siting injection facilities include favorable hydrogeologic conditions, proximity to source water facilities, proximity of recovery wells, and unused groundwater storage capacity. Unlike spreading basins that create a veneer of imported water on top of ambient groundwater, injection wells create a zone of imported water around the injection well. The injected water within this zone drifts slowly away from the injection well with the regional groundwater flow. The water quality in wells that tap into the injected water zone will have a water quality that is similar to the imported water.

Reclaimed water. Recharge of reclaimed water can occur through surface spreading, direct injection and by over irrigation. Recharge by percolation and injection is subject to regulatory approval. The DHS proposed regulations for planned recharge projects that recharge reclaimed water were described in Section 3 and are contained in Appendix A.

Reclaimed water can be used to augment potable supplies through groundwater recharge. The volume of natural recharge is small in the West San Jacinto Groundwater Basin management area. The dilution of reclaimed water that can be obtained in the groundwater basin could be

small and insufficient to achieve the dilution requirements in the proposed guidelines. Therefore, reclaimed water may have to be blended with other non-reclaimed water prior to recharge. The most probable source of blending water will be imported water purchased from Metropolitan.

The groundwater basins can also be used for seasonal storage of reclaimed water. Reclaimed water can be stored in the groundwater basins during the winter when demand for reclaimed water is low and recovered in the spring, summer and fall when reclaimed water demands exceed supply.

The subbasins in the management area that are conducive to recharge of reclaimed water, either by spreading or injection, include the Perris North, Lakeview and Perris South subbasins. Reclaimed water can be recharged in the San Jacinto Lower Pressure, Menifee and Winchester subbasins by injection.

Increase in Yield. The increase in yield from artificial recharge is approximately equal to the long term average annual volume of artificial recharge. That is, if the annual volume of artificial recharge is 30,000 acre-ft, then the increase in groundwater yield would be about 30,000 acre-ft. The Lakeview, Perris North and Perris South subbasins are the most promising subbasins for artificial recharge that can increase potable supplies to the West San Jacinto Groundwater Basin management area. These basins have a combined unused storage capacity of about 600,000 acre-ft, good water quality and reasonably good aquifer properties. The natural replenishment in these subbasins is small, averaging about 29,000 acre-ft/yr (Table 4-1). Hydrogeologic conditions and economics control the size of artificial recharge projects in these subbasins. Based on current information, it seems reasonable to expect that the combined increase in groundwater yield from artificial recharge could range from 30,000 to 50,000 acre-ft/yr.

Information Needs. New information and engineering studies are required to develop definitive estimates of the size and benefits of potential artificial recharge projects. The types of new information and studies that are required include:

- ❑ geophysical studies to determine aquifer boundaries and geometry
- ❑ hydrogeologic studies to determine aquifer hydraulic properties
- ❑ geochemical studies to establish ambient groundwater quality, trends, and compatibility of ambient groundwater with recharge water

- ❑ facility studies to site and evaluate engineering and facility requirements
- ❑ economic studies
- ❑ environmental studies

Part of these investigations should include demonstration or pilot projects. Demonstration-level artificial recharge projects should be done to test the technical and institutional feasibility of artificial recharge. Demonstration projects should include the following:

- ❑ Surface spreading in The Perris North, Perris South and Lakeview subbasins. Small recharge basins, observation wells and pipelines would be constructed and operated to develop data and design criteria for full scale projects. The source water would be imported water from Metropolitan and reclaimed water from EMWD.
- ❑ Groundwater Injection in The Perris North, Perris South and Lakeview subbasins. Injection of imported water could be done in the winter time using EMWD's existing wells in these subbasins. Small observation wells may need to be constructed.
- ❑ Water Harvesting in the Lakeview subbasin. Storm water captured in EMWD's Mystic Lake project could be captured and conveyed to test recharge basins in the Lakeview subbasin.

Recovery of Contaminated Groundwater

Some of the groundwater in the West San Jacinto Groundwater Management area is contaminated and cannot be put to beneficial use without treatment. Currently, production of contaminated groundwater is avoided. Contaminated groundwater takes up storage in the aquifer and reduces the useful storage capacity in the groundwater basins. Contaminated groundwater can be put to beneficial use through treatment. The types of treatment that are appropriate depend on the nature of contamination and the intended water use. The types of treatment that appear appropriate in the West San Jacinto Management area are blending, demineralization and nitrate removal through ion exchange. Other treatment technologies may be required if water quality conditions change or new types of contamination are discovered.

Blending. Blending is a very simple form of treatment and consists of mixing a poor quality supply with a suitable amount of high quality water such that the blend is of adequate quality for its intended use. Table 7-1 lists the groundwater subbasins, the reclamation plants that receive water from these subbasins, reclamation plant TDS regulatory limitations, estimated average

TABLE 7-1
BLENDING WATER REQUIREMENTS TO MEET TITLE 22 DRINKING WATER REGULATIONS AND WASTE DISCHARGE REQUIREMENTS AT RECLAMATION PLANTS

Subbasin	Supply Tributary to EMWD Reclamation Plant (1)	Reclamation Plant TDS Objective (mg/L)	Estimated Average TDS in Subbasin (2) (mg/L)	Required Water Supply TDS (mg/L)	Blending Ratio of SWP Water to Groundwater for SWP Water TDS (in mg/L) of 250	300
Perris North	Moreno Valley	550	450	300	3.0	Infeasible
Lakeview	Perris Valley	825	500	575	No Blending Required	No Blending Required
Perris South-I	Perris Valley	825	700	575	0.4	0.5
Perris South-II	Perris Valley	825	1,100	575	1.6	1.9
Perris South-III	Sun City	950	1,100	700	0.9	1.0
Menifee-I	Sun City	950	3,000	700	5.1	5.8
Menifee-II	Sun City	950	2,200	700	3.3	3.8
Winchester	(3)	na	2,000	na	na	na
San Jacinto Lower Pressure	Perris Valley	825	1,000	575	1.3	1.5

note - (1) based on Figure 3-1 Existing Wastewater Service Areas, Wastewater Facilities Master Plan, (Black & Veatch, James M. Montgomery, 1990); revised by EMWD 1993.

(2) Subbasin averages based on available data, and in most cases, old data. Average for Perris South-II excludes Ski Land area.

(3) Winchester subbasin is currently unsewered. In the future, the Winchester subbasin area will either be sewered to a new reclamation plant in Winchester area or sewered to an existing reclamation plant.

TDS concentration for each subbasin, the water supply TDS requirement and the blending ratios for SWP water to groundwater. Based on existing groundwater quality information, blending SWP water with groundwater from the San Jacinto Lower Pressure, Perris North, Perris South-I, parts of Perris South-II, and parts of Perris South-III, could provide potable water that is also within the waste discharge requirements of EMWD reclamation plants. Generally, blending ratios around one are considered economically feasible and blending ratios of two could be feasible. Lakeview groundwater will not need to be blended. Perris North groundwater will need three parts of SWP water if it is to be used in the area tributary to the Moreno Valley reclamation plant. Groundwater from Perris South-I, Perris South-II, Perris South-III, and the San Jacinto Lower Pressure subbasins can easily be blended with SWP water. Menifee-I, Menifee-II and Winchester cannot be economically blended.

Demineralization. Demineralization is a treatment process that reduces the mineral content of groundwater to a specified level that is established for the use of the product water. Demineralization facilities, often called desalters, have been constructed in the Arlington subbasin, near Riverside, and are in design for the Chino Basin and the Menifee area.

The proposed Menifee desalter will convert 4,200 acre-ft/yr of groundwater pumped from the Menifee I and II subbasins with a TDS concentration of 2,400 mg/L to 3,360 acre-ft of potable water, with a TDS concentration of 400 mg/L (Black & Veatch, 1993). Product water from the Menifee desalter will be served in EMWD service area.

Demineralization could be used to recover the yield of the San Jacinto Lower Pressure, Perris South-I, Perris South-II, Perris South-III, and Winchester subbasins. These basins are excessively mineralized, partly from irrigated agriculture and partly from natural sources. The proposed Menifee desalter will recover the yield of the Menifee-I and Menifee-II subbasins. EMWD is considering treating groundwater from the Perris South II, Perris South III and Winchester subbasins at the Menifee desalter site in a future expansion of that facility.

Other Treatment Technologies. Other treatment technologies can be used to recover groundwater when other contaminants render groundwater unusable. Selective ion exchange can be used to remove specific ions such as nitrate or uranium. Granulated activated carbon (GAC), air stripping and advanced oxidation can be used individually, or in combination, to remove organic compounds. The need for these treatment technologies is unknown at this time due to the lack of water quality data.

Increase In Supply. Currently, contaminated groundwater is either avoided, or is used for non-potable demands such as agricultural or landscape irrigation. These non potable demands, whenever possible, could be supplied with reclaimed water, allowing the contaminated groundwater to be treated and supplied for municipal use. The volume of contaminated groundwater that can be recovered and used through blending will cause an equal reduction in the demand for imported water. The volume of contaminated groundwater that can be recovered through demineralization varies between 70 and 85 percent of the water produced for demineralization; the remaining water is a brine which must be exported. The volume of potable water produced by the demineralization will cause an equal reduction in the demand for imported water. The increase in supply from the recovery of contaminated groundwater is equal to the safe yield of the subbasins where the recovery projects will occur, minus the existing level of groundwater pumping in those subbasins. Table 7-2 summarizes considerations for blending and demineralization of elements and presents an estimate of the groundwater production that could be used for blending or demineralization. The volume of groundwater available for blending or demineralization is estimated as the safe yield of the subbasin, minus reported groundwater production. The safe yield used in this estimate includes the recharge of EMWD reclaimed water. The estimates of groundwater available for blending and demineralization shown in Table 7-2 are slightly higher than would be implemented because actual groundwater production by local producers is higher than reported production. Estimates of actual groundwater production will need to be developed prior to implementing blending or demineralization elements.

Cost. The cost of blending consists of the capital and operations and maintenance costs associated with wells, pipelines and reservoirs required to implement blending. The costs of these types of facilities are highly sensitive to location of wells, blending water sources and the design flow rates (e.g., base load or peaking). The development of these costs is beyond the scope of this investigation. Most of the facilities that will be required for blending will be required even if blending were not used. Thus, the incremental cost associated with blending facilities will be small, relative to the cost of future water distribution facilities. The volume of groundwater used with blending would offset the need for an equal amount of imported water. The SWP water used for blending is not a new imported water demand. The blending water would come from SWP water that would have been used if there were no blending with groundwater. Therefore, blending will cause a net decrease in imported water demands.

The cost of demineralization varies depending on source water quality, product water quality, well field(s), distribution system and the treatment technology. The Menifee desalter is a three

TABLE 7-2
CONSIDERATIONS FOR BLENDING AND DEMINERALIZATION ELEMENTS

Conjunctive Use Characteristics	Subbasin					
	Lakeview	Menifee	Perris North	Perris South (1)	San Jacinto Lower Pressure	Winchester
Groundwater Quality (2)	Good	Poor	Good	Poor	Poor	Poor
Range in Capacity of Producing Wells (gpm)	100-2,000	10-1,000	90-1,000	90-1,000	Unknown	100-850
Safe Yield						
Natural Safe Yield	6,800	3,300	13,700	8,300	2,500	1,600
Natural Safe Yield plus Reclaimed Water Recharge (acre-ft/yr)	6,800	4,700	19,500	12,800	2,500	1,800
Average Reported Groundwater Production 1987 to 1991 (2) (acre-ft/yr)	4,000	0	2,300	1,400	500	0
Potential Groundwater Production That could Be Used for Blending and Demineralization (acre-ft/yr)	Not Applicable	4,700	Not Applicable	12,100	700	1,800

note - (1) part of Perris South-I and -II have good quality water
(2) Production values shown in Table 4-3 and excludes small producers (<25 acre-ft/yr).

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mgd treatment plant with a capital cost estimated to range from $14,000,000 to $17,000,000. Table 7-3 lists the capital and operations and maintenance cost opinions for the Menifee desalter (Black & Veatch, 1993). The 1995 cost to produce water from the Menifee desalter is about $501 per acre-ft, which is slightly higher than comparable water imported from Metropolitan. By 2001, the unit cost of water from the Menifee desalter will be equal to water from Metropolitan.

Metropolitan has instituted a Groundwater Recovery (GWR) program that will subsidize the cost of these desalters up to $250 per acre-ft. In the GWR program, Metropolitan will purchase the product water from the desalter for up to $250 over Metropolitan's base treated rate and sell the water back to EMWD at the base treated rate. Metropolitan instituted this program to encourage the recovery of contaminated groundwater. Table 7-3 shows how the GWR program will work for the Menifee desalter.

Information Needs. New information and engineering studies are required to develop definitive estimates of the size and benefits of projects to recover contaminated groundwater. The types of new information and studies that are required include:

- geophysical studies to determine aquifer boundaries and geometry
- hydrogeologic studies to determine aquifer hydraulic properties
- geochemical studies to establish ambient groundwater quality, and trends
- facility studies to site and evaluate engineering and facility requirements
- economic studies
- environmental studies

Part of these investigations should include demonstration or pilot projects. Demonstration-level projects for the recovery of contaminated water should be done to test the technical and institutional feasibility of full scale projects. Demonstration projects should include the following:

- Pilot scale demineralization projects in Winchester, Perris South and San Jacinto Lower Pressure subbasins. These tests would provide design data for large scale projects.

- Well scale blending projects. Poor quality groundwater from out-of-service EMWD wells could be injected into EMWD's distribution system. This could be done with EMWD's Falico well in the Perris South subbasin

TABLE 7-3
MENIFEE DESALTER COSTS AND METROPOLITAN'S GROUNDWATER RECOVER PROGRAM

Year	Menifee Desalter Cost				Metropolitan Treated Base Rate	Metropolitan GWR Subsidy	Purchase Price to Metropolitan	Remaining Unsubsidized Cost	Unit Cost to EMWD
	Amortized Capital cost ($)	Annual O & M Cost ($)	Total Annual Cost (1) ($)	Unit Cost (2) ($/acre-ft)	($/acre-ft)	($/acre-ft)	($/acre-ft)	($/acre-ft)	($/acre-ft)
1995	$919,652	$1,748,734	$2,668,386	$794	$454	$250	$704	$90	$544
1996	$919,652	$1,801,196	$2,720,848	$810	$483	$250	$733	$77	$560
1997	$919,652	$1,855,232	$2,774,884	$826	$515	$250	$765	$61	$576
1998	$919,652	$1,910,889	$2,830,541	$842	$545	$250	$795	$47	$592
1999	$919,652	$1,968,216	$2,887,868	$859	$578	$250	$828	$31	$609
2000	$919,652	$2,027,262	$2,946,914	$877	$613	$250	$863	$14	$627
2001	$919,652	$2,088,080	$3,007,732	$895	$649	$246	$895	$0	$649
2002	$919,652	$2,150,722	$3,070,374	$914	$688	$226	$914	$0	$688
2003	$919,652	$2,215,244	$3,134,896	$933	$730	$203	$933	$0	$730
2004	$919,652	$2,281,701	$3,201,353	$953	$773	$180	$953	$0	$773
2005	$919,652	$2,350,152	$3,269,804	$973	$820	$153	$973	$0	$820
2006	$919,652	$2,420,657	$3,340,309	$994	$869	$125	$994	$0	$869
2007	$919,652	$2,493,277	$3,412,929	$1,016	$921	$95	$1,016	$0	$921
2008	$919,652	$2,568,075	$3,487,727	$1,038	$976	$62	$1,038	$0	$976
2009	$919,652	$2,645,117	$3,564,769	$1,061	$1,035	$26	$1,061	$0	$1,035
2010	$919,652	$2,724,471	$3,644,123	$1,085	$1,097	$0	$1,085	$0	$1,097

note (1) annual O & M cost escalate at three percent per year

(2) desalter produces 3,360 acre-ft/yr

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and other wells in Winchester and the Lower San Jacinto subbasins, as appropriate.

CONJUNCTIVE USE

Conjunctive use is an operational strategy that combines the operations of multiple sources of water and storage resources in such a way that the combined yield is greater than the yield that would occur from the sum of independent, uncoordinated operations of the sources. The same definition would apply if other goals could be achieved by coordinated operation and the yield remained at an acceptable level. Other goals might include reduced cost, more reliable supply, and the attainment of environmental objectives. In most cases, conjunctive use results in increased yield and lower cost. Conjunctive use is commonly associated with storing of imported water in groundwater basins for use during periods of shortage. The more general definition could involve EMWD reclamation and municipal distribution facilities, Metropolitan facilities and resources, state project facilities and resources, groundwater basins within EMWD, and, potentially, groundwater basins outside of EMWD. Conjunctive use can operate seasonally, over-year or both. Seasonal conjunctive use would bank water during seasonal period(s) of over-supply or abundance for use during dry times of the year. Over-year conjunctive use would bank water during years of over-supply or abundance for use during drought periods and imported water shortages.

Table 7-4 summarizes the considerations for conjunctive use projects by subbasin. Based on current knowledge of groundwater conditions, EMWD could bank local runoff, imported water purchased from Metropolitan and reclaimed water in the Lakeview, Perris North and Perris South subbasins during the period of October 1 through April 30, for use either during the summer, during periods of imported water shortages, or both. The unused storage capacity of the Lakeview, Perris North and Perris South subbasins is about 600,000 acre-ft. EMWD could use up to half (and possibly more) of this unused storage capacity for seasonal and over-year storage, thereby reducing the cost of imported water purchases and providing an additional source of water during periods of imported supply shortage.

Recharge would be accomplished with a combination of new spreading basins and injection wells. Recovery of recharge will be through existing and new production wells. Where practical, injection and production will occur at the same well. That is, injection will take place

TABLE 7-4
CONSIDERATIONS FOR CONJUNCTIVE USE PROJECTS

Conjunctive Use Characteristics	Subbasin					
	Lakeview	Menifee	Perris North	Perris South(1)	San Jacinto Lower Pressure	Winchester
Unused Groundwater Storage Capacity (acre-ft)	230,000	40,000	220,000	150,000	9,000	5,000
Groundwater Quality (2)	Good	Poor	Good	Poor	Poor	Poor
Range in Capacity of Producing Wells (gpm)	100-2,000	10-1,000	90-1,000	90-1,000	Unknown	100-850
Recharge Methods	Spreading Basins In-Lieu Injection	Injection In-Lieu	Spreading Basins In-Lieu Injection	Spreading Basins In-Lieu Injection	Injection In-Lieu	Injection In-Lieu
Spreading Basin Potential	Yes	No	Yes	Yes	No	No
Proximity to Imported Water Facilities	State Project Water Colorado River Water		State Project Water	State Project Water Colorado River Water		State Project Water Colorado River Water
Proximity to Reclaimed Water Facilities	Yes	Yes	Yes	Yes	Yes	Yes
Proximity to Major Drainage Facilities	San Jacinto River	Salt Creek	Perris Valley Drain	San Jacinto River Salt Creek	San Jacinto River	Salt Creek

note - (1) part of Perris South-I and -II have good quality water

(2) good quality water has a TDS less than 500 mg/L; poor quality water has TDS greater than 500 mg/L and generally greater than 1,000 mg/L

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during the recharge period of October 1 through April 30, followed by groundwater production at the same well during the period of May 1 to September 30. This type of aquifer storage and recovery scheme is ideal for areas where spreading is infeasible due to land use, low recharge rates or groundwater quality limitations.

Reclaimed water could be a source of recharge in a conjunctive use program for augmentation of potable supplies. Parts of groundwater subbasins could be used for the seasonal storage of reclaimed water.

Based on current knowledge of groundwater conditions, conjunctive use with imported supplies and local runoff in the San Jacinto Lower Pressure, Menifee and Winchester subbasins appears to be more difficult to implement and of less benefit. Limited conjunctive use in these subbasins could be done in conjunction with groundwater treatment.

Increase in Supply. The increase in supply from conjunctive use could not be determined at this level of study. Under a worst case scenario, conjunctive use would reduce shortages that EMWD customers would face during imported water shortages and would reduce the cost of imported water use through the purchase of off-peak supplies and use of reclaimed water for recharge. EMWD should be able to shift about 30,000 to 50,000 acre-ft year of base rate purchases to off-peak, with large conjunctive use projects in the Lakeview, Perris North and Perris South subbasins. The reduction in cost would be much more substantial if a blend of reclaimed water and imported water were recharged during the winter.

Information Needs. New information and engineering studies are required to develop definitive estimates of the size and benefits of potential artificial recharge projects. The types of new information and studies that are required include:

- ❑ geophysical studies to determine aquifer boundaries and geometry
- ❑ hydrogeologic studies to determine aquifer hydraulic properties
- ❑ geochemical studies to establish ambient groundwater quality, trends, and compatibility of ambient groundwater with imported water
- ❑ facility studies to site and evaluate engineering and facility requirements
- ❑ economic studies
- ❑ environmental studies

Demonstration projects should be developed to test injection of treated imported water in the Lakeview, Perris North and Perris South subbasins. These demonstration projects would test the feasibility of well injection for groundwater recharge and aquifer storage and recovery for conjunctive use. Demonstration level injection well tests should be done for blends of treated imported water and reclaimed water.

EXCHANGE OF AGRICULTURAL AND OTHER NON-POTABLE WATER USERS FROM GROUNDWATER TO RECLAIMED WATER

The exchange of agricultural and other non-potable groundwater production to municipal uses can occur through:

- retirement of agricultural lands, that is, the conversion of agricultural lands to non-agricultural uses; and
- by substituting other supplies such as reclaimed water.

Agricultural demands are projected to range from 33,000 acre-ft/yr in 1995 to 31,000 acre-ft/yr in 2010. The average agricultural demand during this period is approximately equal to the total yield of the West San Jacinto Basin. The substitution of reclaimed water for agriculture groundwater production and other non-potable uses is a prerequisite to developing municipal supplies from the West San Jacinto Groundwater Basin. There are some agricultural demands that cannot be satisfied with reclaimed water, such as dairy cow washing and processing of produce for market.

Increase in Supply. The increase in municipal supply that will occur from the exchange of agricultural and other non-potable groundwater production to municipal production is approximately one acre-ft for each acre-ft of exchange. Agricultural groundwater production is projected to range from about 24,100 acre-ft/yr in 1995, to 22,100 acre-ft/yr in 2010. A reasonable goal would be to exchange between 10,000 to 20,000 acre-ft of agricultural and other non-potable groundwater production to municipal production.

Demonstration-level projects for the exchange of agricultural and other non-potable users from groundwater to reclaimed water should be done to test the technical and institutional feasibility of full scale projects. Long term use of reclaimed water for irrigation may impact the drainage characteristics of the soil. Demonstration projects should be done to investigate the impacts from irrigation with reclaimed water on soils and evaluate appropriate soil and irrigation management practices. EMWD is currently in the process of completing exchange agreements similar to that

described above with Moreno Valley Ranch Golf Course and University of California, Riverside, in the Perris North subbasin and Mr. John D. Mott in Lakeview Subbasin.

Cost. The cost associated with supplying reclaimed water to agricultural users is the capital, operations and maintenance cost associated with the conveyance of reclaimed water to the agricultural and other non-potable water users. This cost is a sunk cost as EMWD must treat and dispose of reclaimed water whether any water exchange occurs or doesn't occur. The water supply cost associated with the exchange of agricultural groundwater production to municipal production with the retirement of agricultural lands is assumed to be zero.

SECTION 8

SECTION 8
GROUNDWATER MANAGEMENT PLAN

CONTENTS OF THE MANAGEMENT PLAN

The management plan described herein is a program to achieve the management plan goals and includes conceptual descriptions of elements of the plan, and a description of the process to define and implement these elements consistent with the management plan goal. This plan, when adopted, will be the groundwater management program for the West San Jacinto Groundwater Basin management area. The groundwater management program will include: the development and implementation of policies, engineering investigations, facilities construction and operation, and other management activities. There are significant deficiencies in the knowledge of the groundwater resources of the West San Jacinto Groundwater Basin management area. These deficiencies preclude the definitive descriptions for some of the physical and institutional elements of the groundwater management plan. The groundwater management program includes studies to develop additional information that is necessary to develop all the institutional and physical elements described in the plan.

MANAGEMENT PLAN CRITERIA

The goal of the management plan stated in Section 6 is:

> ***maximize the use of groundwater for potable demands in such a way as to lower the cost of water supply and to improve the reliability of the <u>total</u> water supply for <u>all water users in the West San Jacinto Groundwater Basin management area</u>***

This goal extends to all groundwater users. Groundwater users that are not dependent on EMWD should benefit from the groundwater management plan. Adverse impacts, if any, from the

groundwater plan will be minimized or mitigated. The rights of private groundwater producers will be protected. Groundwater producers who extract 10 acre-ft/yr or less shall be exempt from the operation and implementation of the groundwater management plan.

The implementation of this goal and its attendant constraints requires a set of criteria from which to test the various elements of the Management Plan. These criteria include:

- ❑ meet future water demands
- ❑ minimize dependence on imported water
- ❑ adequate (safe) water supply quality
- ❑ minimum cost
- ❑ ease of implementation

The groundwater management plan must be an integral part of satisfying the water demands in the West San Jacinto Groundwater Basin management area. Each element of the plan must, on its own, either add to the water supply or, by complementary action, cause the yield of another element to increase.

Minimizing the dependence on imported water is driven by the need for reliability and cost. The management area will, for the foreseeable future, be heavily dependent on imported water. Imported water is expensive and prone to shortage. Groundwater, properly managed, can be used to minimize peak seasonal demand on imported supplies and can provide carry-over storage for use when shortages occur in the imported supply.

The yield developed by the management program should, when delivered to water users, be of suitable quality. For municipal users this will be potable quality. For private groundwater producers, groundwater quality should be improved or the same as if the groundwater management plan did not exist.

The cost of municipal water supplies should be less with the management plan. The water supply cost for private water users should be less or unchanged. The yield of the management plan is part of the mix of water sources available in the management area. The groundwater management elements incorporated in the groundwater management plan will be such as to minimize the cost of the total water supply and will not be based on the individual element cost.

The groundwater management plan should be implementable. The benefits, cost and institutional complexity should be such that it will be feasible to implement the groundwater management plan.

ULTIMATE PLAN DESCRIPTION

The groundwater management plan consists of a series of elements that, when implemented, will achieve the management plan goal stated above within the constraints. The management plan includes implementation of new policies, institutional arrangements, and physical projects. EMWD will be the agency responsible for implementation of the groundwater management plan. Based on the information developed in this study and presented in the previous sections, the ultimate groundwater management plan should include the following elements.

Establishment of a Groundwater Basin Manager

EMWD will implement the groundwater management plan. EMWD Board of Directors will be the decision-making body responsible for directing the implementation of the groundwater management plan. EMWD staff will serve as the staff to assist the EMWD Board of Directors in implementing the plan.

Upon adoption of the groundwater management plan, EMWD Board of Directors will appoint an Advisory Committee. The Advisory Committee will be composed of seven members, with one member each from city of Moreno Valley, city of Perris, Nuevo Mutual Water Company, Edgemont Gardens Mutual Water Company, and EMWD; and two members representing agricultural producers. The Advisory Committee shall study, review and provide comments on all groundwater management plan activities directly to the EMWD Board of Directors.

EMWD staff will prepare an annual engineering report describing the operation of the management plan for review by the EMWD Board of Directors, Advisory Committee and groundwater producers. EMWD, in consultation with the Advisory Committee and participating groundwater producers, will develop a coordinated operating strategy on an annual basis, based on the management plan and the findings of the annual report.

Monitoring of Groundwater Production

EMWD, in cooperation with the Advisory Committee, will implement a groundwater production monitoring program. Detailed estimates of the safe yield will be developed in the first year of the groundwater production monitoring. Groundwater production estimates will be developed by EMWD based on totalizing meters, energy usage and land use. EMWD will produce a groundwater production report and estimates of overdraft (if any). These data will be included in the annual report provided to the Advisory Committee. The production monitoring program will not limit or suspend groundwater production by existing groundwater producers.

Monitoring of Groundwater Level and Quality

EMWD, in cooperation with the Advisory Committee, will implement a groundwater level and quality monitoring program. Groundwater level and quality data will be collected from well owners. EMWD will measure groundwater levels and quality from select private wells. Groundwater levels and quality data from agencies' wells will be provided to EMWD by the agencies. EMWD will compile these data and develop estimates of the groundwater in storage, change in storage, overdraft and groundwater quality conditions. These data will be included in the annual report provided to the management committee.

Development of Well Construction Policies

EMWD, in cooperation with the Advisory Committee, the Department of Health Services and the Riverside County Health Department, will develop well construction policies that are specific to the West San Jacinto Groundwater Basin management area. These policies will be updated continuously based on new regulatory requirements and data. These polices will not limit or suspend groundwater production by existing groundwater producers.

Development of a Well Abandonment and Destruction Program

EMWD, in cooperation with the Advisory Committee, the Department of Health Services and the Riverside County Health Department, should develop well abandonment and destruction policies that are specific to the West San Jacinto Groundwater Basin management area. These policies should be updated continuously based upon new regulatory requirements and data.

Monitoring of Well Construction, Abandonment and Destruction

EMWD has compiled and digitized most, if not all the well construction information that is available for existing wells. EMWD, in cooperation with other groundwater producers, will collect well construction data for new wells. EMWD will provide comments and suggestions to supplement design criteria that will be required by other agencies, including the Department of Health Services and the Riverside County Health Department. EMWD, through the monitoring of groundwater production, will determine wells that are inactive and make recommendations to well owners regarding the fate of these wells.

Groundwater Quality Protection

EMWD, in cooperation with the Advisory Committee and parties responsible for groundwater quality degradation, should develop cooperative plans to prevent further degradation of groundwater and to integrate the solution of existing water quality problems to maximize the beneficial use of groundwater. The known areas of concern are the high TDS groundwater in the Perris South II (Ski Land area) and Winchester subbasins, and the groundwater contamination associated with March Air Force Base. The existing efforts undertaken by EMWD to rehabilitate the Menifee subbasins (the Menifee desalter project) will be completed independent of the groundwater management plan. Additional degraded groundwater areas could be discovered through groundwater monitoring.

Exchange of Agricultural and Other Non-potable Groundwater Production to Municipal Use

The intent of this element is to increase the groundwater yield available for municipal use by either retiring agricultural and non potable demands or by substituting reclaimed water for groundwater used for agricultural and other non-potable uses. It is the goal of this element to maximize the exchange of groundwater production from non-potable uses to municipal uses. Incentives should be developed to encourage the exchange of agricultural groundwater production to municipal use. From an agricultural perspective, the cost of using reclaimed water should be equal to, or less than, the cost of groundwater.

EMWD should consider providing reliable reclaimed water service to individual farms and other non-potable users by constructing pipelines from EMWD reclamation facilities to logical points

in the farm irrigation systems. The farmer would pay for the reclaimed water at a rate that would make the farmer indifferent to either groundwater or reclaimed water; or at a rate slightly less than his groundwater production cost. The rate should be based on the actual cost of groundwater production and the usefulness of the farmer's well to EMWD. The farmer would pay for reclaimed water based on the operation and maintenance cost of his well. The farmer would produce only enough groundwater for potable uses on the farm, and future potable demands, when the land is developed, would be served by EMWD.

If the agricultural well were suitable for municipal use, then the farmer's well and necessary easements could be purchased by EMWD. The purchase price would be reflected in the cost of reclaimed water. In this case, the farmer would pay for reclaimed water based on the operation and maintenance cost of his well, less the amortized purchase price of the farmer's well. In either case, the reclaimed water rate may have to be discounted slightly to cause the exchange to occur.

Use of reclaimed water on some soils may reduce the drainage rate of soil and lead to water logged and other undesirable soil conditions. Each site where reclaimed water could be applied in lieu of groundwater needs to be evaluated to ensure that the reclaimed water can safely be applied to the soil. This evaluation will be completed prior to formalizing agreements to exchange groundwater for reclaimed water.

Maximize Yield Augmentation with Local Resources - Local Runoff and Reclaimed Water

Yield augmentation through the recharge of runoff (water harvesting) and through the recharge of reclaimed water should be implemented where consistent with water quality objectives and other elements of the groundwater management plan. The Lakeview, Perris North and Perris South subbasins appear to be the most feasible areas for this element. The cost associated with the recharge of runoff and reclaimed water are the capital and operation costs for the facilities to capture and recharge runoff and reclaimed water.

The specifics of recharge and conveyance facilities will be developed after a thorough groundwater resources evaluation is performed and planning studies are done to develop and evaluate yield augmentation alternatives.

Maximize Conjunctive Use

Conjunctive use should be implemented in the West San Jacinto Groundwater Basin management area. The unused storage capacity in the West San Jacinto Groundwater Basin management area is about 670,000 acre-ft, with about 600,000 acre-ft or 90 percent in the Lakeview, Perris North and Perris South subbasins. The yield from conjunctive use, exclusive of safe yield, could range from 30,000 to 50,000 acre-ft, or perhaps larger. Conjunctive use will improve overall water supply reliability, groundwater quality, and will lower water supply cost. These benefits will be realized by all groundwater users.

The specifics of recharge, extraction, conveyance and treatment facilities will be developed after a thorough groundwater resources evaluation is performed and planning studies are done to develop and evaluate conjunctive use alternatives.

Groundwater Treatment

Groundwater treatment in the form of blending and demineralization should be done in the West San Jacinto Groundwater Basin management area to recover contaminated groundwater for municipal use. The specifics of treatment facilities will be developed after a thorough groundwater resources evaluation is performed and planning studies are done to evaluate groundwater treatment feasibility.

Groundwater Management Plan Alternatives

Four groundwater management alternatives were developed to evaluate the economic benefits to all water users in the groundwater management area. All four of these alternatives include the following management elements:

- ❑ Establishment of Groundwater Basin Manager
- ❑ Monitoring of Groundwater Production
- ❑ Monitoring of Groundwater Level and Quality
- ❑ Development of Well Construction Policies
- ❑ Development of a Well Abandonment and Destruction Program
- ❑ Monitoring of Well Construction, Abandonment and Destruction
- ❑ Groundwater Quality Protection

Alternative 1 - Agricultural Exchange and Blending. Alternative 1 consists of the above-mentioned common elements plus the exchange of agricultural groundwater production, of which 2,000 acre-ft/yr are permanent transfers from land use conversions and about 17,500 acre-ft/yr of exchange of groundwater production for reclaimed water. Seven thousand one hundred acre-ft/yr of poor quality groundwater will be pumped from the San Jacinto Lower Pressure and Perris South subbasins and blended with imported water for municipal use.

Alternative 2 - Agricultural Exchange, Blending and Demineralization. Alternative 2 consists of the above-mentioned common elements plus the exchange of agricultural groundwater production, of which 2,000 acre-ft/yr are permanent transfers from land use conversions and about 21,700 acre-ft/yr of exchange of groundwater production for reclaimed water. Seven thousand one hundred acre-ft/yr of poor quality groundwater will be pumped from the San Jacinto Lower Pressure and Perris South subbasins and blended with imported water for municipal use. Five thousand three hundred acre-ft/yr of highly mineralized groundwater from the Perris South and Winchester subbasins will be pumped and demineralized to produce about 4,200 acre-ft of drinking water.

Alternative 3 - Agricultural Exchange, Blending, Demineralization and 30,000 acre-ft/yr Conjunctive Use. Alternative 3 includes all the elements of Alternative 2, plus conjunctive use. Conjunctive use will be implemented in the Perris North, Perris South I, Perris South II and Lakeview subbasins. Recharge would occur in spreading basins. Source water is state project water and reclaimed water. Average annual increase in recharge and extraction from conjunctive use will be about 30,000 acre-ft/yr.

Alternative 4 - Agricultural Exchange, Blending, Demineralization and 50,000 acre-ft/yr Conjunctive Use.. Alternative 4 is identical to Alternative 3 except that the conjunctive use element has been expanded to 50,000 acre-ft/yr.

Economic Evaluation of the Groundwater Management Plan Alternatives

Tables 8-1 through 8-4 illustrate the economic benefits that water users in the West San Jacinto Groundwater Basin management area would realize if a groundwater management plan were implemented. Each table lists the projected total demand for water and shows how that demand would be satisfied with each groundwater management plan alternative. For economic

TABLE 8-1
PRELIMINARY ESTIMATE OF COST OF WATER SUPPLY PLAN FOR THE WEST SAN JACINTO GROUNDWATER BASIN MANAGEMENT AREA
ALTERNATIVE 1 - AGRICULTURAL EXCHANGE AND BLENDING

Year	Demand	Imported Water: Treated Base Water: Direct Use	Imported Water: Treated Base Water: Blending	Imported Water: Treated Base Water: Rate	Imported Water: Total: Imported Volume	Imported Water: Total: Imported Cost	Reclaimed Water: Direct Use	Reclaimed Water: Rate	Reclaimed Water: Total Recl. Water Use	Reclaimed Water: Cost	Agricultural Groundwater: Volume	Agricultural Groundwater: Rate	Agricultural Groundwater: Cost	Municipal Use of Groundwater: Demineralization: Volume	Demineralization: Rate	Direct Municipal Use: Volume	Direct Municipal Use: Rate	Blending: Volume	Blending: Rate	Blending: Cost	Total Mun. Use of Groundwater	Total Groundwater Usage	Total Cost	Composite Unit Cost
	(acre-ft/yr)	(acre-ft/yr)	(acre-ft/yr)	($/acre-ft)		($)	(acre-ft/yr)	($/acre-ft)		($)	(acre-ft/yr)	($/acre-ft)	($)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)		(acre-ft/yr)	(acre-ft/yr)	($)	($/acre-ft)
1995	80,000	44,500	0	$454	44,500	$20,203,000	8,900	$63	8,900	$560,700	24,100	$63	$1,518,300	0	$0	2,500	$68	0	$68	$170,000	2,500	26,600	$22,452,000	$281
1996	83,000	47,300	0	$483	47,300	$22,845,900	10,849	$66	10,849	$710,826	22,351	$66	$1,464,438	0	$0	2,500	$71	0	$71	$176,800	2,500	24,851	$25,197,964	$304
1997	86,000	46,740	0	$515	46,740	$24,071,100	12,798	$68	12,798	$872,066	20,602	$68	$1,403,837	3,360	$576	2,500	$74	0	$74	$2,119,232	5,860	26,462	$28,466,235	$331
1998	89,000	49,540	0	$545	49,540	$26,999,300	14,747	$71	14,747	$1,045,067	18,853	$71	$1,336,045	3,360	$592	2,500	$76	0	$76	$2,180,347	5,860	24,713	$31,560,759	$355
1999	92,000	33,604	5,500	$578	39,104	$22,602,112	16,696	$74	16,696	$1,230,513	17,104	$74	$1,260,583	3,360	$609	8,636	$80	7,100	$80	$3,298,045	19,096	36,200	$28,391,254	$309
2000	95,000	34,635	5,500	$613	40,135	$24,615,015	18,645	$77	18,645	$1,429,123	15,355	$77	$1,176,947	3,360	$627	10,385	$83	7,100	$83	$3,553,296	20,845	36,200	$30,774,381	$324
2001	99,000	36,706	5,500	$649	42,206	$27,391,694	20,594	$80	20,594	$1,641,653	13,606	$80	$1,084,604	3,360	$649	12,134	$86	7,100	$86	$3,835,566	22,594	36,200	$33,953,516	$343
2002	103,000	38,757	5,500	$688	44,257	$30,448,816	22,543	$83	22,543	$1,868,898	11,857	$83	$982,989	3,360	$688	13,883	$89	7,100	$89	$4,189,309	24,343	36,200	$37,490,013	$364
2003	107,000	40,808	5,500	$730	46,308	$33,804,840	24,492	$86	24,492	$2,111,697	10,108	$86	$871,510	3,360	$730	15,632	$93	7,100	$93	$4,568,301	26,092	36,200	$41,356,348	$387
2004	111,000	42,859	5,500	$773	48,359	$37,381,507	26,441	$90	26,441	$2,370,929	8,359	$90	$749,540	3,360	$773	17,381	$97	7,100	$97	$4,966,679	27,841	36,200	$45,468,654	$410
2005	115,000	44,910	5,500	$820	50,410	$41,336,200	28,390	$93	28,390	$2,647,521	6,610	$93	$616,418	3,360	$820	19,130	$101	7,100	$101	$5,395,423	29,590	36,200	$49,995,562	$435
2006	120,600	50,310	5,500	$869	55,810	$48,498,890	28,590	$97	28,590	$2,772,818	6,610	$97	$641,075	3,360	$869	19,130	$105	7,100	$105	$5,665,672	29,590	36,200	$57,578,455	$477
2007	126,200	55,710	5,500	$921	61,210	$56,374,410	28,790	$101	28,790	$2,903,904	6,610	$101	$666,718	3,360	$921	19,130	$109	7,100	$109	$5,950,225	29,590	36,200	$65,895,257	$522
2008	131,800	61,110	5,500	$976	66,610	$65,011,360	28,990	$105	28,990	$3,041,040	6,610	$105	$693,387	3,360	$976	19,130	$113	7,100	$113	$6,249,252	29,590	36,200	$74,995,039	$569
2009	137,400	66,510	5,500	$1,035	72,010	$74,530,350	29,190	$109	29,190	$3,184,501	6,610	$109	$721,122	3,360	$1,035	19,130	$118	7,100	$118	$6,566,287	29,590	36,200	$85,002,260	$619
2010	143,000	71,910	5,500	$1,097	77,410	$84,918,770	29,390	$113	29,390	$3,334,573	6,610	$113	$749,967	3,360	$1,085	19,130	$123	7,100	$122	$6,857,835	29,590	36,200	$95,861,145	$670
Total Volume	1,719,000	765,929	66,000		831,929		350,045				201,955			47,040		202,831		85,200			335,071	537,026		
Fraction of Total		45%	4%				20%				12%			3%		12%		5%						
Total Cost						$641,033,264				$31,725,830			$15,937,480							$65,742,269			$754,438,842	
Fraction of Total						85%				4%			2%							9%				
Present Value																							$449,025,139	

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TABLE 8-2
PRELIMINARY ESTIMATE OF COST OF WATER SUPPLY PLAN FOR THE WEST SAN JACINTO GROUNDWATER BASIN MANAGEMENT AREA
ALTERNATIVE 2 - AGRICULTURAL EXCHANGE, BLENDING AND DEMINERALIZATION

Year	Demand	Imported Water					Reclaimed Water				Agricultural Groundwater			Municipal Use of Groundwater								Total Groundwater Usage	Total Cost	Composite Unit Cost
		Treated Base Water			Total									Demineralization		Direct Municipal Use		Blending		Municipal Cost	Total Mun. Use of Groundwater			
		Direct Use	Blending	Rate	Imported Volume	Imported Cost	Direct Use	Rate	Total Recl. Water Use	Cost	Volume	Rate	Cost	Volume	Rate	Volume	Rate	Volume	Rate					
	(acre-ft/yr)	(acre-ft/yr)	(acre-ft/yr)	($/acre-ft)		($)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($)	(acre-ft/yr)	($/acre-ft)	($)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)		(acre-ft/yr)	(acre-ft/yr)	($)	($/acre-ft)
1995	80,000	44,500	0	$454	44,500	$20,203,000	8,900	$63	8,900	$560,700	24,100	$63	$1,518,300	0	$0	2,500	$68	0	$68	$170,000	2,500	26,600	$22,452,000	$281
1996	83,000	47,300	0	$483	47,300	$22,845,900	11,269	$66	11,269	$738,345	21,931	$66	$1,436,919	0	$0	2,500	$71	0	$71	$176,800	2,500	24,431	$25,197,964	$304
1997	86,000	46,740	0	$515	46,740	$24,071,100	13,638	$68	13,638	$929,304	19,762	$68	$1,346,598	3,360	$576	2,500	$74	0	$74	$2,119,232	5,860	25,622	$28,466,235	$331
1998	89,000	49,540	0	$545	49,540	$26,999,300	16,007	$71	16,007	$1,134,359	17,593	$71	$1,246,753	3,360	$592	2,500	$76	0	$76	$2,180,347	5,860	23,453	$31,560,759	$355
1999	92,000	31,924	5,500	$578	37,424	$21,631,072	18,376	$74	18,376	$1,354,331	15,424	$74	$1,136,766	7,540	$609	6,136	$80	7,100	$80	$3,644,789	20,776	36,200	$29,766,958	$324
2000	95,000	32,555	5,500	$613	38,055	$23,327,715	20,745	$77	20,745	$1,590,086	13,255	$77	$1,015,984	7,540	$627	8,305	$83	7,100	$83	$4,002,073	22,945	36,200	$31,935,858	$336
2001	99,000	34,186	5,500	$649	39,686	$25,756,214	23,114	$80	23,114	$1,842,535	11,086	$80	$883,722	7,540	$649	10,474	$86	7,100	$86	$4,405,557	25,114	36,200	$34,888,027	$352
2002	103,000	35,817	5,500	$688	41,317	$28,426,096	25,483	$83	25,483	$2,112,635	8,917	$83	$739,252	7,540	$688	12,643	$89	7,100	$89	$4,954,190	27,283	36,200	$38,232,173	$371
2003	107,000	37,448	5,500	$730	42,948	$31,352,040	27,852	$86	27,852	$2,401,395	6,748	$86	$581,812	7,540	$730	14,812	$93	7,100	$93	$7,543,390	29,452	36,200	$41,878,637	$391
2004	111,000	39,079	5,500	$773	44,579	$34,459,567	30,221	$90	30,221	$2,709,876	4,579	$90	$410,593	7,540	$773	16,981	$97	7,100	$97	$8,159,104	31,621	36,200	$45,739,140	$412
2005	115,000	40,710	5,500	$820	46,210	$37,892,200	32,590	$93	32,590	$3,039,193	2,410	$93	$224,745	7,540	$820	19,150	$101	7,100	$101	$8,825,036	33,790	36,200	$49,981,175	$435
2006	120,600	46,110	5,500	$869	51,610	$44,849,090	32,790	$97	32,790	$3,180,158	2,410	$97	$233,735	7,540	$869	19,150	$105	7,100	$105	$9,300,185	33,790	36,200	$57,563,169	$477
2007	126,200	51,510	5,500	$921	57,010	$52,506,210	32,990	$101	32,990	$3,327,537	2,410	$101	$243,085	7,540	$921	19,150	$109	7,100	$109	$9,802,183	33,790	36,200	$65,879,015	$522
2008	131,800	56,910	5,500	$976	62,410	$60,912,160	33,190	$105	33,190	$3,481,619	2,410	$105	$252,808	7,540	$976	19,150	$113	7,100	$113	$10,331,196	33,790	36,200	$74,977,783	$569
2009	137,400	62,310	5,500	$1,035	67,810	$70,183,350	33,390	$109	33,390	$3,642,703	2,410	$109	$262,920	7,540	$1,035	19,150	$118	7,100	$118	$10,894,942	33,790	36,200	$84,983,916	$619
2010	143,000	67,710	5,500	$1,097	73,210	$80,311,370	33,590	$113	33,590	$3,811,103	2,410	$113	$273,437	7,540	$1,085	19,150	$122	7,100	$122	$11,395,584	33,790	36,200	$95,791,494	$670
Total Volume	1,719,000	724,349	66,000		790,349		394,145				157,855			97,200		194,251		85,200			376,651	534,506		
Fraction of Total		42%	4%		46%		23%				9%			6%		11%		5%						
Total Cost						$605,726,384				$35,855,879			$11,807,430							$105,904,608			$759,294,301	
Fraction of Total						80%				5%			2%							14%				
Present Value																							$452,553,506	

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TABLE 8-3 (revised 9/7/94)
PRELIMINARY ESTIMATE OF COST OF WATER SUPPLY PLAN FOR THE WEST SAN JACINTO GROUNDWATER BASIN MANAGEMENT AREA
ALTERNATIVE 3 - AGRICULTURAL EXCHANGE, BLENDING, DEMINERALIZATION AND
30,000 ACRE-FT CONJUNCTIVE USE (ALL RECHARGE THROUGH SPREADING)

Year	Demand	Imported Water: Treated Base Water: Direct Use	Imported Water: Treated Base Water: Blending	Imported Water: Treated Base Water: Rate	Imported Water: Untr. Seasonal Water: Conj. Use	Imported Water: Untr. Seasonal Water: Rate	Imported Water: Total: Imported Volume	Imported Water: Total: Imported Cost	Reclaimed Water: Direct Use	Reclaimed Water: Rate	Reclaimed Water: Conj. Use	Reclaimed Water: Rate	Reclaimed Water: Total Recl. Water Use	Reclaimed Water: Cost	Agricultural Groundwater: Volume	Agricultural Groundwater: Rate	Agricultural Groundwater: Cost	Municipal Use of Groundwater: Demineralization: Volume	Municipal Use of Groundwater: Demineralization: Rate	Municipal Use of Groundwater: Direct + Conj. Use: Volume	Municipal Use of Groundwater: Direct + Conj. Use: Rate	Municipal Use of Groundwater: Blending: Volume	Municipal Use of Groundwater: Blending: Rate	Municipal Use of Groundwater: Cost	Municipal Use of Groundwater: Total Mun. Use of Groundwater	Total Groundwater Usage	Total Cost	Composite Unit Cost
	(ac-ft/yr)	(ac-ft/yr)	(ac-ft/yr)	($/ac-ft)	(ac-ft/yr)	($/ac-ft)		($)	(ac-ft/yr)	($/ac-ft)	(ac-ft/yr)	($/ac-ft)	(ac-ft/yr)	($)	(ac-ft/yr)	($/ac-ft)	($)	(ac-ft/yr)	($/ac-ft)	(ac-ft/yr)	($/ac-ft)	(ac-ft/yr)	($/ac-ft)	($)	(ac-ft/yr)	(ac-ft/yr)	($)	($/ac-ft)
1995	80,000	44,500	0	$454	0	$256	44,500	$20,203,000	8,900	$63	0	$0	8,900	$560,700	24,100	$63	$1,518,300	0	$0	2,500	$68	0	$68	$170,000	2,500	26,600	$22,452,000	$281
1996	83,000	41,500	0	$483	0	$278	47,500	$22,942,500	11,069	$66	0	$0	11,069	$725,241	21,931	$66	$1,436,919	0	$0	2,500	$71	0	$71	$176,800	2,500	24,431	$25,281,460	$305
1997	86,000	47,140	0	$515	0	$304	47,140	$24,277,100	13,238	$68	0	$0	13,238	$902,048	19,762	$68	$1,346,598	3,360	$576	2,500	$74	0	$74	$2,119,232	5,860	25,622	$28,644,978	$333
1998	89,000	50,140	0	$545	0	$319	50,140	$27,326,300	15,407	$71	0	$0	15,407	$1,091,839	17,593	$71	$1,246,753	3,360	$592	2,500	$76	0	$76	$2,180,347	5,860	23,453	$31,845,239	$358
1999	92,000	2,724	5,500	$578	20,000	$338	28,224	$11,513,472	17,576	$74	10,000	$0	27,576	$1,295,370	15,424	$74	$1,136,766	7,540	$609	36,136	$80	7,100	$80	$8,031,300	50,776	66,200	$21,976,908	$239
2000	95,000	3,555	5,500	$613	20,000	$361	29,055	$12,774,715	19,745	$77	10,000	$0	29,745	$1,513,437	13,255	$77	$1,015,984	7,540	$627	38,305	$83	7,100	$83	$8,484,045	52,945	66,200	$23,788,181	$250
2001	99,000	5,386	5,500	$649	20,000	$389	30,886	$14,849,014	21,914	$80	10,000	$0	31,914	$1,746,877	11,086	$80	$883,722	7,540	$649	40,474	$86	7,100	$86	$8,986,808	55,114	66,200	$26,466,420	$267
2002	103,000	7,217	5,500	$688	20,000	$417	32,717	$17,093,296	24,083	$83	10,000	$0	34,083	$1,996,570	8,917	$83	$739,252	7,540	$688	42,643	$89	7,100	$89	$9,638,691	57,283	66,200	$29,467,809	$286
2003	107,000	9,048	5,500	$730	20,000	$447	34,548	$19,557,320	26,252	$86	10,000	$0	36,252	$2,263,444	6,748	$86	$581,812	7,540	$730	44,812	$93	7,100	$93	$10,333,271	59,452	66,200	$32,737,846	$306
2004	111,000	10,879	5,500	$773	20,000	$477	36,379	$22,204,378	28,421	$90	10,000	$0	38,421	$2,548,473	4,579	$90	$410,593	7,540	$773	46,981	$97	7,100	$97	$11,062,661	61,621	66,200	$36,226,104	$326
2005	115,000	12,710	5,500	$820	20,000	$511	38,210	$25,142,468	30,590	$93	10,000	$0	40,590	$2,852,682	2,410	$93	$224,745	7,540	$820	49,150	$101	7,100	$101	$11,844,734	63,790	66,200	$40,064,630	$348
2006	120,600	18,110	5,500	$869	20,000	$545	43,610	$31,422,808	30,790	$97	10,000	$0	40,790	$2,986,187	2,410	$97	$233,735	7,540	$869	49,150	$105	7,100	$105	$12,440,672	63,790	66,200	$47,083,402	$390
2007	126,200	23,310	5,500	$921	20,000	$582	49,010	$38,363,837	30,990	$101	10,000	$0	40,990	$3,125,807	2,410	$101	$243,085	7,540	$921	49,150	$109	7,100	$109	$13,068,288	63,790	66,200	$54,801,017	$434
2008	131,800	28,910	5,500	$976	20,000	$621	54,410	$46,014,012	31,190	$105	10,000	$0	41,190	$3,271,819	2,410	$105	$252,808	7,540	$976	49,150	$113	7,100	$113	$13,727,946	63,790	66,200	$63,206,586	$480
2009	137,400	34,310	5,500	$1,035	20,000	$664	59,810	$54,477,596	31,390	$109	10,000	$0	41,390	$3,424,511	2,410	$109	$262,920	7,540	$1,035	49,150	$118	7,100	$118	$14,427,562	63,790	66,200	$72,592,590	$528
2010	143,000	39,710	5,500	$1,097	20,000	$708	65,210	$63,758,026	31,590	$113	10,000	$0	41,590	$3,584,184	2,410	$113	$273,437	7,540	$1,085	49,150	$122	7,100	$122	$15,069,509	63,790	66,200	$82,685,156	$578
Total Volume	1,719,000	385,349	66,000		240,000		691,349		373,145						157,855			97,200		554,251		85,200			736,651	894,506			
Fraction of Total		22%	4%		14%		40%		22%						9%			6%		32%		5%							
Total Cost								$451,919,843						$33,889,189			$11,807,430							$141,763,865			$639,380,327	
Fraction of Total								71%						5%			2%							22%				
Present Value																											$384,636,284	

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TABLE 8-4 (revised 9/7/94)
PRELIMINARY ESTIMATE OF COST OF WATER SUPPLY PLAN FOR THE WEST SAN JACINTO GROUNDWATER BASIN MANAGEMENT AREA
ALTERNATIVE 4 - AGRICULTURAL EXCHANGE, BLENDING, DEMINERALIZATION AND
50,000 ACRE-FT CONJUNCTIVE USE (80% RECHARGE THROUGH SPREADING, 20% RECHARGE THROUGH INJECTION)

Year	Demand	Imported Water: Treated Base Water: Direct Use	Imported Water: Treated Base Water: Blending	Imported Water: Treated Base Water: Rate	Imported Water: Untr. Seasonal Water: Conj. Use	Imported Water: Untr. Seasonal Water: Rate	Imported Water: Treated Seasonal Water: Conj. Use	Imported Water: Treated Seasonal Water: Rate	Imported Water: Total: Imported Volume	Imported Water: Total: Imported Cost	Reclaimed Water: Direct Use	Reclaimed Water: Rate	Reclaimed Water: Conj. Use	Reclaimed Water: Rate	Reclaimed Water: Total Recl Water Use	Reclaimed Water: Cost	Agricultural Groundwater: Volume	Agricultural Groundwater: Rate	Agricultural Groundwater: Cost	Municipal Use of Groundwater: Demineralization Volume	Demineralization Rate	Direct + Conj. Use Volume	Direct + Conj. Use Rate	Blending Volume	Blending Rate	Blending Cost	Total Muni. Use of Groundwater	Total Groundwater Usage	Total Cost	Composite Unit Cost
	(acre-ft/yr)	(acre-ft/yr)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)		($)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($)	(acre-ft/yr)	($/acre-ft)	($)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)	($)	(acre-ft/yr)	(acre-ft/yr)	($)	($/acre-ft)
1995	80,000	44,500	0	$454	0	$256		$309	44,500	$20,203,000	8,900	$63	0	$0	8,900	$560,700	24,100	$63	$1,518,300	0	$0	2,500	$66	0	$68	$170,000	2,500	26,600	$22,452,000	$281
1996	83,000	47,500	0	$483	0	$278		$332	47,500	$22,942,500	11,069	$66	0	$0	11,069	$723,241	21,931	$66	$1,436,919	0	$0	2,500	$71	0	$71	$176,800	2,500	24,431	$23,281,460	$303
1997	86,000	47,140	0	$513	0	$304		$357	47,140	$24,277,100	13,238	$68	0	$0	13,238	$902,048	19,762	$68	$1,346,598	3,360	$376	2,500	$74	0	$74	$2,119,232	5,860	25,622	$28,644,978	$333
1998	89,000	50,140	0	$545	0	$319		$381	50,140	$27,326,300	15,407	$71	0	$0	15,407	$1,091,839	17,593	$71	$1,246,753	3,360	$592	2,500	$76	0	$76	$2,180,347	5,860	23,453	$31,845,239	$358
1999	92,000	0	5,500	$578	21,362	$338	1,362	$408	28,224	$10,954,780	17,376	$74	10,000	$0	27,376	$1,293,370	15,424	$74	$1,136,766	7,540	$609	38,860	$80	7,100	$80	$8,247,996	53,500	66,924	$21,634,911	$235
2000	95,000	0	5,500	$613	21,777	$361	1,778	$436	29,055	$12,012,205	19,745	$77	10,000	$0	29,745	$1,513,437	13,255	$77	$1,015,984	7,540	$627	41,860	$83	7,100	$83	$8,778,158	56,500	69,755	$23,319,784	$243
2001	99,000	0	5,500	$649	22,693	$389	2,693	$465	30,886	$13,652,783	21,914	$80	10,000	$0	31,914	$1,746,877	11,086	$80	$883,722	7,540	$649	45,860	$86	7,100	$86	$9,450,228	60,500	71,586	$25,733,610	$260
2002	103,000	0	5,500	$688	23,609	$417	3,609	$496	32,717	$15,422,561	24,083	$83	10,000	$0	34,083	$1,996,570	8,917	$83	$739,252	7,540	$688	49,860	$89	7,100	$89	$10,284,492	64,500	73,417	$28,442,875	$276
2003	107,000	0	5,500	$730	24,524	$447	4,524	$529	34,548	$17,368,898	26,252	$86	10,000	$0	36,252	$2,263,444	6,748	$86	$581,812	7,540	$730	53,860	$93	7,100	$93	$11,177,302	68,500	75,248	$31,391,455	$293
2004	111,000	0	5,500	$773	25,439	$477	5,440	$564	36,379	$19,457,314	28,421	$90	10,000	$0	38,421	$2,548,473	4,579	$90	$410,593	7,540	$773	57,860	$97	7,100	$97	$12,113,587	72,500	77,079	$34,531,966	$311
2005	115,000	0	5,500	$820	26,355	$511	6,355	$601	38,210	$21,786,477	30,590	$93	10,000	$0	40,590	$2,852,642	2,410	$93	$224,745	7,540	$820	61,860	$101	7,100	$101	$13,124,060	76,500	78,910	$37,987,985	$338
2006	120,000	0	5,500	$869	29,055	$545	9,055	$641	43,610	$26,423,415	30,790	$97	10,000	$0	40,790	$2,966,187	2,410	$97	$233,735	7,540	$869	67,260	$105	7,100	$105	$14,336,479	81,900	84,310	$43,979,816	$365
2007	126,200	3,310	5,500	$921	30,000	$581	10,000	$682	49,010	$32,588,451	30,990	$101	10,000	$0	40,990	$3,123,807	2,410	$101	$243,085	7,540	$921	69,150	$109	7,100	$109	$15,245,692	83,790	86,200	$51,203,235	$406
2008	131,800	8,910	5,500	$976	30,000	$621	10,000	$726	54,410	$39,970,938	31,190	$105	10,000	$0	41,190	$3,271,819	2,410	$105	$252,908	7,540	$976	69,150	$113	7,100	$113	$15,992,446	83,790	86,200	$59,488,012	$451
2009	137,400	14,310	5,500	$1,035	30,000	$664	10,000	$773	59,810	$48,148,719	31,390	$109	10,000	$0	41,390	$3,424,511	2,410	$109	$262,930	7,540	$1,035	69,150	$118	7,100	$118	$16,782,642	83,790	86,200	$68,618,794	$499
2010	143,000	19,710	5,500	$1,097	30,000	$708	10,000	$823	65,210	$57,129,354	31,590	$113	10,000	$0	41,590	$3,584,184	2,410	$113	$273,437	7,540	$1,085	69,150	$122	7,100	$122	$17,518,792	83,790	86,200	$78,505,767	$549
Total Volume	1,719,000	233,720	66,000		314,814		74,814		691,349		373,145						137,855			97,200		703,880		85,200			886,280	1,044,135		
Fraction of Total		14%	4%		18%		4%		40%		22%						9%			6%		41%		5%						
Total Cost										$409,664,995						$33,849,189			$11,807,430							$157,700,273			$613,061,887	
Fraction of Total										67%						6%			2%							26%				
Present Value																													$371,114,039	

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evaluation purposes, all the plan elements are assumed on line in 1999, that is, all elements would be implemented in five years. Actual implementation could take place over a longer period of time ranging from five to fifteen years. This analysis assumes an amortization period of 20 years, amortization rate of six percent and an inflation rate of four percent. Capital, operations and maintenance costs for recharge facilities, and blending facilities are not included. Salvage costs are not included for the wells and desalters.

Tables 8-1 through 8-4 list the annual cost of water supply and the total present value cost of the water supply plan with the implementation of a groundwater management plan. Similar costs are presented in Table 5-6 for a case without a groundwater management plan. The groundwater management plan alternatives are compared to the *no groundwater management plan case* in Table 8-5. The difference in costs between the *with management plan* cases and *without management plan* case occurs in years 1999 through 2010.

Alternative 1 - Agricultural Exchange and Blending groundwater management plan case has a present value savings of about $108,000,000 over the no groundwater management plan case illustrated in Table 5-6. The saving comes from the exchange of up to 17,500 acre-ft/yr of agricultural groundwater production to municipal uses and the reduction in the use of a like amount of imported water.

Alternative 2 - Agricultural Exchange, Blending and Demineralization groundwater management plan is identical to Alternative 1 except that the agricultural exchange of groundwater production to municipal uses has been expanded to about 21,700 acre-ft/yr and municipal groundwater production has been expanded by about 4,200 acre-ft/yr through construction of a demineralization facility. Alternative 2 has a present value savings of about $104,000,000 over the *no groundwater management plan case* illustrated in Table 5-6 and is comparable to the cost of Alternative 1. The cost savings over the *no groundwater management plan case* come from the exchange of up to 21,600 acre-ft/yr of agricultural groundwater production to municipal uses and the reduction in the use of a like amount of imported water. The cost of Alternative 2 is slightly higher than Alternative 1 because the demineralization costs are higher than the cost of imported water prior to 2010. After 2010 demineralization costs will be less than imported water. Alternative 2 would have costs savings greater than Alternative 1 if the economic analysis were extended beyond 2010.

TABLE 8-5 (revised 9/7/94)
COMPARISON OF GROUNDWATER MANAGEMENT PLAN ALTERNATIVES

Alternative	Percentage of Total Supply			Size of Groundwater Management Plan Elements				Present Value Cost of Supply	Reduction in Present Value Cost of Supply from Groundwater Management Plan
	Non Interruptible Treated Imported Water	Seasonal Treated Imported Water	Seasonal Untreated Imported Water	Agricultural Exchange (acre-ft/yr)	Blending (acre-ft/yr)	Demineralization (acre-ft/yr)	Conjunctive Use (acre-ft/yr)		
No Groundwater Management Plan	64%	0%	0%	0	0	0	0	$557,000,000	na
1 Agricultural Exchange and Blending	49%	0%	0%	17,510	7,100	0	0	$449,000,000	$108,000,000
2 Agricultural Exchange, Blending and Demineralization	46%	0%	0%	21,690	7,100	4,180	0	$453,000,000	$104,000,000
3 Agricultural Exchange, Blending, Demineralization and 30,000 acre-ft/yr Conjunctive Use (all recharge through spreading)	26%	0%	14%	21,690	7,100	4,180	30,000	$385,000,000	$172,000,000
4 Agricultural Exchange, Blending, Demineralization and 50,000 acre-ft/yr Conjunctive Use (80 recharge through spreading, 20 % through injection)	18%	4%	18%	21,690	7,100	4,180	50,000	$371,000,000	$186,000,000

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Alternative 3 - Agricultural Exchange, Blending, Demineralization and 30,000 acre-ft/yr Conjunctive Use management plan has all the elements contained in Alternative 2 plus the incorporation of 30,000 acre-ft/yr of conjunctive use. The source water for conjunctive use is 20,000 acre-ft of state project water and 10,000 acre-ft/yr of reclaimed water. The demand for treated non-interruptible water from Metropolitan has dropped from 64 percent for the *no management plan case* to 26 percent. The demand for untreated seasonal water has risen to 14 percent. Treated non-interruptible and seasonal untreated imported water make up 40 percent of municipal supplies. Alternative 3 has a present value savings of about $172,000,000 over the *no groundwater management plan case* illustrated in Table 5-6 and about $66,000,000 over Alternatives 1 and 2. About 62 percent of the cost savings comes from the agricultural exchange, blending and demineralization elements included in Alternatives 1 and 2; the remaining cost savings are due to conjunctive use.

Alternative 4 - Agricultural Exchange, Blending, Demineralization and 50,000 acre-ft/yr Conjunctive Use management plan has all the elements contained in Alternative 3 except that conjunctive use has been expanded from 30,000 to 50,000 acre-ft. The source water for conjunctive use is 40,000 acre-ft of state project water and 10,000 acre-ft/yr of reclaimed water. The demand for treated non-interruptible water from Metropolitan has dropped from 64 percent for the no management plan case to 18 percent. Untreated seasonal water has risen to 18 percent and treated seasonal water to 4 percent. Treated non-interruptible, treated seasonal and seasonal untreated imported water make up 40 percent of municipal supplies. Treated seasonal water would be used for recharge by injection. Alternative 4 has a present value savings of about $186,000,000 over the *no groundwater management plan case* illustrated in Table 5-6 and about $80,000,000 over Alternatives 1 and 2. About 57 percent of the cost savings comes from the agricultural exchange, blending and demineralization elements included in Alternatives 1 and 2; the remaining cost savings are due conjunctive use.

The groundwater management plan development costs and the costs of recharge of basins and blending facilities are not included in Tables 8-1 through 8-4. These costs could have a present value ranging from $50,000,000 to $70,000,000. The cost savings from implementation of any of these alternatives far exceed the cost of implementation. The projected cost savings from the groundwater management plan illustrated in Tables 8-1 through 8-4 are for the 15-year period of 1999 to 2010 in which the capital-intensive facilities, such as spreading basins, have been in operation (and amortized) for 11 years. If these analyses were extended to the period of time

over which capital-intensive facilities were to be financed, say 20 years, the cost saving would be significantly greater.

There are two additional significant benefits from a groundwater management plan. First, imported water for direct use has been reduced by half, which will improve overall water supply reliability. The volumetric impact of water shortages in the imported water supply could be reduced by half. Second, the recharge of state project water into the Lakeview, Perris North and Perris South subbasins will improve the quality of the groundwater in these subbasins.

The groundwater management alternatives illustrated in Tables 8-1 through 8-4 clearly show that the economic benefits, water supply reliability benefits and water quality benefits of a groundwater management plan are very significant. Tables 8-1 through 8-4 assume that the conjunctive use elements are operational in 1999. As mentioned above, it could take an additional five years (till 2004) to implement the large scale conjunctive use projects described in these examples. Other management elements, yield augmentation in particular, should also be included in the management plan. Cooperative efforts among the water users in the management area, and results of future engineering and economic studies will define which elements will ultimately be used in the management plan.

FINANCING THE GROUNDWATER MANAGEMENT PLAN

The primary beneficiaries of the plan are municipal water users in the West San Jacinto Groundwater Basin management area. Private groundwater producers such as farmers, dairy operators and individuals with small domestic wells will either be beneficially impacted or have no impacts. It is the intent of the plan to mitigate all significant adverse groundwater impacts to private groundwater producers. The types of beneficial impacts that private well owners could experience will be stabilized or increased groundwater levels where overdraft is currently occurring, such as the Lakeview subbasin, and reduced supply cost for those groundwater producers that can use reclaimed water in lieu of groundwater.

The cost of implementing and operating the West San Jacinto Groundwater Basin management plan should be born by municipal water users in the management area. The cost savings experienced by the local private groundwater users should be their incentive to participate in the groundwater management plan. There could be some cost to local groundwater producers if

groundwater replenishment is necessary due to groundwater overdraft. In the event of continued overdraft, an equitable cost sharing plan should be developed to correct the overdraft.

EMWD, acting as manager of the West San Jacinto Basin Groundwater Basin, will not levy and/or collect any rate, fee or charge from any groundwater producer unless authorized by law or contract with the producer, or in the event a producer extracts water stored in a basin by entities participating in the management plan. The plan will not require financial participation by any producer unless there is a consideration provided to such producer in the form of a quantifiable benefit to the producer.

The benefits and costs associated with the groundwater management plan should be accounted for locally, that is, by subbasin or some other geographic unit, to insure the benefits and costs are equitably distributed. The benefits to municipal users in the management area are essentially uniform throughout the management area and thus, the costs associated with those benefits should be distributed uniformly to all municipal water users in the management area. Localized benefits or costs to the Nuevo Water Company and the Edgemont Gardens Mutual Water Company should be estimated when the projects implemented by the groundwater management plan are better defined. EMWD and these agencies may need to develop adjustments in the cost of water supplied to these agencies by EMWD to compensate for localized benefits and costs to these agencies that are caused by the management plan.

Some of the elements of the management plan are capital intensive such as recharge facilities, wells, treatment plants, pipelines, etc. EMWD will need to develop a plan to finance these elements of the groundwater management plan with cost recovery based on the sale of water developed by the plan, or some other method as appropriate. The economic analysis presented previously in this section show that the management plan should easily pay for itself.

IMPLEMENTATION OF THE GROUNDWATER MANAGEMENT PLAN

Upon adoption of the groundwater management plan, EMWD will form the Advisory Committee and implement the groundwater management plan. The implementation of the groundwater management plan will occur in phases and consist of the following:

Phase 1 Short Term Implementation

Phase 2 Refine the Ultimate Groundwater Management Plan

Phase 3 Ultimate Groundwater Management Plan Implementation

Phase 1 Short Term Implementation

The goals of the short term implementation phase are to: implement those elements of the groundwater management plan that are easy to implement, where existing information is adequate for implementation; and to develop and implement demonstration projects that will provide engineering information necessary for design of management elements in the ultimate plan. This phase consists of five tasks that are described below.

Task 1-1 Groundwater Resources Evaluation. Section 4 described what is currently known about the groundwater resources in the management area, based on available reports and data. Most of the water quality data and groundwater elevation data is fifteen to twenty years old. There are no definitive studies evaluating the feasibility of surface water recharge. A complete groundwater resource evaluation should be done to define the groundwater resources in the management area. This effort will include the following sub tasks.

Define the Hydrogeologic Characteristics of the basin including: geology; flow controlling features such as faults, barriers, aquicludes, effective base of the aquifer, and hydraulic conductivity. This will involve: review of existing well logs, new aquifer tests, drilling new test holes, and geophysical studies.

Describe Groundwater Quality Conditions Historical groundwater quality data will be mapped and reviewed. EMWD has recently collected and entered these data into a data base, which will greatly facilitate this effort. A completely new groundwater quality monitoring program will be conducted evaluating the groundwater quality for constituents described in Title 22, plus other constituents that could be regulated and constituents that can be used to understand the groundwater hydrology, such as isotopes of oxygen and hydrogen.

Describe the Occurrence of Groundwater including: groundwater levels, groundwater hydrology, volume of groundwater in storage, unused groundwater storage, and groundwater production and use. This will involve an extensive

groundwater level survey, and review/estimation of historical and future groundwater production.

Task 1-2 Develop Groundwater Management Policies. In this task EMWD, in cooperation with the Advisory Committee and participating groundwater producers, will develop policies for monitoring of groundwater production, monitoring groundwater level and quality, monitoring of well construction, well construction, well abandonment and destruction. Policies for the exchange of agricultural and other non-potable groundwater production to municipal use will be developed in this Task.

Task 1-3 Construct and Operate Demonstration Projects for Blending, Demineralization and Conjunctive Use. EMWD will evaluate the technical feasibility of blending, demineralization, irrigation with reclaimed water, and conjunctive use through small scale demonstration projects. The experience and data developed in this task will be used in subsequent tasks for design of large scale projects. The demonstration projects described in Section 7, or similar projects, will be constructed and operated. The feasibility of water harvesting will be evaluated.

Task 1-4 Develop Water Resources Planning Model. A water resources planning model will be used to evaluate the groundwater level response, groundwater quality response, water supply reliability, water supply quality and wastewater quality responses of the management plan. This model will be used to evaluate management plan alternatives in Phase 1 and in subsequent phases.

Task 1-5 Develop and Evaluate Feasibility Level Plans for the Management Plan Elements. The management elements and new management elements that arise from Tasks 1-1 and 1-2 efforts, will be combined and developed into alternatives. The capacity, size and operational characteristics of the management elements will be defined and analyzed using the data from Tasks 1-1, 1-3 and 1-4. An initial environmental study will be done to assess probable environmental impacts and help develop the scope of work for environmental studies in Phase 2.

Phase 2 Refine the Ultimate Groundwater Management Plan

Phase 1 Short Term Implementation will develop policies and data necessary for defining the ultimate groundwater management plan. Phase 2 consists of the detailed engineering, environmental and financial work to describe and implement the ultimate management plan. The complexity and cost for the analyses described below are dependent on the management plan elements included in the management plan. Phase 2 consists of four tasks that are described below.

Task 2-1 Prepare Facility and Operation Plans. This task will produce an initial set of facility and operational plans. The initial plans will be based on the results of Phase 1 and will be used in *Task 2-2 Prepare Project Specific Environmental Impact Report.* The initial facility and operational plans will include plans and cost opinions. The facility and operational plans will be modified in this task, based on the Task 2-2 effort to minimize undesirable environmental impacts and to include mitigation measures. The facility and operational plan will be finalized with the EIR prepared in Task 2-2. An optimum management plan will be developed that is consistent with the management plan goal and its constraints.

Task 2-2 Prepare Project Specific Environmental Impact Reports (EIR). EIR's will be prepared for the implementation of specific groundwater management elements that are developed in Phase 1. This Task consists of the following sub tasks.

Prepare and Distribute Notice of Preparation (NOP). The NOP will be prepared based on the results of the initial environmental study prepared in Task 1-5 and the facility and operational plans developed in Task 2-1. The final scope of work for the EIR studies will be based on the NOP and comments received on the NOP.

Estimate Environmental Impacts and Develop Mitigation Plans. This work will include: biological assessments, archaeological assessments, impact assessments and development of mitigation plans. This Task includes the evaluation of other environmental impacts such as construction related impacts, growth inducing impacts and cumulative impacts. Alternative facility and operational plans and mitigation measures will be developed in coordination with *Task 2-1 Prepare*

Facility and Operation Plans. This task includes the development of mitigation and mitigation monitoring plans.

Prepare and Distribute Draft EIR(s).

Conduct Meetings, Public Hearings and Respond to Comments.

Finalize EIR(s).

Task 2-3 Prepare Engineering Report for a Planned Recharge Project. California Department of Health Services is requiring that new projects that involve planned recharge of reclaimed water follow the proposed regulations for planned recharge projects. This has recently occurred in the Los Angeles Central Basin, the Chino Basin and in the Riverside-Colton Basins. The data and models developed in Phase 1 will be used to evaluate the hydraulic and water quality response from reclaimed water recharge. This task consists of the following subtasks.

Describe the Impacts from Reclaimed Water Recharge. This subtask includes estimating the impacts of wastewater recharge at the regional and local levels. The data and models developed in Phase I will be used to estimate the regional and local impacts. If warranted, the facility and operational plans will be revised and the impact analysis repeated.

Develop a Groundwater Production Management and Monitoring Plan. A groundwater production management and monitoring plan will be developed consistent with proposed DHS regulations. The implementation of this plan will be included in the EIR's developed in Task 2-2 and the institutional plan developed in Task 2-4.

Prepare Engineering Report.

Task 2-4 Institutional Planning. This task consists of institutional planning necessary for implementation of the groundwater management plan. The work will be iterative with the institutional plans and agreements evolving throughout Phase 2. This task consists of the following subtasks.

Describe Powers and Limitations of Entities Involved in Groundwater Management Plan. This subtask consists of identifying and describing the

statutory responsibilities, powers and limitations of participants, regulatory agencies and third party interests.

Describe Regulatory and Water Rights Implications of Groundwater Management Plan. This task consists of describing the existing and proposed regulatory limits and water rights implications of the groundwater management plan; and the development of institutional arrangements and agreements necessary for implementation of plan elements.

Conduct Economic Analysis of Groundwater Management Plan. The capital and operating costs of the groundwater management plan will be evaluated and updated throughout Phase 2. Using Task 2-1 results, the economic benefits and costs for participating entities and third parties will be evaluated. The results of the economic analysis will feed back to Task 2-1, providing the opportunity to optimize the groundwater management plan.

Develop Preliminary Financing Plan. Financing alternatives will be developed throughout the Phase 2 effort that will be consistent with the facilities described in Task 2-1 and the financing capabilities of the participating agencies.

Describe Institutional Arrangements Necessary to Implement Groundwater Management Plan. This subtask consists of finalizing alternative institutional arrangements for participation, facility construction, ownership and management, payment and collection of fees, etc..

Develop Agreements. This subtask consists of preparing draft agreements for all the agreements that will be necessary to implement the ultimate groundwater management plan.

Phase 3 Ultimate Groundwater Management Plan Implementation

The facility plans, environmental documentation and draft agreements developed in Phase 2 will be converted to construction documents, project-specific environmental documentation and final agreements. These projects will then be constructed and operated. The sequencing and sizing of the management elements will depend on actual future water demands and the availability of

funds for construction. It is premature to speculate on the magnitude of the effort required by most of these tasks because of uncertainties in what facilities and operating plans will be included in the groundwater management plan and the timing of the tasks.

Task 3-1 Prepare Final Design and Bid Documents. This task consists of final engineering, design and preparation of bid documents. The types of facilities that will be included are wells, pipelines, reservoirs, treatment facilities, and spreading basins.

Task 3-2 Prepare Project Specific Supplemental EIR's and Negative Declarations. This task consists of the preparation of supplemental project-specific EIR's and negative declarations (if applicable). These documents will be for specific elements in groundwater management plan projects that will include wells, pipelines and recharge facilities.

Task 3-3 Prepare Final Agreements. This task consists of developing and finalizing the agreements that allow the groundwater management plan to be constructed and operated.

Construction and Operation. Several series of tasks will need to be developed to describe the construction and operational process for the groundwater management plan elements that will actually be constructed.

MANAGEMENT AND MONITORING

The management and monitoring of the groundwater management plan will occur while the elements of ultimate groundwater management plan are being implemented. The management and monitoring activities developed in Phase 1 will be adopted by EMWD board action. Future modifications to management and monitoring programs will be incorporated as warranted by change conditions.

SCHEDULE AND COST

The Phase 1 work should take about two years to complete. Phase 2 will take about two years to complete and will overlap Phase 1 by about one year. The cumulative time required to complete phases 1 and 2 will be about three years. Phase 3 could take up to 10 years to complete with

some projects (e.g., blending) coming on line within a couple of years and other projects (e.g., large scale surface recharge) taking 10 years to implement.

The cost to complete Phases 1 and 2 is estimated to range between 2 to 3 million dollars. The cost to complete Phase 3 cannot be estimated until the ultimate plan is described at the conclusion of Phase 2.

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REFERENCES

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APPENDIX A

A - 1

AB 3030 with AB 1152 Amendments

PART 2.75

GROUNDWATER MANAGEMENT

Chapter		Sectic
1.	General Provisions	107
2.	Definitions	107
3.	Groundwater Management Plans	107
4.	Finances	107
5.	Miscellaneous	107

Part 2.75 was added by Stats.1992, c. 947 (A.B.3030), § 2.

Former Part 2.75, Groundwater Resources, consisting of §§ 10750 to 10767, was added by Stats.1991, c. 908 (A.B.255), § 1, and repealed by Stats.1992, c. 947 (A.B.3030), § 1.

CHAPTER 1

GENERAL PROVISIONS

Section		Section	
10750.	Legislative findings, declarations and intent.		ny without agreement prohibite application of section.
10750.2.	Application of part.	10750.8.	Management by local agencies withi
10750.4.	Adoption of groundwater management plan or program not required.		service area of another agency with out agreement prohibited; applic tion of section.
10750.6.	Authority of local agencies or watermaster to manage groundwater not affected.	10750.9.	Groundwater management progran procedures to establish commence prior to January 1, 1993; completion amendment.
10750.7.	Management by local agencies within service area of another agency, water corporation or mutual water compa-	10750.10.	Other powers.

Chapter 1 was added by Stats.1992, c. 947 (A.B.3030), § 2.

§ 10750. Legislative findings, declarations and intent

The Legislature finds and declares that groundwater is a valuable natural resource in California, an should be managed to ensure both its safe production and its quality. It is the intent of the Legislatur to encourage local agencies to work cooperatively to manage groundwater resources within thei jurisdictions.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

§ 10750. Application of part

(a) Subject to subdivision (b), this part applies to all groundwater basins in the state.

(b) This part does not apply to any portion of a groundwater basin that is subject to groundwater management by a local agency or a watermaster pursuant to other provisions of law or a court order, judgment, or decree, unless the local agency or watermaster agrees to the application of this part.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former § 10750, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10750.4. Adoption of groundwater management plan or program not required

Nothing in this part requires a local agency overlying a groundwater basin to adopt or implement a groundwater management plan or groundwater management program pursuant to this part.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

§ 10750.6. Authority of local agencies or watermaster to manage groundwater not affected

Nothing in this part affects the authority of a local agency or a watermaster to manage groundwater pursuant to other provisions of law or a court order, judgment, or decree.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

§ 10750.7. Management by local agencies within service area of another agency, water corporation or mutual water company without agreement prohibited; application of section

(a) A local agency may not manage groundwater pursuant to this part within the service area of another local agency, a water corporation regulated by the Public Utilities Commission, or a mutual water company without the agreement of that other entity.

(b) This section applies only to groundwater basins that are not critically overdrafted.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former § 10762, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10750.8. Management by local agencies within service area of another agency without agreement prohibited; application of section

(a) A local agency may not manage groundwater pursuant to this part within the service area of another local agency without the agreement of that other entity.

(b) This section applies only to groundwater basins that are critically overdrafted.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former § 10762, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10750.9. Groundwater management program; procedures to establish commenced prior to January 1, 1993; completion; amendment

(a) A local agency that commences procedures, prior to January 1, 1993, to adopt an ordinance or resolution to establish a program for the management of groundwater pursuant to Part 2.75 (commencing

with Section 10750), as added by Chapter 903 of the Statutes of 1991, may proceed to adopt the ordinance or resolution pursuant to * * * Part 2.75, and the completion of those procedures is deemed to meet the requirements of this part.

(b) A local agency that has adopted an ordinance or resolution pursuant to Part 2.75 (commencing with Section 10750), as added by Chapter 903 of the Statutes of 1991, may amend its groundwater management program by ordinance or resolution of the governing body of the local agency to include any of the plan components set forth in Section 10753.7.

(Added by Stats.1992, c. 947 (A.B.3030), § 2. Amended by Stats.1993, c. 320 (A.B.1152), § 1.)

§ 10750.10. Other powers

This part is in addition to, and not a limitation on, the authority granted to a local agency pursuant to other provisions of law.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former § 10766, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10751. Repealed by Stats.1992, c. 947 (A.B.3030), § 1

Historical and Statutory Notes

The repealed section, added by Stats.1991, c. 903 (A.B. 255), § 1, set forth definitions. See, now, § 10752.

CHAPTER 2

DEFINITIONS

Section
10752. Definitions.

Chapter 2 was added by Stats.1992, c. 947 (A.B.3030), § 2.

§ 10752. Definitions

Unless the context otherwise requires, the following definitions govern the construction of this part:

(a) "Groundwater" means all water beneath the surface of the earth within the zone below the water table in which the soil is completely saturated with water, but does not include water which flows in known and definite channels.

(b) "Groundwater basin" means any basin identified in the department's Bulletin No. 118, dated September 1975, and any amendments to that bulletin, but does not include a basin in which the average well yield is less than 100 gallons per minute.

(c) "Groundwater extraction facility" means any device or method for the extraction of groundwater within a groundwater basin.

(d) "Groundwater management plan" or "plan" means a document that describes the activities intended to be included in a groundwater management program.

(e) "Groundwater management program" or "program" means a coordinated and ongoing activity undertaken for the benefit of a groundwater basin, or a portion of a groundwater basin, pursuant to a groundwater management plan adopted pursuant to this part.

(f) "Groundwater recharge" means the augmentation of groundwater, by natural or artificial means, with surface water or recycled water.

(g) "Local agency" means any local public agency that provides water service to all or a portion of its service area, and includes a joint powers authority formed by local public agencies that provide water service.

(h) "Recharge area" means the area that supplies water to an aquifer in a groundwater basin and includes multiple wellhead protection areas.

(i) "Watermaster" means a watermaster appointed by a court or pursuant to other provisions of law.

(j) "Wellhead protection area" means the surface and subsurface area surrounding a water well or well field that supplies a public water system through which contaminants are reasonably likely to migrate toward the water well or well field.

(Added by Stats.1992, c. 947 (A.B.3030), § 2. Amended by Stats.1993, c. 320 (A.B.1152), § 2.)

Historical and Statutory Notes

1992 Legislation
Former § 10752 was repealed by Stats.1992, c. 947 (A.B.3030), § 1. See, now, § 10753.

Derivation: Former § 10751, added by Stats.1991, c. 903 (A.B.255) § 1.

CHAPTER 3. GROUNDWATER MANAGEMENT PLANS

Section		Section	
10753.	Adoption or implementation of plan.	10753.6.	Written protest; contents; majority protest.
10753.2.	Hearing; notice; resolution of intention to adopt plan.	10753.7.	Plan components.
10753.3.	Publication of resolution of intention.	10753.8.	Rules and regulations to implement and enforce plan.
10753.4.	Preparation of plan; adoption; expiration of resolution of intention.	10753.9.	Potential impact of rules and regulations on business activities; consideration.
10753.5.	Second hearing; notice; protests to adoption of plan.		

Chapter 3 was added by Stats.1992, c. 947 (A.B.3030), § 2.

§ 10753. Adoption or implementation of plan

(a) Any local agency, whose service area includes a groundwater basin, or a portion of a groundwater basin, that is not subject to groundwater management pursuant to other provisions of law or a court order, judgment, or decree, may, by ordinance, or by resolution if the local agency is not authorized to act by ordinance, adopt and implement a groundwater management plan pursuant to this part within all or a portion of its service area.

(b) Notwithstanding subdivision (a), a local public agency, other than an agency defined in subdivision (g) of Section 10752, that provides flood control, groundwater management, or groundwater replenishment, or a local agency formed pursuant to this code for the principal purpose of providing water service that has not yet provided that service, may exercise the authority of this part within a groundwater basin * * * that is located within its boundaries within areas that are either of the following:

(1) * * * Not served by a local agency.

(2) * * * Served by a local * * * agency * * * whose governing body, by a majority vote, declines to exercise the authority of this part and enters into an agreement with the local public agency pursuant to Section 10750.7 or 10750.8.

(Added by Stats.1992, c. 947 (A.B.3030), § 2. Amended by Stats.1993, c. 320 (A.B.1152), § 3.)

Historical and Statutory Notes

1992 Legislation
Former § 10753 was repealed by Stats.1992, c. 947 (A.B.3030), § 1. See, now, § 10753.2.

Derivation: Former § 10752, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10753.2. Hearing; notice; resolution of intention to adopt plan

(a) Prior to adopting a resolution of intention to draft a groundwater management plan, a local agency shall hold a hearing, after publication of notice pursuant to Section 6066 of the Government Code, on whether or not to adopt a resolution of intention to draft a groundwater management plan pursuant to this part for the purposes of implementing the plan and establishing a groundwater management program.

(b) At the conclusion of the hearing, the local agency may draft a resolution of intention to adopt a groundwater management plan pursuant to this part for the purposes of implementing the plan and establishing a groundwater management program.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former § 10753, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10753.3. Publication of resolution of intention

(a) After the conclusion of the hearing, and if the local agency adopts a resolution of intention, the local agency shall publish the resolution of intention in the same manner that notice for the hearing held under Section 10753.2 was published.

(b) Upon written request, the local agency shall provide any interested person with a copy of the resolution of intention.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former § 10754, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10753.4. Preparation of plan; adoption; expiration of resolution of intention

The local agency shall prepare a groundwater management plan within two years of the date of the adoption of the resolution of intention. If the plan is not adopted within two years, the resolution of intention expires, and no plan may be adopted except pursuant to a new resolution of intention adopted in accordance with this chapter.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

§ 10753.5. Second hearing; notice; protests to adoption of plan

(a) After a groundwater management plan is prepared, the local agency shall hold a second hearing to determine whether to adopt the plan. Notice of the hearing shall be given pursuant to Section 6066 of the Government Code. The notice shall include a summary of the plan and shall state that copies of the plan may be obtained for the cost of reproduction at the office of the local agency.

(b) At the second hearing, the local agency shall consider protests to the adoption of the plan. At any time prior to the conclusion of the second hearing, any landowner within the local agency may file a written protest or withdraw a protest previously filed.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former § 10755, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10753.6. Written protest; contents; majority protest

(a) A written protest filed by a landowner shall include the landowner's signature and a description of the land owned sufficient to identify the land. A public agency owning land is deemed to be a landowner for the purpose of making a written protest.

(b) The secretary of the local agency shall compare the names and property descriptions on the protest against the property ownership records of the county assessors.

(c) (1) A majority protest shall be determined to exist if the governing board of the local agency finds that the protests filed and not withdrawn prior to the conclusion of the second hearing represent more than 50 percent of the assessed value of the land within the local agency subject to groundwater management pursuant to this part.

(2) If the local agency determines that a majority protest exists, the groundwater plan may not be adopted and the local agency shall not consider adopting a plan for the area proposed to be included within the program for a period of one year after the date of the second hearing.

(3) If a majority protest has not been filed, the local agency, within 35 days after the conclusion of the second hearing, may adopt the groundwater management plan.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former §§ 10756, 10757, added by Stats. 1991, c. 903 (A.B.255), § 1.

§ 10753.7. Plan components

A groundwater management plan may include components relating to all of the following:

(a) The control of saline water intrusion.

(b) Identification and management of wellhead protection areas and recharge areas.

(c) Regulation of the migration of contaminated groundwater.

(d) The administration of a well abandonment and well destruction program.

(e) Mitigation of conditions of overdraft.

(f) Replenishment of groundwater extracted by water producers.

(g) Monitoring of groundwater levels and storage.

(h) Facilitating conjunctive use operations.

(i) Identification of well construction policies.

(j) The construction and operation by the local agency of groundwater contamination cleanup, recharge, storage, conservation, water recycling, and extraction projects.

(k) The development of relationships with state and federal regulatory agencies.

(*l*) The review of land use plans and coordination with land use planning agencies to assess activities which create a reasonable risk of groundwater contamination.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

§ 10753.8. Rules and regulations to implement and enforce plan

(a) A local agency shall adopt rules and regulations to implement and enforce a groundwater management plan adopted pursuant to this part.

(b) Nothing in this part shall be construed as authorizing the local agency to make a binding determination of the water rights of any person or entity.

(c) Nothing in this part shall be construed as authorizing the local agency to limit or suspend extractions unless the local agency has determined through study and investigation that groundwater replenishment programs or other alternative sources of water supply have proved insufficient or infeasible to lessen the demand for groundwater.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

§ 10753.9. Potential impact of rules and regulations on business activities; consideration

In adopting rules and regulations pursuant to Section 10753.8, the local agency shall consider the potential impact of those rules and regulations on business activities, including agricultural operations, and to the extent practicable and consistent with the protection of the groundwater resources, minimize any adverse impacts on those business activities.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

CHAPTER 4

FINANCES

Section		Section	
10754.	Local agencies; water replenishment district powers; fees and assessments.		payment of costs; remediation program excluded.
10754.2.	Annual fees and assessments based on amount of groundwater extracted;	10754.3.	Elections to authorize assessments or fees.

Chapter 4 was added by Stats.1992, c. 947 (A.B.3030), § 2.

§ 10754. Local agencies; water replenishment district powers; fees and assessments

For purposes of groundwater management, a local agency that adopts a groundwater management plan pursuant to this part has the authority of a water replenishment district pursuant to Part 4 (commencing

with Section 60220) of Division 18 and may fix and collect fees and assessments for groundwater management in accordance with Part 6 (commencing with Section 60300) of Division 18.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

1992 Legislation

Former § 10754 was repealed by Stats.1992, c. 947 (A.B.3030), § 1. See, now, § 10753.3.

Derivation: Former §§ 10759, 10760 added by Stats. 1991, c. 903 (A.B.255), § 1.

§ 10754.2. Annual fees and assessments based on amount of groundwater extracted; payment of costs; remediation program excluded

(a) Subject to Section 10754.3, except as specified in subdivision (b), a local agency that adopts a groundwater management plan pursuant to this part, may impose equitable annual fees and assessments for groundwater management based on the amount of groundwater extracted from the groundwater basin within the area included in the groundwater management plan to pay for costs incurred by the local agency for groundwater management, including, but not limited to, the costs associated with the acquisition of replenishment water, administrative and operating costs, and costs of construction of capital facilities necessary to implement the groundwater management plan.

(b) The local agency may not impose fees or assessments on the extraction and replacement of groundwater pursuant to a groundwater remediation program required by other provisions of law or a groundwater storage contract with the local agency.

(Added by Stats.1992, c. 947 (A.B.3030), § 2. Amended by Stats.1993, c. 320 (A.B.1152), § 4.)

Historical and Statutory Notes

Derivation: Former §§ 10759, 10760 added by Stats. 1991, c. 903 (A.B.255), § 1.

§ 10754.3. Elections to authorize assessments or fees

Before a local agency may levy a water management assessment pursuant to Section 10754.2 or otherwise fix and collect fees for the replenishment or extraction of groundwater pursuant to this part, the local agency shall hold an election on the proposition of whether or not the local agency shall be authorized to levy a groundwater management assessment or fix and collect fees for the replenishment or extraction of groundwater. The local agency shall be so authorized if a majority of the votes cast at the election is in favor of the proposition. The election shall be conducted in the manner prescribed by the laws applicable to the local agency or, if there are no laws so applicable, then as prescribed by laws relating to local elections. The election shall be conducted only within the portion of the jurisdiction of the local agency subject to groundwater management pursuant to this part.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former § 10761, added by Stats.1991, c. 903 (A.B.255), § 1.

CHAPTER 5

MISCELLANEOUS

Section		Section	
10755.	Annexed land; compliance with plan.		powers agreements; agreements with public entities or private parties.
10755.2.	Coordinated plans for local agencies within same groundwater basin; joint	10755.3.	Meetings to coordinate plans.
		10755.4.	Limitation on application of part.

Chapter 5 was added by Stats.1992, c. 947 (A.B.3030), § 2.

§ 10755. Annexed land; compliance with plan

(a) If a local agency annexes land subject to a groundwater management plan adopted pursuant to this part, the local agency annexing the land shall comply with the groundwater management plan for the annexed property.

(b) If a local agency subject to a groundwater management plan adopted pursuant to this part annexes land not subject to a groundwater management plan adopted pursuant to this part at the time of annexation, the annexed territory shall be subject to the groundwater management plan of the local agency annexing the land.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

1992 Legislation

Former § 10755 was repealed by Stats.1992, c. 947 (A.B.3030), § 1. See, now, § 10753.5.

Derivation: Former § 10764, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10755.2. Coordinated plans for local agencies within same groundwater basin; joint powers agreements; agreements with public entities or private parties

(a) It is the intent of the Legislature to encourage local agencies, within the same groundwater basin, that are authorized to adopt groundwater management plans pursuant to this part, to adopt and implement a coordinated groundwater management plan.

(b) For the purpose of adopting and implementing a coordinated groundwater management program pursuant to this part, a local agency may enter into a joint powers agreement pursuant to Chapter 5 (commencing with Section 6500) of Division 7 of Title 1 of the Government Code with public agencies, or a memorandum of understanding with public or private entities providing water service.

(c) A local agency may enter into agreements with public entities or private parties for the purpose of implementing a coordinated groundwater management plan.

(Added by Stats.1992, c. 947 (A.B.3030), § 2. Amended by Stats.1993, c. 320 (A.B.1152), §5.)

Historical and Statutory Notes

Derivation: Former §§ 10758, 10763 added by Stats. 1991, c. 903 (A.B.255), § 1.

§ 10755.3. Meetings to coordinate plans

Local agencies within the same groundwater basin that conduct groundwater management programs within that basin pursuant to this part shall, at least annually, meet to coordinate those programs.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

§ 10755.4. Limitation on application of part

Except in those groundwater basins that are subject to critical conditions of groundwater overdraft, as identified in the department's Bulletin 118–80, revised on December 24, 1982, the requirements of a groundwater management plan that is implemented pursuant to this part do not apply to the extraction of groundwater by means of a groundwater extraction facility that is used to provide water for domestic purposes to a single-unit residence and, if applicable, any dwelling unit authorized to be constructed pursuant to Section 65852.1 or 65852.2 of the Government Code.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

§§ 10756 to 10767. Repealed by Stats.1992, c. 947 (A.B.3030), § 1

Historical and Statutory Notes

Sections 10756 and 10757, see, now, § 10753.6.

Section 10758, see, now, § 10755.2.

Sections 10759 and 10760, see, now, §§ 10754 and 10754.2.

Section 10761, see, now, § 10754.3.

Section 10762, see, now, §§ 10750.7 and 10750.8.

Section 10763, see, now, § 10755.2.

Section 10764, see, now, § 10755.

Section 10766, see, now, § 10750.10.

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Proposed Regulation: Title 22, California Code of Regulations
Division 4. Environmental Health, Chapter 3 Reclamation Criteria

PROPOSED REGULATION:

Title 22, CALIFORNIA CODE OF REGULATIONS

DIVISION 4. ENVIRONMENTAL HEALTH

CHAPTER 3. RECLAMATION CRITERIA

ARTICLE 1. DEFINITIONS

Section 60301. Definitions.

(a) **Reclaimed Water.** Reclaimed water means water which, as a result of treatment of domestic wastewater, is suitable for a direct beneficial use or a controlled use that would not otherwise occur.

(b) **Reclamation Plant.** Reclamation plant means an arrangement of devices, structures, equipment, processes and controls which produce a reclaimed water suitable for the intended reuse.

(c) **Regulatory Agency.** Regulatory agency means the California Regional Water Quality Control Board in whose jurisdiction the reclamation plant is located.

(d) **Direct Beneficial Use.** Direct beneficial use means the use of reclaimed water which has been transported from the point of production to the point of use without an intervening discharge to waters of the State.

(e) **Food Crops.** Food crops mean any crops intended for human consumption.

(f) **Spray Irrigation.** Spray irrigation means application of reclaimed water to crops by spraying it from orifices in piping.

(g) **Surface Irrigation.** Surface irrigation means application of reclaimed water by means other than spraying such that contact between the edible portion of any food crop and reclaimed water is prevented.

(h) **Restricted Recreational Impoundment.** A restricted recreational impoundment is a body of reclaimed water in which recreation is limited to fishing, boating, and other non-body-contact water recreation activities.

(i) **Nonrestricted Recreational Impoundment.** A nonrestricted recreational impoundment is an impoundment of reclaimed water in which no limitations are imposed on body-contact water sport activities.

(j) **Landscape Impoundment.** A landscape impoundment is a body of reclaimed water which is used for aesthetic enjoyment or which otherwise serves a function not intended to include public contact.

(k) **Approved Laboratory Methods.** Approved laboratory methods are those specified in the latest edition of "Standard Methods for the Examination of Water and Wastewater," prepared and published jointly by the American Public Health Association, the American Water Works Association, and the Water Pollution Control

Federation and which are conducted in laboratories approved by the State Department of Health.

(l) **Unit Process.** Unit process means an individual stage in the wastewater treatment sequence which performs a major single treatment.

(m) **Primary Effluent.** Primary effluent is the effluent from a wastewater treatment process which provides removal of sewage solids so that it contains not more than 0.5 milliliter per liter per hour of settleable solids as determined by an approved laboratory method.

(n) **Oxidized Wastewater.** Oxidized wastewater means wastewater in which the organic matter has been stabilized, is nonputrescible, and contains dissolved oxygen.

(o) **Biological Treatment.** Biological treatment means methods of wastewater treatment in which bacterial or biochemical action is intensified as a means of producing an oxidized wastewater.

(p) **Secondary Sedimentation.** Secondary sedimentation means the removal by gravity of settleable solids remaining in the effluent after the biological treatment process.

(q) **Coagulated Wastewater.** Coagulated wastewater means oxidized wastewater in which colloidal and finely divided suspended matter have been destabilized and agglomerated by the addition of suitable floc-forming chemicals or by an equally effective method.

(r) **Filtered Wastewater.** Filtered wastewater means an oxidized, coagulated, clarified wastewater which has been passed through natural undisturbed soils or filter media, such as sand or diatomaceous earth, so that the turbidity as determined by an approved laboratory method does not exceed an average operating turbidity of 2 turbidity units and does not exceed 5 turbidity units more than 5 percent of the time during any 24-hour period.

(s) **Disinfected Wastewater.** Disinfected wastewater means wastewater in which the pathogenic organisms have been destroyed by chemical, physical or biological means.

(t) **Multiple Units.** Multiple units means two or more units of a treatment process which operate in parallel and serve the same function.

(u) **Standby Unit Process.** A standby unit process is an alternate unit process or an equivalent alternative process which is maintained in operable condition and which is capable of providing comparable treatment for the entire design flow of the unit for which it is a substitute.

(v) **Power Source.** Power source means a source of supplying energy to operate unit processes.

(w) **Standby Power Source.** Standby power source means an automatically actuated self-starting alternate energy source maintained in immediately operable condition and of sufficient

capacity to provide necessary service during failure of the normal power supply.

(x) **Standby Replacement Equipment.** Standby replacement equipment means reserve parts and equipment to replace broken-down or worn-out units which can be placed in operation within a 24-hour period.

(y) **Standby Chlorinator.** A standby chlorinator means a duplicate chlorinator for reclamation plants having one chlorinator and a duplicate of the largest unit for plants having multiple chlorinator units.

(z) **Multiple Point Chlorination.** Multiple point chlorination means that chlorine will be applied simultaneously at the reclamation plant and at subsequent chlorination stations located at the use area and/or some intermediate point. It does not include chlorine application for odor control purposes.

(aa) **Alarm.** Alarm means an instrument or device which continuously monitors a specific function of a treatment process and automatically gives warning of an unsafe or undesirable condition by means of visual and audible signals.

(bb) **Person.** Person also includes any private entity, city, county, district, the State or any department or agency thereof.

(cc) **Direct Injection.** The controlled subsurface addition of water directly into the groundwater basin that results in the

replenishment of groundwater used or suitable for use as a source of domestic water supply.

(dd) **General Mineral.** Water analyses for bicarbonate, carbonate, and hydroxide alkalinity, calcium, chloride, copper, foaming agents, iron, magnesium, manganese, pH, sodium, sulfate, specific conductance, total dissolved solids, total hardness, and zinc.

(ee) **General Physical.** Water analyses for color and odor.

(ff) **Initial Percolative Capacity.** The rate (unit volume per unit area per unit time or unit length per unit time) at which water moves through the soil prior to recharge conditions.

(gg) **Organics Removal.** Granular activated carbon adsorption or reverse osmosis treatment designed to remove organic compounds from the reclaimed water.

(hh) **Planned Groundwater Recharge Project.** Any water reclamation project designed for the purpose of recharging groundwater suitable for use as a source of domestic water supply.

(ii) **Project Category I.** A surface spreading recharge project which uses reclaimed water that has been oxidized, filtered, disinfected, and subjected to organics removal.

(jj) **Project Category II.** A surface spreading recharge project which uses reclaimed water that has been oxidized, filtered, and disinfected.

(kk) **Project Category III.** A surface spreading recharge project which uses reclaimed water that has been oxidized and disinfected.

(ll) **Project Category IV.** A direct injection recharge project which uses reclaimed water that has been oxidized, filtered, disinfected, and subjected to organics removal.

(mm) **Project Sponsor.** An agency or agencies that receives from a Regional Water Quality Control Board water reclamation requirements for a planned groundwater recharge project.

(nn) **Surface Spreading.** The controlled application of water to the ground surface for the purpose of replenishing groundwater used or suitable for use as a source of domestic water supply.

(oo) **Total Organic Carbon (TOC).** The oxidizable organic carbon present in the reclaimed water measured by the methods prepared and published jointly by the American Public Health Association, the American Water Works Association, and the Water Pollution Control Federation in Section 5310 of the 17th edition of Standard Methods for the Examination of Water and Wastewater and which are conducted in laboratories approved by the State Department of Health Services.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

ARTICLE 5.1. GROUNDWATER RECHARGE

~~Section 60320. Groundwater Recharge.~~

~~(a) Reclaimed water used for groundwater recharge of domestic water supply aquifers by surface spreading shall be at all times of a quality that fully protects public health. The State Department of Health Services' recommendations to the Regional Water Quality Control Boards for proposed groundwater recharge projects and for expansion of existing projects will be made on an individual case basis where the use of reclaimed water involves a potential risk to public health.~~

~~(b) The State Department of Health Services' recommendations will be based on all relevant aspects of each project, including the following factors: treatment provided, effluent quality and quantity, spreading area operations, soil characteristics, hydrogeology, residence time, and distance to withdrawal.~~

~~(c) The State Department of Health Services will hold a public hearing prior to making the final determination regarding the public health aspects of each groundwater recharge project. Final recommendations will be submitted to the Regional Water Quality Control Board in an expeditious manner.~~

Section 60320.01. Planned Groundwater Recharge Projects.

(a) This article shall apply only to planned groundwater recharge projects using reclaimed water. The creation or operation of recharge facilities to cause the infiltration or

injection of reclaimed water into a groundwater basin is evidence of a planned groundwater recharge project.

(b) A wastewater disposal project which is not designed for groundwater recharge, but which incidentally results in portions of the treated wastewater reaching groundwater or discharging to an ephemeral stream, is not covered by this article.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.02. Source Control.

All reclaimed water used for planned groundwater recharge projects shall be from a wastewater collection system operating under a comprehensive program for the control of discharge of toxic wastes from point sources, which is approved by the Regional Water Quality Control Board.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.03. Treatment Requirements and Performance Standards.

(a) Reclaimed water used for planned groundwater recharge projects shall comply with the following treatment requirements and treatment performance standards. Monitoring requirements and the basis for determining compliance with treatment performance standards are specified in Section 60320.06.

(1) Oxidized Wastewater.

Oxidized wastewater is required for all project categories. The oxidized wastewater prior to recharge shall not exceed 20 milligrams per liter (mg/L) total organic carbon (TOC), 30 mg/L suspended solids (SS), and 30 mg/L biochemical oxygen demand (BOD).

(2) Filtered Wastewater.

(A) Filtered wastewater is required for project categories I, II, and IV.

(B) The turbidity of the filtered wastewater prior to recharge shall not exceed an average of 2 turbidity units.

(C) The turbidity of the filtered wastewater prior to recharge shall not exceed 5 turbidity units more than 5 percent of the time during any 24-hour period.

(3) Disinfected Wastewater.

(A) Disinfected wastewater is required for all project categories.

(B) For project categories I, II, and IV, the median number of total coliform organisms in the disinfected wastewater shall not exceed 2.2 per 100 milliliters (mL). The number of total coliform organisms shall not exceed 23 per 100 mL in more than one sample within any 30-day period.

(C) For project category III, the median number of total coliform organisms in the disinfected wastewater shall not exceed 23 per 100 mL. The number of total coliform organisms shall not exceed 240 per 100 mL in more than one sample within any 30-day period.

(4) Organics Removal.

Reclaimed water used for project categories I and IV shall be subjected to organics removal. The TOC in the wastewater prior to recharge shall be reduced to the concentration specified in Table 1 as identified by the reclaimed water contribution to any affected domestic water supply well and by project category. The entire reclaimed water stream used for project category IV shall be subjected to organics removal.

Table 1. Maximum Allowable TOC after Organics Removal

Reclaimed Water Contribution (%)	Maximum TOC (mg/L)	
	Surface Spreading (Category I)	Direct Injection (Category IV)
0-20	20	5
21-25	16	4
26-30	12	3
31-35	10	3
36-45	8	2
46-50	6	2

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.04. Reclaimed Water Quality Requirements.

(a) The level of general physical characteristics, radioactivity, and the concentration of general mineral, inorganic chemicals (excepr nitrogen compounds), and organic chemicals in the reclaimed water prior to recharge shall not exceed the maximum contaminant levels specified in Chapter 15, Sections 64435, 64443, 64444.5, and 64473.

(b) The total nitrogen concentration of the reclaimed water shall not exceed a standard of 10 mg/L as nitrogen unless the project sponsor demonstrates that the standard can be consistently met prior to reaching the groundwater level.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.05. Recharge Site Requirements.

(a) Maximum Reclaimed Water Contribution.

(1) For project categories II and III, all the water of reclaimed water origin extracted from any domestic water supply well shall not exceed 20 percent of the total flow.

(2) For project categories I and IV, all the water of reclaimed water origin extracted from any domestic water supply well shall not exceed 50 percent of the total flow.

(3) Calculation of the percent in section 60320.05(a)(1 and 2) shall be based upon the reclaimed water contribution of all planned groundwater recharge projects affecting the basin.

(b) Minimum Depth-To-Groundwater Requirement.

(1) Planned groundwater recharge projects using surface spreading shall meet the minimum depth-to-groundwater requirements specified in Table 2 by project category and initial percolative capacity.

(2) Planned groundwater recharge projects shall not be allowed where the initial percolative capacity exceeds 0.3 in/min.

(3) The initial percolative capacity shall be determined once by representative testing of the spreading area prior to the start of groundwater recharge and shall reflect conditions throughout the required depth to groundwater. The testing procedure and results shall be described in the engineering report submitted pursuant to Section 60320.07.

(A) For existing surface spreading basins using reclaimed water or other waters, the initial percolative capacity shall be determined at least 14 days after the basins which make up a spreading area have been drained and at least 24 hours after pre-recharge conditions have been restored in the bottom of the basin.

(B) For proposed surface spreading basins, the initial percolative capacity shall be determined in a prototype basin or basins.

Table 2. Minimum Required Depth-to-Groundwater for Surface Spreading Groundwater Recharge Projects

	Minimum Depth-to-Groundwater (ft)		
Initial Percolative Capacity (in/min)	Project Category		
	I	II	III
≤0.2	10	10	20
≤0.3	20	20	50

(c) Minimum Retention Time Underground and Horizontal Separation Requirements.

(1) Reclaimed water shall be retained underground a minimum of 6 months prior to being withdrawn at a domestic water supply well for project categories I and II.

(2) Reclaimed water shall be retained underground a minimum of 12 months prior to being withdrawn at a domestic water supply well for project categories III and IV.

(3) The minimum horizontal separation between an area where reclaimed water is applied by surface spreading and a domestic

water supply well shall be 500 feet for project categories I and II.

(4) The minimum horizontal separation between an area where reclaimed water is applied by surface spreading and a domestic water supply well shall be 1000 feet for project category III.

(5) The minimum horizontal separation between the point where reclaimed water is applied by direct injection and a domestic water supply well shall be 2000 feet for project category IV.

(6) The project sponsor shall prevent the use of groundwater for drinking water within the area required to achieve the minimum retention time and minimum horizontal separation pursuant to Section 60320.05 (c)(1-5).

(d) Monitoring Wells.

Monitoring wells shall be provided to detect the influence of the recharge operation. As a minimum, monitoring wells shall be located at points one-quarter and one-half of the distance (plus or minus 10%) from the recharge area to the nearest domestic water supply well. The number and location of the proposed monitoring wells shall be described in the engineering report submitted pursuant to Section 60320.07.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.06. Monitoring and Compliance.

(a) Treatment Performance Standards.

(1) Oxidized Wastewater. For all project categories, the BOD, SS, and TOC concentration of the oxidized wastewater shall be determined from 24-hour composite samples. Compliance with Section 60320.03(a)(1) shall be determined monthly for each constituent by averaging the results of all samples collected during the month and comparing the average to the standard in Section 60320.03(a)(1).

(A) The BOD samples for all project categories shall be collected at least weekly.

(B) The SS samples for all project categories shall be collected at least daily.

(C) The TOC samples for project categories II and III shall be collected at least daily.

(D) The TOC samples for project categories I and IV shall be collected at least weekly.

(2) Filtered Wastewater. For project categories I, II, and IV, the turbidity of the filtered wastewater shall be continuously measured and recorded.

(A) Turbidity measurements shall be read at least once every 4 hours. Compliance with the average operating turbidity pursuant to Section 60320.03(a)(2)(B) shall be

determined monthly by averaging the results of all turbidity samples read during the month and comparing the average to the turbidity standard in Section 60320.03(a)(2)(B).

(B) The turbidity record shall be read daily. Compliance with the high turbidity duration standard pursuant to Section 60320.03(a)(2)(C) shall be determined monthly by determining the highest percent of a day during the month that the filtered wastewater exceeded 5 turbidity units and comparing that percent to the standard in Section 60320.03(a)(2)(C).

(3) **Disinfected Wastewater.** For all project categories, bacteriological samples shall be collected and tested for coliform to monitor the performance of the disinfection process each day reclaimed water is produced for planned groundwater recharge projects. Compliance with the disinfected wastewater requirements pursuant to Section 60320.03(a)(3) shall be determined daily by determining the median coliform result of the last 7 days for which analyses have been completed and comparing that median to the appropriate coliform standard in Section 60320.03(a)(3).

(4) **Organics Removal.** For project categories I and IV the TOC concentration in the wastewater after the organics removal process shall be determined daily from 24-hour composite samples. Compliance with the organics removal requirement pursuant to Section 60320.03(a)(4) shall be determined daily

by averaging daily TOC concentrations for the last 90 days of operation and comparing that average to the appropriate maximum TOC concentration in Section 60320.03(a)(4).

(b) Reclaimed Water Quality.

(1) On a quarterly basis, grab or 24-hour composite samples of reclaimed water shall be collected and analyzed for the general mineral and general physical constituents listed in subsections 64433(1) and (2), for the inorganic chemicals (except nitrogen compounds) listed in Section 64435 (Table 2), and for gross alpha and gross beta. Compliance with Section 60320.04(a) shall be determined annually by averaging the results of all samples collected during the previous 12 months and comparing the average to the standards in Section 64473 (Table 6), Section 64435 (Table 2), and Section 64443 (Table 4).

(2) On a quarterly basis, grab samples of reclaimed water shall be collected and analyzed for the organic chemicals in Table 5, Section 64444.5. Compliance with Section 60320.04(a) shall be determined annually by averaging the results of all samples collected during the previous 12 months and comparing the average to the standards in Section 64444.5 (Table 5).

(3) On a weekly basis, grab or 24-hour composite samples shall be collected and analyzed for total nitrogen. Compliance with Section 60320.04(b) shall be determined annually by averaging the results of all samples collected

during the previous 12 months and comparing the average to the total nitrogen standard in Section 60320.04(b).

(c) Recharge Site Requirements.

(1) Maximum Reclaimed Water Contribution.

(A) The reclaimed water contribution, pursuant to Sections 60320.03(a)(4) and 60320.05(a), shall be determined annually and at the domestic water supply well which receives the highest percentage of reclaimed water. The method used for the annual determination shall be described in the engineering report pursuant to Section 60320.07. Compliance with the maximum reclaimed water contribution shall be determined by averaging the last five annual determinations of reclaimed water contribution and comparing that average to the appropriate maximum percent contribution in Section 60320.05(a).

(B) The project sponsor shall demonstrate and document, once every five years, in a complete engineering report to the Regional Water Quality Control Board and the Department of Health Services that the maximum reclaimed water contribution pursuant to Section 60320.05(a) will not be exceeded.

(2) Minimum Depth-to-Groundwater Requirement.

(A) The depth-to-groundwater shall be measured every day reclaimed water is present in the spreading basin.

Compliance with Section 60320.05(b) shall be determined daily by averaging the previous 30 daily depth-to-groundwater measurements taken when reclaimed water was present in the spreading basin and comparing the result to the appropriate standard in Table 2.

(B) When the average depth-to-groundwater is less than the depth-to-groundwater requirement pursuant to Section 60320.05(b), the discharge of reclaimed water onto the spreading basin shall be halted until the depth-to-groundwater measurement exceeds the required depth-to-groundwater pursuant to Section 60320.05(b).

(C) The depth-to-groundwater shall be measured at at least one monitoring well located at each spreading basin. The location of this well shall be specified in the engineering report pursuant to Section 60320.07. The monitoring well shall be sited so that the groundwater level is measured at a point where it is closest to the bottom of the spreading basin.

(3) Minimum Retention Time Underground and Horizontal Separation Requirements.

(A) The retention time underground, pursuant to Section 60320.05(c), shall be determined annually and at the domestic water supply well in which the reclaimed water has the shortest retention time underground. The method used for the annual determination shall be described in the

engineering report pursuant to Section 60320.07. Compliance with the minimum retention time underground shall be determined by averaging the last five annual determinations of retention time and comparing that average to the appropriate retention time in Section 60320.05(c).

(B) The project sponsor shall demonstrate and document, once every five years, in a complete engineering report to the Regional Water Quality Control Board and Department of Health Services that the minimum retention time underground pursuant to Section 60320.05(c) will not be exceeded.

(C) Compliance with the horizontal separation requirement pursuant to Section 60320.05(c) for surface spreading and direct injection projects shall be determined by taking field measurements of the shortest distance between a point of recharge and a domestic water supply well. In no case shall the distance be less than the horizontal separation requirement pursuant to Section 60320.05(c).

(d) Monitoring Well Requirements.

Samples shall be collected from monitoring wells at least quarterly and analyzed for TOC and total nitrogen.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.07. Engineering Report.

(a) Any project sponsor proposing a groundwater recharge project using reclaimed water shall submit an engineering report on the proposed groundwater recharge project to the regulatory agency. The report shall be prepared by an engineer registered in California and experienced in the fields of wastewater treatment and public water supply, in conjunction with a geologist, experienced in hydrogeology and registered in California.

(b) Groundwater recharge projects not in operation by January 1, 1993, shall not recharge reclaimed water until the project sponsor submits a complete engineering report to the Regional Water Quality Control Board and the Department of Health Services. For direct injection projects, the Department will not schedule a hearing pursuant to section 13540, Article 6, until a complete engineering report has been received by the Department.

(c) For existing groundwater recharge projects, project sponsors have five years from January 1, 1993 to submit a completed engineering report to the Regional Water Quality control Boards and Department of Health Services.

(d) For existing and proposed groundwater recharge projects, the engineering report shall consist of a thorough investigation and evaluation of the groundwater recharge project, impacts on the existing and potential uses of the impacted groundwater basin, and proposed means for achieving compliance with Sections

60320.01 to 60320.06. The engineering report shall include, but not be limited to the following:

(1) An engineering plan of the reclamation plant, transmission facilities, spreading basins/direct injections wells, and monitoring wells.

(2) A physical description of the proposed groundwater recharge project.

(3) A hydrogeologic study on the impacted groundwater basin. The study shall describe the impact of the recharge project on domestic groundwater sources. The study shall describe the source, area of recharge, quantity, quality, and groundwater flow patterns of all basin recharge waters. The study shall identify all quantities and sources of water used to determine the percent reclaimed water contribution. The study shall identify the aquifer zone in which the maximum allowed reclaimed water contribution is not met pursuant to Section 60320.05(a). The study shall identify the aquifer zone in which the provided organics removal is not sufficient for the reclaimed water contribution to the groundwater pursuant to Section 60320.03(a)(4). The study shall identify all wells that will be impacted by the proposed project and describe the groundwater quality in the impacted basin. The study shall identify the well(s) subject to the highest reclaimed water contribution and shortest reclaimed water retention time. The study shall also include quantitative

descriptions of the soil, soil layers, infiltration rates, aquifer transmissivity, groundwater movement, historic depth-to-groundwater, safe yield of the basin, and usable storage capacity of the basin.

(4) A description of the operational and management personnel, their qualifications, experience, and responsibilities.

(5) A description of how the project will be operated to comply with the recharge site requirements of maximum reclaimed water contribution, minimum depth-to-groundwater, horizontal separation, and retention time underground pursuant to Section 60320.05 (b and c).

(6) Identification of the agency responsible for preventing the use of groundwater for drinking water within certain areas pursuant to Section 60320.05 (c)(6), and the mechanism that will be used.

(7) A contingency plan for redirection of reclaimed water when treatment performance standards or depth-to-groundwater requirements are not met.

(8) A description of the methods of determination and results for initial percolative capacity, maximum reclaimed water contribution, minimum retention time underground, and horizontal separation.

(9) The number and location of monitoring wells in the spreading basin and groundwater basin.

(10) A plan for the monitoring well network to monitor groundwater flow and water quality in the impacted groundwater basin.

(11) A water quality monitoring plan for the treated wastewater, reclaimed water, and monitoring wells.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.08. Alternatives.

(a) Alternatives to the recharge site requirements specified in Section 60320.05 (b) and (c) (2, 4, and 5), or the treatment performance standards specified in Section 60320.03 (a)(1 to 4) may be allowed if the project sponsor demonstrates to the regulating agency that the proposed alternative reliably achieves an equal degree of public health protection. Alternatives may not be used to reduce the retention time below 6 months in Section 60320.05 (c)(2) or the horizontal separation below 500 feet in Section 60320.05 (c)(4 and 5). Alternatives to Sections 60320.01 to 60320.07, inclusive, shall not be allowed, unless the planned groundwater recharge projects meet the requirements of Section 60320.08 (b to e) or 60320.09

(b) Alternatives to achieve a disinfected and filtered wastewater pursuant to Section 60320.03(a)(2) and (a)(3)(B and C)

shall be accepted if the project sponsor demonstrates to the regulating agency that the alternatives reliably provide an equal degree of public health protection. Such a demonstration shall be based on the results from a prior equivalency demonstration, pilot-plant testing, or full-scale testing on an installation that is treating a wastewater with similar flow and wastewater quality characteristics as the wastewater proposed for treatment.

(c) Alternatives to the granular activated carbon or reverse osmosis treatment processes shall be accepted if the project sponsor demonstrates to the regulating agency that the organics removal treatment performance standards pursuant to Section 60320.03 (4) can be reliably met. Such a demonstration shall be based on the results from a prior equivalency demonstration, pilot-plant testing, or full-scale testing on an installation that is treating a wastewater with similar flow and wastewater quality characteristics as the wastewater proposed for treatment.

(d) The results of any alternative demonstration shall be presented in a complete report prepared and signed by an engineer registered in California and experienced in the fields of wastewater treatment and public water supply. Such alternatives shall not be accepted until the Regional Water Quality Control Boards and the Department of Health Services have reviewed the reports.

(e) Within 60 days following the first full year of operation of any alternative approved by the regulating agency, the project

sponsor shall submit an report, prepared by an engineer registered in California and experienced in the fields of wastewater treatment and public water supply, describing the effectiveness of the plant operation. The report shall include results of all water quality tests performed and shall evaluate compliance with established performance standards under actual operating conditions. It shall also include an assessment of problems experienced, corrective actions needed, and a schedule for providing needed improvements.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.09. Research and Demonstration Projects.

The maximum percentage reclaimed water contribution in the total flow extracted from any domestic water supply well pursuant to Section 60320.05(a)(2) shall not apply to a project which the Department has designated as a research and demonstration project for the purpose of conducting special monitoring, treatment, health effects, or other research studies.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

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Drinking Water Standards and Health Advisories Table

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

DRINKING WATER STANDARDS AND HEALTH ADVISORIES TABLE

DECEMBER 1993

DRINKING WATER AND GROUNDWATER PROTECTION BRANCH

Contact: Bruce Macler, Regional Toxicologist, (415) 744-1884

REGION 9 DRINKING WATER STANDARDS AND HEALTH ADVISORIES TABLE

The USEPA Region 9 Drinking Water Standards and Health Advisories Table is a compendium of numerical standards, advisories and related information for chemicals and other contaminants which may be found in ground and surface waters. It provides a comprehensive listing of all current and proposed National Primary Drinking Water Regulations (NPDWRs), specific Maximum Contaminant Levels (MCLs) for California, Arizona and Hawaii, and California Drinking Water Action Levels. Where available, it includes USEPA Integrated Risk Information System (IRIS) cancer risk levels and oral reference dose (RfD) values, and USEPA Office of Ground Water and Drinking Water (OGWDW) Health Advisories for drinking water contaminants.

In order to make this table a manageable size, very few explanations or caveats for the values are included in the body of the table. Because of this, and the fact that background documentation and understanding of the derivation of specific values are critical to the proper use of this information, this table should not be used as a sole source of information for decision making. While the Appendix contains brief explanations of the different standards, criteria and advisories, consideration must be given to the context in which these numbers will be used. The appropriate reference materials should be consulted to determine the applicability of the number being considered. Some references are listed in the Appendix.

The values in this table are current to the publication date, but are subject to change. The user is advised to contact Bruce Macler, Regional Toxicologist, USEPA Region 9, at (415) 744-1884, if questions arise regarding current values.

INFORMATION IN THIS TABLE

The information for specific contaminants in this table is arranged by contaminant type. Inorganic chemicals are listed first, followed by radionuclides, organic chemicals, microbial contaminants and water quality factors.

For each contaminant, any applicable or proposed USEPA National Primary Drinking Water Regulation is listed. These include the enforceable **Maximum Contaminant Levels (MCLs)**, the health-based **Maximum Contaminant Level Goals (MCLGs)**, and the aesthetics-based **Secondary MCLs**. A given contaminant may have both a MCL and a Secondary MCL, as well as a MCLG. The regulatory status of these values is indicated. **Proposed MCLs or MCLGs** have been formally proposed by USEPA, but not promulgated. **Final MCLs or MCLGs** have been promulgated, but are not yet effective as of the

publication date. The effective date, if available, is indicated. **Current MCLs or MCLGs** are in effect.

In addition to regulatory information, health risk information is provided in the table. Data from IRIS for cancer and non-cancer health effects associated with drinking water contaminants is listed. The **RfD** is the daily oral intake (on a body weight basis) that is below the level USEPA believes to be without adverse, non-cancer health risks (i.e., zero risk). The IRIS **10^{-6} risk level** is that contaminant concentration (in ug/liter) in drinking water that might yield no greater than an additional risk of one-in-a-million (10^{-6}) after a lifetime of drinking that water. The USEPA OGWDW Health Advisories provide information on acceptably safe levels of exposures to contaminants in drinking water. The **Acute 10-day** values apply specifically to acute toxic effects on children, but should be protective for adults. The **chronic (lifetime)** values for non-cancer health effects should be protective of health even with a lifetime exposure. In most cases, this value will be the same as the MCLG, if one has been established. The chronic (lifetime) values for cancer are set at a level that should yield no greater than an additional 10^{-6} risk over a lifetime exposure. EPA **cancer weight of evidence** determinations are listed to provide additional information on EPA's judgement of carcinogenicity for each chemical. The weight of evidence classifications are as follows:

A	known human carcinogen
B1	probable human carcinogen based on human data
B2	probable human carcinogen based on animal data
C	possible human carcinogen based on animal data
D	insufficient data to classify chemical
E	not a human carcinogen

APPLICABILITY AND USES OF THIS TABLE

The different types of standards and advisories contained in this table are based upon approaches and assumptions that are specific to each and consequently may have varying applications depending on their derivation. Use of specific types of information should be guided by the relevant legal requirements and an understanding of the meaning of the information itself.

MCLs and treatment techniques are the only federally enforceable NPDWRs. They are set to be health protective as well as feasible. More stringent state-specific MCLs are enforceable in the indicated state. MCLGs are not enforceable, but provide health-based guidance for decision making. MCLGs for chemicals causing non-carcinogenic health effects are based on the RfD and set at a level believed to be safe. MCLGs for chemicals believed to be carcinogens are set at zero, from the perspective that no level of carcinogen is safe. Feasibility is not considered in setting MCLGs. Secondary MCLs are not enforceable, but provide information on aesthetics and palatability.

Health advisories and criteria are not formally promulgated in regulations and are subject to change as new data and analyses become available. MCLGs, values in IRIS and health advisories are developed by different offices and on different schedules. Therefore, values for similar effects from a given chemical may not be consistent throughout the table. The derivations of MCLGs and chronic (lifetime) health advisories for non-carcinogenic chemicals are based on the same assumptions regarding endpoints of toxicity. In theory, the MCLG and lifetime health advisory should be the same for a specific contaminant. Slight differences in the table are due to rounding of numbers.

When considering a value to use for determining an acceptable level of contaminant in drinking water, the MCL should be selected first. In the absence of existing or proposed MCLs, users may have to decide which criteria are most appropriate. USEPA recommends a priority ranking to first consider any proposed MCLG (if other than zero), followed by the IRIS RfD or cancer risk level, and finally the chronic health advisory values.

Under the **Superfund Program**, remdial actions must comply with the **Applicable or Relevant and Appropriate Requirements (ARARs)**. For actions involving contamination of drinking water supplies, the ARARs under the Safe Drinking Water Act are the MCLs. Where there are no MCLs, or where the MCLs are determined to be insufficiently protective because of multiple contaminants, reference should be made to Superfund guidance documents to determine clean-up policy. For remedial actions impacting aquatic organisms and waters regulated under the Clean Water Act, consult the National Ambient Water Quality Criteria (NAWQC).

SYMBOLS USED IN THE TABLE

mg/l = milligrams per liter, equivalent to parts per million (**ppm**)
ug/l = micrograms per liter, equivalent to parts per billion (ppb)

Note: values in table are in ug/l unless otherwise stated

IRIS = USEPA Integrated Risk Information System
RfD = Reference dose for daily oral ingestion in micrograms per kilogram body weight per day (ug/kg-d)
10^{-6} = one in a million excess lifetime cancer risk
TT = treatment technique, set in lieu of numeric MCL
+ = value from USEPA Final Draft Health Advisory
td = temperature dependent value
LOQ = Limit of quantification
T&O = taste and odor refers to a value based upon organoleptic data for controlling undersirable taste and odor qualities

INORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Aluminum	Secondry	50-200								1000		
Ammonia							30,000		D			
Antimony	Current	6	6	0.4		15	3		D			
Arsenic	Current	50		0.3	0.02			0.02	A	50		50
Asbestos	Current	7E+6 long fi	7E+6 bers						A			
Barium	Current	2,000	2,000	70			2,000+		D	1,000		1000
Beryllium	Current	4	4	5	.008	30,000		0.008	B2			
Boron				90		900	600		D			
admium	Current	5	5	.5		40+	5+		D	10		10
Chloramine				100		1000	2600		D			
Chlorate									D			
Chloride	Secondry	250ppm										
Chlorine									D			
Chlorine Dioxide				3			80		D			

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Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.

INORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Chlorite												
Chromium(Total)	Current	100	100	5		1,000+	100+		D	50		50
Copper	Current Secondry	TT## 1,000	1,300						D			
Cyanide	Current	200	200	22		200+	200+		D			
Fluoride	Current Proposed secondry	4,000 2,000	4,000	120					D	1400- 2400td		
Iron	Secondry	300										
Lead	Current	TT#	0						B2	50		
Manganese	Secondry	50		140								
Mercury (inorganic)	Current	2	2	0.3			2+		D	2		
Molybdenum				5		80	35		D			
Nickel	Current	100	100	20		1,000+	100+		D			
Nitrate (as N)	Current	10ppm	10ppm	1600		10,000+***			D	45ppm as NO3		10ppm (as N)
Nitrite (as N)	Current	1,000	1,000	160		1,000+***			D			
Selenium	Current	50	50	5						10		50

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Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
TT - Treatment technique in lieu of numeric MCL
- Treatment technique triggered at Action Level of 1300 ppb
td - td- temperature dependent value
- Treatment technique and public notification triggered at Action Level of 15 ppb
*** - 10-day HA for nitrate/nitrite for 4kg child (protective of 10kg child & adults); also used for chronic (lifetime)

INORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Silver	Secondry	100		5		200	100		D	50		50
Strontium				600		25,000	17,000		D			
Sulfate	Secondry	250 ppm										
Thalium	Current	2	0.5	0.07		7	0.4					
Vanadium				7					D			
Zinc	Secondry	5,000		300		6,000	2,000		D			5,000
Acrylonitrile					0.06	20+		0.06+	B1			10
RADIONUCLIDES												
Gross Alpha, excl. Uranium & Radon	Current	15pCi/l						.15pCi/l	A	15pCi/l		
Gross Beta	Current	4mrem per yr						0.04mrem per year	A	50pCi/l		
Radium 226	Current Proposed	5 pCi/l (+228) 20pCi/l	 0					.22-.26 pCi/l	A	5 pCi/l (+Ra 22		
Radium 228	Current Proposed	5 pCi/l (+226) 20pCi/l	 0					.22-.26 pCi/l	A	5 pCi/l (+Ra 22		
Radon	Proposed	300 pCi/l	0					1.5pCi/l	A			
Strontium 90									A	8pCi/l		

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Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.

RADIONUCLIDES Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Tritium									A	20nCi/l		
Uranium	Proposed	20 ppb	0					0.7 ppb	A	20pCi/l		35pCi/l
ORGANIC												
Acenaphthylene (acenapthene)				60								
Acephate				4					C			
Acetone				100					D			
Acetophenone				100								
Acifluorfen				13	1.0	2,000+		1.0+	B2			
Acrolein									C			320
Acrylamide	Current	TT	0	0.2	.01	30+		0.01+	B2			
Adipates (di(ethylhexyl)-adipate)	Current	400	400	600	0.03	20,000	400	0.03	C			
Alachlor	Current	2	0	10	0.4	100+		0.4+	B2		LOQ (.2)	0.2
Aldicarb	Final(a)	3	1	1.0			7+		D		10	9
Aldicarb Sulfone	Final(a)	2	1	1.0			7+		D			

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
TT - Treatment technique in lieu of numeric MCL
a - Effective date postponed

ORGANIC Chemicals	EPA Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Aldicarb Sulfoxide	Final(a)	4	1	1.0			7+		D			
Aldrin				0.03	.002	0.3		0.002	B2		LOQ (0.05)	
Allyl alcohol				5								
Ametryn				9		9,000+	60+		D			
Ammonium Sulfamate				280		20,000+	2,000+		D			
Anthracene (PAH)				300					D			
Atrazine	Current	3	3	35	0.16	100+	3+		C	3		(HI 3)
Baygon (Propoxur)				4		40+	3+		C		90	
nefin				300								
Bentazon (Basagran)				2.5		300+	20+		D	18		
Benzene	Current	5	0		1	200+		1.0+	A	1		5
Benzene hexachloride α, β isomers (BHC)											0.7 α 0.3 β	
Benz(a)anthracene (PAH)	Proposed	0.1	0						B2			
Benzo(a)pyrene (PAH)	Current	0.2	0						B2			

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Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
HI - State of Hawaii MCL

ORGANIC Chemicals	EPA Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Benzo(b)fluoranthene (PAH)	Proposed	0.2	0						B2			
Bolero (thiobencarb)										70		
Bromacil				130		5,000+	90+		C			
Bromochloromethane				13		1,000	90					
Bromodichloro-methane (THM)	Current	100 a		20	0.6	7,000+		0.6	B2			
Bromoform (THM)	Current	100 a		20	4	2,000		4	B2			
Bromomethane (Methyl Bromide)				1		100+	10+		D			2.5
Butyl benzyl-phthlate (PAE)	Proposed	100	0	200					C			
Butylate				50		2,000+	350+		D			
Captafol				2	4				C			
Captan				130					B2		350	
Carbaryl				100		1,000+	700+		D		60	
Carbofuran	Current	40	40	5		50+	40+		E	18		36
Carbon Disulfide				100								830

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Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
a - Total Trihalomethanes MCL includes 4 compounds: chloroform, bromodichloromethane, dibromochlormethane, bromoform

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Carbon Tetrachloride	Current	5	0	0.7	0.3	200+		0.3+	B2	0.5		5
Carboxin				100		1,000+	700+		D			
Chloral Hydrate				0.2		1,400	60		D			
Chloramben				15		3,000+	100+		D			
Chlordane	Current	2	0	0.06	0.03	60+		0.03+	B2	0.1		
2,4-Dinitrotoluene				2	50	500		50	B2			
Chlorobenzene (Monochlorobenzene)	Current	100	100	20		2,000+	100+		D	30		
Chlorodibromomethane (THM)	Current	100 @		20		7,000	60		C			
Chloroform (trichloromethane) (THM)	Current	100 @		10	6	4,000		6.0	B2			
bis-2-Chloroisopropyl ether				40		4,000+	300+		D			
Chloromethane				4		400	3		C			
2-Chlorophenol				5		50	40		D			
Chloropicrin											50(37 T&O)	
Chlorothalonil				15	1.5	200+		1.5+	B2			

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Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
@ - Total Trihalomethanes MCL includes 4 compounds: chloroform, bromodichloromethane, dibromochlormethane, bromoform

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Chlorotoluene(o,p)				20		2,000+	100+		D			
CIPC (Chlorpropham) (isopropylN(3chloro-phenyl) carbamate)				200							350	
Chlorpyrifos				3		30+	20+		D			
Cresol(o,m)				500					C			
Cyanazine				2		100+	1		C			
DDT				0.5	0.1				B2			
Dalapon	Current	200	200	26		3,000+	200+		D			
DCPA (Dacthal)				500		80,000+	4,000+		D			
Di(ethylhexyl)-adipate (Adipates)	Current	400	400	600	0.03	20,000	400+	0.03	C			
Diazinon				0.09		20+	0.6+		E		14	
Dibromochloro-methane (THM)	Current	100 @		20		7,000	60		C			
1,2-Dibromo-3-chloro propane (DBCP)	Current	0.2	0		0.03	50+		0.03	B2	0.2		(HI.04)
Dibutyl phthalate (PAE)				100					D			
Dicamba				30		300+	200+		D			

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Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
@ - Total Trihalomethanes MCL includes 4 compounds: chloroform, bromodichloromethane, dibromochlormethane, bromoform
HI - State of Hawaii MCL

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Dichloroacetic Acid				8		50,000+			B2			
Dichloroacetonitrile				8		1000+	6+		C			
1,2-Dichlorobenzene (o-Dichlorobenzene)	Current Proposed secondry	600 10	600	90		9,000+	600+		D		130 *** (10T&O)	
1,3-Dichlorobenzene (m-Dichlorobenzene)	Current	600	600	90		9,000+	600+		D		130 *** (20T&O)	
1,4-Dichlorobenzene (p-Dichlorobenzene)	Current Proposed secondry	75 5	75	100		10,000+	75+		C	5		750
Dichlorodifluoro-methane (Freon 12)				200		40,000+	1,000+		D			1.0
1,1-Dichloroethane										5		
1,2-Dichloroethane	Current	5	0		0.4	700+		0.4	B2	0.5		5.0
1-Dichloroethylene	Current	7	7	9		1,000+	7+		C	6		7.0
cis-1,2-Dichloro-ethylene	Current	70	70	10		3,000+	70+		D	6		
trans-1,2-Dichloro-ethylene	Current	100	100	20		2,000+	100+		D	10		
Dichloromethane (Methylene chloride)	Current	5	0	60		2,000+		5+	B2		40	
2,4-Dichlorophenol				3		30+	20+		D			
2,4-Dichlorophenoxy -acetic acid (2,4-D)	Current	70	70	10		300+	70+		D	100		100

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Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
*** - Action Level is for a single isomer or sum isomers

ORGANIC Chemicals	EPA Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
1,2-Dichloropropane	Current	5	0		0.5	90+		0.5+	B2	5		
1,3-Dichloropropene				0.3	0.2	30+		0.2+	B2	0.5		
Dieldrin				0.05	.002	0.5+		0.002+	B2		LOQ-(0.05)	
Diethylphthalate (PAE)				800			5000+		D			
Diisopropylmethyl-phosphonate				80		8,000+	600+		D			
Dimethoate				0.2							140	
Dimethrin				300		10,000+	2,000+		D			
Dimethylaniline				20	0.05				C			
2,4-Dimethylphenol				200							400 (T&O)	
2,6-Dinitrotoluene				1.0	50 (tg)	400		50 (tg)	B2 (TG)			
1,3 Dinitrobenzene				0.1		40	1		D			
Dinoseb	Current	7	7	1		300+	7+		D			
1,4-Dioxane (p-Dioxane)					7	400+		7+	B2			
Dioxin (2,3,7,8-TCDD)	Current	3E-5	0	1E-6	2E-7	1E-4		2E-7+	B2			

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Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
tg - technical grade dinitrotoluene only

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Diphenamid(e)				30		300+	200+		D		40	
Di(ethylhexyl)-phthalate (PAE) (Phthalates)	Current	6	0	20	3			3+	B2	4		
Diquat	Current	20	20	2.2			20+		D			
Disulfoton				0.04		10+	0.3+		E			
Diuron				2		1,000+	10+		D			
Endothall	Current	100	100	20		800+	100+		D			
Endrin	Current	2	2	0.3		20+	2+		D	.2		0.2
Epichlorohydrin	Current	TT	0	2	4	100+		4	B2			
hion				0.5							35	
Ethylbenzene	Current Proposed secondry	700 30	700	100		3,000+	700+		D	680		
Ethylene Dibromide (dibromoethane) (EDB)	Current	0.05	0		4E-4	8		0.0004	B2	0.02		(HI.04)
Ethylene Glycol				2,000		6,000+	7,000+		D			
Ethylene Thiourea (ETU)				0.08	0.3	300+		0.3	B2			
Fenamiphos				0.25		9+	2+		D			

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Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
TT - Treatment technique in lieu of numeric MCL
HI - State of Hawaii MCL

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Fluometuron				13		2,000+	90+		D			
Fluorotrichloro-methane				300		7,000+	2,000+		D			
Folpet				100					B2			
Fonofos				2		20+	10+		D			
Formaldehyde				150		5,000+	1,000+		B1		30	
Glycidaldehyde				4					B2			
Glyphosate	Current	700	700	100		20,000+	700+		D	700		
HMX				50		5,000+	400+		D			
Heptachlor	Current	0.4	0	0.5	.008	10+		0.008+	B2	0.01		
Heptachlor epoxide	Current	0.2	0	0.013	.004			0.004	B2	0.01		
Hexachlorobenzene (Perchlorobenzene) (HCB)	Current	1	0	0.8	0.02	50+		0.02+	B2			
Hexachlorobutadiene				2		300+	1+		C			
Hexachlorocyclo-pentadiene (HEX)	Current Proposed secondry	50 8	50	7					D			
n-Hexane						4,000+			D			

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Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.

ORGANIC Chemicals	EPA Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Hexazinone				33		3,000+	200+		D			
Isophorone				200		15,000+	100+		C			
Lindane (gamma-HCCH) (gamma-BHC)	Current	0.2	0.2	0.3		1,000+	0.2+	0.03	C	4		
Linuron				2					C			
MCPA				1.5		100+	11+		E			
Malathion				20		200+	200+		D		160	
Maleic Hydrazide				500		10,000+	4,000+		D			
Cresol(p)				5					C			
erphos				0.3								
Methomyl (Lannate)				25		300+	200+		D			
Methoxychlor	Current	40	40	5		50	40		D	100		
Methylene Chloride (Dichloromethane)	Current	5	0	60	5	2,000+		5+	B2		40	
Methyl ethyl ketone (MEK,2-Butanone)				600					D			
Methyl Parathion				.25		300+	2+		D		30	

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Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Methyl t-butyl ether				5		3,000+	40+		D			
Metolachlor				150		2,000+	100+		C			
Metribuzin				25		5,000+	200+		D			
Mirex				0.2	.02				B2			
Molinate				2						20		
Naphthalene				4		500+	20+		D			
Nitroguanidine				100		10,000+	700+		D			
Oxamyl (Vydate)	Current	200	200	25		200+	200+		E			
Paraquat				4.5		100+	30+		E			
Parathion (Ethyl Parathion)				6					C		30	
Pentachloronitro-benzene (Terrachlor)				3	0.1				C		0.9	
Pentachlorophenol	Current	1	0	30	0.3	300+		0.3	B2		30	
Phenol				600		6,000+	4,000+		D		5(T&O) Cl2Syst	
Phthalates (di(ethylhexyl)-phthalate)	Current	6	0	20	3			3+	B2	4		

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Picloram	Current	500	500	70		20,000+	500+		D			
Polychlorinated Biphenyls (PCBs)	Current	0.5	0		.005			0.005	B2			
Polynuclear Aromatic Hydrocarbons (PAHs) (benzo(a)pyrene)	Current	0.2	0						B2			
Prometon				15		200+	100+		D			
Pronamide				75		800+	50+		C			
Propachlor				13		500+	90+		D			
Propazine				20		1,000+	10+		C			
Propham				20		5,000+	100+		D			
DX				3	0.3	100+	2+	.3	C			
Simazine	Current	4	4	5		70	4+		C	10		
Styrene	Current Proposed secondry	100 10	100	200		2,000+	100+		C			
Tebutiuron				70		3,000+	500+		D			
Terbacil				13		300+	90+		E			
Terbufos				.13		5+	0.9+		D			

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Terrachlor (pentachloro-nitrobenzene)				3	0.1				C		0.9	
1,1,1,2-Tetrachloro-ethane				30	1	2,000+	70+	1+	C			
1,1,2,2-Tetrachloro-ethane									C	1		
Tetrachloroethylene (Perchloroethylene)	Current	5	0	10	0.7	2,000+		0.7+	B2	5		
2,3,7,8-Tetrachloro-dibenzo-p-dioxin (Dioxin)	Current	3E-5	0	1E-6	2E-7	1E-4+		2E-7+	B2			
Thiobencarb										70		
Toluene	Current Proposed secondry	1,000 40	1,000	200		2,000+	1,000+		D		100	
Toxaphene	Current	3	0	100	0.03	40+		0.03+	B2	5		5
Tribromomethane (Bromoform)(THM)	Current	100 @		20	4	2,000+		4	B2			
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon 113)										1200		
Trichloroacetic acid				40		2000	1000		C			
1,2,4-Trichloro-benzene	Current	70	70	10		100+	70		D			
1,3,5-Trichloro-benzene				6		600+	40+		D			
1,1,1-Trichloro-ethane	Current	200	200	35		40,000+	200+		D	200		200

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
@ - Total Trihalomethanes MCL includes 4 compounds: chloroform, bromodichloromethane, dibromochlormethane, bromoform

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
1,1,2-Trichloro-ethane	Current	5	3	4		400+	3+		C	32		
Trichloroethylene	Current	5	0		3			3	B2	5		5
Trichlorofluoro-methane (Freon 11)				700						150	150	
2,4,6-Trichloro-phenol					3			3	B2			
2,4,5,-Trichloro-phenoxyacetic acid (2,4,5-T)				10		800+	70+		D			
2,4,5 Trichlorphen-oxypropionic acid (2,4,5-TP) (Silvex)	Current	50	50	7.5		200+	50+		D	10		10
1,2,3-Trichloro-propane				6		600+	40+		B2			(HI .8)
Trifluralin				7.5		80+	5+	5+	C			
ihalomethanes TTHM) (See Chloroform)	Current	100 @							B2	100		
Trinitroglycerol						5	5					
Trinitrotoluene				0.5	1	20	2	1	C			
Trithion											7	
Vinyl Chloride	Current	2	0		.015	3,000+		0.015+	A	0.5		
Xylenes- sum of isomers	Current Proposed secondry	10ppm 20	10ppm	2000		40,000+	10,000+		D	1750		

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
HI - State of Hawaii MCL
@ - Total Trihalomethanes MCL includes 4 compounds: chloroform, bromodichloromethane, dibromochlormethane, bromoform
TT - Treatment technique in lieu of numeric MCL

MICROB.-TURBIDITY Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
MICROB.-TURBIDITY												
Giardia Lamblia	Current	TT	0									
Heterotrophic Plate Count	Current	TT β	NA									
Legionella	Current	TT β	0									
Total Coliforms	Current	P/A ∞∞	0									
Turbidity	Current	1/5 NTU	NA									
Viruses	Current	TT β	0									
WATER QLTY.SECONDARY MAX.CONT.LEV												
Color	Secondry	15color units										
Corrosivity	Secondry	Noncor-rosive										
Foaming Agents	Secondry	500										
Odor (Odor threshold)	Secondry	3.0 OT#										
Total Dissolved Solids (TDS)	Secondry	500 ppm										
pH	Secondry	6.5-8.5										

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
TT - Treatment technique in lieu of numeric MCL
β - Surface waters and groundwater under the direct influence of surface water only.
∞∞ - P/A - MCL is based on the presence/absence of total coliforms
∂ - 1 NTU Monthly average, 5 NTU two-day consecutive average
- Odor Threshold Numbers

TABLE 2

PRIORITY LIST OF CONTAMINANTS WHICH MAY REQUIRE REGULATION UNDER THE SDWA (1991 VERSION)

Microorganisms

Cryptosporidium

Inorganics

Aluminum
Boron
Chloramines
Chlorate
Chlorine
Chlorine dioxide
Chlorite
Cyanogen chloride
Hypochlorite ion
Manganese
Molybdenum
Strontium
Vanadium
Zinc

Pesticides

Asulan
Bentazon
Bromacil
Cyanazine
Cyromazine
DCPA (and acid metabolites)
Dicamba
Ethylenethiourea
Fomesafen
Latofen/Acifluorfen
Metalaxyl
Methomyl
Metolachlor
Metribuzin
Parathion degradation product (4-nitrophenol)
Prometon
2,4,5-T
Thiodicarb
Trifluralin

Synthetic Organic Chemicals

Acrylonitrile
Bromobenzene
Bromochloroacetonitrile
Bromodichloromethane
Bromoform
Bromomethane
Chloroethane
Chloroform
Chloromethane
Chloropicrin
o-Chlorotoluene
p-Chlorotoluene
Dibromoacetonitrile
Dibromochloromethane
Dibromomethane
Dichloroacetonitrile
1,3-Dichlorobenzene
Dichlorodifluoromethane
1,1-Dichloroethane
2,2-Dichloropropane
1,3-Dichloropropane
1,1-Dichloropropene
1,3-Dichloropropene
2,4-Dinitrophenol

Synthetic Organic Chemicals (con't)

2,4-Dinitrotoluene
2,6-Dinitrotoluene
1,2-Diphenylhydrazine
Fluorotrichloromethane
Hexachlorodutadiene
Hexachloroethane
Isophorone
Methyl ethyl ketone
Methyl isobutyl ketone
Methyl t-butyl ether
Naphthalene
Nitrobenzene
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrahydrofuran
Trichloroacetonitrile
1,2,3-Trichloropropane

Chlorination/ chloramination byproducts (misc.): haloacetic acids, haloketones, chloral hydrate, 3-chloro-4-(dichloromethyl)-5-hydroxy-2(5H)-furanone (MX-2), N-organochloramines

Ozonation byproducts: aldehydes, epoxides, peroxides, nitrosamines, bromate, iodate

APPENDIX

DESCRIPTION OF STANDARDS AND ADVISORIES

Authority

Under the authority of the Safe Drinking Water Act (SDWA, Public Law 93-523), the USEPA is mandated to establish National Primary Drinking Water Regulations for contaminants occurring in drinking water. Primary NPDWRs are established and enforced to protect the public from adverse health effects resulting from a drinking water contaminant. Included in these regulations are the drinking water standards which set either 1) treatment techniques to control a contaminant, or 2) the Maximum Contaminant Level (MCL) allowable for the contaminant in drinking water. An MCL is set when an appropriate method of detection for the contaminant exists. A treatment technique approach is used when it is not possible to quantify the contaminant at the level necessary to protect public health. Secondary standards are established based on non-health related aesthetic qualities of appearance, taste and odor. These secondary standards are not federally enforceable.

States may choose to accept responsibility (Primacy Status) for the oversight and enforcement of US drinking water regulations. States which have primacy status from USEPA must adopt State drinking water standards that are at least as stringent as federal standards. A state may choose to enforce secondary standards as well as primary standards.

USEPA Maximum Contaminant Level Goals (MCLGs)

MCLGs are developed by the Office of Science and Technology in the USEPA Office of Water as a required first step toward promulgation of NPDWRs. MCLGs are non-enforceable health goals which are to be set at levels at which no known or anticipated adverse effects on the health of persons occur, and which allow for an adequate margin of safety. Prior to the SDWA Amendments of 1986, these levels were called Recommended Maximum Contaminant Levels (RMCLs). MCLGs are strictly health-based levels and are derived from relevant toxicological data.

For chemicals that produce adverse health effects and are not believed to be carcinogenic (non-carcinogens), the MCLG is based on the Reference Dose (RfD). A RfD is calculated from toxicological data to represent a contaminant level that should be without risk of adverse health effects even with a lifetime exposure. USEPA assumes that a threshold exists for non-cancer health effects from chemical contaminants, below which the effect will not occur. Thus the MCLG will be a non-zero number. The RfD, which is based on the

total daily amount of contaminant taken up by a person on a body weight basis, is converted to a Drinking Water Equivalent Level (DWEL) concentration and adjusted for the percentage contribution of other sources (relative source contribution, RSC) of the contaminant besides drinking water (air, food, etc) to arrive at the MCLG. This calculation assumes a lifetime consumption of 2 liters of drinking water per day by a 70 kg adult. Unless otherwise noted, the RSC from drinking water for organic and inorganic compounds is respectively 20% and 10%.

USEPA assumes that no threshold exists for cancer and thus, there is no absolutely safe level of contamination. For chemicals that are known (Group A) or probable (Group B) human carcinogens, USEPA policy directs that the MCLG be set at zero, in accordance with a recommendation by the US Congress. For contaminants believed to be possible human carcinogens (Group C), the MCLG may be derived based on relevant non-cancer health effects as described above. In this case, the RfD is divided by an additional uncertainty factor of 10. In some cases, Group C chemicals will have MCLGs set based on calculated maximum lifetime cancer risks of between 1/10,000 and 1/million.

Maximum Contaminant Levels (MCLs)

MCLs are federally enforceable limits for contaminants in drinking water established as NPDWRs. The MCL for a given contaminant is set as close to the corresponding MCLG as is feasible. "Feasible" is defined in the 1986 SDWA Amendments as "feasible with the use of the best technology, treatment techniques and other means which the Administrator finds, after examination for efficacy under field conditions and not solely under laboratory conditions, are available (taking cost into consideration)." To promulgate a MCL for a contaminant requires that a method of detection for that contaminant is available suitable for the level desired and a Best Available Technology is identified that can feasibly remove the contaminant to the desired level.

Secondary Maximum Contaminant Levels

Secondary MCLs are established under the SDWA to protect the public welfare. Such regulations apply to contaminants in drinking water that adversely affect its odor, taste or appearance and consequently cause a substantial number of persons to discontinue its use. Secondary MCLs are not based on direct adverse health effects associated with the contaminant, although some contaminants may have both a MCL and a SMCL. SMCLs are considered as desirable goals and are not fereally enforceable. However, states may choose to promulgate and enforce SMCLs at the state level.

Health Advisories

Health Advisories (HAs) for drinking water contaminants are levels considered to be without appreciable health risk for specific durations of exposure. HAs should be considered guidance and are not enforceable drinking water standards. HAs were previously know as Suggested No Adverse Response Levels (SNARLs).

USEPA HAs are developed and published initially as External Review Drafts, and then as a Final Draft. This designation indicates that the HA will be always subject to change as additional information becomes available. HAs are developed for one-day, 10-day, longer-term (approximately 7 years) and lifetime (70 year) exposures based on data describing non-carcinogenic health effects resulting from the contaminant. One-day and 10-day HAs use parameters which reflect exposures and effects for a 10 kg child consuming 1 liter of water per day. Lifetime HAs consider a 70 kg adult consuming 2 liters of water per day. Longer-term HAs can incorporate either child or adult parameters. A relative source contribution from water is also factored into the lifetime HA calculation to account for exposures from other sources (air, food, soil, etc) of the contaminant.

For known or probably human carcinogens, the lifetime HA level is based on an upper-bound excess lifetime cancer risk of 1/million. This means that **USEPA considers that the risk from a lifetime consumption of water at the given level is unlikely to be greater than 1/million, is most likely substantially less and may be zero.**

Reference Dose (RfD) and Drinking Water Equivalent Level (DWEL)

The RfD is a daily exposure level which is believed to be without appreciable health risk to humans over a lifetime. The RfD is usually derived from an experimental "no observed adverse effect level" (NOAEL), identified as the highest dose in the most relevant study that did not result in a known adverse effect. The NOAEL is divided by various uncertainty factors to derive the RfD. These uncertainty factors account for the variation in human response, extrapolation to human responses if animal experiments were used, data quality and relevance. The RfD takes the form of dose ingested per unit body weight per day (ug/kg-d).

The DWEL is the conversion of the RfD into an equivalen water concentration. It assumes that a 70 kg adult consumes two liters of water per day and that the total dose to a person results solely from drinking water. It is important to remember that actual exposures in the environment may occur through other routes, such as inhalation or dermal contact, or from other sources, such as from food or soil.

California Action Levels

California Department of Health Services Action Levels are health-based criteria derived much in the same way as EPA Health Advisories. Specific approaches to determining cancer risks and exposure assumptions may differ in some ways from those used by USEPA. California Action Levels are not enforceable drinking water standards, but are levels at which CA DOHS strongly urges water purveyors to take corrective action to reduce the level of contamination in the water they supply. Action Levels cease to exist when CA State MCLS are promulgated.

Integrated Risk Information System (IRIS)

IRIS is an EPA catalogue of Agency risk assessment and risk management information for chemical substances. It is available electronically in several formats. The risk assessment information contained in IRIS, unless specifically noted, has been reviewed and agreed upon by intra-agency work groups and represents Agency consensus. Chemical contaminants listed in IRIS may have descriptions of relevant toxicological experiments and risk assessment approaches used in the determination of RfDs, cancer risks and health advisories. Extensive bibliographies are included. Regulations and regulatory status for different media may be presented.

REFERENCES

EPA MCLs: Code of Federal Regulations, Title 40, Part 141.

EPA Final Rule and Proposed Rule, Fluoride: Federal Register Vol. 50, No. 220, November 14, 1985.

EPA Final Rule and Proposed Rule, Volatile Synthetic Organic Chemicals: Federal Register Vol. 50, No. 219, November 13, 1985.

EPA Final Rule, Fluoride National Primary and Secondary Drinking Water Regulations: Federal Register Vol. 51, No. 63, April 2, 1986.

EPA Final Rule, Volatile Organic Chemicals Drinking Water Regulations: Federal Register Vol. 52, No. 130, July 8, 1987.

EPA Proposed Rule, National Primary and Secondary Drinking Water Regulations; Synthetic Organic Chemicals and Inorganc Chemicals Federal Register, Vol. 55, No. 143, July 25, 1990.

EPA Final Rule, National Primary Drinking Water Regulations; Federal Register, Vol. 56, No. 20, January 30, 1991.

EPA Final Rule, Maximum Contaminant Level Goals and National Primary Drinking Water Regulations for Lead and Copper; Federal Register, Vol. 56, No. 110, June 7, 1991.

EPA Final Rule, National Primary Drinking Water Regulations; Federal Register, Vol. 56, No. 126, July 1, 1991.

NAS Health Advisories: Drinking Water and Health, National Academy Press, Volumes 1 (1977), 3 (1980), 4 (1982), 5 (1983), 6 (1986), and 7 (1988).

EPA Health Advisories: are from the EPA Office of Drinking Water. These are published and are available from the National Technical Information Service (NTIS).

IRIS, Integrated Risk Information System, EPA, Office of Health and Environmental Assessment, Office of Research and Development, Washington, D.C. 20460.

Arizona Department of Health Services, Office of Risk Assessment and Investigation, 3008 N. 3rd Street, Phoenix, Arizona 85012.

California Department of Health Services, Office of Drinking Water, 2151 Berkeley Way, Berkeley, CA 94704.

APPENDIX B

TABLE B-1
AVAILABILITY OF GROUNDWATER QUALITY DATA FOR WELLS IN THE WEST SAN JACINTO AREA

State Well Number	Period of Record	Types of Analysis				
		TDS	NO3	Gen Min	Other	Other Type
T2S/3W 31N1	1955 - 1983			21	4	metals, organics
31R1	1957 - 1963			12		
_36E1	1949			1		
T2S/4W 36R1	1956 - 1960			2		
T3S/2W 7R	1985 - 1993	1	1	1		
7P1	1953 - 1967			29		
_8E1	1973			1		
18R1	1963 - 1973			3		
18R2	1973 - 1992			2		
21A1	1969			1		
21A2	1973			1		
21B1	1963			1		
21C1	1949			1		
26L1	1973			1		
26M1	1963 - 1973			3		
27G1	1963 - 1993	1	1	4		
28L	1992	1	1			
28Q1	1975 - 1992	1	1	2		
29R1	1952			1		
30C1	1963			1		
32C1	1967			1		
32G1	1959 - 1964			2		
32R1	1963 - 1965			2		
33A	1967			1		
34E	1992	1	1			
34M	1967			2		
34Q	1967			1		
34Q1	1967			1		
35M	1967 - 1992			2		
35M1	1965 - 1967			2		
35Q2	1973			2		
32E	1985			1		
32D1	1985			1		
T3S/3W 2H1						
2L1	1973			1		
2L2	1973 - 1991	2	2	2	2	metals, pesticides
6D	1970 - 1985			6		
6D2	1991			2	2	metals
6M1	1967 - 1970			2		
6N3	1967 - 1983			6	1	metals
7F1	1968			1		
7Q1	1977	1				
12K1	1973 - 1991	1		10		

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TABLE B-1 (Continued)
AVAILABILITY OF GROUNDWATER QUALITY DATA FOR WELLS IN THE WEST SAN JACINTO AREA

State Well Number	Period of Record	Types of Analysis				
		TDS	NO3	Gen Min	Other	Other Type
18A1	1977			1		
20A	1958 - 1960			2		
20G2	1977	1				
21A1	1977	1				
21A2	1965 - 1977			3		
21C	1958			1		
21C1	1950 - 1977	1		5		
22D1	1960 - 1976			9		
22D	1977	1				
_29E1	1958 - 1978	1		21		
29M1	1953 - 1983			24		
30H1	1977	1		1		
30J1	1977	1		1		
30Q1	1977	1		1		
31B1	1993	1	1			
32M1	1958 - 1959			1		
T3S/4W1J1	1974 - 1982			5		
4W10	1981 - 1983			3		
4W10	1981 - 1983				3	metals
24C1	1976 - 1982			2		
24D1	1976 - 1983			3		
24D2	1976 - 1983			3	1	pesticides
T4S/2W 2C	1953 - 1973			6		
2D1	1963 - 1967			2		
2D2	1965			1		
2K1	1973			1		
2N2	1949			1		
3P	1967			1		
7J	1991	1	1			
7P	1992	1	1			
7Q	1991	1	1			
8B	1991	1	1			
_8E1	1967			1		
8G	1993	1	1			
8Q	1967			1		
8R	1967 1993		1	1		
8K	1993		1			
8Q	1993		1			
9M1	1973 - 1979			8		
10A	1993	1	1			
10A1	1975 - 1993	1	1	1		
10B1	1975			1		

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TABLE B-1 (Continued)
AVAILABILITY OF GROUNDWATER QUALITY DATA FOR WELLS IN THE WEST SAN JACINTO AREA

State Well Number	Period of Record	Types of Analysis				
		TDS	NO3	Gen Min	Other	Other Type
10C1	1963 - 1967			2		
10E	1964 - 1993		1	2		
11B1	1964 - 1974			10		
11B2	1972 - 1974			4		
11C1	1963 - 1979			19		
11C2	1993	1	1			
11D1		1	1			
_11E1	1964			1		
_11E2	1963 - 1967			3		
11F	1964			1		
11F1	1972			1		
12N	1967			1		
12N1	1958			1		
17D2	1965 1976			10		
18A1	1965 1989		1	18		
18B1	1965 1989			13		
18D	1990	1	1			
18D1	1977	1				
18G1	1987		1			
18G3	1939 1979			13		
24H1	1957 1984		1	13	2	metals
24J1	1972 1973			2		
27H2	1974 1979			9		
_36E1	1993	1	1			
36J1	1954 1958			7		
36J2	1963			1		
36M	1985			1		
36N	1983 1991				2	bacteriological
T4S/3W 6A3	1975 - 1981	1		3		
6C	1991			3	1	organics
6C1	1994	1	1			
6C2	1975 - 1977	1		2		
6F1	1977	1		1		
6H1	1970 - 1979			6	2	pesticides
6H2	1973 - 1983			5		
6Q1	1954 - 1993	2	1	32	1	organics
6Q2	1986				2	organics
6Q3	1967 - 1988			15	5	organics,metals radiological
7G2	1953 - 1977	1		1		
7H1	1977	1		1		
7J1	1955 - 1977	1		28		

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TABLE B-1 (Continued)
AVAILABILITY OF GROUNDWATER QUALITY DATA FOR WELLS IN THE WEST SAN JACINTO AREA

State Well Number	Period of Record	Types of Analysis				
		TDS	NO3	Gen Min	Other	Other Type
7J2	1993	1	1			
_8E1	1969 - 1977	1		2		
8N1	1963			1		
9N2	1966			1		
9N3	1966 - 1977	1		4		
9P	1993	1	1			
10E	1981			2		
_10E1	1980 - 1983			2		
_10E3	1967			1		
13Q1	1955 - 1969			25		
16B				1		
16C	1985 - 1993			1	1	organics & metals
16N1	1958 - 1977	1		22		
17A1	1959 - 1968			18		
17C1	1954 - 1965			24		
17J1	1956 - 1978			11		
17J3	1977	1		1		
18	1970			1		
18J	1972			1		
18J2	1975 - 1988			7	4	organics & metals
19A1	1953 - 1993	2	1	3		
19A3	1977	1				
20P1	1954			1		
21F	1956 - 1976	1		28		
21D	1958 -			1		
24B	1990		1			
24B1	1963 - 1977	1		1		
24N	1969			1		
24P1	1943 - 1976			29		
25D2	1965 - 1977	1		3		
26J1	1958 - 1973			4		
26K	1989 - 1991	3	5	3		
28C1	1954					
28H1	1965 - 1968			13		
29C3	1977			2		
29G2	1970 - 1977	1		5		
29K1	1963 1977	1		2		
29Q	1969			1		
29Q1	1959 1969			2		
32B	1965			1		
4S/4W 1A1	1993	1	1			
4S/4W 1G1	1993	2	1			
T5S/1W 30D	1992			1		

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TABLE B-1 (Continued)
AVAILABILITY OF GROUNDWATER QUALITY DATA FOR WELLS IN THE WEST SAN JACINTO AREA

State Well Number	Period of Record	Types of Analysis				
		TDS	NO3	Gen Min	Other	Other Type
30D2	1977			1		
_30E2	1992			1		
30M1	1957 - 1960			8		
T5S/2W 7E	1990		1			
14R	1980 - 1981			2		
15A1	1958 - 1960			6		
_15E1	1953 - 1956			4		
15F1	1963			1		
15G1	1982 - 1985			2		
15H	1982	1	1			
16F	1982			1		
16F1	1993	1	1			
16G	1983			1		
17B	1982 - 1985	2	2	2		
17B	1982			1		
17B1	1969 - 1978			18		
17C	1982			1		
17C1	1953 - 1967			27		
17F	1982 - 1985			2		
19N1	1953 - 1979			49		
21M2	1993	1				
2.20E+03	1993	1				
23J	1972			1		
23P1	1989				4	bacteriological
23P1	1989		2			
23Q	1986			1		
23R	1989				3	bacteriological
23R	1986			1		
23R1	1973			1		
24B	1981			1		
24B1	1993	1	1			
25C	1979			1		
25C1	1965 - 1977			3		
_25E1	1959 - 1963			2		
25J	1991	1	1			
26B	1987			1		
26G1	1968			1		
26G2	1957			1		
26H2	1963			1		
26H3	1964			1		
26L1	1963			2		
27N1	1988		1	1	1	bacteriological
30D	1991			1	1	radiological
30J1	1975			1		
31N1	1975			1		

Mark J. Wildermuth
Water Resources Engineer

TABLE B-1 (Continued)
AVAILABILITY OF GROUNDWATER QUALITY DATA FOR WELLS IN THE WEST SAN JACINTO AREA

State Well Number	Period of Record	Types of Analysis				
		TDS	NO3	Gen Min	Other	Other Type
31R	1987			1		
31R	1987				1	metals
33E	1981	1				
35A	1991			1		
35A1	1993	1				
35B1	1969 - 1993	1		1		
35D2	1993	1	1			
36D	1991			3		
36D4	1993		1			
T5S/3W 2Q1	1993	1	1			
3Q2	1975			1		
3R1	1963 - 1968			3		
3R1	1977	1				
3R2	1977	1				
7B1	1975			1		
10H1	1975			1		
11M1	1953			1		
11M2	1955 - 1981			23		
13A	1977 - 1981			2		
13A1	1993	1	1			
13H1	1993	1	1			
14P1	1985			1		
14P1	1977	1				
14P1	1975			1		
15H1	1993	1	1			
16D1	1993	1	1			
16F1	1993	1	1			
16P1	1955 - 1958			6		
16P2	1977 - 1981			2		
17R1	1991			1		
21C1	1975			1		
21C1	1977	1				
21D1	1962 - 1971			17		
21D2	1960 - 1975			16		
21D2	1977	1				
21K	1993	1	1			
24C1	1993	1	1			
27L1	1975			1		
28M1	1993	1	1			
28M2	1993	1	1			
28M3	1993	1	1			
28M4	1993	1	1			
29H1	1955 - 1959			8		
29Q1	1958			1		
32G	1976			1		

Mark J. Wildermuth
Water Resources Engineer

TABLE B-1 (Continued)
AVAILABILITY OF GROUNDWATER QUALITY DATA FOR WELLS IN THE WEST SAN JACINTO AREA

State Well Number	Period of Record	Types of Analysis				
		TDS	NO3	Gen Min	Other	Other Type
33R2	1991			1		
33R2	1991				1	organics
35N	1992			1		
35P1	1956 - 1968			4		
35Q	1977 - 1993	2	1			
36D1	1963 - 1968			4		
36K1	1962 - 1963			2		
36N	1977	1				
36N1	1991			1		
36P	1992			5		
36P1	1953 - 1956			3		
36Q1	1958 - 1965			11		
T6S/2W 1A2	1976			1		
2G1	1963			1		
2N1	1963			1		
3R2	1962 - 1970			5		
4R1	1988			1		
4R2	1988		1			
7A	1988		1			
7A1	1993	1	1			
7N	1975			1		
7R2	1993	1	1			
T6S/3W 1	1991			4		
1D1	1965			1		
1D2	1975			1		
1E1	1977	1				
1J1	1975			1		
1J2	1993	1	1			
2A	1993	1	1			
2F1	1963 - 1968			4		
2C1	1975			1		
2D	1993	1	1			
2E	1993	1	1			
2G	1991	2	2	5	2	organics
2H	1991	1	1	2	2	organics
3C	1967			1		
3C1	1975 - 1991			3		
3C2	1975			1		
3H2	1977 - 1991	1		1		
3L1	1993	1	1			
3L2	1993	1	1			
4K1	1953 - 1963			2		
9B1	1975			1		
Totals		106	79	1015	48	

Mark J. Wildermuth
Water Resources Engineer

TABLE B-1 (Continued)
AVAILABILITY OF GROUNDWATER QUALITY DATA FOR WELLS IN THE WEST SAN JACINTO AREA

		Statistics		
	Total	Average	Maximum	Minimum
Length of Record (years)		5.18	40	1
Number of Samples per Well		4.14	49	1
Samples per Year		1	11	0
Year of Last Sample		1979	1994	1949
Total Number of Wells with Data	301			
Fraction of Wells with Only One Sample	63%			

Mark J. Wildermuth
Water Resources Engineer

Appendix C – California Urban Water Conservation Council – Best Management Practices Reports for 2002/2003 and 2003/2004

Water Supply & Reuse

Reporting Unit: **Eastern Municipal Water District - Retail**

Year: **2003**

Water Supply Source Information

Supply Source Name	Quantity (AF) Supplied	Supply Type
MWD	65763	Imported
EMWD	18200	Groundwater
EMWD	21600	Recycled

Total AF: 105563

Reported as of 9/29/05

Accounts & Water Use

Reporting Unit Name:	Submitted to CUWCC	Year:
Eastern Municipal Water District - Retail	**01/27/2005**	**2003**

A. Service Area Population Information:

1. Total service area population 526691

B. Number of Accounts and Water Deliveries (AF)

Type	Metered		Unmetered	
	No. of Accounts	Water Deliveries (AF)	No. of Accounts	Water Deliveries (AF)
1. Single-Family	91587	47622	0	0
2. Multi-Family	1035	4727	0	0
3. Commercial	1934	6073	0	0
4. Industrial	115	394	0	0
5. Institutional	631	6206	0	0
6. Dedicated Irrigation	791	6145	0	0
7. Recycled Water	82	16296	0	0
8. Other	337	3943	0	0
9. Unaccounted	NA	0	NA	0
Total	96512	91406	0	0
	Metered		**Unmetered**	

Reported as of 9/29/05

BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2003**

A. Implementation

1. Based on your signed MOU date, 02/07/1992, your Agency STRATEGY DUE DATE is:	02/06/1994
2. Has your agency developed and implemented a targeting/ marketing strategy for SINGLE-FAMILY residential water use surveys?	yes
a. If YES, when was it implemented?	07/01/1997
3. Has your agency developed and implemented a targeting/ marketing strategy for MULTI-FAMILY residential water use surveys?	no
a. If YES, when was it implemented?	

B. Water Survey Data

Survey Counts:	Single Family Accounts	Multi-Family Units
1. Number of surveys offered:	142	0
2. Number of surveys completed:	142	0
Indoor Survey:		
3. Check for leaks, including toilets, faucets and meter checks	yes	yes
4. Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, if necessary	yes	yes
5. Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as neccesary; replace leaking toilet flapper, as necessary	yes	yes
Outdoor Survey:		
6. Check irrigation system and timers	yes	yes
7. Review or develop customer irrigation schedule	yes	yes
8. Measure landscaped area (Recommended but not required for surveys)	yes	yes
9. Measure total irrigable area (Recommended but not required for surveys)	yes	yes
10. Which measurement method is typically used (Recommended but not required for surveys)	Odometer Wheel	
11. Were customers provided with information packets that included evaluation results and water savings recommendations?	yes	yes
12. Have the number of surveys offered and completed, survey results, and survey costs been tracked?	yes	yes
a. If yes, in what form are surveys tracked?	database	
b. Describe how your agency tracks this information.		

Input to customer accounts & database and quarterly reports to MWD

C. Water Survey Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	10000	10000
2. Actual Expenditures	10650	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Reported as of 9/29/05

BMP 02: Residential Plumbing Retrofit

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2003**

A. Implementation

1. Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts? yes

   a. If YES, list local jurisdictions in your service area and code or ordinance in each:

   EMWD Ordinance No. 72.19, which is updated regularly & recognized as lawful by local municipalities.

2. Has your agency satisfied the 75% saturation requirement for single-family housing units? no

3. Estimated percent of single-family households with low-flow showerheads: 68%

4. Has your agency satisfied the 75% saturation requirement for multi-family housing units? no

5. Estimated percent of multi-family households with low-flow showerheads: 72%

6. If YES to 2 OR 4 above, please describe how saturation was determined, including the dates and results of any survey research.

B. Low-Flow Device Distribution Information

1. Has your agency developed a targeting/ marketing strategy for distributing low-flow devices? yes

   a. If YES, when did your agency begin implementing this strategy? 07/01/1994

   b. Describe your targeting/ marketing strategy.

   Beginning in July 1997, identified & contacted top 20% of water users -- offer survey & conduct those requesting accordingly. In addition, conduct numerous surveys each year beyond those targeted.

Low-Flow Devices Distributed/ Installed	SF Accounts	MF Units
2. Number of low-flow showerheads distributed:	42	100
3. Number of toilet-displacement devices distributed:	114	50
4. Number of toilet flappers distributed:	31	25
5. Number of faucet aerators distributed:	15	8

6. Does your agency track the distribution and cost of low-flow devices? yes

   a. If YES, in what format are low-flow devices tracked? Database

   b. If yes, describe your tracking and distribution system :

   Regular posting to customer accounts, database and quarterly project reports to MWD

C. Low-Flow Device Distribution Expenditures

	This Year	Next Year
1. Budgeted Expenditures	5000	5000
2. Actual Expenditures	5500	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Reported as of 9/29/05

BMP 03: System Water Audits, Leak Detection and Repair

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2003**

A. Implementation

1. Has your agency completed a pre-screening system audit for this reporting year?	yes
2. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:	
a. Determine metered sales (AF)	93448
b. Determine other system verifiable uses (AF)	100
c. Determine total supply into the system (AF)	97074
d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required.	0.96
3. Does your agency keep necessary data on file to verify the values used to calculate verifiable uses as a percent of total production?	yes
4. Did your agency complete a full-scale audit during this report year?	no
5. Does your agency maintain in-house records of audit results or the completed AWWA audit worksheets for the completed audit?	no
6. Does your agency operate a system leak detection program?	yes
a. If yes, describe the leak detection program:	
Fix leaks as they are reported and replace pipes with leak history	

B. Survey Data

1. Total number of miles of distribution system line.	1528
2. Number of miles of distribution system line surveyed.	1528

C. System Audit / Leak Detection Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No
a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."	

E. Comments

Reported as of 9/29/05

BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing

Reporting Unit:
Eastern Municipal Water District - Retail

BMP Form Status:
100% Complete

Year:
2003

A. Implementation

1. Does your agency require meters for all new connections and bill by volume-of-use? yes

2. Does your agency have a program for retrofitting existing unmetered connections and bill by volume-of-use? no

   a. If YES, when was the plan to retrofit and bill by volume-of-use existing unmetered connections completed?

   b. Describe the program:

   All accounts - without exception - are metered. Therefore, no retrofitting program or funding for same is necessary.

3. Number of previously unmetered accounts fitted with meters during report year. 0

B. Feasibility Study

1. Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters? yes

   a. If YES, when was the feasibility study conducted? (mm/dd/yy) 07/01/1997

   b. Describe the feasibility study:

   Discussions between Conservation, Customer Service & Information Systems revealed that not enough landscape accounts have mixed-use meters to make any changes/incentives possible.

2. Number of CII accounts with mixed-use meters. 2680

3. Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period. 0

C. Meter Retrofit Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

   a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

All CII landscape accounts with 3,000 sq. ft. or more have been put on water budgets since 1992

Reported as of 9/29/05

BMP 05: Large Landscape Conservation Programs and Incentives

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2003**

A. Water Use Budgets

1. Number of Dedicated Irrigation Meter Accounts:	621
2. Number of Dedicated Irrigation Meter Accounts with Water Budgets:	385
3. Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF):	3446
4. Actual Use for Irrigation Meter Accounts with Water Budgets (AF):	2263
5. Does your agency provide water use notices to accounts with budgets each billing cycle?	yes

B. Landscape Surveys

1. Has your agency developed a marketing / targeting strategy for landscape surveys?	yes
a. If YES, when did your agency begin implementing this strategy?	01/01/1997

b. Description of marketing / targeting strategy:

Monthy contacts -- some written, some oral/in person - every month. PDA classes & moisture sensor installations have also been implemented. Monthly water budget statements sent out and yearly non-compliance settlements charges have been implemented. Also, contracted w/San Jacinto/Hemet Resouce Conservation District to provide Landscape Audits for all non-compliance fee payers.

2. Number of Surveys Offered.	100
3. Number of Surveys Completed.	10
4. Indicate which of the following Landscape Elements are part of your survey:	
a. Irrigation System Check	yes
b. Distribution Uniformity Analysis	yes
c. Review / Develop Irrigation Schedules	yes
d. Measure Landscape Area	yes
e. Measure Total Irrigable Area	yes
f. Provide Customer Report / Information	yes
5. Do you track survey offers and results?	yes
6. Does your agency provide follow-up surveys for previously completed surveys?	yes

a. If YES, describe below:

Monthly Water Budget Reports to all accounts with Landscape Meters/Plan Checks. Contract with San Jacinto/Hemet Resource Conservation District to perform audits on all accts who have paid a non-compliance settlement fee for going over their water allocated budget.

C. Other BMP 5 Actions

1. An agency can provide mixed-use accounts with ETo-based landscape budgets in lieu of a large landscape survey	no

program.
Does your agency provide mixed-use accounts with landscape budgets?

2. Number of CII mixed-use accounts with landscape budgets.	0
3. Do you offer landscape irrigation training?	yes
4. Does your agency offer financial incentives to improve landscape water use efficiency?	yes

Type of Financial Incentive:	Budget (Dollars/ Year)	Number Awarded to Customers	Total Amount Awarded
a. Rebates	0	0	0
b. Loans	0	0	0
c. Grants	0	0	0

5. Do you provide landscape water use efficiency information to new customers and customers changing services? yes

a. If YES, describe below:

Review of Plan Checks, Assignment of Water Budget, Orientation of Landscape/Irrigation Ordinance 72.19, and follow-up. Monthly water consumption statement.

6. Do you have irrigated landscaping at your facilities?	yes
a. If yes, is it water-efficient?	yes
b. If yes, does it have dedicated irrigation metering?	yes
7. Do you provide customer notices at the start of the irrigation season?	yes
8. Do you provide customer notices at the end of the irrigation season?	yes

D. Landscape Conservation Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	37000	38000
2. Actual Expenditures	56119	

E. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

F. Comments

No. A1 - relates to all dedicated landscape metered accounts in our sytem. No. A2 - relates to all dedicated landscape metered accts in our system that are active & have a full 12 months usage history. Also, note that No. A1 is less than previous reports due to accts converting to recycled water and/or being designated as under the 3,000 sq ft requirement. EMWD does charge "disincentive fees" from $100 - $500 dollars for going over water budgets by percentages on a 5 step/tiered scale.

Reported as of 9/29/05

BMP 06: High-Efficiency Washing Machine Rebate Programs

Reporting Unit:
Eastern Municipal Water District - Retail

BMP Form Status:
100% Complete

Year:
2003

A. Implementation

1. Do any energy service providers or waste water utilities in your service area offer rebates for high-efficiency washers? yes

   a. If YES, describe the offerings and incentives as well as who the energy/waste water utility provider is.

   Socal Edison & the Gas Company at various times offered rebates of $75 to $125 per HEW, until all funds were expended. June 2002 - Nov 2002, MWD offered a $100 rebate for customers within MWD/EMWD zip codes. Eastern provided an additional $10 for a total rebate of $110. Dec 2002 - June 2003, MWD offered a rebate of $110. Eastern provided staff, marketing and costs associated with administering this program - no rebate dollars.

2. Does your agency offer rebates for high-efficiency washers? yes

3. What is the level of the rebate? 0

4. Number of rebates awarded. 313

B. Rebate Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	7000	7000
2. Actual Expenditures	6920	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

   a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 9/29/05

BMP 07: Public Information Programs

Reporting Unit:
Eastern Municipal Water District - Retail

BMP Form Status:
100% Complete

Year:
2003

A. Implementation

1. Does your agency maintain an active public information program to promote and educate customers about water conservation? yes

a. If YES, describe the program and how it's organized.

On-going Bill Stuffers, News Releases and Water Bill messages, along with a Conservation "Hotline" are used to consistently apprise customers of using water wisely & efficiently.

2. Indicate which and how many of the following activities are included in your public information program.

Public Information Program Activity	Yes/No	Number of Events
a. Paid Advertising	yes	10
b. Public Service Announcement	no	
c. Bill Inserts / Newsletters / Brochures	yes	15
d. Bill showing water usage in comparison to previous year's usage	yes	
e. Demonstration Gardens	no	
f. Special Events, Media Events	yes	6
g. Speaker's Bureau	yes	8
h. Program to coordinate with other government agencies, industry and public interest groups and media	yes	

B. Conservation Information Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	25000	40000
2. Actual Expenditures	24500	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 9/29/05

BMP 08: School Education Programs

Reporting Unit:
Eastern Municipal Water District - Retail

BMP Form Status:
100% Complete

Year:
2003

A. Implementation

1.Has your agency implemented a school information program to promote water conservation? yes

2. Please provide information on your school programs (by grade level):

Grade	Are grade-appropriate materials distributed?	No. of class presentations	No. of students reached	No. of teachers' workshops
Grades K-3rd	yes	42	30928	0
Grades 4th-6th	yes	38	17156	0
Grades 7th-8th	yes	3	960	0
High School	yes	10	12969	0

3. Did your Agency's materials meet state education framework requirements? yes

4. When did your Agency begin implementing this program? 7/1/1991

B. School Education Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	117404	166320
2. Actual Expenditures	156184	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

The numbers provided in the "number of students reached" category above, account for all aspects of our education program that reach students with a water conservation message. The various programs used to reach students include educational tours of EMWD facilities, a water conservation theater program (assembly style presentations), free water education materials, a "water-wise" poster contest and classroom presentations. The numbers listed reflect the total students reached through all of these programs. EMWD has seen growth in its area, which has resulted in expanding programs to reach more students. As growth continues, EMWD will continue to see the #'s increase.

Reported as of 9/29/05

BMP 09: Conservation Programs for CII Accounts

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2003**

A. Implementation

1. Has your agency identified and ranked COMMERCIAL customers according to use?	yes
2. Has your agency identified and ranked INDUSTRIAL customers according to use?	yes
3. Has your agency identified and ranked INSTITUTIONAL customers according to use?	yes

Option A: CII Water Use Survey and Customer Incentives Program

4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option? yes

CII Surveys	Commercial Accounts	Industrial Accounts	Institutional Accounts
a. Number of New Surveys Offered	2	0	0
b. Number of New Surveys Completed	2	0	0
c. Number of Site Follow-ups of Previous Surveys (within 1 yr)	2	0	0
d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)	0	0	0

CII Survey Components	Commercial Accounts	Industrial Accounts	Institutional Accounts
e. Site Visit	yes	no	no
f. Evaluation of all water-using apparatus and processes	yes	no	no
g. Customer report identifying recommended efficiency measures, paybacks and agency incentives	yes	no	no

Agency CII Customer Incentives	Budget ($/Year)	No. Awarded to Customers	Total $ Amount Awarded
h. Rebates	25790	279	25790
i. Loans	0	0	0
j. Grants	0	0	0
k. Others	0	0	0

Option B: CII Conservation Program Targets

5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this option?	yes
6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings?	yes
7. Estimated annual savings (AF/yr) from site-verified actions taken by agency since 1991.	170
8. Estimated annual savings (AF/yr) from non-site-verified actions taken by agency since 1991.	60.09

B. Conservation Program Expenditures for CII Accounts

	This Year	Next Year
1. Budgeted Expenditures	5000	5000
2. Actual Expenditures	5000	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

   a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 9/29/05

BMP 09a: CII ULFT Water Savings

Reporting Unit:
Eastern Municipal Water District - Retail

BMP Form Status:
100% Complete

Year:
2003

1. Did your agency implement a CII ULFT replacement program in the reporting year? Yes

If No, please explain why on Line B. 10.

A. Targeting and Marketing

1. What basis does your agency use to target customers for participation in this program? Check all that apply.

Potential savings
CII Sector or subsector

a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

Special marketing material from Management Company (HDMC), contracted through Metropolitan Water District of Southern California (MWD), provided the tools to do individualized target mailings.

2. How does your agency advertise this program? Check all that apply.

Direct letter
Bill message
Newsletter
Web page
Trade publications
Other print media
Trade shows and events
Telemarketing

a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

Direct mailing of marketing clip sheets. Also, advertising in customer newsletters and Chamber presentations.

B. Implementation

1. Does your agency keep and maintain customer participant information? (Read the Help information for a complete list of all the information for this BMP.) Yes

2. Would your agency be willing to share this information if the CUWCC did a study to evaluate the program on behalf of your agency? Yes

3. What is the total number of customer accounts participating in the program during the last year ? 1

CII Subsector	Number of Toilets Replaced			
4.	Standard Gravity Tank	Air Assisted	Valve Floor Mount	Valve Wall Mount
a. Offices	0	0	0	0
b. Retail / Wholesale	0	0	0	0
c. Hotels	72	0	0	0
d. Health	0	0	0	0
e. Industrial	0	0	0	0

f. Schools: K to 12	0	0	0	0
g. Eating	0	0	0	0
h. Govern-ment	0	0	0	0
i. Churches	0	0	0	0
j. Other	0	0	0	0

5. Program design.

Rebate or voucher

6. Does your agency use outside services to implement this program? Yes

a. If yes, check all that apply.

Consultant

7. Participant tracking and follow-up. No follow-up

8. Based on your program experience, please rank on a scale of 1 to 5, with 1 being the least frequent cause and 5 being the most frequent cause, the following reasons why customers refused to participate in the program.

a. Disruption to business	4
b. Inadequate payback	4
c. Inadequate ULFT performance	2
d. Lack of funding	5
e. American's with Disabilities Act	1
f. Permitting	1
g. Other. Please describe in B. 9.	0

9. Please describe general program acceptance/resistance by customers, obstacles to implementation, and other isues affecting program implementation or effectiveness.

Eastern has very limited CII Industry - a lot of new construction with low-flow toilets already installed

10. Please provide a general assessment of the program for this reporting year. Did your program achieve its objectives? Were your targeting and marketing approaches effective? Were program costs in line with expectations and budgeting?

Participation level this fiscal year doubled from the past year - Hopefully, we will continue to escalate customer participation

C. Conservation Program Expenditures for CII ULFT

1. CII ULFT Program: Annual Budget & Expenditure Data

	Budgeted	Actual Expenditure
a. Labor	1500	1500
b. Materials	150	150
c. Marketing & Advertising	350	350
d. Administration & Overhead	0	0
e. Outside Services	0	0
f. Total	2000	2000

2. CII ULFT Program: Annual Cost Sharing

a. Wholesale agency contribution	4320
b. State agency contribution	0
c. Federal agency contribution	0
d. Other contribution	0
e. Total	4320

D. Comments

Reported as of 9/29/05

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2003**

A. Implementation

Rate Structure Data Volumetric Rates for Water Service by Customer Class

1. Residential	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$32717616
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$7975087
2. Commercial	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$3912530
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$0
3. Industrial	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$253835
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$0
4. Institutional / Government	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$3999504
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$0
5. Irrigation	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	$2206056
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$0
6. Other	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$1373121

d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$36703

B. Conservation Pricing Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 9/29/05

BMP 12: Conservation Coordinator

Reporting Unit:
Eastern Municipal Water District - Retail

BMP Form Status:
100% Complete

Year:
2003

A. Implementation

1. Does your Agency have a conservation coordinator? no
2. Is this a full-time position? no
3. If no, is the coordinator supplied by another agency with which you cooperate in a regional conservation program ? no
4. Partner agency's name:
5. If your agency supplies the conservation coordinator:
   - a. What percent is this conservation coordinator's position? %
   - b. Coordinator's Name
   - c. Coordinator's Title
   - d. Coordinator's Experience and Number of Years
   - e. Date Coordinator's position was created (mm/dd/yyyy) 12/1/1991
6. Number of conservation staff, including Conservation Coordinator. 3

B. Conservation Staff Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	232359	160000
2. Actual Expenditures	152854	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no
   - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Full time Conservation Coordinator, Ted Haring, retired in September 2002. Position not filled - by type - in 2003. However, Conservation Program Representatives and Department Director temporarily took over a portion of Coordinator's assignments. Additional conservation staff was hired in 2004

Reported as of 9/29/05

BMP 13: Water Waste Prohibition

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2003**

A. Requirements for Documenting BMP Implementation

1. Is a water waste prohibition ordinance in effect in your service area? yes

a. If YES, describe the ordinance:

Ordinance No. 72.19 provides special provisions for water conservation measures for golf courses & large landscape projects. In addition, several provisions for conservation ethics are included for all EMWD customers.

2. Is a copy of the most current ordinance(s) on file with CUWCC? yes

a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:

Moreno Valley, Hemet, Temecula, Murrieta, Perris & San Jacinto	All cities defer to EMWD's Ordinance No. 72.19

B. Implementation

1. Indicate which of the water uses listed below are prohibited by your agency or service area.

a. Gutter flooding yes

b. Single-pass cooling systems for new connections yes

c. Non-recirculating systems in all new conveyor or car wash systems no

d. Non-recirculating systems in all new commercial laundry systems no

e. Non-recirculating systems in all new decorative fountains yes

f. Other, please name
Irrigation during hot/daylight hours. Water between midnight & 6:00 a.m. yes

2. Describe measures that prohibit water uses listed above:

The Ordinance, requirements for new business connections (on file with CUWCC) and basic conservation messages/bill stuffers that are ongoing.

Water Softeners:

3. Indicate which of the following measures your agency has supported in developing state law:

a. Allow the sale of more efficient, demand-initiated regenerating DIR models. yes

b. Develop minimum appliance efficiency standards that:

i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used. yes

ii.) Implement an identified maximum number of gallons discharged per gallon of soft water produced. yes

c. Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site

regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply.	yes
4. Does your agency include water softener checks in home water audit programs?	yes
5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models?	yes

C. Water Waste Prohibition Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	4000	4000
2. Actual Expenditures	4000	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Even though current law does not allow EMWD to prohibit residential on-site regeneration water softeners, our agency discourages this use when queried by customers. Also, Eastern's load limits into the sewer system for commercial water softeners takes care of itself.

Reported as of 9/29/05

BMP 14: Residential ULFT Replacement Programs

Reporting Unit:
Eastern Municipal Water District - Retail

BMP Form Status:
100% Complete

Year:
2003

A. Implementation

	Single-Family Accounts	Multi-Family Units
1. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	yes

Number of Toilets Replaced by Agency Program During Report Year

Replacement Method	SF Accounts	MF Units
2. Rebate	906	70
3. Direct Install	0	0
4. CBO Distribution	0	0
5. Other	0	0
Total	**906**	**70**

6. Describe your agency's ULFT program for single-family residences.

A rebate program has been in place since 2000 and is totally administered by EMWD staff

7. Describe your agency's ULFT program for multi-family residences.

A rebate program has been in place since 2000 and is totally administered by EMWD staff

8. Is a toilet retrofit on resale ordinance in effect for your service area? no

9. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

N/A	N/A

B. Residential ULFT Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	35000	35000
2. Actual Expenditures	34240	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 9/29/05

Water Supply & Reuse

Reporting Unit: **Eastern Municipal Water District - Wholesale**

Year: **2003**

Water Supply Source Information

Supply Source Name	Quantity (AF) Supplied	Supply Type
MWD	65763	Imported
EMWD	18200	Groundwater
EMWD	21600	Recycled

Total AF: 105563

Purchaser Information

Name of Agency	Quantity (AF) Supplied	Retailer or Wholesaler
Lake Hemet MWD	1295	retail
City of Perris	2038	retail
DWR	27	wholesale
City of San Jacinto	36	retail
Western MWD	658	wholesale
Nuevo Water Company	530	retail
Murrieta County Water District	52	retail
City of Hemet	717	retail

Total AF: 5353

Reported as of 9/29/05

BMP 03: System Water Audits, Leak Detection and Repair

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Wholesale	**100% Complete**	**2003**

A. Implementation

1. Has your agency completed a pre-screening system audit for this reporting year?	yes
2. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:	
a. Determine metered sales (AF)	93448
b. Determine other system verifiable uses (AF)	100
c. Determine total supply into the system (AF)	97074
d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required.	0.96
3. Does your agency keep necessary data on file to verify the values used to calculate verifiable uses as a percent of total production?	yes
4. Did your agency complete a full-scale audit during this report year?	no
5. Does your agency maintain in-house records of audit results or the completed AWWA audit worksheets for the completed audit?	no
6. Does your agency operate a system leak detection program?	yes
a. If yes, describe the leak detection program:	

Fix leaks as they are reported and replace pipes with leak history

B. Survey Data

1. Total number of miles of distribution system line.	1528
2. Number of miles of distribution system line surveyed.	1528

C. System Audit / Leak Detection Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No
a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."	

E. Comments

Reported as of 9/29/05

BMP 07: Public Information Programs

Reporting Unit:
Eastern Municipal Water District - Wholesale

BMP Form Status:
100% Complete

Year:
2003

A. Implementation

1. Does your agency maintain an active public information program to promote and educate customers about water conservation? yes

a. If YES, describe the program and how it's organized.

On-going Bill Stuffers, News Releases and Water Bill messages, along with a Conservation "Hotline" are used to consistently apprise customers of using water wisely & efficiently.

2. Indicate which and how many of the following activities are included in your public information program.

Public Information Program Activity	Yes/No	Number of Events
a. Paid Advertising	yes	10
b. Public Service Announcement	no	
c. Bill Inserts / Newsletters / Brochures	yes	15
d. Bill showing water usage in comparison to previous year's usage	yes	
e. Demonstration Gardens	no	
f. Special Events, Media Events	yes	6
g. Speaker's Bureau	yes	8
h. Program to coordinate with other government agencies, industry and public interest groups and media	yes	

B. Conservation Information Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	25000	40000
2. Actual Expenditures	24500	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 9/29/05

BMP 08: School Education Programs

Reporting Unit:
Eastern Municipal Water District - Wholesale

BMP Form Status:
100% Complete

Year:
2003

A. Implementation

1.Has your agency implemented a school information program to promote water conservation? yes

2. Please provide information on your school programs (by grade level):

Grade	Are grade-appropriate materials distributed?	No. of class presentations	No. of students reached	No. of teachers' workshops
Grades K-3rd	yes	42	30928	0
Grades 4th-6th	yes	38	17156	0
Grades 7th-8th	yes	3	3	0
High School	yes	10	10	0

3. Did your Agency's materials meet state education framework requirements? yes

4. When did your Agency begin implementing this program? 7/1/1991

B. School Education Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	117404	166320
2. Actual Expenditures	156184	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

The numbers provided in the "number of students reached" category above, account for all aspects of our education program that reach students with a water conservation message. The various programs include educational tours of EMWD facilities, a water conservation theater program (assembly style presentations), free water education materials, a "water-wise" poster contest and classroom presentations. The numbers listed reflect the total students reached through all of these programs. EMWD has seen growth in the area whigh has resulted in expanding programs to reach more students. As growth continues, the numbers will increase.

Reported as of 9/29/05

BMP 10: Wholesale Agency Assistance Programs

Reporting Unit:
Eastern Municipal Water District - Wholesale

BMP Form Status:
100% Complete

Year:
2003

A. Implementation

1. Financial Support by BMP

BMP	Financial Incentives Offered?	Budgeted Amount	Amount Awarded	BMP	Financial Incentives Offered?	Budgeted Amount	Amount Awarded
1	No	0	0	**8**	No	0	0
2	No	0	0	**9**	No	0	0
3	No	0	0	**10**	No	0	0
4	No	0	0	**11**	No	0	0
5	No	0	0	**12**	No	0	0
6	yes	0	0	**13**	No	0	0
7	No	0	0	**14**	yes	0	0

2. Technical Support

a. Has your agency conducted or funded workshops addressing CUWCC procedures for calculating program savings, costs and cost-effectiveness?	No
b. Has your agency conducted or funded workshops addressing retail agencies' BMP implementation reporting requirements?	No
c. Has your agency conducted or funded workshops addressing:	
1) ULFT replacement	No
2) Residential retrofits	No
3) Commercial, industrial, and institutional surveys	No
4) Residential and large turf irrigation	No
5) Conservation-related rates and pricing	No

3. Staff Resources by BMP

Qualified	No. FTE	Qualified	No. FTE

BMP	Staff Available for BMP?	Staff Assigned to BMP	BMP	Staff Available for BMP?	Staff Assigned to BMP
1	No		**8**	No	
2	No		**9**	No	
3	No		**10**	No	
4	No		**11**	No	
5	No		**12**	No	
6	No		**13**	No	
7	No		**14**	No	

4. Regional Programs by BMP

BMP	Implementation/ Management Program?	BMP	Implementation/ Management Program?
1	No	**8**	No
2	No	**9**	No
3	No	**10**	No
4	No	**11**	No
5	No	**12**	No
6	yes	**13**	No
7	No	**14**	yes

B. Wholesale Agency Assistance Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

EMWD encourages its few sub-agencies to participate in rebate programs. Presently, only one (Lake Hemet MWD) is getting MWD/EMWD pass thru funds for ULFTs and washers. However, it is our understanding that since MWD accounts for these funds, EMWD has to indicate a "No" on these items.

Reported as of 9/29/05

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Wholesale	**100% Complete**	**2003**

A. Implementation

Rate Structure Data Volumetric Rates for Water Service by Customer Class

1. Residential	
a. Water Rate Structure	
b. Sewer Rate Structure	
c. Total Revenue from Volumetric Rates	$
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$
2. Commercial	
a. Water Rate Structure	
b. Sewer Rate Structure	
c. Total Revenue from Volumetric Rates	$
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$
3. Industrial	
a. Water Rate Structure	
b. Sewer Rate Structure	
c. Total Revenue from Volumetric Rates	$
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$
4. Institutional / Government	
a. Water Rate Structure	
b. Sewer Rate Structure	
c. Total Revenue from Volumetric Rates	$
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$
5. Irrigation	
a. Water Rate Structure	
b. Sewer Rate Structure	
c. Total Revenue from Volumetric Rates	$
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$
6. Other	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$9492488

d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$0

B. Conservation Pricing Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 9/29/05

BMP 12: Conservation Coordinator

Reporting Unit:
Eastern Municipal Water District - Wholesale

BMP Form Status:
100% Complete

Year:
2003

A. Implementation

1. Does your Agency have a conservation coordinator?	no
2. Is this a full-time position?	no
3. If no, is the coordinator supplied by another agency with which you cooperate in a regional conservation program ?	no
4. Partner agency's name:	
5. If your agency supplies the conservation coordinator:	
a. What percent is this conservation coordinator's position?	%
b. Coordinator's Name	
c. Coordinator's Title	
d. Coordinator's Experience and Number of Years	
e. Date Coordinator's position was created (mm/dd/yyyy)	12/1/1991
6. Number of conservation staff, including Conservation Coordinator.	3

B. Conservation Staff Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	232359	160000
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	no
a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."	

D. Comments

Full time Conservation Coordinator, Ted Haring, retired in September 2002. Position not filled - by type - in 2003. However, Conservation Program Representatives and Department Director temporarily took over a portion of Coordinator's assignments. Additional conservation staff was hired in 2004.

Reported as of 9/29/05

Water Supply & Reuse

Reporting Unit: **Eastern Municipal Water District - Retail**

Year: **2004**

Water Supply Source Information

Supply Source Name	Quantity (AF) Supplied	Supply Type
MWD	75868	Imported
EMWD	17685	Groundwater
EMWD	25094	Recycled

Total AF: 118647

Reported as of 9/29/05

Accounts & Water Use

Reporting Unit Name:	Submitted to CUWCC	Year:
Eastern Municipal Water District - Retail	**01/27/2005**	**2004**

A. Service Area Population Information:

1. Total service area population 550000

B. Number of Accounts and Water Deliveries (AF)

Type	Metered		Unmetered	
	No. of Accounts	Water Deliveries (AF)	No. of Accounts	Water Deliveries (AF)
1. Single-Family	99871	54616	0	0
2. Multi-Family	1046	5014	0	0
3. Commercial	2146	8033	0	0
4. Industrial	115	411	0	0
5. Institutional	661	6879	0	0
6. Dedicated Irrigation	945	8566	0	0
7. Recycled Water	82	16545	0	0
8. Other	275	3598	0	0
9. Unaccounted	NA	0	NA	0
Total	105141	103662	0	0
	Metered		**Unmetered**	

Reported as of 9/29/05

BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit:
Eastern Municipal Water District - Retail

BMP Form Status:
100% Complete

Year:
2004

A. Implementation

1. Based on your signed MOU date, 02/07/1992, your Agency STRATEGY DUE DATE is:	02/06/1994
2. Has your agency developed and implemented a targeting/ marketing strategy for SINGLE-FAMILY residential water use surveys?	yes
a. If YES, when was it implemented?	07/01/1997
3. Has your agency developed and implemented a targeting/ marketing strategy for MULTI-FAMILY residential water use surveys?	no
a. If YES, when was it implemented?	

B. Water Survey Data

Survey Counts:	Single Family Accounts	Multi-Family Units
1. Number of surveys offered:	94	0
2. Number of surveys completed:	94	0
Indoor Survey:		
3. Check for leaks, including toilets, faucets and meter checks	yes	yes
4. Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, if necessary	yes	yes
5. Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as neccesary; replace leaking toilet flapper, as necessary	yes	yes
Outdoor Survey:		
6. Check irrigation system and timers	yes	yes
7. Review or develop customer irrigation schedule	yes	yes
8. Measure landscaped area (Recommended but not required for surveys)	yes	yes
9. Measure total irrigable area (Recommended but not required for surveys)	yes	yes
10. Which measurement method is typically used (Recommended but not required for surveys)	Odometer Wheel	
11. Were customers provided with information packets that included evaluation results and water savings recommendations?	yes	yes
12. Have the number of surveys offered and completed, survey results, and survey costs been tracked?	yes	yes
a. If yes, in what form are surveys tracked?	database	
b. Describe how your agency tracks this information.		

Input to customer accounts, database and quarterly reports to MWD

C. Water Survey Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	10000	10000
2. Actual Expenditures	7050	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Reported as of 9/29/05

BMP 02: Residential Plumbing Retrofit

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2004**

A. Implementation

1. Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts? yes

   a. If YES, list local jurisdictions in your service area and code or ordinance in each:

   EMWD Ordinance No. 72.19, which is updated regularly & recognized as lawful by local municipalities

2. Has your agency satisfied the 75% saturation requirement for single-family housing units? no

3. Estimated percent of single-family households with low-flow showerheads: 75%

4. Has your agency satisfied the 75% saturation requirement for multi-family housing units? no

5. Estimated percent of multi-family households with low-flow showerheads: 80%

6. If YES to 2 OR 4 above, please describe how saturation was determined, including the dates and results of any survey research.

B. Low-Flow Device Distribution Information

1. Has your agency developed a targeting/ marketing strategy for distributing low-flow devices? yes

   a. If YES, when did your agency begin implementing this strategy? 07/01/1994

   b. Describe your targeting/ marketing strategy.

   Beginning in July 1997, identified & contacted top 20% of water users -- offer survey & conduct those requesting accordingly. In addition, conduct numerous surveys each year beyond those targeted.

Low-Flow Devices Distributed/ Installed	SF Accounts	MF Units
2. Number of low-flow showerheads distributed:	31	108
3. Number of toilet-displacement devices distributed:	53	50
4. Number of toilet flappers distributed:	10	10
5. Number of faucet aerators distributed:	16	8

6. Does your agency track the distribution and cost of low-flow devices? yes

   a. If YES, in what format are low-flow devices tracked? Database

   b. If yes, describe your tracking and distribution system :

   Regular posting to customer accounts, database and quarterly project reports to MWD

C. Low-Flow Device Distribution Expenditures

	This Year	Next Year
1. Budgeted Expenditures	5000	5000
2. Actual Expenditures	760	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Most of the devices that were distributed this year were previously paid for, except the aerators.

Reported as of 9/29/05

BMP 03: System Water Audits, Leak Detection and Repair

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2004**

A. Implementation

1. Has your agency completed a pre-screening system audit for this reporting year?	yes
2. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:	
a. Determine metered sales (AF)	103045
b. Determine other system verifiable uses (AF)	336
c. Determine total supply into the system (AF)	106455
d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required.	0.97
3. Does your agency keep necessary data on file to verify the values used to calculate verifiable uses as a percent of total production?	yes
4. Did your agency complete a full-scale audit during this report year?	no
5. Does your agency maintain in-house records of audit results or the completed AWWA audit worksheets for the completed audit?	no
6. Does your agency operate a system leak detection program?	yes
a. If yes, describe the leak detection program:	

Fix leaks as they are reported and replace pipes with leak history

B. Survey Data

1. Total number of miles of distribution system line.	1867
2. Number of miles of distribution system line surveyed.	1867

C. System Audit / Leak Detection Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No
a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."	

E. Comments

Reported as of 9/29/05

BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing

Reporting Unit:
Eastern Municipal Water District - Retail

BMP Form Status:
100% Complete

Year:
2004

A. Implementation

1. Does your agency require meters for all new connections and bill by volume-of-use? yes

2. Does your agency have a program for retrofitting existing unmetered connections and bill by volume-of-use? no

   a. If YES, when was the plan to retrofit and bill by volume-of-use existing unmetered connections completed?

   b. Describe the program:

   All accounts - without exception - are metered. Therefore, no retrofitting program or funding for same is necessary.

3. Number of previously unmetered accounts fitted with meters during report year. 0

B. Feasibility Study

1. Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters? yes

   a. If YES, when was the feasibility study conducted? (mm/dd/yy) 07/01/1997

   b. Describe the feasibility study:

   Discussions between Conservation, Customer Service & Information Systems revealed that not enough landscape accounts have mixed-use meters to make any changes/incentives possible.

2. Number of CII accounts with mixed-use meters. 2922

3. Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period. 0

C. Meter Retrofit Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

   a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

All CII dedicated landscape accounts with 3,000 sq. ft. or more have been put on water budgets since 1992

Reported as of 9/29/05

BMP 05: Large Landscape Conservation Programs and Incentives

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2004**

A. Water Use Budgets

1. Number of Dedicated Irrigation Meter Accounts:	732
2. Number of Dedicated Irrigation Meter Accounts with Water Budgets:	392
3. Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF):	3729
4. Actual Use for Irrigation Meter Accounts with Water Budgets (AF):	2742
5. Does your agency provide water use notices to accounts with budgets each billing cycle?	yes

B. Landscape Surveys

1. Has your agency developed a marketing / targeting strategy for landscape surveys?	yes
a. If YES, when did your agency begin implementing this strategy?	1/1/1997

b. Description of marketing / targeting strategy:

Monthly contacts -- some written, some oral/in person - every month. PDA classes offered to all water budget accounts & maintenance personnel.

2. Number of Surveys Offered.	0
3. Number of Surveys Completed.	0
4. Indicate which of the following Landscape Elements are part of your survey:	
a. Irrigation System Check	yes
b. Distribution Uniformity Analysis	yes
c. Review / Develop Irrigation Schedules	yes
d. Measure Landscape Area	yes
e. Measure Total Irrigable Area	yes
f. Provide Customer Report / Information	yes
5. Do you track survey offers and results?	yes
6. Does your agency provide follow-up surveys for previously completed surveys?	yes

a. If YES, describe below:

Review of Plan Checks, Assignement of Water Budgets, Orientation of Landscape/Irrigation Ordinance 72.19, and follow-up.

C. Other BMP 5 Actions

1. An agency can provide mixed-use accounts with ETo-based landscape budgets in lieu of a large landscape survey program. Does your agency provide mixed-use accounts with landscape budgets?	no
2. Number of CII mixed-use accounts with landscape budgets.	0

3. Do you offer landscape irrigation training? yes

4. Does your agency offer financial incentives to improve landscape water use efficiency? yes

Type of Financial Incentive:	Budget (Dollars/ Year)	Number Awarded to Customers	Total Amount Awarded
a. Rebates	0	0	0
b. Loans	0	0	0
c. Grants	0	0	0

5. Do you provide landscape water use efficiency information to new customers and customers changing services? yes

a. If YES, describe below:

Review of Plan Checks, Assignment of Water Budget, Orientation of Landscape/Irrigation Ordinance 72.19, and follow-up. Monthly water consumption statement.

6. Do you have irrigated landscaping at your facilities? yes

a. If yes, is it water-efficient? yes

b. If yes, does it have dedicated irrigation metering? yes

7. Do you provide customer notices at the start of the irrigation season? yes

8. Do you provide customer notices at the end of the irrigation season? yes

D. Landscape Conservation Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	38000	30000
2. Actual Expenditures	30307	

E. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

F. Comments

No. A1 - relates to all dedicated landscape metered accounts in our sytem. No. A2 - relates to all dedicated landscape metered accts in our system that are active & have a full 12 months usage history. Also, note that No. A1 is less than previous reports due to accts converting to recycled water and/or being designated as under the 3,000 sq ft requirement. EMWD does charge "disincentive fees" from $100 - $500 dollars for going over water budgets by percentages on a 5 step/tiered scale.

Reported as of 9/29/05

BMP 06: High-Efficiency Washing Machine Rebate Programs

Reporting Unit:
Eastern Municipal Water District - Retail

BMP Form Status:
100% Complete

Year:
2004

A. Implementation

1. Do any energy service providers or waste water utilities in your service area offer rebates for high-efficiency washers? yes

   a. If YES, describe the offerings and incentives as well as who the energy/waste water utility provider is.

   The Gas Company offered rebates from $75 to $125, SCE offered rebates from $100 to $150. Rebates varied in amounts based on washers MEF Factor.

2. Does your agency offer rebates for high-efficiency washers? yes

3. What is the level of the rebate? 0

4. Number of rebates awarded. 553

B. Rebate Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	5000	5000
2. Actual Expenditures	5530	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

   a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 9/29/05

BMP 07: Public Information Programs

Reporting Unit:
Eastern Municipal Water District - Retail

BMP Form Status:
100% Complete

Year:
2004

A. Implementation

1. Does your agency maintain an active public information program to promote and educate customers about water conservation? yes

a. If YES, describe the program and how it's organized.

On-going Bill Stuffers, News Releases, Website and Water Bill messages, along with a Conservation "Hotline" are used to consistently apprise customers of using water wisely & efficiently.

2. Indicate which and how many of the following activities are included in your public information program.

Public Information Program Activity	Yes/No	Number of Events
a. Paid Advertising	yes	15
b. Public Service Announcement	yes	1
c. Bill Inserts / Newsletters / Brochures	yes	20
d. Bill showing water usage in comparison to previous year's usage	yes	
e. Demonstration Gardens	no	
f. Special Events, Media Events	yes	12
g. Speaker's Bureau	yes	10
h. Program to coordinate with other government agencies, industry and public interest groups and media	yes	

B. Conservation Information Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	40000	40000
2. Actual Expenditures	40500	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 9/29/05

BMP 08: School Education Programs

Reporting Unit:
Eastern Municipal Water District - Retail

BMP Form Status:
100% Complete

Year:
2004

A. Implementation

1.Has your agency implemented a school information program to promote water conservation? yes

2. Please provide information on your school programs (by grade level):

Grade	Are grade-appropriate materials distributed?	No. of class presentations	No. of students reached	No. of teachers' workshops
Grades K-3rd	yes	67	67368	0
Grades 4th-6th	yes	47	16252	0
Grades 7th-8th	yes	4	1825	0
High School	yes	10	12785	2

3. Did your Agency's materials meet state education framework requirements? yes

4. When did your Agency begin implementing this program? 7/1/1991

B. School Education Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	166320	180000
2. Actual Expenditures	170000	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

The numbers provided in the "numbers of students reached" category above, account for all aspects of our education program that reach students with a water conservation message. The various programs used to reach students include: educational tours of EMWD facilities, a water conservation theatre program (assembly style presentation), free (new curriculum) water education materials, "water-wise" poster contest, website information, and classroom presentations. The numbers of students reached has increased over the past few years due to tremendous growth in the Inland Empire.

Reported as of 9/29/05

BMP 09: Conservation Programs for CII Accounts

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2004**

A. Implementation

1. Has your agency identified and ranked COMMERCIAL customers according to use?	yes
2. Has your agency identified and ranked INDUSTRIAL customers according to use?	yes
3. Has your agency identified and ranked INSTITUTIONAL customers according to use?	yes

Option A: CII Water Use Survey and Customer Incentives Program

4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option? yes

CII Surveys	Commercial Accounts	Industrial Accounts	Institutional Accounts
a. Number of New Surveys Offered	4	0	0
b. Number of New Surveys Completed	4	0	0
c. Number of Site Follow-ups of Previous Surveys (within 1 yr)	2	0	0
d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)	0	0	0

CII Survey Components	Commercial Accounts	Industrial Accounts	Institutional Accounts
e. Site Visit	yes	no	no
f. Evaluation of all water-using apparatus and processes	yes	no	no
g. Customer report identifying recommended efficiency measures, paybacks and agency incentives	yes	no	no

Agency CII Customer Incentives	Budget ($/Year)	No. Awarded to Customers	Total $ Amount Awarded
h. Rebates	48865	449	48865
i. Loans	0	0	0
j. Grants	0	0	0
k. Others	0	0	0

Option B: CII Conservation Program Targets

5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this option?	yes
6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings?	yes
7. Estimated annual savings (AF/yr) from site-verified actions taken by agency since 1991.	176.37
8. Estimated annual savings (AF/yr) from non-site-verified actions taken by agency since 1991.	57.36

B. Conservation Program Expenditures for CII Accounts

	This Year	Next Year
1. Budgeted Expenditures	10000	10000
2. Actual Expenditures	2775	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

   a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 9/29/05

BMP 09a: CII ULFT Water Savings

Reporting Unit:
Eastern Municipal Water District - Retail

BMP Form Status:
100% Complete

Year:
2004

1. Did your agency implement a CII ULFT replacement program in the reporting year? Yes

If No, please explain why on Line B. 10.

A. Targeting and Marketing

1. What basis does your agency use to target customers for participation in this program? Check all that apply.

Potential savings
CII Sector or subsector

a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

Special marketing material from Management Company (HDMC), contracted through Metropolitan Water District of Southern California (MWD), provided the tools to do individual target mailings.

2. How does your agency advertise this program? Check all that apply.

Direct letter
Bill message
Newsletter
Web page
Trade publications
Other print media
Trade shows and events
Telemarketing

a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

Direct mailing of marketing of clip sheets. Also, advertising in customer newsletters and Chamber presentations.

B. Implementation

1. Does your agency keep and maintain customer participant information? (Read the Help information for a complete list of all the information for this BMP.) Yes

2. Would your agency be willing to share this information if the CUWCC did a study to evaluate the program on behalf of your agency? Yes

3. What is the total number of customer accounts participating in the program during the last year ? 3

CII Subsector	Number of Toilets Replaced			
4.	Standard Gravity Tank	Air Assisted	Valve Floor Mount	Valve Wall Mount
a. Offices	1	0	0	0
b. Retail / Wholesale	0	0	0	0
c. Hotels	108	0	0	0
d. Health	0	0	0	0
e. Industrial	0	0	0	0

f. Schools: K to 12	0	0	0	0
g. Eating	0	0	0	0
h. Govern-ment	0	0	0	0
i. Churches	0	0	0	0
j. Other	0	0	0	0

5. Program design.

Rebate or voucher

6. Does your agency use outside services to implement this program? Yes

a. If yes, check all that apply.

Consultant

7. Participant tracking and follow-up. No follow-up

8. Based on your program experience, please rank on a scale of 1 to 5, with 1 being the least frequent cause and 5 being the most frequent cause, the following reasons why customers refused to participate in the program.

a. Disruption to business	4
b. Inadequate payback	4
c. Inadequate ULFT performance	2
d. Lack of funding	5
e. American's with Disabilities Act	1
f. Permitting	1
g. Other. Please describe in B. 9.	0

9. Please describe general program acceptance/resistance by customers, obstacles to implementation, and other isues affecting program implementation or effectiveness.

Eastern has very limited CII Industry - a lot of new construction with low-flow toilets already installed.

10. Please provide a general assessment of the program for this reporting year. Did your program achieve its objectives? Were your targeting and marketing approaches effective? Were program costs in line with expectations and budgeting?

Participation level this fiscal year increased from the past year. Hopefully, we will continue to escalate customer participation

C. Conservation Program Expenditures for CII ULFT

1. CII ULFT Program: Annual Budget & Expenditure Data

	Budgeted	Actual Expenditure
a. Labor	1500	1500
b. Materials	0	0
c. Marketing & Advertising	150	150
d. Administration & Overhead	0	0
e. Outside Services	0	0
f. Total	1650	1650

2. CII ULFT Program: Annual Cost Sharing

a. Wholesale agency contribution	2220
b. State agency contribution	0
c. Federal agency contribution	0
d. Other contribution	0
e. Total	2220

D. Comments

Reported as of 9/29/05

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Retail	**100% Complete**	**2004**

A. Implementation

Rate Structure Data Volumetric Rates for Water Service by Customer Class

1. Residential	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$40136425
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$10071707
2. Commercial	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$5266756
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$0
3. Industrial	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$269468
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$0
4. Institutional / Government	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$4510148
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$0
5. Irrigation	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	$1958212
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$13528
6. Other	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$2024754

d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$44440

B. Conservation Pricing Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 9/29/05

BMP 12: Conservation Coordinator

Reporting Unit:
Eastern Municipal Water District - Retail

BMP Form Status:
100% Complete

Year:
2004

A. Implementation

1. Does your Agency have a conservation coordinator? no
2. Is this a full-time position? no
3. If no, is the coordinator supplied by another agency with which you cooperate in a regional conservation program ? no
4. Partner agency's name:
5. If your agency supplies the conservation coordinator:
   - a. What percent is this conservation coordinator's position? %
   - b. Coordinator's Name
   - c. Coordinator's Title
   - d. Coordinator's Experience and Number of Years
   - e. Date Coordinator's position was created (mm/dd/yyyy)
6. Number of conservation staff, including Conservation Coordinator. 5

B. Conservation Staff Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	152834	280000
2. Actual Expenditures	167912	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no
   - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Ted Haring, former Conservation Coordinator, was hired as a part-time contract employee in April 2004 to conduct a number of conservation duties. Also, in June of 2004, Deb Whitney was hired as a Conservation Analyst. Therefore, in 2004-2005 fiscal year, the Conservation Department has 3 full-time & 2 part-time employees.

Reported as of 9/29/05

BMP 13: Water Waste Prohibition

Reporting Unit:
Eastern Municipal Water District - Retail

BMP Form Status:
100% Complete

Year:
2004

A. Requirements for Documenting BMP Implementation

1. Is a water waste prohibition ordinance in effect in your service area? yes

a. If YES, describe the ordinance:

Ordinance No. 72.19 provides special provisions for water conservation measures for golf courses & large landscape projects. In addition, several provisions for conservation ethics are included for all EMWD customers.

2. Is a copy of the most current ordinance(s) on file with CUWCC? yes

a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:

Moreno Valley, Hemet, Temecula, Murrieta, Perris & San Jacinto	All cities defer to EMWD's Ordinance No. 72.19

B. Implementation

1. Indicate which of the water uses listed below are prohibited by your agency or service area.

a. Gutter flooding yes

b. Single-pass cooling systems for new connections yes

c. Non-recirculating systems in all new conveyor or car wash systems no

d. Non-recirculating systems in all new commercial laundry systems no

e. Non-recirculating systems in all new decorative fountains yes

f. Other, please name
Irrigation during hot/daylight hours. Water between midnight & 6:00 a.m. yes

2. Describe measures that prohibit water uses listed above:

The Ordinance, requirements for new business connections (on file with CUWCC) and basic conservation messages/bill stuffers that are ongoing.

Water Softeners:

3. Indicate which of the following measures your agency has supported in developing state law:

a. Allow the sale of more efficient, demand-initiated regenerating DIR models. yes

b. Develop minimum appliance efficiency standards that:

i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used. yes

ii.) Implement an identified maximum number of gallons discharged per gallon of soft water produced. yes

c. Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site

regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply.	yes
4. Does your agency include water softener checks in home water audit programs?	yes
5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models?	yes

C. Water Waste Prohibition Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	4000	4000
2. Actual Expenditures	4000	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Even though current law does not allow EMWD to prohibit residential on-site regeneration water softeners, our agency discourages this use when queried by customers. Also, Eastern's load limits into the sewer system for commercial water softeners takes care of itself.

Reported as of 9/29/05

BMP 14: Residential ULFT Replacement Programs

Reporting Unit:
Eastern Municipal Water District - Retail

BMP Form Status:
100% Complete

Year:
2004

A. Implementation

	Single-Family Accounts	Multi-Family Units
1. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	yes

Number of Toilets Replaced by Agency Program During Report Year

Replacement Method	SF Accounts	MF Units
2. Rebate	643	58
3. Direct Install	0	0
4. CBO Distribution	0	0
5. Other	0	0
Total	**643**	**58**

6. Describe your agency's ULFT program for single-family residences.

A rebate program has been in place since 2000 and is totally administered by EMWD staff

7. Describe your agency's ULFT program for multi-family residences.

A rebate program has been in place since 2000 and is totally administered by EMWD staff

8. Is a toilet retrofit on resale ordinance in effect for your service area? no

9. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

N/A	N/A

B. Residential ULFT Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	35000	26000
2. Actual Expenditures	26115	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Less toilets rebated - no brochure printing this fiscal year.

Reported as of 9/29/05

Water Supply & Reuse

Reporting Unit: **Eastern Municipal Water District - Wholesale**

Year: **2004**

Water Supply Source Information

Supply Source Name	Quantity (AF) Supplied	Supply Type
MWD	75868	Imported
EMWD	17685	Groundwater
EMWD	25094	Recycled

Total AF: 118647

Purchaser Information

Name of Agency	Quantity (AF) Supplied	Retailer or Wholesaler
Lake Hemet MWD	328	retail
City of Perris	2252	retail
DWR	63	wholesale
City of San Jacinto	84	retail
Western MWD	0	wholesale
Nuevo Water Company	752	retail
Murrieta County Water District	281	retail
City of Hemet	377	retail

Total AF: 4137

Reported as of 9/29/05

BMP 03: System Water Audits, Leak Detection and Repair

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Wholesale	**100% Complete**	**2004**

A. Implementation

1. Has your agency completed a pre-screening system audit for this reporting year?	yes
2. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:	
a. Determine metered sales (AF)	103045
b. Determine other system verifiable uses (AF)	336
c. Determine total supply into the system (AF)	106455
d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required.	0.97
3. Does your agency keep necessary data on file to verify the values used to calculate verifiable uses as a percent of total production?	yes
4. Did your agency complete a full-scale audit during this report year?	no
5. Does your agency maintain in-house records of audit results or the completed AWWA audit worksheets for the completed audit?	no
6. Does your agency operate a system leak detection program?	yes
a. If yes, describe the leak detection program:	

Fix leaks as they are reported and replace pipes with leak history

B. Survey Data

1. Total number of miles of distribution system line.	1867
2. Number of miles of distribution system line surveyed.	1867

C. System Audit / Leak Detection Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No
a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."	

E. Comments

Reported as of 9/29/05

BMP 07: Public Information Programs

Reporting Unit:
Eastern Municipal Water District - Wholesale

BMP Form Status:
100% Complete

Year:
2004

A. Implementation

1. Does your agency maintain an active public information program to promote and educate customers about water conservation? yes

a. If YES, describe the program and how it's organized.

On-going Bill Stuffers, News Releases and Water Bill messages, along with a Conservation "Hotline" are used to consistently apprise customers of using water wisely & efficiently.

2. Indicate which and how many of the following activities are included in your public information program.

Public Information Program Activity	Yes/No	Number of Events
a. Paid Advertising	yes	15
b. Public Service Announcement	yes	1
c. Bill Inserts / Newsletters / Brochures	yes	20
d. Bill showing water usage in comparison to previous year's usage	yes	
e. Demonstration Gardens	no	
f. Special Events, Media Events	yes	12
g. Speaker's Bureau	yes	10
h. Program to coordinate with other government agencies, industry and public interest groups and media	yes	

B. Conservation Information Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	40000	40000
2. Actual Expenditures	40500	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 9/29/05

BMP 08: School Education Programs

Reporting Unit:
Eastern Municipal Water District - Wholesale

BMP Form Status:
100% Complete

Year:
2004

A. Implementation

1.Has your agency implemented a school information program to promote water conservation? yes

2. Please provide information on your school programs (by grade level):

Grade	Are grade-appropriate materials distributed?	No. of class presentations	No. of students reached	No. of teachers' workshops
Grades K-3rd	yes	67	67368	0
Grades 4th-6th	yes	47	16252	0
Grades 7th-8th	yes	4	1825	0
High School	yes	10	12785	2

3. Did your Agency's materials meet state education framework requirements? yes

4. When did your Agency begin implementing this program? 7/1/1991

B. School Education Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	166320	180000
2. Actual Expenditures	170000	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

The numbers provided in the "number of students reached" category above, account for all aspects of our education program that reach students with a water conservation message. The various programs include educational tours of EMWD facilities, a water conservation theater program (assembly style presentations), free water education materials, a "water-wise" poster contest and classroom presentations. The numbers listed reflect the total students reached through all of these programs. EMWD has seen growth in the area whigh has resulted in expanding programs to reach more students. As growth continues, the numbers will increase.

Reported as of 9/29/05

BMP 10: Wholesale Agency Assistance Programs

Reporting Unit:
Eastern Municipal Water District - Wholesale

BMP Form Status:
100% Complete

Year:
2004

A. Implementation

1. Financial Support by BMP

BMP	Financial Incentives Offered?	Budgeted Amount	Amount Awarded	BMP	Financial Incentives Offered?	Budgeted Amount	Amount Awarded
1	No	0	0	**8**	No	0	0
2	No	0	0	**9**	No	0	0
3	No	0	0	**10**	No	0	0
4	No	0	0	**11**	No	0	0
5	No	0	0	**12**	No	0	0
6	yes	0	0	**13**	No	0	0
7	No	0	0	**14**	yes	0	0

2. Technical Support

a. Has your agency conducted or funded workshops addressing CUWCC procedures for calculating program savings, costs and cost-effectiveness?	No
b. Has your agency conducted or funded workshops addressing retail agencies' BMP implementation reporting requirements?	No
c. Has your agency conducted or funded workshops addressing:	
1) ULFT replacement	No
2) Residential retrofits	No
3) Commercial, industrial, and institutional surveys	No
4) Residential and large turf irrigation	No
5) Conservation-related rates and pricing	No

3. Staff Resources by BMP

Qualified	No. FTE	Qualified	No. FTE

BMP	Staff Available for BMP?	Staff Assigned to BMP	BMP	Staff Available for BMP?	Staff Assigned to BMP
1	No		**8**	No	
2	No		**9**	No	
3	No		**10**	No	
4	No		**11**	No	
5	No		**12**	No	
6	No		**13**	No	
7	No		**14**	No	

4. Regional Programs by BMP

BMP	Implementation/ Management Program?	BMP	Implementation/ Management Program?
1	No	**8**	No
2	No	**9**	No
3	No	**10**	No
4	No	**11**	No
5	No	**12**	No
6	yes	**13**	No
7	No	**14**	yes

B. Wholesale Agency Assistance Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

EMWD encourages its few sub-agencies to participate in rebate programs. Presently, only one (Lake Hemet MWD) is getting MWD/EMWD pass thru funds for ULFTs and washers. However, it is our understanding that since MWD accounts for these funds, EMWD has to indicate a "No" on these items.

Reported as of 9/29/05

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
Eastern Municipal Water District - Wholesale	**100% Complete**	**2004**

A. Implementation

Rate Structure Data Volumetric Rates for Water Service by Customer Class

1. Residential	
a. Water Rate Structure	
b. Sewer Rate Structure	
c. Total Revenue from Volumetric Rates	$
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$
2. Commercial	
a. Water Rate Structure	
b. Sewer Rate Structure	
c. Total Revenue from Volumetric Rates	$
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$
3. Industrial	
a. Water Rate Structure	
b. Sewer Rate Structure	
c. Total Revenue from Volumetric Rates	$
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$
4. Institutional / Government	
a. Water Rate Structure	
b. Sewer Rate Structure	
c. Total Revenue from Volumetric Rates	$
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$
5. Irrigation	
a. Water Rate Structure	
b. Sewer Rate Structure	
c. Total Revenue from Volumetric Rates	$
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$
6. Other	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$2570154

d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources $0

B. Conservation Pricing Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reason that this figure is less is due to Eastern's sales to Lake Elsinore MWD now being carried on Western Municipal WD books.

Reported as of 9/29/05

BMP 12: Conservation Coordinator

Reporting Unit:
Eastern Municipal Water District - Wholesale

BMP Form Status:
100% Complete

Year:
2004

A. Implementation

1. Does your Agency have a conservation coordinator? no
2. Is this a full-time position? no
3. If no, is the coordinator supplied by another agency with which you cooperate in a regional conservation program ? no
4. Partner agency's name:
5. If your agency supplies the conservation coordinator:
   - a. What percent is this conservation coordinator's position? %
   - b. Coordinator's Name
   - c. Coordinator's Title
   - d. Coordinator's Experience and Number of Years
   - e. Date Coordinator's position was created (mm/dd/yyyy) 12/1/1991
6. Number of conservation staff, including Conservation Coordinator. 5

B. Conservation Staff Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	152834	280000
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no
   - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Ted Haring, former Conservation Coordinator, was hired as a part-time contract employee in April 2004 to conduct a number of conservation duties. Also, in June of 2004, Deb Whitney was hired as a Conservation Anaylst. Therefore, in 2004-2005 fiscal year, the Conservation Department has 3 full-time & 2 part-time employees.

Reported as of 9/29/05

Appendix D - Water Shortage Contingency Plan

Eastern Municipal Water District

Water Shortage Contingency Plan

Ordinance No.117

Effective July 6, 2005

Attachment A

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Water Shortage Contingency Plan
For Domestic (Potable) Water

Eastern Municipal Water District

Section I: Declaration of Purpose and Principles

In accordance with Water Code 10632 requirements, Eastern Municipal Water District (EMWD) is responsible for conserving the available water supply, protecting the integrity of water supply facilities (infrastructure), and implementing a contingency plan in times of drought, supply reductions, failure of water distribution systems or emergencies. Particular emphasis is placed on use of domestic (potable) water, sanitation, fire protection and preserving public health, welfare, and safety, in addition to minimizing the adverse impacts of water supply shortage or other water supply emergency conditions that do not include recycled water. Therefore, EMWD hereby adopts regulations and restrictions on the delivery and consumption of **potable outdoor water use only.**

Water Surplus and Drought Management Plan (WSDM) – Since EMWD purchases approximately 80 percent of its domestic (potable) water from the Metropolitan Water District of Southern California (MWD), the District recognizes the interdependence of surplus and shortage actions of MWD. WSDM is a coordinated plan utilizing all available resources to maximize supply reliability. The overall objective of the WSDM Plan is to ensure that shortage allocation of MWD's imported water supplies is NOT required. New regional storage projects and other on-going "drought-proofing" efforts by MWD and its member agencies have reduced the need for EMWD drought conservation targets in excess of those adopted by MWD through its WSDM and IRP Plans.

The overall policy objective of the WSDM allocation method will be to minimize the impacts to any one agency and the region as a whole. To meet that objective, the method of allocating firm imported supply will account for each agency's demands on Metropolitan, each agency's local resources, and each agency's total retail demands. **The WSDM Plan allocation will also take into account each agency's conservation and recycled water programs.**

In the event that the District was to implement the Water Shortage Contingency Plan (the Plan), it is recognized that the reduction in sales would impact the revenues that would normally be generated. To the extent that this reduction negatively impacts the coverage of its fixed related costs (those that are not tied to volume) the District will utilize its Rate Stabilization Reserve to mitigate any shortfall.

Potable water regulated or prohibited under the Plan is considered to be non-essential use; continuation of such uses during times of potable water shortage or other emergency water supply conditions are deemed to constitute a waste of water and will be subject to penalties as defined in Sections X, XI and XII of this Plan.

The Plan is based on the following priorities:

- Public safety, health and welfare
- Sustaining economic vitality
- Quality of life

Section II: Public Involvement

Opportunity for the public to provide input into the Plan is provided by public notice -- 30 days prior to implementation. See Section V for authorization process of Board of Directors and General Manager to activate the Water Shortage Contingency Plan.

Section III: Public Education

EMWD will periodically provide the public with information about the Plan, including conditions under which each stage of the Plan is to be initiated or terminated and the conservation response measures to be implemented in each stage. This information will be provided by means of public events, website, press releases, bill inserts, etc.

Section IV: Coordination with Regional Water Planning Groups

The service area of EMWD is located within the regional area of the Santa Ana Watershed Project Authority (SAWPA). In addition to SAWPA, coordination and implementation of this Plan are in concert with Metropolitan Water District's (MWD) Water Surplus and Drought Management Plan (WSDM) as well as the EMWD sub-agencies – Lake Hemet Municipal Water District, Nuevo Water Company, Murrieta County Water District, and the cities of Perris, Hemet and San Jacinto.

Section V: Authorization Process

A. Long and Short Term Water Deficiencies

Driven by the requirements outlined in Water Code 10632, the District's General Manager shall request the Board of Directors to authorize and implement the provisions of the Plan, which declares that the demand for potable water consumption is anticipated to be in excess of the water supply. The request shall be made at a regular or special meeting of the Board of Directors where findings will dictate the necessity, if any, to implement provisions of the Plan. The Board of Directors shall have the authority to initiate or terminate the water shortage contingency measures described in this Plan.

B. Emergency Water Shortage Response

By adopting this Plan, the Board of Directors authorizes the General Manager to declare the extent of potable water shortage emergency and to implement the appropriate water shortage contingency measures. The General Manager shall report such water shortage condition and level of response to the Board of Directors at a time which is reasonable and practicable. Refer to Water System Emergency Operation Procedures within the Urban Water Management Plan.

The declaration of the Board shall be made by public announcement and shall be published in a newspaper of general circulation. The declaration shall become effective immediately upon such publication.

Section VI: Application

The water shortage contingency measures of this Plan shall apply to all persons, customers, and property utilizing potable water provided by EMWD. The terms "person" and "customer" as used in the Plan include individuals, corporations, partnerships, agencies, associations, and all other legal entities.

Section VII: Definitions

For the purposes of this Plan**,** the following definitions shall apply:

Aesthetic water use: ornamental or decorative fountains, reflecting pools, and water gardens.

Base period: the period of time over which the customer's water use is computed.

Billing unit: the unit amount of water used to apply water rates for the purposes of calculating commodity charges for the customer water usage and equals 100 cubic feet or 748 gallons of water.

Commercial, Industrial and Institutional (CII): non-profit establishments, governmental entities, schools, retail establishments, hotels, motels, restaurants, car washes and office buildings.

Conservation: those practices, techniques, and technologies that reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water or increase the recycling and reuse of water so that supply is conserved and made available for future or alternative uses.

Customer: any person, company, agency, or organization using water supplied by EMWD.

Customer Classifications: residential, commercial, industrial, institutional, agriculture, large landscape accounts, wholesale (sub-agencies).

District: Eastern Municipal Water District.

Domestic water: used for personal needs or for household or sanitary purposes such as drinking, bathing, heating, cooking, sanitation, or for cleaning a residence, business, industry, or institution. Also used for landscape irrigation.

Even numbered address: street addresses, box numbers, or rural postal route numbers ending in 0, 2, 4, 6, or 8 and locations without addresses.

Historical base period: any customer who was not a customer during the full historical base period shall be assigned an average daily usage by the District.

Household: residential premises served by the customer's meter.

Industrial water use: processes designed to convert materials of lower value into forms having greater usability and value.

Landscape irrigation use: the irrigation and maintenance of landscaped areas, whether publicly or privately owned, including residential and commercial lawns, gardens, golf courses, parks, rights-of-way and medians.

Lifeline: Amount of water necessary to meet a household's minimum needs for health, safety and sanitation.

Non-essential water use: not essential or required for the protection of public, health, safety and welfare.

Odd numbered address: street addresses, box numbers, or rural postal route numbers ending in 1, 3, 5, 7, or 9.

Potable water: filtered/treated water suitable for drinking; also used for household needs and landscape irrigation.

Water Shortage Contingency Plan: the Plan

Water shortage: a condition in which the existing or projected potable water supply available to EMWD is not anticipated to meet the water requirements of its customers. This condition may be the result of factors including, but not limited to, voluntary or mandatory curtailment of the District's allocation from the Metropolitan Water District of Southern California (MWD), drought, emergency conditions or failure of water distribution systems.

Water shortage period: the period beginning on the effective date of the Board of Directors approval of implementing EMWD's Water Shortage Contingency Plan, and ending on the date of the General Manager's finding that a potable water shortage no longer exists.

Section VIII: Criteria for Initiation/Termination of Water Shortage Contingency Stages

At a time of long or short-term drought conditions or other emergencies, EMWD shall continue to monitor potable water supply shortage conditions on a regular basis and shall determine when conditions warrant initiation or termination of each stage of the Plan as follows:

A. Stage 1: When water deficiencies range between 5 and 10 percent (voluntary stage).

B. Stage 2: When water deficiencies range from more than 10 percent and up to 25 percent (mandatory stage).

C. Stage 3: When water deficiencies range from more than 25 percent and up to 50 percent (mandatory stage).

D. Stage 4: When water deficiencies are more than 50 percent (mandatory stage).

Section IX: Public Notification Procedures

When the District determines that a potable water shortage condition exists, any or all of the following notification procedures may be implemented:

A. Notify the general public and influential local decision-makers what the situation is, what actions should be taken, what they are intended to achieve, and how these actions are to be implemented.

B. The public at large will be informed of the situation and what must be done. Contact can be made through billing inserts, water conservation booths, speaker's bureau, community association meetings, newsletters, education programs, etc. Literature should be provided on the potable water shortage condition, conservation methods, and water-savings devices.

C. Use of media in all its available forms should be employed. This would include public service announcements on radio and cable television as well as press releases in local newspapers.

D. Post all pertinent information on the District's web site.

Section X: Water Shortage Contingency Measures (Households)

A. Stage 1: When potable water deficiencies range between 5 and 10 percent. The following water use restrictions are voluntary under Stage 1 and mandatory under Stage 2 or greater:

1. Do not hose down driveways or any other hard surfaces except for health or sanitary reasons. Use a broom or blower instead.
2. Irrigate lawns and landscape only between midnight and 6:00 a.m. (unless hand watering). Adjust automatic timer clocks accordingly.
3. Adjust and operate all landscape irrigation systems in a manner that will maximize irrigation efficiency and avoid over watering or watering of hardscape and the resulting runoff.
4. Refrain from using decorative fountains unless they are equipped with a recycling system.
5. Where possible, install pool and spa covers to minimize water loss due to evaporation.
6. Do not allow hoses to run while washing vehicles. Use a bucket or a hose with an automatic shutoff valve.

NOTE*: The above measures are similar to on-going conservation procedures followed under existing Ordinance No. 72.19.*

B. Stage 2: When water deficiencies range from more than 10 percent and up to 25 percent. Customers shall be requested to adhere to restrictions prescribed in Stage 1 on a mandatory basis, in addition to the following mandatory water use restrictions:

1. No replacement water will be provided for ponds, lakes, etc.

C. Stage 3: When water deficiencies range from more than 25 percent and up to 50 percent. Customers shall be requested to adhere to restrictions prescribed in Stages 1 and 2, in addition to the following mandatory water use restrictions:

1. Water used on a one-time basis for purposes such as construction and dust control shall be limited to that quantity identified in a plan submitted by the user describing water use requirements. The plan shall be submitted to the District for approval.
2. The use of water from fire hydrants shall be limited to fire fighting and related activities.
3. Water for municipal purposes shall be limited to activities necessary to maintain the public health, safety and welfare.
4. Outdoor irrigation by sprinklers will only be allowed on even-numbered days of the month for those locations with a street address ending in an **even last digit.** Outdoor irrigation of locations not having a street address shall irrigate on even-numbered days of the month.
5. Outdoor irrigation by sprinklers will only be allowed on odd-numbered days of the month for those locations with a street address in an **odd last digit.**
6. Washing of autos, trucks, trailers, motor homes, boats, airplanes or other types of mobile equipment is prohibited. However, such washings are exempted from these regulations for municipalities or commercial entities where the health, safety and welfare of the public is contingent upon frequent vehicle cleaning such as garbage trucks or vehicles used to transport food and perishables.

D. Stage 4: When water deficiencies are more than 50 percent. Customers shall be requested to adhere to restrictions prescribed in Stages 1 through 3, in addition to the following mandatory water use restrictions:

1. Irrigation of landscaping is only allowed twice per week with hand-held hose only.
2. No replacement water provided for pools and spas until such time as Stage 4 restrictions are deemed no longer in effect.
3. No one shall cause the emptying or refilling of existing pools or spas for cleaning purposes. Current water levels will be maintained.
4. All new landscaping shall be limited to drought-tolerant plantings as determined by the District.
5. No new lawns/turf, whether by seed or sod, shall be permitted.
6. No person or entity shall be required to implement any new landscaping requirements of any association, developer or governing agency until the termination of Stage 4.
7. Use of water by all types of commercial car washes shall be reduced in volume by 50 percent.

Section XI: Water Shortage Contingency Measures (CII)

A. Stage 1: When potable water deficiencies range between 5 and 10 percent. Customers shall be requested to adhere to restrictions prescribed in Stage 1 of Section X in addition to the following voluntary water use restriction:

1. Reference evapotranspiration (ET) factors for individually metered landscape projects will be reduced from 1.0 (100 percent of ET) to 0.8 (80 percent of ET).

B. Stage 2: When potable water deficiencies range from more than 10 percent and up

to 25 percent. Customers shall be requested to adhere to restrictions prescribed in Stage 1 of Section X on a mandatory basis.

C. Stage 3: When potable water deficiencies range from more than 25 percent and up to 50 percent. Customers shall be requested to adhere to restrictions prescribed in Stages 1 and 2 of Section X, in addition to the following mandatory water use restriction:

1. Landscape meters to 75 percent of ET.

D. Stage 4: When potable water deficiencies are more than 50 percent. Customers shall be requested to adhere to restrictions prescribed in Stages 1 through 3 in Section X, in addition to the following mandatory water use restriction:

1. Landscape meters to 60 percent of ET.

Section XII: Water Shortage Contingency Measures (Agriculture)

A. Stage 4: When potable water deficiencies are more than 50 percent. Customers shall be requested to adhere to the following mandatory restriction:

1. Based on interruptible agriculture water from MWD, field and row crops may be discontinued.

Section XIII: Enforcement

A. No person or entity shall knowingly or intentionally allow the use of potable water from the District for residential, commercial, industrial, agricultural, governmental, or any other purpose in a manner contrary to any provision of this Plan, or in an amount in excess of that permitted by the water shortage response stage in effect at the time pursuant to action taken by District, in accordance with provisions of this Plan.

B. The various responses to drought or emergencies described in previous sections are intended to avoid or defer the need for rationing community water supplies, while preserving some latitude of choice with respect to how much potable water individual customers use. However, the success of this framework depends on all customers using water efficiently. In the event of unreasonable use or waste, the District reserves the right to impose penalties in addition to the financial disincentives described, including the right to install flow restrictors or to shut off supply.

C. If a person or entity knowingly or intentionally violates the provision of the Plan, the Board of Directors may choose to implement either the event driven or tiered rate penalties as described below:

1. Event-driven penalties:

NOTE: *For irrigation/landscape accounts, the penalties listed below are in addition to the current Annual Assessment Schedule in Ordinance No. 72.19.*

a. For the first monthly violation of these sub-sections, the District shall issue a written notice of fact of such violation to the customer.
b. For the second and third month violations, a surcharge of 100% of current water bill commodity charge shall be added to the customer's water bill.
c. For the fourth and succeeding month(s) violation, a surcharge of 200% of current water bill commodity charge shall be added to the customer's water bill.
d. Thereafter, the District may install a flow restricting device of one gallon per minute (1 GPM) capacity for services up to 1 ½" size and comparatively sized restrictors for larger services.
e. The District may also terminate a customer's irrigation/landscape meter service.

NOTE*: Flow restricting devices and/or termination of service will only be undertaken after a hearing held by a review board where the customer has an opportunity to respond to the District's evidence that the customer has repeatedly violated this chapter's rules regarding the conservation of potable water and that such action is reasonably necessary to assure compliance with this Plan. Prior to any restoration of the service, the customer shall pay all District charges for any restriction or termination of service and its restoration.*

2. Tiered rate penalty:

a. The District shall have the option to impose a tiered rate system that will provide for charges and/or penalties for higher consumption of water over and above the requirements stated herein throughout Stages 1 through 4 of this Plan.

NOTE: *In the event the historical commodity cannot be established using actual recorded amounts of potable water used by a customer during the corresponding billing period in the calendar year preceding the potable water shortage period, the District shall assign the historical commodity.*

Section XIV: Variances

A. The District may, in writing, grant temporary variance for existing potable water uses otherwise prohibited under this Plan if it is determined that failure to grant such variance would cause an emergency condition adversely affecting the health, sanitation, or fire protection for the public or the person requesting such variance, and if one or more of the following conditions are met:

1. Compliance with this Plan cannot be technically accomplished during the duration of the potable water supply shortage or other condition for which the Plan is in effect.
2. Alternative methods can be implemented which will achieve the same level of reduction in potable water use.

B. Persons requesting an exemption from the provisions of this Ordinance shall file a petition for variance with the District within 10 days after the Plan or a particular

drought/emergency response stage has been invoked. All petitions for variances shall be reviewed by the District, and shall include the following:

1. Name and address of the petitioner(s).
2. Purpose of potable water use.
3. Specific provision(s) of the Plan from which the petitioner is requesting relief.
4. Detailed statement as to how the specific provision of the Plan adversely affects the petitioner or what damage or harm will occur to the petitioner or others if petitioner complies with this Plan.
5. Description of the relief requested.
6. Period of time for which the variance is sought.
7. Alternative water use restrictions or other measures the petitioner is taking or proposes.
8. Alternative potable water use restrictions or other measures the petitioner is taking, or proposes to take, to meet the intent of this Plan and the compliance date.
9. Other pertinent information.

C. Variances granted by the District shall be subject to the following conditions, unless waived or modified by the District:

1. Variances granted shall include a timetable for compliance.
2. Variances granted shall expire when the Plan is no longer in effect, unless the petitioner has failed to meet specified requirements.

D. No variance shall be retroactive or otherwise justify any violation of this Plan occurring prior to the issuance of the variance.

Appendix E - List of References

**Hemet San Jacinto Water Management Area 2004 Annual Report*, Eastern Municipal Water District, June 2005.

***Integrated water Resources Plan 2003 Update,* The Metropolitan Water District of Southern California, May 2004.

Market Absorption Analysis Eastern Municipal Water District Hemet San Jacinto Area, Empire Economics Inc, October 2004.

Market Absorption Analysis Eastern Municipal Water District Moreno Valley Study Area Empire Economics Inc, April 2005.

Market Absorption Analysis Eastern Municipal Water District Perris Valley North Study Area, Empire Economics Inc, April 2005.

Market Absorption Analysis Eastern Municipal Water District Perris Valley West Study Area, Empire Economics Inc, April 2005.

Market Absorption Analysis Eastern Municipal Water District Salt Creek Corridor, Empire Economics Inc, May 2004.

**The Metropolitan Water district of Southern California, Regional Urban Water Management Plan*, The Metropolitan Water District of Southern California, September 2005.*

Riverside County Integrated Plan, County of Riverside, 2003
www.rcip.org

Socioeconomic Forecast Study Eastern Municipal Water District, Empire Economics Inc, May 2003.

Water Shortage Emergency Operations Procedure Manual, Eastern Municipal Water District, December 2005.

**West San Jacinto Groundwater Basin Management Plan 2004 Annual Report*, Eastern Municipal Water District, April 2005.

* Available on EMWD's website at EMWD.org

** Available on MWD's website at. mwdh2o.com

Appendix F - Department of Water Resources Checklist

DWR Checklist

	Reference
Coordination with Appropriate Agencies	**(Water Code § 10620 (d)(1)(2))**
Participated in area, regional, watershed or basin wide plan	N/A
Describe the coordination of the plan preparation and anticipated benefits.	Appendix A
Table 1 is included in Appendix 1	
Describe resource maximization / import minimization plan	**(Water Code §10620 (f))**
Describe how water management tools / options maximize resources & minimize need to import water	Groundwater Page 13,15-30 Recycled Water Page 14, 71-75
EMWD has made effort to protect and maximize the local resources of groundwater and recycled water. These efforts are discussed in the groundwater and recycled water portions of the plan.	
Plan Updated in Years Ending in Five and Zero	**(Water Code § 10621(a))**
Date updated and adopted plan received	Adopted December 21,2005
City and County Notification and Participation	**(Water Code § 10621(b))**
Notify any city or county within service area of UWMP of plan review & revision	Appendix A
Consult and obtain comments from cities and counties within service area	Appendix A
Service Area Information	**Water Code § 10631 (a))**
Include current and projected population	Table 1.2 Page
Population projections were based on data from state, regional or local agency	Section 1
Population - Current and Projected	Section 1
Describe climate characteristics that affect water management	Section 1
Describe other demographic factors affecting water management	Section 1
Climate	Table 1.3
Water Sources	**(Water Code § 10631 (b))**
Identify existing and planned water supply sources	Section 2
Provide current water supply quantities	Tables 2.1-2.3
Provide planned water supply quantities	Tables 2.1-2.3
Current And Planned Water Supplies - AFY	Tables 2.1-2.3

DWR Checklist

If Groundwater identified as existing or planned source	(Water Code §10631 (b)(1-4))
Has management plan	Yes - West San Jacinto Hemet/San Jacinto Basin No-
Attached management plan (b)(1)	Appendix B (Plan)and Appendix G (MOUs)
Description of basin(s) (b)(2)	Section 3 Basin Description
Basin is adjudicated	NA
If adjudicated, attached order or decree (b)(2)	NA
Quantified amount of legal pumping right (b)(2)	Section 3 Groundwater Pumping Rights
Groundwater Pumping Rights - AF Year	Section 3 Groundwater Pumping Rights
DWR identified, or projected to be, in overdraft (b)(2)	Yes
Plan to eliminate overdraft (b)(2)	Section 3, Groundwater Management
Analysis of location, amount & sufficiency, last five years (b)(3)	Section 3, Past Production
Analysis of location & amount projected, 20 years (b)(4)	Section 3, Projected Production
Amount of Groundwater pumped - AFY	Table 3.4
Amount of Groundwater projected to be pumped - AFY	Table 3.5
Reliability of Supply	**(Water Code §10631 (c) (1-3)**
Describes the reliability of the water supply and vulnerability to seasonal or climatic shortage	Section 4
Supply Reliability - AF Year	Table 4.1
Water Sources Not Available on a Consistent Basis	**(Water Code §10631 (c))**
Describe the reliability of the water supply due to seasonal or climatic shortages	Section 4
Describe the vulnerability of the water supply to seasonal or climatic shortages	Section 4
No unreliable sources	
Factors resulting in inconsistency of supply	NA
Describe plans to supplement or replace inconsistent sources with alternative sources or DMMs	NA
No inconsistent sources	Yes

DWR Checklist

Transfer or Exchange Opportunities	(Water Code §10631 (d))
Describe short term and long term exchange or transfer opportunities	Section 5
No transfer opportunities	Under Development
Transfer and Exchange Opportunities - AF Year	NA
Water Use Provisions	**(Water Code §10631 (e)(1)(2))**
Quantify past water use by sector	Section 6
Quantify current water use by sector	Section 6 Retail Sectors
Project future water use by sector	Section 6 Retail Sectors
Past, Current and Projected Water Deliveries	Table 6.1
Identify and quantify sales to other agencies	Section 6 Wholesale to Other Agencies
No sales to other agencies	NA
Sales to Other Agencies - AFYear	Table 6.3
Additional Water Uses and Loses- AFYear	Table 6.4
Total Water Use - AFYear	Table 6.5

Planned Water Supply Projects and Programs, including non-implemented DMMs	(Water Code §10631 (g))
No non-implemented / not scheduled DMMs	Section 7

Planned Water Supply Projects and Programs	(Water Code §10631 (h))
No future water supply projects or programs	NA
Detailed description of expected future supply projects & programs	Section 8
Timeline for each proposed project	Table 8.2
Quantification of each projects normal yield (AFY)	Table 8.1
Quantification of each projects single dry-year yield (AFY)	Table 8.1
Quantification of each projects multiple dry-year yield (AFY)	Table 8.1
Future Water Supply Projects	Tables 8.2 & 8.1

Opportunities for development of desalinated water	(Water Code §10631 (i))
Describes opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply	Desalination plants for groundwater are discussed in Section 2 & 3. Recycled water desalination discussed in Section 9.
No opportunities for development of desalinated water	NA
Opportunities for desalinated water	Table 9.1

DWR Checklist

District is a CUWCC signatory	**(Water Code § 10631 (j))**
Urban suppliers that are California Urban Water Conservation Council members may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).	Yes
The supplier's CUWCC Best Management Practices Report should be attached to the UWMP.	Appendix C
Agency is a CUWCC member	Yes
2003-04 annual updates are attached to plan	Appendix C
Both annual updates are considered completed by CUWCC website	Yes
If Supplier receives or projects receiving water from a wholesale supplier	**(Water Code §10631 (k))**
Agency receives, or projects receiving, wholesale water	Yes
Agency provided written demand projections to wholesaler, 20 years	Coordinated with MWD over several months providing information about population and supply.
Agency demand projections provided to wholesale suppliers - AFY	Table 10.2
Wholesaler provided written water availability projections, by source, to agency, 20 years	MWD provided RUWMP with regional projections.
Wholesaler identified & quantified the existing and planned sources of water- AFY	
Wholesale Supply Reliability - % of normal AFY	100%
Factors resulting in inconsistency of wholesaler's supply	NA
Water Shortage Contingency Plan Section	**(Water Code § 10632)**
Stages of Action	**(Water Code § 10632 (a))**
Provide stages of action	Section 11, Stages of Action
Provide the water supply conditions for each stage	Section 11, Stages of Action
Includes plan for 50 percent supply shortage	Section 11, Stages of Action
Water Supply Shortage Stages and Conditions	Table 11.1
three-year Minimum Water Supply	**(Water Code §10632 (b))**
Identifies driest 3-year period	Section 11, Estimate of Minimum Supply
Minimum water supply available by source for the next three years	Section 11, Estimate of Minimum Supply
three-year Estimated Minimum Water Supply - AF Year	Table 11.2
Preparation for catastrophic water supply interruption	**(Water Code §10632 (c))**

DWR Checklist

Provided catastrophic supply interruption plan	Section 11, Catastrophic Supply Interruption
Preparation Actions for a Catastrophe	Section 11, Catastrophic Supply Interruption

Prohibitions	**(Water Code § 10632 (d))**
List the mandatory prohibitions against specific water use practices during water shortages	Section 11, Prohibition, Penalties and Consumption Reduction Methods
Mandatory Prohibitions	Table 11.3

DWR Checklist

Consumption Reduction Methods	(Water Code § 10632 (e))
List the consumption reduction methods the water supplier will use to reduce water use in the most restrictive stages with up to a 50% reduction.	Section 11, Prohibition, Penalties and Consumption Reduction Methods
Consumption Reduction Methods	Table 11.4

Penalties	(Water Code § 10632 (f))
List excessive use penalties or charges for excessive use	Section 11, Prohibition, Penalties and Consumption Reduction Methods
Penalties and Charges	Table 11.5

Revenue and Expenditure Impacts	(Water Code § 10632 (g))
Describe how actions and conditions impact revenues	Section 11, Analysis of Revenue Table 11.6
Describe how actions and conditions impact expenditures	Section 11, Analysis of Revenue Table 11.7
Describe measures to overcome the revenue and expenditure impacts	Section 11, Analysis of Revenue
Proposed measures to overcome revenue impacts	Table 11.8
Proposed measures to overcome expenditure impacts	Table 11.8

Water Shortage Contingency Ordinance/Resolution	(Water Code § 10632 (h))
Attach a copy of the draft water shortage contingency resolution or ordinance.	Appendix D

Reduction Measuring Mechanism	(Water Code § 10632 (i))
Provided mechanisms for determining actual reductions	Section 11, Monitoring
Water Use Monitoring Mechanisms	Table 11.9

Recycling Plan Agency Coordination	Water Code § 10633
Describe the coordination of the recycling plan preparation information to the extent available..	Section 12, Planning Coordination
Participating agencies	Table 12.1

Wastewater System Description	(Water Code § 10633 (a))
Describe the wastewater collection and treatment systems in the supplier's service area	Section 12, Wastewater Quantity, Quality and Current Use
Quantify the volume of wastewater collected and treated	Section 12, Wastewater Quantity, Quality and Current Use
Wastewater Collection and Treatment - AF Year	Table 12.3

DWR Checklist

Wastewater Disposal and Recycled Water Uses	(Water Code § 10633 (a - d))
Describes methods of wastewater disposal	Section 12, Wastewater Quantity, Quality and Current Use
Describe the current type, place and use of recycled water	Section 12, Wastewater Quantity, Quality and Current Use
None	Section 12, Wastewater Quantity, Quality and Current Use
Describe and quantify potential uses of recycled water	Section 12, Wastewater Quantity, Quality and Current Use
Disposal of wastewater (non-recycled) AF Year	Table 12.4
Recycled Water Uses - Actual and Potential (AFY)	Table 12.5
Determination of technical and economic feasibility of serving the potential uses	

Projected Uses of Recycled Water	(Water Code § 10633 (e))
Projected use of recycled water, 20 years	Section 12, Potential and Projected Use , Optimization Plan with Incentives
Projected Future Use of Recycled Water in Service Area - AF Year	Table 12.6
Recycled Water Uses - 2000 Projection compared with 2005 actual - AFY	Table 12.7

Plan to Optimize Use of Recycled Water	(Water Code § 10633 (f))
Describe actions that might be taken to encourage recycled water uses	Section 12, Methods to Encourage Recycled Water Use
Describe projected results of these actions in terms of acre-feet of recycled water used per year	Unknown
Methods to Encourage Recycled Water Use	Section 12, Methods to Encourage Recycled Water Use
Provide a recycled water use optimization plan which includes actions to facilitate the use of recycled water (dual distribution systems, promote recirculating uses)	Section 12, Methods to Encourage Recycled Water Use

Water quality impacts on availability of supply	(Water Code §10634)
Discusses water quality impacts (by source) upon water management strategies and supply reliability	Section 13
No water quality impacts projected	
Current & projected water supply changes due to water quality - percentage	Tables 13.1-13.4

DWR Checklist

Supply and Demand Comparison to 20 Years	(Water Code § 10635 (a))
Compare the projected normal water supply to projected normal water use over the next 20 years, in 5-year increments.	Section 14
Projected Normal Water Supply - AF Year	Table 14.1
Projected Normal Water Demand - AF Year	Table 14.2
Projected Supply and Demand Comparison - AF Year	

DWR Checklist

Supply and Demand Comparison: Single-dry Year Scenario	(Water Code § 10635 (a))
Compare the projected single-dry year water supply to projected single-dry year water use over the next 20 years, in 5-year increments.	Section 15
Projected single dry year Water Supply - AF Year	Table 15.1
Projected single dry year Water Demand - AF Year	Table 15.2
Projected single dry year Supply and Demand Comparison - AF Year	Table 15.3

Supply and Demand Comparison: Multiple-dry Year Scenario	(Water Code § 10635 (a))
Project a multiple-dry year period (as identified in Table 9) occurring between 2006-2010 and compare projected supply and demand during those years	Section 16
Projected supply during multiple dry year period ending in 2010 - AF Year	Table 16.1
Projected demand multiple dry year period ending in 2010 - AFY	Table 16.2
Projected Supply and Demand Comparison during multiple dry year period ending in 2010- AF Year	Table 16.3
Project a multiple-dry year period (as identified in Table 9) occurring between 2011-2015 and compare projected supply and demand during those years	Section 16
Projected supply during multiple dry year period ending in 2015 - AF Year	Table 16.4
Projected demand multiple dry year period ending in 2015 - AFY	Table 16.5
Projected Supply and Demand Comparison during multiple dry year period ending in 2015- AF Year	Table 16.6
Project a multiple-dry year period (as identified in Table 9) occurring between 2016-2020 and compare projected supply and demand during those years	Section 16
Projected supply during multiple dry year period ending in 2020 - AF Year	Table 16.7
Projected demand multiple dry year period ending in 2020 - AFY	Table 16.8
Projected Supply and Demand Comparison during multiple dry year period ending in 2020- AF Year	Table 16.9
Project a multiple-dry year period (as identified in Table 9) occurring between 2021-2025 and compare projected supply and demand during those years	Section 16
Projected supply during multiple dry year period ending in 2025 - AF Year	Table 16.10
Projected demand multiple dry year period ending in 2025 - AFY	Table 16.11
Projected Supply and Demand Comparison during multiple dry year period ending in 2025- AF Year	Table 16.12

DWR Checklist

Provision of Water Service Reliability section to cities/counties within service area	(Water Code § 10635(b))
Provided Water Service Reliability section of UWMP to cities and counties within which it provides water supplies within 60 days of UWMP submission to DWR	

Does the Plan Include Public Participation and Plan Adoption	(Water Code § 10642)
Attach a copy of adoption resolution	
Encourage involvement of social, cultural & economic community groups	
Plan available for public inspection	
Provide proof of public hearing	
Provided meeting notice to local governments	

Review of implementation of 2000 UWMP	(Water Code § 10643)
Reviewed implementation plan and schedule of 2000 UWMP	
Implemented in accordance with the schedule set forth in plan	
2000 UWMP not required	

Provision of 2005 UWMP to local governments	(Water Code § 10644 (a))
Provide 2005 UWMP to DWR, and cities and counties within 30 days of adoption	

Does the plan or correspondence accompanying it show where it is available for pu	(Water Code § 10645)
Does UWMP or correspondence accompanying it show where it is available for public review	

Appendix G – Cooperative Agreements – Hemet/San Jacinto Water Management Area

1. MOU to Work Cooperatively to Promote Conjunctive Use Projects and Programs in the Upper San Jacinto River Basins (with Dept. of Water Resources), June 2001.

2. Agreement to Develop a Groundwater Monitoring Program in the Hemet/ San Jacinto Management Area, September 2003.

3. Agreement for Principles for Water Management, February 2004.

4. MOU for Interim Water Supply Plan, April 2004.

5. MOU for Preparation of Water Management Plan for the Hemet/San Jacinto Management Area, June 2004.

MEMORANDUM OF UNDERSTANDING
TO WORK COOPERATIVELY TO PROMOTE CONJUNCTIVE USE PROJECTS AND PROGRAMS IN UPPER SAN JACINTO RIVER BASINS

This Memorandum of Understanding (MOU) is entered into this 19TH day of June, 2001, by and between the California Department of Water Resources (DWR) and the City of San Jacinto, City of Hemet, Lake Hemet Municipal Water District, and Eastern Municipal Water District, also referred to collectively as "the Parties".

RECITALS

A. Groundwater in the Upper San Jacinto River Basins has been and will remain a significant source of the water for the people, environment, and agribusiness of Riverside County and provides an invaluable contribution to the local economy and public well being.

B. The City of San Jacinto, City of Hemet, Lake Hemet Municipal Water District, and Eastern Municipal Water District strive to increase the availability and reliability of local ground and surface water resources in Riverside County.

C. The City of San Jacinto, City of Hemet, Lake Hemet Municipal Water District, and Eastern Municipal Water District have an interest in the management of their groundwater resources.

D. The Parties recognize that there is the potential for conjunctive management of ground and surface water resources, and are willing to explore the possibility of increasing the availability of dry-year supplies through regional conjunctive use efforts.

E. DWR seeks to facilitate and support local groundwater management efforts, particularly those that could increase dry-year water supplies, within the safe-yield and without the overdraft of groundwater basins.

F. Cooperation, open communication, and consensus building among the Upper San Jacinto River Basins stakeholders are recognized as prerequisites to deciding on any preferred action.

G. The Parties have determined that further study of the feasibility and practicality of developing a groundwater conjunctive use program is necessary for the accurate evaluation of the safe yield of the Upper San Jacinto River Basins.

ARTICLES

NOW, THEREFORE, the Parties recognize that this MOU is a statement of principles and not a binding agreement, and the Parties agree to the following principles:

1. The Parties will work cooperatively to formulate a conjunctive water management program, identifying potentially feasible initiatives, programs, or projects that enhance the dependable yield of the Upper San Jacinto River Basins. An initial review of possible programs or projects shall be undertaken to identify actions that will provide water supply benefits and are technically, environmentally, economically, institutionally, socially, and legally feasible. This initial review shall be commonly referred to as "Phase I". An outline of the Phase I work, attached to this MOU as Appendix A, covers specific tasks that are to be performed as part of this initial review.

2. When the Parties have reached agreement on completion of Phase I, as described in Article 1 of this MOU, other activities to be completed cooperatively may include evaluation of large-scale groundwater banking and exchange, investigation of additional banking and exchange pilot projects, and implementation of an expanded groundwater monitoring and data management program.

3. To accomplish specific tasks outlined in Article 2, the Parties will enter into agreements that define the scope of work, cost sharing, schedule, and other details. Such specific agreements will be supplementary to, and consistent with, the objectives of this MOU.

4. The Parties will share all technical data, analyses, conclusions, and findings developed through the course of implementing this MOU.

Appendix A

Tasks

1. Establish an Upper San Jacinto River Basins Advisory Panel of local civic and technical leaders, and other stakeholders, to facilitate the feasibility evaluation of a conjunctive water management study for the Upper San Jacinto River Basins.

2. Develop and implement an outreach program for interested parties within the Upper San Jacinto River Basins throughout the planning process to share and exchange information, foster open and honest communication, and build consensus and reach a decision on possible courses of action.

3. Identify current and future water needs of stakeholders in the Upper San Jacinto River Basins, ensuring that all related needs are identified including environmental and third party needs.

4. Identify potential conjunctive water management projects in the Upper San Jacinto River Basins that can help address local water supply issues and needs while concurrently helping improve the overall dry year water supply reliability.

5. Jointly prepare a programmatic feasibility evaluation report, identifying specific conjunctive water management project and program options for the Upper San Jacinto River Basins.

6. As part of the programmatic feasibility evaluation, conduct a preliminary environmental review, identifying the impacts of potential projects or programs, including possible third party impacts, and possible measures that could avoid or mitigate the impacts.

7. As part of the programmatic feasibility evaluation, outline the principles of, and operating criteria for, the various potential basin-wide conjunctive water management scenarios and projects.

IN WITNESS WHEREOF, the Parties hereto have executed this MOU as of the day and year first written above.

City of Hemet

By: _____

CALIFORNIA DEPARTMENT OF WATER RESOURCES

By: _____

IN WITNESS WHEREOF, the Parties hereto have executed this MOU as of the day and year first written above.

Eastern Municipal Water District

By: _____

CALIFORNIA DEPARTMENT OF WATER RESOURCES

By: _____

IN WITNESS WHEREOF, the Parties hereto have executed this MOU as of the day and year first written above.

Lake Hemet Municipal Water District

By: _____

CALIFORNIA DEPARTMENT OF WATER RESOURCES

By: _____

IN WITNESS WHEREOF, the Parties hereto have executed this MOU as of the day and year first written above.

City of San Jacinto

By: _____

CALIFORNIA DEPARTMENT OF WATER RESOURCES

By: _____

AGREEMENT TO DEVELOP A GROUNDWATER MONITORING PROGRAM IN THE HEMET/SAN JACINTO MANAGEMENT AREA

THIS AGREEMENT is made and entered into by and among the following entities, which are hereinafter collectively referred to as the "AGENCIES."

City of Hemet
Lake Hemet Municipal Water District
City of San Jacinto
Eastern Municipal Water District

I. RECITALS

A - Background:

1. Groundwater in the Hemet/San Jacinto Management Area has been, and will remain, a significant source of water for the people and agribusiness of Riverside County providing an invaluable contribution to the local economy and public good.
2. The Cities of Hemet and San Jacinto, Lake Hemet Municipal Water District, and Eastern Municipal Water District strive to increase the availability and reliability of local surface and ground water resources in the area.
3. The Cities of Hemet and San Jacinto, Lake Hemet Municipal Water District, and Eastern Municipal Water District have an interest in the management of local water resources within the Hemet/San Jacinto Management Area.
4. The Department of Water Resources seeks to support local groundwater management efforts, particularly those that could increase dry-year water supplies, within the safe yield and without the overdraft of groundwater resources.
5. Through cooperation, open communication, and consensus building among the AGENCIES, the Hemet/San Jacinto Groundwater Policy and Technical Committees were formed in June of 2001 to identify programs needed to improve groundwater resources management in the area.
6. The AGENCIES have determined that development and implementation of a groundwater monitoring program is necessary for the accurate evaluation of the operational yield of the Hemet/San Jacinto Management Area.

B – The Purpose of this Agreement:

1. Develop a Monitoring Program in the Hemet/San Jacinto Management Area.
2. Appoint Eastern Municipal Water District as the Monitoring Program Administrator.
3. Establish an equitable funding mechanism among the Agencies to collect and fund the Monitoring Program.

II. COVENANTS

NOW, THEREFORE, in consideration of the foregoing recitals and mutual covenants contained herein, the AGENCIES hereby agree as follows:

A Develop a Groundwater Monitoring Program:
The AGENCIES and other private groundwater producers in the area hereby agree to develop the Groundwater Monitoring Program, as more specifically provided for in Attachment 1.

B Roles and Responsibilities of the AGENCIES:
The AGENCIES shall perform the duties as more specifically provided for in Attachment 1.

C Monitoring Program Costs:
A total of $200,000 is estimated to be required for the meter installation and first year operation of the monitoring program. This amount includes contingencies and uncertainties associated with such monitoring programs. Attachment 1 contains detailed cost estimates.
It is anticipated that Department of Water Resources (DWR) will contribute $100,000 of the $200,000 estimated cost for the meter installation and first year implementation of the monitoring program, provided the Agencies agree to fund and implement the monitoring program into future years pursuant to Covenant II.D, below.

D Cost Sharing of the Monitoring Program:
Until the full implementation of the Water Management Plan, the AGENCIES will share the annual Monitoring Program costs based on their base groundwater production percentages as determined by the Hemet/San Jacinto Groundwater Policy Committee and shown below:

Cost Sharing Prior to Plan Implementation			
Agency	**Base Production (AF)**	**Percentage**	**Cost Contribution**
City of Hemet	6,320	19.6 %	$ 19,600
City of San Jacinto	4,031	12.5 %	$ 12,500
LHMWD.	11,063	34.2 %	$ 34,200
EMWD	10,869	33.7 %	$ 33,700
Totals	**32,283**	**100.0 %**	**$100,000**

As noted above, the AGENCIES' share of the first year's budget is $100,00. Future years' budgets will be approved by the Hemet/San Jacinto Groundwater Policy Committee, and incorporate any excesses or deficits from prior years.

E Term of the Agreement:
This Agreement shall terminate, unless extended by mutual agreement of the AGENCIES, on the date a stipulated judgment for the Water Management Plan is executed by the AGENCIES provided that all debts and liabilities of the Monitoring Program are satisfied.

An Agency may terminate its participation in this agreement on an anniversary date of the Agreement by given the other Agencies written notice three months prior to that anniversary date.

F Ownership of Documents:
All data and reports produced shall become the joint property of the AGENCIES.

G Effective Date:
This Agreement shall become effective upon execution by all AGENCIES pursuant to authorization by each AGENCY's Governing Board.

H Counterparts:
This Agreement may be executed in original counterparts, which together shall constitute a single agreement.

IN WITNESS WHEREOF, the AGENCIES have executed this Agreement on the date set forth below.

CITY OF HEMET

DATE 9/13/03 BY _____
City Manager

CITY OF SAN JACINTO

DATE 9-16-03 BY _____
City Manager

LAKE HEMET MUNICIPAL WATER DISTRICT

DATE 9/16/03 BY _____
General Manager

EASTERN MUNICIPAL WATER DISTRICT

DATE 9/19/03 BY _____
General Manager

ATTACHMENT 1
Hemet/San Jacinto Management Area
Groundwater Monitoring Program

1. INTRODUCTION

In order to implement a sound Water Management Plan, it is necessary to have adequate data on which to base decisions. The purpose of the groundwater monitoring program is to collect, analyze, and compile water level, water quality, and groundwater production data for the administration and implementation of the Water Management Plan. The Hemet/San Jacinto Management Area is shown in Figure 1. The program provides the information necessary for a comprehensive view of the groundwater basins. The groundwater monitoring program includes the following elements:

- Water Level Monitoring
- Water Quality Monitoring
- Groundwater Extraction Monitoring
- Inactive Well Capping/Sealing

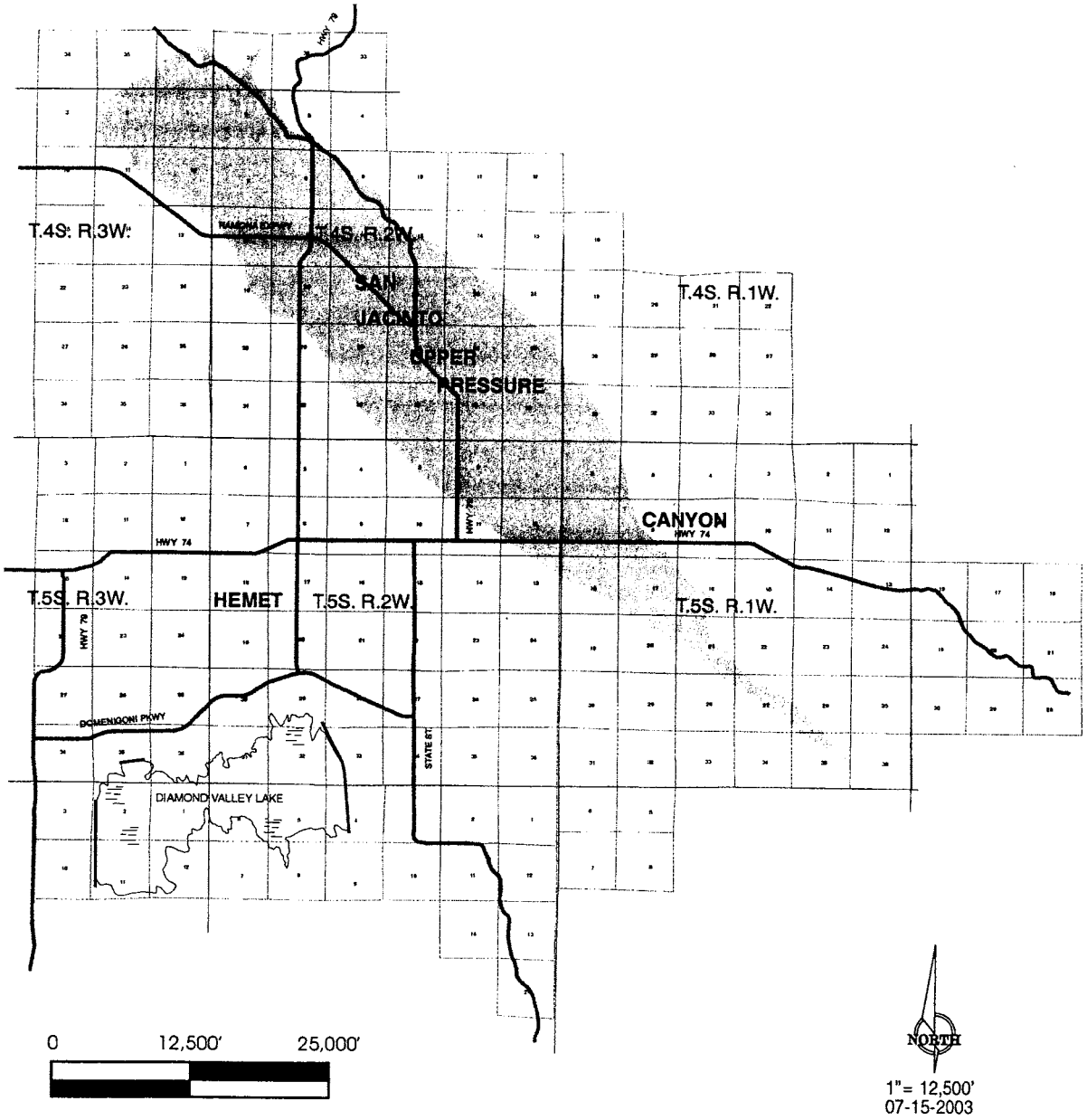
Data management and reporting are also key elements. Collected data will be entered into the EMWD's Regional Water Resources Database (RWRD). An annual report will summarize the monitoring activities and results of the analyses of the monitoring data, as well as provide other pertinent information regarding activities in the local management zones.

Water level and groundwater extraction data will be used to quantify basin stresses and to provide data for estimation of overdraft conditions within any given year and to provide the basis for the following year replenishment. Water quality information will be used to track basin water quality trends. Such data allows for characterization of basin hydrology, evaluation of groundwater flow conditions, and monitoring of groundwater quality improvement or degradation. In addition, inactive, unused wells will be capped/sealed as they are potential sources of groundwater contamination and present hazardous conditions. The water level and extraction monitoring will allow for a more accurate estimation of the amount of groundwater in storage, changes in storage, and over draft and groundwater conditions. The information gained from these efforts will be used in water resources decision-making for the area.

2. PROGRAM BENEFITS

Proper management and augmentation of local groundwater supplies requires a detailed understanding of conditions and trends within local groundwater basins. In conjunction with existing and planned groundwater level and quality monitoring, accurate monitoring of groundwater extraction will allow participants to understand how groundwater

Figure 1: Hemet/San Jacinto Management Area



conditions are changing and make informed decisions on how best to manage and replenish the groundwater resources.

By undertaking an extensive data-gathering effort, all parties involved in the Hemet/San Jacinto Management Area can be assured that operational yield estimates are based on the best available information. Expansion of the current monitoring effort will augment the database used in making decisions on implementation of the water management plan and contribute to the development of a successful management of the basins.

3. CURRENT ACTIVITIES

A well survey was conducted and an inventory of municipal and private wells was generated. Wells included in this inventory came from a variety of sources including the current monitoring program, municipal well lists, and wells for which Notices of Groundwater Extraction had been filed with the State. At the present time, using 2002 data, there is water level data from 188 wells, water quality data from 112 wells, and groundwater production data from 96 wells in the database. Eighty-eight wells have been identified as potential additions to the program. Figure 2 shows the well locations identified for additional investigation. A few wells have not yet been located precisely enough for inclusion on the map. This number may change since additional wells may be discovered, or new wells may be drilled, prior to the full implementation of this monitoring program.

The locations of currently identified wells are captured using Global Positioning System (GPS) technology. The GPS is a highly accurate, satellite-based, spatial positioning technology. The unit currently in use is capable of providing horizontal accuracy (x, y coordinates) within three feet. Because of the nature of the GPS satellite configuration and other considerations, the unit is not able to provide equally accurate vertical positions (z coordinate or elevation). Generally, the accuracy of the GPS-derived elevations is within ten to fifteen feet.

When the 88 wells mentioned above are physically located during site visits, their GPS position will be determined and that location will be entered into the database along with the State Well Number (or township, range, section, and quarter section) and other pertinent well-related information.

Prior to any well monitoring, permission must be obtained from the well owner. A copy of the Permission Form is attached (Attachment A). EMWD has provided over 100 copies of these permission forms for distribution and is in the process of receiving the signed permission forms from the private groundwater producers.

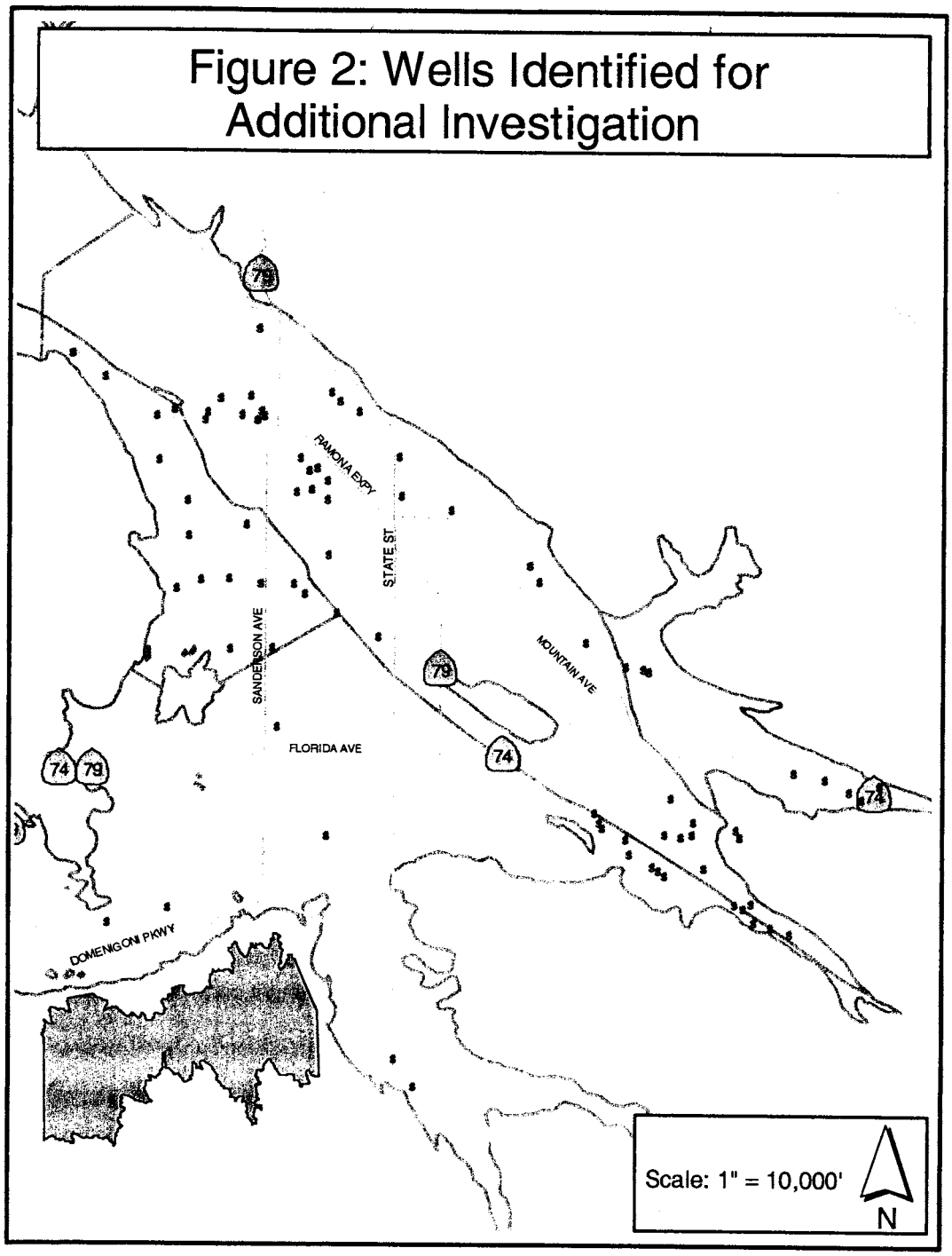


Figure 2: Wells Identified for Additional Investigation
79
RAMONA EXPY
STATE ST
SANDERSON AVE
MOUNTAIN AVE
79
FLORIDA AVE
74
74
79
74
DOMENIGONI PKWY
Scale: 1" = 10,000'
N

4. WATER LEVEL MONITORING PROGRAM

Water levels are proposed to be measured twice a year, spring and fall, to capture the high and low water levels and to determine seasonal effects on groundwater levels. The measurements will be taken prior to and following warm weather when groundwater production is high. Based on the existing information, approximately 270 wells have been identified in the Hemet/San Jacinto Management Area for water level measuring, necessitating around 540 individual measurements per year. Figure 3 shows the wells proposed for inclusion in the Water Level Monitoring Program.
General steps that are required for measuring water levels are as follows:

- A site inspection for potential hazards including open drive shafts, automatic machinery, motor operations including farm equipment, etc. is conducted
- The status of the well is confirmed, i.e., pumping or static. The well should have been in static mode (non-operational) for at least 12 hours, preferably 24 hours
- The depth to water is measured using an electric water level indicator
- The depth to water is recorded
- The recorded value is compared with previous levels for data quality control
- A final site inspection is done

5. WATER QUALITY MONITORING PROGRAM

The water quality samples are collected once a year, generally in the warmer months when the wells are running. Approximately 190 wells in the Hemet/San Jacinto Management Area have been identified for sampling. Figure 4 shows the wells proposed for inclusion in the Water Quality Monitoring Program. Constituents routinely monitored include, general minerals, metals, and total nitrogen.

The procedures for taking water quality samples differ depending on whether the well has existing pumping equipment or not. The sampling procedure is lengthier and more complicated if the well does not have an existing pump.

When the well to be sampled has a pump and is running, the sampling procedure will be follows:

- A site inspection for potential hazards including open drive shafts, automatic machinery, motor operations including farm equipment, etc. is conducted
- The status of the well (pumping or not) is confirmed. If the well is not running, it is turned on
- The sampling port on the well is located, opened, and flushed or purged. Field EC (electrical conductance) and water temperature are taken and recorded
- The water sample is taken using standard methods and proper protocol for the constituents to be sampled
- A final site inspection is done

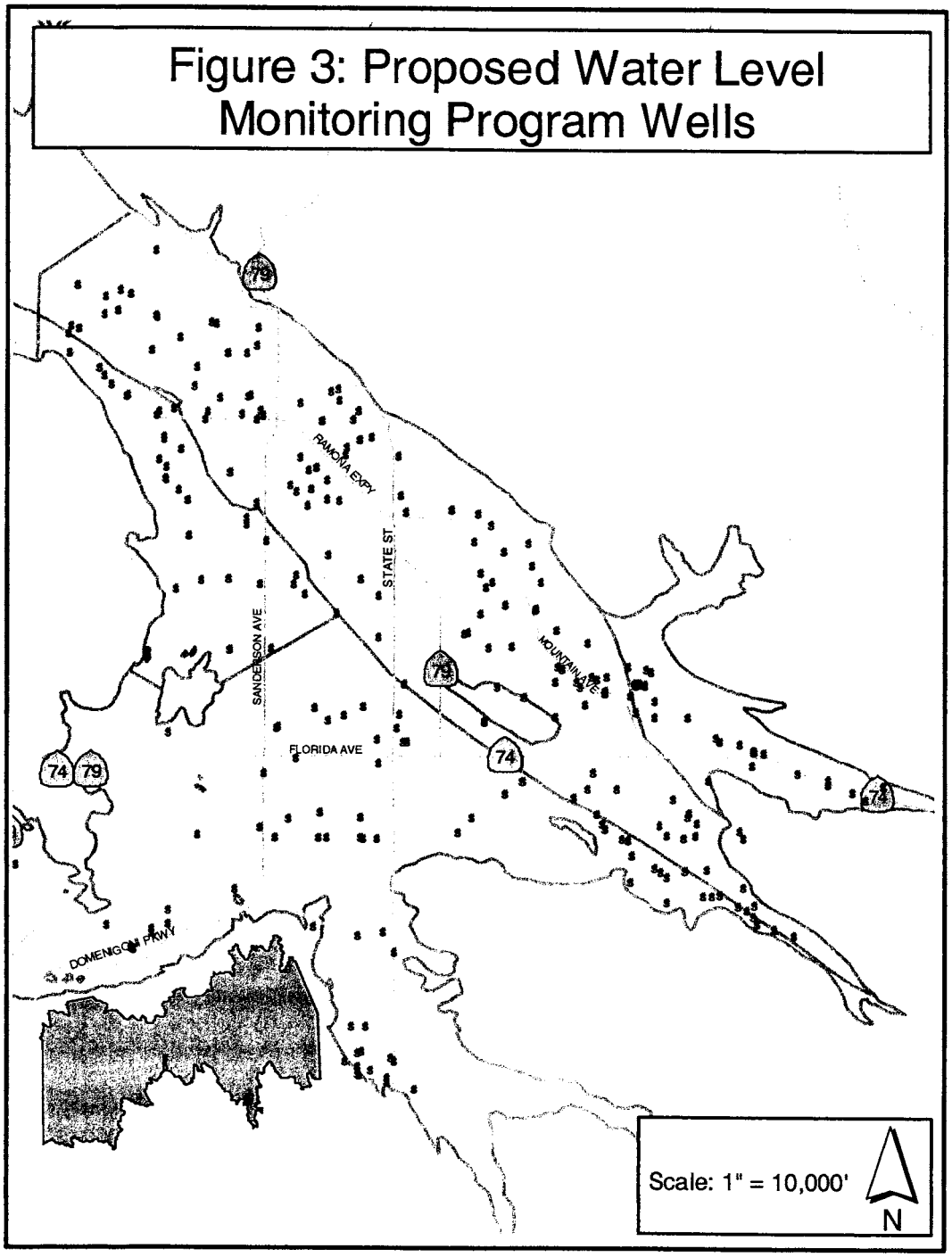


Figure 3: Proposed Water Level Monitoring Program Wells
79
RAMONA EXPY
STATE ST
SANDERSON AVE
MOUNTAIN VIEW AVE
79
FLORIDA AVE
74
74
79
74
DOMENIGONI PKWY
Scale: 1" = 10,000'
N

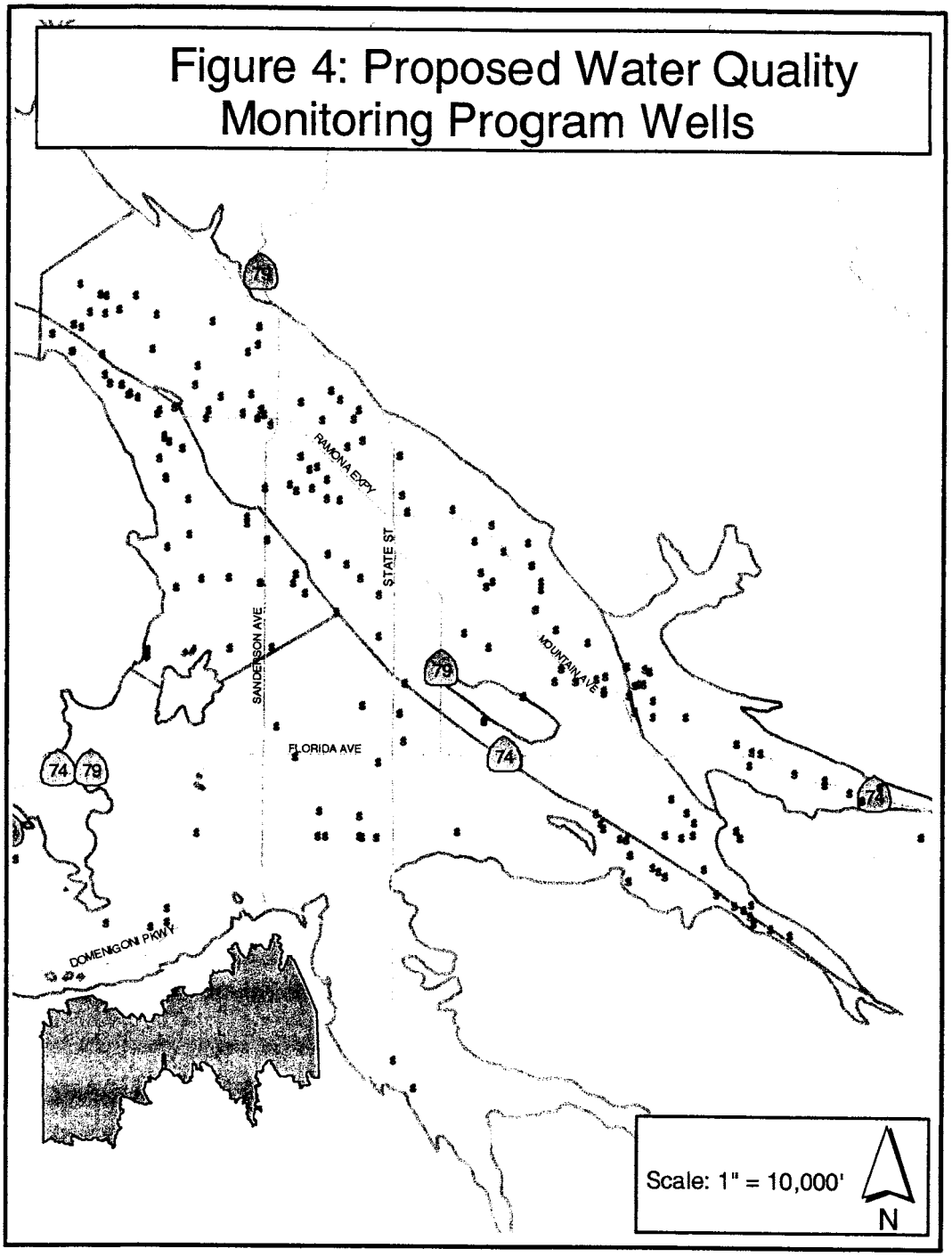


Figure 4: Proposed Water Quality Monitoring Program Wells
RAMONA EXPY
STATE ST
SANDERSON AVE
MOUNTAIN AVE
FLORIDA AVE
DOMENIGONI PKWY
74
79
Scale: 1" = 10,000'
N

When the well does not have an existing pump, a pump must be set in the well and the procedure will be as follows:

- A site inspection for potential hazards including open drive shafts, automatic machinery, motor operations including farm equipment, etc. is conducted
- The depth to water in the well is measured to determine pump setting depth
- The total existing well depth is determined by sounding the bottom of the well. This is done to prevent setting the pump in a sanded region
- The water volume in the casing is calculated to determine the length of time necessary to purge the well for a minimum of three full well volumes
- The pump is set using either continuous reel or column pipe and all electrical and discharge lines are connected
- The well is purged a minimum of three well volumes while monitoring temperature and conductivity
- Conductivity is stabilized. Conductivity is considered stabilized when five measurements taken 3-5 minutes apart are within:
  +/- 5% for conductivity <= 100 μS/cm, or
  +/- 3% for conductivity >100 μS/cm
- The water sample is taken using standard methods and proper protocol for the constituents being sampled
- Electrical and discharge lines are disconnected and the pump is pulled
- The well is closed or sealed
- A final site inspection is done

6. GROUNDWATER EXTRACTION MONITORING PROGRAM

The Groundwater Extraction Monitoring Program involves the metering of wells producing 25 or more acre-feet of groundwater per year. In conjunction with groundwater level and quality monitoring, accurate metering of groundwater extraction will allow for a better understanding of how groundwater conditions are changing and will allow the Watermaster to quantify basin stresses. Groundwater extraction data will be developed from a variety of sources including:

- Meters installed and monitored by EMWD
- Existing, privately owned meters read by EMWD personnel
- Extraction estimates based on land use, i.e., acreage under cultivation and type of crop or numbers of livestock in the case of dairies. This method is used for local producers that will not be participating in the monitoring program

6.1. Initial Program Setup and Meter Installation

Implementation of the Extraction Monitoring Program requires extensive involvement and cooperation of the local private producers. The program participants must provide permission for meter installation and access to their wells. EMWD staff will work closely with the private well owners' representatives to identify and acquire necessary permissions from the existing private well owners in the area. All meter installation

activities will be scheduled at the convenience of the well owner. Installed meters shall remain the property of EMWD as a representative of the Watermaster. The procedure for meter installation by EMWD will be as follows:

- Well owner's permission (copy is attached) for meter installation is verified
- A preliminary site inspection is conducted to review piping and well configuration and determine equipment/supplies needed
- An installation design is prepared and a meeting is held with the well owner for approval/acceptance of the design
- As much as possible, off-site fabrication is done to minimize inconvenience to the owner's operation of the well
- The installation is scheduled and approved by well owner
- The meter is installed and all piping appurtenances are returned to normal operation
- A final site inspection is done

6.2. On-going Extraction Monitoring

The cost of meter maintenance and monitoring of all metered wells will be borne by the Watermaster. Meters on approximately 175 wells are proposed to be read monthly and groundwater usage will be entered into the RWRD for review and analysis. Figure 5 shows the well locations proposed for inclusion in the Extraction Monitoring Program.

As part of this program, well owners agree to provide access to EMWD staff for meter maintenance and the monthly reading of the meters. EMWD will periodically schedule meter maintenance and calibration with the well owner. Such activities will be at the well owners' convenience and will not impact agricultural operations.

Well owners wishing to maintain their own meters may do so. Upon the request of the well owner, EMWD will consider providing maintenance and calibration of privately owned meters, contingent upon the needs of the program and the availability of funding.

When installation of a meter on a well is not physically possible or when a well cannot be metered for other reasons, groundwater production from that well will be estimated using acreage, crop type, or number of animals in the case of dairies. These estimates will be compared with metered groundwater usage at sites of similar size with similar usage as a quality control/quality assurance measure.

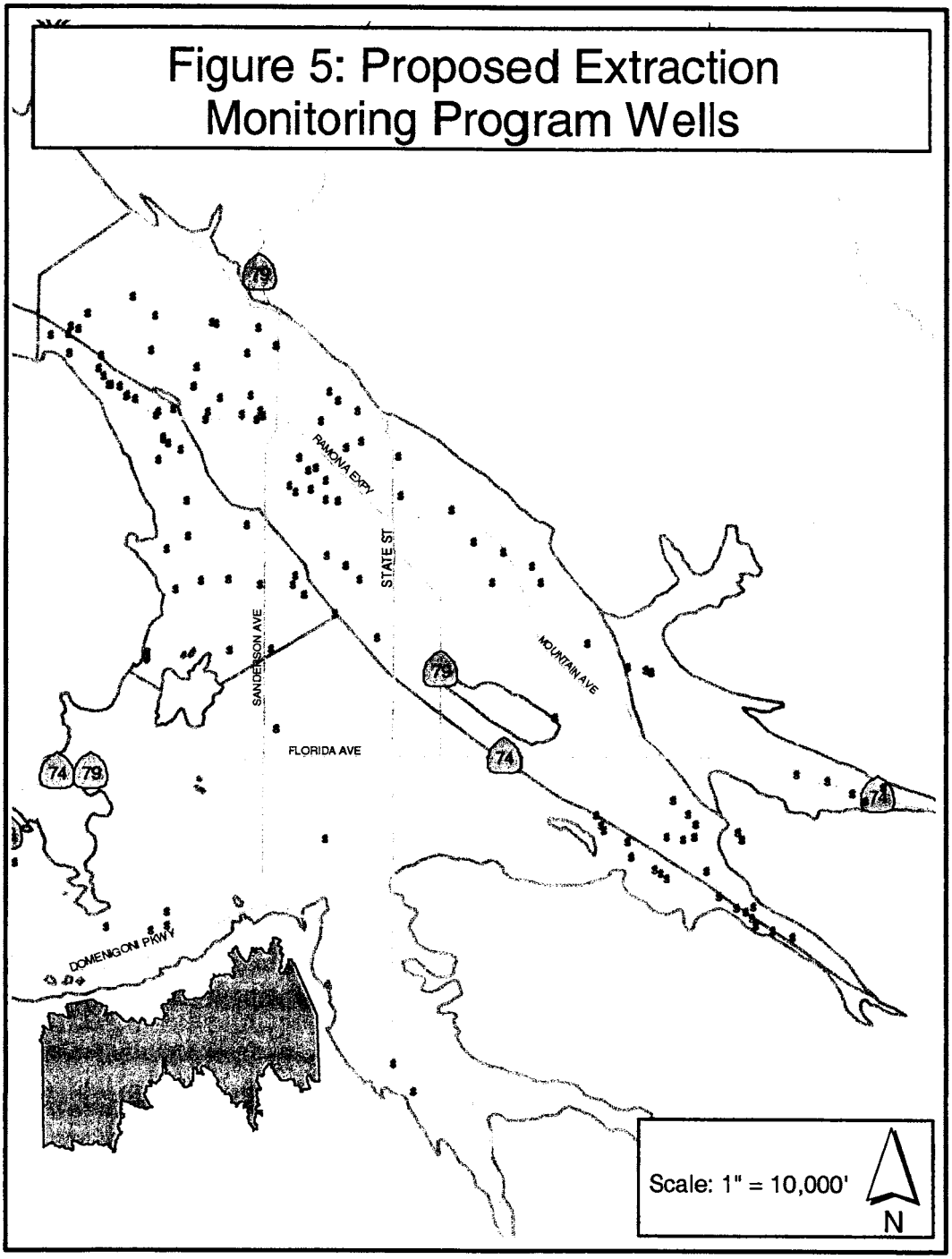


Figure 5: Proposed Extraction Monitoring Program Wells
79
RAMONA EXPY
STATE ST
SANDERSON AVE
MOUNTAIN AVE
79
FLORIDA AVE
74
74
79
74
DOMENIGONI PKWY
Scale: 1" = 10,000'
N

6.3. Other Sources of Extraction Data

In addition to the sources listed above, available data on groundwater extractions can also be obtained from the California Division of Water Rights compiled database on the annual reporting of groundwater extractions. However, total groundwater production in most areas is expected to be higher than the State figures because not all groundwater producers file the annual recordation notices with the State. The State has microfiche records of recordations from 1947 through 1985. From 1985 forward, the records are kept as hard copy. The quality of the State's information in electronic format for 1994 to the present is questionable and EMWD has developed its own database based on the microfiche and hard copy records and this data will be incorporated into the RWRD.

7. DATA MANAGEMENT

Combined with existing available data, the new data generated by the proposed groundwater monitoring program will be used by the Watermaster to analyze how conditions are changing in local groundwater basins. The data may be used in the following ways:

- Trend analyses of the relationship between groundwater pumping, water levels, and water quality
- Analysis of the volume of water contained in local groundwater basins and determination of the rate of natural recharge of these basins
- Preparation of mathematical models of groundwater systems for use in analyzing management alternatives
- Development of accurate water consumption figures for agricultural land use
- Protection of private water rights through the documentation of individual groundwater use
- Quantification of replenishment requirements for the following year

Data reporting by EMWD to the Watermaster includes annual reports documenting level/quality trends and extraction quantities for each groundwater basin. The annual reports will contain the results of regional analyses performed in the preceding year and a summation of any problems noted.

Private well owners will receive annual reports on their wells. These Well Owner Reports will include copies of water quality samples, water level measurements, and extraction amounts for their wells. Recordation of groundwater extraction with the Watermaster is a fundamental means of protecting private groundwater rights and all well owners are encouraged to participate.

8. INACTIVE WELL CAPPING/SEALING PROGRAM

The purpose of this program is to prevent groundwater contamination and eliminate hazards by capping/sealing inactive and/or unused wells. Open casings are especially vulnerable to contamination from surface flows or vandalism - such as the dumping of oil or other waste products. Large open casings, 16 to 18 inches in diameter, also present a

hazard to small children and animals. It is not known how many open casings or unused wells exist in the area.

During field activities EMWD staff has discovered a number of inactive wells; many covered by brush, wood, and dirt - not visible to the casual observer. Frequently, the property owner did not own the property at the time the well was drilled and was unaware of its existence. In all cases, once an old well was discovered, the property owner has been agreeable to having the casing capped.

To protect groundwater supplies, EMWD staff will use the available monitoring program funds to cap and seal an inactive well or open casing at no charge to the well owner. Priority is given to those wells that are potentially dangerous open holes (16-18" casings) or those located in areas where flooding resulting from precipitation might carry manure, fertilizers, or other contaminants into the well. These wells may still be used for water level and, in some cases, water quality monitoring.

It is anticipated that the need exists to initially cap or seal five to ten casings per year, with that number diminishing over time.

9. MONITORING PROGRAM COST ESTIMATES

The costs of the Groundwater Monitoring Program will be borne by the Administrative Assessments of the Hemet/San Jacinto Water Management Plan. However, until the Plan is implemented, it is proposed that the Cities of Hemet and San Jacinto, Lake Hemet Municipal Water District, and Eastern Municipal Water District share these costs based on their base groundwater production percentages.

The current cost for the program set-up, meter installations, and the first year of monitoring is estimated at $180,000. Even though there are some contingencies included in these cost estimates, there is some uncertainty in the total number of wells that will be included in the actual program. Therefore, although the estimated cost is $180,000, due to uncertainty as to the actual costs for this effort, a total of $200,000 is being proposed.

It is anticipated that the Department of Water Resources (DWR) will provide $100,000 for the meter installation and first year implementation of the Monitoring Program, provided the Agencies agree to fund and implement the monitoring program into future years pursuant to this Section.

Implementation of the Extraction Monitoring Program involves an initial expenditure of funds to cover the costs of meters and meter installation. Those costs are itemized in Table 1, below.

Table 1 Meter Installation Cost Estimates	
Activity	**Estimated Cost**
Field Survey and Preparation of Specs.	$ 4,700
Permission & Installation Coordination	$ 4,800
Purchase of Meters & Related Materials	$ 50,000
Meter Installation and Calibration	$ 13,300
Vehicle/Equipment Rentals	$ 1,300
Contingencies	$ 5,900
Total	**$ 80,000**

Following installation of meters, costs will be associated with the monthly reading of meters and meter maintenance.

The annual cost of the Groundwater Monitoring Program is estimated at $100,000 and details of these cost estimates are shown in Table 2.

Table 2 On-going Monitoring Program Cost Estimates	
Activity	**Estimated Cost**
Water Level Monitoring Program	$ 12,500
Water Quality Monitoring Program	$ 38,200
Extraction Monitoring Program	$ 18,800
Inactive Well Capping/Sealing Program	$ 5,000
Documentation and Reporting	$ 14,700
Contingencies	$ 10,800
Total	**$ 100,000**

The DWR funds, as well as those funds provided by the agencies and cities, will be placed in an EMWD restricted account to be used only for the Monitoring Program costs. Any funds not used for the initial installation of meters (Table 1) or for the first year monitoring effort (Table 2) will be carried over and used for the next year's monitoring effort. Table 3 shows each agency's base production, percentage, and pro rata contribution.

Table 3 Cost Sharing Prior to Plan Implementation			
Agency	**Base Production (AF)**	**Percentage**	**Cost Contribution**
City of Hemet	6,320	19.6 %	$ 19,600
City of San Jacinto	4,031	12.5 %	$ 12,500
LHMWD.	11,063	34.2 %	$ 34,200
EMWD	10,869	33.7 %	$ 33,700
Totals	**32,283**	**100.0 %**	**$100,000**

10 ROLES AND RESPONSIBILITIES

Until the implementation of the Water Management Plan and formation of an organization to oversee the Watermaster's needs and requirements, the Cities of Hemet and San Jacinto, Lake Hemet Municipal Water District (LHMWD), and Eastern Municipal Water District (EMWD) have agreed to work as partners toward the implementation of the Groundwater Monitoring Program outlined in pervious sections, above. The roles of each entity, including the private groundwater producers, are summarized below.

10.1 EMWD's Role

EMWD is hereby appointed as the Monitoring Program Administrator for purposes of this Agreement. EMWD shall have the following responsibilities and shall be reimbursed for time expended on behalf of the Monitoring Program at EMWD's rate of salary, plus overhead, burden, and cost of materials:

- Continue efforts to acquire the $100,000 grant from DWR
- Develop financial plan amendments in the event of DWR $100,000 grant funding problems and/or expansion of the program to include surface water monitoring
- Prepare and submit invoices for each participant based on shares identified in Table 3, above, or any other amendments agreed upon by all participants
- Provide its pro rata share of the Monitoring Program costs based on estimates outlined in Table 3, above
- Establish a restricted account for the Monitoring Program
- Manage Monitoring Program funds and provide a quarterly status report on funds and expenditures
- Identify and conduct a survey of private wells within the Hemet/San Jacinto Management Area
- Work with the private well owners' Policy Committee Representatives to secure the private well owners' permissions
- Handle all aspects of meter procurement
- Organize, facilitate, and complete meter installations on private wells participating in the monitoring program
- Continue the well capping/sealing of the private wells as a means of protecting groundwater from contamination
- Provide field, administrative, and laboratory services
- Provide vehicle and equipment rentals for the program
- Hire outside consultants and/or resources if required
- Compile the data resulting from the monitoring program and enter it into the Regional Water Resources Database
- Develop an annual report documenting the field data for the Watermaster's use
- Develop a financing plan for the future program implementing

10.2 Cities of Hemet and San Jacinto and LHMWD's Role

Acting as partners in the Monitoring Program effort, the Cities of Hemet and San Jacinto and LHMWD shall have the following responsibilities:

- Provide water level, quality and extraction data on their respective individual wells to EMWD
- Provide their pro rata share of the Monitoring Program costs based on the estimates outlined in Table 3, above
- Assist EMWD staff in communicating with private well owners in their respective jurisdictions

10.3 Private Groundwater Producers' Policy Committee Representatives' Role

As the liaison between the private producers and the agencies and Cities, the Policy Committee Representatives are the main source of communication with the private producers during the startup stages of program implementation. The groundwater monitoring program described in this document relies on the private groundwater producers' Representatives to secure the well owner's permission (copy is attached) and to provide signed permission forms to EMWD.

10.4 Groundwater Monitoring Program Participants' Role

The Cities of Hemet and San Jacinto, and Lake Hemet Municipal Water District must provide the groundwater monitoring related data to EMWD in a timely manner. The private groundwater producers participating in the program should provide access to their wells in accordance with the agreed upon permission form (see attachment A for a copy of such permission form).

ATTACHMENT A

Hemet/San Jacinto Valley Groundwater Management Plan
Groundwater Monitoring Programs
Participation/Permission Statement

1. Well Owner□s Name_____
Address:

Phone Number: Day_____ Evening _____
Well Location (Description, Street Address, Riverside Co. Assessor Parcel No., etc.):

State Well No. (if known): _____ Well Name_____

2. **Monitoring Program: Water Level and Water Quality Sampling**

_____ I hereby give permission for field personnel from Eastern Municipal Water District (EMWD), on behalf of the Management Plan, to sample my well for **(circle one);**

WATER LEVELS **WATER QUALITY** **BOTH**

I will provide access to the well for the sampling. I wish to receive copies of the water quality testing results and request that they be sent to the address above. In the event that the pump is not turned on for water quality sampling, EMWD will re-imburse the well owner for the energy cost to operate the pump for sampling. The time of sampling will be mutually agreed upon by the Well Owner and the EMWD Field Technician who will contact the Well Owner by telephone to arrange the time of sampling.

3. **Extraction Monitoring Program**

Check one:

_____ I have a meter on my well and hereby give permission for EMWD field personnel, on behalf of the Water Management Plan, to periodically read the meter.

_____ I do not currently have a meter on my well. I hereby give EMWD, on behalf of the Water Management Plan, permission to evaluate my well for suitability for inclusion in the program and, if suitable, to install a meter on the well at their expense and to periodically read the meter. I will receive copies of

the meter read upon request. The meter shall remain the property of EMWD and I will exercise care and caution while it is on my well.

4. **Non-interference**
Sampling, measurements, and readings will be conducted so as to not interfere with the Well Owners use of the well.

5. **Hold Harmless**
EMWD hereby agrees to indemnify and hold Well Owner harmless from any and all claims for damage to property or injuries to persons arising by reason of or in any manner connected with the operations covered by this Participation/ Permission Statement that are to be performed by the District or District's contractor, personnel or equipment. Such indemnification shall include attorneys' fees and court costs.

6. **Acknowledgement**
The Well Owner recognizes that the groundwater extraction data is collected as a result of these programs will be used to establish the basin yield as part of the Water Management Plan.

_____
Signature of Well Owner

_____
Date

_____
EMWD Field Technician

_____
Date

PRINCIPLES FOR WATER MANAGEMENT

1. Water Management Plan. These Principles, approved by the appropriate authority of each party, are intended to form the basis from which the parties will develop a Water Management Plan ("Management Plan") for the area described in Section 2. The Management Plan is being developed to ensure an adequate and reliable source of future water supply. The Management Plan is also intended to facilitate and accommodate a settlement of the claims of the Soboba Band of Luiseno Indians ("Soboba Tribe").

2. Management Area. The area included in the Management Plan consists of the Canyon Sub-basin and the San Jacinto Upper Pressure Sub-basin, downstream to Bridge Street, and the Hemet Basins ("Management Area"). The Management Area is shown upon the attached map.

3. Pumpers within the Management Area. The primary pumpers within the Management Area are: Eastern Municipal Water District ("Eastern"), Lake Hemet Municipal Water District ("Lake Hemet"), City of San Jacinto ("San Jacinto"), and City of Hemet ("Hemet") (individually

"Public Agency," collectively "Public Agencies"); the Soboba Tribe (not a Management Plan participant); and approximately 62 individual agricultural and other private pumpers who pump more than 25 acre-feet per year ("Private Pumpers").

4. Goals. The parties agree that the Management Plan shall incorporate and serve to implement the following goals:

A. Allowing for Future Urban Growth. The parties acknowledge that the Management Area will continue to experience residential, commercial, and industrial growth and development, and that existing water production and service systems will need to be expanded to meet this growth. It is estimated that at least 15,000 afy incremental water supply capacity over the existing base production rights of the Public Agencies must be dedicated to adequately serve this growth. The Management Plan should serve and provide a clear planning process so that each affected Public Agency will be able to meet these projected growth needs.

B. Water Quality Protection. Implementation of the Management Plan should protect and/or enhance Management Area water quality. However, implementation of certain elements of the Management Plan may cause limited localized water quality degradation. If such degradation impedes the then current beneficial use of any Public Agency in the Management Area, the Watermaster described in Section 22 ("Watermaster") shall implement appropriate mitigation measures to ensure water supply to the affected Public Agency and bear the associated costs. The standards for local water quality degradation shall be defined in the Management Plan.

C. Cost-Effective Management. The Management Plan should serve to support the pursuit of cost-effective water supply and water treatment by the Public Agencies, both individually and collectively.

D. Overdraft. The groundwater levels within the Management Area have generally been declining for a number of years, and the Management Area is presently in a condition of overdraft. It is recognized that the Management Plan will, within a reasonable period, eliminate groundwater overdraft and enhance operational yield by

implementing a combination of available water resources management elements. These elements include: reduction in native groundwater production; enhanced recharge with native, imported and/or recycled water; development of supplemental supplies such as imported and recycled water; and water conservation programs.

E. Monitoring. The Watermaster shall implement a monitoring program to ensure the Management Plan activities follow best management and engineering principles to protect Management Area water resources.

5. Public Agencies Base Production Rights.

A. The base production rights of Eastern, Lake Hemet and Hemet in the first year of the Management Plan shall be based upon their average production for calendar years 1995-1999. This period was chosen to reflect these Public Agencies' recent pumping, and shall determine their base production rights.

B. The base production right of San Jacinto in the first year of the Management Plan, shall be based upon its average production for calendar years 1995-1999, plus 500 afy. The 500 afy is added because San Jacinto's recent production does not reflect its historic production because of water purchases and other factors.

C. Pursuant to Section 21 below, for the life of the Management Plan, Hemet and San Jacinto shall each add an additional 900 afy to their base production rights. The additional 900 afy shall not be subject to reduction by the Watermaster as provided in Section 5.D and shall not be subject to any Administrative or Replenishment Assessments as provided in Section 6, or other fee or charge imposed under the Management Plan.

D. It is the goal of the Management Plan to adjust base production rights over time to a level consistent with the Watermaster's calculation of the Public Agencies' share of safe yield for the Management Area. Based on current information, it appears that the total reduction in base production rights will need to be approximately 35%. The ultimate reduction will be based on periodic demand, hydrology, recharge and

availability of imported water. In order to implement this reduction in a phased manner, each Public Agency's base production rights shall be subject to adjustment as follows:

(1) A 10% reduction from the base production rights in the first year of the Management Plan; and

(2) Until base production rights are consistent with the Public Agencies' share of safe yield, Watermaster shall determine the reductions in base production rights in each subsequent year of the Management Plan, to achieve this goal within 6 years of approval of the Management Plan. Each reduction shall not be more than 10% of the base production right of the prior year.

(3) Pursuant to Section 7(A)(2)(b), upon conversion of a Class B Participant's land from agricultural to a use that requires water service from a Public Agency, the Public Agency shall receive an increase in its base production rights equal to the adjusted base production right of the Class B Participant.

6. Public Agency Production Assessments. The Public Agency production will be subject to the following assessments:

A. An Administrative Assessment on each acre-foot pumped by a Public Agency up to its adjusted base production right. The parties contemplate that the Administrative Assessment will be $50.00 per acre-foot of water pumped in the first year of the Management Plan, and that such amount will thereafter be set by the Watermaster.

B. A Replenishment Assessment on each acre-foot pumped by a Public Agency in excess of its adjusted base production right equal to the cost of providing a like quantity of supplemental water to recharge the Management Area, including recharge losses. Pumping by a Public Agency in excess of its adjusted base production right in order to meet increasing demands is expected and permissible, provided that such excess extractions shall be subject to the Replenishment Assessment. The costs of providing a like quantity of supplemental water shall include the costs of water, O&M costs of the replenishment system, capital recovery and other administrative costs. Currently, the total of these cost items is estimated to be in the range

of $300 to $400 per acre-feet; the actual amount will reflect the costs at the time incurred.

7. Private Pumpers Water Rights. The Public Agencies recognize the overlying water rights of the Private Pumpers, and do not intend to take or adversely impact these rights without an agreement with the owner of such rights. The Management Plan will lay out alternatives for the retention, protection, or transfer of such rights, leaving selection of the alternative to the individual overlying water rights owner. A Private Pumper can elect not to participate in the Management Plan and not to formally acknowledge its existence. Such Pumpers shall be referred to herein as "Non-Participants"; such Pumpers shall continue to exercise whatever water rights they may hold under California law unaffected by the Management Plan. There is no intent to affect water use that is consistent with the historical use of the Private Pumpers. However, other pumpers under the Management Plan do not waive their rights to challenge new or expanded water rights. Non-Participants will not have the option of joining the program at a later date. The alternatives available to participants are as follows:

A. (1) Class A Participation. A Private Pumper can elect to sign a written agreement acknowledging the existence of the Management Plan. Such Pumper shall be a Class A Participant and shall be entitled to vote for and/or be elected to serve as the Private Pumper representative on the Management Plan's governing board or body described in Paragraph 22 below, but shall not otherwise be required to participate in the Management Plan implementation. A Class A Participant may, without any financial assessment by the Watermaster, pump from his/her/its property within the Management Area the amount of water that can be put to reasonable and beneficial use on the Pumper's land as may be authorized under California law. Class A Participants shall have the right to convert to Class B Participation during a grace period that shall end three (3) years after the effective date of the Management Plan, as approved by a judgment of the Superior Court for Riverside County, upon payment of the total assessments the Pumper would have paid had the Pumper elected to be a member of Class B from the outset, plus interest.

(2) Class B Participation. A Private Pumper can become a Class B Participant by electing to limit annual pumping to the Pumper's average annual production during the calendar years 1995 through

1999 and to pay replenishment assessments on amounts in excess of that average annual production. A Class B Participant shall enjoy the following benefits of Plan Participation:

a. Vote for and/or be elected to serve as the Private Pumper's representative on the Management Plan's Governing Board;

b. Upon conversion of Pumper's land from agricultural use to a use that requires water service from a participating Public Agency, Public Agency shall credit to the extent legally permissible, Pumper or Pumper's successor-in-interest's adjusted production right, using the formula in Section 5 towards satisfaction of any requirement then in effect for water supply assessment requirements. Furthermore, Pumper or Pumper's successor-in-interest shall be given a credit for Pumper's adjusted production right using the formula in Section 5 towards any fees associated with water supply that the Public Agency may then have in effect. The Public Agency serving the converted land shall receive a credit to its production right as set forth in Section 5.

c. To the extent the Pumper's land is not covered under Section 7(A)(2)(b), Pumper will be eligible to enter into a contract with the Management Plan, or a participating Public Agency, to sell for a defined period of time some portion of Pumper's adjusted production right, under terms and conditions mutually agreed upon by the Pumper and the Management Plan. Criteria used in consideration of such contract shall include:

(i) Management Plan's need to acquire additional water supplies to address Basin overdraft and recovery;

(ii) Submission of a water conservation plan, including use of in lieu water, by Pumper that will reasonably guarantee conservation of water that would otherwise be produced from the Basin;

(iii) Public policy considerations of local government jurisdictions, including economic and land use impacts of proposed water conservation plan.

B. In-Lieu Water Use. In the event a Private Pumper (or successor) receives recycled and/or imported water from a Public Agency to serve an overlying use in place of groundwater, or otherwise engages in an in-lieu program, the overlying water right of the Private Pumper (or successor) shall not be diminished by the receipt and use of such recycled and/or imported water or by engaging in an in-lieu program.

C. Well Monitoring. To become a Class A or B Participant, a Private Pumper shall authorize the metering of the Pumper's well(s) and the collection of groundwater level and quality data, and the reading thereof by Management Plan personnel. The metering and reading shall be at no cost to the Pumper, and the Pumper shall receive copies of the reports and information obtained upon request.

D. Future Production Participation. Any new Pumper after the effective date of the Management Plan, as approved by a judgment of the Superior Court for Riverside County, can only participate as a Class A Participant as described in Section 7A(1).

E. Replacement Wells. The redrilling of existing wells and the drilling of new wells to replace existing wells will not be considered new private production.

8. Capital Facilities. Each Public Agency shall continue to own its existing capital facilities for water management. However, capital facilities may be jointly constructed and owned by the Management Plan. Joint financing of such facilities may be funded by regional capital fees, loans and grants, contributions for storage by The Metropolitan Water District of Southern California ("Metropolitan") or other third-parties, and municipal bonds. Responsibility for the costs of any existing and future capital facility of the Management Plan should be apportioned among the Public Agencies based on relative benefit to be derived by each Public Agency. Any of the participating Public Agencies may propose projects to be included in the Management Plan to increase Management Area water supply. Such proposals, after evaluation by the Watermaster, shall be included or rejected. If the Watermaster chooses to reject the proposal, the proposing Public Agency may implement the rejected project as long as it does not significantly impact the implementation of the Management Plan and/or interfere with the ongoing production by the Public Agencies.

9. Soboba Tribe's Water Rights. The Soboba Tribe's water rights shall be determined as part of a settlement among the Soboba Tribe, the United States, Eastern, Lake Hemet and Metropolitan. Major points of the proposed settlement are:

A. The Soboba Tribe shall have a senior, prior right in the Canyon and San Jacinto Upper Pressure Sub-basins of 9000 afy, but its use shall be limited to a maximum of 4100 afy during the first 50 years after the effective date of the settlement.

B. The Soboba Tribe shall have the right to purchase replenishment water for use pursuant to the Principles of Settlement at the Management Plan replenishment rate.

C. The Soboba settlement provides that, among other things, Metropolitan will use its best efforts to deliver sufficient water to yield a 15-year average of 7,500 afy to the Management Plan until 2035 at its long-term interruptible rate (currently $233/af).

D. Subject to full funding of the settlement by the United States, the Management Plan shall pay the Soboba Tribe $10 million.

E. The Management Plan will also pay the Soboba Tribe $7 million. A Public Agency's payment of its share of this amount is optional, but in order to obtain the benefits of the low-cost Metropolitan water delivered pursuant to the settlement, a Public Agency shall pay its share of this amount.

F. The Management Plan will receive $10 million for capital improvements from the United States, and all unused Soboba Tribe water based on the Public Agency's participation in the payment in Section 9(E) above.

10. Implementation of These Principles. These Interim Principles for Water Management shall be used by the parties as a basis for the preparation of the Management Plan, and a stipulated judgment in a water rights adjudication. As explained below, the Management Plan shall be administered by the Watermaster. The Watermaster will be under the continuing jurisdiction of the Court.

11. Assessment Program. The assessment program contemplated by the Management Plan shall be administered by the Watermaster subject to the governance provisions herein. All payments shall be made to the Watermaster and shall be maintained in a separate restricted fund. All assessments shall be used exclusively to acquire imported, recycled or Metropolitan water for the recharge of the Management Area, and for the facilities and operational and administrative expenses associated with the assessment and recharge programs. Subject to Management Plan approval, assessments may also be used by affected parties to acquire and deliver water for direct use by the parties, in lieu of pumping.

12. Replenishment Program. The replenishment program contemplated by the Management Plan shall also be administered by the Watermaster. The program shall include: the acquisition of supplemental water supplies (including imported, recycled and Soboba Tribe water); the expenditure of assessments; the recharge of the Management Area; and the construction and operation of all necessary facilities, including but not limited to, development of surface and sub-surface percolation and injection facilities. Priority for replenishment will be based on an equitable

apportionment of available replenishment water among the sub-basins after full consideration of: the Public Agency's participation in the payment in Section 9(E) above; the Management Area conditions; water demands; the availability of storage capacity to accommodate the recharge of natural flows; the availability of appropriate conveyance facilities; and the availability of replenishment or imported water. The Watermaster is encouraged to take advantage of surplus imported water that occasionally may be available at low cost, and to use available assessment funds to bank such recharge against future pumping in excess of adjusted production rights.

13. Rights to Groundwater. Groundwater in the Management Area may occur from: natural recharge; spreading operations of natural flows; replenishment with imported, recycled or Metropolitan water acquired with assessment funds; or in-lieu recharge programs financed with assessment funds. All such groundwater shall be available to support the pumping of the parties as allowed herein, and shall not be the property of any individual party, subject to the provisions of Section 14.

14. Storage Rights. The parties recognize that unused storage capacity exists in the Management Area, and the Management Plan contemplates that this capacity will be managed conjunctively with available imported and recycled water supplies. Subject to availability of the Management Plan fund for assessments and unused storage capacity as determined by Watermaster, the Management Area will be recharged and water stored therein when such supplies are available, and drawn upon by the Public Agencies in dry years when such supplemental water supplies may not be available. In addition, unused storage capacity as determined by Watermaster may be used for "put and take" operations of recycled or imported water that is paid for by any party to the Management Plan provided that:

A. Such operations do not interfere with the rights of any other pumper, or with the use of the storage capacity for recharge and storage under the Management Plan;

B. Water available for recharge is purchased first, as needed, for the Management Plan;

C. Later recovery of stored water shall exclude losses; and

D. Such recovered water may be used anywhere within the service area of the party.

Any conjunctive use programs for the benefit of territory outside of the Management Area shall be subject to the governance provisions herein. Any storage, conjunctive use programs by third parties or in-lieu recharge programs financed with assessment funds shall be subject to the governance provisions herein.

15. Spreading Operations. The Public Agencies shall independently or jointly operate their respective facilities to maximize the existing spreading and recharge operations of natural flow in the Management Area.

16. Recharge Water Quality. Consistent with Section 4(E) above all water used to replenish any sub-basin in the Management Area shall meet the Regional Water Quality Control Board requirements, and may be used in any sub-basin where such requirements are met.

17. Recharge Losses. The accounting for storage recharge of the Management Area shall not include any water that escapes therefrom and migrates downstream beyond the Management Area. Losses will be calculated based upon best engineering principles.

18. Recycled Water. The use of recycled water can be of substantial benefit in providing additional water in the Management Area. Each Public Agency may implement a recycled water program, including the ownership, operation and construction of all necessary facilities, and the application for and administration of any loan or grant applications. The Management Plan will support loan or grant applications, and the Public Agencies will work to integrate recycled water into the Management Plan to the extent economically feasible while meeting regulatory standards. Subject to existing recycled water contracts, the Management Plan will have a first right of refusal to purchase excess recycled water for recharge. Priority shall be given to Management Area recharge for the use of recycled water which originates therefrom.

19. Export. The Public Agencies may export water outside the Management Area, on a temporary basis, upon approval by the Watermaster.

However, any water exported shall be replenished with an appropriate amount of similar or better quality water as determined by Watermaster. Also, water exports by the Public Agencies shall not interfere with the Management Plan or any other Public Agency's operations. The Management Plan will set forth the specific criteria for the export of water, including, but not limited to, conjunctive use programs.

20. Credits. Recharge credits documented before the Management Plan shall be calculated pursuant to the Management Plan. Future recharge credits shall be established by replenishment of water or by not exercising the full, adjusted base production right, and shall be calculated pursuant to the Management Plan.

21. Tunnel Seepage, Stream Diversions, Fruitvale To resolve Eastern's use of Tunnel seepage, Lake Hemet's stream diversions and Eastern's use of Fruitvale water, 900 afy shall be added to Hemet's adjusted base production and 900 afy shall be added to San Jacinto's adjusted base production right as discussed in Section 5 above. This is intended to provide Hemet and San Jacinto a fair share of water from these disputed issues.

22. Governance. The Management Plan will be administered by a Watermaster as follows:

A. The governing board of the Watermaster shall consist of one elected official from each of the Public Agencies and one Private Pumper representative selected by the Private Pumpers who participate in the Management Plan. Each member shall have one vote.

B. The Watermaster's duties shall include: determining safe yield; determining replenishment needs; determining annual adjusted base production rights; purchasing and selling imported and recycled water; constructing future capital facilities; establishing assessment rates; initiating necessary conservation and drought management measures; and implementing other responsibilities identified in the Management Plan documents.

Dated: 1/28, 2004.

EASTERN MUNICIPAL WATER DISTRICT

By: _____

Dated: FEB. 23, 2004.

LAKE HEMET MUNICIPAL WATER DISTRICT

By: _____

Dated: _____, 2004.

CITY OF HEMET

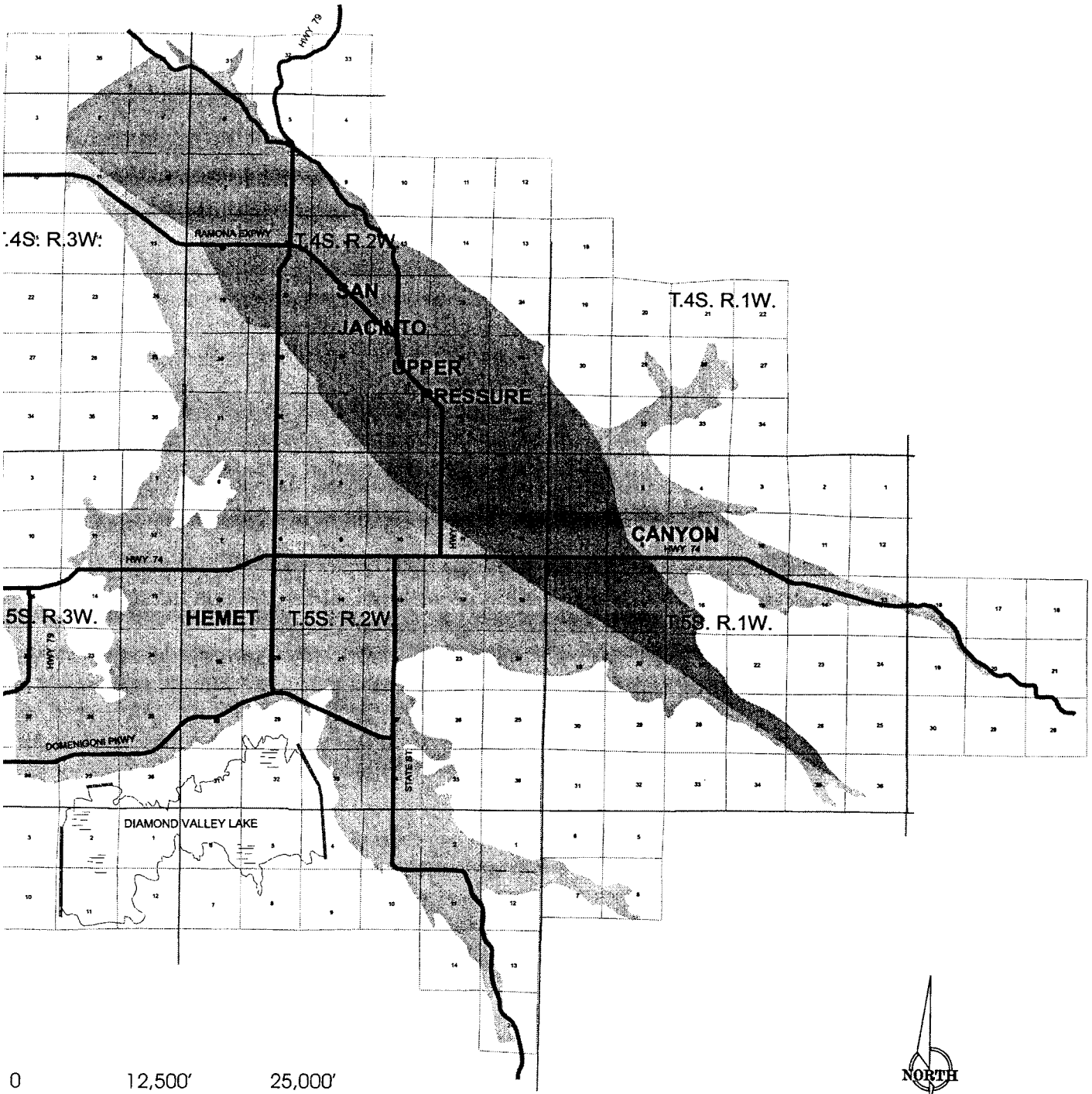
By: _____

Dated: 2-23, 2004.

CITY OF SAN JACINTO

By: _____

MANAGEMENT AREA



MEMORANDUM OF UNDERSTANDING

INTERIM WATER SUPPLY PLAN

UPPER SAN JACINTO SUB-BASINS

This Memorandum Of Understanding; Interim Water Supply Plan, Upper San Jacinto Sub-Basins ("MOU"), is hereby entered into this 1st day of April, 2004 by and between the EASTERN MUNICIPAL WATER DISTRICT, a California municipal water district ("EMWD"), LAKE HEMET MUNICIPAL WATER DISTRICT, a California municipal water district ("LHMWD"), CITY OF HEMET, a California general law city ("Hemet"), and CITY OF SAN JACINTO, a California general law city ("San Jacinto"), (collectively referred to hereinafter as the "Parties"), based on the following facts:

RECITALS

A. The Parties have entered into that "Memorandum of Understanding to Work Cooperatively to Promote Conjunctive Use Projects and Programs in Upper San Jacinto River Basins" dated June 19, 2001 (the "Conjunctive Use MOU"). The purpose of the Conjunctive Use MOU is to encourage cooperation among the Parties to facilitate and support local groundwater management efforts and conjunctive use programs particularly those that could increase dry-year water supplies, within the safe-yield and without the overdraft of San Jacinto groundwater basins.

B. The Parties have also entered into that "Agreement to Develop a Groundwater Monitoring Program in the Hemet/San Jacinto Management Area" dated _____ 2003 ("GWM Program"). The purpose of the GWM Program is to measure and monitor groundwater levels to assist in the accurate evaluation of conditions of overdraft and the evaluation of operational safe yield in the Hemet/San Jacinto Management Area.

C. Furthermore, in February of 2004, the Parties each approved a statement of principles entitled "Principles for Water Management" (the "PWM") with regard to the Hemet and San Jacinto Basins. The PWM establishes the framework from which the Parties will develop a Water Management Plan for the Hemet and San Jacinto Basins.

D. The Conjunctive Use MOU and the PWM recognize that the Parties, individually and collectively, have an interest in managing and preserving the ground and surface water resources within the Hemet and San Jacinto Basins in order to alleviate an escalating condition of overdraft within those Basins.

E. Through the ongoing GWM Program conducted by the Parties, it has been discovered that well levels within certain portions of the Canyon and Intake sub-areas of the San Jacinto Basin ("Upper San Jacinto Sub-Basins") have declined more than the Parties had originally projected. This fact suggests that the condition of overdraft in the Upper San Jacinto Sub-Basins may be deteriorating more rapidly than anticipated,

making a collective effort to address the situation prudent prior to establishment of the Water Management Plan.

F. Therefore, in furtherance of the goals stated in the Conjunctive Use MOU and the PWM, it is the purpose and intent of the Parties in entering into this MOU to provisionally address the deteriorating situation by providing interim stabilization of the Upper San Jacinto Sub-Basins through the application of approximately 6,000 acre feet of direct and indirect groundwater recharge during calendar year 2004. To implement this goal, the Parties pledge to undertake the following actions during the calendar year 2004.

OPERATIVE PROVISIONS

NOW, THEREFORE, in consideration of the promises made and recited herein, the Parties do hereby enter into this Memorandum of Understanding setting forth their pledges, commitments, understandings and appropriate limiting conditions, as follows:

ARTICLE 1.0 - EMWD's PLEDGES AND CONDITIONS

1.1 **Pledges by EMWD**. Subject to the conditions set forth in Section 1.2, EMWD pledges the following:

1.1.1 Purchase and Recharge of Water. EMWD will contribute up to Eight Hundred Eighty Three Thousand Dollars and No Cents ($883,000.00) for the acquisition, transportation, operations, and recharge of imported water into the Upper San Jacinto Sub-Basins. EMWD will coordinate and cooperate with LHMWD and MWD regarding the acquisition of imported water. EMWD understands and agrees that it will implement the transportation and recharge of the purchased imported water into the Upper San Jacinto Sub-Basins using its existing conveyance and spreading facilities within the Management Area.

1.1.2 Restriction on Conveyances and Exports. EMWD will use its best efforts to eliminate flows from San Jacinto Basin to the Homeland and Juniper flats area during July, August, and September 2004, and will eliminate the use of any conveyance water during the 2004 calendar year in the Menifee Area. EMWD will not otherwise export any water intended for groundwater recharge, or made available due to groundwater recharge, in the Upper San Jacinto Sub-Basins during the 2004 calendar year. In addition, EMWD will pursue construction of Reach 16 to deliver recycled water to the Heartland Area and will investigate water supply contingency plans.

1.2 **EMWD's Conditions**. The pledges of EMWD stated in Section 1.1 are subject to the following conditions:

1.2.1 Optimizing Capacity. That the Parties cooperate with EMWD's efforts to optimize its delivery capacity during the months of July, August, and September 2004, by refraining, to the extent feasible, from exercising their rights to

delivery of Entitlement Water and/or Excess Water ("Fruitvale Water") under EMWD's Improvement District No. 24 program as provided in those agreements between the Parties individually and EMWD ("Fruitvale Agreements"). It is understood and agreed that any Party's cooperation with such effort by EMWD will not result in a loss, waiver, abrogation or diminishment of their contract rights under the Fruitvale Agreements or such other rights as the Party may have to purchase and receive Fruitvale Water.

1.2.2 Compliance by Other Parties. That each other party use its best efforts in good faith to perform and fulfill their respective pledges as expressed in Sections 2.1, 3.2, and 4.2.

1.3 **Acceptance of Other Parties' Conditions**. EMWD hereby accepts each other Party's conditions on their respective pledges.

1.4 **Cooperation with Other Parties**. EMWD agrees to cooperate with the other Parties to reasonably facilitate each Party's performance of their pledge, to share information and to regularly meet and confer concerning implementation of this MOU as part of the regularly scheduled meetings of the Groundwater Policy Committee or such sub-committee as the Policy Committee shall designate from time to time.

ARTICLE 2.0 - LHMWD'S PLEDGES AND CONDITIONS

2.1 **Pledges by LHMWD**. Subject to the conditions set forth in Section 2.2, LHMWD pledges the following:

2.1.1 Purchase and Recharge of Water. LHMWD will contribute up to Eight Hundred Twenty-eight Thousand Dollars and No Cents ($828,000.00) for the acquisition, transportation, operations, and recharge of imported water into the Upper San Jacinto Sub-Basins. LHMWD will coordinate and cooperate with EMWD and MWD regarding the acquisition of imported water. LHMWD understands and agrees that EMWD will implement the transportation and recharge of the purchased imported water into the Upper San Jacinto Sub-Basins using its existing conveyance and spreading facilities within the Management Area.

2.1.2 Optimizing Capacity. LHMWD will cooperate with EMWD's efforts to optimize EMWD's delivery capacity during the months of July, August, and September 2004, by refraining during such months, to the extent feasible, from exercising their rights to delivery of Entitlement Water and/or Excess Water ("Fruitvale Water") under EMWD's Improvement District No. 24 program as provided in those agreements between the Parties individually and EMWD. It is understood and agreed that LHMWD's cooperation with such effort by EMWD will not result in a loss, waiver, abrogation or diminishment of LHMWD's contract rights under the Fruitvale Agreements or such other rights as LHMWD may have to purchase and receive Fruitvale Water.

2.2 **LHMWD's Conditions**. The pledges of LHMWD stated in Section 2.1 are subject to the following conditions:

2.2.1 Emergency Production of Water. In the event LHMWD experiences an emergency loss of water production capacity or is otherwise unable to satisfy its municipal demand through the use of its own facilities, as determined by the LHMWD, LHMWD reserves the right to exercise its rights to delivery of Fruitvale Water during the months of July, August and September 2004 and shall pay EMWD the standard rate for Fruitvale Water, for amounts delivered within LHMWD's entitlement. For amounts required by LHMWD and delivered by EMWD over the entitlement amount, LHMWD shall pay EMWD's then current wholesale water rates.

2.2.2 Restriction on Conveyance Water and Exports. That EMWD use its best efforts to eliminate flows from San Jacinto Basin to the Homeland and Juniper flats area during July, August, and September 2004, and to eliminate the use of any conveyance water during the 2004 calendar year in the Menifee Area. EMWD will not otherwise export any water intended for groundwater recharge, or made available due to groundwater recharge, in the Upper San Jacinto Sub-Basins during the 2004 calendar year.

2.2.3 Preservation of Fruitvale Water Rights. Notwithstanding LHMWD's pledge to not exercise its entitlements to purchase and receive Fruitvale Water during July, August and September 2004, such pledge and non-exercise shall not be construed by the Parties or any of them as a waiver, failure to exercise, or other abrogation of LHMWD's rights under the Fruitvale Agreements or Fruitvale Adjudication and such rights shall be preserved, survive without diminishment, and remain valid and in full force and effect.

2.2.4 Compliance by Other Parties. That each other party use its best efforts in good faith to perform and fulfill their respective pledges as expressed in Sections 1.1, 3.2, and 4.2.

2.3 **Acceptance of Other Parties' Conditions**. LHMWD hereby accepts each other Party's conditions on their respective pledges.

2.4 **Cooperation with Other Parties**. LHMWD agrees to cooperate with the other Parties to reasonably facilitate each Party's performance of their pledge, to share information and to regularly meet and confer concerning implementation of this MOU as part of the regularly scheduled meetings of the Groundwater Policy Committee or such sub-committee as the Policy Committee shall designate from time to time.

ARTICLE 3.0 - HEMET'S PLEDGES AND CONDITIONS

3.1 **Acknowledgement of Conditions**. Hemet acknowledges the need of the Parties to cooperatively minimize the impacts on water resources in the Upper San Jacinto Sub-Basins. The Parties acknowledge that groundwater resources and well levels surrounding Hemet's water production facilities in the Hemet Basin have not experienced the same rate of decline, as have facilities of the Parties in the San Jacinto Basin. The Parties further acknowledge that Hemet's temporary reallocation of production from the Upper San Jacinto Sub-Basins to the Hemet Basin, as stated in

Section 3.2.1 [Reallocation of Water Production], is provided by Hemet as a means of cooperating with, and providing benefit to, the other Parties to address the conditions in the Upper San Jacinto Sub-Basins. The Parties also acknowledge that Hemet's temporary reallocation of production will not adversely impact the rights, interests, or facilities of the other Parties, and will not unreasonable contribute to the overdraft of the Hemet Basin.

3.2 **Pledges by Hemet**. Subject to the conditions set forth in Section 3.3, Hemet pledges the following:

3.2.1 Reallocation of Water Production. Hemet will reduce its water production and/or receipt from the Upper San Jacinto Sub-Basins during calendar year 2004 by a total of 1072 acre feet. The reduction will be accomplished by: (i) reducing groundwater production from Hemet wells No. 6 and No. 9, by approximately 300 acre feet over the 2004 calendar year; and (ii) by foregoing the exercise of its right to receive deliveries of Entitlement Water or Excess Water ("Fruitvale Water") – currently 772 acre feet -- under EMWD's Improvement District No. 24 program as provided in that Agreement between Hemet and EMWD dated June 13, 1972 ("Fruitvale Agreement") during calendar year 2004. Hemet will off-set this decrease in water production and/or receipt with an increase in groundwater production from Hemet's new or existing facilities in the Hemet Basin.

3.2.2 Optimizing Capacity. Hemet will cooperate with EMWD's efforts to optimize EMWD's delivery capacity during the months of July, August, and September 2004, by refraining during such months, to the extent feasible, from exercising its rights to delivery of Entitlement Water and/or Excess Water ("Fruitvale Water") under EMWD's Improvement District No. 24 program as provided in those agreements between the Parties individually and EMWD ("Fruitvale Agreements"). It is understood and agreed that Hemet's cooperation with such effort by EMWD will not result in a loss, waiver, abrogation or diminishment of Hemet's contract rights under the Fruitvale Agreements or such other rights as Hemet may have to purchase and receive Fruitvale Water.

3.3 **Hemet's Conditions**. The pledge's of Hemet stated in Section 3.2 are subject to the following conditions:

3.3.1 Emergency Production of Water. In the event Hemet experiences an emergency loss of water production capacity, or is otherwise unable to satisfy its municipal demand from its own facilities, as determined by the Hemet Water District, Hemet shall be entitled to increase water production from Hemet Well No. 6 and No. 9, or receive Fruitvale Water during the duration of the emergency. Hemet's pledge to reallocate water production as provided in Section 3.2 shall be reduced by the same amount. However, Hemet shall contribute an amount of funds equal to the acre feet of water produced multiplied by EMWD's then current wholesale water rate for the acquisition of replacement water.

3.3.2 Preservation of Water Lease Obligations. Hemet has an obligation to produce one hundred (100) acre feet of water per year each from Well No. 6 and Well No. 9. Notwithstanding anything to the contrary in Section 3.2, Hemet shall be entitled to produce such amounts from these wells. Hemet anticipates that it will be able to meet both its pledged reduction and its lease obligations.

3.3.3 Preservation of Fruitvale Water Rights. Notwithstanding Hemet's pledge to not exercise its entitlements to purchase and receive Fruitvale Water during calendar year 2004, such pledge and non-exercise shall not be construed by the Parties or any of them as a waiver, failure to exercise, or other abrogation of Hemet's rights under the Fruitvale Agreements or Fruitvale Adjudication and such rights shall be preserved, survive without diminishment, and remain valid and in full force and effect.

3.3.4 Restriction on Conveyance Water and Exports. That EMWD use its best efforts to eliminate flows from San Jacinto Basin to the Homeland and Juniper flats area and to eliminate the use of any conveyance water during the 2004 calendar year in the Menifee Area. EMWD will not otherwise export any water intended for groundwater recharge in the Upper San Jacinto Sub-Basins during the 2004 calendar year.

3.3.5 Compliance by Other Parties. That each other party use its best efforts in good faith to perform and fulfill their respective pledges as expressed in Sections 1.1, 2.1, and 4.2.

3.4 **Acceptance of Other Parties' Conditions**. Hemet hereby accepts each other Party's conditions on their respective pledges.

3.5 **Cooperation with Other Parties**. Hemet agrees to cooperate with the other Parties to reasonably facilitate each Party's performance of their pledge, to share information and to regularly meet and confer concerning implementation of this MOU as part of the regularly scheduled meetings of the Groundwater Policy Committee or such sub-committee as the Policy Committee shall designate from time to time.

ARTICLE 4.0 - SAN JACINTO'S PLEDGES AND CONDITIONS

4.1 **Acknowledgement of Conditions**. San Jacinto acknowledges the need of the Parties to cooperatively minimize the impacts on water resources in the Upper San Jacinto Sub-Basins.

4.2 **Pledges by San Jacinto**. Subject to the conditions set forth in Section 4.3, San Jacinto pledges the following:

4.2.1 Pledge of Future Credits. San Jacinto pledges 243 acre feet (the current equivalent of $78,260 at the import water rate of $322) of future recharge credits that are anticipated to accrue to San Jacinto pursuant to Section 20 of the Principles For Water Management. San Jacinto's recharge credits will be reduced by 243 acre feet once accrued. Another Party may purchase these credits from the

Watermaster for $78,260, which amount will then be applied to the 2004 interim recharge program.

4.2.2 Optimizing Capacity. San Jacinto will make a good faith effort to cooperate with EMWD's efforts to optimize EMWD's delivery capacity during the months of July, August, and September 2004, by refraining, to the extent feasible in its sole discretion, from exercising its rights to delivery of Entitlement Water and/or Excess Water ("Fruitvale Water") under EMWD's Improvement District No. 24 program as provided in those agreements between the Parties individually and EMWD ("Fruitvale Agreements"). It is understood and agreed that San Jacinto's cooperation with such effort by EMWD will not result in a loss, waiver, abrogation or diminishment of San Jacinto's contract rights under the Fruitvale Agreements or such other rights as San Jacinto may have to purchase and receive Fruitvale Water.

4.3 **San Jacinto's Conditions**. San Jacinto's pledges as stated in Section 4.2 are subject to the following conditions:

4.3.1 Emergency Production of Water. In the event San Jacinto experiences an emergency loss of water production capacity or is otherwise unable to satisfy its municipal demand through the use of its own facilities, as determined by the San Jacinto, San Jacinto reserves the right to exercise its rights to delivery of Fruitvale Water during the months of July, August and September 2004 and shall pay EMWD the standard rate for Fruitvale Water, for amounts delivered within San Jacinto's entitlement. For amounts required by San Jacinto and delivered by EMWD over the entitlement amount, San Jacinto shall pay EMWD's then current wholesale water rates.

4.3.2 Preservation of Fruitvale Rights. Notwithstanding San Jacinto's pledge to not otherwise exercise its entitlements to purchase and receive Fruitvale Water during July, August and September 2004, such pledge and non-exercise shall not be construed by the Parties or any of them as a waiver, failure to exercise, or other abrogation of San Jacinto's rights under the Fruitvale Agreement or Fruitvale Adjudication and such rights shall be preserved, survive without diminishment, and remain valid and in full force and effect.

4.3.3 Restriction on Conveyances and Exports. That EMWD use its best efforts to eliminate flows from San Jacinto Basin to the Homeland and Juniper flats area and will eliminate the use of any conveyance water during the 2004 calendar year in the Menifee Area. EMWD will not otherwise export any water intended for groundwater recharge in the Upper San Jacinto Sub-Basins during the 2004 calendar year.

4.3.4 Compliance by Other Parties. That each other party use its best efforts in good faith to perform and fulfill their respective pledges as expressed in Sections 1.1, 2.1, and 3.2.

4.4 **Acceptance of Other Parties' Conditions**. San Jacinto hereby accepts each other Party's conditions on their respective pledges.

4.5 **Cooperation with Other Parties**. San Jacinto agrees to cooperate with the other Parties to reasonably facilitate each Party's performance of their pledge, to share information and to regularly meet and confer concerning implementation of this MOU as part of the regularly scheduled meetings of the Groundwater Policy Committee or such sub-committee as the Policy Committee shall designate from time to time.

ARTICLE 5.0 - MISCELLANEOUS PROVISIONS

5.1 **Term**. This MOU shall terminate, unless extended by the mutual agreement of the Parties memorialized in writing, on December 31, 2004.

5.2 **Costs & Expenses**. The Parties shall bear the costs of implementing their own pledges, and shall bear their own costs and expenses otherwise participating in this MOU.

5.3 **Authority**. The individuals executing this Agreement on behalf of the Parties and the instruments referenced on behalf of the Parties represent and warrant that they have the legal power, right and actual authority to bind the Parties to the terms and conditions hereof and thereof.

5.4 **Counterpart Originals**. This Agreement may be executed in duplicate originals, each of which is deemed to be an original.

5.5 **Effective Date**. This MOU has become effective among and between the Parties on the date by which each Party's governing board or council has approved the MOU and the authorized representative of each Party has executed the MOU.

IN WITNESS WHEREOF, the Parties hereto have executed this Memorandum of Understanding on the date and year first above written.

EASTERN MUNICIPAL WATER DISTRICT

By: _____

Its: GENERAL MANAGER

LAKE HEMET MUNICIPAL WATER DISTRICT

By: _____

Its: GENERAL MANAGER

CITY OF HEMET

By: _____

Steve Temple, City Manager

ATTEST:

By: _____

Stephen Clayton
City Clerk

Approved as to Form:

By: _____

Eric S. Vail
Assistant City Attorney for the City of Hemet

CITY OF SAN JACINTO

By: _____

Peter A. Cosentini, City Manager

ATTEST:

_____

Dorothy L. Chouinard, City Clerk

Approved as to Form:

By: _____

City Attorney for the City of San Jacinto
Best Best & Krieger LLP

MEMORANDUM OF UNDERSTANDING

PREPARATION OF WATER MANAGEMENT PLAN FOR THE HEMET/SAN JACINTO MANAGEMENT AREA

This Memorandum Of Understanding: Preparation of Water Management Plan for the Hemet/San Jacinto Management Area ("MOU"), is hereby entered into this 17th day of June, 2004 by and between the EASTERN MUNICIPAL WATER DISTRICT, a California municipal water district ("EMWD"), LAKE HEMET MUNICIPAL WATER DISTRICT, a California municipal water district ("LHMWD"), CITY OF HEMET, a California general law city ("Hemet"), and CITY OF SAN JACINTO, a California general law city ("San Jacinto"), (collectively referred to hereinafter as the "Parties"), based on the following facts:

RECITALS

A. Groundwater in the Hemet/San Jacinto Management area has been, and will remain, a significant source of water for the people and agribusiness of Riverside County providing an invaluable contribution to the local economy and public good. As a result, the Parties have acknowledged their collective interest in the management of local water resources within the Hemet/San Jacinto Management area.

B. In furtherance of this collective interest, the Parties entered into that "Memorandum of Understanding to Work Cooperatively to Promote Conjunctive Use Projects and Programs in Upper San Jacinto River Basins" dated June 19, 2001 (the "Conjunctive Use MOU"). The purpose of the Conjunctive Use MOU is to encourage cooperation among the Parties to facilitate and support local groundwater management efforts and conjunctive use programs particularly those that could increase dry-year water supplies, within the safe-yield and without the overdraft of San Jacinto groundwater basins.

C. In the cooperative spirit of the Conjunctive MOU and with assistance from the State Department of Water Resources, the parties engaged in several rounds of policy discussions and technical investigations into suitable methods to alleviate the overdraft, manage long term water supplies, and provide for demands of growth. As the result of these efforts, the Parties each approved a statement of principles entitled "Principles for Water Management" (the "Principles") in February 2004 with regard to the Hemet and San Jacinto Basins. The Principles established the framework from which the Parties agreed to develop a Water Management Plan for the Hemet and San Jacinto Basins.

D. The intent of this MOU is to provide for the creation of the Water Management Plan ("WMP") called for in the Principles, to appoint Eastern Municipal Water District as the Contract Administrator for preparation of the WMP, and to establish an equitable mechanism for funding the WMP by the Parties.

OPERATIVE PROVISIONS

NOW, THEREFORE, in consideration of the promises made and recited herein, the Parties do hereby enter into this Memorandum of Understanding setting forth their pledges, commitments, understandings and appropriate limiting conditions, as follows:

ARTICLE 1.0 AGREEMENT TO UNDERTAKE WMP

1.1 **Cooperation**. The Parties agree that the WMP shall be timely undertaken and completed in accordance with this MOU. In order to ensure the timely and efficient completion of the WMP within the budget described in this MOU, the Parties agree to cooperate with and amongst each other, to share information necessary for the preparation of the WMP, and to take such other reasonable actions as may be necessary for the timely completion of the WMP, provided such actions do not result in additional costs to the Parties.

1.2. **Scope of Work**. The WMP shall be prepared in accordance with the Scope of Work attached hereto and incorporated herein by reference as Attachment 1 (hereinafter referred to as the "Scope of Work"). The Scope of Work defines the extent of the WMP, the tasks necessary for its completion, assigns responsibility for those tasks, and outlines the basic content of each constituent section.

1.3. **Consultant**. The Parties agree that the WMP shall be prepared by an independent contractor, except for those sections which the Scope of Work designates will be prepared by EMWD or the Parties collectively. The Parties agree that Water Resources & Information Management Engineering, Inc, (hereinafter "WRIME") is hereby selected to be the independent contractor principally responsible for undertaking and completing the Scope of Work. However, it is contemplated that WRIME will subcontract with, or EMWD will enter into separate contracts with, GEOSCIENCE, Support Services, Inc., and Stetson Engineering (hereinafter collectively referred to as "Subconsultants") for certain work identified in the Scope of Work. Subconsultants shall serve as consultants for WRIME with regard to performance of the Scope of Work and shall not serve as consultants for Hemet or San Jacinto or their attorneys for performance of the Scope of Work.

1.4. **Project Cost**. The Parties agree that the amount to be paid to WRIME and Subconsultants for undertaking and completing the Scope of Work shall not exceed that amounts reflected on the WMP Budget attached hereto and incorporated herein by reference as Attachment 2. The WMP Budget reflects a total, not to exceed, project cost of $180,894 ("Total Project Cost"). The Parties agree that the approximately $16,869 remaining in the budget for the Hemet/San Jacinto Groundwater Association ("GWA") and the approximately $20,000 remaining in the budget for the Integrated Water Management Plan ("IWMP") shall be reprogrammed and allocated toward payment of the Total Project Cost. After application of these funds, a cost of $144,025 remains to be funded by and apportioned among the Parties ("Adjusted Project Cost"). The Adjusted

Project Cost excludes individual expenses of the Parties regarding for their own review, comment, and approval of the WMP as well as expenses of EMWD in preparing sections of the WMP for which the Scope of Work indicates it is principally responsible.

ARTICLE 2.0 OBLIGATIONS OF THE PARTIES

2.1 **Funding of WMP**. Each of the Parties individually agrees to fund up to their apportioned share of the Adjusted Project Cost as determined in Article 3.0 "Apportionment of Cost" and to pay such share in a lump sum payment within thirty (30) calendar days of receipt of an invoice from EMWD, provided that EMWD invoices the parties in July of 2004 or thereafter in accordance with Attachment 3.

2.2 **Administration of Contract**. EMWD hereby agrees to act as the contracting agency for the preparation of the WMP. In this regard, EMWD shall enter into and execute the appropriate contract(s) with WRIME and the Subconsultants to perform the Scope of Work for an amount not to exceed the Project Cost. EMWD shall also perform the duties set forth in Attachment 3.

ARTICLE 3.0 APPORTIONMENT OF COST

3.1. **Method of Apportionment**. The Parties agree to apportion the Adjusted Project Cost among themselves based on each Party's pro rata share of the total base production of all the Parties as determined by the Hemet/San Jacinto Policy Committee and shown below:

Apportionment of Adjusted Project Cost (*900 af credit taken out)			
Agency	**Base Production (AF)**	**Percentage**	**Cost Contribution**
City of Hemet*	5,420	17.7 %	$ 25,492
City of San Jacinto*	3,131	10.3 %	$ 14,835
LHMWD.	11,063	36.3 %	$ 52,281
EMWD	10,869	35.7 %	$ 51,417
Totals	**30,483**	**100.0 %**	**$144,025**

ARTICLE 4.0 MISCELLANEOUS PROVISIONS

4.1 **Term**. This MOU shall terminate, unless extended by the mutual agreement of the Parties memorialized in writing, upon acceptance of the completed WMP by the governing boards of each of the Parties, provided the Consultant has been fully paid for the Scope of Work and has released the Parties, and each of them, from any claims for further or additional compensation for the Scope of Work.

4.2 **Ownership of Documents**. The WMP together with all data, information, materials and reports (including electronically or digitally stored materials) produced in the preparation of the WMP shall become the joint property of the Parties upon acceptance of the WMP.

4.3 **Individual Costs & Expenses**. Except for the costs and expenses which the Parties have collectively agreed to fund as provided in Article 3.0 "Apportionment of Funding" of this MOU, any cost or expense incurred any one of the Parties with regard to the WMP or its review or approval, shall remain the sole cost and expense of the incurring Party.

4.4 **Authority**. The individuals executing this Agreement on behalf of the Parties and the instruments referenced on behalf of the Parties represent and warrant that they have the legal power, right and actual authority to bind the Parties to the terms and conditions hereof and thereof.

4.5 **Counterpart Originals**. This Agreement may be executed in original counterparts, which together shall constitute a single agreement.

4.6 **Effective Date**. This MOU has become effective among and between the Parties on the date by which each Party's governing board or council has approved the MOU and the authorized representative of each Party has executed the MOU.

IN WITNESS WHEREOF, the Parties hereto have executed this Memorandum of Understanding on the date and year first above written.

EASTERN MUNICIPAL WATER DISTRICT

By: _____
_____, General Manager

LAKE HEMET MUNICIPAL WATER DISTRICT

By: _____
ROBERT V. LINDQUIST, JR., General Manager

[additional signatures on following page]

CITY OF HEMET

By: _____
Steve Temple, City Manager

ATTEST:

By: Sarah McComas
~~for Stephen Clayton~~ Sarah McComas
Deputy City Clerk

Approved as to Form:

By: Julie H. Biggs
~~Eric S. Vail~~
Assistant City Attorney

CITY OF SAN JACINTO

By: Peter A. Cosentino
Peter A. Cosentino, City Manager

ATTEST:

By: Dorothy L. Chavinard
City of San Jacinto
City Clerk

Approved as to Form:

By: Robert Hargreaves, Best Best & Krieger
City Attorney

ATTACHMENT 1

(Scope of Work)

ATTACHMENT 1

(Scope of Work)

ATTACHMENT 1

(Scope of Work)

Hemet/San Jacinto Groundwater Management Area
Water Management Plan
SCOPE OF WORK

April 23, 2004

Introduction

The Stakeholders in the Hemet/San Jacinto Groundwater Management Area are working to develop a strong foundation to guide and support responsible water management throughout the management area well into the future. The central component of this foundation is to be a Water Management Plan (WMP). The representatives of the stakeholders (Eastern Municipal Water District, Lake Hemet Municipal Water District, Cities of Hemet and San Jacinto, and Private Water Producers) in the Policy Committee (PC) have recently agreed on and signed the Principles for Water Management (Principles) in the basin. In addition, the Stakeholders are working with the Soboba Tribe and the Federal Government to develop a Settlement Agreement that would address past water use practices in the basin and make provision for the water rights of the Soboba Tribe. The Settlement Agreement would provide sufficient legal and technical basis for future water supplies for the Tribe.

The Principles are the basis from which the parties will develop a WMP for the area. The representatives of the stakeholders in the Technical Committee (TC) have provided the proper technical analysis, foundations, and recommendations to the PC so that the PC members can make technically sound decisions. The Department of Water Resources (DWR) has entered into a Memorandum Of Understanding (MOU) to provide financial, technical, and facilitation support to the Stakeholders, so that a long-term sustainable groundwater management plan is developed by the local stakeholders for the basin. To meet its MOU obligations, the DWR staff and Consultant have provided appropriate technical and engineering support to the TC and PC. The Principles are established in-lieu and in anticipation of further guidance that may be provided by a stipulated judgment of the court established to resolve outstanding groundwater issues.

The work performed to-date have been related to development of the Basin Assessment Report (BAR), the Integrated Water Management Plan (IWMP), and to lay the foundations for the WMP, which includes:

- Review and Analysis of Fruitvale production records and conveyance water practices
- Operational Yield Study (Jan 2003)
- Assessment of Historical and Projected Land and Water Use Data (TM 1- June 2003)

- Description of Preferred Potential Conjunctive Use Projects (TM 2 – May 2003)
- Identification and screening of recharge sites and projects
- Preliminary screening of recharge sites for modeling analysis
- Modeling of the recharge sites and their effectiveness to enhance groundwater levels in each subarea

Additional work has been performed by the local agencies that will be used as part of the supporting analysis and documents for development of the Water Management Plan. These are:

- Development of San Jacinto Watershed Groundwater Model for EMWD
- Report on Feasibility Analysis of the San Jacinto River Recharge & Extraction Project
- Draft Environmental Impact Report (To be published in April 2004)

In addition, as part of the IWMP, the following work is under study by local stakeholders and/or by the Consultants:

- Water Supply Reliability
- Conjunctive Use Analysis
- Water Supply Contingency Plan
- Groundwater Monitoring Plan
- Regional Water Resources Database
- Feasibility analysis of Cienega and Fairview Ponds for Recharge

Additional work is required to develop a WMP to support the Settlement Agreement, implement the Principles, and manage the available supply consistent with the agreements and any court ordained requirements. The program to make the Principles effective needs to be designed to integrate approaches for implementation of demand side solutions, non- structural management solutions, and to establish priorities for new water supply capital facilities.

The Water Management Plan document to be produced as part of this Scope of Work will be an agreed upon guideline for existing and projected general conditions of the basin, as well as overview of the planned facilities at various stages to meet the future water supply needs in the basin. Additional detail studies will be required to evaluate the individual projects and/or groups of projects to meet the water needs in the basin.

Scope of Work

The following scope of work is intended to support preparation of the Hemet/San Jacinto Groundwater Management Area Water Management Plan (WMP) Report as currently conceived in the DRAFT outline dated March 15, 2004.

In order to complete the WMP document on time and within the limited budget, the consultant team (WRIME, Stetson, Geoscience) will be working closely with the management and staff of the agencies, as well as the legal team to ensure proper coordination and communication, appropriate analysis, and quality work product.

The activities required to develop the WMP are grouped in the following Tasks:

Task 1. Refinement of Safe Yield Analysis

The purpose of this task is to pull together the information with regards to groundwater basin safe yield estimates made in the past, refine the methodology used to estimate the safe yield of the basin, and develop an appropriate methodology and estimate for the safe yield of the basin.

The following will be performed:

- Collect and document previous safe yield studies; and
- Refine and document safe yield estimate;

WRIME will be responsible to perform this Task with Geoscience performing the review of methodology.

Task 2. Analysis of Groundwater Quality Conditions

The purpose of this task is to document the general water quality conditions using existing and available data, including known or potential sources of degradation that could pose a risk to groundwater and potentially reduce the available groundwater supply. The water quality data available in electronic formats will be aggregated from various sources; each source and the data quality will be documented. An inventory of water quality issues will be developed, and water quality standards and objectives consistent with the Regional Water Quality Control Board Basin Plan will be presented.

The following will be performed:

- Collect historical groundwater quality data. This includes surface water data from various sources, including the RWQCB and USGS.
- Map and identify known degraded sites. Identify sites that could impact groundwater quality. This includes current and known remediation and treatment program sites and other sites contained in the existing DHS drinking source water assessments program (DSWAP) mapping database.
- Identify water quality constraints. Using maps, tables, and graphs current water quality conditions.

WRIME will be responsible to perform this Task with Geoscience performing the review of methodology.

Task 3. Preparation of DRAFT Water Management Plan Document

The purpose of this task is to collect the information and analysis performed as part of other past studies, as well as Tasks 1 and 2 of this Scope of Work, and to prepare the draft of the WMP document. The outline of the WMP document as discussed and approved by the attorneys is attached as Exhibit A. Following is a brief description of each major section of the WMP along with preliminary assumptions that would be considered in the write-up.

Executive Summary

This section will present an executive summary of the WMP document. The section will present the general findings of the plan supported by appropriate graphics, as necessary. *WRIME will be responsible for this section, and it will be approximately 5 pages.*

3.1. Introduction

This section will include the overview of the Plan, and discuss the goals of the WMP. The introduction will be brief and will lay out the background to the plan development and its intended use. *WRIME will be responsible for this section, and it will be approximately 2 pages.*

3.2. Management Plan Framework

This section will introduce the Management Plan participants with a brief history and background on each organization, including role of the State; discuss the geographic boundaries of the sub-basins in the management area; provide a brief discussion of the past agreements and past related activities leading to the WMP. Appropriate GIS maps will be produced to assist in presentation of the material. *WRIME will be responsible for this section, and it will be approximately 5 pages.*

3.3. State of The Basin

The purpose of this task is to establish the historical and existing conditions of the groundwater basin. This will assist in development of baseline conditions in the future for analysis of alternative water management plan options. Consultant will describe existing physical settings, key planning assumptions, review historical, current, and forecasted conditions, using existing studies and data; this includes basin geology and sub-basin boundaries, basin hydrology, rainfall, surface water, basin groundwater levels, basin recharge conditions, and groundwater quality conditions. Majority of the information for this section is available from previous work efforts, other than the discussion on groundwater quality, which will depend on some past reports, but mostly on the work performed under Task 2. *WRIME will be responsible for this section, and it will be approximately 25*

pages. Geoscience and Stetson will provide support and overview on this Task.

3.4. Existing Water Supplies

This task will include review of the previous reports and investigations describing the status of water supplies to each stakeholder agency. This section of the document will explain in general terms the sources of water supply, average annual historical amount of each supply, and trends for future availability of water supplies for each stakeholder. There will be no analysis of water supply conditions or forecasting of the reliability of supplies as part of this Task. Appropriate GIS maps will be produced to assist in presentation of the materials. *WRIME will be responsible for this section, and it will be approximately 10 pages.*

3.5. Groundwater Rights

This task will primarily rely on the information provided by the attorneys and EMWD on the base groundwater production rights for the public agencies, private producers, and the Soboba Tribe. This section of the document will reference legal or other documents that cite the groundwater rights and responsibilities of each stakeholder, describe the methodology used for development of base production rights, and schedule for adjustments of such rights.

*The Legal Team **(Firm or person)** will be responsible to author this section. Stetson will review and coordinate to ensure proper context is developed. WRIME will be responsible for technical editorial and insertion into the WMP document.*

This section will be approximately 5 pages.

3.6. Surface Water Rights

This section describes the surface water rights of both LHMWD and EMWD based on information provided by the attorneys, as well as how these rights are to be preserved in the WMP and as part of the Principles.

*The Legal Team **(Firm or person)** will be responsible to author this section. Stetson will review and coordinate to ensure proper context is developed. WRIME will be responsible for technical editorial and insertion into the WMP document.*

This section will be approximately 1-2 pages.

3.7. Other Soboba Tribe Settlement Requirements

This section will provide description of requirements for the settlement of the Tribe water rights issues, including discussions on any financial obligations, responsibilities in providing water to the Tribe when it cannot produce water

from the basin, as well as issues with respect to groundwater quality limitations on the recharge water in the Canyon sub-basin. This section will rely to a large extent on the Draft Environmental Impact Report (DEIR) document, as well as other information provided by EMWD and/or LHMWD. No additional information and/or data collection or analysis of data will be done as part of this Task.

*The Legal Team **(Firm or person)** will be responsible to author this section. Stetson will review and coordinate to ensure proper context is developed. WRIME will be responsible for technical editorial and insertion into the WMP document.*

This section will be approximately 5 pages.

3.8. Institutional Plan

EMWD is the leading stakeholder in developing the institutional plan. This information will be developed, discussed, and agreed upon in the by the agency managers, attorneys, and consultants. The information will be synthesized and documented by EMWD and included as part of this section of the document. Minor coordination and editorial effort needed to include this section in the document.

EMWD will be responsible to author this section. EMWD will be responsible to coordinate with the CAM, TC and PC members to ensure that the approach, content, and documentation is agreed upon by the Stakeholders and/or their representatives. All graphics, charts, and tables will be developed by EMWD. WRIME will be responsible for technical editorial to ensure consistency with the remaining sections of the document, as well as insertion into the WMP document.

This section will be approximately 10 pages.

3.9. Water Supply Plan Elements

The purpose of this task is to develop section 9 of the WMP document. This task includes review of the past documents, including the Basin Assessment Report (BAR), Integrated Water Management Plant (IWMP) Technical Memoranda, and DEIR for the Integrated Recharge and Recovery Program (IRRP), synthesis of the information, and documentation of the various water supply elements for the WMP.

No new information and/or analysis will be made as part of this Task. It is assumed that the information is available in the existing documents to be provided by EMWD.

WRIME will be responsible for this section, with overview by Geoscience and Stetson. This section will be approximately 10 pages.

3.10. Future Water Supply Projects

The purpose of this task is to develop section 10 of the WMP document. This task includes review of the recently developed documents in the Basin Assessment efforts and the IWMP Technical Memoranda, as well as the DEIR for the IRRP to synthesis the information on planned and potential water supply projects. There will be no additional analysis, studies, and/or information collection on these projects; the document will solely rely on the past work performed, summarize the information, and to the extent possible will identify future work plans needed to move these projects forward.

No new information and/or analysis will be made as part of this Task. It is assumed that the information is available in the existing documents to be provided by EMWD.

WRIME will be responsible for this section, with overview by Geoscience and Stetson. This section will be approximately 10 pages.

3.11. Financial Plan

EMWD is the leading stakeholder in developing the financial plan. This information will be developed, discussed, and agreed upon in the by the agency managers, attorneys, and consultants. The information will be synthesized and documented by EMWD and included as part of this section of the document. Minor coordination and editorial effort needed to include this section in the document.

EMWD will be responsible to author this sections. EMWD will be responsible to coordinate with the CAM, TC and PC members to ensure that the approach, content, and documentation is agreed upon by the Stakeholders and/or their representatives. All graphics, charts, and tables will be developed by EMWD. WRIME will be responsible for technical editorial to ensure consistency with the remaining sections of the document, as well as insertion into the WMP document.

This section will be approximately 15 pages.

3.12. Implementation Plan

EMWD is the leading stakeholder in developing the implementation plan. This information will be developed, discussed, and agreed upon in the by the agency managers, attorneys, and consultants. The information will be synthesized and documented by EMWD and included as part of this section of the document. Minor coordination and editorial effort needed to include this section in the document.

EMWD will be responsible to author this sections. EMWD will be responsible to coordinate with the CAM, TC and PC members to ensure that

the approach, content, and documentation is agreed upon by the Stakeholders and/or their representatives. All graphics, charts, and tables will be developed by EMWD. WRIME will be responsible for technical editorial to ensure consistency with the remaining sections of the document, as well as insertion into the WMP document.

This section will be approximately 10 pages.

Task 4. Production and distribution of draft WMP document

4.1. Draft WMP Document

This task includes the effort needed to produce the WMP draft document, including word-processing, technical editorial, and production of the report. Electronic copies of the document version in MS Word format will be distributed for comment.

4.2. Final WMP Document

This task includes efforts to incorporate the comments on the draft report, and finalizing the document. Fifteen hard copies of the report, along with electronic copy in PDF version will be submitted.

Task 5. Coordination Meetings and Project Management

This task includes project management time to coordinate the work performed under this scope with the stakeholder agencies as well as other team members, including subconsultants. This task also includes time to attend the following coordination meetings:

- Up to two (2) TC Meetings to discuss the methodology and results of Tasks 1 and 2
- Up to two (2) PC meetings to present the findings of the WMP
- Up to four (4) CAM meetings to coordinate with the CAM members on the development of the WMP document and its relation and coordination with the Settlement Agreement, Stipulated Judgment, and the Principles.

Task Responsibilities

In order to ensure proper coordination and identify clear responsibilities for authorship of various sections of the document, Table A presents the responsible person(s) for each task and/or subtask.

Table A- Task Responsibility

Task	Lead	Support & Review	
1	WRIME	Stetson, Geoscience	
2	WRIME	Stetson, Geoscience	
3			
3.1	WRIME	Stetson, Geoscience	
3.2	WRIME	Stetson, Geoscience	
3.3	WRIME	Stetson, Geoscience	
3.4	WRIME	Stetson, Geoscience	
3.5	Legal Team	Stetson, WRIME	
3.6	Legal Team	Stetson, WRIME	
3.7	Legal Team	Stetson, WRIME	
3.8	EMWD	WRIME	
3.9	WRIME	Stetson, Geoscience	
3.10	WRIME	Stetson, Geoscience	
3.11	EMWD	WRIME	
3.12	EMWD	WRIME	
4	WRIME	Stetson, Geoscience	
5	N/A		

Estimated Cost

Table B presents the estimated cost to perform the water quality analysis, safe yield analysis, and complete the WMP document. The detail hours and billing rates are included in a supporting spreadsheet table.

Table B- Estimated Budget

Task	Budget
1- Safe Yield Analysis	$14,540
2- Water Quality Inventory	$18,852
3- WMP Preparation	$90,890
4- Document Preparation	$21,476
Ten Percent Contingency for Tasks 1-4	$14,562
5- Project Management, Coordination, and Meetings	$20,560
Project Management	*$3,680*
Coordination with Agencies	*$1,990*
2 TC Meetings	*$4,990*
2 PC Meetings	*$3,300*
4 CAM Meetings	*$6,600*
Total	**$180,894**

ATTACHMENT 2

(WMP Budget)

ATTACHMENT 2

(WMP Budget)

ATTACHMENT 2

(WMP Budget)

Hemet/San Jacinto Groundwater Management Area
Water Management Plan
ESTIMATE OF COST
23-Apr-04

Task	Subtask/ Chapter	Description	Ali	Steve	Dennis	LHMWD Consultant	Financial Consultant	Matt	Super-vising	Senior	Associate	Assistant	GIS	Graphics/ CAD	Admin/ Secy	ODC	Cost
		Hourly Labor Rate	*$175*	*$175*	*$175*	*$175*	*$175*	*$160*	*$150*	*$135*	*$120*	*$90*	*$98*	*$80*	*$50*	*$1*	
1	**Refinement of Safe Yield analysis**		**8**	**0**	**12**	**0**	**0**	**6**	**0**	**0**	**72**	**16**	**0**	**0**	**0**	**$0**	**$14,540**
1	1	**Collect and document previous safe yield studies**									8						**$960**
1	2	**Refine and document safe yield estimate**	4					2			64						**$8,700**
1	5	**Review Safe Yield Analysis**	4		12			4				16					**$4,880**
2	**Analysis of groundwater quality conditions**		**4**	**0**	**8**	**0**	**0**	**18**	**0**	**0**	**96**	**0**	**24**	**0**	**0**	**$0**	**$18,852**
2	1	**Collect historical groundwater quality data**[1]	2					4			40						**$5,790**
2	2	**Map and identify known contamination sites**						4			16		16				**$4,128**
2	3	**Identify water quality constraints**	2		8			10			40		8				**$8,934**
3	**Preparation of draft Water Management Plan Document**		**136**	**54**	**32**	**0**	**0**	**86**	**0**	**0**	**286**	**0**	**20**	**0**	**40**	**$0**	**$90,890**
3		**Executive Summary**	40	4	4			24			8				4		**$13,400**
3	1	**Introduction**	24	2	2			2			8				4		**$6,380**
3	1.1	*Overview of Management Plan*															
3	1.2	*Water Management Plan Goals*															
3	2	**Management Plan Framework**	4	2	2			2			16		8		2		**$4,524**
3	2.1	*Management Plan Participants*															
3	2.2	*Management Area*															
3	2.3	*Previous Agreements and Institutional Bodies*															
3	2.4	*Activities Related to management of the GW Basins*															
3	3	**State of the Basin**	16	8	8			12			128		12		4		**$24,256**
3	3.1	*Basin Geology and Boundaries*	1								4		1				
3	3.2	*Basin Hydrology*	1								4		1				
3	3.3	*Basin Groundwater Conditions*	1								12		1				
3	3.4	*Basin Surface Water Conditions*	1								4		1				
3	3.5	*Key WQ Constituents of Concern*	1					2			8						
3	3.6	*GW Quality Conditions*	4					4			40		4				
3	3.7	*SW Quality Conditions*	2					2			16		4				
3	3.8	*Imported Quality Conditions*	1					2			8						
3	3.9	*Reclaimed Quality Conditions*	1					2			8						
3	3.10	*Current Water Demands*	1								4						
3	3.11	*Estimates of Safe Yield and Overdraft*	1								16						
3	3.12	*Projected Water Demands*	1								4						
3	4	**Existing Water Supplies**	4	2	2			8			24				2		**$5,660**
3	5	**Groundwater Rights**	4	12	2						4				2		**$3,730**
3	5.1	*Public Agencies Base Production Rights*															
3	5.2	*Private Pumpers Production Rights*															
3	5.3	*Soboba Tribe Water Rights*															
3	6	**Surface Water Rights**	4	4	2						4				2		**$2,330**
3	6.1	*LHMWD's Diversion Rights*															
3	6.1	*EMWD's Diversion Rights*															

Hemet/San Jacinto Groundwater Management Area
Water Management Plan
ESTIMATE OF COST
23-Apr-04

Task	Subtask/ Chapter	Description	Ali	Steve	Dennis	LHMWD Consultant	Financial Consultant	Matt	Super-vising	Senior	Associate	Assistant	GIS	Graphics/ CAD	Admin/ Secy	ODC	Cost
		Hourly Labor Rate	*$175*	*$175*	*$175*	*$175*	*$175*	*$160*	*$150*	*$135*	*$120*	*$90*	*$98*	*$80*	*$50*	*$1*	
3	7	**Other Soboba Tribe Settlement Requirements**	8	12	2						10				2		$5,150
3	7.1	*Financial Obligations*									2						
3	7.2	*Settlement of All Water Rights Claims*									2						
3	7.3	*Water Purchases from MWD*									2						
3	7.4	*Plan Obligations to Supply Water to Soboba Tribe*									2						
3	7.5	*Quality Limits on Canyon Sub-basin recharged water*									2						
3	8	**Institutional Plan**	8	1	1			2			12				4		$3,710
3	8.1	*Watermaster*															
3	8.2	*Technical Committee*															
3	9	**Water Supply Plan Elements**	4	2	2			16			24				4		$7,040
3	9.1	*Replenishment*															
3	9.2	*Direct Delivery of Imported Water*															
3	9.3	*Direct Delivery of Recycled Water*															
3	10	**Future Water Supply Projects**	4	2	2			16			24				2		$6,940
3	10.1	*Planned Water Supply Projects*															
3	10.2	*Potential Water Supply Projects*															
3	11	**Financial Plan**	8	1	1			2			12				4		$3,710
3	11.1	*Administrative Assessments*															
3	11.2	*Replenishment Assessments*															
3	11.3	*Payment of $10 million to Tribe*															
3	11.4	*Receiving of $10 million from Federal Government*															
3	11.5	*Payment of $7 million for Unused Water*															
3	11.6	*Operational Expenses*															
3	11.7	*Capital Improvement Expenses*															
3	12	**Implementation Plan**	8	2	2			2			12				4		$4,060
3	12.1	*Administrative Responsibility*															
3	12.2	*Operational Responsibility*															
3	12.3	*Ownership of Facilities*															
3	12.4	*Capital Improvement Responsibility*															
4		**Production and distribution of draft WMP document**	**8**	**14**	**14**	**16**	**0**	**26**	**0**	**0**	**36**	**0**	**2**	**20**	**32**	**$500**	**$21,476**
4	1	**Draft WMP Document (electronic copy only)[2]**						1			4			12	16		$2,400
4		**Draft document review**		12	12	16											$7,000
4		**Address Comments on DRAFT Document**	4	2	2			24			16		2				$7,356
4	2	**Final WMP Document[3]**	4					1			16			8	16	$500	$4,720
		10% Contingency on performing the project work	**16**	**7**	**7**	**2**	**0**	**14**	**0**	**0**	**49**	**2**	**5**	**2**	**7**	**$50**	**$14,576**
5		**Coordination and Meetings and Project Management**	**82**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**28**	**0**	**0**	**0**	**12**	**$2,250**	**$20,560**
5		**Project management**	16								4				8		$3,680
5		**Coordination with Agencies**	2								12				4		$1,990
5		**2 TC Meetings**	16								12					$750	$4,990
5		**2 PC Meetings**	16													$500	$3,300
5		**4 CAM Meetings**	32													$1,000	$6,600
		Total	**254**	**75**	**73**	**18**	**0**	**150**	**0**	**0**	**567**	**18**	**51**	**22**	**91**	**$2,800**	**$180,894**

1 Data is assumed to be readily available in electronic form from local, state, and federal sources including RWQCB and USGS
2. Draft documents will be delivered electronically
3. 15 copies of 150-page documents with some color figures
4. 2 TC, 2 PC, and 4 CAM meetings in Perris/Hemet for Ali, 1 TC and 4 CAM meetings for Dennis and Steve in Perris/Hemet

ATTACHMENT 3

(EMWD Role and Responsibilities)

EMWD ROLE AND RESPONSIBILITIES

In furtherance of the goals and objective established in the Principles of Water Management and prior to the formation of an organization to oversee the Watermaster's needs and requirements, the Cities of Hemet and San Jacinto, Lake Hemet Municipal Water District (LHMWD), and Eastern Municipal Water District (EMWD) have agreed to work as partners toward the preparation of the Water Management Plan outlined in the Memorandum of Understanding to which this document is attached.

EMWD is hereby appointed as the Contract Administrator for purposes of preparation of the Water Management Plan ("WMP"). EMWD shall have the following responsibilities:

- Continue efforts to acquire grants from DWR as may be applicable to preparation of the WMP.
- Prepare and submit invoices for each participant based on shares identified in the MOU, above, or any other amendments agreed upon by all participants.
- Provide its pro rata share of the WMP Adjusted Project Costs based on estimates outlined in the MOU.
- Establish a restricted account for the WMP funds.
- Manage WMP funds and provide a quarterly status reports on funds and expenditures.
- Contract with WRIME and/or GEOSCIENCE and Stetson Engineers as necessary to procure preparation of the WMP as provided in the MOU.
- Administer the contract(s) for preparation of the WMP, interface with and monitor the work of the consultants retained.
- Provide quarterly status reports to the Policy Committee Representatives on WMP preparation and completion.
- Prepare the sections of the WMP identified in the MOU for which EMWD has been designated as responsible.
- Hire additional outside consultants and/or resources if required, provided any additional expenses for preparation of the WMP over and above the Adjusted Project Cost shall be submitted to the contributing parties for their prior approval and agreement as to allocation of costs.

Appendix M:

Elsinore Valley Water District Reference Materials

Appendix M1:

2005 Urban Water Managment Plan

Elsinore Valley Municipal Water District

Final Report

Urban Water Management Plan

December 2005

MWH

ELSINORE VALLEY
MUNICIPAL WATER DISTRICT

Urban Water Management Plan

FINAL REPORT

December 2005

MWH

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Section 1
Introduction

The Elsinore Valley Municipal Water District (EVMWD) was formed in 1950 under the Municipal Water District Act of 1911. Having a 96 square mile service area (EVMWD, 2004c), EVMWD provides water and wastewater services to the cities of Lake Elsinore, Canyon Lake, and the California Oaks area of Murietta. In addition, EVMWD serves the unincorporated communities of Wildomar, the Farm, Cleveland Ranch, Meadowbrook, Lakeland Village, Rancho Capistrano – El Cariso Village, Horsethief Canyon, and Temescal Canyon.

The purpose of this section is to explain the objectives of an Urban Water Management Plan (UWMP) and describe how this plan was developed.

1.1 PROJECT AUTHORIZATION

This UWMP has been prepared in accordance with the agreement for consulting services between the EVMWD and MWH dated September 12, 2005. This report was prepared under the scope of services of Phase I of this contract. The work related to the remaining phases are presented in separate reports.

1.2 REPORT OVERVIEW

This UWMP is divided into ten sections. This Section provides a brief description of the Urban Water Management Planning Act.

Section 2 describes EVMWD's coordination with other water agencies in the development of this 2005 UWMP, along with a description on how this report was prepared and the steps taken to notify cities and counties in their service area regarding this UWMP update.

Section 3 provides an overview of EVMWD's current and projected water demand and supply through the year 2030. Historical and projected populations are provided, along with the historical and projected potable and non-potable water demands. An overview of EVMWD's water supplies, the historical usage of supply sources, and the projected water supply mix through the year 2030 is provided.

Section 4 describes each Demand Management Measure (DMM) that is currently being implemented or is scheduled for implementation. It also includes an implementation schedule, summary of water savings, and actions needed for EVMWD to meet the coverage requirements for each Best Management Practice (BMP).

Section 5 summarizes the Water Shortage Contingency Plan, analyzes water shortage impacts, and describes activities to mitigate those impacts.

Section 6 summarizes EVMWD's recycled water plan, including historical and projected recycled water use through the year 2030.

Section 7 describes the impact of water quality on the reliability of water supply.

Section 8 discusses water supply reliability by comparing projected water demands with the available supplies as presented in **Section 3**. Normal Year, Single-Dry-Year, and Multiple-Dry-Year scenarios are evaluated through the year 2030.

Section 9 discusses the actions taken to adopt and implement EVMWD's 2005 UWMP.

Section 10 presents a summary of miscellaneous provisions required by the Urban Water Management Planning Act.

The majority of tables presented in this report correspond with the sample table formats included in the *Guidebook to Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan* prepared by the California Department of Water Resources (California Department of Water Resources (DWR), 2005).

1.3 URBAN WATER MANAGEMENT PLANNING ACT

The UWMP for the EVMWD is for the period of 2005 through 2009. This report has been prepared in compliance with California Water Code, Division 6, Part 2.6. The Urban Water Management Planning Act (Water Code Section 10610 et. Seq.) became effective on January 1, 1984. Many amendments have been added to the Act, the most recent occurring in 2004.

The Act requires that every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually (acre-ft/yr) prepare and adopt an UWMP. The act requires urban water suppliers to prepare an UWMP that describes and evaluates sources of supply, reasonable and practical efficient water uses, recycling, and water demand management activities. The amendments require additional actions concerning urban water management plan preparation and considerations of such issues as metering, drought contingency planning, and water recycling. The Act requires that each water supplier prepares or updates its UWMP every five years before December 31, in years ending in five and zero. A copy of the Urban Water Management Planning Act is included in **Appendix B** (California Department of Water Resources (DWR), 2005).

The requirements for an UWMP set forth in the California Water Code Sections 10610 through 10656 are intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure that there are adequate water supplies to meet existing and future water demands. The need for the planning and management of urban water supplies are based on the following declaration of the State of California Legislature (Water Code 10610):

- The waters of the state are a limited and renewable resource subject to ever-increasing demands.

- The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.
- A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate.
- As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years.
- Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.
- Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basin water quality objectives and promoting the beneficial use of recycled water.
- Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.
- Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.
- The quality of source supplies can have a significant impact on water management strategies and supply reliability.

1.4 SB 610

In 2001, the California Legislature enacted two laws that are intended to improve the linkage between water supply planning and new development. California Water Code (Water Code) Section 10910 *et seq*. (enacted as Senate Bill (SB) 610 (Costa) in 2001) requires water suppliers to prepare a water supply assessment (WSA) for certain new developments (referred to as "projects"). The WSA must address whether the projected water supply over the next 20 years is adequate to meet the demand projected for the project plus existing and planned future uses. Section 66473.7 of the California Government Code (enacted as SB 221 (Kuehl) in 2001) requires the agency approving a subdivision (as defined in the code) to include as a condition for approval written verification that a sufficient water supply is available. SB 610 and SB 221 are companion measures which seek to promote more collaborative planning between local water suppliers and cities and counties. Both statutes require detailed information regarding water availability to be provided to the city and county decision-makers prior to approval of specified large development projects.

As defined in Section 10912 of the Water Code, a "project" is a development that is subject to the California Environmental Quality Act (CEQA) and is defined as follows:

1. A proposed residential development of more than 500 dwelling units.
2. A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space.
3. A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space.

4. A proposed hotel or motel, or both, having more than 500 rooms.
5. A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area.
6. A mixed-use project that includes one or more of the projects specified in this subdivision.
7. A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project.

A similar definition for a "subdivision" is included in Government Code Section 66473.7.

A SB 610 assessment is typically prepared as part of the CEQA process for approval of a new development. This UWMP for the EVMWD is prepared in accordance with SB 610.

1.5 PLAN SUBMITTAL REQUIREMENTS

According to the Act, this UWMP will be submitted to the DWR within 30 days of adoption by the Board of Directors of the EVMWD.

The plan will be submitted to the California DWR before December 31, 2005. If new requirements are put into place before that date, this report should be amended.

1.6 ACKNOWLEDGEMENTS

MWH wishes to acknowledge and thank all of the District's staff for their support and assistance in completing this project with special thanks to Ronald Young, General Manager; Phillip Miller, District Engineer; and Joe Mouawad, Senior Engineer.

1.7 PROJECT STAFF

The following MWH staff were principally involved in the preparation of this UWMP:

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	Stephanie Sansom
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1.8 LIST OF ABBREVIATIONS

Abbreviations have been used in this report to conserve space and improve readability. Each abbreviation has been spelled out the first time it is used. Subsequent usage of the term is usually identified by its abbreviation. The abbreviations used are shown in **Table 1-1**.

Table 1-1
List of Abbreviations

Abbreviation	Description
ac	acre
acre-ft/yr	acre-feet per year
Act	Urban Water Management Planning Act (Water Code Section 10610-10656)
ADD	Average Day Demand
AVP	Auld Valley Pipeline
BMP	Best Management Practice
CFD	community facilities district
CII	Commercial-Industrial-Institutional
CIP	Capital Improvement Program
CUWCC	California Urban Water Conservation Council
DMM	Demand Management Measures
DWR	California State Department of Water Resources
DU	dwelling unit
DYY	Dry Year Yield
EDU	Equivalent Dwelling Unit
ENR	Engineering News Record
EVMWD	Elsinore Valley Municipal Water District
EWD	Elsinore Water District
ET	evapotranspiration
ETo	average monthly reference ET
FY	Fiscal Year
GP	General Plan
gpd	gallons per day
gpd/cap	gallons per day per capita
HDR	High Density Residential
HECW	High-Efficiency Clothes Washers
HGL	Hydraulic Grade Line
HOA	Home Owners Association
INF	Infrastructure
LESJWA	Lake Elsinore and San Jacinto Watersheds Authority
LDR	Low Density Residential
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MDD	Maximum Day Demand
MDR	Medium Density Residential
MFR	Multi Family Residential
MOU	Motion of Understanding regarding water conservation in California
NC	Neighborhood Commercial
OBMP	Optimum Basin Management Plan
POA	Property Owners Association
RCD	Riverside-Corona Resource Conservation District
RWQCB	Regional Water Quality Control Board
SCAG	Southern California Association of Governments
SFR	Single Family Residential
SPW	State Project Water
TDS	Total Dissolved Solids

Abbreviation	Description
TVP	Temescal Valley Pipeline
WDF	water demand factor
WFA	Water Facilities Authority
WMP	Water Master Plan
WRF	water reclamation facility
WTP	water treatment plant
MWDSC	Metropolitan Water District of Southern California
ULFT	Ultra Low Flush Toilets
UWMP	Urban Water Management Plan

Section 2
Agency Coordination

2.1 EVMWD'S 2005 UWMP

Water Code Section 10620:

(a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).

(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.

(c) An urban water supplier indirectly providing water shall not include planning elements in its water-management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.

(d)

(1) An urban water supplier may satisfy the requirements of this part by participation in area wide, regional, watershed, or basin wide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.

(2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

Water Code Section 10617: *"Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.*

Water Code Section 10621:

(a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero.

(b) Every urban water supplier required to prepare a plan pursuant to this part shall notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

(c) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

EVMWD prepared an UWMP in year 2000 in compliance with the Act which was adopted by EVMWD's Board of Directors on December 22, 1999 (Montgomery Watson/Maddaus Water Management/The Weber Group, 2000). This UWMP is an update of that document. It incorporates a number of significant changes in the region's water planning and management activities that have taken place in the last five years. These changes include, but are not limited to, the Dry Year Yield (DYY) program of Metropolitan Water District of Southern California (MWDSC), EVMWD's Distribution System Master Plan (MWH, 2002), and EVMWD's Recycled Water System Master Plan (Kennedy-Jenks Consultants, 2005b).

2.2 INTER-AGENCY COORDINATION

Water Code Section 10620.d.2: *Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.*

EVMWD coordinated the preparation of this UWMP with MWDSC, Western Municipal Water District (Western MWD), Eastern Municipal Water District (Eastern MWD), the Elsinore Water District (EWD), the County of Riverside Planning Department, the Cities of Canyon Lake, Lake Elsinore, Murietta, The Farm Mutual Water Company, and other interested parties. The actions EVMWD has taken to coordinate the preparation of this UWMP with these agencies are summarized in **Table 2-1**.

Table 2-1
Coordination with Appropriate Agencies

Agency	Was contacted for assistance?	Was sent a copy of the draft plan?	Commented on the draft?	Attended public meetings?	Was sent a notice of intention to adopt?	Not Involved / No Information
MWDSC		X			X	
EMWD		X			X	
WMWD		X			X	
EWD		X			X	
The Farm Mutual Water Company		X				
County of Riverside Planning Department	X				X	
City of Canyon Lake	X				X	
City of Lake Elsinore	X				X	
City of Murietta	X				X	

2.3 RESOURCE MAXIMIZATION AND IMPORT MINIMIZATION PLAN

EVMWD has implemented several water management strategies in efforts to maximize local resources and minimize the need for imported water. Currently, EVMWD is pumping groundwater from local basins according to its entitled water rights in each of the basins (Elsinore, San Bernardino Bunker Hill, Rialto-Colton and Riverside North). In addition, EVMWD treats water from Canyon Lake according to an agreement with the Canyon Lake Property Owners Association (POA) that requires the maintenance of a minimum lake elevation. EVMWD also uses recycled water for irrigation use, and plans on identifying and implementing further opportunities for recycled use in the future. By implementing such a water management strategy, EVMWD aims to minimize imported water use to the extent that local water resources allow.

2.4 CITY AND COUNTY NOTIFICATION AND PARTICIPATION

A letter of notification was sent to the Cities of Lake Elsinore, Canyon Lake, Murrieta, and the County of Riverside Planning Department on October 6, 2005 pursuant to Section 10621(b) of the Water Code. This letter contained notification of the UWMP update and the request for comments during the update process.

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Section 3
Contents of the UWMP

3.1 APPROPRIATE LEVEL OF PLANNING FOR EVMWD

Water Code Section 10630*: It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.*

This UWMP contains all elements required by the Urban Water Management Planning Act. Information is provided at an appropriate level of detail for planning for the current water demands and for the expected increase in water demands over the next 25 years. Historical information is also included where available.

3.2 SERVICE AREA INFORMATION WITH 25-YEAR PROJECTIONS

Water Code Section 10631: *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

(A) Describe the service area of the supplier; including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

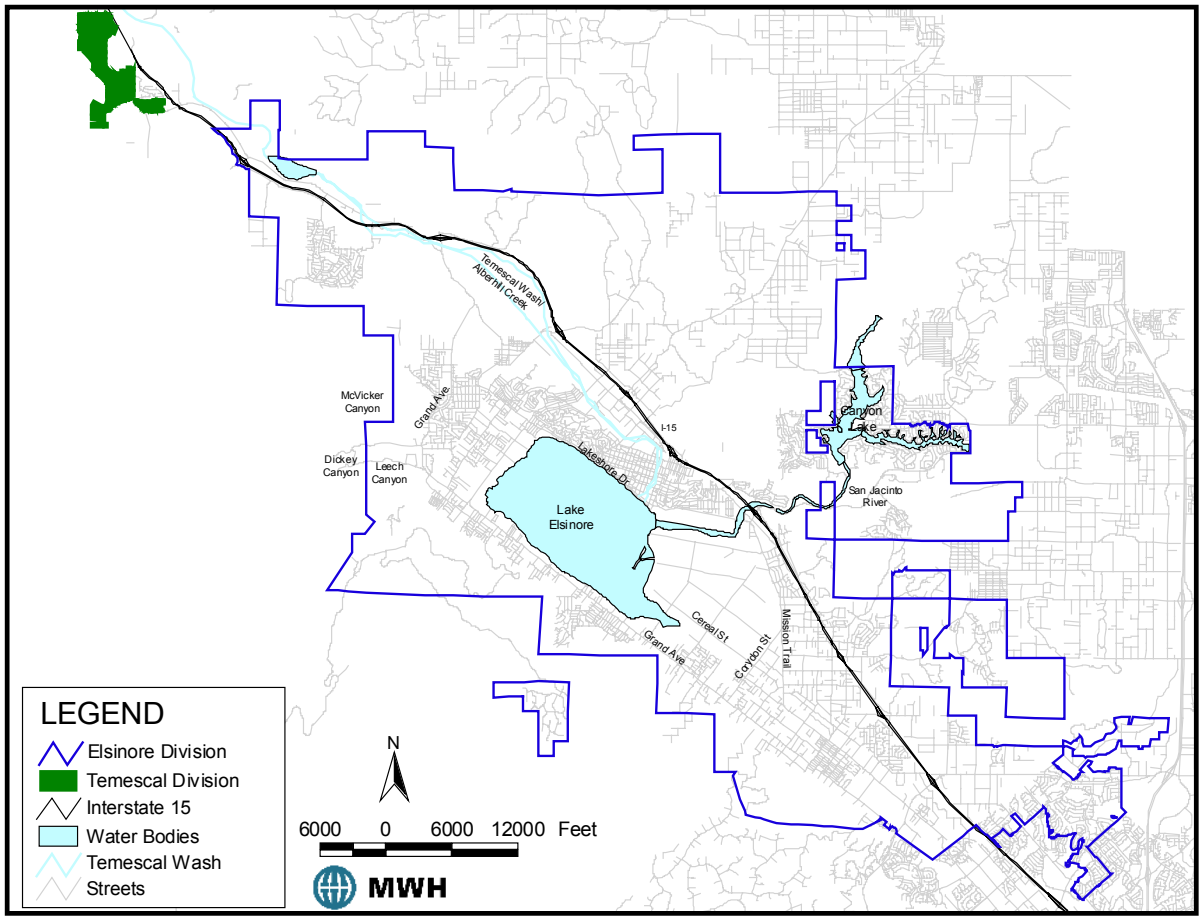
Demographic factors that may affect water use include current and projected population, climate, population density, and customer type. This information is covered in the following subsections and factored into the planning study.

A 25-year planning period is used in this UWMP to cover the period of 2005 to 2030. EVMWD chose this planning period so that prior to the next UWMP update (in 2010), this document can be used as a valid reference for water supply assessments and written verification of water supply for the 20-year period between 2010 and 2030.

3.2.1 EVMWD Service Area

EVMWD's service area is divided into two divisions: the Elsinore Division and the Temescal Division. The map of the service area is in **Figure 3-1.** The Elsinore Division makes up the majority of the service area with more than 32,000 accounts, encompassing an area of 96 square miles. The Temescal Division is isolated from and located to the northwest of the Elsinore Division. It covers an area of approximately 2.5 square miles and has about 900 accounts.

Figure 3-1
EVMWD Service Area



3.2.2 History of EVMWD

EVMWD was incorporated on December 23, 1950, under the provisions of the California Municipal Water District Act of 1911. The purpose of EVMWD is to finance, construct, operate, and maintain water and wastewater systems serving properties within EVMWD's boundaries. EVMWD was formed to protect local water supplies and import supplemental water to alleviate water shortages. At the time of incorporation, EVMWD had too low of an assessed valuation to become a member of the Metropolitan Water District of Southern California (MWDSC). MWDSC was formed in 1928 by a legislative act to provide supplemental water for its member agencies in Southern California. Western MWD was formed in 1954 under the Municipal Water District Act of 1911 to bring supplemental water from MWDSC to growing western Riverside County. Following Western MWD's annexation to MWDSC, EVMWD was annexed to Western MWD's service area in 1954 (EVMWD, 2005a).

A bond election was held in 1955 that provided $1,600,000 in capital funding for transmission, storage, treatment, and limited distribution facilities for the importation and distribution of MWDSC water within EVMWD. Subsequent negotiations with the Temescal Water Company

(TWC) resulted in the Railroad Canyon Storage Agreement (1955), which provided EVMWD with 3,000 acre-feet of storage in Railroad Canyon Reservoir (EVMWD, 2005a).

During 1956 and 1957, construction proceeded on the loop feeder system and Improvement District No. 1. Also during this period, several small mutual water companies petitioned EVMWD to accept their physical facilities and operate them. These were Elsinore Valley Mutual, Kilmeny Lot Owner's Mutual, Landowner's Mutual, Grand Avenue Mutual, Lakeview Mutual, and Clayton Mutual water companies. The first delivery of MWDSC water started on April 8, 1957 (EVMWD, 2005a).

In July 1962, Improvement District No. 2 encompassing the Meadowbrook area was formed, which increased the EVMWD service area by one-third. Services were extended to the El Cariso area by the formation of Improvement Districts 3A and 4, and to the Eucalyptus Grove area by the formation of Assessment District 65-1 under the Improvement Act of 1911. During 1967-68, Improvement District U-1 serving the Rancho Capistrano area was formed. The formation of Improvement District U-2 during 1967-68, serving the Canyon Lake Development, was the initial step to providing sewer service within EVMWD. In 1969, the assets of South Elsinore Mutual Water Company were purchased, and the services in that area were consolidated with regular operations. The acquisition of the TWC in 1989 increased the service area of EVMWD to the Temescal Valley. This portion of District's service area became the Temescal Division (EVMWD, 2005a).

Today, the residents within the EVMWD boundary are served by one of three water service agencies: EVMWD, EWD, and The Farm Mutual Water Company. The latter two are located entirely within EVMWD boundaries, and obtain most of their water wholesale from EVMWD. EVMWD also provides wastewater and recycled water service to customers. EVMWD is legally empowered to, but does not currently, provide services for storm water disposal facilities and fire protection facilities.

As a municipal water district, EVMWD has the authority to act in its own name to make and enter into contracts; to incur debts, liabilities, or obligations; and to issue bonds, notes, warrants, and other evidences of indebtedness. EVMWD also has the authority to collect revenues in the form of rates and charges for facilities and services provided. EVMWD has the power to levy *ad valorem* (property) taxes and acquire property and rights-of-way by eminent domain procedures.

3.2.3 Population

The Southern California Association of Governments (SCAG) has compiled historical population and employment by census tract every five years and projected them to 2030 as part of its 2004 Regional Growth Plan. Historical data and projections for portions of census tracts within EVMWD boundaries, in both the Elsinore and Temescal Divisions, from 2000 through 2030 are shown in **Figure 3-2.** Projections for 5-year intervals are summarized in **Table 3-1.**

The service area population was projected to increase from 80,603 in 2000 to 100,153 in 2005 (4.5 percent per annum). The projected overall growth rate from 2005 to 2030 averages 2.4 percent per annum. Employment is projected to increase from 13,746 in 2000 to 16,099 in

2005 (3.2 percent per annum). The projected overall growth rate for employment from 2005 to 2030 is 2.9 percent per annum.

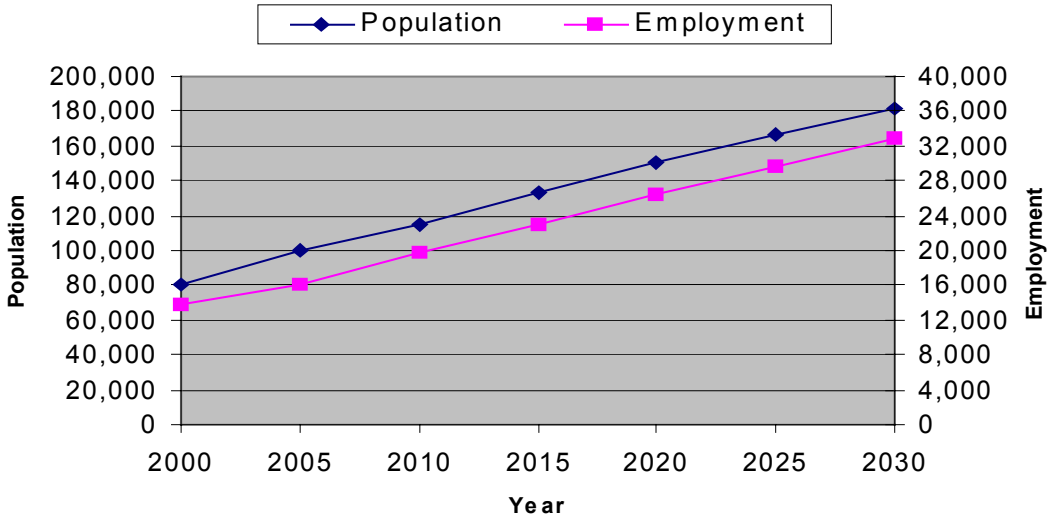
Population growth can be used to anticipate growth in future water demand, while employment growth is useful in projecting demands specifically related to certain classes of users (daytime, commercial and industrial, etc.). However, the recent SCAG projections have not been able to accurately reflect the actual population trends within the EVMWD service area, as the area has experienced extremely rapid growth and development.

Table 3-1
Population and Employment Forecasts

Year	2000	2005	2010	2015	2020	2025	2030
Population	80,603	100,153	115,034	133,333	150,870	166,806	181,940
Employment	13,746	16,099	19,858	23,091	26,369	29,649	32,972

Reference: SCAG, 2004.

Figure 3-2
Projected Population and Employment Within the EVMWD Service Area



3.2.4 Climate

The climatic character of the area is semi-arid, with warm, dry summers and mild winters. Areas to the west experience cooler summers due to onshore breezes. Upland areas have colder winters due to the surrounding low areas and higher elevations. Summer temperatures can exceed 100 degrees F, but nights are cool. Winters are also cool and wet and night temperatures rarely drop below 25 degrees F. Annual precipitation averages 8 to 12 inches and annual evapotranspiration (ET) averages about 55 inches. The average growing season is 250 to 300 days per year along the river bottom and valley areas and less than 250 days in the upland areas. **Table 3-2** presents a summary of monthly temperature and precipitation for Lake Elsinore based on data from the

last 57 years. **Table 3-3** presents a summary of the region's average monthly reference ET, or ETo, levels based on historical data since 1986, taken from the nearest active station.

Table 3-2
Climate Summary: Temperature and Precipitation

Month	Temperature - º F			Precipitation - in		
	Mean	Avg Max	Avg Min	Avg	Max	Min
Jan	51.0	65.3	36.8	2.68	13.94	0.00
Feb	53.4	67.7	39.0	2.46	11.94	0.00
Mar	56.3	71.1	41.5	1.79	9.83	0.00
Apr	60.7	76.4	44.8	0.67	4.27	0.00
May	66.2	82.0	50.3	0.18	2.02	0.00
Jun	72.7	90.5	54.7	0.02	0.32	0.00
Jul	78.9	98.0	59.7	0.07	1.67	0.00
Aug	79.5	98.4	60.7	0.10	3.13	0.00
Sep	75.2	93.6	56.9	0.24	4.26	0.00
Oct	66.8	83.9	49.7	0.42	7.66	0.00
Nov	57.3	73.1	41.6	1.07	7.33	0.00
Dec	51.4	66.3	36.4	1.65	8.67	0.00
Annual	64.1	80.5	47.7	11.35	23.02	2.71

Reference: National Weather Service Cooperative Station 42805 – Elsinore, 1948-2005.

Table 3-3
Climate Summary: Evapotranspiration

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
ETo (in.)	2.74	2.71	3.79	4.79	5.48	6.19	6.79	6.75	5.29	4.18	3.41	2.87	**54.99**

Reference: California Irrigation Management Information System: Station 62 – Temecula, 1986-2005.

Air quality is consistently better than that of surrounding communities.

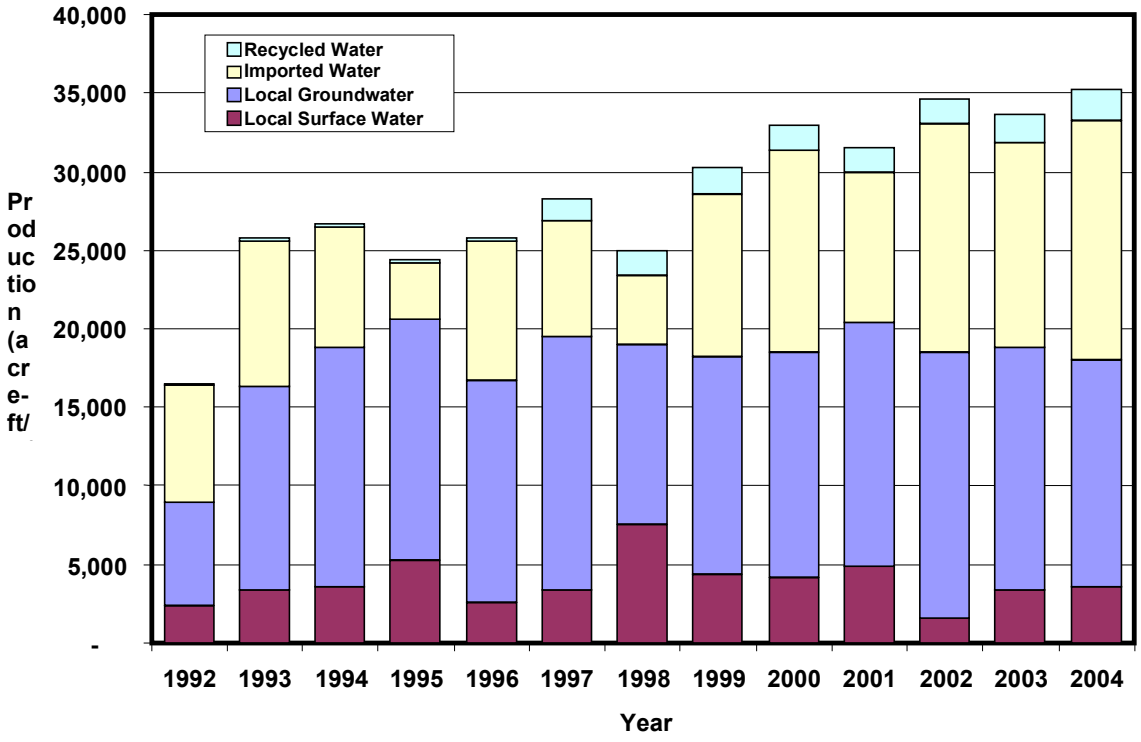
3.3 WATER SOURCES

Water Code Section 10631(b)*: Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a).*

Except during droughts, the water supply has been adequate to accommodate the rapid growth in EVMWD's service area, even during times of drought when customers curtailed their own water use. EVMWD relies on a combination of local groundwater, surface water, imported water, and recycled water supplies to meet potable and non-potable demands. As EVMWD becomes more dependent on imported water to meet future growth, it will be subject to the same potential for water shortages that may face Southern California. This section includes a description of water supply sources available to EVMWD.

Figure 3-3 shows the annual production of each supply source for the period 1992 to 2004. (Potable supply data for Temescal Division in 1992 were not available.)

Figure 3-3
Quantities of Existing Water Supply Sources



Total production from all sources over the period has averaged 28,500 acre-feet/year. Groundwater production has been relatively stable, averaging about 14,000 acre-ft/yr. Surface water supplies have been highly variable and dependent on local runoff conditions. Surface water production has ranged from a low of 1,600 acre-feet/year (when Canyon Lake was out of service) up to 7,500 acre-feet/year. Purchases of imported water supplies have increased significantly in the last five years in response to growth trends. Supply has been purchased from MWDSC via Eastern MWD and Western MWD when needed. This water is used as supplemental water because it is EVMWD's most expensive source. Imported water purchases over this period have averaged 9,600 acre-feet/year.

3.3.1 Existing Potable Water Supplies

EVMWD obtains its potable water supplies from local groundwater, local surface water from Canyon Lake, and imported water from MWDSC. The locations of these sources are presented in **Figure 3-4**.

Groundwater

Water Code Section 10631(b)*: ...if groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:*

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court order or the board has adjudicated the rights to pump groundwater, a copy of the order to decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree.

For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

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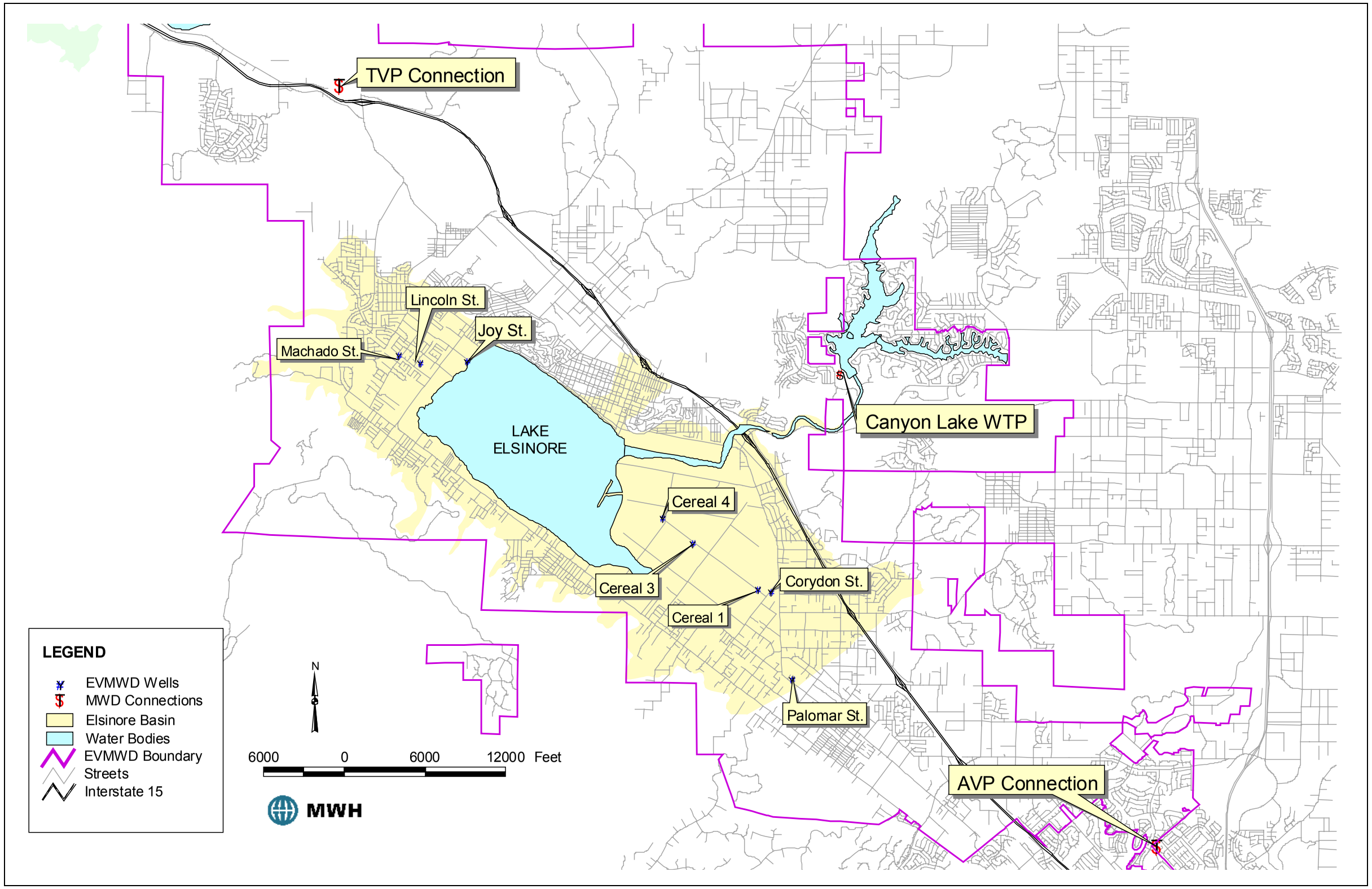
Figure 3-4
Locations of Existing Potable Water Supply Sources



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(4) *A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historical records.*

EVMWD has access to groundwater from Elsinore Basin, Temescal Valley basins, San Bernardino Bunker Hill Basin, Rialto-Colton and Riverside-North Basin, and Coldwater Basin.

EVMWD's existing water supplies are surface water from Canyon Lake, groundwater pumping, and imported water from MWDSC via the TVP and Auld Valley Pipeline (AVP). A summary of supply capabilities of the existing water sources is presented in **Table 3-4**. Details on each supply source follows.

Table 3-4
Existing Potable Water Sources

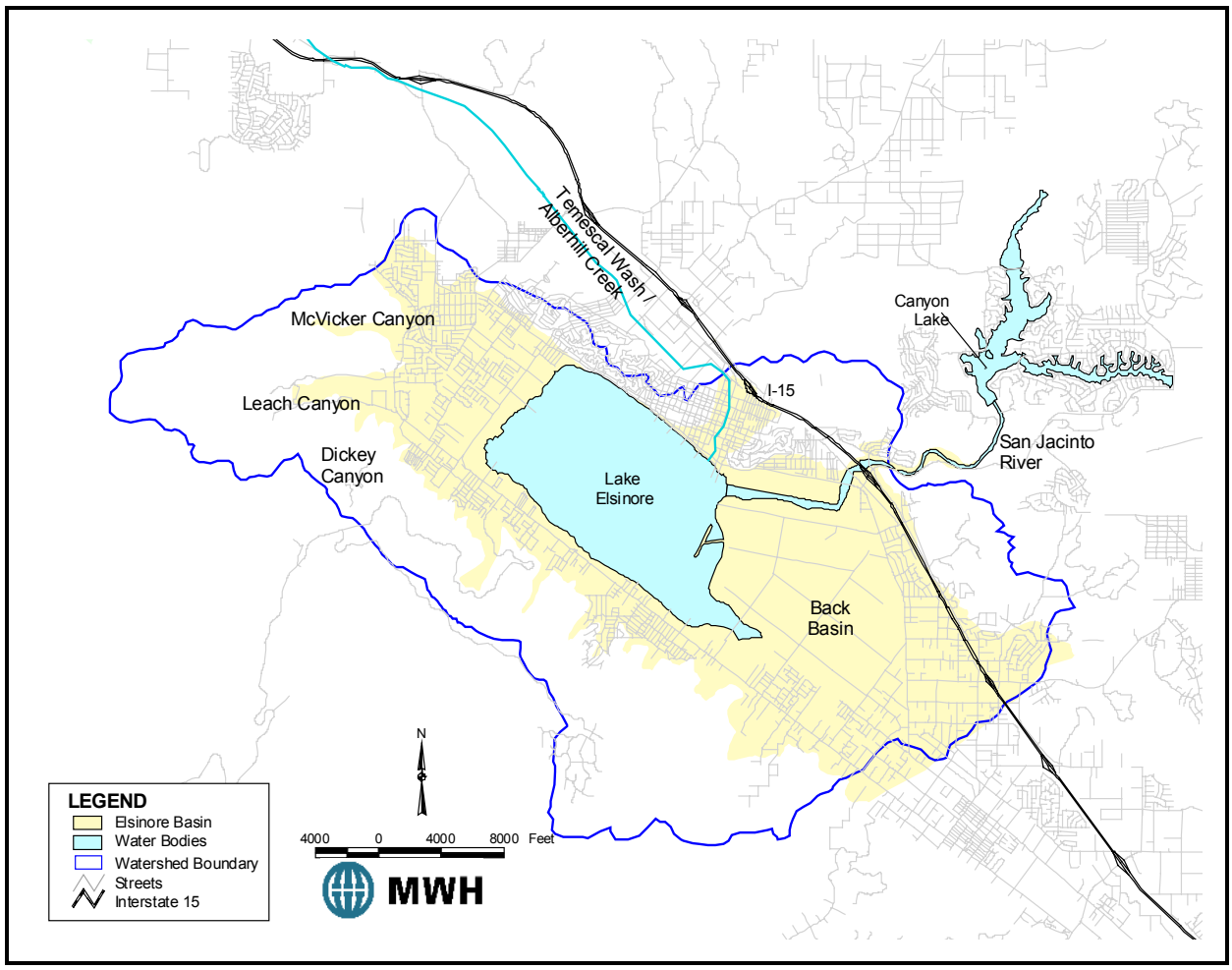
Water Supply Source	Capacity (mgd)	Average Year (acre-ft/yr)	Single Dry Year (acre-ft/yr)	Multiple-Dry Years (acre-ft/yr)	Single Wet Year (acre-ft/yr)
Existing Supplies					
Canyon Lake (Natural Runoff)	9.0	2,700	700	1,900	6,600
Canyon Lake (Purchased from MWDSC Connection WR-31)		5,400	7,400	6,200	1,500
Groundwater	13.7	5,500	5,500	5,500	5,500
TVP	12.7	14,190	14,190	14,190	14,190
AVP	24.2	27,100	27,100	27,100	27,100
Coldwater Basin[1]	1.3	700	700	700	700
Total - Existing Supplies	**60.9**	**55,590**	**55,590**	**55,590**	**55,590**

1 – Limited by the existing demands in the TDSA. While additional supply and capacity exist, the flow is not available to the Elsinore Division without modifications to existing facilities.

Elsinore Groundwater Basin

The Elsinore Groundwater Basin is the major source of potable groundwater supply for EVMWD, EWD, and other private groundwater producers. The Elsinore Basin is located in a graben (a down-dropped geologic block) created by two major fault zones: the Glen Ivy Fault Zone to the northeast and the Wildomar Fault Zone to the southeast. The groundwater basin encompasses approximately 25 square miles of valley fill including Lake Elsinore, which covers about 3,600 acres of the basin. The surface water drainage area tributary to the basin consists of 42 square miles of mountain and valley area. Major streams include McVicker Canyon, Leach Canyon, Dickey Canyon, and the San Jacinto River, which drain into Lake Elsinore and provide a portion of the basin recharge. **Figure 3-5** presents the location of the groundwater basin, the tributary watershed that drains into the basin, surrounding streams, and other bodies of water.

Figure 3-5
Elsinore Groundwater Basin



The California Department of Water Resources has designated the Elsinore Basin as Basin No. 8-4 and is located within the Santa River watershed. Further information on the basin is presented in DWR Bulletin 118 California's Groundwater. (California Department of Water Resources (DWR), 2003).

EVMWD prepared a groundwater management plan (GWMP) for the Elsinore Basin pursuant to the California Water Code §10750 *et seq*. The EVMWD Board of Directors adopted this plan on March 24, 2005. The GWMP presents detailed information on the Elsinore Basin including a plan to reduce the overdraft and improve groundwater supply reliability. The GWMP concluded that the current sustainable yield of the Elsinore Basin is 5,500 acre-ft/year (MWH, 2003a).

EVMWD has nine operating potable groundwater wells with a total capacity of 13.7 million gallons per day (mgd). Groundwater supplied 35 to 45 percent of EVMWD demands in the past five years.

Water rights for the Elsinore Groundwater Basin are not adjudicated (MWH, 2003a). According to the GWMP, approximately 94 percent of groundwater produced by the basin is pumped by EVMWD. Other groundwater producers include EWD and private well owners. EWD, which supplies water to customers in two detached service areas, normally has capacity to pump approximately 5 percent of total groundwater produced by the basin. However, EWD does not currently produce groundwater. EVMWD currently supplies potable water to meet EWD's demands. Local pumpers with private wells only account for about one percent of basin production (MWH, 2003a).

Coldwater Basin Groundwater

EVMWD pumps groundwater from wells located in the Temescal Valley to serve users in its Temescal Division. The wells draw from the Coldwater Basin, Lee Lake Basin, and the Bedford Basin. Only three wells, all in Coldwater Basin, are used for potable supply. The rest of the wells are used for non-potable purposes. (MWH, 2004a).

The Coldwater Basin is an unadjudicated basin located about 8 miles southeast of the City of Corona within the Temescal Valley southwest of Interstate 15. The basin covers about 1,680 acres. Major surface water drainages include Coldwater, Anderson, Bixby, Mayhew, and Brown Canyons, which surround the western and southern boundaries of the groundwater basin.

The Coldwater Basin lies within a down-dropped block between the North Glen Ivy and South Glen Ivy faults, which are associated with the right lateral strike-slip-dominated Elsinore Fault Zone (EFZ). The EFZ extends approximately 200 km from Baja California north to the Corona area. The Coldwater Basin is surrounded by the metamorphic, volcanic and granitic basement rocks of the Santa Ana Mountains to the south and west, and the Bedford groundwater basin, which is located to the north and east and is separated from the Coldwater Basin by the North Glen Ivy fault. In a recharge feasibility study, MWH reviewed and compiled available data to evaluate the geometry and update the hydrogeologic conceptual model for the Coldwater Basin (MWH, 2005a). Based upon the data compiled as part of that report, the Coldwater Basin watershed contains the following stratigraphic units: alluvium, Bedford Canyon Formation, volcanic rocks, and granitic basement rocks. Only the alluvium produces significant groundwater resources.

There do not appear to be any significant confining layers within the alluvium except in the northwestern portion of the basin where there is substantial clay. Currently, water levels are generally declining throughout the basin. However, historical records indicate that the basin is very responsive to changes in operational and climatic conditions. Recharge to the alluvium occurs along the margins of the basin through Mayhew, Coldwater, Anderson, Bixby and Brown Canyons. Faults within the basin appear to be complete barriers to subsurface flow except where gravel pits cross the faults.

The total basin storage volume is estimated to be approximately 74,800 acre-ft based upon a specific yield ranging from 7 to 9 percent. The estimated groundwater in storage as of September 2000 was 41,600 acre-ft (about 55 percent full). The estimated cumulative loss in storage in the Coldwater Basin between 1977 and 2000 was approximately 10,000 acre-ft (MWH, 2004b)..

For the period between 1991 and 2000, an average of 6,300 acre-feet per year (acre-ft/yr) of groundwater was produced from the basin. The principal groundwater producers in the basin are the EVMWD and the City of Corona, which account for all but about 200 acre-ft/yr of the total average groundwater production in the basin. The remainder of the pumpers in the basin are agricultural users and the gravel pit owners. Approximately one-third of the total basin groundwater extraction from 1991 to 2000 was produced from EVMWD's wells, while two-thirds of the total groundwater production was produced from the City of Corona's wells. District wells serve agricultural and municipal users in the Coldwater Basin area (MWH, 2004b).

Since 1998, groundwater levels within the Coldwater Basin have been declining at a rate of about 50 feet per year throughout the basin. Groundwater levels in many wells are at or below the previous historic low levels of the mid-1970s. Most shallow groundwater wells, particularly in the center of the basin, are currently dry. This water level decline is the result of both an extended period of low rainfall and increased groundwater production in the basin. More groundwater is being extracted each year than is being replenished naturally causing groundwater to be taken from storage. Previous estimates of safe yield for the basin have ranged from 3,100 acre-ft/yr to 5,300 acre-ft/yr. Groundwater extraction over the past several years has exceeded these estimates. Because the groundwater basin is only 800 feet deep, this supply, if not augmented, will not be available in the future at current extraction rates. (MWH, 2004b)

A review of pumping records from 1991 to 2001 from the "Coldwater Basin Recharge Feasibility Study" (MWH, 2004b) shows that EVMWD has withdrawn about 25 percent of the total volume pumped. Assuming the total safe yield is about 5,200 acre-feet/year, EVMWD could expect to have about 1,250 acre-feet/year available.

The current source capacities of the Station 71, Station 72, and Mayhew Wells are 630, 450, and 330 gallon per minute (gpm) respectively. If all three wells were to run for 24 hours a day and 365 days a year, there is a total pumping capacity of 2.03 mgd and 2,274 acre-ft/yr (MWH, 2001a). Therefore, for estimating the supply availability, EVMWD's share of the safe yield is the limiting value at 1,250 acre-feet/year.

Since this combined well capacity supplying potable water is below safe yield estimates of the Coldwater Basin, the total pumping capacity is assumed as the projected supply availability for the Temescal Domestic Service Area (TDSA), defined as the portion of Temescal Division using potable supply.

Other Groundwater Supplies

EVMWD's acquisition of TWC in August 1989 resulted in ownership of 51.9 percent of the stock in three mutual water companies: Meeks and Daley Water Company, Agua Mansa Water Company, and Alta Mesa Water Company. This stock provides water rights and production/conveyance capacity through the mutual water companies' facilities and water supply sources. The TWC acquisition also provided EVMWD entitlements to "canal carrying rights" located in the Gage Canal and the Riverside Canal, including rights to the Palm Avenue Well that is located in Grand Terrace.

The San Bernardino-Bunker Hill Basin is located in San Bernardino County and covers about 92 square miles. The basin coves the entire City of San Bernardino, and extends west, north, and east of the city (Montgomery Watson/Black & Veatch, 1997).

The mutual water companies have rights to pump 7,833 acre-ft/yr of water from the San Bernardino-Bunker Hill Basin of which 7,515 acre-ft/yr may be exported to Riverside County (Western-San Bernardino Watermaster, 2003). Through its shareholder ownership, EVMWD's annual allotment from the San Bernardino-Bunker Hill Basin is approximately 3,900 acre-feet.

EVMWD's stock ownership also entitles it to groundwater in the unadjudicated Rialto-Colton and Riverside-North Basins. The Water Resources Development Plan (WRDP) estimated the total water available to EVMWD from these basins to be 7,152 acre-ft/yr (Montgomery Watson/Black & Veatch, 1997) based on the capacity of the Station 36 and Palm Avenue wells.

All of the water rights in these basins have been temporarily transferred or leased to Western MWD in exchange for capacity in the Mills Gravity Pipeline, which is further discussed in **Section 3.5**.

Table 3-5 provides a summary of the available groundwater supply pumping per basin.

Table 3-5
Groundwater Supply (acre-ft/yr)

Groundwater Basin	Supply (acre-ft/yr)
Elsinore Groundwater Basin[1]	5,500
San Bernardino Bunker Hill Basin	3,900
Rialto-Colton and Riverside North Basins[2]	7,152
Coldwater Basin[3]	1,250
TOTAL	**17,802**

1 – This basin is unadjudicated The value here is based upon the current estimated safe yield of Elsinore Basin (MWH, 2003. "Elsinore Basin Groundwater Management Plan" prepared for Elsinore Valley Municipal Water District).
2 – This basin is unadjudicated.
3 – This basin is unadjudicated. The value here is based on the upper limit of the estimated safe yield and historical share of total withdrawal by EVMWD.

Table 3-6 summarizes total groundwater pumped in the Elsinore Basin in the last five years.

Table 3-6
Amount of Groundwater Pumped from the Elsinore Basin (acre-ft/yr)

Groundwater Basin	2000	2001	2002	2003	2004	Average (1998-2004)
Elsinore Groundwater Basin	7,675	9,495	9,441	9,555	12,328	9,163
% of Total Water Supply	**35**	**45**	**39**	**40**	**36**	**39**

Reference: EVMWD Monthly Production Sheets provided by EVMWD staff. All data shown are for calendar years.

Surface Water

Surface water for EVMWD's potable supply is obtained from Canyon Lake for the Elsinore Division. No surface water sources are used for potable supply to the Temescal Division.

Canyon Lake

Surface water is obtained for EVMWD customers from Canyon Lake, also known as the Railroad Canyon Reservoir. Canyon Lake was constructed in 1928 by TWC to store water for agricultural use in the area. Formed by Railroad Canyon Dam, Canyon Lake impounds water from the San Jacinto River, Salt Creek, and local surface runoff. With a spillway elevation of 1381.85 ft mean sea level (msl) (HDR, 2004), the reservoir originally had a capacity of about 12,000 acre-ft. However, siltation has decreased the capacity of the lake to 11,920 acre-ft . Canyon Lake's current normal operating storage capacity is approximately 4,766 acre-ft based on the minimum lake level for recreation (see below) (HDR, 2004). The lake is being dredged to restore a portion of the lost capacity as part of the Canyon Lake Improvement Project funded by Proposition 13.

The Railroad Canyon Storage Agreement between EVMWD and TWC that was approved in October 1955 allowed EVMWD to store approximately 3,000 acre-feet of water in Canyon Lake and treat that water at the Canyon Lake Water Treatment Plant (WTP) before distribution. In August 1989, EVMWD acquired the assets and water rights of the TWC including Canyon Lake.

The Canyon Lake Property Owners Association (POA) leases the surface rights to the lake and fringe land around the lake for recreational purposes under an agreement dating from 1968. The lease agreement between EVMWD and the Canyon Lake POA requires that the minimum lake elevation be kept at 1,372 ft msl (HDR, 2004). EVMWD typically discontinues operation of the Canyon Lake WTP if the lake level is expected to drop below 1,372 ft. If the level falls below 1,372 feet, EVMWD is required to purchase MWDSC water to maintain the minimum lake elevation. During the 2001-02 fiscal year, the EVMWD imported 1,055 acre-feet of water to maintain the level of the lake at the contractually-specified level.

There is limited hydrologic data documenting the inflows to the lake. The United States Geological Survey (USGS) maintains gauging stations on the San Jacinto River (and Salt Creek upstream of Canyon Lake. Both gauges have only been in place for five years. During periods of high runoff, Canyon Lake fills and spills into the San Jacinto River where it flows into Lake Elsinore. The USGS gauge on the San Jacinto River below Railroad Canyon Dam (No. 11070500) has an 89-year history (United States Geological Survey (USGS), 2005). Over the last 25 years, significant spillovers occurred in 1980, 1983, 1993, 1995, 1998 and 2005. Since October 1, 2004, almost 49,000 acre-ft of water spilled over Railroad Canyon Dam causing Lake Elsinore to rise nearly 20 ft.

Through the acquisition of the TWC, EVMWD has the rights to divert up to 12,000 acre-ft/yr of natural drainage from the San Jacinto River from about December 1 to about June 1 of each season and store that water in the Railroad Canyon Reservoir pursuant to Water Rights License 1533 (State Department of Public Works Division of Water Resources (SDPW-DWR), 1935). A subsequent license allows the diversion of 2.4 cfs of San Jacinto River water from about April 1

to about May 31 of each season pursuant to Water Rights License 6327 (State Water Rights Board (SWRB), 1961). In settlement of litigation regarding the release of water into Lake Elsinore, EVMWD and the City of Lake Elsinore agreed that EVMWD would not treat more than 8,000 acre-ft/yr (about 7.1 mgd continuous flow) of San Jacinto River flows in any water year at EVMWD's Canyon Lake Water Treatment Plant. This 8,000 acre-ft/yr limit applies only to San Jacinto River runoff and excludes any imported water conveyed in the river channel to Canyon Lake.

Other sources of water for Canyon Lake include untreated imported water from MWDSC connections WR-18A (Colorado River water) and WR-31 (State Water Project water). Each of these imported water connections has a capacity of 69 cfs (44.6 mgd). EVMWD could purchase the imported water from MWDSC through Western MWD, which would be discharged into the San Jacinto River near Nuevo and flow downstream to Canyon Lake. EVMWD avoids purchasing water from the MWDSC connection WR-18A because the high total dissolved solids (TDS) in Colorado River supply adversely affects wastewater effluent quality. Construction of MWDSC connection WR-31 was completed in December 2003, but EVMWD has not taken any flows to date through this connection. Because the cost of treating raw MWDSC water is relatively expensive, it is typically more cost-effective to purchase treated water from the AVP or the Temescal Valley Pipeline (TVP). In addition, some water released into the San Jacinto River percolates into the intervening Lakeview and Perris groundwater basins before it reaches Canyon Lake. It is estimated that approximately 84 to 94 percent of any water purchased from these connections actually reaches the lake (MWH, 2002). Consequently, such releases are typically made in the wet season when the river has natural inflows to minimize losses. In spite of the lack of recent use, EVMWD still has the ability to supplement its Canyon Lake supply with untreated imported water in the event of a local water shortage.

Treated Imported Water

As a member agency of Western MWD, EVMWD purchases treated imported MWDSC water from Western MWD through the AVP and the TVP. The AVP and the TVP are located on the southeastern and northwestern end of EVMWD's distribution system, respectively.

Table 3-7 summarizes rates for purchasing imported water from MWDSC.

Table 3-7
MWDSC Imported Water Rates

Type	Effective 1/1/2005		Effective 1/1/2006	
	Untreated	Treated[1]	Untreated	Treated[1]
Replenishment	$238	$325	$238	$335
Tier 1	$331	$443	$331	$453
Tier 2	$412	$524	$427	$549

Source: Metropolitan Water District of Southern California, 2005. *Budget 2005/2006*. Available: http://www.mwdh2o.com/mwdh2o/pages/finance/finance01.html. Accessed: October 25, 2005.
1 - Western Municipal Water District adds an administrative charge of $5.00/acre-ft for water delivered through the Temescal Valley Pipeline. Eastern Municipal Water District adds an administrative charge of $11.00/acre-ft for water delivered through the AVP.

Auld Valley Pipeline

EVMWD entered into the Water Facility Capacity Agreement for the AVP with Eastern MWD on November 21, 1986. Based on this agreement, EVMWD has the rights to purchase or acquire a maximum flow rate of 37.5 cubic feet per second (cfs) (24.2 mgd or approximately 27,100 acre-ft/yr if used continuously) from Eastern MWD through the MWDSC Connection EM-17. Eastern MWD sells imported water for the AVP to Western MWD, which in turn sells the water to EVMWD through an Interagency Water Sales Agreement (September 14, 1988). It is assumed that EVMWD will be able to obtain the full source capacity or 27,100 acre-ft/yr from the AVP on an annual basis. This imported water is a blend of State Water Project (SWP) and Colorado River Aqueduct water. Prior to conveyance to the AVP, the water is treated at MWDSC's R. A. Skinner Filtration Plant. It is then pumped into the Loop Zone and Cal Oaks Zone at the California Oaks Pumping Station located on Hancock Avenue.

Temescal Valley Pipeline

Installation of the TVP was completed in February 2002. EVMWD obtains imported water from the TVP through Western MWD. The source of this water is SWP water that originates from MWDSC's Mills Filtration Plant in Riverside. The Mills Gravity Pipeline (also known as the Woodcrest Pipeline), which is owned, operated and maintained by Western MWD, runs westerly to its termination point near the intersection of Cajalco Road and Temescal Valley Road.

According to the Distribution System Master Plan (DSMP), the EVMWD connection at the pipeline terminus has a design capacity of 41 cfs (26.5 mgd or approximately 29,700 acre-ft/yr). Water is transferred to the TVP from the Mills Gravity Pipeline at the Woodcrest vault, located in Corona at the intersection of Temescal Canyon Road and La Gloria Street (MWH, 2002). The current hydraulic capacity of the TVP is 19.6 cfs (12.7 mgd or 14,190 acre-ft/yr) based on gravity flow from the Woodcrest Pipeline. The TVP was designed to convey up to 41 cfs (26.5 mgd or 29,700 acre-ft/yr) with the construction of a booster pumping station. Like the AVP, it is assumed that EVMWD can obtain up to the entire current hydraulic capacity, or 14,190 acre-ft/yr, from the TVP on an annual basis. The TVP project was developed to provide additional water supplies from sources located north of the EVMWD service area. It includes an 8 million gallon (mg) terminal storage reservoir, transmission mains, fill lines, and appurtenances.

On August 23, 2001, EVMWD entered into a reciprocal use agreement with Western MWD that provided EVMWD with a conditional right to use 9 cfs of capacity from the Mills Gravity Pipeline. In return for the imported water capacity, EVMWD granted Western MWD an entitlement to water acquired from the Meeks and Daley rights (EVMWD, 2001a; EVMWD, 2001c).

A separate lease agreement between EVMWD and Western MWD provides EVMWD with the ability to use up to 5 cfs (3.2 mgd or 3,620 acre-ft/yr) of additional capacity from the Mills Gravity Pipeline on a temporary basis (EVMWD, 2001b). On August 8, 2002, the EVMWD Board of Directors approved an amendment to the lease agreement to lease an additional 7 cfs (4.5 mgd or 5,068 acre-ft/yr) from the Mills Pipeline, increasing the total lease capacity to 12 cfs (7.8 mgd or 8,688 acre-ft/yr) (EVMWD, 2002a). Thus, EVMWD can currently obtain up to 21 cfs (13.6 mgd or approximately 15,200 acre-ft/yr) of water from the TVP.

3.3.2 Existing Non-Potable Water Supplies

EVMWD serves non-potable demands for irrigation and to maintain water levels in Lake Elsinore during dry years. Non-potable irrigation demands are met through a combination of groundwater, surface water, and tertiary-treated recycled water.

Groundwater

Groundwater wells in Temescal Division are used to supply non-potable water for irrigation and industrial users. The supply comes from 12 wells: seven wells in the Elsinore Basin, two wells in the Coldwater Basin, and three wells in the Bedford Basin. About 4,000 to 5,000 acre-feet/year of non-potable supply are produced by wells for non-potable use in Temescal Division (MWH, 2004a).

Surface Water

Surface water diversions from Lee Lake, Temescal Wash, Horsethief Canyon, and Indian Canyon are used to supply non-potable irrigation and industrial uses in the Temescal Division (MWH, 2004a).

Recycled Water

EVMWD's recycled water supply comes from the Regional Water Reclamation Facility (WRF), Railroad Canyon WRF, and Horsethief WRF. EVMWD has typically used the treated effluent from Railroad Canyon WRF and Horsethief WRF for irrigation, except during storm events. Effluent from the Regional WRF is typically discharged into the Temescal Wash.

Table 3-8 summarizes the reclaimed water production as reported in EVMWD's 2004 Comprehensive Annual Financial Report (EVMWD, 2004b). It should be noted that a portion of the wastewater flows collected by EVMWD is diverted to the Rancho California Water District for treatment and disposal at its Santa Rosa WRF.

Railroad Canyon WRF and Horsethief Canyon WRF

The effluent from Railroad Canyon WRF and Horsethief Canyon WRF meets Title 22 requirements for tertiary treatment. The current rated capacity for Railroad Canyon WRF and Horsethief Canyon WRF are 1.2 mgd and 0.5 mgd, respectively. Based on normalized trends in the number of service connections, the historical flows are 0.90 mgd to Railroad Canyon WRF and 0.43 mgd to Horsethief Canyon WRF in 2004. Most of the treated water from Railroad Canyon WRF is directed to the Canyon Lake Golf Course and the Canyon Hills development, with excess effluent bypassed to the Regional WRF. Treated recycled water from Horsethief Canyon WRF is distributed to local landscape irrigation users (MWH, 2005a).

Table 3-8
Historical Recycled Water Production: FY 1995-2004 (mgd)

Year	Horsethief Canyon	Railroad Canyon	Regional WRF	Total
1995	0.15	0.92	3.18	4.25
1996	0.15	0.89	3.24	4.28
1997	0.17	0.94	3.34	4.44
1998	0.19	0.97	3.73	4.89
1999	0.22	0.93	3.70	4.85
2000	0.26	0.95	3.71	4.92
2001	0.32	0.93	3.79	5.04
2002	0.38	0.91	3.73	5.02
2003	0.47	0.88	4.09	5.44
2004	0.43	0.88	4.46	5.77

Reference: EVMWD Comprehensive Annual Financial Report for the year ended in June 30, 2004 (EVMWD, 2004).

Regional WRF

The Regional WRF was recently expanded and currently has a rated capacity of 8 mgd. The wastewater effluent is treated with tertiary treatment and is discharged to Temescal Wash. Flows to the Regional WRF in 2004 were approximately 4.5 mgd. As population and water demands increase, EVMWD anticipates future expansions to an ultimate capacity of 30 mgd (Kennedy-Jenks Consultants, 2003).

Beginning in June 2002, effluent from the Regional WRF and from Eastern MWD has been used for replenishing Lake Elsinore as part of a 2-year pilot test program. The purpose of this program was to evaluate the effects of using recycled water for lake replenishment as part of an overall lake management strategy. When the pilot program ended in December 2004, 10,043 acre-ft of total effluent had been discharged into the lake.

In March 2005, EVMWD received a revised National Pollutant Discharge Elimination System (NPDES) permit from the Regional Water Quality Control Board (RWQCB) to discharge effluent into the lake. This permit requires EVMWD to reduce the nutrient loading to the lake (Regional Water Quality Control Board, 2005). EVMWD is currently installing phosphorus removal treatment at the Regional WRF to comply with the permit.

Eastern MWD and Rancho California WD

Eastern MWD currently operates the Temecula Valley Regional WRF. This facility was recently expanded to 12 mgd. Eastern MWD completed construction of the Temecula Valley Effluent Disposal Pipeline that would convey effluent from the Temecula Valley Regional WRF and Rancho California Water District's (RCWD) Santa Rosa WRF to Temescal Wash for disposal. This facility allows Eastern MWD and RCWD to avoid costly nutrient removal facilities required for discharge to the Santa Margarita River. This pipeline passes through EVMWD's service area. Since EVMWD currently contributes approximately 1.5 mgd of flow to RCWD, EVMWD is entitled to this amount of recycled water from this facility. In addition, effluent from the Temecula Valley Effluent Disposal Pipeline may be purchased by EVMWD to meet

future recycled water demands under existing agreements with Eastern MWD. Water from this facility may be used in the Wildomar and Canyon Hills regions and was evaluated as part of the *Wildomar Service Area Recycled Water Master Plan Study* (Kennedy-Jenks Consultants, 2004).

Eastern MWD currently (FY 2003-04) generates approximately 38 mgd of effluent at its four active regional water reclamation facilities. The amount of effluent is expected to grow to 48 mgd by the year 2013. Approximately 60 to 70 percent of the effluent currently generated is sold to agricultural and irrigation users (Eastern MWD, 2004). Consequently, about 10 to 15 mgd (11,200 to 16,800 acre-ft/yr) of effluent is available from Eastern MWD on an annual basis. Based on current operations, Eastern MWD retains as much recycled water as possible within its system, storing excess water for summer use. Once its storage ponds are full, Eastern MWD discharges water to Temescal Wash through the Effluent Disposal Pipeline, primarily in the winter months. **Table 3-9** presents Eastern MWD's treated wastewater disposal amounts as projected in the draft version of their 2005 UWMP (EMWD, *Draft 2005 Urban Water Management Plan*, 2005). This treated wastewater is assumed to be available to EVMWD for supply of future irrigation demands.

Table 3-9
Eastern MWD Disposal of Wastewater

Disposal	Treatment	2000	2005	2010	2015	2020	2030
Livestream Discharge in acre-ft/yr	Tertiary	0	8,842	7,911	15,433	21,256	26,956
Livestream Discharge in mgd	Tertiary	0	7.9	7.1	13.8	19.0	24.1

Temescal System

The water supply for the Temescal System is obtained from a series of wells. There are seven wells that draw from the Elsinore Basin, five wells that draw from the Coldwater basin, and three wells that draw from the Bedford basin. The water is pumped from these wells into the agricultural line, which consists of a series of enclosed gravity pipes, siphons and open canals.

There are four wells in the distribution system, Barney Lee #1 through #4, which are located adjacent to 13200 Temescal Canyon Road in Elsinore, California. These wells, located in the Elsinore basin, pump water directly into the Elsinore line. Station 70, which is also located in the vicinity of Barney Lee wells, just southeast of Lee Lake, pumps into the Elsinore line. Two wells located in Gregory Canyon, Gregory #1 and #2 pump into the Gregory Line, which carries the water to the Elsinore Line. Station 70 along with the two Gregory wells is located in Elsinore groundwater basin.

Station 71, Station 72 and Mayhew Well along the Maitri Road also pump water into the Elsinore Line. Water from these three wells which are located in the Coldwater Basin, is also used for domestic purposes after carrying out chlorination and pumping into the domestic water distribution system. Station 26 Well, also located along Maitri Road in the Coldwater Basin, can pump into the Elsinore Line. Station 26 Well is active, but is prone to frequent mechanical failure.

Water pumped from these eleven wells listed above is transported through the Elsinore Line to Division Box where it mixes with water pumped from the Division Box Well and Warm Springs Well. The Division Box is located at 24391 Temescal Canyon Road. Both Division Box Well and Warm Springs Well are also located in the Coldwater Basin.

Sump Well (New Sump), Flagler #2, and Flagler #3 are the three wells located in Bedford Groundwater Basin. Sump Well pumps into TWC line, which carries the water to Elsinore Line. Flagler #2 and Flagler #3 pump into the No. 5 Line, which during normal operation carries water to the Division Box.

Both Elsinore Line and No. 5 Line deliver water to the Division Box. This water is further distributed to the customers at the northern end of the Temescal system through the No. 2 Line.

Water obtained from these wells is also supplemented with water received from the Indian Canyon Line and the Horsethief Line. Catchment areas for these lines are located in the Indian Canyon and Horsethief Canyon respectively. These catchment areas capture the surface water runoff from the canyons and transport the water to the Elsinore Line by gravity.

Any unused water in the Temescal System is carried to the No. 2 Reservoir. A pump installed at the reservoir can then pump the water back up the No. 2 Line and serve customers if needed. Water from the Temescal System can potentially serve future irrigation demands in the Elsinore Division, particularly in the Horsethief and Alberhill regions.

3.3.3 Projected Potable Water Supplies

Since EVMWD's population is expected to increase in the next 25 years, additional water supply sources are necessary to meet future potable water demands. **Table 3-10** provides a summary of current potable water supplies and projected availability of the current supplies through 2030.

Future water supplies include the construction of a pump station that would increase the TVP capacity and implementation of the Back Basin Groundwater Storage Project (BBGSP) as part of the Elsinore Basin GWMP. **Table 3-11** provides a summary of these water supply sources and their annual average and maximum day availability during average/normal, single-dry, multiple-dry, and wet years. In wet and average years, imported water will be injected for storage in the Elsinore Basin and withdrawn during dry periods. This creates additional water demand during wet and average years, and additional water supply during dry years.

Groundwater

Due to increasing potable and non-potable water demands, current overdraft of the Elsinore Basin is projected to increase from approximately 4,400 acre-ft/yr to about 6,500 acre-ft/yr in year 2020 in the absence of groundwater management (MWH, 2003a). In addition to the overdraft, water levels are also expected to decline, which could adversely impact water quality and land subsidence in the EVMWD service area. The GWMP and the BBGSP were developed to address the basin's overdraft condition, enhance water quality, and improve water supply reliability by increasing EVMWD's available water supplies to meet future potable water demands. **Table 3-12** provides a summary of the amount of groundwater projected to be

pumped from the basin through 2030. The summary does not include the BBGSP, in which groundwater would either be recharged or pumped depending on the variability between normal, wet, and dry years.

Table 3-10
Existing Potable Water Supply Projections During a Single Dry Year (acre-ft)

Water Supply Sources	Capacity (mgd)	2005	2010	2015	2020	2025	2030
Wholesale Water Provider							
Eastern MWD – AVP	24.2	27,100	27,100	27,100	27,100	27,100	27,100
Western MWD – TVP	12.7	14,190	14,190	14,190	14,190	14,190	14,190
Elsinore Groundwater Basin	13.7	5,500	5,500	5,500	5,500	5,500	5,500
San Bernardino Bunker Hill Basin (Transfer to Western MWD)[1]		3,900	3,900	3,900	3,900	3,900	3,900
Rialto-Colton and Riverside North Basins (Transfer to Western MWD)[1]		7,150	7,150	7,150	7,150	7,150	7,150
Supplier Surface Diversions							
Canyon Lake (Natural Runoff)	9.0	2,700	2,700	2,700	2,700	2,700	2,700
Canyon Lake (Purchased from MWDSC Connection WR-31)		5,400	5,400	5,400	5,400	5,400	5,400
Groundwater (TDSA)[2]	1.3	700	700	800	800	800	800
Total	**60.9**	**55,590**	**55,590**	**55,690**	**55,690**	**55,690**	**55,690**

1. All of the water rights in these basins have been transferred to Western MWD for capacity in the Mills Gravity Pipeline. Since the amounts are already included in the TVP supply, they are not included in the total.
2. For reporting purposes, groundwater supply is limited here to the projected demands in the TDSA, since it is not certain whether this supply (total capacity of 2270 gpm) will be available to the rest of EVMWD.

Table 3-11
Future Potable Water Sources

Water Supply Source	Capacity (mgd)	Average Year (acre-ft/yr)	Single Dry Year (acre-ft/yr)	Multiple Dry Years (acre-ft/yr)	Single Wet Year (acre-ft/yr)
BBGSP [1]	9.0	(800)	9,100	8,800	(6,900)
Terra Cotta Well[2]	1.4	--	--	--	--
TVP Pumping Station[3]	13.8	11,800	11,800	11,800	11,800
Additional Imported MWD water[4]	20.2	11,200	11,200	11,200	11,200
Total	**44.4**	**22,200**	**32,100**	**31,800**	**16,100**

1- The first half of the project is assumed to come online during 2007, the second half during 2009.
2- Yield is included in Elsinore Basin groundwater values (Table 3-10). Expected be online by 2007.
3- Expected to be online by 2008.
4- MWD is currently evaluating several alternatives to increase imported water treatment and conveyance to Riverside County (see imported water discussion). This supply will be used to meet MDD beyond 2020, at which time a capacity shortage would exist without this additional source.

Table 3-12
Amount of Groundwater Projected to be Pumped (acre-ft/yr)

Groundwater Basin	2005	2010	2015	2020	2025	2030
Elsinore Groundwater Basin	5,500	5,500	5,500	5,500	5,500	5,500
San Bernardino Bunker Hill Basin (Transfer to Western MWD) [1]	3,900	3,900	3,900	3,900	3,900	3,900
Rialto-Colton and Riverside North Basins (Transfer to Western MWD) [1]	7,150	7,150	7,150	7,150	7,150	7,150
% of Total Water Supply	**12**	**11**	**10**	**10**	**10**	**10**

Reference: MWH, 2003. "Elsinore Basin Groundwater Management Plan" prepared for Elsinore Valley Municipal Water District.
1. All of the water rights in these basins have been transferred to Western MWD for capacity in the Mills Gravity Pipeline. Since the amounts are already included in the TVP supply, they are not included in the % of Total Water Supply calculations.

Groundwater Management Plan

MWH prepared a Final Draft GWMP for EVMWD in June 2003 (MWH, 2003a). This document was subject to public review for more than one year. Following the required public hearings, the EVMWD Board of Directors adopted the GWMP on March 24, 2005.

The main objective of the GWMP is to provide a guideline that resolves the overdraft problem in the Elsinore Basin. Four alternatives are identified based on analysis of current and projected water supplies and demands. These alternatives aim to achieve a balanced groundwater basin through: 1) a conjunctive use program using 14 dual-purpose injection-extraction wells; 2) spreading basins in Leach and McVicker Canyons with the installation of five new extraction wells; 3) a combination of in-lieu recharge and water conservation; 4) use of recycled water for lake recharge; and 5) a basin monitoring program. The alternatives evaluated are as follows:

- Alternative 1 – Groundwater recharge by dual purpose injection/extraction wells
- Alternative 2 – Groundwater recharge by surface spreading
- Alternative 3 – In-lieu recharge and water conservation
- Alternative 4 – Combination of dual purpose wells, in-lieu recharge, increased water recycling and conservation

Alternative 4 was selected as the recommended plan because it includes water conservation and increased recycled water use for replenishment of Lake Elsinore in addition to groundwater replenishment using dual-purpose (injection-extraction) wells through the BBGSP.

Treated Imported Water

Additional imported water supplies would be obtained from the TVP through construction of the TVP pumping station. Water may also be obtained from the Riverside-Corona Feeder project.

Temescal Valley Pipeline Pumping Station

The TVP was designed to deliver up to 41 cfs (26.5 mgd). However, achieving this capacity requires a pumping station to increase the hydraulic gradeline sufficiently to overcome

headlosses associated with the higher flow rate. EVMWD has budgeted for the preliminary design of the pumping station as part of its FY 2005-06 budget. Design is expected to begin at that time, with construction completed in FY 2006-07. EVMWD has not located a site for this pump station at this time; one possible site is on a portion of the future Alberhill WRF site.

EVMWD's total usage rights and lease capacity from the TVP connection on the Mills Gravity Pipeline is currently 21 cfs (13.5 mgd). There is currently unallocated capacity in the Mills Gravity Pipeline. EVMWD intends to contract for additional capacity in the Mills Gravity Pipeline with Western MWD when the capacity is required, but has already begun discussions with Western MWD about acquiring the needed capacity. This allows EVMWD to avoid the standby charge Western MWD imposes on unused pipeline capacity.

Riverside-Corona Feeder

In addition to the TVP, EVMWD is working with Western MWD in the development of the Riverside-Corona Feeder. This project is being planned as a conjunctive use project. This project consists of groundwater production wells and a major feeder pipeline capable of delivering 40,000 acre-ft/yr of groundwater from the Bunker Hill Basin in San Bernardino to water purveyors in the northern part of Western MWD's service area. Such purveyors are primarily dependent on imported water from the MWDSC Mills Treatment Plant for water needed to support future growth. A major goal of the project is to reduce dependence on direct delivery of imported water and thereby contribute to the Upper Santa Ana Watershed effort of becoming self-sufficient under conditions of dry year hydrology.

Both local and imported water are available in the Bunker Hill Basin during periods of wet year hydrology. The project stores water available during wet periods for domestic and municipal purposes during dry years. Through agreement with San Bernardino Valley Municipal Water District (SBVMWD) and MWDSC, high-quality State Water Project water can be purchased during periods of surplus at reduced rates and recharged. In exchange, groundwater can be produced in the pressure zone to consistently meet demands irrespective of the periodic shortages due to dry hydrology. Similarly, abundant rainfall in the watershed can be recharged in replenishment basins or reservoirs when available and produced on demand from wells in the pressure area.

Because the Riverside-Corona Feeder is a long-term project that is in the early stages of development, its capacity is not included in this UWMP.

Other Imported Water Projects

MWDSC is currently evaluating several alternatives to increase imported water treatment and conveyance capacity in Riverside County (Metropolitan Water District of Southern California, 2005c). Potential projects under consideration include:

- Expansion of the Mills Filtration Plant – This project would require paralleling the Box Springs Feeder to the plant and paralleling the existing Woodcrest Pipeline to Corona.
- Construction of a new Lakeview Filtration Plant – This plant would be located near the Lakeview Mountains between Lake Perris and Diamond Valley Reservoir. A pipeline would

convey water south to the existing AVP and a lateral would be constructed along Newport Road to convey water to the Canyon Lake area. This plant would likely treat SWP water.

- Construction of a new Eagle Valley Filtration Plant – This plant would be constructed near Lake Mathews and would primarily treat Colorado River water unless MWDSC delivers SWP water to Lake Mathews. Water from this plant would be conveyed to Orange County either through a pipeline along the Santa Ana River canyon or a tunnel under the Santa Ana Mountains. This facility would cross the Temescal Valley Pipeline south of Corona.

MWDSC indicated that a new treatment plant is needed by 2018 to meet projected demands. Although this would not increase the short-term water supply of EVMWD, a new treatment plant would significantly improve EVMWD's long-term water supply. The Lakeview Filtration Plant with a pipeline to the AVP and Canyon Lake would provide EVMWD with access to additional SWP water, thus improving the long-term supply and water quality for EVMWD.

MWDSC has projected that adequate supplies will be available until 2030 for its member agencies, of which EVMWD's projected demands are accounted for through Western MWD. Conveyance of this additional supply of water will be an issue of future discussion for EVMWD.

3.3.4 Projected Non-Potable Water Supplies

This section describes EVMWD's plans for additional recycled water supplies to meet non-potable demands in the next 25 years, including the Alberhill WRF and the Regional WRF expansion. Analysis of historical per-connection water usage and wastewater production data shows that 44 percent of potable water usage becomes wastewater. Using the projected water demands, projected wastewater flows are shown in **Table 3-13**. Projected flows for the Alberhill WRF are based on projections from the Alberhill Water and Wastewater Facilities Phasing Study. Flows for the Horsethief Canyon, Railroad Canyon and Southern areas are based on revised projections prepared in 2005 for the EVMWD Wastewater Master Plan.

A portion of the EVMWD's service area is not sewered. It is assumed that septic flow will be the same as the 2000-2004 average because existing septic areas will convert to sewers at the same rate that new land without access to sewers develops.

Regional WRF

The Regional WRF had flows of approximately 4.5 mgd in 2004. The majority of future customers, to whom EVMWD has given will-serve letters, are tributary to the Regional WRF. The additional wastewater flow to the Regional WRF coming from developments with will-serve letters is projected to be approximately 5.7 mgd. An additional 0.3 mgd of committed new wastewater flows would be tributary to RCWD, which may be conveyed to the Regional WRF through the Lakeshore Interceptor Sewer. Therefore, the combined existing and committed wastewater flow to the Regional WRF is projected to be 10.5 mgd by about 2018, which exceeds the existing plant capacity (MWH, 2005a).

Future developments without will-serve letters are expected to further increase the Regional WRF flows to about 14.8 mgd by 2030. To meet the increased flows, EVMWD will begin

planning for expansion of the Regional WRF when the average flow reaches 6 mgd, which is projected to occur in 2007 (MWH, 2005a).

Table 3-13
Projected Wastewater Flows by Treatment Facility

Year	Alberhill WRF (mgd)	Horsethief WRF [1] (mgd)	Railroad Canyon WRF (mgd)	Southern Area [2] (mgd)	Regional WRF (mgd)	Total Treated Flow (mgd)	Septic Flow [2] (mgd)	Total Wastewater (mgd)
2000		0.26	0.95	0.98	3.71	**5.9**	3.29	**9.19**
2001		0.32	0.93	0.98	3.79	**6.02**	2.59	**8.61**
2002		0.38	0.91	0.99	3.73	**6.01**	3.52	**9.53**
2003		0.47	0.88	0.99	4.09	**6.43**	3.33	**9.76**
2004		0.43	0.88	1.00	4.46	**6.77**	3.37	**10.14**
2005	0.05	0.42	1.15	1.00	5.16	**7.78**	3.31	**11.09**
2010	1.14	0.50	1.15	1.04	7.08	**10.91**	3.31	**14.22**
2015	1.23	0.50	1.15	1.06	9.33	**13.27**	3.31	**16.58**
2020	1.81	0.50	1.15	1.11	11.07	**15.64**	3.31	**18.95**
2025	2.40	0.50	1.17	1.14	12.67	**17.88**	3.31	**21.19**
2030	2.99	0.50	1.17	1.14	14.76	**20.56**	3.31	**23.87**

1- Flows may be treated at the Alberhill WRF in the future.
2- Historical flows are estimated.

The current NPDES permit for the Regional WRF requires that a minimum of 0.5 mgd of flow be discharged to Temescal Wash for environmental habitat needs (Regional Water Quality Control Board (Regional Board), 2005). Therefore, the total recycled water available from the Regional WRF will be approximately 14.2 mgd in 2030. When necessary, the treated effluent will be used to replenish Lake Elsinore to maintain a minimum lake level of 1,240 ft MSL. Otherwise, the water will be utilized for non-potable water uses or discharged to Temescal Wash. Discharges to the wash are expected to occur primarily during the winter months of wet years when water is not required for lake augmentation and non-potable demands are low.

Alberhill WRF

The new Alberhill WRF will serve the Alberhill development and may ultimately replace the existing Horsethief Canyon WRF. The plant will be constructed in approximately 1 mgd increments, with a full capacity of 5.4 mgd. According to the Alberhill Water and Wastewater Facilities Phasing Plan, the plant is scheduled to be online in 2008 (Kennedy-Jenks Consultants, 2005b). Treated effluent from the plant will be used for irrigation in the Horsethief Canyon and Alberhill areas. Surplus water will be discharged to Temescal Creek or reused in EVMWD's Temescal Division. The projected flow to the Alberhill WRF is expected to be 3.0 mgd by 2030 (including flows above .5 mgd to Horsethief WRF that will be diverted to Alberhill WRF). Developments with will-serve letters represent 0.46 mgd of the projected flow in 2030.

Temescal Pipeline System

This system delivers non-potable water to users, primarily agricultural customers, in the Temescal Valley. EVMWD has plans to convert the Temescal Pipeline System to non-potable water use, which will free up groundwater for possible potable use.

3.4 RELIABILITY OF SUPPLY

Water Code Section 10631(c)*: Describe the reliability of each of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:*

(1) An average water year.
(2) A single dry water year.
(3) Multiple dry water years.

For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

EVMWD's water supplies are surface water from Canyon Lake, groundwater pumping, and imported water from MWD via the TVP and AVP. Water supply from these sources is predicted to be fully reliable through 2030. **Table 3-14** summarizes the water supply reliability during average/normal, single-dry, multiple-dry, and wet years.

Table 3-14
Local Supply Reliability (acre-ft/yr)

Water Year Type	Surface Water (acre-ft/yr)	Groundwater (acre-ft/yr)	Imported Raw Water (acre-ft/yr)	Treated Imported Water (acre-ft/yr)	% of Normal
Average/Normal Year	2,700	5,500	5,810	34,300	100
Wet Year	6,600	5,500	1,850	34,300	100
Single Dry-Year	700	5,500	7,650	34,300	100
Multiple Dry-Years	1,900	5,500	6,470	34,300	100

3.4.1 Imported Water Supply Reliability

MWDSC and its member agencies utilize an Integrated Resources Planning (IRP) approach to determine the appropriate level of supply reliability and establish cost-effective approaches to achieve that reliability goal. The 1996 IRP process identified a Preferred Resource Mix that relied on a diverse mix of resources to achieve a goal of 100 percent reliability for full service water demands through 2020. The IRP established regional targets for conservation, local supplies, SWP supplies, Colorado River supplies, groundwater banking, and water transfers. In 2001, the IRP Update was completed which extended the reliability outlook and resources plan

to provide 100 percent reliability through the year 2030. As part of its update, MWDSC increased its targets for conservation, water recycling and groundwater recovery, SWP and Colorado River supplies, and Central Valley storage and transfers. The goal of these increased targets is to ensure a minimum 10 percent planning reserve or buffer between supplies and demands in the event that certain supplies cannot be developed as planned.

In 2003, MWDSC prepared a report on its water supply reliability for use in water supply assessments, which is incorporated into this Plan by reference. Based on MWDSC's reliability analysis, the existing Colorado River and SWP water supplies are sufficient to meet its projected demands in wet and normal years through 2030. In single and multiple dry years, existing MWDSC supplies are adequate through about 2019. However, MWDSC has an aggressive program to develop additional Colorado River and SWP supplies and local storage programs. These programs include water transfers such as the Imperial Irrigation District-San Diego County Water Authority transfer, the Palo Verde Irrigation District land management program, off-aqueduct storage in desert groundwater basins, Delta improvements, transfers with other SWP contractors, and southern California conjunctive use programs. Development of 25 percent of the planned capacity of these additional programs would be sufficient to meet the projected imported demands. Consequently, imported water is considered to be fully reliable through 2030 (Metropolitan Water District of Southern California, 2003). Summary tables from MWDSC's analysis are presented in **Appendix C**.

Since that report was prepared, MWDSC has continued to implement new projects and reassess its supply reliability. In September 2005, MWDSC issued its draft Regional UWMP (Metropolitan Water District of Southern California, 2005d). Although this document has not been finalized, it updates the reliability analyses presented in the 2003 report. MWDSC indicates that its existing supplies are now adequate to meet the projected demands in all hydrologic conditions through 2030. Implementation of planned supplies increases reliability and maintains an adequate reserve.

In addition to its supply planning activities, MWDSC developed the Water Surplus and Drought Management (WSDM) Plan (Metropolitan Water District of Southern California, 1999). The WSDM Plan is based on the strategy of storing surplus supplies in wet periods for use during drought periods. It consists of five water surplus stages and seven water shortage stages that define progressive actions to be taken depending on available supplies. For example, in a Stage 1 shortage, MWDSC would make withdrawals from Diamond Valley Lake storage. As the severity of shortage increases, MWDSC would withdraw water from out-of-region storage, suspend deliveries to local long term storage and replenishment programs, withdraw water from groundwater storage and SWP terminal reservoirs, and call for extraordinary conservation measures. Water allocations for full-service customers would not be implemented until a Stage 7 Shortage is reached. The overriding goal of the WSDM is to never reach a Stage 7 Shortage. MWDSC staff provides its board of directors with water supply and demand forecast reports throughout each year which help determine appropriate management actions. Based on its water supply development in conjunction with the WSDM Plan, MWDSC's supplies for full-service deliveries are expected to be fully reliable through 2030. **Table 3-15** presents the anticipated surface water deliveries from the Canyon Lake WTP.

Table 3-15
Anticipated Surface Water Deliveries with Supplemental Imported Water

Water Year Type	San Jacinto River Water (acre-ft/yr)	Imported Water – WR-31 (acre-ft/yr)	Total (acre-ft/yr)	Maximum Capacity (mgd)
Wet Year	6,550	1,850	8,400	9.0
Normal Year	2,590	5,810	8,400	9.0
Single Dry Year	750	7,650	8,400	9.0
Multiple Dry Years	1,930	6,470	8,400	9.0

3.5 TRANSFER AND EXCHANGE OPPORTUNITIES

Water Code Section 10631(d)*: Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.*

On August 23, 2001, EVMWD entered into a reciprocal use agreement with Western MWD that provided EVMWD with a conditional right to use 9 cfs of capacity in the Mills Gravity Pipeline. In return for the imported water capacity, EVMWD granted Western MWD entitlement to water acquired from the Meeks and Daley rights (EVMWD, 2001a).

A separate lease agreement between EVMWD and Western MWD provides EVMWD with up to 5 cfs (3.2 mgd or 3,620 acre-ft/yr) of additional capacity from the Mills Gravity Pipeline on a temporary basis (EVMWD, 2001b). On August 8, 2002, the EVMWD Board of Directors approved a lease agreement amendment to lease an additional 7 cfs (4.5 mgd or 5,068 acre-ft/yr) from the Mills Pipeline, increasing the total lease capacity to 12 cfs (7.8 mgd or 8,688 acre-ft/yr) (EVMWD, 2002a). In addition to the lease capacity from the Mills Pipeline, EVMWD also has an "exchange of assets" with the Temescal Water Division to supply a capacity of 9 cfs (5.8 mgd or 6,516 acre-ft/yr) (EVMWD, 2002b). Thus, EVMWD contractually has the water rights for up to 21 cfs (13.6 mgd or approximately 15,200 acre-ft/yr) of water from the TVP.

Table 3-16
Transfers and Exchanges (acre-ft/yr)

Transfer Agency	Transfer or Exchange	Short Term	Proposed Quantities	Long Term	Proposed Quantities
Western MWD	Exchange	Yes	15,200	Yes	15,200

3.6 WATER USE BY CUSTOMER TYPE

Water Code Section 10631(e)*:*

(1) Quantify, to the extent records are available, past and current water use, over the same increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all o f the following uses:

(A) Single-family residential.
(B) Multifamily.
(C) Commercial.
(D) Industrial.
(E) Institutional and governmental.
(F) Landscape.
(G) Sales to other agencies.
(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(2) Agricultural.
(3) The water use projections shall be in the same five-year increments described in subdivision (a).

This section discusses existing and projected potable water demands in EVMWD's Elsinore service area.

3.6.2 Existing Water Demands

As of January 2005, EVMWD serves a total of 33,400 potable service connections. EVMWD also serves 30 non-potable connections with recycled water, meeting an annual demand of 254 acre-ft in 2004. EVMWD also uses recycled water to maintain the level of Lake Elsinore. **Table 3-17** presents the historical water use by class of user since 1999.

Table 3-17
Historic Water Use By Class

Year	Water Use Sectors	Single Family	Multi-family	Comm-ercial	Indus-trial	Instit. / Govt.	Dedicated Irrigation	Recycled Water	Total
1999	# of accounts	24,739	395	820	30	53	693	6	26,736
	Deliveries (AF)	13,566	646	3,704	1,234	274	6,558	20	26,002
2000	# of accounts	25,639	406	851	30	55	716	6	27,703
	Deliveries (AF)	15,379	714	2,045	1,758	282	7,348	38	27,563
2001	# of accounts	26,577	407	893	30	60	747	12	28,726
	Deliveries (AF)	15,108	704	2,197	1,537	282	6,782	26	26,636
2002	# of accounts	28,038	408	935	31	68	780	26	30,286
	Deliveries (AF)	16,600	716	2,261	1,617	293	7,241	86	28,813
2003	# of accounts	29,647	410	969	31	67	828	29	31,981
	Deliveries (AF)	16,903	732	2,479	1,565	253	7,526	160	29,618
2004	# of accounts	31,262	412	1,021	31	70	916	30	33,742
	Deliveries (AF)	18,642	703	2,225	1,548	213	6,796	254	30,381

Existing Potable Water Demands

EVMWD's historical potable water demands are presented in **Table 3-18**. The historical potable water demands are calculated using the total production from EVMWD's potable water sources: groundwater wells, surface water treated at Canyon Lake WTP, and imported water purchased from MWDSC through Western MWD and conveyed through the TVP and from Eastern MWD through the AVP. The historical annual water demand was normalized to remove the effects of cool wet years and hot dry years by computing the normalized demand per service connection. Multiplying the normalized consumption per connection by the number of connections gives the "normal" demand for each year. The variation between the actual and normal water demands represents the range in demand due to weather variations. By identifying the maximum variations of the actual demands to the normal demands over the recorded 12 year period (1992-2004), it was estimated that dry year annual demands are at 9.2 percent above average year annual demands, and wet year annual demands are at 10 percent below average year demands. A maximum day demand (MDD) to average day demand (ADD) peaking factor of 2.0 is used based on previous studies. Based on the water usage trends, EVMWD's existing (2004) average demand is estimated at 27,175 acre-ft/yr. **Figure 3-6** shows the historical potable water demand and the normalized demand.

EVMWD provides wholesale water to the Farm Mutual Water Company and the EWD. In 2004, EMVWD provided 421 and 594 acre-feet of wholesale water, respectively, to these two customers. Future build-out demand for the Farm Mutual Water Company is included with the projections in **Table 3-19.** The future demand for EWD is assumed to be the same as the existing demand.

Existing Recycled Water Demands

EVMWD currently has non-potable water customers in the Canyon Lake, Horsethief Canyon and Lake Elsinore areas. Non-potable customers in Canyon Lake are served with tertiary-treated recycled water from the Railroad Canyon WRF. Non-potable customers in Horsethief Canyon are served with tertiary-treated recycled water from Horsethief Canyon WRF. All effluent from these two plants is used for non-potable irrigation demands, except during wet weather flows when influent to the Railroad Canyon WRF is bypassed to the Regional WRF for treatment and disposal. Historical recycled water use is summarized in **Table 3-19.** Dry year demands are assumed to be 9 percent above average year demands and wet year demands are assumed to be 10 percent below average year demands. Existing and future recycled water demands are discussed in detail in **Section 6**.

An additional water demand that impacts EVMWD's water supply balance is lake stabilization. Based on a settlement agreement between EVMWD and the City of Lake Elsinore, EVMWD must release water into Lake Elsinore when the water surface elevation is less than 1,240 ft (Superior Court, 2003). Lake replenishment is only necessary in normal and dry years, as there is sufficient surface runoff in wet years to maintain adequate lake levels. Based on hydrologic analyses prepared for EVMWD and the Lake Elsinore-San Jacinto Watershed Authority (LESJWA), maintaining the Level of Lake Elsinore requires an average of about 5,900 acre-ft/yr of replenishment water and up to 10,300 acre-ft/yr during dry years (MWH, 2005b).

Table 3-18
Historic Potable Water Demands

Year	Actual Potable Demands (acre-ft/yr)	Number of Service Connections	Demand per Connection (acre-ft/yr)	Normalized Demand per Connection (acre-ft/yr)	Normal Potable Demands (acre-ft/yr)
1992	16,365	19,499	0.839	0.810	15,793
1993	16,505	20,185	0.818	0.810	16,356
1994	17,137	20,923	0.819	0.811	16,961
1995	16,994	21,758	0.781	0.811	17,646
1996	17,848	22,868	0.780	0.811	18,555
1997	19,195	23,790	0.807	0.812	19,311
1998	17,953	24,576	0.731	0.812	19,958
1999	21,902	25,453	0.860	0.812	20,680
2000	23,392	26,358	0.887	0.813	21,424
2001	21,915	27,427	0.799	0.813	22,303
2002	24,251	28,861	0.840	0.814	23,480
2003	24,851	31,537	0.788	0.814	25,668
2004	26,939	33,374	0.807	0.814	27,175

Note: Flows are normalized based on the number of service connections in the Elsinore Division that year and the linear trend of usage per service connection.

Figure 3-6
Historical Potable Water Demands

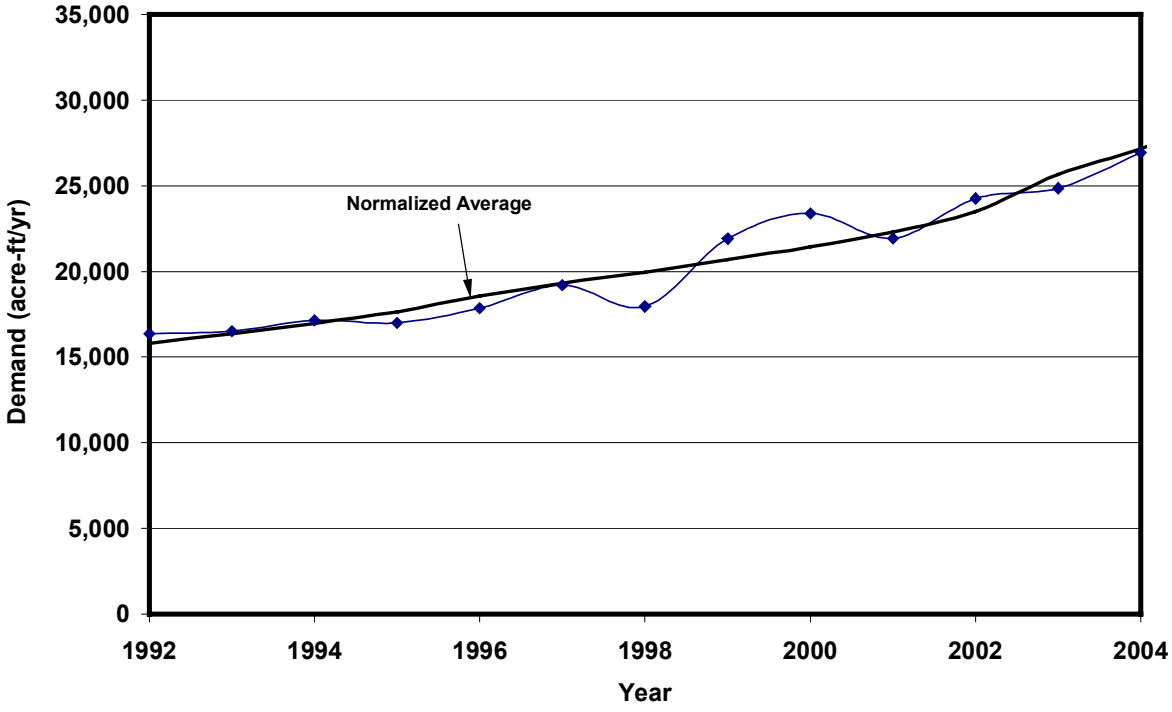


Table 3-19
Historical Recycled Water Demands (by Fiscal Year)

Fiscal Year	Canyon Lake [1] (acre-ft/yr)	Horsethief Canyon [1] (acre-ft/yr)	Regional WRF to Lake Elsinore [2] (acre-ft/yr)	Eastern MWD to Lake Elsinore [2] (acre-ft/yr)
1991	415.2	52.2	0	0
1992	352.9	54.3	0	0
1993	417.4	96.1	0	0
1994	500.3	112.0	0	0
1995	328.1	128.9	0	0
1996	375.4	129.2	0	0
1997	385.5	147.9	0	0
1998	256.6	181.7	0	0
1999	429.4	268.5	0	0
2000	352.9	293.7	0	0
2001	414.0	345.6	0	0
2002	379.3	379.6	0	0
2003	435.5	418.3	2,018	1,498
2004	529.1	435.2	1,101	4,999

References:
1- EVMWD, Comprehensive Annual Financial Reports, 2002 and 2004
2- Viega-Nascimento and Anderson, 2004

In January 2002, EVMWD was issued a NPDES permit to discharge up to 4,480 acre-ft/yr of recycled water from EVMWD's Regional WRF and from Eastern MWD's recycled water system into Lake Elsinore for lake stabilization under a two-year pilot project. The permit was extended until January 28, 2005 when the pilot project concluded. From program inception in June 2002 until its conclusion, over 10,000 acre-ft of recycled water was used for lake stabilization. In March 2005, EVMWD was issued a revised NPDES permit for the Regional WRF that allows it to treat up to 8 mgd and discharge up to 7.5 mgd into Lake Elsinore for lake stabilization, 0.5 mgd to Temescal Wash for wetland enhancement and any remaining effluent for non-potable use (Regional Water Quality Control Board (RWQCB), 2005).

3.7 PROJECTED POTABLE WATER DEMANDS

Water demand projections were developed as part of EVMWD's previous UWMP (Montgomery Watson/Maddaus Water Management/The Weber Group, 2000) and the Distribution System Master Plan (DSWP) (MWH, 2002). These DSMP projections were based on a detailed evaluation of adopted and proposed specific plans for new development and anticipated in-fill development. These projections were further updated in District-Wide Water Supply Assessment (MWH, 2005a). In this report, the water demand projections were modified based on recent changes in the projected timing of some developments and projected demands were updated to reflect land use changes. The projections were also updated to reflect recycled water use for irrigation in future developments (discussed separately in **Section 6**). **Table 3-20** presents the current estimated potable water demands for future developments.

Previous reports only projected demands out to the year 2025. For developments beyond 2025, the DSMP and WSA projections were extended to 2030 to include an additional 5 years of optional projection. In extending the demand projections, development plans were analyzed to determine whether development would occur into 2025-2030. For any such developments, facilities plan documents (if available) were consulted to determine demand projections for 2025-2030. In cases where such documentation was not available, the demand projections were extended to 2030 using the projection trend through 2025.

A demand projection for the Southerly (by John Laing Homes) at Lake Elsinore development was prepared in 2003 in conjunction with a water supply assessment (MWH, 2003b). Demand for the proposed Lumos development (East Lake Specific Plan Amendment No. 8) which is in the environmental review process has also been included based on proposed land use information (City of Lake Elsinore, 2005).

The anticipated timing and demand associated with development in the Alberhill community facilities district (CFD) was modified based on recent planning reports on the formation of the CFD (Kennedy-Jenks Consultants, 2005b). Projected potable demands for Alberhill Ranch were modified according to a Water Master Plan developed for the area (Hunsaker & Associates, 2003). From this report, potable demands were estimated by calculating total demand minus the demands for slopes and parks that could be met with recycled water. For the area surrounding Alberhill Ranch and CFD, acreage and duty factors were obtained from land use files in order to calculate projected demand. Development is projected to occur from 2005 to 2015 for Alberhill Ranch and CFD, and 2015 to 2030 for the Alberhill surroundings.

The projected potable demands for Ramsgate (including Rosetta Canyon) were modified according to a facilities plan performed for the region (Hunsaker & Associates, 2004). The study area for this report extends beyond the actual Ramsgate boundaries. This service area was generally determined to be that area tributary by gravity flow to the north side of the I-15 between State Route 74 (Central Avenue) and 2nd Street and extending north to Highway 74 and Ethanac Road. The entire region is included in the demand calculations.

Potable demand projections for the TDSA were included based upon information from the DSMP (MWH, 2001b). The demands from the DSMP were projected to 2020, which is assumed to be the buildout demand for the TDSA.

Table 3-20
Projected Potable Water Demands for Major Developments in EVMWD Service Area 2005-2030

Years	Area Description	Total Demand (acre-ft/yr)	% developed by 2030	Projected demand by 2030 (acre-ft/yr)
Inside Current EVMWD Boundary				
2005-2010	Canyon Hills	1,326	100%	1,326
2005-2030	East Lake[4]	6,999	69%	4,838
2005-2025	The Farm/Sunset Ridge	1,473	100%	1,473
2005-2030	Lake Edge	316	45%	128
2005-2015	Alberhill CFD[1]	2,296	100%	2,296
2005-2015	Alberhill Ranch[2]	871	100%	871
2005-2030	CFD 98-2	3,212	100%	3,212
2005-2025	West Lake	233	100%	233
2005-2030	La Laguna	688	100%	688
2005-2030	Wildomar	2,057	40%	823
2005-2010	Tuscany Hills	317	100%	317
2010-2030	Ramsgate and Surroundings[3]	4,239	100%	4,239
2005-2025	Canyon Lake Infill	427	100%	427
2005-2030	Murietta/Cal Oaks	347	100%	347
2010-2025	North Peak	678	100%	678
2015-2030	Alberhill Surroundings[5]	6,500	50%	3,250
2005-2030	Other Infill Locations	12,043	40%	4,817
2005-2015	Greer Ranch and Others	399	100%	399
2005-2020	TDSA	152	100%	152
Subtotal		**44,617**		**30,514**
Outside Current EVMWD Boundary				
2005-2010	Lusk	82	100%	82
2010-2030	Country Club Heights	2,077	30%	623
Subtotal		**2,159**		**705**
TOTAL		**46,776**		**31,219**

Reference: Except as otherwise noted, modified from MWH, 2002. *Distribution System Master Plan,* prepared for EVMWD, May 2002.

1. Kennedy Jenks, *Draft Technical Memorandum – Alberhill Water & Wastewater Facilities Phasing Plan*, June 2005.
2. Hunsaker & Associates, *Water and Sewer Master Plans for Alberhill Ranch*, May 9, 2003.
3. Hunsaker & Associates, *Water, Wastewater & Recycled Water Facilities Plan*, July 27, 2004.
4. Includes Southerly and LUMOS.
5. Calculated for this report from acreage and duty factors obtained from the District's land use files.

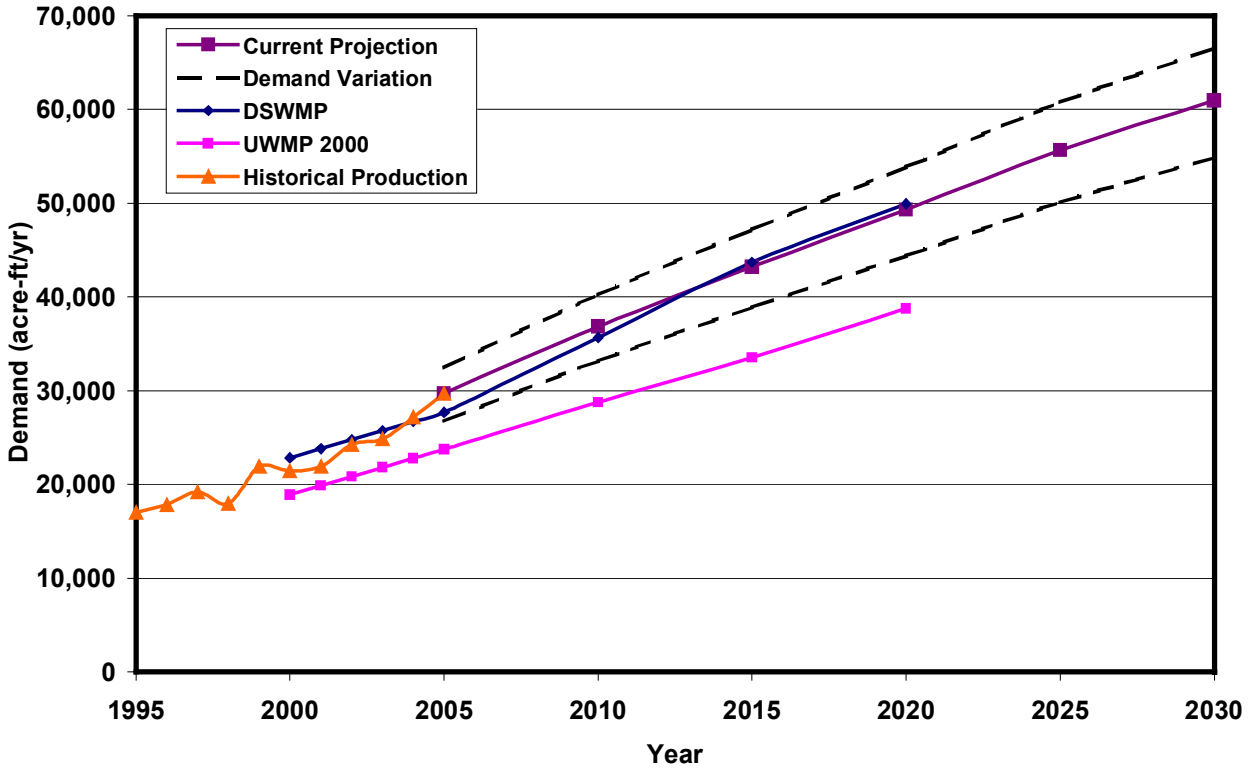
The revised potable water demand projections are shown in **Table 3-21** and **Figure 3-7**. The revision accounts for conversions from existing potable to recycled use (see **Section 6** for more detail). Total potable water demands are expected to nearly double between 2005 and 2030.

Table 3-21
Revised Potable Water Demand Projections

Year	Average Annual Demand (acre-ft/yr)	Below Normal Annual Demand (acre-ft/yr)	Above Normal Annual Demand (acre-ft/yr)	Average Day Demand (mgd)	Maximum Day Demand (mgd)
2005	29,716	26,744	32,450	26.5	53.1
2010	35,833	32,250	39,130	32.0	64.0
2015	41,186	37,067	44,975	36.8	73.6
2020	47,305	42,575	51,657	42.3	84.5
2025	53,630	48,267	58,564	47.9	95.8
2030	58,923	53,031	64,344	52.6	105.3

Note: MDD is estimated to be 2.0 times ADD.

Figure 3-7
Comparison of Total Water Demand Projections



Future water demands are projected for developments that EVMWD has already committed to serve through will-serve letters. The letters are valid for a fixed time period (normally one year)

and are subject to a set of conditions. Water duties developed for the DSMP as shown in **Table 3-22** are used for demand projections and tracking future growth.

A typical single-family home is considered to be one equivalent dwelling unit (EDU). The demand of one EDU is 400 gal/day. Conversion factors for each land use category to EDU are also shown in **Table 3-22**.

Table 3-22
Water Duties

Land Use Category	Water Duties	Duties Unit	Conversion to EDU	EDU Conversion Unit
Low Density Residential (less than 4 DU/acre)	500	gal/day/DU	1.25	DU/EDU
Medium Density Residential (4 to 12 DU/acre)	400	gal/day/DU	1.0	DU/EDU
High Density Residential (greater than 12 DU/acre)	300	gal/day/DU	0.75	DU/EDU
Commercial	3,000	gal/day/acre	8.0	acres/EDU
Parks/Irrigation	4,000	gal/day/acre	10.0	acres/EDU
Schools	60	gal/day/student	0.15	students/EDU

Proposed Developments

EVMWD has already committed to serve 128 developments through will-serve letters (EVMWD, 2005b). Based on the water duties in **Table 3-22**, the projected total future average-year potable water demand for these developments is 14,244 acre-ft/yr (12.72 mgd). These demand projections represent the build-out demand for all developments that EVMWD has committed to serve Proposed developments without will-serve letters are not included in this total, but are included in the 25-year projections. Under state law, developments having more than 500 units or the equivalent demand must have water supply assessments performed for them to confirm EVMWD's ability to meet their projected demand. EVMWD will perform a water supply assessment when new large developments are proposed that have not been issued will-serve letters, but their demand is included in the demand projections shown in **Table 3-21**. In order to perform the assessment, EVMWD would review the projected demand of the proposed development and make a finding that it is consistent with the projected demands and available supplies..

Projected demands for each of the developments with will-serve letters are calculated using the following methods:

- where development or region-specific water master plans have been developed, the demand projections were used directly from these documents
- where the number of lots was known, demand projections were calculated based on the density of the development (dividing number of lots by total acreage) and number of lots
- the Lake Elsinore Unified School District was contacted to determine the number of students for new schools or additional students for school expansions

- where no other data was available, the demand projections were calculated based on the number of acres and potential land use

When completed, these developments will add 12.72 mgd or 14,244 acre-ft/yr of new water demands in average-demand years.

As shown in **Table 3-23** over 38 percent of the committed demand (4.85 mgd or 5,433 acre-ft/yr) is under construction and over 23 percent (2.95 mgd or 3,305 acre-ft/yr) is in the design/plan check process. In addition to these committed demands, 17,064 acre-ft/yr (15.22 mgd) of additional new demand is expected to occur over the next 25 years as a result of developments that have not entered the planning process. The committed demands presented in **Table 3-23** are based upon EVMWD's monthly engineering project status as of July 2005 and include those committed demands that will be converted to recycled demands in the future.

Table 3-23
Summary of Committed Water Demand by Development Status

Development Status	Number of Developments	Acres	Total EDUs	Demand (gal/day)
Proposed	2	240	415	175,000
Planning	54	5,520	10,880	4,740,000
Design - Plan Check	18	2,140	4973	2,951,000
Under Construction	54	4,645	11,520	4,849,000
TOTAL	**128**	**12,546**	**27,788**	**12,715,000**

Reference: EVMWD Monthly Engineering Project Status, July 2005 (EVMWD, 2005a).

3.7.1 Summary of Projected Demands

Table 3-24 presents the projected potable water demand in 2030. By 2030, annual demands in average years are expected to be about 59,000 acre-ft/yr, which includes a demand reduction due to the conversion of existing users to recycled water (see **Section 6**). It is assumed that there is no reduction due to passive conservation. In dry years, the potable water demand may increase to about 64,300 acre-ft/yr. The MDD is based on 2.0 times the ADD in normal water years and is projected to be 105.3 mgd. This table shows that committed demands with will-serve letters represent about 24 percent of the future demand with additional planned growth representing about 29 percent of the future demand. The projected growth in demand is shown on **Figure 3-8**. **Figure 3-9** shows a comparison of the existing and projected average day and maximum day demands. Committed demand represents projected growth through about 2017. As mentioned before, it is expected that additional developments will enter the planning process over time, increasing future demands.

Table 3-24
Summary of Potable Water Demands – 2030

Demand Category	Normal year (acre-ft/yr)	Below Normal Year (acre-ft/yr)	Above Normal Year (acre-ft/yr)	ADD (mgd)	MDD (mgd)
Existing Demands	29716	26744.4	32450	26.5	53.1
Conversion to Recycled	-2013	-1812	-2198	-1.8	-3.6
Committed Demands	14244	12820	15554	12.7	25.4
Remaining future Demand	16976	15278	18538	15.2	30.3
Total Annual Demand	**58923**	**53031**	**64344**	**52.6**	**105.3**

Figure 3-8
Existing and Projected Potable Water Demand 2000-2030

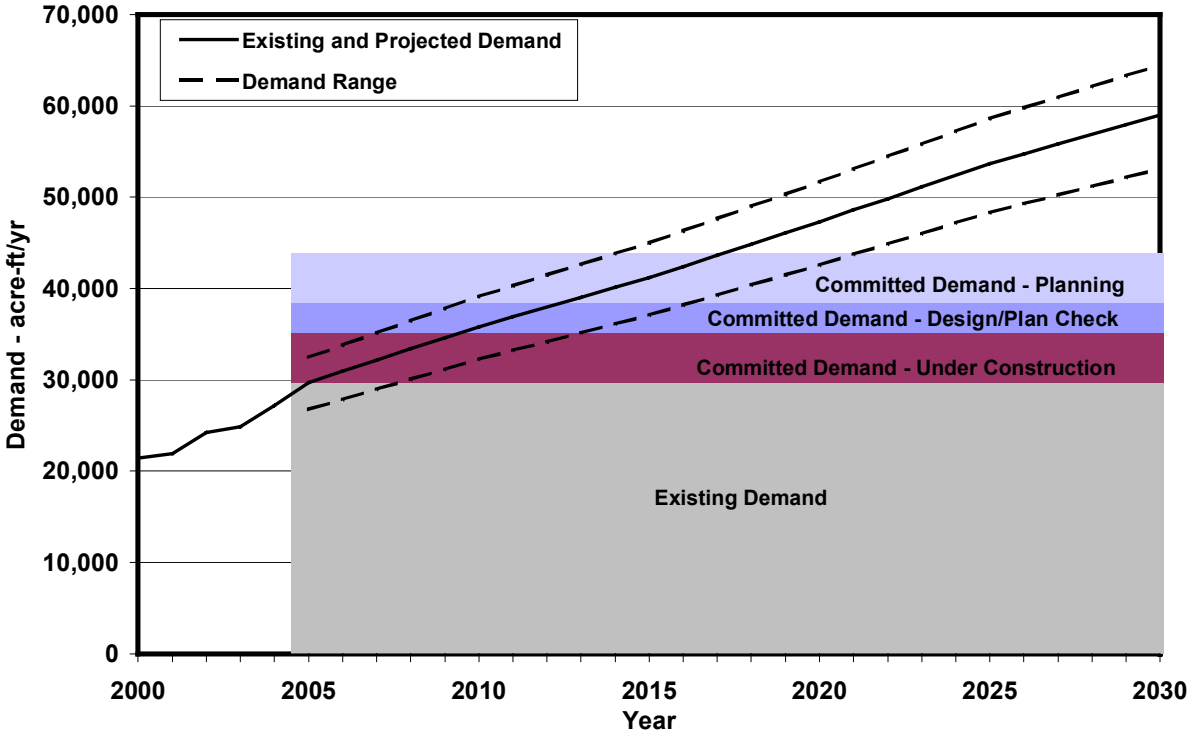
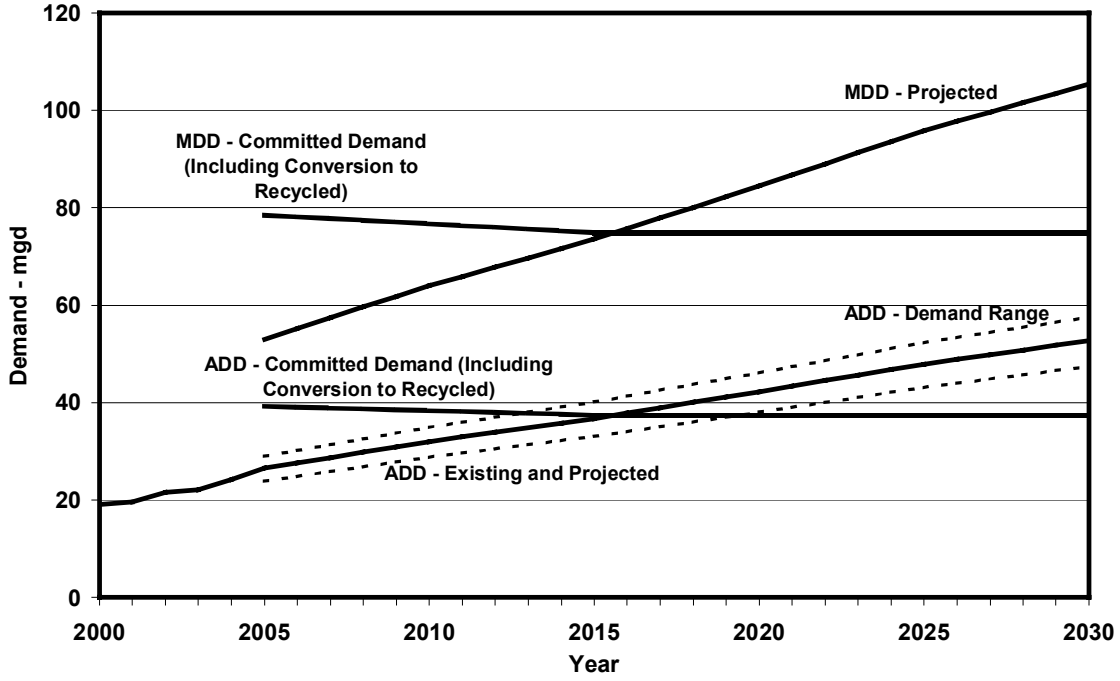


Figure 3-9
Existing and Projected Average Day and Maximum Day Water Demand
2000-2030



The total projected demand in 2030 is shown in **Table 3-25**. See **Section 6** for a detailed discussion of non-potable demands.

Table 3-25
Summary of Existing and Planned Future Water Demands – 2030

Demand Category	Average Year (acre-ft/yr)	Wet Year (acre-ft/yr)	Dry Year (acre-ft/yr)
Potable Demands	58,923	53,031	64,344
Non-Potable Demands	14,830	8,037	20,052
Total Demand	**73,753**	66,378	80,538

3.8 PLANNED WATER SUPPLY PROJECTS AND PROGRAMS

Water Code Section 10631(h): *Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total protected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the*

water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

Planned water supply projects and programs for EVMWD were discussed earlier in this section. **Table 3-11** summarizes the water supply source, the capacity, and the projected available water supply for an average year, a single dry year, multiple dry years, and a single wet year.

3.9 DEVELOPMENT OF DESALINATED WATER

Water Code Section 10631(i): *Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.*

EVMWD has no plans for the development of desalinated water for use as a long-term water supply, as indicated in **Table 3-26**. EVMWD is not located near an ocean water supply, and the groundwater extracted from the EVMWD's wells does not have a high enough salinity content to require desalination.

Table 3-26
Opportunities for Desalinated Water

Sources of Water	Yield (acre-ft/yr)	Start Date	Type of Use	Other
N/A	N/A	N/A	N/A	N/A

3.10 CURRENT OR PROJECTED SUPPLY INCLUDING WHOLESALE WATER

Water Code section 10631(k)*: Urban water suppliers that rely upon a wholesale agency for a source of water, shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water -year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).*

EVMWD currently receives imported water, as needed, for its retail service area from MWDSC through Western MWD. **Table 3-27** summarizes the demand projections provided to MWDSC from Western MWD for the period of 2005 to 2030.

Table 3-28 summarizes the information provided to Western MWD from MWDSC on the planned sources and quantities in their Regional Water Management Plan (Metropolitan Water District of Southern California, 2005b). MWDSC's average supply capability for all its member agencies exceeds the estimated demand.

Table 3-27
Average Demand Projections Provided to Wholesale Suppliers (acre-ft/yr)

Wholesaler	2010	2015	2020	2025	2030
Estimated Retail Demand	34,450	39,435	45,186	51,152	56,436
Estimated Wholesale Demand	1,383	1,751	2,119	2,478	2,487

1- Retail demand includes water loss (Western MWD, 2005. *Western MWD 2005 Urban Water Management Plan*, October 14, 2005.)

Table 3-28
Wholesaler Identified and Quantified Existing and Planned Sources of Water Available (acre-ft/yr)

Wholesaler Sources	2010	2015	2020	2025	2030
MWDSC					
Current Supplies					
Colorado River	711,000	678,000	677,000	677,000	677,000
California Aqueduct	1,772,000	1,772,000	1,772,000	1,772,000	1,772,000
In-Basin Storage	0	0	0	0	0
Supplies Under Development					
Colorado River	0	0	0	0	0
California Aqueduct	185,000	185,000	240,000	240,000	240,000
Transfers to Other Agencies	0	0	0	0	0
Maximum Supply Capability[1]	2,688,000	2,600,000	2,654,000	2,654,000	2,654,000

1- Represents expected supply capability for resource programs for all of MWD (Western MWD, 2005. *Western MWD 2005 Urban Water Management Plan*, October 14, 2005.)

As previously discussed, MWDSC can maintain reliable supplies under the conditions that have existed in past dry periods through the period of 2005 to 2030. **Table 3-29** summarizes MWDSC's expected reliability for periods of drought. Potential inconsistencies in MWDSC supplies are summarized in **Table 3-30.**

Table 3-29
Wholesale Supply Reliability – Percent of Normal Supply

Wholesaler Source	Single Dry-Year	Multiple Dry Years		
		Year 1	Year 2	Year 3
MWDSC	100	100	100	100

Reference: Western MWD, 2005. *Western MWD 2005 Urban Water Management Plan*, October 14, 2005.

Table 3-30
Factors Resulting in Inconsistency of Wholesaler's Supply

Name of Supply	Legal	Environmental	Water Quality	Climatic
MWDSC	Competition for New Supplies	Endangered Species	• Contamination of Supply • More Stringent Water Quality Standards	Drought Conditions

Reference: Western MWD, 2005. *Western MWD 2005 Urban Water Management Plan*, October 14, 2005.

Section 4
Determination of DMM Implementation

Water Code Section 10631.5: *The department shall take into consideration whether the urban water supplier is implementing or scheduled for implementation, the water demand management activities that the urban water supplier identified in its urban water management plan, pursuant to Section 10631, in evaluating applications for grants and loans made available pursuant to Section 79163. The urban water supplier may submit to the department copies of annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities.*

4.1 DMM IMPLEMENTATION

EVMWD became a signatory to the California Urban Water Conservation Council (CUWCC) MOU regarding Urban Water Conservation in California on December 11, 2002. A copy of the 2004 Retail Best Management Practices Report, 2004 Wholesale Best Management Practices Report, 2003-2004 Coverage Report, and Total Savings Report are presented in **Appendices D** to provide documentation of Demand Management Measure (DMM) implementation.

4.2 DEMAND MANAGEMENT MEASURES

Water Code Section 10631 (f & j):
(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

- *(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:*
  - *(a) Water survey programs for single-family residential and multifamily residential customers.*
  - *(b) Residential plumbing retrofit.*
  - *(c) System water audits, leak detection, and repair.*
  - *(d) Metering with commodity rates for all new connections and retrofit of existing connections.*
  - *(e) Large landscape conservation programs and incentives.*
  - *(f) High-efficiency washing machine rebate programs.*
  - *(g) Public information programs.*
  - *(h) School education programs.*
  - *(i) Conservation programs for commercial, industrial, and institutional accounts.*
  - *(j) Wholesale Agency Programs.*
  - *(k) Conservation pricing.*
  - *(l) Water conservation coordinator.*
  - *(m) Water waste prohibition.*

(n) *Residential ultra-low-flush toilet replacement programs.*

(2) A schedule of implementation for all water demand management measures proposed or described in the plan.

(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.

(j) Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to that council in accordance with the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated September 1991, may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).

4.2.2 Review of Water Demands

Conservation measures should target water use sectors that have the highest demand or where water savings can be achieved at low cost.

The major focus of the conservation program should be residential water use, both single and multi-family, because they comprise almost 64 percent of the total water use in EVMWD's service area in 2004 (EVMWD, 2004b). Many of the homes are now built with water-efficient plumbing fixtures to comply with state and local ordinances, so conservation of outdoor water uses should be emphasized.

4.2.3 List of Best Management Practices

The intent of the BMPs is to encourage water utilities to evaluate a number of measures and use those that are appropriate as the cornerstone of their conservation program. All customer classes are targeted by BMPs to make a comprehensive water conservation program.

The current list of BMPs in California contains 14 practices or measures. The list developed in 1991 by the California Urban Water Conservation Council contained 16 measures. The list was changed in 1997 when four measures were dropped, two new ones added, and revisions were made to others.

Table 4-1 lists the BMPs from the MOU with their targeted customer categories (EVMWD, 2004b).

Table 4-1
Best Management Practices with Targeted Customer Categories

Measure	Targeted Customer Categories
1. Water Survey Programs for Single-Family Residential and Multi-Family Residential Customers	Single-Family and Multi-Family Residential
2. Residential Plumbing Retrofit	Pre-1992 Single-Family and Multi-Family Residential Dwellings
3. System Water Audits, Leak Detection, and Repair	System
4. Metering with Commodity Rates for all New Connections and Retrofit of Existing Connections	All
5. Large Landscape Conservation Programs and Incentives	Irrigation Accounts
6. High-Efficiency Washing Machine Rebate Programs	New & Existing Residential
7. Public Information Programs	All
8. School Education Programs	Residential
9. Conservation Programs for Commercial, Industrial, and Institutional (CII) Accounts	CII
10. Wholesale Agency Assistance Programs	All (not applicable to retail customers)
11. Conservation Pricing	All
12. Water Conservation Coordinator	All
13. Water Waste Prohibition	All
14. Residential ULFT Replacement Programs	Residential

EVMWD has had an active water conservation program ever since the 1986-92 drought. The program will continue to expand as staffing and budget allows. Further discussion of the above listed BMPs and the steps EVMWD is taking to implement them is provided below.

In addition to starting implementation on all BMPs, the MOU requires that signatories achieve a specified level of coverage for each of the BMPs (EVMWD, 2004a). For most of the BMPs, there are multiple criteria to be checked in order to meet coverage requirements. For instance in BMP 1 "Water Survey Programs for SFR and MFR Customers", there are two conditions for evaluating coverage. One is that EVMWD must offer surveys to at least 20 percent of the number of all SFR and MFR accounts each reporting period. The second is that by the year 2012, surveys must be completed for at least 15 percent of all SFR and MFR accounts that existed in 2002. **Table 4-4** summarizes the criteria for coverage, whether coverage criteria are met, and required actions for EVMWD to achieve full compliance with the requirements of the MOU. If full coverage has already been achieved, "N/A" (not applicable) is indicated.

The duration allowed for achieving full coverage varies by BMP. The maximum duration is 10 years from the date that initial implementation is required. Since the latest year that implementation must start is 2005, the maximum duration for full implementation ends in 2015.

However, the expiration of agencies' signatures on the MOU is 10 years from the date of signature, which is December 2012 for EVMWD. After that point, each agency is to renew its commitment to the MOU on an annual basis. Therefore, it is recommended that EVMWD plan to achieve full coverage of each BMP no later than fiscal year (FY) 2012.

BMP 1 – Water Survey Programs for Single-Family Residential (SFR) and Multi-Family Residential (MFR) Customers

Implementation of BMP 1 was required to begin by December 10, 2004. The coverage requirements are: (1) Adopt a targeting and marketing strategy by December 10, 2004; (2) Offer surveys to 20 percent of SFR and 20 percent of MFR accounts each reporting period; and (3) Complete surveys for 15 percent of SFR and 15 percent of MFR accounts existing in the signatory year within 10 years of the implementation date, or by 2014. In 2002, there were 28,038 SFR accounts and 408 MFR accounts. EVMWD is considered on track if surveys are completed for 1.5 percent of accounts by 2005, 3.6 percent by 2006, 6.3 percent by 2007, 9.6 percent by 2008, 13.5 percent by 2009, and 15 percent by 2010.

EVMWD offers an indoor and outdoor water survey to existing single-family and multi-family residential customers with high water use through the services of the Riverside-Corona Resource Conservation District (RCD). The top 20 percent of water users are targeted for surveys to achieve the most significant water savings. Home water surveys have also been offered to attendees of EVMWD's annual landscape workshops. Surveys predominantly focus on outdoor water use, identifying water waste, improving water use efficiency, and preparing a customized lawn irrigation schedule. Indoor surveys are also routinely performed during the in-home verifications of the purchase of high-efficiency washing machines and ultra-low-flush toilets. In July 2004, a conservation brochure was designed and distributed to assist customers in performing their own home water survey.

EVMWD has also been successful in involving the community with home water surveys. In addition to school-based education programs, students are asked to complete a home water survey with their family and discuss the results. Service groups like the Boy Scouts have also participated in conducting water surveys as part of a community service program.

EVMWD implemented their targeting and marketing strategy in 1991 for SFRs only. They offered 150 and completed 8 surveys in 2004. In order to meet full coverage requirements, EVMWD must complete surveys for 4,151 more SFR accounts and 61 more MFR accounts.

BMP 2 – Residential Plumbing Retrofit

Implementation of BMP 2 was required to begin by July 1, 2004. EVMWD must distribute or directly install low-flow showerheads to 10 percent of SFR accounts and 10 percent of MFR accounts constructed prior to 1992 during each reporting period. These showerhead conversion requirements continue until 75 percent is reached for both SFR and MFR accounts. In 1992, there were 19,729 SFR and 347 MFR accounts.

Homes built before 1980 generally do not have low-flow showerheads, low-flush toilets, or faucet aerators. Even some homes built prior to 1992 may not have these devices because of

poor plumbing code enforcement. The U.S. Energy Policy Act of 1992 has required 1.6 gallons per flush (gpf) toilets, 2.5 gpm showerheads, and 2.5 gpm faucets since January 1, 1994. As homeowners remodel older homes or desire to replace plumbing fixtures, these older homes will, over many years, be brought up to code.

EVMWD implemented a targeting and marketing strategy for distributing low-flow devices in 1997. MWDSC launched a showerhead give-away program and distributed toilet water displacement devices, which EVMWD assisted customers to participate in. In January 2004, EVMWD launched its own showerhead give-away program for all customers whose homes were built before 1994. Customer notification is achieved through press releases, flyers included with bills, cable TV public service announcements, and promotions at community outreach events. This program is totally funded by EVMWD.

Recently, EVMWD has sent a conservation letter and kits designed by Niagara Conservation to high water users. These kits include water-efficient gardening equipment retrofits, such as low-flow nozzles.

To-date, EVMWD has distributed 127 showerheads to SFR accounts and 19 to MFR accounts. In order to meet full coverage requirements, EVMWD must distribute 14,670 more showerheads to SFR accounts and 241 more to MFR accounts.

BMP 3 – System Water Audits, Leak Detection, and Repair

Implementation of this BMP was required to begin by July 1, 2004. EVMWD must do the following: (1) Track and report unaccounted-for-water losses and take action if losses exceed 10 percent. (2) Maintain a leak detection program.

Some unmetered water uses that contribute to unaccounted-for-water are authorized by EVMWD. Unmetered uses include flushing hydrants by fire departments or water use in unmetered EVMWD buildings. The remainder of unaccounted-for water is caused by system leaks or meter inaccuracy. The purpose of this measure is to reduce leaks from older systems and from broken pipes, joints, or valves. This BMP requires no action if unaccounted-for water is less than 10 percent (other than studies to verify that it is). Starting in 1995 after system rehabilitation efforts by EVMWD, unaccounted-for water dropped below 10 percent and has remained below 10 percent since then. EVMWD monitors unaccounted-for water by comparing water produced with water sales system-wide on a monthly basis (EVMWD, 2004. *Comprehensive Annual Financial Report for the year ended June 30, 2004*, December 2004.). Should the unaccounted-for water exceed 10 percent on an annual basis, EVMWD will undertake a system water audit to identify leaks. If cost-effective, EVMWD will increase leak detection and repair efforts and a meter replacement program if not already in-place, until the unaccounted-for water is reduced below 10 percent.

EVMWD has included funds in its most recent budget to increase the budget for the leak detection program. It is anticipated that reducing unaccounted-for-water leak detection and improving repair efforts will be a major focus of EVMWD during 2006.

Since EVMWD does not have an unaccounted-for-water loss of more than 10 percent, currently in compliance and not required to perform an audit.

Although EVMWD does not have an official leak detection program, it has equipment to detect leaks in selected areas on an as-needed basis. EVMWD plans to implement an official leak detection program in 2006.

BMP 4 – Metering with Commodity Rates for all New Connections and Retrofit of Existing Connections

Implementation of BMP 4 was required to begin by July 1, 2005. EVMWD must meet the following conditions to comply with the coverage requirements: (1) Be on track to retrofit 100 percent of its unmetered accounts within 10 years of the implementation date; (2) Meter all new connections and bill by volume-of-use; and (3) Conduct feasibility study for retrofitting mixed-use CII meters.

EVMWD has no unmetered accounts aside from those authorized for usage. EVMWD also requires meters for all new connections and bills by volume-of-use. Therefore, they are in compliance with this requirement.

EVMWD has retrofitted 916 mixed-use CII accounts with irrigation meters in 2004. However, they report that they "have no method in place to identify the amount of CII accounts with mixed- use meters." (EVMWD, 2004b). MWH recommends that EVMWD implement a survey of their CII accounts to identify mixed-use meters and perform the required feasibility study, although this is not required to maintain compliance.

BMP 5 – Large Landscape Conservation Programs and Incentives

Implementation of BMP 5 was required to begin by July 1, 2005. EVMWD must meet the following conditions to comply with the coverage requirements: (1) Complete budgets for 90 percent of irrigation accounts by July 1, 2007; (2) Maintain an incentive program for retrofitting irrigation meters; and (3a) Offer surveys to 20 percent of CII accounts with mixed-used meters each reporting period. Since EVMWD has no method in place to identify the amount of CII accounts with mixed use meters, the total number of CII accounts was used in calculations; (3b) Complete surveys for 15 percent of CII accounts with mixed-use meters existing in the signatory year within 10 years (2015) of implementation date.

EVMWD will be on track if surveys are completed for 1.5 percent of accounts by the end of first reporting period (2006) following the implementation date, 3.6 percent by 2007, 6.3 percent by 2008, 9.6 percent by 2009, 13.5 percent by 2010, and 15 percent by 2011. Agencies can instead meet this requirement by maintaining a program to retrofit mixed-use accounts with dedicated irrigation meters. Agencies can also give mixed-use accounts irrigation water budgets that are based on evapotranspiration rates to serve as reference. EVMWD should provide notices during each billing cycle to these accounts comparing their budgets to actual use.

This measure is designed to reduce peak demand by improving outdoor irrigation efficiency. The MOU identifies all public and private irrigators of landscapes larger than one acre as

candidates for this measure. EVMWD provides non-residential customer support and incentives to improve their landscape water use efficiency. The support varies depending on whether the account has a dedicated landscape meter, which is common for larger sites.

Large landscape water audits have been promoted through the local school district and through the City of Lake Elsinore. Audits were performed by the RCD upon request from EVMWD. Large landscape water users can take advantage of this water audit program, along with the six-course landscape professionals training program "Protector del Agua." This course teaches water efficiency to landscape maintenance workers.

Most large landscape water users are public parks, schools, and locations with large public common areas. During 2005, the Tuscany Hills development was over-watering its large common areas because its standard irrigation controllers required users to calculate complex irrigation schedules and run-times that did not adjust to changing weather conditions. EVMWD offered a $62,000 rebate to the development to replace its standard irrigation controllers with weather-based evapotranspiration (ET) controllers, which automatically adjust the amount of water applied to the landscape based on weather conditions. Replacing the standard irrigation controllers with weather-based ET controllers resulted in reduced irrigation in the Tuscany Hills development.

EVMWD implemented a marketing/targeting strategy for landscape surveys in 1994. They have offered 6 surveys and completed none. If the survey results indicate a need for ET-controller devices, EVMWD provides information on them. They also provide information on rebates for other recommended items if available. Large-landscape water audits are provided by RCD. EVMWD has 916 dedicated irrigation meters and they do not provide ETo-based water budgets.

In order to achieve compliance, EVMWD must develop ETo-based water budgets for 770 of its dedicated irrigation accounts and complete surveys for 79 more of its dedicated irrigation accounts.

BMP 6 – High-Efficiency Washing Machine Rebate Programs

Implementation of BMP 6 was required to begin by July 1, 2004. EVMWD must offer a financial incentive (rebate) from July 1, 2004 to Jan 1, 2007. Agencies must achieve a coverage goal equal to the number of dwelling units in the service area multiplied by 0.048. Points are awarded based on the number of rebates awarded towards a certain type of washing machine. EVMWD is considered on track if they earn points as a percentage of the CG according to the following schedule: 10 percent by January 1, 2005, 30 percent by July 1, 2005, 50 percent by January 1, 2006, 75 percent by July 1, 2006, and 100 percent by January 1, 2007.

EVMWD encourages customers to purchase high-efficiency (side-loading) washing machines. These washing machines can reduce water usage by about one-third, but are currently more expensive than conventional washing machines. EVMWD works with MWD to promote these machines and pass through the $110 MWDSC washing machine rebate to its customers. EVMWD also includes an additional $15 rebate to their customers, resulting in a total rebate of $125 per machine (EVMWD, 2004b). Availability of the rebate is advertised in water bill inserts twice per year. Large home improvement stores including Home Depot, Lowe's, and Sears have

all been informed about the appliance rebate program and are an integral part of promoting the rebate program to their customers.

The total number of dwelling units was obtained using GIS analysis of SCAG census projections in the EVMWD service area, resulting in an estimate of 32,822 households in 2007, which was used to calculate the coverage goal of 1,575 points. Using conservative assumptions for earning points, EVMWD would earn 1 point for each rebate for a High-Efficiency Washing Machines (HEW) with a water factor value between 8.5 and 9.5. EVMWD reported awarding 375 rebates as of June 1, 2004, equal to 375 points. In order to achieve full compliance, EVMWD needs to award 1,145 more rebates by 2007.

BMP 7 – Public Information Programs

Implementation of BMP 7 was required to begin by July 1, 2004. EVMWD must implement and maintain a public information program to promote and educate customers about water conservation.

EVMWD has a program and therefore is in compliance. EVMWD will continue current programs, which include:

- Co-sponsoring the annual City of Lake Elsinore Neighborhood Prize Contest.
- Participating in the statewide Water Awareness Month.
- Putting additional and updated conservation information on EVMWD's web site.
- Continuing to promote water conservation with water bill inserts in the spring and summer.

The public information program consists of legislative and community outreach programs, including an extensive water education program directed to public schools, and conservation programs directed to residential, commercial, and institutional customers. Annual landscape design classes are given to residential customers, along with water audits to commercial and industrial customers. Monthly billing inserts, website access, tours, and outreach through community events are also provided. All of the residential rebate programs are promoted on a regular basis. Community outreach is also extended with a sponsorship program that includes donations of bottled water which carry the conservation message to thousands of customers per year.

BMP 8 – School Education Programs

Implementation of BMP 8 was required to begin by July 1, 2004. EVMWD must implement and maintain a school education program to promote water conservation.

Long-term results to eliminate wasteful water-use habits are best achieved by the education of youth. EVMWD has had a school education program since 1987 and has a good relationship with the local school district. The program utilizes educational and theatrical presentations, poster contests, printed educational materials, and science fair support to target school-age children. They, in turn, inform their parents of the importance of water conservation in Southern

California. Teaching children to respect the value of water helps them grow into responsible adults with a conservation ethic. Educational material meets state education frameworks and grade appropriate materials are distributed to grade levels K-3, 4-6, 7-8, and high school. EVMWD plans to continue its program at current levels and look for new material to keep the program current and interesting to students on an on-going basis with the pretext of expanding the program over the next few years. Thus, EVMWD is in compliance with the requirements of this BMP.

BMP 9 – Conservation Programs for Commercial, Industrial, and Institutional (CII) Accounts

Implementation of BMP 9 is required to begin by July 1, 2005. EVMWD must do the following: (1) Identify and rank by use commercial, industrial, and institutional accounts and (2) EVMWD has an option to survey 10 percent of CII accounts within 10 years of the implementation date, to reduce CII water use by 10 percent of the 1997 CII water use within 10 years of the implementation date (by 2015), or do both. EVMWD is exempt from the part of this BMP requiring a 3-year-long CII ULFT program because it signed the MOU after July 1, 2001.

Based on EVMWD's reporting to the CUWCC, it has chosen to reduce water use. EVMWD has identified and ranked by use the CII accounts. EVMWD is considered on track if savings are 0.5 percent of baseline water use by 2006, 2.4 percent by 2007, 4.2 percent by 2008, 6.4 percent by 2009, 9.0 percent by 2010, and 10 percent by 2011.

EVMWD reports that this program is currently not being implemented due to the low CII development in EVMWD's service area. However, the employment growth rate is projected to be higher than the population growth rate over the next twenty years. Nearly all of these businesses have or are anticipated to have the low-flow plumbing fixtures and other water-saving equipment. Depending on the nature of the commercial establishments that develop into the area, the opportunities of implementing this BMP are expected to increase in the future. In the meantime, EVMWD plans to track the consumption of CII customers on a monthly basis and urge those with significant irrigation water use to install irrigation meters (BMP 4).

Current CII customers receive information about the availability of incentives. If CII customers are interested, EVMWD provides programs offered through MWDSC, including the "Save A Buck" program. MWDSC offers this program to help businesses become more aware of the water-saving technologies available, and to provide the necessary financial incentives to encourage their implementation. The "Save A Buck" program helps to lower water and sewer bills, reduces energy costs, results in environmental benefits, and improves water efficiency through rebates for replacing toilets, spray valves, cooling conductivity controllers, and commercial clothes washers.

EVMWD estimated that since 1991, it has saved 0.35 acre-ft/year from site-verified actions taken by EVMWD and 3.14 acre-ft/yr from non-site-verified actions. To achieve full compliance, it must reduce water use by a total of 127 acre-ft by 2010.

BMP 10 – Wholesale Agency Assistance Programs

Implementation of BMP 10 was required to begin by July 1, 2005. EVMWD must meet the following condition to comply with the coverage requirements: Offer financial support, technical support, staff resources, and regional programs to the retail end-users of its wholesale customers. EVMWD is in compliance.

EVMWD supplies a small amount of wholesale water to three retail water utilities. EVMWD implemented this BMP by allowing the water retailers' customers to directly participate in EVMWD's programs. For example, they are eligible for retrofit kits, audits, and rebates just as EVMWD's retail customers are. EVMWD is in compliance with this BMP.

BMP 11 – Conservation Pricing

Implementation of BMP 11 is required to begin by July 1, 2004. EVMWD must implement a conservation pricing rate structure.

EVMWD has an increasing block structure in place for its residential customers, which use most of the water. All other customers pay for water on a uniform rate basis (EVMWD, 2004b). EVMWD is in compliance with this BMP and intends to keep this rate structure in place during the time horizon of this UWMP.

BMP 12 – Water Conservation Coordinator

Implementation of BMP 12 was required to begin by July 1, 2004. EVMWD must staff and maintain the conservation coordinator position and provide support staff as necessary.

EVMWD has designated a part-time (50 percent) water conservation coordinator supported by administrative staff as needed. Duties of the coordinator are:

- Coordination and oversight of conservation programs and BMP implementation.
- Preparation and submittal of the progress reports to various parties.
- Communication and promotion of water conservation issues to senior agency management, coordination with operations and planning staff, preparation of an annual conservation budget, and preparation of water conservation plan updates.

EVMWD plans to hire a full-time conservation staff member by the end of 2005 to expand the conservation programs in EVMWD's service area. EVMWD hired O'Reilly Communications to assist with public notifications, billing inserts, and mass mail-outs, which has increased the water conservation budget.

EVMWD is in compliance with this BMP.

BMP 13 – Water Waste Prohibition

Implementation of BMP 13 was required by July 1, 2004. EVMWD must enact and enforce measures prohibiting gutter flooding, single-pass cooling systems in new connections, non-

recirculating systems in all new conveyor car wash and commercial laundry systems, and non-recycling decorative water fountains.

EVMWD has ordinances prohibiting water waste in times of declared water shortage, but it does not meet the requirements of this BMP. Currently, EVMWD requests customers to voluntarily install non-single pass cooling systems, recirculating conveyor car wash systems, and recirculating commercial laundry systems. There was a court case in Escondido whereby a resident challenged a city water softener ordinance and won. As a result, most water agencies in California, including EVMWD, cannot enforce such prohibitions.

EVMWD plans to enact and enforce the measures defined in this BMP in 2006 (EVMWD, 2004b).

BMP 14 – Residential Ultra-Low-Flush Toilet (ULFT) Replacement Programs

Implementation of BMP 14 was required to begin by July 1, 2004. EVMWD must meet the following conditions to comply with the coverage requirements: (1) Implement a ULFT replacement program at least as effective as requiring replacement on resale within 10 years of the implementation date. (2) Achieve water savings from residential ULFT replacement programs equal to 90 percent of the Exhibit 6 (Assumptions and Methodology for Determining Estimates of Reliable Water Savings from the Installation of ULF Toilets) coverage requirement. EVMWD did not provide any data for Exhibit 6 calculations. The 2003-2004 Coverage Report "treats an agency with missing base year data required to complete the Exhibit 6 coverage requirement as out of compliance." However, some of the required information could be estimated from data found on the web sites of Lake Elsinore, the US Census Bureau, and the California Department of Finance (see Appendix D). Reasonable assumptions were made for data that could not be obtained.

EVMWD has implemented a limited toilet replacement program offering incentives to existing residential customers who replace their high water-use toilets with typically ULF toilets. ULFTs reduce toilet-flushing water to about 1.6 gpf. This is a significant water saving from an average of 5-7 gpf for regular toilets and 3.5 gpf for low-water-use toilets. Since January 1, 1994, the federal Energy Policy Act of 1992 has required toilets to use 1.6 gpf. In 2004, EVMWD awarded rebates to 135 SF accounts and 4 MF accounts. To achieve full compliance, it needs to award more rebates to be as effective in achieving water savings as requiring replacement on resale.

Because the Energy Policy Act requires the sale of low-flow fixtures, there is a significant chance of so-called "free-riders" with this measure. Moreover, it is not cost-effective to buy a ULFT without the MWDSC rebate. This is especially true if the overlap with natural replacement is considered. Therefore, EVMWD will pass the $60 MWDSC toilet rebate to its customers (EVMWD, 2004b). If customers install a dual-flush toilet, this rebate increases to $80. Since the objective is to convince customers who were not planning to replace their toilet to do so, customers remodeling their homes by permit, who are already obligated to use the 1.6 gpf toilets, will not be eligible. There is some administration cost for EVMWD, including program administration, publicity, and rebate distribution tracking. The availability of rebates is

promoted on local cable TV, via regularly issued press releases, at community outreach events, and in the lobby of EVMWD's headquarters.

4.3 SCHEDULE OF DMM IMPLEMENTATION

Table 4-2 presents the implementation schedule required by the MOU for each BMP, as well as the actual dates of implementation for retail and wholesale customers, if known.

Table 4-2
Implementation Schedule

Measure	Required Implementation Date	Retail Implementation Actual Date	Wholesale Implementation Actual Date
1. Water Survey Programs for Single-Family Residential and Multi-Family Residential Customers	December 10, 2004	On Sept. 15, 1991	NA
2. Residential Plumbing Retrofit	July 1, 2004	On Jan. 1, 1997	NA
3. System Water Audits, Leak Detection, and Repair	July 1, 2004	To be Implemented in 2006	Not Implemented
4. Metering with Commodity Rates for all New Connections and Retrofit of Existing Connections	July 1, 2005	Implemented	NA
5. Large Landscape Conservation Programs and Incentives	July 1, 2005	Implemented Jan. 1, 1994	NA
6. High-Efficiency Washing Machine Rebate Programs	July 1, 2004	Implemented	NA
7. Public Information Programs	July 1, 2004	Implemented	Implemented
8. School Education Programs	July 1, 2004	Implemented Mar. 18, 1991	Implemented Mar. 18, 1991
9. Conservation Programs for CII Accounts (Exception: EVMWD is not subject to the 3-Year Interim CII ULFT Program because it became a signatory after July 1, 2001.)	July 1, 2005	Implemented	NA
10. Wholesale Agency Assistance Programs	July 1, 2005	N/A	Implemented
11. Conservation Pricing	July 1, 2004	Implemented	Implemented
12. Water Conservation Coordinator	July 1, 2004	Implemented Mar. 18, 1991	Implemented Mar. 18, 1991
13. Water Waste Prohibition	July 1, 2004	To be implemented in 2006	NA
14. Residential ULFT Replacement Programs	July 1, 2004	Implemented Jan. 2001	NA

Sources: (1) California Urban Water Conservation Council (CUWCC), 2004. Memorandum of Understanding Regarding Urban Water Conservation in California, March 10, 2004.
(2) EVMWD, 2004. 2004 Best Management Practice Report, June 1, 2004.

4.4 CONSERVATION SAVINGS

Table 4-3 presents a summary of estimated savings-to-date in acre-feet for each of the BMPs, as reported by EVMWD to CUWCC in the Total Savings Report (EVMWD, 2005c). Water savings are estimated only for those BMPs for which savings can be quantified.

Table 4-3
Estimated Actual Water Savings

BMP Measure	Water Savings (acre-ft/yr)
1. Water Survey Programs for Single-Family and Multi-Family Residential Customers	3
2. Residential Plumbing Retrofit	1
4. Metering with Commodity Rates for all New Connections and Retrofit of Existing Connections	0
5. Large Landscape Conservation Programs and Incentives	5
6. High-Efficiency Washing Machine Rebate Programs	14
9. Conservation Programs for CII Accounts	8
9a. CII ULFT Water Savings	0
14. Residential ULFT Replacement Programs	87
Total	**117**

Source: EVMWD, 2005. Total Savings Report, 2005.

4.5 COVERAGE COMPLIANCE

The initial term of the MOU commenced on September 1, 1991 and will be in effect for ten years, after which it is automatically renewed on an annual basis as to all signatories unless a signatory withdraws. EVMWD signed the MOU in December 2002.

Table 4-4 summarizes the coverage criteria, actions implemented by EVMWD, and actions to be completed in order to meet the requirements of the MOU for each BMP.

presents a plan for completing implementation of the BMPs in the coming fiscal year 2005-2006 through 2011-2012. This period was selected to coincide with the remainder of the 10-year period commencing from EVMWD's signature of the MOU. The plan draws from coverage requirements and measures of schedule performance in the MOU, as well as actual coverage reported to-date by EVMWD.

also presents a projection of water savings resulting from implementation of the recommended plan. The per-unit savings used in this table are based upon the recently-completed Urban Water Management Plan for the City of Ontario (MWH, 2005c). The City of Ontario is also a signatory to the MOU and the service area is considered comparable in character and growth to EVMWD for BMP implementation planning purposes. It should be noted that water savings cannot be quantified for many of the BMPs.

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Table 4-4
BMP Coverage

BMP	On Track?	Coverage Criteria	Action completed by EVMWD	Actions To Meet Requirements by 2012
1. Water Survey Programs for Single-Family Residential and Multi-Family Residential Customers	NO	1. Adopt survey targeting and marketing strategy on time 2. Offer surveys to 20 percent of SFR accounts and 20 percent of MFR units during report period 3. Be on track to survey 15 percent of SFR accounts and 15 percent of MFR accounts existing in signatory year within 10 years of implementation start date.	1. Implemented SFR targeting and marketing strategy on 9/15/1991. 2. Offered 150 SFR surveys in 2004. 3. Completed 8 SFR surveys in 2004. Note: 28,038 SFR and 408 MFR accounts existed in 2002.	1. Implement MFR targeting and marketing strategy 2. Offer surveys to 20% of SFR and 20% of MFR each reporting period 3. Complete surveys for 4,151 more SFR accounts and 61 more MFR units.
2. Residential Plumbing Retrofit	NO	1. The agency has demonstrated that 75 percent of SFR accounts and 75 percent of MFR units constructed prior to 1992 are fitted with low-flow showerheads. 2. An enforceable ordinance requiring the replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts is in place for the agency's service area. 3. The agency has distributed or directly installed low-flow showerheads and other low-flow plumbing devices to not less than 10 percent of single-family accounts and 10 percent of multi-family units constructed prior to 1992 during the reporting period.	1. Implemented targeting and marketing strategy for distributing low-flow devices on 1/1/1997. 2. Distributed 127 showerheads to SFR and 19 to MRF accounts in 2004. Note: 19,729 SFR and 347 MFR accounts in 1992.	1. Distribute showerheads to 14,670 more SFR accounts and 241 more MFR units.
3. System Water Audits, Leak Detection, and Repair	YES	1. Perform an annual prescreening audit. If the result is equal to or greater than 0.9 nothing more needs be done. 2. Perform an annual prescreening audit. If the result is less than 0.9, perform a full audit in accordance with AWWA's Manual of Water Supply Practices, Water Audits, and Leak Detection.	1. EVMWD does not have an unaccounted-for-water loss of more than 10 percent. 2. EVMWD has equipment to search for a leak in a specific area where they suspect a leak on an as-needed basis.	1. EVMWD plans to implement an official leak detection and repair program in 2006.
4. Metering with Commodity Rates for all New Connections and Retrofit of Existing Connections	YES	1. An agency must be on track to retrofit 100 percent of its unmetered accounts within 10 years to be in compliance.	1. EVMWD requires meters for all new connections and bills by volume-of-use. 2. Retrofitted 916 mixed-use CII accounts with irrigation meters in 2004.	N/A
5. Large Landscape Conservation Programs and Incentives	NO	1. Develop water budgets for 90 percent of its dedicated landscape meter accounts within four years of the date implementation is to start. 2. (a) Offer landscape surveys to at least 20 percent of its CII accounts with mixed use meters each report cycle and be on track to survey at least 15 percent of its signatory year CII accounts with mixed use meters within 10 years of the date implementation is to start OR (b) Implement a dedicated landscape meter retrofit program for CII accounts with mixed use meters or assign landscape budgets to mixed use meters. 3. Implement and maintain customer incentive program(s) for irrigation equipment retrofits.	1. Implemented marketing and targeting strategy for landscape surveys on 1/1/1994. 2. Offered 6 surveys and completed none. 3. EVMWD has 916 dedicated irrigation meters. Note: EMVWD does not provide ETo-based water budgets.	1. Develop water budgets for 770 of its dedicated landscape meter accounts. 2. Offer landscape surveys to 20% of dedicated irrigation accounts each reporting period. Complete landscape surveys for 79 more dedication irrigation accounts.
6. High-Efficiency Washing Machine Rebate Programs	YES	1. Offer a cost-effective financial incentive for high-efficiency washers if one or more energy service providers in service area offer financial incentives for high-efficiency washers.	1. Awarded 375 rebates as of 6/1/2004. Note 1: Assumed lowest efficiency High-Efficiency Washing Machines so only 1 point will be earned for each rebate towards the Coverage Goal.	Award 1,200 more rebates.
7. Public Information Programs	YES	1. Implement and maintain a public information program to promote and educate customers about water conservation.	1. Implemented and maintained a public information program.	N/A
8. School Education Programs	YES	1. Implement and maintain a school education program to promote water conservation.	1. Implemented and maintained a school education program.	N/A

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Table 4-4 (Continued)
BMP Coverage

BMP	Coverage Met?	Coverage Criteria	Action completed by EVMWD	Actions To Meet Requirements by 2012
9. Conservation Programs for CII Accounts	YES	1. Agency has identified and ranked by use commercial, industrial, and institutional accounts. 2. (a): Agency is on track to survey 10 percent of commercial accounts, 10 percent of industrial accounts, and 10 percent of institutional accounts within 10 years of date implementation to commence. OR 2(b): Agency is on track to reduce CII water use by an amount equal to 10 percent of 1997 CII water use within 10 years of date implementation to commence. OR Condition 2(c): Agency is on track to meet the combined target as described in Exhibit 1 BMP 9 documentation.	1. Identified and ranked by use the CII accounts. 2. Based on the 2004 BMP Report and 2003-04 Coverage Report data, EVMWD has chosen the option to reduce water use. 3. Saved 0.35 acre-ft/yr from site-verified actions and 3.14 acre/ft/yr from non-site verified actions from 1991 to 6/1/2004. Note 1: 1997 data obtained from EVMWD's UWMP 2000. Assumed Comm'l + Other = CII customers. Note 2: EVMWD is except from the 3-year CII UFLT program because it signed the MOU after July 1, 2001.	1. Reduce water use by a total of 127 acre-ft
10. Wholesale Agency Assistance Programs	YES	1. Timely and complete reporting of all information as provided for under "Reporting and Record Keeping Requirements" in BMP 10. 2. Offer workshops covering all topics listed under "Technical Support" in BMP 10.	1. Offered financial support, technical support, staff resources, and regional programs to the retail end-users of its wholesale customers.	N/A
11. Conservation Pricing	YES	1. Agency shall maintain rate structure consistent with BMP 11's definition of conservation pricing. Implementation methods shall be at least as effective as eliminating non-conserving pricing and adopting conserving pricing. For signatories supplying both water and sewer service, this BMP applies to pricing of both water and sewer service. Signatories that supply water but not sewer service shall make good faith efforts to work with sewer agencies so that those sewer agencies adopt conservation pricing for sewer service.	1. Implemented an increasing block water rate structure for residential customers and a uniform water rate structure for CII and irrigation customers.	N/A
12. Water Conservation Coordinator	YES	1. Agency shall staff and maintain the position of conservation coordinator and provide support staff as necessary.	1. EVMWD has had a conservation coordinator since 3/18/1991.	N/A
13. Water Waste Prohibition	NO	1. Implementation methods shall be enacting and enforcing measures prohibiting gutter flooding, single pass cooling systems in new connections, non-recirculating systems in all new conveyer car wash and commercial laundry systems, and non-recycling decorative water fountains.	1. Requests customers to voluntarily install non-single pass cooling, recirculating conveyor car wash, and commercial laundry systems. Their existing ordinance does not enforce this. 2. Cannot enforce water softener ordinance due as a result of court case in Escondido.	1. EVMWD plans to update its water waste ordinance in 2006 to enact and enforce measures prohibiting gutter flooding, single-pass cooling, non-circulating car wash and laundry, and non-recycling decorative water fountains.
14. Residential ULFT Replacement Programs	NO	1. Water savings from toilet replacement programs equal to 90 percent of Exhibit 6 coverage requirement. This report treats an agency with missing base year data required to compute the Exhibit 6 coverage requirement as out of compliance.	1. EVMWD has not provided any data for Exhibit 6 calculations.	1. Achieve water savings from toilet replacement programs equal to 90 percent of MOU Exhibit 6 coverage requirement.

Sources: 1) California Urban Water Conservation Council (CUWCC), 2004. *Memorandum of Understanding Regarding Urban Water Conservation in California*, March 10, 2004.
2) EVMWD, 2004a. 2003-2004 Best Management Practice Coverage Report, June 1, 2004.
3) EVMWD, 2004b. 2004 Best Management Practice Report, June 1, 2004.

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Table 4-5
BMP Implementation Plan

Best Management Practice	Historical	Implementation Plan to Meet MOU Requirements								Total	Unit	Savings (AFY/unit)	Estimated Total Savings from 2003-2012
	FY 03-04 (Implemented To Date)	FY 04-05	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	FY 10-11	FY 11-12				
(1) Water Survey Programs												N/A	N/A
SFR Customers	314	0	6326	6576	6826	7076	7326	0	0	34444	surveys offered	N/A	N/A
MFR Customers	0	0	93	97	101	105	108	0	0	504	surveys offered	N/A	N/A
SFR Customers	52	0	957	808	925	1093	420	0	0	4255	surveys completed	N/A	N/A
MFR Customers	0	0	15	11	13	16	6	0	0	61	surveys completed	N/A	N/A
(2) Residential Plumbing Retrofit												N/A	N/A
SFR Customers	127	0	3819	2100	1973	1973	1973	1973	986	14924	showerheads	0.01	144
MFR Customers	19	0	50	54	35	35	35	35	17	279	showerheads	0.01	3
(3) System Water Audits, Leak Detection and Repair	yes	0	0	0	0	0	0	0	0	0	audits	N/A	N/A
(4) Metering with Commodity Rates for all New Connections and Retrofit of Existing	yes	0	0	0	0	0	0	0	0	0	unmetered accounts	N/A	N/A
(5) Large Landscape Conservation Programs and Incentives	36	0	11	16	21	25	30	0	0	139	landscape meters surveyed	0.96	134
(6) High-Efficiency Washing Machine Rebate Programs	375	0	969	607	0	0	0	0	0	1950	RES HEW rebates	0.046	89
(7) Public Information Programs	24	0	0	0	0	0	0	0	0	24	events	N/A	N/A
(8) School Education Programs	3818	0	0	0	0	0	0	0	0	3818	students	N/A	N/A
(9) Conservation Program Targets for CII accounts	49	0	9	51	23	39	46	0	0	216	acre-ft	1	216
(11) Conservation Pricing	yes	0	0	0	0	0	0	0	0	0	increasing price block	N/A	N/A
(12) Conservation Coordinator	yes	0	0	0	0	0	0	0	0	0	coordinator	N/A	N/A
(13) Water Waste Prohibition	no	0	yes	0	0	0	0	0	0	0	water waste ordinance	N/A	N/A
(14) Residential ULFT Replacement Program	139	0	NA	NA	NA	NA	NA	NA	NA	139	residential ULFT rebates	0.03	4
Total													**598**

NA = data not available

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4.6 EVALUATION OF DMMS NOT IMPLEMENTED

Water Code Section 10631(g):
(g): *An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:*

(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.
(2) Include a cost-benefit analysis, identifying total benefits and total costs.
(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.

Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

EVMWD has implemented or plans the implementation of all DMMs.

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Section 5
Water Shortage Contingency Plan

EVMWD adopted a Water Shortage Contingency Plan on February 5, 1992, that is included herein by reference. This section provides a summary of that plan in order to meet the requirements of the UWMP Act. Because recycled water is provided by EVMWD to customers on an as-available basis as governed by adopted rules and regulations, the discussion in this section focuses on potable water.

5.1 INTENT OF THE PLAN

EVMWD's Water Shortage Contingency Plan (James M. Montgomery Consulting Engineers, 1992) was prepared to comply with Assembly Bill 11x (1991). The bill required every urban water supplier to file a plan, because of the worsening 1986–1992 drought. The bill modified Section 10632 of the California Water Code. Key requirements of the current Section 10632 are summarized and discussed in the following sections.

5.2 STAGES OF ACTION

Water Code Section 10632(a): *The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier:*

> *(a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.*

The key elements of the EVMWD's Water Shortage Contingency Plan are ordinances with phased water use restrictions and a drought rate structure. The District has two water shortage ordinances: Nos. 78 and 81, presented in **Appendix E**. The drought plan stages and reduction goals (applied to the base years specified in the ordinances) are presented in **Table 5-1**. Determination of a Stage I, II, III, or IV condition is at the discretion of EVMWD's General Manager in consultation with the Board of Directors.

Table 5-1
Water Supply Shortage Stages and Conditions

Stage	Voluntary or Mandatory Reduction	Reduction Goal (%)			
		Retail Customers (Firm Deliveries)	Wholesale Customers (Firm Deliveries)	Retail Customers (Interruptible Deliveries)	Retail Agricultural Customers (Interruptible Deliveries)
I	Voluntary	10	10	Non-specific	Non-specific
II	Mandatory	5	5	20	20
III	Mandatory	10	10	30	30
IV	Mandatory	15	15	40	40
V	Mandatory	N/A	20	N/A	50

The trigger levels (to move from one stage to the next) depend on the local water situation and actions taken by MWDSC. MWDSC's actions represent the principal trigger(s) for EVMWD's action, because cutbacks in its supply to EVMWD will require action to mitigate impacts.

EVMWD does not have customers with interruptible deliveries at this time.

5.3 ESTIMATE OF MINIMUM SUPPLY FOR THE NEXT THREE YEARS

Water Code Section 10632(b): *An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.*

Because EVMWD relies on a combination of groundwater, local surface water, and imported water supplies, supply production is driven by demands. When groundwater and local surface water supplies are low, imported water is used to meet demands. Therefore, the period of "driest" historical supply actually corresponds to the period of lowest demands and is not a good indicator of shortages in supply. Instead, projections of driest multiple years of supply for water years 2006, 2007, and 2008 were used in this analysis. The projections were taken from values presented in the service reliability analysis, described in **Section 8**. The projection includes all potable sources of supply, including imported water, and assumes these supplies will remain constant over the period of interest.

The average annual potable demand listed in **Table 5-2** is projected for water years 2006 through 2008 using linear interpolation of values in **Section 3**.

MWDSC has stated in its Urban Water Management Plan (MWDSC, 2005) Metropolitan Water District of Southern California, 2005. Urban Water Management Plan ((Draft) Sept. 2005) that the supply of imported water it provides is considered to be fully reliable through 2030. EVMWD's demands would be met through the purchase of supplemental supply from MWDSC, even in the event of a drought impacting local supply availability.

Table 5-2
Three-Year Estimated Minimum Water Supply and Average Demands (acre-ft/yr)

Water Year	(a) Projected Multiple Dry-Year Supply	(b) Average Demand	(c) Surplus = (a) - (b)	Surplus (%)
2006	55,590	30,939	24,651	80%
2007	55,590	32,163	23,427	73%
2008	55,590	33,386	22,204	67%

It should also be noted that EVMWD is empowered to declare a water shortage and enforce mandatory restrictions on water customers to further reduce demands.

5.4 CATASTROPHIC SUPPLY INTERRUPTION PROGRAM

Water Code Section 10632(c): *Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.*

Ordinances No. 78 and 81 apply to water supply emergencies due to disasters other than droughts. In the ordinance, an "emergency supply shortage" is defined as "any water shortage caused by an earthquake, loss of electrical power, pipeline breakage, or any other threatened or existing water shortage caused by a disaster or facility failure which results in District inability to meet the water demands of its customers." Response to emergency supply shortages are identical to droughts and the water shortage stages previously discussed apply. These actions are summarized in **Table 5-3**.

Table 5-3
Preparation Actions for a Catastrophic Supply Interruption

Possible Catastrophe	Summary of Actions
Regional Power Outage	• Implement Ordinances No. 78 and 81 • Declare emergency supply shortage • Notify public of emergency supply shortage condition • Prohibit non-essential water usage • Require reduction of water usage to specified goals • Enforce penalties for non-compliance • Enact incentive/disincentive water rates • Develop emergency water management plans if more stringent conservation measures are required • Establish task force to develop ongoing conservation measures/programs
Earthquake	
Pipeline Break	
Facility Failure	
Any Other	

5.5 PROHIBITIONS, PENALTIES, AND CONSUMPTION REDUCTION METHODS

Water Code Section 10632(d-f):

(d) Additional, mandatory prohibitions against specific water use practices during water shortages including, but not limited to, prohibiting the use of potable water for street cleaning

(e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

(f) Penalties or charges for excessive use, where applicable.

The mandatory water use restrictions and actions are detailed in Ordinances No. 78 and 81. Key prohibited actions by stage are presented in **Table 5-4**.

Table 5-4
Mandatory Prohibitions

Restriction	Stage When Restriction Becomes Mandatory
No landscape irrigation between 11am and 4pm	Stage I
No runoff from irrigation	
Water efficient landscaping encouraged	
No landscape irrigation between 6am and 6pm unless hand-held hose or drip irrigation or reclaimed water is used	Stage II
Irrigation only three times per week	
No water served in restaurants unless requested	
Irrigation only twice a week	Stage III
Commercial car washing using recycled water only	
No filling swimming pools	
No golf course watering, except greens, unless reclaimed water is used	
Irrigation only once a week	Stage IV
Water rationing by customer class	
No turf planting at new homes until drought is over	

During a Stage I shortage, while a water usage reduction to meet a reduction goal is voluntary (as indicated in **Table 5-1**), the restrictions on water-use activities shown in **Table 5-4** are mandatory. Examples of water consumption reduction methods and the project percent of reduction are presented in **Table 5-5**.

Table 5-5
Consumption Reduction Methods

Consumption Reduction Method	Stage When Method Takes Effect	Projected Reduction (percent)
Demand Reduction Program	Varies	Varies with Stage
Voluntary Rationing	Varies	10 (Total)
Education Program	Varies	10 (Total)
Plumbing Fixture Replacement	Varies	10 (Total)
Mandatory Rationing	Varies	Up to 50 (Total)
Flow Restrictions	Varies	Up to 50 (Total)
Use Prohibitions	Varies	Up to 50 (Total)

EVMWD's water shortage ordinances include penalties for customers for non-compliance. These include warnings, fines, flow restrictions, and finally, water service shut-offs. Penalties and charges for non-compliance are summarized in **Table 5-6**.

Table 5-6
Penalties and Charges

Penalties or Charges	Stage When Penalty Takes Effect
First Violation – Notice of Non-Compliance	Varies
Second Violation – Fine, Flow Restriction, or Water Service Shutoff	Varies
Referral of Misdemeanor Charge	Varies

5.6 ANALYSIS OF REVENUE IMPACTS OF REDUCED SALES DURING SHORTAGES

Water Code Section 10632(g):

(g) An analysis of the impacts of each of the actions and condition described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water suppliers, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

A reduction in the amount of water consumed will lead to a reduction in revenue and expenses for EVMWD. These reductions will impact EVMWD's ability to finance its operations during periods of water shortages. Revenue reductions were calculated based upon the following assumptions:

- water reduction goals by stage shown in **Table 5-1** are met
- percentage of revenue from retail customers versus wholesale customers would remain stable at 2004 levels
- there are no customers with interruptible deliveries
- revenue from 2006 to 2008 is projected by scaling up 2004 revenues by the projected quantity of water delivered

Table 5-7 presents a summary of projected revenue reduction by stage and year for water years 2006 through 2008. The revenue reduction is the total reduction corresponding to that stage, not an incremental reduction from one stage to the next. Also note that the revenue reduction in Stage I is calculated assuming EVMWD's *voluntary* water usage reduction goal is met. This voluntary goal is the same as the *mandatory* reduction goal in Stage III (see **Table 5-1),** hence the values for Stages I and III are the same. All revenues shown are in 2004 dollars.

Table 5-7
Reduced Revenue Due to Water Shortage

Stage	2006	2007	2008
I	$2,025,000	$2,105,000	$2,185,000
II	$1,013,000	$1,053,000	$1,093,000
III	$2,025,000	$2,105,000	$2,185,000
IV	$3,037,000	$3,157,000	$3,277,000
V	$3,061,000	$3,182,000	$3,303,000

Expenditures by EVMWD are also expected to decrease in the event of a water shortage. Reductions are expected in water purchases, water pumping and booster expenses, and wastewater lift station expenses.

Expense reductions were calculated based upon the following assumptions:

- water reduction goals shown in **Table 5-1** by stage are met
- there are no customers with interruptible deliveries
- expenses from 2006 to 2008 is projected by scaling up 2004 expenses by the projected quantity of water delivered
- the unit price for savings from reduced water purchases is for imported water
- water pumping and booster pumping expenses would be reduced in proportion to the reduction in quantity delivered
- wastewater lift station expenses would be reduced in proportion to the reduction in quantity delivered

MWDSC has adopted a policy and fund to manage supplies in times of shortage to avoid changing rates (MWDSC, 1999). Rates may change if actual supply availability and/or customer demands are considerably different than their assumed conditions. For the purposes of this analysis, water supply costs from MWDSC are not expected to increase in times of water shortages. Reduced water purchases are calculated using MWDSC Tier 1 rates for treated water, plus the higher of the two possible surcharges from wholesale suppliers. One surcharge of $5/acre-foot would be paid to Western MWD for delivery through the TVP and the other surcharge of $11/acre-foot would be paid to Eastern MWD for delivery through the AVP (see Section 3 for details), so the AVP surcharge was used in the calculation. A projection of reduced expenses by stage and water year is presented in **Table 5-8**. All expenses shown are in 2004 dollars.

Table 5-8
Reduced Expenses Due to Water Shortage

Stage	2006	2007	2008
I	$1,736,000	$1,878,000	$1,996,000
II	$868,000	$939,000	$999,000
III	$1,736,000	$1,878,000	$1,996,000
IV	$2,603,000	$2,817,000	$2,994,000
V	$2,624,000	$2,840,000	$3,018,000

The net revenue impact of revenue loss and expenditure reduction for each water shortage stage is calculated as revenue reduction minus expenditure reduction. The net revenue calculations are provided in **Table 5-9** in 2004 dollars.

Table 5-9
Net Revenue Reduction by Stage

Stage	2006	2007	2008
I	$289,000	$227,000	$189,000
II	$145,000	$114,000	$94,000
III	$289,000	$227,000	$189,000
IV	$434,000	$340,000	$283,000
V	$437,000	$342,000	$285,000

Methods of compensating for the reduced revenue include penalties for excess water use and rate increases for customers. Penalties for excess water use encourage conservation in turn, further reducing revenue from water sales, but penalties generally only provide a small amount of revenue. If the water shortage is deemed temporary, a rate increase may not be required.

For long-term shortages, immediate rate increases may be considered. A consequence of rate increases may be further conservation by customers. EVMWD would not change fixed domestic monthly service charges during a water shortage because these charges provide revenue for operational expenditures.

5.7 DRAFT ORDINANCE AND USE MONITORING PROCEDURE

Water Code Section 10632(h & i):

(h) A draft water shortage contingency resolution or ordinance.

(i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

EVMWD's Water Shortage Contingency Plan (James M. Montgomery Consulting Engineers, 1992) was discussed at the beginning of this Section. Copies of the two drought ordinances associated with the plan are presented in **Appendix E**.

EVMWD originally prepared its Water Shortage Contingency Plan and Ordinances No. 78 and 81 to correspond with MWDSC's 1990 "Incremental Interruption and Conservation Plan." That plan was put into place during the 1987-1992 statewide drought and has since been superceded by MWDSC's Water Shortage and Drought Management (WSDM) Plan, described in Section 3 (MWDSC, 1999).

It is recommended that EVMWD revise its water shortage ordinances and Water Shortage Contingency Plan to coordinate with MWDSC's WSDM Plan. That plan sets forth MWDSC's intended actions in the event of a surplus or shortage in supply, the availability of resources and water demands, and how the plan fits into the framework of MWDSC's regional resource management. EVMWD should also revise its Water Shortage Contingency Plan and drought ordinances to reflect changes to its rate structure, customer base and new developments, water usage patterns, and the addition of recycled water services. These revisions might include an update to the baseline year used for the water reduction goals, the number of water shortage stages, and the water usage reduction goals. EVMWD may also want to consider adding a description of monitoring and actions needed to determine compliance in order to support the enforcement activities set forth.

EVMWD has metered connections with which to monitor customer use on a monthly basis. It is recommended that EVMWD adopt a mechanism for determining actual reductions on a monthly basis by establishing a baseline for normal water use and comparing that to monthly usage.

Table 5-10
Water Use Monitoring Mechanisms

Mechanisms for Determining Actual Reductions	Type and Quality of Data Expected
Monitor monthly billed water usage and compare usage to baseline.	Quality of billing data expected to be sufficient to evaluate effectiveness of actions taken.

Section 6
Recycled Water Plan

6.1 COORDINATION

Water Code section 10633
10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

As discussed in **Section 2**, in the effort to minimize the need for imported water, EVMWD plans to expand its recycled water system to provide recycled water for irrigation users and and to maintain water levels in Lake Elsinore during normal and dry years. EVMWD has coordinated with the appropriate agencies in the preparation of plans presented in this UWMP.

6.2 WASTEWATER QUANTITY, QUALITY AND CURRENT USERS

Water Code section 10633 (a-c)
(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.
(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.
(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

6.2.1 Existing Recycled Water Supplies

EVMWD's non-potable demands are supplied by tertiary treated wastewater from the Regional WRF, Railroad Canyon WRF, and Horsethief Canyon WRF. Historically, EVMWD used the treated effluent from Railroad Canyon WRF and Horsethief Canyon WRF for irrigation, except during storm events. Effluent from the Regional WRF is typically discharged into the Temescal Wash, but in recent years, has also been used for lake replenishment.

Table 6-1 summarizes the reclaimed water production as reported in EVMWD's 2004 Comprehensive Annual Financial Report (Eastern MWD, 2004). It should be noted that a portion of the wastewater flows collected by EVMWD is diverted to RCWD for treatment and disposal at its Santa Rosa WRF.

Railroad Canyon WRF and Horsethief Canyon WRF

The effluent from Railroad Canyon WRF and Horsethief Canyon WRF receives tertiary treatment and meets Title 22 requirements. The current rated capacity for Railroad Canyon WRF and Horsethief Canyon WRF are 1.2 mgd and 0.5 mgd, respectively. Based on normalized trends from the number of service connections, flows in 2004 were estimated to be 0.90 mgd to Railroad Canyon WRF and 0.42 mgd to Horsethief Canyon WRF. Most of the treated water from Railroad Canyon WRF is directed to the Canyon Lake Golf Course and the Canyon Hills development, with excess effluent bypassed to the Regional WRF. Treated recycled water from Horsethief Canyon WRF is distributed to local landscape irrigation users (Montgomery Watson/Maddaus Water Management/The Weber Group, 2000).

Table 6-1
Historical Recycled Water Production (FY 1995-2004)
(Units are in mgd)

Year	Horsethief Canyon WRF	Railroad Canyon WRF	Regional WRF	Total
1995	0.146	0.917	3.182	4.245
1996	0.151	0.885	3.239	4.275
1997	0.171	0.936	3.336	4.443
1998	0.192	0.969	3.726	4.887
1999	0.223	0.926	3.701	4.850
2000	0.260	0.950	3.709	4.919
2001	0.320	0.930	3.785	5.035
2002	0.377	0.910	3.729	5.016
2003	0.472	0.879	4.089	5.440
2004	0.427	0.883	4.464	5.774

Reference: EVMWD Comprehensive Annual Financial Report for the year ended in June 30, 2004 (EVMWD, 2004c).

Regional WRF

The Regional WRF was expanded in 2004 and currently has a rated capacity of 8 mgd. The wastewater effluent is tertiary-treated discharged to the Temescal Wash. Flows to the Regional WRF in 2004 were about 4.5 mgd. As population and water demands increase, EVMWD anticipates future expansions to an ultimate capacity of 30 mgd (Kennedy-Jenks Consultants, 2003).

Beginning in June 2002, effluent from the Regional WRF and from Eastern MWD has been used for replenishing Lake Elsinore as part of a 2-year pilot test program. The purpose of this program was to evaluate the effects of using recycled water for lake replenishment as part of an overall lake management strategy. As of December 2004, 10,043 acre-ft of effluent has been discharged into the lake.

In March 2005, EVMWD received a revised NPDES permit from the RWQCB to discharge effluent into the lake. This permit requires EVMWD to reduce the nutrient loading to the lake

(Regional Water Quality Control Board (RWQCB), 2005). In 2005, EVMWD will install phosphorus removal treatment at the Regional WRF to comply with the permit.

Eastern MWD and Rancho California WD

Eastern MWD currently operates the Temecula Valley Regional WRF. This facility was recently expanded to 12 mgd. Eastern MWD completed construction of the Temecula Valley Effluent Disposal Pipeline that would convey effluent from the Temecula Valley Regional WRF and Rancho California Water District's (RCWD) Santa Rosa WRF to Temescal Wash for discharge. This facility allows Eastern MWD and RCWD to avoid costly nutrient removal facilities required for discharge into the Santa Margarita River. This pipeline passes through EVMWD's service area. In addition, effluent from the Temecula Valley Effluent Disposal Pipeline may be available to EVMWD for purchase to meet future recycled water demands under existing agreements with Eastern MWD. Water from the Temecula Valley Pipeline may be used in the Wildomar and Canyon Hills regions and was evaluated as part of the *Wildomar Service Area Recycled Water Master Plan Study* (Kennedy-Jenks Consultants, 2004).

Eastern MWD currently (FY 2003-04) generates approximately 38 mgd of effluent at its four active regional water reclamation facilities. The amount of effluent is expected to grow to 48 mgd by the year 2013. Approximately 60%-70% of the effluent currently generated is sold to agricultural and irrigation users (Eastern MWD, 2004). Consequently, about 10 to 15 mgd (11,200 to 16,800 acre-ft/yr) of effluent is available for purchase from Eastern MWD on an annual basis. Based on current operations, Eastern MWD retains as much recycled water as possible within its system, storing excess water for summer use. Once its storage ponds are full, Eastern MWD discharges water to Temescal Wash through the Effluent Disposal Pipeline, primarily in the winter months. **Table 6-2** presents Eastern MWD's treated wastewater disposal amounts as projected in the draft version of their 2005 UWMP (EMWD, *Draft 2005 Urban Water Management Plan*, 2005). This treated wastewater is assumed to be available to EVMWD for supply of future irrigation demands.

Table 6-2
Eastern MWD Disposal of Wastewater

Disposal	Treatment	2000	2005	2010	2015	2020	2030
Livestream Discharge (acre-ft/yr)	Tertiary	0	8,842	7,911	15,433	21,256	26,956
Livestream Discharge (mgd)	Tertiary	0	7.9	7.1	13.8	19.0	24.1

6.2.2 Future Recycled Water Supplies

The following section describes EVMWD's plans for additional recycled water supplies to meet non-potable demands in the next 20 years, including the Alberhill WRF and the Regional WRF expansion. Analysis of historical per connection water usage and wastewater production data shows that 44 percent of potable water usage becomes wastewater. Using the projected water demands in **Section 3**, projected wastewater flows are shown in **Table 6-3**. Projected flows for

the Alberhill WRF are based on projections from the draft Alberhill Water and Wastewater Facilities Phasing Study (Kennedy-Jenks Consultants, 2005a). Flows for the Horsethief Canyon WRF, Railroad Canyon WRF, and Southern areas are based on revised projections prepared in 2005 for the EVMWD Wastewater Master Plan (Kennedy-Jenks Consultants, 2005d). These flows are not expected to increase significantly in the future.

A portion of the EVMWD's service area is not sewered. It is assumed that septic flow will be the same as the 2000-2004 average because existing septic areas will convert to sewers at the same rate that new land without access to sewers develops.

Regional WRF

The Regional WRF has existing flows of approximately 4.5 mgd. The majority of future customers that EVMWD has committed to serve (i.e., will-serve commitments presented in **Section 3**) are tributary to the Regional WRF. Considering the potable water demand projections in **Section 3**, the additional wastewater flow to the Regional WRF due to committed developments is projected to be approximately 5.7 mgd. An additional 0.3 mgd of committed new wastewater flows will be tributary to RCWD, which may be conveyed to the Regional WRF through the Lakeshore Interceptor Sewer. Therefore, the combined existing and committed wastewater flow to the Regional WRF is projected to be 10.5 mgd by 2018, which exceeds the existing plant capacity. Future development without will-serve letters is expected to increase the Regional WRF flows to about 14.8 mgd by 2030.

To treat the additional flows, EVMWD will begin planning for expansion of the Regional WRF when the average flow reaches 6 mgd (2007). The previous estimate of Regional WRF flows prepared for the Wastewater Master Plan was 8.3 mgd in 2025 (Kennedy-Jenks Consultants, 2005d).

Table 6-3
Projected Wastewater Flows by Treatment Facility

Year	Alberhill WRF (mgd)	Horsethief Canyon WRF[1] (mgd)	Railroad Canyon WRF (mgd)	Southern Area[2] (mgd)	Regional WRF (mgd)	Total Treated Flow[3] (mgd)	Septic (mgd)	Total Wastewater (mgd)
2000		0.26	0.95	0.98	3.71	5.9	3.29	**9.19**
2001		0.32	0.93	0.98	3.79	6.02	2.59	**8.61**
2002		0.38	0.91	0.99	3.73	6.01	3.52	**9.53**
2003		0.47	0.88	0.99	4.09	6.43	3.33	**9.76**
2004		0.43	0.88	1.00	4.46	6.77	3.37	**10.14**
2005	0.05	0.42	1.15	1.00	5.48	8.11	3.31	**11.42**
2010	1.14	0.5	1.15	1.04	7.17	11.00	3.31	**14.31**
2015	1.23	0.5	1.15	1.06	9.74	13.68	3.31	**16.98**
2020	1.81	0.5	1.15	1.11	11.42	16.00	3.31	**19.30**
2025	2.40	0.5	1.17	1.14	13.20	18.41	3.31	**21.72**
2030	2.99	0.5	1.17	1.14	14.76	20.56	3.31	**23.87**

1- Flows may be treated at the Alberhill WRF in the future.

2- Historical flows are estimated.
3- All treated wastewater flows are anticipated to meet recycled standards.

The current NPDES permit for the Regional WRF requires that a minimum of 0.5 mgd of flow be discharged to Temescal Wash for environmental habitat needs (Regional Water Quality Control Board (RWQCB), 2005). Therefore, the total recycled water available from the Regional WRF is projected to be approximately 14.2 mgd in 2030. When necessary, the treated effluent will be used to replenish Lake Elsinore to maintain a minimum lake level of 1,240 ft msl. Otherwise, the water will be utilized for non-potable water uses or discharged to Temescal Wash. Discharges to the wash are expected to occur primarily during the winter months of wet years when water is not required for lake augmentation and non-potable demands are low.

EVMWD recently commissioned the preparation of a recycled water master plan for the Regional WRF service area. This plan will identify recycled water demands and facilities to deliver recycled water to customers that can be feasibly served.

Alberhill WRF

The new Alberhill WRF will serve the Alberhill development and may ultimately replace the existing Horsethief Canyon WRF. The plant will be constructed in approximately 1 mgd increments, with a full capacity of 5.4 mgd. According to the Alberhill Water and Wastewater Facilities Phasing Plan, the plant is scheduled to be online in 2008 (Kennedy-Jenks Consultants, 2005a). Treated effluent from the plant will be used for irrigation in the Horsethief Canyon and Alberhill areas. Any surplus water will be discharged to Temescal Creek or reused in EVMWD's Temescal Division. The projected flow to the Alberhill WRF is expected to be 3.0 mgd by 2030 including 0.22 mgd of flow from Horsethief Canyon. Developments with current will-serve letters represent 0.46 mgd of the projected flow in 2030.

Temescal Pipeline System

As part of its acquisition of TWC in 1989, EVMWD operates the Temescal Pipeline System. This system consists of 17 non-potable wells, booster pump stations, weirs, a sand trap, a reservoir, and an agricultural transmission line made of several different pipe sections. This system currently delivers non-potable water to users (mainly agricultural) in the Temescal Valley between Lake Elsinore and Corona. Flows from this system can potentially supply irrigation demands in the Horsethief and Alberhill regions.

Summary of Recycled Water Supplies

A summary of future recycled water supplies is listed in **Table 6-4**. Recycled water supplies do not vary significantly during dry years.

Table 6-4
Recycled Water Supplies – 2030

Source	Projected Average Flows	
	(mgd)	(acre-ft/yr)
Alberhill WRF	3.0	3340
Horsethief Canyon WRF	0.5	560
Railroad Canyon WRF	1.2	1,310
Regional WRF	14.8	16,520
Santa Rosa WRF	1.5	1,680
Temecula Valley Regional WRF	12.0	13,430
Total	**33.0**	**36,840**

6.3 POTENTIAL AND PROJECTED USE, OPTIMIZATION PLAN WITH INCENTIVES

Water Code section 10633 (d-g)

(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility f serving those uses.

(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

EVMWD currently serves recycled water to customers in Horsethief Canyon and Canyon Lake. These customers are presented as existing users in **Table 6-5**. EVMWD is considering expanding its non-potable water system (which receives recycled water from RCWD and Eastern MWD) to serve non-potable demands in the Wildomar area. Potential future non-potable demands due to increased growth include irrigation customers in the Wildomar, Lake Elsinore, Alberhill areas, the Southerly at Lake Elsinore (John Laing Homes) and Lumos Communities developments in East Lake. Recycled water demands will also increase to maintain Lake Elsinore water levels.

Non-potable water demands are discussed for five main regions within the EVMWD service area – Wildomar, Lake Elsinore, Alberhill, Ramsgate, and Canyon Hills. Recycled water demands for irrigation are assumed to have a MDD/ADD peaking factor of 2.77 based on evapotranspiration and rainfall patterns.

6.3.1 Wildomar Region

EVMWD recently completed the *Wildomar Service Area Recycled Water Master Plan* (Kennedy-Jenks Consultants, 2004) and is considering expanding its non-potable water system, with delivery of recycled water from Rancho California WD and Eastern MWD. The Wildomar recycled water system will serve non-potable demands in the Wildomar and Lake Elsinore regions, including existing customers utilizing potable water for irrigation and the Southerly and Lumos developments in East Lake. Potable water demands that could be converted to recycled water demands in the Wildomar region total 1,060 acre-ft/yr (Kennedy-Jenks Consultants, 2004). The Southerly at the Lake Elsinore development has a projected non-potable water demand of 1,220 acre-ft/yr. Evaluation of land use for the proposed Lumos development (East Lake Specific Plan Amendment No. 8) indicates this development could generate 890 acre-ft/yr of non-potable demand. Other future Wildomar non-potable irrigation demands total an additional 150 acre-ft/yr.

6.3.2 Lake Elsinore Region

Kennedy-Jenks Consultants is preparing a recycled water master plan update for EVMWD focusing on the Lake Elsinore region (Kennedy-Jenks Consultants, 2005. *Draft Facilities Planning Report for the Elsinore Valley Municipal Water District's Regional Service Area – Recycled Water Project Plan*, prepared for EVMWD, August 2005). Preliminary results of a market assessment (Kennedy-Jenks Consultants, 2005b) have identified major residential and commercial areas that could utilize significant volumes of recycled water. These include major residential and commercial areas in the Lake Elsinore area, the existing agricultural line called the Elsinore Pipeline, and Lake Elsinore itself. The recycled water demands for the Lake Elsinore area are summarized as:

- Residential and commercial uses for school fields, parks, cemeteries, and golf courses within three distinct areas (downtown, Northwest, and Northeast) near the Regional WRF have an expected demand of about 1,130 acre-ft/yr. This estimate excludes demands for John Laing Homes East Lake, Alberhill Ranch, and Rosetta Canyon), for which separate demand estimates are made. Recycled water demands for Lakeside High School are also excluded since its supply comes from its own well.
- Another potential recycled water demand is providing up to 10,300 acre-ft/yr (7.5 mgd) to Lake Elsinore during dry years (5,900 acre-ft/yr during normal years) as part of an environmental restoration project. This use is discussed later in this section.

These demands, excluding those in the Temescal system, total nearly 11,430 acre-ft/yr (10.2 mgd), which is greater than the current effluent flow from the Regional WRF. Currently, the District expects to meet this recycled water demand by utilizing the effluent from the Regional WRF and augmenting it with recycled water from the Temecula Valley Regional WRF via Eastern MWD. In the future, EVMWD also plans an expansion of the Regional WRF that will increase the amount of available recycled water.

6.3.3 Alberhill Region

Planned developments in the Alberhill region have significant irrigation demands (parks, open space, slopes, and wildlife corridors) which can be served using recycled water. Kennedy-Jenks Consultants is preparing a Recycled Water Master Plan Market Assessment for the Alberhill Service Area (Kennedy-Jenks Consultants, 2005e.). Based upon proposed land use, the projected recycled water demand for the Alberhill CFD is calculated as about 540 acre-ft/year. In 2003, Hunsaker & Associates prepared Water and Sewer Master Plans for the Alberhill Ranch Development (Hunsaker & Associates, 2003). Based upon proposed land use area for parks and slopes, the irrigation demand for Alberhill Ranch is projected at 410 acre-ft/yr. For estimating the recycled demands in the surrounding areas, the percentage of recycled demand out of potable demand for Alberhill CFD and Alberhill Ranch were applied to the projected potable demands of the surrounding areas, given that similar types of development are expected to occur in the region. Based upon this calculation, the recycled demand for Alberhill surroundings is projected at 980 acre-ft/yr. The total irrigation demands for the proposed developments in the Alberhill region, which include Alberhill CFD, Alberhill Ranch, and the surrounding areas is projected to be 1,935 acre-ft/yr, which are projected to match the timing of the developments (discussed in **Section 3**). The irrigation demands in the Alberhill region will be met by recycled water from the proposed Alberhill WRF that will replace the existing Horsethief Canyon WRF.

6.3.4 Ramsgate Region

Developments in the Ramsgate region also have significant irrigation demands (parks, open space, slopes, and wildlife corridors) which can be met using recycled water. The irrigation demand for the proposed developments in the Ramsgate region is projected to be about 900 acre-ft/yr, based on values presented in the *Ramsgate Water, Wastewater & Recycled Water Facilities Plan* (Hunsaker & Associates, 2004a). The irrigation demands are projected to match the timing of the developments (discussed in **Section 3**). The Ramsgate Facilities Plan service area studied in this report extends beyond the Ramsgate boundaries, and was generally determined to be that area tributary by gravity flow to the north side of I-15 between State route 74 (Central Avenue) and 2nd Street and extending north to Highway 74 and Ethanac Road. These demands will be met by recycled water from the Regional WRF; the developer is installing recycled water pipelines as part of the development's on-site utilities. If necessary, supply from the Regional WRF will also be augmented with recycled water from the Temecula Valley Regional WRF via Eastern MWD.

6.3.5 Canyon Hills

Based upon data from 2004, the existing annual demand of the Canyon Lake Golf Course is 278 acre-ft/yr, while Phases 1 and 2 of the Canyon Hills recycled water system account for another 210 acre-ft/yr (0.5 mgd) of existing demand (Personal Correspondence with EVMWD staff, October 25, 2005.). EVMWD plans to expand the Canyon Hills recycled water system to irrigate parkways, medians, slopes, parks, and two school sites in Phases 3 through 7 of the development. This will increase the recycled water demand an additional 960 acre-ft/yr (0.86 mgd). (Psomas, 2005). The recycled water system is expected to be fully online by 2015. The total projected recycled water demand for the Canyon Hills region is nearly 1,450 acre-ft/yr.

6.3.6 Temescal System

Approximately 3,000 acre-ft/yr may be supplied to users currently receiving non-potable water through the Elsinore Pipeline in the Temescal Canyon area. Currently, some of this demand is being served by the treated effluent from the Regional WRF through a diversion of water from the Temescal Wash into the Elsinore Pipeline. The rest of the demand is met with supply from non-potable wells in the Temescal Valley. It is not certain whether the Temescal system will be converted to recycled use, for which reason these users are not included in the projections.

6.3.7 Lake Stabilization

Since June 2003, EVMWD has been replenishing Lake Elsinore with tertiary-treated effluent from the Regional WRF and Eastern MWD's Temecula Valley effluent pipeline under a pilot project discharge permit issued by the RWQCB. In March 2004, EVMWD also began operating the refurbished Island Wells to replenish the lake.

In December 2004, the RWQCB adopted total maximum daily loads (TMDLs) which limit the discharge of nitrogen and phosphorus into Lake Elsinore. The RWQCB subsequently issued a NPDES permit for the Regional WRF that reflect the new TMDLs (Regional Water Quality Control Board (RWQCB), 2005). To comply with the TMDLs and the NPDES permit, EVMWD is installing phosphorus removal treatment at the Regional WRF and the Lake Elsinore and San Jacinto Watersheds Authority (LESJWA) is installing a lake aeration system and other facilities to maintain the quality of the lake (MWH, 2005. *Draft Program Environmental Impact Report for Lake Elsinore Stabilization and Enhancement Project,* prepared for Lake Elsinore and San Jacinto Watershed Authority, March 2005). Initially, EVMWD will discharge all available Regional WRF effluent (less 0.5 mgd for wetlands maintenance in Temescal Wash) along with Island Well water to Lake Elsinore. As the available recycled water increases, the amount of Island Well water can gradually be decreased.

6.3.8 Projected Recycled Water Demand

As shown in **Table 6-5**, the recycled water demand in the EVMWD service area is expected to increase to approximately 14,830 acre-ft/yr in a normal demand year. During dry years when the maximum amount of water is required for Lake Elsinore and irrigation demand is high, recycled water usage could increase to nearly 20,050 acre-ft/yr. If EVMWD's available recycled water supply is insufficient to meet this demand, it could purchase water from Eastern MWD or supply potable water to meet these demands. **Table 6-5** also shows the estimated MDD. For irrigation users, the MDD/ADD factor is 2.77 (the factor is applied to an ADD for an above normal year). Consequently, the MDD for irrigation usage is expected to be 22.1 mgd in 2030. For lake replenishment, the MDD is assumed to equal the annual demand because lake replenishment water would be delivered generally year-around at a constant rate. The combined MDD during dry years could be 33.3 mgd. **Table 6-10** shows the total supply versus demand from Eastern MWD and

Table 6-5
Summary of Recycled Water Demands – 2030

Demand Category	Normal Year	Below Normal Year	Above Normal Year
Average Annual Demand - acre-ft/yr			
Existing Canyon Lake Golf Course[1]	278	250	304
Existing Horsethief[2]	202	182	221
Future Alberhill Ranch[3]	414	373	452
Future Alberhill CFD[4]	541	487	591
Future Alberhill Surroundings[5]	980	882	1,070
Existing Canyon Hills (Phases 1 and 2) [1]	210	189	229
Future Canyon Hills (Phases 3-7) [6]	960	864	1,048
Downtown Area Conversion from Existing Potable Use[2]	206	185	225
Northwest Area Conversion from Existing Potable Use[2]	401	361	438
Northwest Area Future use[2]	119	107	130
Northeast Area Conversion from Existing Potable Use[2]	346	311	378
Northeast Area Future Use[2]	55	50	60
Future Ramsgate[7]	897	807	980
Wildomar Conversion from Existing Potable Use[8]	1,060	954	1,158
Future Wildomar[8]	150	135	164
Southerly at Lake Elsinore (John Laing Homes) [8]	1,221	1,099	1,333
LUMOS (East Lake Specific Plan Amendment No. 8) [8]	890	801	972
Subtotal - Irrigation Demand	8,930	8,037	9,752
Lake Replenishment[9]	5,900	0	10,300
Total	**14,830**	**8,037**	**20,052**
Maximum Day Demand - mgd			
Irrigation	22.1	19.9	24.1
Lake Replenishment	5.3	0.0	9.2
TOTAL	**27.4**	**19.9**	**33.3**

1. Personal Correspondence with EVMWD staff, October 25, 2005.
2. Kennedy/Jenks, *Draft Facilities Planning Report for EVMWD's Regional Service Area – Recycled Water Project Plan,* August 2005.
3. Hunsaker and Associates, *Water and Sewer Master Plans for the Alberhill Ranch Development*, 2003.
4. Based upon proposed land use files.
5. Assumed that the same percentage of recycled to potable use in Alberhill Ranch and Alberhill CFD applies to the surroundings.
6. Psomas, *Canyon Hills Recycled Water Project: Water Recycling Construction Funding Program Grant Application*, January 20, 2005.
7. Hunsaker & Associates, *Ramsgate Water, Wastewater & Recycled Water Facilities Plan*, July 27, 2004.
8. Kennedy/Jenks, Wildomar Service Area Recycled Water Master Plan, June 2004.
9. MWH, *Draft Program Environmental Impact Report for Lake Elsinore Stabilization and Enhancement Project*, March 2005.

Table 6-6 through **Table 6-9** presents the projected recycled water supply versus demand in 5 year increments categorized by supply source.

Table 6-6
Projected Recycled Supply Versus MDD for the Regional Area (mgd)

	2010	2015	2020	2025	2030
Regional MDD					
Downtown Area Conversion from Existing Potable Use	0.3	0.6	0.6	0.6	0.6
Northwest Area Conversion from Existing Potable Use	0.5	1.1	1.1	1.1	1.1
Northwest Area Future Use	0.1	0.2	0.2	0.3	0.3
Northeast Area Conversion from Existing Potable Use	0.5	0.9	0.9	0.9	0.9
Northeast Area Future Use	0.1	0.1	0.1	0.1	0.1
Lake Replenishment	9.2	9.2	9.2	9.2	9.2
Future Ramsgate	0.5	1.0	1.5	1.9	2.4
TOTAL MDD	**11.2**	**13.1**	**13.6**	**14.1**	**14.6**
Regional Supplies					
Regional WRF (mgd)[1]	6.7	9.2	10.9	12.7	14.2
Eastern MWD (mgd)[2]	2.0	3.9	2.7	1.4	0.4
Island Wells (mgd)[3]	2.5	0	0	0	0
TOTAL Supplies	**11.2**	**13.1**	**13.6**	**14.1**	**14.6**

1. Includes a reduction of 0.5 mgd of required discharge to the Temescal Wash.
2. Flows from Eastern MWD are based on anticipated need for irrigation water (not available for lake replenishment). See Table 6-2 for Eastern MWD's supply availability.
3. Supply from the Island Wells would temporarily be available to meet part of the lake replenishment demand until adequate expansion of the Regional WRF.

Table 6-7
Projected Recycled Supply Versus MDD for Canyon Lake/Canyon Hills (mgd)

	2010	2015	2020	2025	2030
Canyon Lake/Canyon Hills MDD					
Existing Canyon Lake	0.8	0.8	0.8	0.8	0.8
Existing Canyon Hills	0.6	0.6	0.6	0.6	0.6
Future Canyon Hills	0.5	2.6	2.6	2.6	2.6
TOTAL MDD	**1.9**	**4.0**	**4.0**	**4.0**	**4.0**
Canyon Lake/Canyon Hills Supplies					
Railroad Canyon WRF	1.2	1.2	1.2	1.2	1.2
Eastern MWD[1]	0.7	2.8	2.8	2.8	2.8
TOTAL Supplies	**1.9**	**4.0**	**4.0**	**4.0**	**4.0**

1. Flows from Eastern MWD are based on anticipated need for recycled water. See Table 6-2 for Eastern MWD's supply availability.

Table 6-8
Projected Recycled Supply Versus MDD for Alberhill/Horsethief (mgd)

	2010	2015	2020	2025	2030
Alberhill/Horsethief MDD					
Existing Horsethief	0.5	0.5	0.5	0.5	0.5
Future Alberhill	1.9	2.6	3.5	4.3	5.2
TOTAL MDD	**2.4**	**3.1**	**4.0**	**4.8**	**5.7**
Alberhill/Horsethief Supplies					
Horsethief Canyon WRF	0.5	0.5	0.5	0.5	0.5
Alberhill WRF	1.1	1.2	1.8	2.4	3.0
Temescal System[1]	0.8	1.4	1.7	1.9	2.2
TOTAL Supplies	**2.4**	**3.1**	**4.0**	**4.8**	**5.7**

1. Water from the Temescal non-potable system would be available to meet MDD in the Alberhill and Horsethief areas.

Table 6-9
Projected Recycled Supply Versus MDD for the Wildomar Region (mgd)

	2010	2015	2020	2025	2030
Wildomar Region MDD					
Existing Wildomar Potable Conversion	1.4	2.9	2.9	2.9	2.9
Future Wildomar & East Lake	2.0	4.8	5.9	6.0	6.1
TOTAL MDD	**3.4**	**7.7**	**8.8**	**8.9**	**9.0**
Wildomar Region Supplies					
Rancho California WD[1]	1.5	1.5	1.5	1.5	1.5
Eastern MWD[2]	1.9	6.2	7.3	7.4	7.5
TOTAL Supplies	**3.4**	**7.7**	**8.8**	**8.9**	**9.0**

1. Flows from Rancho California WD are based on existing EVMWD wastewater treated at the Santa Rosa WRF.
2. Flows from Eastern MWD are based on anticipated need for recycled water. See Table 6-2 for Eastern MWD's supply availability.

Table 6-10 shows the total supply versus demand via Eastern MWD. **Table 6-11** summarizes the total recycled supply versus demand for all regions within the EVMWD.

Table 6-10
Projected Recycled Supply versus MDD via Eastern MWD (mgd)

	2010	2015	2020	2025	2030[1]
Eastern MWD Demand	4.6	12.9	12.8	11.6	10.7
Eastern MWD Supply	7.1	13.8	19	24.1	24.1

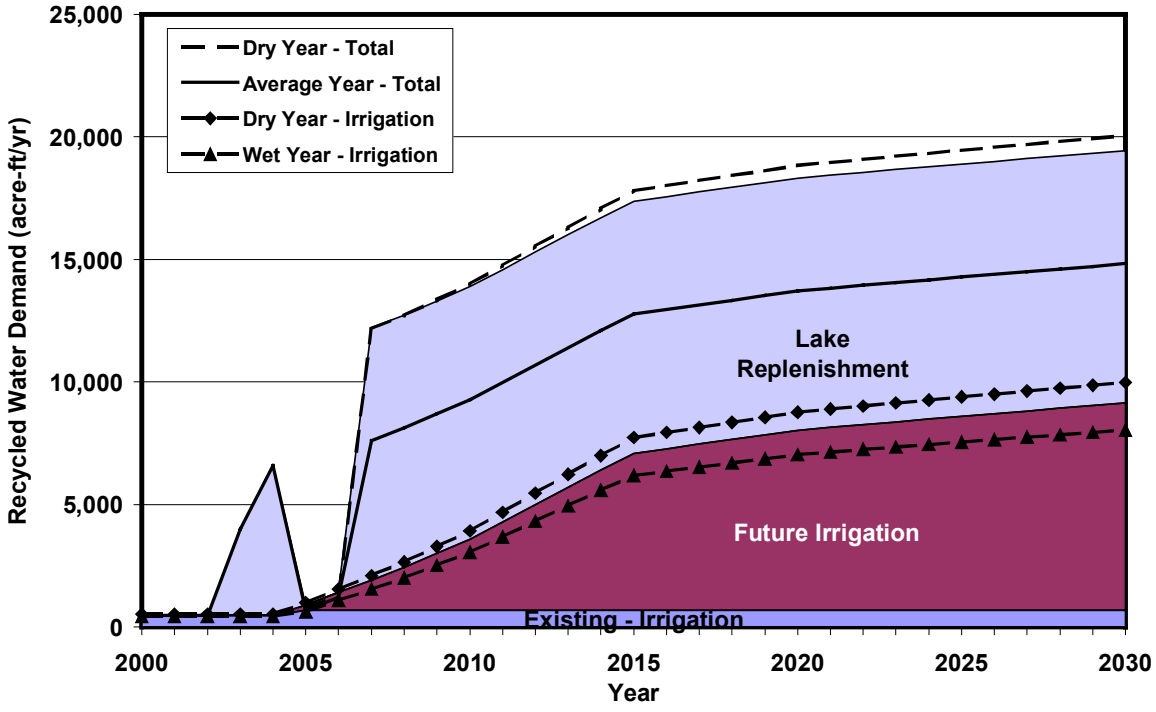
1. Supply projections (livestream disharge) in Eastern MWD's UWMP only extend until 2025. Based upon the consistent increase until 2025, the supply for 2030 is conservatively assumed to be the same as for 2025.

Table 6-11
Total Recycled Supply versus Demand (mgd)

	2010	2015	2020	2025	2030
MDD					
Regional	11.2	13.1	13.6	14.1	14.6
Canyon Lake/Canyon Hills	1.9	4.0	4.0	4.0	4.0
Alberhill/Horsethief	2.4	3.1	4.0	4.8	5.7
Wildomar Region	3.4	7.7	8.8	8.9	9.0
TOTAL MDD	**18.9**	**27.9**	**30.4**	**31.8**	**33.3**
Supply					
Regional	11.2	13.1	13.6	14.1	14.6
Canyon Lake/Canyon Hills	1.9	4.0	4.0	4.0	4.0
Alberhill/Horsethief	2.4	3.1	4.0	4.8	5.7
Wildomar Region	3.4	7.7	8.8	8.9	9.0
TOTAL Supply	**18.9**	**27.9**	**30.4**	**31.8**	**33.3**

Figure 6-1 presents the estimated build-up of recycled water demand through 2030. The chart shows the wide range in recycled water demand due to lake replenishment demands.

Figure 6-1
Projected Recycled Water Demand



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Section 7
Water Quality Impacts on Reliability

Water Code Section 10634: *The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.*

7.1 WATER QUALITY IMPACTS ON SUPPLY RELIABILTY

EVMWD obtains its potable water supplies from local surface water from Canyon Lake, local groundwater, and imported water.

7.1.1 Surface Water

Significant levels of Disinfection By-Products (DBP) have been detected in treated Canyon Lake water. The average level of chlorite measured at the Canyon Lake WTP in 2004 was 0.7 mg/L, which has an Maximum Contaminant Level Goal (MCLG) of 0.8 mg/L and an Maximum Contaminant Level (MCL) of 1.0 mg/L. Currently, breakpoint chlorination is used at all MWDSC connections, which possibly accounts for the high DBP levels in Canyon Lake. EVMWD is converting to chloramination disinfection at all facilities to address this problem. The new disinfection system should be on-line in early 2006.

Canyon Lake had the highest Total Dissolved Solids (TDS) among all of EVMWD's water sources between 1999 and 2004, except in 2003. The TDS in treated water from Canyon Lake ranged between 588 to 660 mg/L, except in 2003 when the concentration dropped to 400 mg/L due to above normal runoff. The secondary (aesthetic) MCL for TDS is 1,000 mg/L.

Despite these water quality issues, no water quality problems from the EVMWD's surface water sources are expected to have an impact on water supply reliability.

7.1.2 Groundwater

Groundwater produced from the EVMWD's wells is EVMWD's most economical water source. However, data from 2004 reveals that groundwater from EVMWD's wells show significant levels of nitrate. Groundwater from the Elsinore Division system had an average nitrate (as N) level of 2.8 mg/L and a maximum level of 8.1 mg/L. Groundwater from the Temescal Division system had an average nitrate (as N) level of 6.2 mg/L, and a maximum level of 6.7 mg/L. The MCL and MCLG for nitrate (as N) is 10 mg/L. The high nitrate levels could be due to contamination from septic systems. Between 1999 and 2004, the flow-weighted TDS of all wells ranged between 399 to 489 mg/L.

Starting from January 23, 2006, water systems are required to comply with the reduced MCL for arsenic. The US EPA lowered the arsenic MCL from 0.050 mg/L to 0.010 mg/L. For groundwater systems, there is a two-year compliance reporting period provided by the US EPA.

Four of EVMWD's wells have arsenic levels exceeding the new MCL. To comply with the deadline, EVMWD is designing and constructing pipelines to blend the elevated arsenic groundwater with imported water that has a low arsenic concentration. EVMWD is also designing a treatment facility to remove arsenic from the groundwater. The cost of the new facilities is estimated to be $3.1 million. Construction of all facilities is anticipated to be completed by July 2007, within the allotted compliance period.

With the current plans to reduce levels of arsenic in the EVMWD's groundwater supply, EVMWD does not anticipate any groundwater quality to have adverse impacts on supply reliability.

7.1.3 Imported Water

EVMWD obtains all of its imported water supply from MWDSC. MWDSC has recognized the importance of the quality of its water supplies, and to the extent possible, is responding to the issue by concentrating on maintaining the quality of its source water and developing water management programs that protect and enhance water quality. These management programs recognize that any contaminants that cannot be sufficiently controlled through protection of source waters must be handled through changed water treatment protocols or blending.

Imported MWDSC water treated at Skinner Filtration Plant is conveyed to EVMWD through the SVP. From 1999 to 2004, the TDS content of this water supply, which is primarily Colorado River water, ranged between 436 to 509 mg/L. In 1999, MWD adopted a policy to maintain the TDS concentration at 500 mg/L (secondary standards for drinking water) or less. This is being accomplished by blending the Colorado River water, which has TDS as high as 700 mg/l, with State Water Project water that has an average TDS of about 300 mg/L.

Imported MWDSC water treated at Mills Filtration Plan is conveyed to EVMWD through the TVP. From 2002 to 2004, the TDS content of this water supply ranged between 263 and 299 mg/L.

Currently there are no restrictions on water supply due to imported water quality. As presented in **Table 7-1**, no projected water supply changes are anticipated due to water quality impacts from any of EVMWD's sources.

Table 7-1
Current & Projected Water Supply Changes Due to Water Quality (percent)

Water Source	2005	2010	2015	2020	2025	2030
Surface Water – Canyon Lake Runoff	0	0	0	0	0	0
Groundwater	0	0	0	0	0	0
Imported Water – AVP	0	0	0	0	0	0
Imported Water – TVP	0	0	0	0	0	0

Section 8
Water Service Reliability

Water Code Section 10635:

(a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry, water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

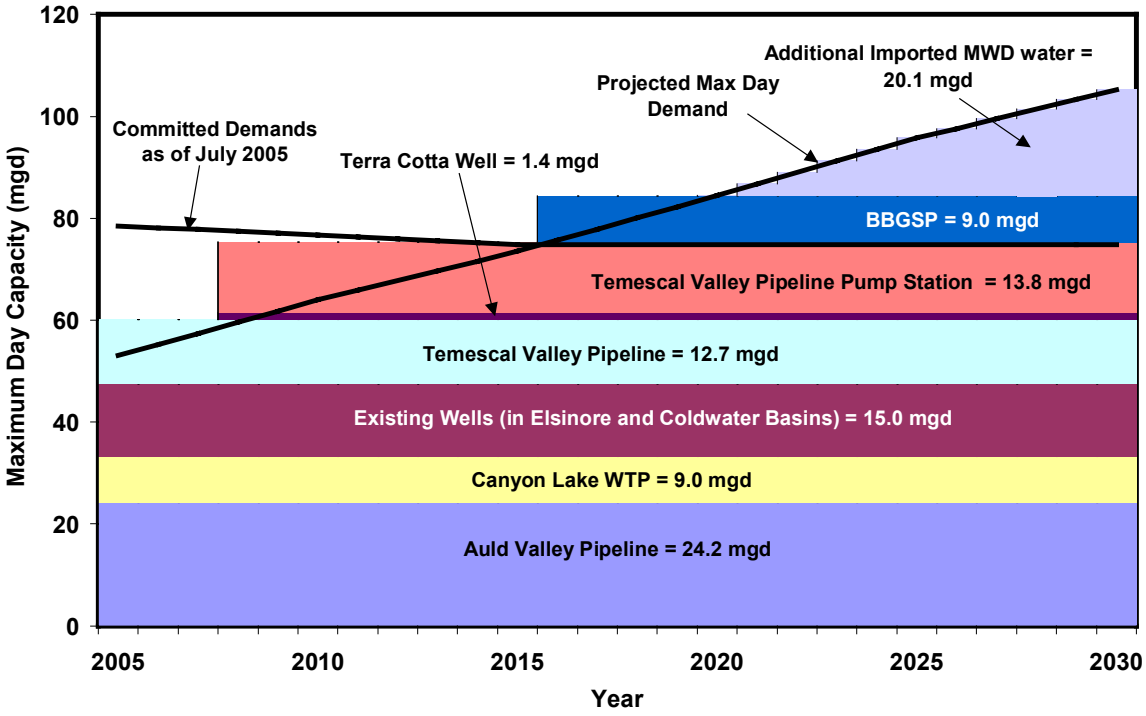
(b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

(c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

Supplies are calculated according to information presented earlier in **Tables 3-5, 3-10, and 3-11**. Beyond 2020, imported MWDSC water sources (in addition to those already projected for through the AVP and TVP) are used to supply needed capacity to meet MDD. In addition, supply from the Coldwater basin is limited by the demand of the TDSA. Demands are calculated from information presented in **Section 3.6-7**. **Figure 8-1** presents EVMWD's supply availability to meet MDD through 2030.

Figure 8-1
Supply Availability to Meet MDD through 2030



8.1 PROJECTED NORMAL WATER YEAR SUPPLY AND DEMAND

The projected normal water year supply includes local groundwater and surface water as well as imported MWDSC water sources. **Table 8-1** summarizes the projected normal water year supply until 2030. Note that recycled water supply and demand is excluded from the calculations (discussed separately in **Section 6**). Current and anticipated future supplies are sufficient to meet the projected normal year water demand through 2030. After 2020, additional water from MWDSC (not including supply already planned for through the AVP and TVP) will be imported to supply increasing MDD.

Table 8-1
Projected Normal Water Year Supply

	2010	2015	2020	2025	2030
Supply (acre-ft/year)	66,590	66,690	66,690	72,627	77,919
% of year 2005	120%	120%	120%	131%	140%

Table 8-2 summarizes the projected normal water year demand until 2030, while **Table 8-3** provides the projected normal year supply and demand comparison. Note that in all tables, MDD is calculated as two times the ADD of a normal water year.

Table 8-2
Projected Normal Water Year Demand

	2010	2015	2020	2025	2030
Demand (acre-ft/year)	35,833	41,186	47,305	53,630	58,923
% of year 2005	121%	139%	159%	180%	198%
MDD (mgd)	64.0	73.6	84.5	95.8	105.3

Table 8-3
Projected Normal Water Year Supply and Demand Comparison

	2010	2015	2020	2025	2030
Supply Totals (acre-ft/year)	66,590	66,690	66,690	72,627	77,919
Demand Totals (acre-ft/year)	35,833	41,186	47,305	53,630	58,923
Difference (supply minus demand)	30,757	25,504	19,385	18,996	18,996
Difference as % of supply	46%	38%	29%	26%	24%
Difference as % of demand	86%	62%	41%	35%	32%
Supply Capacity (mgd)	85.1	85.2	85.2	95.8	105.3
MDD (mgd)	64	73.6	84.5	95.8	105.3
Difference (supply minus demand)	21.1	11.6	0.7	0.0	0.0
Difference as % of Supply Capacity	25%	14%	1%	0%	0%
Difference as % of MDD	33%	16%	1%	0%	0%

8.2 PROJECTED SINGLE DRY-YEAR SUPPLY AND DEMAND

EVMWD has predicted that sufficient supply exists to meet demands for single dry year requirements. As described in the Water Shortage Contingency Plan, dry years may prompt additional water conservation measures to ensure sufficient supply is maintained. **Table 8-4** shows the projected single dry year supply, **Table 8-5** shows the projected single dry year demand, and **Table 8-6** shows the projected single dry year supply and demand comparison. Current and anticipated future supplies are sufficient to meet the projected single dry-year water demand through 2030. After 2020, additional water from MWDSC (not including supply already planned for through the AVP and TVP) will be imported to supply increasing MDD.

Table 8-4
Projected Single Dry-Year Water Supply

	2010	2015	2020	2025	2030
Supply (acre-ft/year)	76,490	76,590	76,590	82,527	87,819
% of projected normal	115%	115%	115%	114%	113%

Table 8-5
Projected Single Dry-Year Water Demand

	2010	2015	2020	2025	2030
Demand (acre-ft/year)	39,129	44,975	51,657	58,565	64,344
% of year 2005	109%	109%	109%	109%	109%
MDD (mgd)	64.0	73.6	84.5	95.8	105.3

Table 8-6
Projected Single Dry-Year Supply and Demand Comparison

	2010	2015	2020	2025	2030
Supply Totals (acre-ft/year)	76,490	76,590	76,590	82,527	87,819
Demand Totals (acre-ft/year)	39,129	44,975	51,657	58,565	64,344
Difference (supply minus demand)	37,361	31,615	24,933	23,962	23,475
Difference as % of supply	49%	41%	33%	29%	27%
Difference as % of demand	95%	70%	48%	41%	36%
Supply Capacity (mgd)	85.1	85.2	85.2	95.8	105.3
MDD (mgd)	64.0	73.6	84.5	95.8	105.3
Difference (supply minus demand)	21.1	11.6	0.7	0.0	0.0
Difference as % of Supply Capacity	25%	14%	1%	0%	0%
Difference as % of MDD	33%	16%	1%	0%	0%

8.3 PROJECTED MULTIPLE DRY-YEAR SUPPLY AND DEMAND

EVMWD has predicted that sufficient supply exists to meet demands for multiple dry year requirements and, similar to single dry-year supply, dry years may prompt additional water conservation measures to ensure sufficient supply is maintained. **Tables 8-7** through **8-19** show multiple-dry-year supply and demand figures through 2030. Current and anticipated future supplies are sufficient to meet the projected multiple dry-year demand through 2030. After 2020, additional water from MWDSC (not including supply already planned for through the AVP and TVP) will be imported to supply increasing MDD.

Table 8-7
Projected Supply During Multiple Dry-Year Period Ending in 2010

	2006	2007	2008	2009	2010
Supply (acre-ft/year)	55,590	71,790	71,790	76,190	76,190
% of projected normal	100%	107%	107%	114%	114%

Table 8-8
Projected Demand during Multiple Dry Year Period Ending in 2010

	2006	2007	2008	2009	2010
Demand (acre-ft/year)	33,786	35,122	36,459	37,795	39,129
% of year 2005	109%	109%	109%	109%	109%
MDD (mgd)	55.3	57.5	59.6	61.8	64.0

Table 8-9
Projected Supply and Demand Comparison During Multiple Dry Year Period Ending in 2010

	2006	2007	2008	2009	2010
Supply Totals (acre-ft/year)	55,590	71,790	71,790	76,190	76,190
Demand Totals (acre-ft/year)	33,786	35,122	36,459	37,795	39,129
Difference (supply minus demand)	21,804	36,668	35,331	38,395	37,061
Difference as % of supply	39%	51%	49%	50%	49%
Difference as % of demand	65%	104%	97%	102%	95%
Supply Capacity (mgd)	60.9	80.6	80.6	85.1	85.1
MDD (mgd)	55.3	57.5	59.6	61.8	64.0
Difference (supply minus demand)	5.6	23.1	21.0	23.3	21.1
Difference as % of Supply Capacity	9%	29%	26%	27%	25%
Difference as % of MDD	10%	40%	35%	38%	33%

Table 8-10
Projected Supply During Multiple Dry Year Period Ending in 2015

	2011	2012	2013	2014	2015
Supply (acre-ft/year)	76,190	76,190	76,190	76,190	76,290
% of projected normal	114%	114%	114%	114%	114%

Table 8-11
Projected Demand during Multiple Dry Year Period Ending in 2015

	2011	2012	2013	2014	2015
Demand (acre-ft/year)	40,298	41,467	42,637	43,806	44,975
% of year projected normal	109%	109%	109%	109%	109%
MDD (mgd)	65.9	67.8	69.7	71.7	73.6

Table 8-12
Projected Supply and Demand Comparison During Multiple Dry Year Period Ending in 2015

	2011	2012	2013	2014	2015
Supply Totals (acre-ft/year)	76,190	76,190	76,190	76,190	76,290
Demand Totals (acre-ft/year)	40,298	41,467	42,637	43,806	44,975
Difference (supply minus demand)	35,892	34,723	33,553	32,384	31,315
Difference as % of supply	47%	46%	44%	43%	41%
Difference as % of demand	89%	84%	79%	74%	70%
Supply Capacity (mgd)	85.1	85.1	85.1	85.1	85.2
MDD (mgd)	65.9	67.8	69.7	71.7	73.6
Difference (supply minus demand)	19.2	17.3	15.4	13.4	11.6
Difference as % of Supply Capacity	23%	20%	18%	16%	14%
Difference as % of MDD	29%	25%	22%	19%	16%

Table 8-13
Projected Supply During Multiple Dry Year Period Ending in 2020

	2016	2017	2018	2019	2020
Supply (acre-ft/year)	76,290	76,290	76,290	76,290	76,290
% of projected normal	114%	114%	114%	114%	114%

Table 8-14
Projected Demand during Multiple Dry Year Period Ending in 2020

	2016	2017	2018	2019	2020
Demand (acre-ft/year)	46,312	47,648	48,985	50,322	51,657
% of year projected normal	109%	109%	109%	109%	109%
MDD (mgd)	75.8	77.9	80.1	82.3	84.5

Table 8-15
Projected Supply and Demand Comparison During Multiple Dry Year Period Ending in 2020

	2016	2017	2018	2019	2020
Supply Totals (acre-ft/year)	76,290	76,290	76,290	76,290	76,290
Demand Totals (acre-ft/year)	46,312	47,648	48,985	50,322	51,657
Difference (supply minus demand)	29,978	28,642	27,305	25,968	24,633
Difference as % of supply	39%	38%	36%	34%	32%
Difference as % of demand	65%	60%	56%	52%	48%
Supply Capacity (mgd)	85.2	85.2	85.2	85.2	85.2
MDD (mgd)	75.8	77.9	80.1	82.3	84.5
Difference (supply minus demand)	9.4	7.3	5.1	2.9	0.7
Difference as % of Supply Capacity	11%	9%	6%	3%	1%
Difference as % of MDD	12%	9%	6%	3%	1%

Table 8-16
Projected Supply During Multiple Dry Year Period Ending in 2025

	2021	2022	2023	2024	2025
Supply (acre-ft/year)	77,166	78,431	79,696	80,961	82,227
% of projected normal	114%	114%	114%	113%	113%

Table 8-17
Projected Demand during Multiple Dry Year Period Ending in 2025

	2021	2022	2023	2024	2025
Demand (acre-ft/year)	53,038	54,420	55,801	57,183	58,565
% of year projected normal	109%	109%	109%	109%	109%
MDD (mgd)	86.8	89.0	91.3	93.5	95.8

Table 8-18
Projected Supply and Demand Comparison During Multiple Dry Year Period Ending in 2025

	2021	2022	2023	2024	2025
Supply Totals (acre-ft/year)	77,166	78,431	79,696	80,961	82,227
Demand Totals (acre-ft/year)	53,038	54,420	55,801	57,183	58,565
Difference (supply minus demand)	24,128	24,011	23,895	23,779	23,662
Difference as % of supply	31%	31%	30%	29%	29%
Difference as % of demand	45%	44%	43%	42%	40%
Supply Capacity (mgd)	86.8	89.0	91.3	93.5	95.8
MDD (mgd)	86.8	89.0	91.3	93.5	95.8
Difference (supply minus demand)	0.0	0.0	0.0	0.0	0.0
Difference as % of Supply Capacity	0%	0%	0%	0%	0%
Difference as % of MDD	0%	0%	0%	0%	0%

Table 8-19
Projected Supply During Multiple Dry Year Period Ending in 2030

	2026	2027	2028	2029	2030
Supply (acre-ft/year)	83,285	84,344	85,403	86,462	87,519
% of projected normal	113%	113%	113%	112%	112%

Table 8-20
Projected Demand during Multiple Dry Year Period Ending in 2030

	2026	2027	2028	2029	2030
Demand (acre-ft/year)	59,720	60,877	62,033	63,190	64,344
% of year projected normal	109%	109%	109%	109%	109%
MDD (mgd)	97.7	99.6	101.5	103.4	105.3

Table 8-21
Projected Supply and Demand Comparison During Multiple Dry Year Period Ending in 2030

	2026	2027	2028	2029	2030
Supply Totals (acre-ft/year)	83,285	84,344	85,403	86,462	87,519
Demand Totals (acre-ft/year)	59,720	60,877	62,033	63,190	64,344
Difference (supply minus demand)	23,565	23,467	23,370	23,273	23,175
Difference as % of supply	28%	28%	27%	27%	26%
Difference as % of demand	39%	39%	38%	37%	36%
Supply Capacity (mgd)	97.7	99.6	101.5	103.4	105.3
MDD (mgd)	97.7	99.6	101.5	103.4	105.3
Difference (supply minus demand)	0.0	0.0	0.0	0.0	0.0
Difference as % of Supply Capacity	0%	0%	0%	0%	0%
Difference as % of MDD	0%	0%	0%	0%	0%

Section 9
Adoption and Implementation of the UWMP

Water Code Section 10640: *Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630).*

The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

Water Code Section 10641: *An urban water supplier required to prepare a plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.*

Water Code Section 10642: *Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.*

Water Code Section 10643: *An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.*

Water Code Section 10644 (a & b):

(a) *An urban water supplier shall file with the department and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be filed with the department and any city or county within which the supplier provides water supplies within 30 days after adoption.*

(b) *The department shall prepare and submit to the Legislature, on or before December 31, in the years ending in six and one, a report summarizing the status of the plans adopted pursuant to this part. The report prepared* by *the department shall identify the outstanding elements of the individual plans. The department shall provide a copy of the report to each urban water supplier that has filed its plan with the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans submitted pursuant to this part.*

Water Code Section 10645: *Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.*

9.1 PLAN DEVELOPMENT AND PUBLIC PARTICIPATION

EVMWD followed its normal procedures for reviewing and adopting the UWMP:

- Review by staff of a preliminary draft of the UWMP;
- Workshop on the UWMP with the Board of Directors;
- Draft plan made available to public two weeks before public hearing. Copies of the report were on file at the EVMWD office at 31315 Chaney Street, Lake Elsinore, CA.
- Legal notice published in the *Press-Enterprise*;
- Public hearing held at a regular EVMWD Board Meeting; and
- Adoption by resolution at EVMWD Board Meeting.

9.2 RESOLUTION FOR ADOPTING THE PLAN

The Board of Directors of EVMWD adopted this urban water management plan on December 12, 2005 as Resolution No. 05-12-01. A copy of this resolution is presented at the end of this section.

9.3 DISTRIBUTION OF THE 2005 UWMP

The final EVMWD 2005 UWMP will be distributed to the following entities:

- City of Lake Elsinore;
- City of Canyon Lake;
- City of Murietta; and
- County of Riverside Planning Department.

Copies of the 2005 UWMP are available to the public upon request.

RESOLUTION NO. 05-12-01

RESOLUTION OF THE BOARD OF DIRECTORS
OF ELSINORE VALLEY MUNICIPAL WATER
DISTRICT ADOPTING THE URBAN WATER
MANAGEMENT PLAN (UWMP) 2005

WHEREAS, the California Legislature enacted Assembly Bill 797 during the 1983-94 Regular Session of the California Legislature (Water Code Section 10610 et. seq.) known as the Urban Water Management Planning Act, which mandates that every urban supplier of water providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre feet of water annually, prepare an Urban Water Management Plan, the primary objective of which is to plan for the conservation and efficient use of water; and

WHEREAS, Elsinore Valley Municipal Water District is an urban supplier of water providing to over 32,000 customers, and has therefore, prepared and circulated for public review a Draft Urban Water Management Plan, in compliance with requirements of AB 797; and

WHEREAS, a properly noticed public hearing regarding said Draft Plan was held by the Board of Directors of Elsinore Valley Municipal Water District on December 12, 2005;

NOW, THEREFORE BE IT RESOLVED, by the Board of Directors of the Elsinore Valley Municipal Water District as follows:

1. The 2005 Urban Water Management Plan is hereby adopted;
2. The General Manager is hereby authorized and directed to file the Plan with the State Water Resources Control Board for approval, and then before December 31, 2005, submit the Plan to the California Department of Water Resources, in accordance with AB797;
3. The General Manager is hereby authorized and directed to implement the Water Conservation Programs as detailed in the adopted Urban Water Management Plan, including recommendations to the Board of Directors regarding necessary procedures, rules, and regulations to carry out effective and equitable water conservation programs.

APPROVED, ADOPTED AND SIGNED this 12th day of December 2005.

Kristine M. Anderson, President of the
Board of Directors of the
Elsinore Valley Municipal Water District

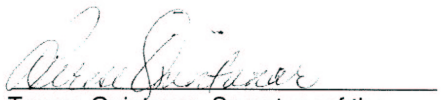
ATTEST:

Terese Quintanar, Board Secretary to the
Board of Directors of the
Elsinore Valley Municipal Water District

STATE OF CALIFORNIA)
) ss:
COUNTY OF RIVERSIDE)

I, Terese Quintanar, Secretary of the Board of Directors of the Elsinore Valley Municipal Water District, do hereby certify that the foregoing Resolution No. 05-12-01, was duly adopted by said Board at its Adjourned Meeting held on December 12, 2005, and that it was so adopted by the following roll call vote:

AYES:	Anderson, Hyland, Ryan, Wicke, Williams
NOES:	None
ABSENT:	None
ABSTAIN:	None



Terese Quintanar, Secretary of the
Board of Directors of the
Elsinore Valley Municipal Water District

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Section 10
Miscellaneous Provisions

Water Code Section 10650 – 10657:

10650. *Any actions or proceedings to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:*

(a) An action or proceeding alleging failure to adopt a plan shall be commenced within 18 months after that adoption is required by this part.

(b) Any action or proceeding alleging that a plan, or action taken pursuant to the plan, does not comply with this part shall be commenced within 90 days after filing of the plan or amendment thereto pursuant to Section 10644 or the taking of that action.

10651*. In any action or proceeding to attack, review, set aside, void, or annul a plan, or an action taken pursuant to the plan by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.*

10652*. The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part or to the implementation of actions taken pursuant to Section 10632. Nothing in this part shall be interpreted as exempting from the California Environmental Quality Act any project that would significantly affect water supplies for fish and wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.*

10653*. The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the State Water Resources Control Board and the Public Utilities Commission, for the preparation of water management plans or conservation plans; provided, that if the State Water Resources Control Board or the Public Utilities Commission requires additional information concerning water conservation to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan prepared to meet federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.*

10654*. An urban water supplier may recover in its rates the costs incurred in preparing its plan and implementing the reasonable water conservation measures included in the plan. Any best water management practice that is included in the plan that is identified in the "Memorandum of Understanding Regarding Urban Water Conservation in California" is deemed to be reasonable for the purposes of this section.*

***10655**. If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof and to this end the provisions of this part are severable.*

***10656**. An urban water supplier that does not prepare, adopt, and submit its urban water management plan to the department in accordance with this part, is ineligible to receive funding pursuant to Division 24 (Commencing with Section 78500) or Division 26 (commencing with Section 79000), or receive drought assistance from the state until the urban water management plan is submitted pursuant to this article.*

***10657**.*

(a) The department shall take into consideration whether the urban water supplier has submitted an updated urban water management plan that is consistent with Section 10631, as amended by the act that adds this section, in determining whether the urban water supplier is eligible for funds made available pursuant to any program administered by the department.

(b) This section shall remain in effect only until January 1, 2006, and as of that date is repealed. unless a later enacted statute, that is enacted before January I, 2006, deletes or extends that date.

Should any of the provisions listed above become applicable, necessary action shall be taken.

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Appendix B
2005 UWMP Guidebook

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Guidebook to Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan

January 18, 2005

Prepared by the California Department of Water Resources

STATE OF CALIFORNIA -- THE RESOURCES AGENCY

ARNOLD SCHWARZENEGGER, *Governor*

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791

January 18, 2005

TO: California Urban Water Suppliers

This *Guidebook to Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan* has been prepared by the Department of Water Resources (DWR) for your use in preparing Urban Water Management Plans (UWMPs). The Guidebook has been posted at the DWR website at: http://www.owue.water.ca.gov/urbanplan/Guidebook.pdf.

An UWMP can be a step-by-step approach for water utilities to assess their water resource needs. It is a solid basis for local and regional water management planning. Every retailer and wholesaler that meets the definition of an "urban water supplier" must prepare an UWMP, and then, if they wish, join with other agencies to prepare an Integrated Regional Water Management Plan (IRWMP). The UWMP can be a key component of the IRWMP and is a condition for eligibility for assistance pursuant to Proposition 50, Chapter 8 grant funds, as well as drought assistance.

An UWMP is also considered to be a source of information for Water Supply Assessments, Water Code Section 10613 et seq. (Added by Stats. 2001, c. 643), and Written Verifications of Water Supply, Water Code Section 66473.7 (Added by Stats. 2001, c. 642). Both statutes require detailed information regarding water availability to be provided to the city and county decision makers prior to approval of specified large development projects. Both statutes repeatedly identify the UWMP as a planning document that, if properly prepared, can be used by a water supplier to meet the standards set forth in both statutes. Thorough and complete UWMPs will allow water suppliers to use UWMPs as a foundation to fulfill the specific requirements of these two statutes. Additionally, an UWMP may serve as a long-range planning document for water supply and a source document for cities and counties as they prepare their General Plans.

Sincerely,

Lester A. Snow
Director

Enclosure

FOREWORD

Note: The Department of Water Resources does not determine whether a specific UWMP complies with the requirements of the Act, but reviews the plans for completeness. Except as provided in Water Code §10631.5 "DWR consideration of Demand Management Measures (DMMs) for specific financial assistance programs," Water Code §10644 "Plans must be filed with DWR," Water Code §10656 "supplier that does not prepare, adopt and submit a Plan to DWR is ineligible to receive drought assistance," and Water Code §10657 "submission of an updated Plan necessary for financial assistance from DWR", the Department of Water Resources has no regulatory, permitting or other approval authority over Plans.

The Urban Water Management Planning Act (Act) requires urban water suppliers to describe and evaluate sources of water supply, efficient uses of water, demand management measures, implementation strategy and schedule, and other relevant information and programs. Specific information required by the Act is cited in the Guidebook, by showing each provision of the Act in Italic font.

The Guidebook has been prepared to assist urban water suppliers in complying with the requirements of the Act. However the information in the Guidebook does not necessarily include all matters which may be necessary to comply with the Act, and some advice or recommendations may not be necessary in a specific case. In the event that information or recommendation in the Guidebook are inconsistent with, or conflict with the requirements of the Act or applicable laws, the Act or other laws shall prevail.

Additionally, tables are included, where applicable, to help plan preparers organize and report the necessary information. For those sections or portions thereof, where tabulating the information is not applicable, it is suggested the required information be reported in narrative format. Completion of the Guidebook tables may not be sufficient to meet the requirement of the Act. Table entries are designed to guide the urban water suppliers to tabulate the information. Table entries may not be inclusive or applicable to your case. As such, you may add to, modify, or replace the tables in reporting required information applicable to your plan. In many instances, even when data is available, the law's requirements need to be addressed in narrative format.

In addition to the Guidebook, DWR has prepared Review Sheets that contain the criteria used by DWR staff in reviewing the UWMP for completeness. As a general rule, DWR reviewers will consider a plan complete if it meets the criteria listed in the Review Sheets. The DWR staff Review Sheets are available to interested parties on the DWR Web Site at http://www.owue.water.ca.gov/urbanplan/assist/assist.cfm. Urban water suppliers may wish to view the Review Sheets. The Review Sheets also contain tables identical to the tables in the Guidebook. DWR staff will enter information contained in the UWMPs into the appropriate Review Sheet tables in the UWMP database. The Review Sheets tables will also assist DWR staff to determine if all required information is included in the UWMP.

While use of Guidebook tables to report the information by the water supplier is encouraged, a supplier is not required (nor are the tables necessarily sufficient) to complete the Guidebook tables to meet the requirements of the Act.

Using the Urban Water Management Plan as a foundation for a new Integrated Regional Water Management Plan

Urban water suppliers are required by the Urban Water Management Planning Act to update their UWMP and submit a complete plan to Department of Water Resources every five years. An UWMP is required in order for a water supplier to be eligible for DWR administered State grants and loans and drought assistance.

An UWMP is considered to be a source of information for Water Supply Assessments (Senate Bill 610) Water Code §10613 *et seq.* (*Added by* Stats. 2001, c. 643), and Written Verifications of Water Supply (SB 221) Water Code §66473.7 (*Added by* Stats. 2001, c. 642). In addition, an UWMP may serve as a long-range planning document for water supply, a source of data for development of a regional water plan, and a source document for cities and counties as they prepare their General Plans.

One of the strategic objectives of DWR and the State is to assist and encourage integrated regional water management planning. The UWMP can provide a step-by step approach for water utilities to assess their water resource needs and supplies, which may serve as a building block for an Integrated Regional Water Management Plan (IRWMP) Water Code § 10530 *et seq.* (SB 1672) (added by Stats. 2002, c. 767).
.
In 2000, the Legislature passed the Integrated Regional Water Management Planning Act, which allows a regional water management group to prepare and adopt an IRWMP that includes qualified programs or projects or qualified reports or studies identified in Water Code § 10540 *et seq.* Many of the water management elements identified in the Act are also part of an UWMP. The intent of the Legislature is to encourage local agencies to work cooperatively to manage their available local and imported water supplies to improve the quality, quantity, and reliability of those supplies.

The Integrated Regional Water Management grant program (Chapter 8 of Proposition 50) Water Code § 79510-7951, administered by DWR and the State Water Resources Control Board, provides funding for preparation and implementation of IRWMPs. The financial assistance provided by this grant program is expected to facilitate a variety of benefits not only through integration of multiple water management activities, but also planning and management on a regional basis, encompassing the service areas of multiple local agencies. IRWMPs will serve as a framework for agencies to integrate programs and projects that protect and enhance the quality and quantity of regional water supplies, as well as providing economic, environmental, and flood control benefits.

An urban water supplier that coordinates preparation of its UWMP with other water suppliers within the region or watershed will improve planning efficiencies and will be able to use its UWMP as a foundation for the IRWMP.

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Guidebook Structure

The Guidebook is designed to provide step-by-step suggestions for completing a **2005 Urban Water Management Plan**. The organization of the Guidebook follows the Urban Water Management Planning Act. The Water Code Section is quoted first in each section. Then text and tables are provided to assist agencies in preparing their Urban Water Management Plans.

DWR recommends that the Guidebook be printed (front and back with odd pages on the right) and placed in a binder so the reader can see two pages at once. The layout of the Guidebook allows the user to read through the directions on the right-hand page and view the related citations from the statute on the left-hand page (except for the Demand Management Section).

You may also request a hard copy of the Guidebook from:

San Joaquin District, Luis G Avila, (559) 230-3364, lgavila@water.ca.gov
Southern District, Sergio Fierro, (818) 543-4652, sergiof@water.ca.gov
Central District, Kim E Rosmaier, (916) 227-7584, krosmaie@water.ca.gov
Northern District, Gene Pixley, (530) 529-7392, pixley@water.ca.gov
Headquarters, David Todd, (916) 651-7027, dtodd@water.ca.gov
Headquarters, Chriss Fakunding, (916) 651-9673, cfakund@water.ca.gov

A map of DWR districts is available at: http://www.dpla2.water.ca.gov/docs.cfm?nav=539.

Throughout the Guidebook the term "Agency" is used to refer to city and county governments and public and private water suppliers that provide water for municipal purposes to 3,000 or more customers or provide more than 3,000 acre-feet of water per year.

Italicized text indicates the actual wording in the law.

The full text of the **Urban Water Management Planning Act** is included as an attachment to the Guidebook and is available at our web site (http://www.owue.water.ca.gov/urbanplan/assist/assist.cfm) as an Adobe PDF or a Microsoft Word document.

Please provide your suggestions for modifications to these planning tools so that this process continues to improve California's water management and planning capabilities. To provide suggestions, please contact the Department of Water Resources, Office of Water Use Efficiency at dtodd@water.ca.gov.

Definitions

Water Code section 10611-10617

10611. Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.

10611.5. "Demand management" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

10612. "Customer" means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.

10613. "Efficient use" means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.

10614. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.

10615. "Plan" means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water demand management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.

10616. "Public agency" means any board, commission, county, city and county, city, regional agency, district, or other public entity.

10616.5. "Recycled water" means the reclamation and reuse of wastewater for beneficial use.

10617. "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

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Introduction

California Water Code §10644(a) requires urban water suppliers to file with the Department of Water Resources, the California State Library, and any city or county within which the supplier provides water supplies, a copy of its Urban Water Management Plan, no later than 30 days after adoption. Urban water suppliers are required to file an Urban Water Management Plan at least once every five years on or before December 31, in years ending in five and zero.

The 2005 Urban Water Management Plans are due December 31, 2005. All urban water suppliers as defined in Section 10617 (including wholesalers), either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet annually are required to prepare an Urban Water Management Plan.

A complete UWMP could be a foundation document and source of information for a Water Supply Assessment and a Written Verification of Water Supply. An UWMP also serves as:

- A long-range planning document for water supply,
- Source data for development of a regional water plan, and
- A source document for cities and counties as they prepare their General Plans.
- A key component to Integrated Regional Water Management Plans.

General Plans are source documents for water suppliers as they prepare their UWMPs. General Plans and UWMPs may be linked, as their accuracy and usefulness are interdependent. Therefore cities, counties, and public and private water suppliers will find it useful to work closely when developing and updating these planning documents. Cities, counties, water districts, property owners, and developers will all be able to utilize the UWMP when planning for and proposing new projects.

Urban Water Management Plans are reviewed by DWR staff to determine whether or not they are complete pursuant to the Urban Water Management Planning Act. Agencies subject to the Act must have adopted a complete UWMP that meets the requirements of the law and submitted it to DWR to be eligible for drought assistance or to receive funds through DWR. Results of the DWR review are provided to urban water suppliers through a review letter. The agency may wish to use the review letter to revise their UWMP for re-submittal. DWR provides a Legislative Report to the California Legislature one year after UWMPs are due to the Department, detailing the status of and outstanding elements of the UWMPs. The Department also prepares reports and provides data for any legislative hearings designed to consider the effectiveness of the submitted UWMPs.

DWR has updated these worksheets included in this Guidebook for the 2005 UWMP and posted them on the DWR Office of Water Use Efficiency web site at: http://www.owue.ca.gov/.

If you have questions regarding the Urban Water Management Planning Act, please contact

San Joaquin District, Luis G Avila, (559) 230-3364, lgavila@water.ca.gov
Southern District, Sergio Fierro, (818) 543-4652, sergiof@water.ca.gov
Central District, Kim E Rosmaier, (916) 227-7584, krosmaie@water.ca.gov
Northern District, Gene Pixley, (530) 529-7392, pixley@water.ca.gov
Headquarters, David Todd, (916) 651-7027, dtodd@water.ca.gov
Headquarters, Chriss Fakunding, (916) 651-9673, cfakund@water.ca.gov

Section 1 - Agency Coordination

Water Code section 10620

10620. (a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).

(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.

(c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.

(d) (1) An urban water supplier may satisfy the requirements of this part by participation in area wide, regional, watershed, or basin wide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.

(2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

Water Code section 10617

10617. "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

NOTE

The UWMP Act requires certain information be included in an Urban Water Management Plan (UWMP). When the law requires a description of an activity, or the identification of a water supply, or asks for quantity or quality, or request other data, your UWMP should contain a complete response. In reviewing an UWMP for completeness, DWR will review each UWMP section and will enter the information in the Review Sheet tables and answer the Review Sheet questions. However, providing the information necessary to complete the Review Sheets does not necessarily meet the requirements of the law.

Tables in the Review Sheet document and in the Guidebook reflect the wording of the law. When a table contains words such as “(other) define” it is understood that information will only be included when it applies to your agency. For instance, in Table 1 (on the next page) DWR reviewers will look for information about the role that “other water suppliers”, water management agencies” and “relevant public agencies” played in the development of your UWMP.

Section 1 - Agency Coordination

Water Provider which will become Urban Water Supplier before 2010 (§ 10620 (b))

If a water supplier currently serves less than 3,000 customers or provides less than 3,000 AF/Y but becomes an urban water supplier, they have one year to adopt and submit an UWMP.

Wholesaler UWMP options (§ 10620 (c))

A wholesale water agency may include information for one or more of their retail agencies if the retail agencies agree. If a retail agency participates in a regional UWMP, all of the information required by the Urban Water Management Planning Act for each retailer must be included and each included agency must adopt the UWMP. However, a regional UWMP may be functionally equivalent to an Integrated Regional Water Management Plan.

Coordination with Appropriate Agencies (§ 10620 (d))

Discuss whether your agency participated in area, regional, watershed or basin wide plan and the anticipated benefits.

Describe the coordination of the plan preparation. You may use the table below that includes a list of the type of agencies with which the supplier is required to coordinate UWMP preparation and examples of types of coordination. You may use this table or other formats to report the required information applicable to your agency. The types of agencies may be replaced with specific agency names.

Coordination with Appropriate Agencies (Table 1)

Check at least one box per row	Participated in UWMP development	Commented on the draft	Attended public meetings	Contacted for assistance	Received copy of draft	Sent notice of intention to adopt	Not Involved / No Information
Other water suppliers							
Water management agencies							
Relevant public agencies							
Other							

UWMP preparation (§ 10620 (e))

The water supplier has several options for the preparation of their UWMP.

- Own staff
- By contract
- In cooperation with other governmental agencies

Describe resource maximization / import minimization plan (§10620 (f))

Discuss how water management tools and options are used to maximize resources and minimize your need to import water. This discussion may include documents you developed, such as: Integrated Regional Water Management Plan, Groundwater Management Plan, Regional Water Efficiency Programs, Water Transfers and Exchanges, Regional Water Plan, Cooperative Agreements, etc.

Section 1 - Agency Coordination

Water Code section 10621

10621. (a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero.

(b) Every urban water supplier required to prepare a plan pursuant to this part shall notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

(c) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

Section 1 – Contents of UWMP

Due Date for UWMP (§ 10621(a))

UWMPs are due by December 31 of years ending in '0' and '5'. Suppliers are encouraged to submit their UWMPs prior to the due date in order to allow sufficient time for DWR review and any necessary additions or revisions by suppliers.

City and County Notification and Participation (§ 10621(b))

Suppliers are required to notify cities and counties in their service area of the opportunity to submit comments regarding the UWMP during the update process. The supplier may consult with and obtain comments from cities and counties that receive the notices required by this subdivision.

Supplier will periodically review and adopt any changes or amendments (§ 10621(c))

When making changes or additions to an UWMP the supplier should follow the procedure set forth in Water Code sections 10640 through 10645.

Section 2 - Contents of Plan
Step 1: Appropriate level of planning for size of agency
Article 2. Contents of Plans

Water Code Section 10630

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied

Section 2 - Contents of UWMP
Step 1: Appropriate level of planning for size of agency

The level of detail provided in an UWMP should reflect the size and complexity of the water supplier. However, all elements required by the Urban Water Management Planning Act must be discussed in an UWMP. Note that certain specific provisions of the Act require inclusion of historic information "if available."

Section 2 - Contents of UWMP
Step Two: Service Area Information with 20 year projections

Water Code section 10631

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

(a) Describe the service area of the supplier; including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

NOTES

The UWMP Act requires a 20-year projection (through 2025 for the 2005 UWMP) for most information required in an UWMP. The tables provided throughout the Guidebook allow for data through 2030. The column is labeled 2030/opt so that it is clear that information for 2030 is NOT required. The inclusion of the 2030 data column was suggested by several water agencies that are preparing water supply assessments and verifications. If your agency anticipates preparing an assessment or verification between 2006 and 2010 the inclusion of 2030 data will allow you to utilize UWMP data for these purposes.

Section 2 - Contents of UWMP
Step Two: Service Area Information with 20 year projections

A variety of demographic factors may affect water use, including current and projected population, climate, population density, and the mix of customer types.

Current population and projected population for your water service area can be presented in a table similar to Table 2, below. Identify source of population projections, i.e. state, regional or local agency.

Population - Current and Projected (Table 2)

	2005	2010	2015	2020	2025	2030/opt
Service Area Population						

Include climate characteristics that affect water management in your service area. It is recommended that average climate data be based on at least the last 30 years, although much of the information on the NOAA website covers more than 50 years (http://www.wrcc.dri.edu/CLIMATEDATA.html). Average ETO data for your service area can be obtained from the CIMIS website (http://wwwcimis.water.ca.gov/cimis/welcome.jsp). Select the CIMIS station that provides data for your area and select the "Standard Monthly Average" to see that CIMIS data.

Climate (Table 3)

	Jan	Feb	Mar	Apr	May	June
Standard Monthly Average ETo						
Average Rainfall (inches)						
Average Temperature (Fahrenheit)						

Climate (continued) (Table 3)

	July	Aug	Sept	Oct	Nov	Dec	Annual
Standard Monthly Average ETo							
Average Rainfall (inches)							
Average Temperature (Fahrenheit)							

Describe other demographic factors affecting water management, such as housing density, future commercial and industrial development, or projected income levels. Much of this data might be available in the General Plan(s) covering your service area.

Section 2 - Contents of UWMP
Step Three: Water Sources

Water Code section 10631

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). . . . .

The tables provided throughout the Guidebook are offered only as a tool to help agencies collect and report information that must be in a complete UWMP. Although use of the provided tables is not required, quantification (to the extent practicable) is required. Not all tables, or parts of tables, apply to every agency. Your UWMP should include only information that is applicable to your agency, whether in tabular or narrative form.

Section 2 - Contents of UWMP
Step Three: Water Sources

Identify existing and planned water supply sources and the current and planned quantities available to the supplier.

Current and Planned Water Supplies – AF/Y (Table 4)

Water Supply Sources	2005	2010	2015	2020	2025	2030/opt
Wholesale water providers						
Name of your supplier						
Name of your supplier						
Name of your supplier						
Supplier produced groundwater						
Supplier surface diversions						
Transfers in or out						
Exchanges in or out						
Recycled Water (current and projected use)						
Desalination						
Other						

Section 2 - Contents of UWMP
Step Three: Water Sources - Groundwater

Water Code section 10631

(b) . . . . If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree.

For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

Section 2 - Contents of UWMP
Step Three: Water Sources - Groundwater

If your agency currently uses, or plans to use groundwater by 2025, your UWMP should include all the information required in the UWMP Act. The description and analysis is to be based on information that is reasonably available, including, but not limited to, historic use records from DWR, and from other sources.

If there is a groundwater management plan, prepared pursuant to Part 2.75 (commencing with Section 10750), discuss its provisions and the impacts upon your use of that basin. If the groundwater plan was adopted by your agency, include a copy in the UWMP.

Describe the groundwater basin(s) from which your agency extracts groundwater and provide information such as the static pumping levels, water quality, extraction rate, total storage, recharge and other factors.

If the groundwater basin(s) is adjudicated, attach the order or decree and identify the quantified amount of legal pumping right.

Groundwater Pumping Rights – AF/Year (Table 5)

Basin Name	Pumping Right – AF/Y
Total	

For basins that have not been adjudicated, state whether the basins are in overdraft. The Department of Water Resources has projected estimates of overdraft, or "water shortage," based on projected amounts of water supply and demand at the hydrologic region level in Bulletin 160, California Water Plan Update (http://www.waterplan.water.ca.gov/). Estimates at the basin or subbasin level will be projected for some basins in Bulletin 118-Update 2003 (http://www.groundwater.water.ca.gov/bulletin118). Data that indicate groundwater level trends over a period of time should be collected and evaluated. If the basin is in overdraft or is projected to be in overdraft, describe in detail your plan to eliminate the overdraft condition.

Provide a detailed analysis of location, amount and sufficiency (see Government Code Section 66473.7) of the groundwater pumped by the supplier for last five years and the amount recharged.

Amount of Groundwater pumped – AF/Y (Table 6)

Basin Name (s)	2000	2001	2002	2003	2004
% of Total Water Supply					

Provide a detailed analysis of location and amount of the groundwater that is projected to be pumped by the supplier. This may include projected cones of depression, changes in direction and amount of groundwater flow, movement and levels of contaminants, projected average annual recharge, salinity/TDS levels and other factors.

Amount of Groundwater projected to be pumped – AF/Y (Table 7)

Basin Name(s)	2010	2015	2020	2025	2030/opt
% of Total Water Supply					

Section 2 - Contents of UWMP
Step Four: Reliability of Supply

Water Code section 10631

(c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

(1) An average water year.

(2) A single dry water year.

(3) Multiple dry water years.

For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

NOTES

Single-dry and multiple-dry years are usually based on historic records of annual runoff from a particular watershed. A multiple-dry year period is generally three or more consecutive years with the lowest average annual runoff. Single-dry and multiple-dry periods should be determined for each watershed (including wholesale sources, the State Water Project, the Colorado River and the Central Valley Project) from which your agency receives a water supply. The information is often presented as a probability of exceedance or probability of occurrence. Many water suppliers have multiple sources of water supplies. To show how the total supply would be affected document how each individual supply will be affected by single-dry and multiple-dry year periods.

Section 2 - Contents of UWMP
Step Four: Reliability of Supply

Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage.
If your agency receives wholesale water, that supplier (e.g., SWP, http://swpdelivery.water.ca.gov) may have already prepared a reliability assessment.

Seasonal shortages are based upon the precipitation patterns of individual watersheds and may vary substantially from one year to the next. Climatic shortages are based upon known factors such as El Nino, the Pacific Decadal Oscillation, and Jet Stream variations. A DWR-funded study, "Reconstructed Sacramento River System Runoff From Tree Rings" (2001) which reconstructed California climate for the last 1,000 years provides a long-term perspective on climate variation. Climate variation studies provide information on projected impacts on California water supply, including long-term variability in the form, time and location that precipitation is received.

To understand whether runoff is above or below normal for seasons and longer timescales, Normal is defined as the median runoff over the previous 30 years or more. This median is recalculated every ten years. Weather information is available at the National Weather Service web site - http://www.nws.noaa.gov/. Runoff data is available from DWR (http://cdec.water.ca.gov/), USGS (http://waterdata.usgs.gov/ca/nwis/sw), and the operator of your local dam.

Normal Year is a year in the historical sequence that most closely represents median runoff levels and patterns.

Single-dry year is generally considered to be the lowest annual runoff for a watershed since the water-year beginning in 1903. Suppliers should determine this for each watershed from which they receive supplies.

Multiple-dry year period is generally considered to be the lowest average runoff for a consecutive multiple year period (three years or more) for a watershed since 1903. For example, 1928-1934 and 1987-1992 were the two multi-year periods of lowest average runoff during the 20th century in the Central Valley basin. Suppliers should determine this for each watershed from which they receive supplies.

Supply Reliability - AF Year (Table 8) (*Suggestion - you may wish to add a row for each source*)

		Multiple Dry Water Years (add columns if necessary)			
Normal Water Year	Single Dry Water Year	Year 1	Year 2	Year 3	Year 4
% of Normal					

Basis of Water Year Data (Table 9)

Water Year Type	Base Year(s)	Hist. Sequence
Normal Water Year		
Single-Dry Water Year		
Multiple-Dry Water Years		

Describe the factors resulting in inconsistency of supply (Table 10)

Name of supply	Legal	Environmental	Water Quality	Climatic

Describe your plans to supplement or replace water sources that may not be available at a consistent level of use with alternative sources (i.e., transfers, recycling, desalination, etc.) or water-use efficiency measures (DMM/ BMP / etc.). Since inconsistent sources will result in a supply deficit, this section should describe how much water will be acquired and from what sources.

Section 2 - Contents of UWMP
Step Five: Transfer and Exchange Opportunities

Water Code section 10631

(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

Section 2 - Contents of UWMP
Step Five: Transfer and Exchange Opportunities

Describe your opportunities for short-term and long-term water exchange and transfer. Include proposed quantities and term of agreement.

Transfers and exchanges can be used for many purposes. Some agencies negotiate transfer agreements to provide a supplemental water supply when their regular supplies are limited or not available. Some exchange agreements provide for reduced costs or improved water quality for one or both agencies. The UWMP Act encourages water agencies to explore how transfers and/or exchanges would improve the reliability, quality, financial health, or other factors of their water supply.

The Water Code definition of short and long-term is that short-term is for a period of one year or less and long-term is for a period of more than one year.

Transfer and Exchange Opportunities – AF/Year (Table 11)

Source Transfer Agency	Transfer or Exchange	Short term	Proposed Quantities	Long term	Proposed Quantities
Total	XXX				

Section 2 - Contents of UWMP
Step Six: Water Use by Customer-type - Past, Current and Future

Water Code section 10631

(e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:

(A) Single-family residential.
(B) Multifamily.
(C) Commercial.
(D) Industrial.
(E) Institutional and governmental.
(F) Landscape.
(G) Sales to other agencies.
(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(2) Agricultural.

(3) The water use projections shall be in the same five-year increments described in subdivision (a).

Section 2 - Contents of UWMP
Step Six: Water Use by Customer-type - Past, Current and Future

Showing the past, current and projected water use by sector is an effective way to show growth patterns and more accurately predict future demand. Projecting future demand by using General Plan land-use zoning designations and projected build out by water use sector usually provides the most accurate demand projections (tables 12-15).

For past and current water use, you may provide limited information if you did not collect water use by customer type. For future water use develop projections based on number of customers per type and water use per type. Data on unmetered accounts and the number of accounts by type is necessary for the DMM / BMP section.

Past, Current and Projected Water Deliveries (Table 12)

Year		Water Use Sectors	Single family	Multi-family	Com-mercial	Indust-rial	Instit / gov	Land-scape	Agric	Total
2000	metered	# of accounts								
		Deliveries AF/Y								
	unmetered	# of accounts								
		Deliveries AF/Y								
2005	metered	# of accounts								
		Deliveries AF/Y								
	unmetered	# of accounts								
		Deliveries AF/Y								
2010	metered	# of accounts								
		Deliveries AF/Y								
	unmetered	# of accounts								
		Deliveries AF/Y								
2015	metered	# of accounts								
		Deliveries AF/Y								
	unmetered	# of accounts								
		Deliveries AF/Y								
2020	metered	# of accounts								
		Deliveries AF/Y								
	unmetered	# of accounts								
		Deliveries AF/Y								
2025	metered	# of accounts								
		Deliveries AF/Y								
	unmetered	# of accounts								
		Deliveries AF/Y								
2030 /opt	metered	# of accounts								
		Deliveries AF/Y								
	unmetered	# of accounts								
		Deliveries AF/Y								

Section 2 - Contents of UWMP
Step Six: Water Use by Customer-type - Past, Current and Future (continued)

Water Code section 10631

(e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:

(A) Single-family residential.
(B) Multifamily.
(C) Commercial.
(D) Industrial.
(E) Institutional and governmental.
(F) Landscape.
(G) Sales to other agencies.
(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(2) Agricultural.

(3) The water use projections shall be in the same five-year increments described in subdivision (a).

Section 2 - Contents of UWMP
Step Six: Water Use by Customer-type - Past, Current and Future (continued)

Identify and quantify sales to other agencies. Sales to other agencies could include wholesale water, exchanges, non-recurring agreements, etc.

Sales to Other Agencies – AF/Year (Table 13)

Water Distributed	2000	2005	2010	2015	2020	2025	2030/opt
name of agency							
name of agency							
Total							

Identify and quantify additional water uses. All water suppliers have unaccounted-for-water and this should be detailed as a separate quantity in 'additional water uses' (Table 14), not included as a part of water use by customer type (Table 12). Any recycled water was included in Table 12 should not be included in Table 14.

Additional Water Uses and Losses – AF/Year (Table 14)

Water Use	2000	2005	2010	2015	2020	2025	2030/opt
Saline barriers							
Groundwater recharge							
Conjunctive use							
Raw water							
Recycled							
Other (define)							
Unaccounted-for system losses							
Total							

Total Water Use – AF/Year (Table 15)

Water Use	2000	2005	2010	2015	2020	2025	2030/opt
Sum of Tables 12, 13, 14							

Total water use is the sum of water use by customer categories, sales to other agencies and additional water uses.

. Section 2 - Contents of UWMP
Step Seven: Demand Management Measures

Water Code section 10631

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

(2) A schedule of implementation for all water demand management measures proposed or described in the plan.

(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.

(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:

(j) Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to that council in accordance with the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated September 1991, may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).

Note on the Council's BMP Reporting Database:

Signatories to the Council's MOU who have used the BMP Reporting Database to report their water conservation activities may retrieve their BMP Activity Reports and their Coverage Reports* for use in satisfying subsections (f) and (g) by linking to the Council's BMP Reporting website at http://bmp.cuwcc.org/bmp/default.htm and following these steps:

To retrieve BMP Activity Reports:

1) login using your Conservation Coordinator's login name and password;
2) select your reporting unit (retail or wholesale, if applicable);
3) select the "Print Reports" button on the upper right hand side of the screen;
4) select the year you are interested in printing by scrolling right or left using the arrow buttons;
5) scroll to the bottom of the screen and click on the "Print All" button all of your agency's reporting data for that year will be printed (note: you may also print to a "PDF" document if your system has the full feature set for Adobe Acrobat installed)

To retrieve Coverage Reports for your agency:

1) select the "Coverage Reports" button at the top of the screen;
2) click on "print coverage reports" (note: you may also print to a "PDF" document if your system has the full feature set for Adobe Acrobat installed)

* The Coverage Report provides information on whether or not your agency is on track for meeting BMP coverage requirements in accordance with the Council's MOU.

Section 2 - Contents of UWMP
Step Seven: Demand Management Measures

The Urban Water Management Planning Act provides two distinct methods for providing information related to Demand Management Measures (DMMs) and meeting the requirements of Water Code Section 10631 (f) and (g).

1. A water supplier who is a member of the California Urban Water Conservation Council (Council) may submit their BMP Activity Reports (Annual Reports). Council members agree to make a good faith effort to implement the 14 urban water conservation Best Management Practices (BMPs) that are intended to reduce long-term urban demands. Members are required to submit annual reports every two years identifying their implementation activities on each of the 14 BMPs. These BMPs are functionally equivalent to the Demand Management Measures in Water Code Section 10631. Council members would utilize the following components from the BMP Reporting Database to satisfy the DMM requirements:
   - The most recent BMP Activity Reports submitted to the Council for reporting years 2003-04.
   - It is recommended that you also include the Annual Reports for 2001-2002 and the Coverage Reports identifying the water supplier's progress on meeting the coverage requirements for quantifiable BMPs
   - It is also recommended that agencies submit the Council Coverage Calculator and any BMP cost-effectiveness forms submitted to the Council in support of exemption submittals.

   To use this method of providing demand management measure implementation information, the supplier must have submitted their BMP Activity Reports on implementation of the Council's 14 BMPs using the Council's BMP Reporting Database.

   OR

2. A water supplier who is not a member of the Council, or chooses not to submit the Council BMP Activity Reports, must include the following data on implementation of DMMs in the UWMP:
   - There are 14 DMMs (see Step Seven below) and each of these, and any other measures the supplier is implementing or has scheduled for implementation, must be discussed in your UWMP.
   - For those DMMs and other measures currently being implemented describe the program, the implementation schedule currently and through 2010, and the methods you will use to evaluate the measure's effectiveness.
   - For those DMMs and other measures scheduled for implementation describe the proposed program, the implementation schedule through 2010, and the methods you propose to use to evaluate the measure's effectiveness.
   - For those DMMs not currently being implemented or scheduled for implementation, an UWMP must evaluate the incremental cost, taking into account factors in Section 2, Step 8 below.

   Include estimates of how much existing water conservation savings have reduced demand and whether those reductions limit the supplier's ability to further increase efficiency and respond to water shortages. This phenomenon is known as "demand hardening". Water-use fixtures and practices continue to yield increased efficiency and the limits of efficiency are unknown. It is important not to underestimate future potential water savings based solely on existing technologies and practices.

Most water use efficiency programs rely on plumbing and appliance retrofits and changes in the consumer's water use that takes place on a consistent, predictable basis. Once most of these retrofits have been completed, some water suppliers' worry that their ability to further reduce water use during dry years will be limited. Districts and customers that have participated actively in water conservation programs fear that across-the-board cuts will affect them disproportionately. However, consumers will still respond behaviorally in drought times, and this additional water savings from the drought response can be measured using daily production records. Public education has proven effective in rallying support for short-term additional water conservation measures. Additionally, programs in which customers are given an annual allotment based partially on historic usage, and billed if usage exceeds their allotment in any given month, provide fairness for efficient customers. Furthermore, the Council's 14 BMPs may change over time to reflect new technologies, devices or programs that may yield additional savings.

Section 2 - Contents of UWMP
Step Seven: Demand Management Measures (continued)

Water Code section 10631

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

(A) Water survey programs for single-family residential and multifamily residential customers.
(B) Residential plumbing retrofit.
(C) System water audits, leak detection, and repair.
(D) Metering with commodity rates for all new connections and retrofit of existing connections.
(E) Large landscape conservation programs and incentives.
(F) High-efficiency washing machine rebate programs.
(G) Public information programs.
(H) School education programs.
(I) Conservation programs for commercial, industrial, and institutional accounts.
(J) Wholesale agency programs.
(K) Conservation pricing.
(L) Water conservation coordinator.
(M) Water waste prohibition.
(N) Residential ultra-low-flush toilet replacement programs.

NOTES

The questions asked about each DMM in this Guidebook (between the lines on the following pages) are similar to the questions asked on the CUWCC BMP Activity Report. The CUWCC questions were developed by water agencies to assist them to describe each DMM (BMP) program in an efficient and thorough manner. Agencies are not required to respond to these questions when describing this program but DWR encourages that they provide this information.

The UWMP Act requires a description of each DMM you are implementing or plan to implement. DWR will take information from your DMM description to complete the Review Sheet tables. The Review Sheet tables are part of a checklist used by DWR staff in reviewing DMMs and do not constitute a complete program description.

Section 2 - Contents of UWMP
Step Seven: Demand Management Measures (continued)

(A) Water survey programs for single-family residential and multifamily residential customers.

Describe the steps necessary to implement this measure.

Suggested questions and ideas (refer to Notes section on Page 24)

Has your agency developed and implemented a targeting/ marketing strategy for SINGLE-FAMILY residential water use surveys?

a. If YES, when was it implemented?

Has your agency developed and implemented a targeting/ marketing strategy for MULTI-FAMILY residential water use surveys?

a. If YES, when was it implemented?

Do your surveys:

- check for leaks, including toilets, faucets and use of meter to check for leaks
- check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, if necessary
- check toilet flow rates and direct customer to ULFT replacement, as necessary; replace leaking toilet flapper, as necessary
- Check irrigation system and timers
- Review or develop customer irrigation schedule
- Measure landscaped area
- Measure total irrigable area

Were customers provided with information packets that included evaluation results and water savings recommendations?

Have the number of surveys offered and completed, survey results, and survey costs been tracked?

a. If yes, in what form are surveys tracked?

Describe the methods you are using or will use to evaluate this measure's effectiveness.

Provide estimates of existing conservation savings on water use and the effect of such savings on the ability to further reduce demand

If DMM is currently being implemented provide the following information

Year program started _____

Table A1 - Actual	2001	2002	2003	2004	2005 (proj)
# of single family surveys					
# of multifamily surveys					
actual expenditures - $					
actual water savings – AF/Y					

If DMM is scheduled for implementation provide the following information

Year program scheduled to start _____

Table A2 - Planned	2006	2007	2008	2009	2010
# of single family surveys					
# of multifamily surveys					
projected expenditures - $					
projected water savings – AF/Y					

(B) Residential plumbing retrofit.

Describe the steps necessary to implement this measure

Suggested questions and ideas (refer to Notes section on Page 24)

Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low flow counterparts?

a. If YES, list local jurisdictions in your service area and code or ordinance in each

Has your agency satisfied the 75% saturation requirement for single-family housing units?
Estimated percent of single-family households with low-flow showerheads:
Has your agency satisfied the 75% saturation requirement for multi-family housing units?
Estimated percent of multi-family households with low-flow showerheads.
Describe how saturation was determined, including the dates and results of any survey research.
Describe your survey methodology

Low-Flow Device Distribution Information

Has your agency developed a targeting/ marketing strategy for distributing low flow devices?

a. If YES, when did your agency begin implementing this strategy?

Describe your targeting/ marketing methods.
Describe your targeting/ marketing strategy. (e.g., distribute devices, install devices)
Number of low-flow showerheads distributed
Number of toilet flappers distributed
Number of faucet aerators distributed
Does your agency track the distribution and cost of low-flow devices?

a. describe tracking format
b. describe your tracking and distribution system :

# of pre-1992 Single Family accounts _____ # of pre-1992 Multiple Family accounts _____

Describe the methods you are using or will use to evaluate this measure's effectiveness.
Provide estimates of existing conservation savings on water use and the effect of such savings on the ability to further reduce demand

If DMM is currently being implemented provide the following information

Year program started _____

Table B1 - Actual	1992-2001	2002	2003	2004	2005 (proj)
# of single family devices					
# of multi-family devices					
actual expenditures - $					
actual water savings – AF/Y					

If DMM is scheduled for implementation provide the following information

Year program scheduled to start _____

Table B2 - Planned	2006	2007	2008	2009	2010
# of single family devices					
# of multi-family devices					
projected expenditures - $					
projected water savings – AF/Y					

(C) System water audits, leak detection, and repair.

Describe the steps necessary to implement this measure

Suggested questions and ideas (refer to Notes section on Page 24)

Has your agency completed a pre-screening system audit for this reporting year?

Specify the values (AF/Year) used to calculate verifiable use as a percent of total production

- Determine metered sales (AF/Y)
- Determine other system verifiable uses (AF/Y)
- Determine total supply into the system (AF/Y)

Does your agency keep necessary data on file to verify the values used to calculate verifiable uses as a percent of total production?

Did your agency complete a full-scale audit during this report year?

Does your agency maintain in-house records of audit results or the completed AWWA audit worksheets for the completed audit?

Does your agency operate a system leak detection program?

a. If yes, describe the leak detection program:

Survey Data

Total number of miles of distribution system lines (DS lines)

Number of miles of distribution system line surveyed:

Year of last complete audit _____ Year of next complete audit _____

Describe the methods you are using or will use to evaluate this measure's effectiveness.

Provide estimates of existing conservation savings on water use and the effect of such savings on the ability to further reduce demand

If DMM is currently being implemented provide the following information

Year program started _____

Table C1 - Actual	2001	2002	2003	2004	2005 (proj)
% of unaccounted water					
miles of distribution lines surveyed					
miles of lines repaired					
actual expenditures - $					
actual water savings – AF/Y					

If DMM is scheduled for implementation provide the following information

Year program scheduled to start _____

Table C2 - Planned	2006	2007	2008	2009	2010
% of unaccounted water					
miles of distribution lines to be surveyed					
miles of lines to be repaired					
projected expenditures - $					
projected water savings – AF/Y					

(D) Metering with commodity rates for all new connections and retrofit of existing connections.

Describe the steps necessary to implement this measure

Suggested questions and ideas (refer to Notes section on Page 24)
Does your agency require meters for all new connections and bill by volume-of -use?
Does your agency have a program for retrofitting existing unmetered connections and billing by volume-of -use?
a. Describe the program:
Specify the number of previously unmetered accounts fitted with meters during report year

Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?
a. Describe the feasibility study:
# of CII accounts with mixed-use meters
# of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period

Total number of accounts _____ *# of accounts w/o commodity rates* _____

Describe the methods you are using or will use to evaluate this measure's effectiveness.
Provide estimates of existing conservation savings on water use and the effect of such savings on the ability to further reduce demand
If DMM is currently being implemented provide the following information
Year program started _____

Table D1 - Actual	2001	2002	2003	2004	2005 (proj)
# of unmetered accounts					
# of retrofit meters installed					
# of accounts without commodity rates					
actual expenditures - $					
actual water savings – AF/Y					

If DMM is scheduled for implementation provide the following information
Year program scheduled to start _____

Table D2 - Planned	2006	2007	2008	2009	2010
# of unmetered accounts					
# of retrofit meters to be installed					
# of accounts without commodity rates					
projected expenditures - $					
projected water savings – AF/Y					

(E) Large landscape conservation programs and incentives.

Describe the steps necessary to implement this measure

Suggested questions and ideas (refer to Notes section on Page 24)

Number of Dedicated Irrigation Meter Accounts _____

Number of Dedicated Irrigation Meter Accounts with Water Budgets _____

Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF) _____

Actual Use for Irrigation Meter Accounts with Water Budgets (AF) _____

Does your agency provide water use notices to accounts with budgets each billing cycle?

Has your agency developed a marketing / targeting strategy for landscape surveys?

Description of marketing / targeting strategy and when you began implementing this strategy?

# of CII accounts _____ # of CII accounts w/ landscape surveys _____

Number of Surveys Completed _____

Indicate which of the following Landscape Elements are part of your survey: Irrigation System Check, Distribution Uniformity Analysis, Review / Develop Irrigation Schedules, Measure Landscape Area, Measure Total Irrigable Area, Provide Customer Report / Information

Do you track survey offers and results?

Does your agency provide follow-up surveys for previously completed surveys?

Do you offer financial incentives to improve landscape water use efficiency?

Do you provide landscape water use efficiency information to new customers and customers changing services?

Do you have irrigated landscaping at your facilities?

Do you provide customer notices at the start of the irrigation season? Do you provide customer notices at the end of the irrigation season?

Describe the methods you are using or will use to evaluate this measure's effectiveness.

Provide estimates of existing conservation savings on water use and the effect of such savings on the ability to further reduce demand

If DMM is currently being implemented provide the following information

Year program started _____

Table E1 - Actual	2001	2002	2003	2004	2005 (proj)
# of budgets developed					
# of surveys completed					
# of follow-up visits					
actual expenditures - $					
actual water savings – AF/Y					

If DMM is scheduled for implementation provide the following information

Year program scheduled to start _____

Table E2 - Planned	2006	2007	2008	2009	2010
# of budgets to be developed					
# of surveys to be completed					
# of follow-up visits					
projected expenditures - $					
projected water savings – AF/Y					

(F) High-efficiency washing machine rebate programs.

Describe the steps necessary to implement this measure

Suggested questions and ideas (refer to Notes section on Page 24)

Do any energy service providers or wastewater utilities in your service area offer rebates for high-efficiency washers?
Describe the offerings and incentives as well as whom the energy/wastewater utility provider is.
Does your agency offer rebates for high-efficiency washers?
What is the level of the rebate?
Number of rebates awarded.

Other agencies offer rebates $____
Cost-effectiveness calculations attached _____

Describe the methods you are using or will use to evaluate this measure's effectiveness.
Provide estimates of existing conservation savings on water use and the effect of such savings on the ability to further reduce demand
If DMM is currently being implemented provide the following information
Year program started _____

Table F1 - Actual	2001	2002	2003	2004	2005 (proj)
$ per rebate					
# of rebates paid					
actual expenditures - $					
actual water savings – AF/Y					

If DMM is scheduled for implementation provide the following information
Year program scheduled to start _____

Table F2 - Planned	2006	2007	2008	2009	2010
$ per rebate					
# of rebates to be paid					
projected expenditures - $					
projected water savings – AF/Y					

(G) Public information programs.

Describe the steps necessary to implement this measure

Suggested questions and ideas (refer to Notes section on Page 24)

Does your agency maintain an active public information program to promote and educate customers about water conservation?

Describe the program and how it's organized.

Indicate which and how many of the following activities are included in your public information program: paid advertising, public service announcement, bill inserts / newsletters / brochures, bill showing water usage in comparison to previous year's usage, demonstration gardens, special events, media events, speaker's bureau, program to coordinate with other government agencies, industry and public interest groups and media

Describe the methods you are using or will use to evaluate this measure's effectiveness.

Provide estimates of existing conservation savings on water use and the effect of such savings on the ability to further reduce demand

If DMM is currently being implemented provide the following information

Year program started _____

Table G1 - Actual	2001	2002	2003	2004	2005 (proj)
a. paid advertising					
b. Public Service Announcement					
c. Bill Inserts / Newsletters / Brochures					
d. Bill showing water usage in comparison to previous year's usage					
e. Demonstration Gardens					
f. Special Events, Media Events					
g. Speaker's Bureau					
h. Program to coordinate with other government agencies, industry and public interest groups and media					
actual expenditures - $					

a complete UWMP requires a description of any of these, or other, activities being implemented and related expenditures

If DMM is scheduled for implementation provide the following information

Year program scheduled to start _____

Table G2 - Planned	2006	2007	2008	2009	2010
a. paid advertising					
b. Public Service Announcement					
c. Bill Inserts / Newsletters / Brochures					
d. Bill showing water usage in comparison to previous year's usage					
e. Demonstration Gardens					
f. Special Events, Media Events					
g. Speaker's Bureau					
h. Program to coordinate with other government agencies, industry and public interest groups and media					
Projected expenditures - $					

(H) School education programs.

Describe the steps necessary to implement this measure

Suggested questions and ideas (refer to Notes section on Page 24)

Has your agency implemented a school information program to promote water conservation?
Please provide information on your school programs (by grade level):
- Grades K-3rd
- Grades 4th-6th
- Grades 7th-8th
- High School
  - Are materials grade appropriate
  - Materials distributed?
  - No. of class presentations
  - No. of students reached
  - No. of teachers' workshops

Did your Agency's materials meet state education framework requirements?
When did your Agency begin implementing this program?

Describe the methods you are using or will use to evaluate this measure's effectiveness.
Provide estimates of existing conservation savings on water use and the effect of such savings on the ability to further reduce demand

If DMM is currently being implemented provide the following information

Year program started _____

Number of classroom presentations

Table H1 - Actual	# of classes	2001	2002	2003	2004	2005 (proj)
Grades K-3rd						
Grades 4th-6th						
Grades 7th-8th						
High School						
actual expenditures - $						

a complete UWMP description requires information on at least one of the grade-ranges and expenditures

If DMM is scheduled for implementation provide the following information

Year program scheduled to start _____

Number of classroom presentations

Table H2 - Planned	# of classes	2006	2007	2008	2009	2010
Grades K-3rd						
Grades 4th-6th						
Grades 7th-8th						
High School						
projected expenditures - $						

Section 2 - Contents of UWMP
Step Seven: Demand Management Measures (continued)

(I) Conservation programs for commercial, industrial, and institutional accounts.

Describe the steps necessary to implement this measure

# of Commercial accounts ____ # of Industrial accounts ____ # of Institutional accounts __

Describe the methods you are using or will use to evaluate this measure's effectiveness.
Provide estimates of existing conservation savings on water use and the effect of such savings on the ability to further reduce demand.
If DMM is currently being implemented provide the following information
Year program started _____

Table I1 - Actual	2001	2002	2003	2004	2005 (proj)
# of on-site surveys completed					
Was an incentives provided					
# of follow-up visits					
actual expenditures - $					
actual water savings – AF/Y					

If DMM is scheduled for implementation provide the following information
Year program scheduled to start _____

Table I2 – Planned	2006	2007	2008	2009	2010
# of on-site surveys to be completed					
Will incentives be provided					
# of follow-up visits					
projected expenditures - $					
projected water savings – AF/Y					

Describe the steps necessary to implement the CII toilet replacement part of this measure (OPTIONAL)
If DMM is currently being implemented provide the following information
Year program started _____

Table I4 - Actual	2001	2002	2003	2004	2005 (proj)
# of commercial replacements					
# of industrial replacements					
# of institutional replacements					
actual expenditures - $					
actual water savings – AF/Y					

If DMM is scheduled for implementation provide the following information
Year program scheduled to start _____

Table I5 - Planned	2006	2007	2008	2009	2010
# of commercial replacements					
# of industrial replacements					
# of institutional replacements					
projected expenditures - $					
projected water savings – AF/Y					

(J) Wholesale agency programs.

Describe the steps necessary to implement this measure

Describe the methods you are using or will use to evaluate this measure's effectiveness.

Provide estimates of existing conservation savings on water use and the effect of such savings on the ability to further reduce demand

If DMM is currently being implemented provide the following information

Year program started _____ # of suppliers served _____

Table J1	Number of agencies assisted/Estimated AF Year Savings				
program activities	2001	2002	2003	2004	2005
Water Surveys					
Residential Retrofit					
System Audits					
Metering-Commodity Rates					
Landscape Programs					
Washing Machines					
Public Information					
School Education					
CII WC / ULF					
Water Waste					
Pricing					
WC Coordinator					
Water Waste					
ULFT Replacement					
actual expenditures - $					

a complete UWMP requires a description of any of these, or other, activities being implemented and related expenditures

If DMM is scheduled for implementation provide the following information

Year program started _____

Table J2	Number of agencies to be assisted/ Estimated AF Year Savings				
program activities	2006	2007	2008	2009	2010
Water Surveys					
Residential Retrofit					
System Audits					
Metering-Commodity Rates					
Landscape Programs					
Washing Machines					
Public Information					
School Education					
CII WC / ULF					
Water Waste					
Pricing					
WC Coordinator					
Water Waste					
ULFT Replacement					
projected expenditures - $					

(K) Conservation pricing.

Describe the steps necessary to implement this measure

Describe the methods you are using or will use to evaluate this measure's effectiveness.
Provide estimates of existing conservation savings on water use and the effect of such savings on the ability to further reduce demand
Do you provide sewer service? _____

Enter the year the rate became effective or is projected to become effective _____

Table K1 - RETAILERS			
Residential			
Water Rate Structure	Define	Sewer Rate Structure	Define
Year rate effective		Year rate effective	
Commercial			
Water Rate Structure	Define	Sewer Rate Structure	Define
Year rate effective		Year rate effective	
Industrial			
Water Rate Structure	Define	Sewer Rate Structure	Define
Year rate effective		Year rate effective	
Institutional/Government			
Water Rate Structure	Define	Sewer Rate Structure	Define
Year rate effective		Year rate effective	
Irrigation (dedicated meter)			
Water Rate Structure	Define		
Year rate effective			
Other			
Water Rate Structure	Define	Sewer Rate Structure	Define
Year rate effective		Year rate effective	
Table K2 - WHOLESALERS			
Water Rate Structure	Define		
Year rate effective			

Discuss all accounts types that apply to your agency. If your agency does not have one of these account types, put NA

(L) Water conservation coordinator.

Describe steps necessary to implement this measure

Suggested questions and ideas (refer to Notes section on Page 24)
Does your Agency have a conservation coordinator?
Is this a full-time position?
If no, is the coordinator supplied by another agency with which you cooperate in a regional conservation program? Partner agency's name

If your agency supplies the conservation coordinator:
a. What percent is this conservation coordinator's position?
b. Coordinator's Name
c. Coordinator's Title
d. Coordinator's Experience
e. Date Coordinator's position was created

Number of conservation staff, including Conservation Coordinator.

Describe the methods you are using or will use to evaluate this measure's effectiveness.
Provide estimates of existing conservation savings on water use and the effect of such savings on the ability to further reduce demand
If DMM is currently being implemented provide the following information
Year program started _____

Table L1 - Actual	2001	2002	2003	2004	2005 (proj)
# of full-time positions					
# of part-time staff					
Position supplied by other agency					
actual expenditures - $					

If DMM is scheduled for implementation provide the following information
Year program scheduled to start _____

Table L2 - Planned	2006	2007	2008	2009	2010
# of full-time positions					
# of part-time staff					
Position supplied by other agency					
projected expenditures - $					

Section 2 - Contents of UWMP
Step Seven: Demand Management Measures (continued)

(M) Water waste prohibition.

Describe steps necessary to implement this measure

Suggested questions and ideas (refer to Notes section on Page 24)

Is a water waste prohibition ordinance in effect in your service area?
Describe the ordinance
Attach a copy of the most current ordinance(s)

Indicate which of the water uses listed below are prohibited by your agency or service area: Gutter flooding, Single-pass cooling systems for new connections, Non-recirculating systems in all new conveyor or car wash systems, Non-recirculating systems in all new commercial laundry systems, Non-recirculating systems in all new decorative fountains, other (please name)

Describe measures that prohibit water uses listed above

Does your agency include water softener checks in home water survey programs?
Does your agency include information about Demand Initiated Regenerating and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models?

Describe the methods you are using or will use to evaluate this measure's effectiveness.
Provide estimates of existing conservation savings on water use and the effect of such savings on the ability to further reduce demand
If DMM is currently being implemented the program description should include the following information
Year program started _____

Table M1 - Actual	2001	2002	2003	2004	2005 (proj)
waste ordinance in effect					
# of on-site visits					
water softener ordinance					
actual expenditures - $					

If DMM is scheduled for implementation the program description should include the following information
Year program scheduled to start _____

Table M2 - Planned	2006	2007	2008	2009	2010
waste ordinance will be in effect					
# of on-site visits					
water softener ordinance					
projected expenditures - $					

(N) Residential ultra-low-flush toilet replacement programs.

Describe the steps necessary to implement this measure

Suggested questions and ideas (refer to Notes section on Page 24)

Does your agency have program(s) for replacing high-water using toilets with ultra-low flush toilets?
Number of toilets replaced by agency program during report year
Replacement method: rebate, direct install, community based organization distribution, other
Describe your agency's ULFT program for single-family residences and for multi-family residences
Is a toilet retrofit on resale ordinance in effect for your service area?

# of pre-1992 Single Family accounts _____ # of pre-1992 Multiple Family accounts _____

Describe the methods you are using or will use to evaluate this measure's effectiveness.

Provide estimates of existing conservation savings on water use and the effect of such savings on the ability to further reduce demand

If DMM is currently being implemented provide the following information

Year Single-Family program started _____

Table N1 - Actual	2001	2002	2003	2004	2005 (proj)
# of ULF rebates					
# of ULF direct installs					
# of ULF CBO installs					
actual expenditures - $					
actual water savings – AF/Y					

a complete UWMP requires a description of any of these, or other, activities being implemented and related expenditures

Year Multi-Family program started _____

Table N2 – Actual	2001	2002	2003	2004	2005 (proj)
# of ULF rebates					
# of ULF direct installs					
# of ULF CBO installs					
actual expenditures - $					
actual water savings – AF/Y					

If DMM is scheduled for implementation provide the following information

Year Single-Family program scheduled to start _____

Table N3 - Planned	2006	2007	2008	2009	2010
# of ULF rebates					
# of ULF direct installs					
# of ULF CBO installs					
projected expenditures - $					
projected water savings – AF/Y					

Year Multi-Family program scheduled to start _____

Table N4 - Planned	2006	2007	2008	2009	2010
# of ULF rebates					
# of ULF direct installs					
# of ULF CBO installs					
projected expenditures - $					
projected water savings – AF/Y					

Section 2 - Contents of UWMP
Step Eight: Evaluation of DMMs not implemented

Water Code section 10631

(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:

(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.

(2) Include a cost-benefit analysis, identifying total benefits and total costs.

(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.

(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

Section 2 - Contents of UWMP
Step Eight: Evaluation of DMMs not implemented

List any DMMs that are not currently being implemented or are not scheduled for implementation.

For each the listed DMM calculate the cost-benefit and the per-AF cost of water.

The Council has a simple cost-benefit spreadsheet for each quantifiable BMP / DMM on their website. These spreadsheet can be downloaded and may be of assistance in preparing cost-benefit analyses and per-AF-cost.

Cost-Benefit Check List

- Cost-Benefit document includes a detailed description of the DMM.
- Cost-Benefit document identifies all relevant costs and benefits of the DMM.
- Cost-Benefit document clearly identifies the perspective of analysis (society, supplier, customer) when identifying program costs and benefits.
- Cost-Benefit document addresses program cost sharing with other project beneficiaries.
- Cost-Benefit document lists and discusses all major assumptions and data used to measure, value, and discount program costs and benefits. It also includes sensitivity analyses for all major assumptions and analysis parameters.
- Cost-Benefit document includes copies of spreadsheet files, models, and supporting documentation used for the analysis.

The cost-benefit calculation must include economic and non-economic factors (environmental, social, health, customer impact, and technological factors) and total benefits and total costs.

This description will include the suppliers' legal authority to implement the DMM and efforts to implement the measures and funding available to implement the DMM and efforts to identify cost share partners.

Evaluation of unit cost of water that would result from non-implemented DMMs and planned water supply project and programs (Table 16)

Non-implemented & Not scheduled DMM / Planned Water Supply Project Name	Per-AF Cost ($)

Cost Effectiveness Summary (Applicable to each item in Table 16)

Total Costs	
Total Benefits	
Discount Rate	
Time Horizon	
Cost of Water ($ per AF)	
Water Savings (AF/Y)	

Examples of costs and benefits include (from CUWCC materials)

Benefits to supplier: avoided supply costs (O&M, chemicals, energy, water purchases, labor, regulatory compliance, capital); environmental benefits, supply reliability/avoided shortage cost)

Costs to supplier: materials, staff time, outside services, marketing, evaluation, regulatory compliance, incentives, environmental costs.

Section 2 - Contents of UWMP
Step Nine: Planned Water Supply Projects and Programs

Water Code section 10631

(h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

Section 2 - Contents of UWMP
Step Nine: Planned Water Supply Projects and Programs

Provide a detailed description of expected future supply projects & programs that may be undertaker to meet your projected water use identified in your water supply and demand assessment required by Water Code §10635(a) (see Section 7) with a timeline (showing projected start date and completion date) for each proposed project. Quantify each proposed project's normal-year supply to agency; single dry-year supply to agency and multiple dry-year supplies to agency.

Do not include descriptions of DMMs described elsewhere in the UWMP.

Future Water Supply Projects (Table 17)

			Multiple-Dry AF Years to agency		
Project Name	Normal-year AF to agency	Single-Dry AF/Year to agency	Year 1	Year 2	Year 3

Normal is defined as the average median over 30 years or more. This median is recalculated every ten years.

Single Dry Year is defined as the lowest annual runoff for a watershed since the water-year beginning in 1903. Suppliers should determine this for each watershed from which they receive supplies.

A Multiple Dry Year period is defined as the lowest average runoff for a continuous multiple year period (three years or more) for a watershed since 1903. For example, 1928-1934 and 1987-1992 were the two multi-year periods of lowest average precipitation and runoff during the 20th century in the Central Valley basin. Suppliers should determine this for each watershed from which they receive supplies.

Weather information is available at the National Weather Service web site - http://www.nws.noaa.gov/

Section 2 - Code Citations - Contents of UWMP
Step Ten: Development of Desalinated Water

Water Code section 10631(i)

(i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

Section 2 - Contents of UWMP
Step Ten: Development of Desalinated Water

Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish ocean water, and brackish groundwater, as a long-term supply.

If a desalinated water supply project is already planned as an expected future supply it should be discussed under Section 2, Step 9. This step (Water Code section 10631 (i)) requires a discussion of whether there is an opportunity to use desalinated water as a future supply.

Opportunities for desalinated water (Table 18)

Sources of Water	Yield AF/Y	Start Date	Type of use	Other
Ocean Water				
Brackish Ocean Water				
Brackish Groundwater				
Other (such as impaired groundwater)				
Other				

Section 2 - Contents of UWMP
Step Eleven: Current or Projected Supply Includes Wholesale Water

Water Code section 10631

(k) Urban water suppliers that rely upon a wholesale agency for a source of water, shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water -year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).

Section 2 - Contents of UWMP
Step Eleven: Current or Projected Supply Includes Wholesale Water

If you receive, or project receiving, wholesale water you must provide the wholesale agency(s) with the amount of water you wish to purchase from that wholesaler for the next 20 years, in five year increments.

Agency demand projections provided to wholesale suppliers – AF/Y (Table 19)

Wholesaler	2010	2015	2020	2025	2030/opt

Include in your UWMP the written information provided by your wholesaler(s) that quantifies water availability to your agency projections for the next 20 years, in five-year increments.

Wholesaler identified & quantified the existing and planned sources of water available to your agency in – AF/Y (Table 20)

Wholesaler Sources	2010		2015		2020		2025		2030/opt	
	Existing	Planned	Existing	Planned	Existing	Planned	Existing	Planned	Existing	Planned
(source 1)										
(source 2)										
(source 3)										

(If more than one wholesaler serves your agency, duplicate this table and provide the source availability for each wholesaler)

The written information provided by the wholesaler(s) must include the reliability of the wholesale supplies, including groundwater, and amount expected to be delivered, during normal, single-dry and multiple-dry years. If the wholesale agency has sources of water that are not available at consistent levels, the wholesaler's information must show the reliability by source and include plans to supplement or replace the inconsistent sources with alternative sources or water demand measures.

Wholesale Supply Reliability - % of normal supply (Table 21)

		Multiple Dry Water Years			
Wholesaler	Single Dry	Year 1	Year 2	Year 3	Year 4

(If more than one wholesaler serves your agency, duplicate this table and provide the source availability during dry years for each wholesaler)

Factors resulting in inconsistency of wholesaler's supply (Table 22)

Name of supply	Legal	Environmental	Water Quality	Climatic

Describe the wholesaler's plans to supplement or replace water sources that may not be available at a consistent level of use with alternative sources or water-use efficiency measures. Since inconsistent sources will result in a supply deficit, this section should describe how much water will be acquired by the wholesaler and from what sources.

In situations where one wholesaler sells water to another wholesaler, (sometimes referred to as a "sub-wholesaler"), the retail water supplier should coordinate gathering the necessary information on its wholesale supply with the sub-wholesaler. This may include gathering documentation from both wholesalers' Urban Water Management Plans and/or supplemental reports.

Section 3 - Determination of DMM Implementation

Water Code section 10631.5

10631.5. The department shall take into consideration whether the urban water supplier is implementing or scheduled for implementation, the water demand management activities that the urban water supplier identified in its urban water management plan, pursuant to Section 10631, in evaluating applications for grants and loans made available pursuant to Section 79163. The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities.

Section 3 - Determination of DMM Implementation

The Urban Water Management Planning Act requires the Department of Water Resources to consider whether an urban supplier is implementing, or has scheduled for implementation, the water demand management measures identified in the supplier's UWMP in evaluating applications for grants and loans.

CUWCC members should include at least their 2003-2004 Annual Report and it is recommended that the CUWCC Coverage Report also be included. Suppliers may also wish to submit their completed 2005 Annual Report with their UWMP.

Suppliers that are not CUWCC signatories will show DMM implementation or scheduled implementation in the DMM section of their UWMP.

Section 4 - Water Shortage Contingency Plan
Step One: Stages of Action

Water Code section 10632 (a)

10632. The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier:

(a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.

Section 4 - Water Shortage Contingency Plan
Step One: Stages of Action

Your UWMP should provide an urban water shortage contingency analysis with all of the six steps included in this section.

An urban water shortage contingency analysis can have both voluntary and mandatory rationing during water supply shortages to help control consumption. Rationing requirements should be reasonably achievable for customers to encourage reductions in consumption. A typical rationing sequence would begin with voluntary rationing. In the second or third year of an extended drought, mandatory rationing might be expected. Factors that can change water use patterns during dry years include educational efforts and rationing policies established in water shortage contingency plans.

Identify stages of action that the supplier will take in response to a water supply shortage. One of these stages must be designed to address a 50 percent reduction in water supply. Identify the specific water supply conditions that trigger activation of each stage of action.

Water Supply Shortage Stages and Conditions (Table 23)

Stage No.	Water Supply Conditions	% Shortage

Section 4 - Water Shortage Contingency Plan
Step Two: Estimate of Minimum Supply for Next Three Years

Water Code section 10632 (b)

(b) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.

Section 4 - Water Shortage Contingency Plan
Step Two: Estimate of Minimum Supply for Next Three Years

Your UWMP should quantify the minimum water supply available during the next three years (e.g., 2006-2008) based on the driest three-year historic sequence for your water supply (a single historic sequence may not apply to all of your agency's water supply sources).

The driest three year historic sequence usually refers to the recorded three-year period with the lowest runoff in the watershed of the supply source.

Different sources of water supplies will have different historical dry year sequences, and different yields during multiple year drought conditions based on hydrology, available storage, contract entitlements, water right characteristics, etc. In some cases there is not a direct correlation between hydrology and available water supply (e.g., groundwater, recycled water, water transfers, conservation, desalination). Alternative methodologies can be developed for these supplies that would provide an estimate of reasonably available water supplies.

Three-Year Estimated Minimum Water Supply – AF/Year (Table 24)

Source	Year 1	Year 2	Year 3	Normal
Total				

Section 4 - Water Shortage Contingency Plan
Step Three: Catastrophic Supply Interruption Plan

Water Code section 10632 (c)

(c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

Section 4 - Water Shortage Contingency Plan
Step Three: Catastrophic Supply Interruption Plan

Provide catastrophic supply interruption plan. Catastrophic events includes non-drought related events. This plan should look at the vulnerability of each source and the delivery and distribution systems to events such as earthquakes, regional power outages, system failures and other events specific to your sources.

The plan should include specific supplier actions designed to minimize the impacts of supply interruption on your service area.

Preparation Actions for a Catastrophe (Table 25)

Possible Catastrophe	Summary of Actions
Regional power outage	
Earthquake	
Other (name event)	
Other (name event)	

Section 4 Water Shortage Contingency Plan
Step Four: Prohibitions, Penalties and Consumption Reduction Methods

Water Code section 10632 (d-f)

(d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.

(e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

(f) Penalties or charges for excessive use, where applicable.

Section 4 - Water Shortage Contingency Plan
Step Four: Prohibitions, Penalties and Consumption Reduction Methods

List the mandatory prohibitions against specific water use practices during water shortages. Prohibitions often include excessive run-off, cleaning paved surfaces with potable water, failure to repair leaks, surface irrigation during restricted hours, etc.

Mandatory Prohibitions (Table 26)

Examples of Prohibitions	Stage When Prohibition Becomes Mandatory
Using potable water for street washing	
Other (name prohibition)	
Other (name prohibition)	
Other (name prohibition)	
Other (name prohibition)	
Other (name prohibition)	
Other (name prohibition)	

List the consumption reduction methods the water supplier will use to reduce water use in the most restrictive stages with up to a 50% reduction. Reduction methods often include customer allocations, irrigation limited to certain days, restrictions on decorative fountains and refilling swimming pools, etc.

Consumption Reduction Methods (Table 27)

Consumption Reduction Method	Stage When Method Takes Effect	Projected Reduction (%)
name method		
name method		
name method		
name method		
name method		
name method		

List excessive use penalties or charges for excessive use. Examples include tiered water rates, flow restrictors installed after repeated violations, water waste charges or water waste school, water rate surcharge for inefficient fixtures, surcharge for uncovered swimming pools, etc.

Penalties and Charges (Table 28)

Penalty or Charge	Stage When Penalty Takes Effect
Penalty for excess use	
Charge for excess use	
Other (name penalties or charges)	
Other (name penalties or charges)	
Other (name penalties or charges)	
Other (name penalties or charges)	
Other (name penalties or charges)	
Other (name penalties or charges)	

Section 4 - Water Shortage Contingency Plan
Step Five: Analysis of Revenue Impacts of Reduce Sales During Shortages

Water Code section 10632 (g)

(g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

Section 4 - Water Shortage Contingency Plan
Step Five: Analysis of Revenue Impacts of Reduced Sales During Shortages

Describe how your planned consumption reduction methods, penalties and prohibitions are likely to impact revenues. Describe how implementing a water shortage program is likely to impact expenditures (cost of additional supply, new staff, computer program modifications, billing changes, advertising costs, etc.)

Describe your proposed measures to overcome likely reduced revenues and increased expenditure (contingency funds, increased rates, rates adjustments, disaster loans, etc.)

Actions and Conditions that Impact Revenues

Type	Anticipated revenue reduction
Reduced sales	
(define)	
(define)	
(define)	

Actions and Conditions that Impact Expenditures

Category	Anticipated cost
Increase staff cost	
Increased O&M cost	
Increased cost of supply & treatment	
(define)	

Proposed measures to overcome revenue impacts (Table 29)

Names of measures	Summary of Effects
Rate adjustment	
Development of reserves	
name of measure	
name of measure	

Proposed measures to overcome expenditure impacts (Table 30)

Names of measures	Summary of Effects
name of measure	
name of measure	
name of measure	
name of measure	

Section 4 - Water Shortage Contingency Plan
Step Six: Draft Ordinance and Use Monitoring Procedure

Water Code section 10632 (h & i)

(h) A draft water shortage contingency resolution or ordinance.

(i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

Section 4 - Water Shortage Contingency Plan
Step Six: Draft Ordinance and Use Monitoring Procedure

Attach a copy of the draft water shortage contingency resolution or ordinance to your UWMP.

Describe the proposed mechanisms you will use to determining actual reductions or a weekly or daily basis, as appropriate to the severity of the water shortage. Examples include monitoring daily production and distribution records, more frequent reading of customer meters, waste water treatment records, etc.

Water Use Monitoring Mechanisms (Table 31)

Mechanisms for determining actual reductions	Type and quality of data expected
Name mechanism	
Name mechanism	
Name mechanism	

Section 5 - Recycled Water Plan
Step One: Coordination

Water Code section 10633

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

Section 5 - Recycled Water Plan
Step One: Coordination

Identify the local water, wastewater, groundwater and planning agencies and how each participated in developing a plan for the use of recycled water in your service area. The UWMP should identify the names and roles of each agency that participated in developing a recycled water plan for your service area.

Participating Agencies (Table 32)

Participating agencies	Role in Plan Development
Water agencies	
Wastewater agencies	
Groundwater agencies	
Planning Agencies	
Other	

Section 5 - Recycled Water Plan
Step Two: Wastewater Quantity, Quality and Current Uses

Water Code section 10633 (a-c)

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

Section 5 - Recycled Water Plan
Step Two: Wastewater Quantity, Quality and Current Uses

Describe the wastewater collection and treatment systems in the service area and quantify the acre-feet of wastewater collected and treated.

Wastewater Collected and Treated – AF/Year (Table 33)

	2000	2005	2010	2015	2020	2025	2030/opt
Wastewater collected & treated in service area							
Quantity that meets recycled water standard							

Your plan should describe the methods of wastewater disposal (to ocean, rivers, land application, etc.) and quantify the amount of treated water that meets the recycled water standards and is being discharged.

Disposal of wastewater (non-recycled) AF/Y (Table 34)

Method of disposal	Treatment Level	2005	2010	2015	2020	2025	2030/opt
Name of method							
Name of method							
Name of method							
Name of method							
Total	XXX						

Identify the current uses of recycled water, including type, place and quantities.

Recycled Water Uses - Actual AF/Y (Table 35 a)

Type of Use	Treatment Level	2005 AF/Y
Agriculture		
Landscape		
Wildlife Habitat		
Wetlands		
Industrial		
Groundwater Recharge		
Other (type of use)		
Other (type of use)		
Total	XXX	

Section 5 - Recycled Water Plan
Step Three: Potential and Projected Use, Optimization Plan with Incentives

Water Code section 10633 (d-g)

(d) A description and quantification of the potential uses of recycled water , including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water , and the projected results of these actions in terms of acre-feet of recycled water used per year.

(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

Section 5 - Recycled Water Plan
Step Three: Potential and Projected Use, Optimization Plan with Incentives

Recycled Water Uses - Potential AF/Y (Table 35 b)

Type of Use	Treatment Level	2010	2015	2020	2025	2030/opt
Agriculture						
Landscape						
Wildlife Habitat						
Wetlands						
Industrial						
Groundwater Recharge						
Other (type of use)						
Total	XXX					

Explain the technical and economic feasibility of serving the potential uses listed above.

Projected Future Use of Recycled Water in Service Area – AF/Y (Table 36)

Type of Use	2010	2015	2020	2025	2030/opt
Agriculture					
Landscape					
Wildlife Habitat					
Wetlands					
Industrial					
Groundwater Recharge					
Other (type of use)					
Total projected use of Recycled Water					

Compare your UWMP 2000 projections with UWMP 2005 actual use and explain any discrepancies.

Recycled Water Uses - 2000 Projection compared with 2005 actual – AF/Y (Table 37)

Type of Use	2000 Projection for 2005	2005 actual use
Agriculture		
Landscape		
Wildlife Habitat		
Wetlands		
Industrial		
Groundwater Recharge		
Other (type of use)		
Total		

Describe actions that might be taken to encourage recycled water use and the projected results of these actions in terms of acre-feet of recycled water used per year

Methods to Encourage Recycled Water Use (Table 38)

Actions	AF of use projected to result from this action				
	2010	2015	2020	2025	2030/opt
Financial incentives					
name of action					
name of action					
name of action					
Total					

Provide a recycled water use optimization plan that includes actions to facilitate the use of recycled water (dual distribution systems, promote recirculating uses, etc.)

Section 6 - Water Quality Impacts on Reliability

Water Code section 10634

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

Section 6 - Water Quality Impacts on Reliability

Analyze and describe how water quality affects water management strategies and supply reliability, for each of the existing sources of water for 20 years, in five-year increments. If groundwater is a source be sure to include it in this discussion.

Current & projected water supply changes due to water quality - percentage (Table 39)

water source	2005	2010	2015	2020	2025	2030/opt

Section 7 - Water Service Reliability

Water Code section 10635

10635 (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

(b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

(c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

Section 7 - Water Service Reliability
Step One: Projected Normal Water Year Supply and Demand

You must provide this information to any city or county within your service area within 60 days of submission of the UWMP to DWR.

Compare the projected normal water supply to projected normal water use over the next 20 years, in 5-year increments.

Projected Normal Water Year Supply – AF/Y (Table 40)

	2010	2015	2020	2025	2030/opt
Supply					
% of Normal Year*					

* from Table 9. Base year for Normal water year

Projected Normal Water Year Demand – AF/Y (Table 41)

	2010	2015	2020	2025	2030/opt
Demand					
% of year 2005					

Projected Normal Year Supply and Demand Comparison – AF/Y (Table 42)

	2010	2015	2020	2025	2030/opt
Supply totals					
Demand totals					
Difference (supply minus demand)					
Difference as % of Supply					
Difference as % of Demand					

Section 7 - Water Service Reliability (continued)

Water Code section 10635

10635 (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

(b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

(c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

Section 7 - Water Service Reliability
Step Two: Projected Single-Dry-Year Supply and Demand Comparison

Water use patterns change during dry years. During dry water years some water agencies cannot provide their customers with 100 % of what they deliver during normal water years. One way to analyze the change in demand is to document expected changes to water demand by sector – assuming increasing demand due to increased irrigation needs and demand reductions resulting from rationing programs and policies.

Compare the projected single-dry year water supply to projected single-dry year water use over the next 20 years, in 5-year increments.

Projected single dry year Water Supply – AF/Y (Table 43)

	2010	2015	2020	2025	2030/opt
Supply					
% of projected normal*					

*For projected normal use Table 40

Projected single dry year Water Demand – AF/Y (Table 44)

	2010	2015	2020	2025	2030/opt
Demand					
% of projected normal*					

*For projected normal use Table 41

Projected single dry year Supply and Demand Comparison – AF/Y (Table 45)

	2010	2015	2020	2025	2030/opt
Supply totals					
Demand totals					
Difference (supply minus demand)					
Difference as % of Supply					
Difference as % of Demand					

Section 7 - Water Service Reliability (continued)

Water Code section 10635

10635 (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

(b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

(c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

Section 7 - Water Service Reliability 2006-2015
Step Three: Projected Multiple-Dry-Year Supply and Demand Comparison

Project a multiple dry year period (based on Table 8) occurring between 2006-2010 and compare projected supply and demand during those years. Because supply and demand will vary during the 20-year projection, the law requires UWMPs to project the impact of multiple-dry year periods for each 5-year period during the 20-year projection.

Water use patterns change during dry years. Many water agencies cannot provide their customers with 100 % of what they deliver during a 'normal' water supply year. One way to analyze the change in demand is to document expected changes to water demand by sector – assuming increasing demand due to increased irrigation needs and demand reductions resulting from rationing programs and policies.

Projected supply during multiple dry year period ending in 2010 – AF/Y (Table 46)

	2006	2007	2008	2009	2010
Supply					
% of projected normal					

Projected demand multiple dry year period ending in 2010 – AF/Y (Table 47)

	2006	2007	2008	2009	2010
Demand					
% of projected normal					

Projected Supply & Demand Comparison during multiple dry year period ending in 2010 –AF/Y (Table 48)

	2006	2007	2008	2009	2010
Supply totals					
Demand totals					
Difference (supply minus demand)					
Difference as % of Supply					
Difference as % of Demand					

Project a multiple dry year period (based on Table 8) occurring between 2011-2015 and compare projected supply and demand during those years

Projected supply during multiple dry year period ending in 2015 – AF/Y (Table 49)

	2011	2012	2013	2014	2015
Supply					
% of projected normal					

Projected demand multiple dry year period ending in 2015 – AF/Y (Table 50)

	2011	2012	2013	2014	2015
Demand					
% of projected normal					

Projected Supply & Demand Comparison during multiple dry year period ending in 2015- AF/Y (Table 51)

	2011	2012	2013	2014	2015
Supply totals					
Demand totals					
Difference (supply minus demand)					
Difference as % of Supply					
Difference as % of Demand					

Section 7 - Water Service Reliability 2016-2025
Step Three: Projected Multiple-Dry-Year Supply and Demand Comparison

Project a multiple dry year period occurring between 2016-2020 and compare projected supply and demand during those years. Because supply and demand will vary during the 20-year projection, the law requires UWMPs to project the impact of multiple-dry year periods for each 5-year period during the 20-year projection.

Water use patterns change during dry years. Many water agencies cannot provide their customers with 100 % of what they deliver during a 'normal' water supply year. One way to analyze the change in demand is to document expected changes to water demand by sector – assuming increasing demand due to increased irrigation needs and demand reductions resulting from rationing programs and policies.

Projected supply during multiple dry year period ending in 2020 – AF/Y (Table 52)

	2016	2017	2018	2019	2020
Supply					
% of projected normal					

Projected demand multiple dry year period ending in 2020 – AF/Y (Table 53)

	2016	2017	2018	2019	2020
Demand					
% of projected normal					

Projected Supply & Demand Comparison during multiple dry year period ending in 2020- AF/Y (Table 54)

	2016	2017	2018	2019	2020
Supply totals					
Demand totals					
Difference (supply minus demand)					
Difference as % of Supply					
Difference as % of Demand					

Project a multiple-dry year period (based on Table 8) occurring between 2021-2025 and compare projected supply and demand during those years

Projected supply during multiple dry year period ending in 2025 – AF/Y (Table 55)

	2021	2022	2023	2024	2025
Supply					
% of projected normal					

Projected demand multiple dry year period ending in 2025 – AF/Y (Table 56)

	2021	2022	2023	2024	2025
Demand					
% of projected normal					

Projected Supply & Demand Comparison during multiple dry year period ending in 2025- AF/Y (Table 57)

	2021	2022	2023	2024	2025
Supply totals					
Demand totals					
Difference (supply minus demand)					
Difference as % of Supply					
Difference as % of Demand					

Provide reliability data to impacted cities and counties within 60 days of UWMP submission to DWR

Section 7 - Water Service Reliability 2026-2030 (Optional)
Step Three: Projected Multiple-Dry-Year Supply and Demand Comparison

Project a multiple dry year period occurring between 2026-2030 and compare projected supply and demand during those years. (optional) Because supply and demand will vary during the 20-year projection, the law requires UWMPs to project the impact of multiple-dry year periods for each 5-year period during the 20-year projection.

Water use patterns change during dry years. Many water agencies cannot provide their customers with 100% of what they deliver during a 'normal' water supply year. One way to analyze the change in demand is to document expected changes to water demand by sector – assuming increasing demand due to increased irrigation needs and demand reductions resulting from rationing programs and policies.

Projected supply during multiple dry year period ending in 2030 – AF/Y (OPTIONAL)

	2026	2027	2028	2029	2030
Supply					
% of projected normal					

Projected demand multiple dry year period ending in 2025 – AF/Y (OPTIONAL)

	2026	2027	2028	2029	2030
Demand					
% of projected normal					

Projected Supply & Demand Comparison during multiple dry year period ending in 2025- AF/Y

	2026	2027	2028	2029	2030
Supply totals					
Demand totals					
Difference (supply minus demand)					
Difference as % of Supply					
Difference as % of Demand					

Section 8 - Adoption and Implementation of UWMP

10640. Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630).

The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

10641. An urban water supplier required to prepare a plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code . The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

10643. An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

10644. (a) An urban water supplier shall file with the department and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be filed with the department and any city or county within which the supplier provides water supplies within 30 days after adoption.

(b) The department shall prepare and submit to the Legislature, on or before December 31, in the years ending in six and one, a report summarizing the status of the plans adopted pursuant to this part. The report prepared by the department shall identify the outstanding elements of the individual plans. The department shall provide a copy of the report to each urban water supplier that has filed its plan with the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans submitted pursuant to this part.

10645. Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

NOTES

Government Code section 6066. *Publication of notice pursuant to this section shall be once a week for two successive weeks. Two publications in a newspaper published once a week or oftener, with at least five days intervening between the respective publication dates not counting such publication dates, are sufficient. The period of notice commences upon the first day of publication and terminates at the end of the fourteenth day, including therein the first day.*

Section 8 - Adoption and Implementation of UWMP

Attach a copy of adoption resolution to your UWMP

Review the DMM implementation plan and the recycled water plan contained in your 2000 UWMP and discuss whether they are being implemented as planned.

If you submitted CUWCC BMP Annual Reports as part of your 2000 UWMP, discuss whether the BMPs were implemented as planned.

You are required to provide your 2005 UWMP to DWR and cities and counties within your service area within 30 days of adoption

You are required to file copies of amendments or changes to the UWMP with DWR and city or counties within your service area within 30 days of adoption.

You are required to make the 2005 UWMP available for public review within 30 days of filing with DWR.

You are required to encourage the involvement of social, cultural & economic community groups prior to and during the preparation of your UWMP. Before adopting your 2005 UWMP you must make the UWMP available for public review and hold a public hearing about your 2005 UWMP. Public and private water suppliers have to notify cities, counties and the community served with notice of the time and place of the public hearing.

Section 9 - Miscellaneous Provisions

Water Code section 10650 - 10657

10650 . Any actions or proceedings to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:
(a) An action or proceeding alleging failure to adopt a plan shall be commenced within 18 months after that adoption is required by this part.
(b) Any action or proceeding alleging that a plan, or action taken pursuant to the plan, does not comply with this part shall be commenced within 90 days after filing of the plan or amendment thereto pursuant to Section 10644 or the taking of that action.

10651. In any action or proceeding to attack, review, set aside, void, or annul a plan, or an action taken pursuant to the plan by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.

10652. The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part or to the implementation of actions taken pursuant to Section 10632. Nothing in this part shall be interpreted as exempting from the California Environmental Quality Act any project that would significantly affect water supplies for fish and wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.

10653. The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the State Water Resources Control Board and the Public Utilities Commission, for the preparation of water management plans or conservation plans; provided, that if the State Water Resources Control Board or the Public Utilities Commission requires additional information concerning water conservation to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan prepared to meet federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.

10654. An urban water supplier may recover in its rates the costs incurred in preparing its plan and implementing the reasonable water conservation measures included in the plan. Any best water management practice that is included in the plan that is identified in the "Memorandum of Understanding Regarding Urban Water Conservation in California" is deemed to be reasonable for the purposes of this section.

10655. If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.

10656. An urban water supplier that does not prepare, adopt, and submit its urban water management plan to the department in accordance with this part, is ineligible to receive funding pursuant to Division 24 (commencing with Section 78500) or Division 26 (commencing with Section 79000), or receive drought assistance from the state until the urban water management plan is submitted pursuant to this article.

10657. (a) The department shall take into consideration whether the urban water supplier has submitted an updated urban water management plan that is consistent with Section 10631, as amended by the act that adds this section, in determining whether the urban water supplier is eligible for funds made available pursuant to any program administered by the department.
(b) This section shall remain in effect only until January 1, 2006, and as of that date is repealed, unless a later enacted statute, that is enacted before January 1, 2006, deletes or extends that date.

Section 9 - Miscellaneous Provisions

Water Code section 10650 - 10657

Agencies subject to the Urban Water Management Planning Act must have adopted a complete UWMP that meets the requirements of the law and submitted it to DWR to be eligible for drought assistance from the State and funds administered by DWR.

Appendix A

Urban Water Management Plan Act

Established: AB 797, Klehs, 1983
Amended: AB 2661, Klehs, 1990
AB 11X, Filante, 1991
AB 1869, Speier, 1991
AB 892, Frazee, 1993
SB 1017, McCorquodale, 1994
AB 2853, Cortese, 1994
AB 1845, Cortese, 1995
SB 1011, Polanco, 1995
AB 2552, Bates, 2000
SB 553, Kelley, 2000
SB 610, Costa, 2001
AB 901, Daucher, 2001
SB 672, Machado, 2001
SB 1348, Brulte, 2002
SB 1384 Costa, 2002
SB 1518 Torlakson, 2002
AB 105, Wiggins, 2003
SB 318, Alpert, 2004

CALIFORNIA WATER CODE DIVISION 6
PART 2.6. URBAN WATER MANAGEMENT PLANNING
CHAPTER 1. GENERAL DECLARATION AND POLICY

10610. This part shall be known and may be cited as the "Urban Water Management Planning Act."

10610.2. (a) The Legislature finds and declares all of the following:
(1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.
(2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.
(3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate.
(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years.
(5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.
(6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.
(7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.
(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.
(9) The quality of source supplies can have a significant impact on water management strategies and supply reliability.
(b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.
10610.4. The Legislature finds and declares that it is the policy of the state as follows:
(a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.

(b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.

(c) Urban water suppliers shall be required to develop water management plans to actively pursue the efficient use of available supplies.

CHAPTER 2. DEFINITIONS

10611. Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.

10611.5. "Demand management" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

10612. "Customer" means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.

10613. "Efficient use" means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.

10614. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.

10615. "Plan" means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water demand management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.

10616. "Public agency" means any board, commission, county, city and county, city, regional agency, district, or other public entity.

10616.5. "Recycled water" means the reclamation and reuse of wastewater for beneficial use.

10617. "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

CHAPTER 3. URBAN WATER MANAGEMENT PLANS

Article 1. General Provisions

10620.

(a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).

(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.

(c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.

(d)(1) An urban water supplier may satisfy the requirements of this part by participation in area wide, regional, watershed, or basin wide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.

(2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

10621.

(a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero.

(b) Every urban water supplier required to prepare a plan pursuant to this part shall notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

(c) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

Article 2. Contents of Plans

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

(1) An average water year.

(2) A single dry water year.

(3) Multiple dry water years.

For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

(e)(1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.
(G) Sales to other agencies.
(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.
(I) Agricultural.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:
(A) Water survey programs for single-family residential and multifamily residential customers.
(B) Residential plumbing retrofit.
(C) System water audits, leak detection, and repair.
(D) Metering with commodity rates for all new connections and retrofit of existing connections.
(E) Large landscape conservation programs and incentives.
(F) High-efficiency washing machine rebate programs.
(G) Public information programs.
(H) School education programs.
(I) Conservation programs for commercial, industrial, and institutional accounts.
(J) Wholesale agency programs.
(K) Conservation pricing.
(L) Water conservation coordinator.
(M) Water waste prohibition.
(N) Residential ultra-low-flush toilet replacement programs.

(2) A schedule of implementation for all water demand management measures proposed or described in the plan.

(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.

(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:

(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.

(2) Include a cost-benefit analysis, identifying total benefits and total costs.

(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.

(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

(h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

(i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

(j) Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to that council in accordance with the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated September 1991, may submit the annual reports identifying water demand

management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).

(k) Urban water suppliers that rely upon a wholesale agency for a source of water , shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water -year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).

10631.5. The department shall take into consideration whether the urban water supplier is implementing or scheduled for implementation, the water demand management activities that the urban water supplier identified in its urban water management plan, pursuant to Section 10631, in evaluating applications for grants and loans made available pursuant to Section 79163. The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities.

10632. The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier:

(a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.

(b) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.

(c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

(d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.

(e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

(f) Penalties or charges for excessive use, where applicable.

(g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

(h) A draft water shortage contingency resolution or ordinance.

(i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

(b) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

(c) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

(d) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(e) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

(f) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

Article 2.5 Water Service Reliability

10635. (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

(b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

(c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

Article 3. Adoption and Implementation of Plans

10640. Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630). The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

10641. An urban water supplier required to prepare a plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

10643. An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

10644. (a) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

(b) The department shall prepare and submit to the Legislature, on or before December 31, in the years ending in six and one, a report summarizing the status of the plans adopted pursuant to this part. The report prepared by the department shall identify the outstanding elements of the individual plans. The department shall provide a copy of the report to each urban water supplier that has filed its plan with the department. The department

shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans submitted pursuant to this part.

10645. Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

CHAPTER 4. MISCELLANEOUS PROVISIONS

10650. Any actions or proceedings to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:

(a) An action or proceeding alleging failure to adopt a plan shall be commenced within 18 months after that adoption is required by this part.

(b) Any action or proceeding alleging that a plan, or action taken pursuant to the plan, does not comply with this part shall be commenced within 90 days after filing of the plan or amendment thereto pursuant to Section 10644 or the taking of that action.

10651. In any action or proceeding to attack, review, set aside, void, or annul a plan, or an action taken pursuant to the plan by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.

10652. The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part or to the implementation of actions taken pursuant to Section 10632. Nothing in this part shall be interpreted as exempting from the California Environmental Quality Act any project that would significantly affect water supplies for fish and wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.

10653. The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the State Water Resources Control Board and the Public Utilities Commission, for the preparation of water management plans or conservation plans; provided, that if the State Water Resources Control Board or the Public Utilities Commission requires additional information concerning water conservation to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan prepared to meet federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.

10654. An urban water supplier may recover in its rates the costs incurred in preparing its plan and implementing the reasonable water conservation measures included in the plan. Any best water management practice that is included in the plan that is identified in the "Memorandum of Understanding Regarding Urban Water Conservation in California" is deemed to be reasonable for the purposes of this section.

10655. If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.

10656. An urban water supplier that does not prepare, adopt, and submit its urban water management plan to the department in accordance with this part, is ineligible to receive funding pursuant to Division 24 (commencing with Section 78500) or Division 26 (commencing with Section 79000), or receive drought assistance from the state until the urban water management plan is submitted pursuant to this article.

10657. (a) The department shall take into consideration whether the urban water supplier has submitted an updated urban water management plan that is consistent with Section 10631, as amended by the act that adds this section, in determining whether the urban water supplier is eligible for funds made available pursuant to any program administered by the department.

(b) This section shall remain in effect only until January 1, 2006, and as of that date is repealed, unless a later enacted statute, that is enacted before January 1, 2006, deletes or extends that date.

Appendix B

Other Resources

- California Environmental Quality Act - http://ceres.ca.gov/ceqa/
- California Land Use Planning Information Network - http://ceres.ca.gov/planning/
- The Governor's Office of Planning and Research - http://www.opr.ca.gov/
- US Bureau of Reclamation Lower Colorado Regional Office - http://www.usbr.gov/lc/region/
- US Bureau of Reclamation Mid-Pacific Region - http://www.usbr.gov/mp/
- California Department of Water Resources Bay Delta Office State Water Project Delivery Reliability Report - http://swpdelivery.water.ca.gov/
- California Department of Water Resources Division of Planning and Local Assistance Groundwater Management in California - http://wwwdpla.water.ca.gov/cgi-bin/supply/gw/management/hq/main.pl

Appendix C
MWD Supply Reliability Tables

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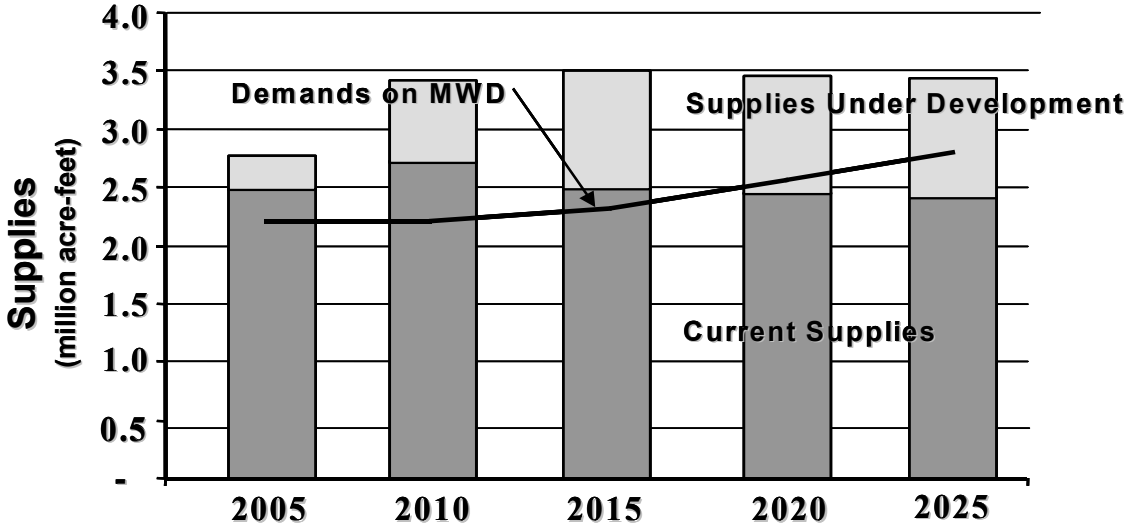
Multiple Dry-year Supply Capability[1] & Projected Demands[2]

(Repeat of 1990-92 Hydrology)

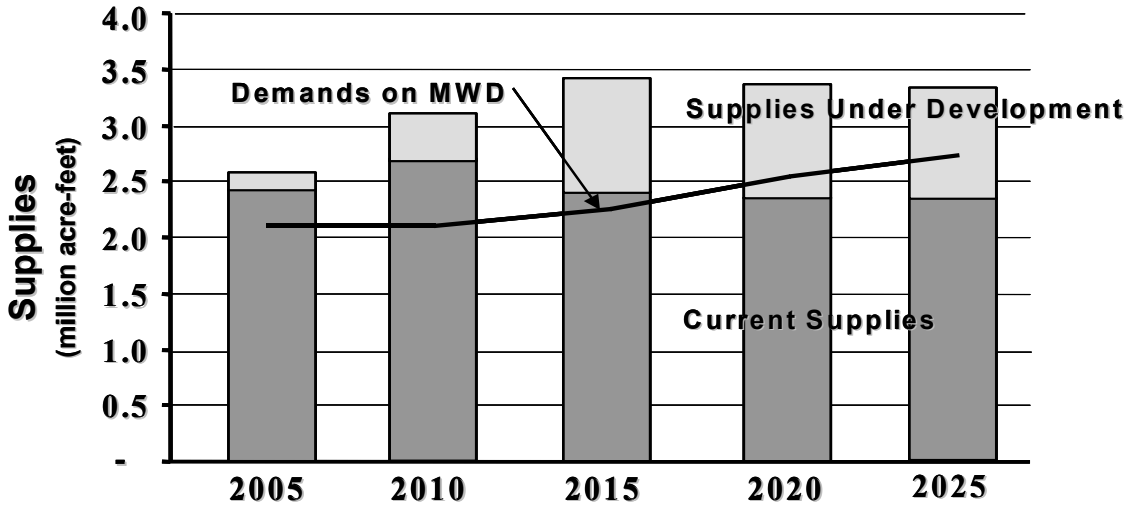


Supply Capability[1] & Potential Reserve or Replenishment

	2005	2010	2015	2020	2025
			(acre-feet per year)		
Current Supplies					
Colorado River[2]	721,330	833,292	833,292	833,292	833,292
California Aqueduct	1,290,300	1,376,100	1,146,100	1,120,300	1,120,300
In-Basin Storage	455,300	531,700	530,400	513,000	499,200
Supplies Under Development					
Colorado River[2]	167,300	416,708	416,708	416,708	416,708
California Aqueduct	20,000	195,000	390,000	390,000	390,000
In-Basin Storage	-	89,000	200,000	200,000	200,000
Maximum Supply Capability[1]	**2,654,200**	**3,441,800**	**3,516,500**	**3,473,300**	**3,459,500**
Total Demands on Metropolitan[3] **(Firm & Replenishment)**	**2,245,200**	**2,175,600**	**2,320,900**	**2,534,100**	**2,688,500**
Potential Reserve & System Replenishment Supply	**409,000**	**1,266,200**	**1,195,600**	**939,200**	**771,000**

1 -- Represents expected supply capability for resource programs.
2 -- Total Colorado River Aqueduct Deliveries limited to 1,250,000 acre-feet per year.
3 -- Based on SCAG 98 RTP, SANDAG 1998 forecasts and member agency projections of local supplies.

Single Dry-year Supply Capability[1] & Projected Demands[2]
(Repeat of 1977 Hydrology)

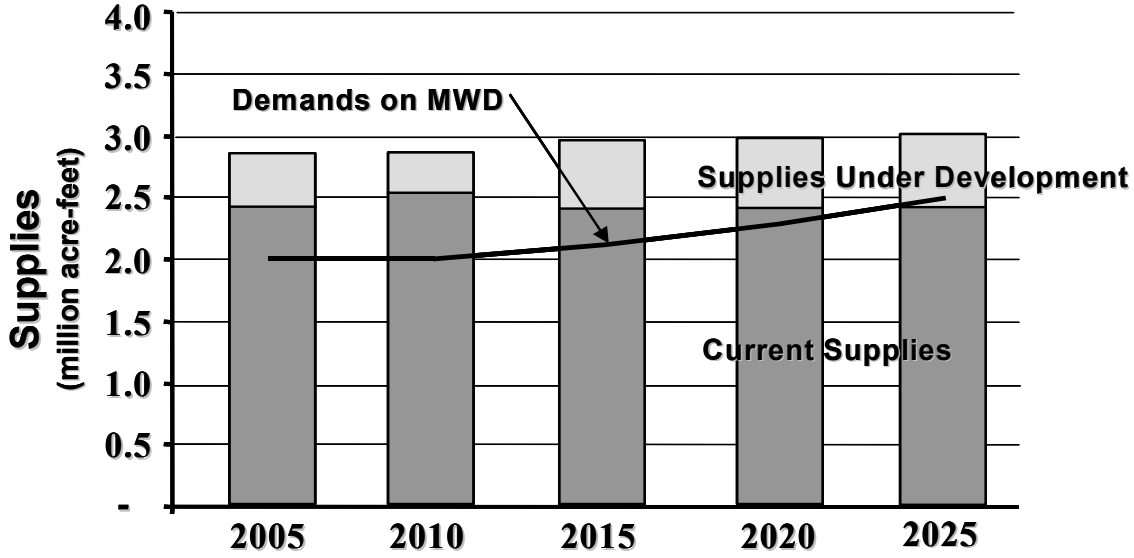


Supply Capability[1] & Potential Reserve or Replenishment

	2005	2010	2015	2020	2025
			(acre-feet per year)		
Current Supplies					
Colorado River[2]	721,330	833,292	833,292	833,292	833,292
California Aqueduct	997,300	997,300	822,300	822,300	822,300
In-Basin Storage	730,400	790,000	787,800	757,900	734,300
Supplies Under Development					
Colorado River[2]	208,600	230,538	416,708	416,708	416,708
California Aqueduct	20,000	195,000	390,000	390,000	390,000
In-Basin Storage	-	89,000	200,000	200,000	200,000
Maximum Supply Capability[1]	**2,677,630**	**3,135,130**	**3,450,100**	**3,420,200**	**3,396,600**
Total Demands on Metropolitan[3] **(Firm & Replenishment)**	**2,169,300**	**2,096,100**	**2,266,500**	**2,487,900**	**2,618,700**
Potential Reserve & System Replenishment Supply	**508,330**	**1,039,030**	**1,183,600**	**932,300**	**777,900**

1 -- Represents expected supply capability for resource programs.
2 -- Total Colorado River Aqueduct Deliveries limited to 1,250,000 acre-feet per year.
3 -- Based on SCAG 98 RTP, SANDAG 1998 forecasts and member agency projections of local supplies.

Average-year Supply Capability[1] & Projected Demands

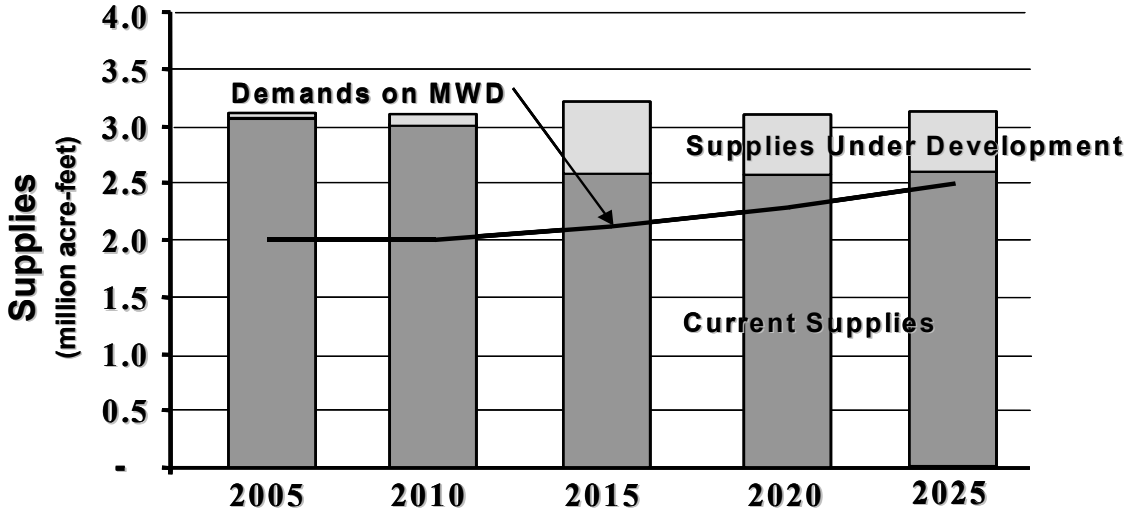


Supply Capability[1] & Potential Reserve or Replenishment

	2005	2010	2015	2020	2025
			(acre-feet per year)		
Current Supplies					
Colorado River[2]	695,330	735,222	719,292	707,292	719,292
California Aqueduct	1,780,800	1,783,200	1,723,900	1,714,900	1,705,900
In-Basin Storage	-	-	-	-	-
Supplies Under Development					
Colorado River[2]	321,500	228,608	260,538	350,038	360,538
California Aqueduct	20,000	65,000	220,000	220,000	220,000
In-Basin Storage	-	-	-	-	-
Maximum Supply Capability[1]	**2,817,630**	**2,812,030**	**2,923,730**	**2,995,230**	**3,005,730**
Total Demands on Metropolitan[3] **(Firm & Replenishment)**	**1,969,700**	**1,886,500**	**2,054,800**	**2,274,000**	**2,402,300**
Potential Reserve & System Replenishment Supply	**847,930**	**925,530**	**868,930**	**721,230**	**603,430**

1 -- Represents expected supply capability for resource programs.
2 -- Total Colorado River Aqueduct Deliveries limited to 1,250,000 acre-feet per year.
3 -- Based on SCAG 98 RTP, SANDAG 1998 forecasts and member agency projections of local supplies

Wet-year Supply Capability[1] & Projected Demands
(Repeat of 1985 Hydrology)



Supply Capability[1] & Potential Reserve or Replenishment

	2005	2010	2015	2020	2025
			(acre-feet per year)		
Current Supplies					
Colorado River[2]	1,156,330	1,156,830	683,292	683,292	683,292
California Aqueduct	1,882,200	1,882,200	1,882,200	1,882,200	1,882,200
In-Basin Storage	-	-	-	-	-
Supplies Under Development					
Colorado River[2]	93,670	93,170	503,138	353,038	360,538
California Aqueduct	20,000	65,000	220,000	220,000	220,000
In-Basin Storage	-	-	-	-	-
Maximum Supply Capability[1]	**3,152,200**	**3,197,200**	**3,288,630**	**3,138,530**	**3,146,030**
Total Demands on Metropolitan[3] **(Firm & Replenishment)**	**1,932,700**	**1,871,500**	**2,046,200**	**2,272,500**	**2,406,000**
Potential Reserve & System Replenishment Supply	**1,219,500**	**1,325,700**	**1,242,430**	**866,030**	**740,030**

1 -- Represents expected supply capability for resource programs.
2 -- Total Colorado River Aqueduct Deliveries limited to 1,250,000 acre-feet per year.
3 -- Based on SCAG 98 RTP, SANDAG 1998 forecasts and member agency projections of local supplies.

Appendix D
Data for DMM Calculations

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Reported as of 6/1

Water Supply & Reuse

Reporting Unit:

Year:
2004

Water Supply Source Information

Supply Source Name	Quantity (AF) Supplied	Supply Type

Total AF:

Accounts & Water Use

Reporting Unit Name: **Elsinore Valley MWD - Retail**

Submitted to CUWCC **02/28/2005**

Year: **2004**

A. Service Area Population Information:

1. Total service area population 112807

B. Number of Accounts and Water Deliveries (AF)

Type	Metered		Unmetered	
	No. of Accounts	Water Deliveries (AF)	No. of Accounts	Water Deliveries (AF)
1. Single-Family	31262	18642	0	0
2. Multi-Family	412	703	0	0
3. Commercial	1021	2225	0	0
4. Industrial	31	1548	0	0
5. Institutional	70	213	0	0
6. Dedicated Irrigation	916	6796	0	0
7. Recycled Water	30	254	0	0
8. Other	0	0	0	0
9. Unaccounted	NA	0	NA	0
Total	33742	30381	0	0
	Metered		**Unmetered**	

BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit:	BMP Form Status:	Year:
Elsinore Valley MWD - Retail	**100% Complete**	**2004**

A. Implementation

1. Based on your signed MOU date, 12/11/2002, your Agency STRATEGY DUE DATE is:	12/10/2004
2. Has your agency developed and implemented a targeting/ marketing strategy for SINGLE-FAMILY residential water use surveys?	yes
a. If YES, when was it implemented?	9/15/1991
3. Has your agency developed and implemented a targeting/ marketing strategy for MULTI-FAMILY residential water use surveys?	no
a. If YES, when was it implemented?	

B. Water Survey Data

Survey Counts:	Single Family Accounts	Multi-Family Units
1. Number of surveys offered:	150	0
2. Number of surveys completed:	8	0
Indoor Survey:		
3. Check for leaks, including toilets, faucets and meter checks	yes	no
4. Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, if necessary	yes	no
5. Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as neccesary; replace leaking toilet flapper, as necessary	yes	no
Outdoor Survey:		
6. Check irrigation system and timers	yes	no
7. Review or develop customer irrigation schedule	yes	no
8. Measure landscaped area (Recommended but not required for surveys)	no	no
9. Measure total irrigable area (Recommended but not required for surveys)	no	no
10. Which measurement method is typically used (Recommended but not required for surveys)		None
11. Were customers provided with information packets that included evaluation results and water savings recommendations?	no	no
12. Have the number of surveys offered and completed, survey results, and survey costs been tracked?	no	no
a. If yes, in what form are surveys tracked?		None

b. Describe how your agency tracks this information.

Home water surveys have always been offered to attendees of the annual landscape workshops. The landscape surveys are normally generated through our customer service department through a work order. The meter and customer service departments handle resident requests for audits. High water use or a high bill normally triggers a request (work order) to the meter superintendent who then performs the landscape audit. Customers receiving landscape surveys are typically left with copies of their water use history and specific peak water usage normally can be identified through the families activities whether it was a water leak, filling of a pool, or visiting relatives.

C. Water Survey Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Funds are not budgeted nor are expenses tracked because water audits are performed as part of regular duties in the customer service and metering areas. Public affairs staff handles requests as needed and the labor is considered a portion of the "conservation" hours. Inside home water audits are also routinely performed during the course of in-home verifications of HECW and ULF installation. In July 2004 a conservation brochure was designed to assist customers in performing their own home water audit. This is budgeted through normaly conservation activities.

BMP 02: Residential Plumbing Retrofit

Reporting Unit:	BMP Form Status:	Year:
Elsinore Valley MWD - Retail	**100% Complete**	**2004**

A. Implementation

1. Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts? yes

   a. If YES, list local jurisdictions in your service area and code or ordinance in each:

   California law now requires the installation of 1.6 gallon toilets and other water-efficient fistures for all new construction under the federal Energy Policy Act of 1992. This law requires that all residential toilets sold after 1/1/94 use 1.6 gallons of water or less per flush.

2. Has your agency satisfied the 75% saturation requirement for single-family housing units? no

3. Estimated percent of single-family households with low-flow showerheads: .005%

4. Has your agency satisfied the 75% saturation requirement for multi-family housing units? no

5. Estimated percent of multi-family households with low-flow showerheads: 2%

6. If YES to 2 OR 4 above, please describe how saturation was determined, including the dates and results of any survey research.

B. Low-Flow Device Distribution Information

1. Has your agency developed a targeting/ marketing strategy for distributing low-flow devices? yes

   a. If YES, when did your agency begin implementing this strategy? 1/1/1997

   b. Describe your targeting/ marketing strategy.

   Promotion of program through landscape classes, billing inserts, lobby displays,through press releases and local cable TV ads.

Low-Flow Devices Distributed/ Installed	SF Accounts	MF Units
2. Number of low-flow showerheads distributed:	127	19
3. Number of toilet-displacement devices distributed:	0	0
4. Number of toilet flappers distributed:	0	0
5. Number of faucet aerators distributed:	0	0

6. Does your agency track the distribution and cost of low-flow devices? yes

   a. If YES, in what format are low-flow devices tracked? Database

   b. If yes, describe your tracking and distribution system :

   We accept showerhead applications in our lobby. The forms are delivered to public affairs staff who determine the applicant is a customer

and that the home was built before 1994, then send the showerheads to the customer. Customer account information is verified and the information is entered into a database and the form is filed.

C. Low-Flow Device Distribution Expenditures

	This Year	Next Year
1. Budgeted Expenditures	6000	2000
2. Actual Expenditures	3838.59	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

In January of 2004 EVMWD launched a showerhead give-away program for all customers whose homes were built before 1994. Customer notification included press releases, bill stuffers, cable TV PSA's and community outreach events. In 2003 we budgeted $6,000 for showerhead purchase prior to receiving a price bid from the vendor. The showerheads were not as costly as originally thought so we reduced the budgeted amount for 2005. This program is totally funded by EVMWD.

BMP 03: System Water Audits, Leak Detection and Repair

Reporting Unit:	BMP Form Status:	Year:
Elsinore Valley MWD - Retail	**100% Complete**	**2004**

A. Implementation

1. Has your agency completed a pre-screening system audit for this reporting year?	no
2. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:	
a. Determine metered sales (AF)	
b. Determine other system verifiable uses (AF)	
c. Determine total supply into the system (AF)	
d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required.	0.00
3. Does your agency keep necessary data on file to verify the values used to calculate verifiable uses as a percent of total production?	yes
4. Did your agency complete a full-scale audit during this report year?	no
5. Does your agency maintain in-house records of audit results or the completed AWWA audit worksheets for the completed audit?	no
6. Does your agency operate a system leak detection program?	no
a. If yes, describe the leak detection program:	

Leak detection is performed on an as needed basis.

B. Survey Data

1. Total number of miles of distribution system line.	541
2. Number of miles of distribution system line surveyed.	0

C. System Audit / Leak Detection Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No
a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."	

E. Comments

EVMWD does not have an "official" leak detection program, however, we do have equipment to search for a leak in a specific area where we suspect a leak.

BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing

Reporting Unit:	BMP Form Status:	Year:
Elsinore Valley MWD - Retail	**100% Complete**	**2004**

A. Implementation

1. Does your agency require meters for all new connections and bill by volume-of-use? — yes

2. Does your agency have a program for retrofitting existing unmetered connections and bill by volume-of-use? — no

   a. If YES, when was the plan to retrofit and bill by volume-of-use existing unmetered connections completed?

   b. Describe the program:

   We have no unmetered accounts.

3. Number of previously unmetered accounts fitted with meters during report year. — 0

B. Feasibility Study

1. Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters? — no

   a. If YES, when was the feasibility study conducted? (mm/dd/yy)

   b. Describe the feasibility study:

2. Number of CII accounts with mixed-use meters. — 0

3. Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period. — 916

C. Meter Retrofit Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? — No

   a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

We have no method in place to identify the amount of CII accounts with mixed use meters.

BMP 05: Large Landscape Conservation Programs and Incentives

Reporting Unit:	BMP Form Status:	Year:
Elsinore Valley MWD - Retail	**100% Complete**	**2004**

A. Water Use Budgets

1. Number of Dedicated Irrigation Meter Accounts:	916
2. Number of Dedicated Irrigation Meter Accounts with Water Budgets:	0
3. Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF):	0
4. Actual Use for Irrigation Meter Accounts with Water Budgets (AF):	0
5. Does your agency provide water use notices to accounts with budgets each billing cycle?	no

B. Landscape Surveys

1. Has your agency developed a marketing / targeting strategy for landscape surveys?	yes
a. If YES, when did your agency begin implementing this strategy?	1/1/1994

b. Description of marketing / targeting strategy:

The availability of large landscape water audits were promoted through the local school district and through the City of Lake Elsinore. Large landscape water audits were preformed by the Riverside-Corona Resource Conservation District upon request from EVMWD. Staff from the Operations and Metering departments also promoted the program.

2. Number of Surveys Offered.	6
3. Number of Surveys Completed.	0
4. Indicate which of the following Landscape Elements are part of your survey:	
a. Irrigation System Check	yes
b. Distribution Uniformity Analysis	yes
c. Review / Develop Irrigation Schedules	yes
d. Measure Landscape Area	yes
e. Measure Total Irrigable Area	yes
f. Provide Customer Report / Information	yes
5. Do you track survey offers and results?	yes
6. Does your agency provide follow-up surveys for previously completed surveys?	yes

a. If YES, describe below:

Depends upon recommendations included in the survey. If a change in irrigation controller systems is recommended we provide ET controller information. If rebates are available to assist in funding modifications, rebate information is provided. We also offer any staff expertise that is needed.

C. Other BMP 5 Actions

1. An agency can provide mixed-use accounts with ETo-based landscape budgets in lieu of a large landscape survey program.

Does your agency provide mixed-use accounts with landscape budgets? no

2. Number of CII mixed-use accounts with landscape budgets. 0

3. Do you offer landscape irrigation training? yes

4. Does your agency offer financial incentives to improve landscape water use efficiency? yes

Type of Financial Incentive:	Budget (Dollars/ Year)	Number Awarded to Customers	Total Amount Awarded
a. Rebates	0	0	0
b. Loans	0	0	0
c. Grants	0	0	0

5. Do you provide landscape water use efficiency information to new customers and customers changing services? yes

a. If YES, describe below:

Yes, if requested. Large landscape water users can take advantage of our water audit program as well as the professional Protector del Agua programs offered in Riverside County and funded by MWD. All billing inserts and information about services are provided to all customers within our service area, large landscape accounts, residential, commercial and institutional. MWD, through WMWD, offers rebates and incentives to large water users throughout our service area. Those programs are promoted by our public affairs staff.

6. Do you have irrigated landscaping at your facilities? yes

a. If yes, is it water-efficient? yes

b. If yes, does it have dedicated irrigation metering? yes

7. Do you provide customer notices at the start of the irrigation season? no

8. Do you provide customer notices at the end of the irrigation season? no

D. Landscape Conservation Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

E. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

F. Comments

The large landscape water audits are offered free of charge to customers and are performed by the Riverside-Corona Resource Conservation District and are funded by our imported water supplier, WMWD. We are continuing to seek funding for our headquarters landscape retrofit program.

BMP 06: High-Efficiency Washing Machine Rebate Programs

Reporting Unit:	BMP Form Status:	Year:
Elsinore Valley MWD - Retail	**100% Complete**	**2004**

A. Implementation

1. Do any energy service providers or waste water utilities in your service area offer rebates for high-efficiency washers? yes

   a. If YES, describe the offerings and incentives as well as who the energy/waste water utility provider is.

   The Metropolitan Water District and the Department of Water Resources through Western Municipal Water District offers a $110.00 rebate per machine.

2. Does your agency offer rebates for high-efficiency washers? yes

3. What is the level of the rebate? 15

4. Number of rebates awarded. 248

B. Rebate Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	3000	3500
2. Actual Expenditures	3720	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

   a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Extremely successful program. Most of the funding comes from MWD through WMWD.

BMP 07: Public Information Programs

Reporting Unit:	BMP Form Status:	Year:
Elsinore Valley MWD - Retail	**100% Complete**	**2004**

A. Implementation

1. Does your agency maintain an active public information program to promote and educate customers about water conservation? yes

a. If YES, describe the program and how it's organized.

We currently have 2 full time staff and a part time clerical assistant in public affairs and a consultant assisting with our programs. Our program consists of legislative and community outreach programs including an extensive water education program directed to public schools, conservation programs directed to residential, commercial and institutional customers. We supply annual landscape design classes to residential customers, water audit programs to commercial/industrial and monthly billing inserts, website access, tours and outreach to community events. All of our residential rebate programs are promoted on a regular basis. The commercial/industrial programs through MWD's Save A Buck are also advertised on a regular basis. We also extend our community outreach with a sponsorship program that includes donations of bottled water which carry the conservation message to thousands of customers each year. In the 2005-06 budget year we have budgeted for a third full time person in Public Affairs to assist us in implementing additionl CII programs, further develop our outdoor landscape conservation program and to better provide residential conservation programs.

2. Indicate which and how many of the following activities are included in your public information program.

Public Information Program Activity	Yes/No	Number of Events
a. Paid Advertising	yes	3
b. Public Service Announcement	yes	1
c. Bill Inserts / Newsletters / Brochures	yes	12
d. Bill showing water usage in comparison to previous year's usage	yes	
e. Demonstration Gardens	no	0
f. Special Events, Media Events	yes	2
g. Speaker's Bureau	yes	6
h. Program to coordinate with other government agencies, industry and public interest groups and media	yes	

B. Conservation Information Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	129309	163767
2. Actual Expenditures	111501	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP

differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

We have budgeted a third full-time staff person for Public Affairs. The new person will assist us in expanding our CII programs, will assist with conservation program tracking and reporting and will be responsible for the BMP program expansion and resporting. We are in the process of developing a water-wise landscape at our district headquarters to set a good example in the community and serve to educate both residential and commercial/industrial customers about water-wise landscape design, maintenance and irrigation.

BMP 08: School Education Programs

Reporting Unit:	BMP Form Status:	Year:
Elsinore Valley MWD - Retail	**100% Complete**	**2004**

A. Implementation

1.Has your agency implemented a school information program to promote water conservation? yes

2. Please provide information on your school programs (by grade level):

Grade	Are grade-appropriate materials distributed?	No. of class presentations	No. of students reached	No. of teachers' workshops
Grades K-3rd	yes	70	2771	32
Grades 4th-6th	yes	3	692	18
Grades 7th-8th	yes	0	355	2
High School	no	0	0	0

3. Did your Agency's materials meet state education framework requirements? yes

4. When did your Agency begin implementing this program? 03/18/1991

B. School Education Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	32351	27975
2. Actual Expenditures	24950	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

I don't see any reductions as the school and student counts are increasing every year within our service area.

BMP 09: Conservation Programs for CII Accounts

Reporting Unit:	BMP Form Status:	Year:
Elsinore Valley MWD - Retail	**100% Complete**	**2004**

A. Implementation

1. Has your agency identified and ranked COMMERCIAL customers according to use?	yes
2. Has your agency identified and ranked INDUSTRIAL customers according to use?	yes
3. Has your agency identified and ranked INSTITUTIONAL customers according to use?	yes

Option A: CII Water Use Survey and Customer Incentives Program

4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option? no

CII Surveys	Commercial Accounts	Industrial Accounts	Institutional Accounts
a. Number of New Surveys Offered	0	0	0
b. Number of New Surveys Completed	0	0	0
c. Number of Site Follow-ups of Previous Surveys (within 1 yr)	0	0	0
d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)	0	0	0

CII Survey Components	Commercial Accounts	Industrial Accounts	Institutional Accounts
e. Site Visit	no	no	no
f. Evaluation of all water-using apparatus and processes	no	no	no
g. Customer report identifying recommended efficiency measures, paybacks and agency incentives	no	no	no

Agency CII Customer Incentives	Budget ($/Year)	No. Awarded to Customers	Total $ Amount Awarded
h. Rebates	0	17	1200
i. Loans	0	0	0
j. Grants	0	0	0
k. Others	0	0	0

Option B: CII Conservation Program Targets

5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this option?	yes
6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings?	yes
7. Estimated annual savings (AF/yr) from site-verified actions taken by agency since 1991.	.35
8. Estimated annual savings (AF/yr) from non-site-verified actions taken by agency since 1991.	3.14

B. Conservation Program Expenditures for CII Accounts

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	1516.5	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

MWD provides CII programs to our service area. We advertise the availability of those programs via billing insert brochures, displays located at key facilities and on our district website. Additionally, staff is involved in local Rotary, Chamber and Economic Development Committees where CII programs are promoted to local business people. To date we have not allocated staff to this component of our conservation programs because our service area has had little commercial/industrial development. Since the area is currently experiencing significant growth, we have budgeted an additional staff member in the 2005-2006 fiscal year whose major role will be to help us develop the commercial/industrial/institutional conservation and rebate programs. Staff currently focuses on large POA/HOA and school district (institutional) assistance with rebate/incentive programs. MWD offers CII programs to businesses in our area, but I do not have access to that data and we do not track at this time. When our program is expanded we will track.

BMP 09a: CII ULFT Water Savings

Reporting Unit:	BMP Form Status:	Year:
Elsinore Valley MWD - Retail	**100% Complete**	**2004**

1. Did your agency implement a CII ULFT replacement program in the reporting year? If No, please explain why on Line B. 10. — No

A. Targeting and Marketing

1. What basis does your agency use to target customers for participation in this program? Check all that apply.

a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

EVMWD Director of Legislative and Community Affairs attends local chamber of commerce Rotary events and regularly discusses CII programs available to us through WMWD and MWD. WMWD Governmental Affairs Officer also attends chamber mixers and distributes Save Water, Save A Buck information.

2. How does your agency advertise this program? Check all that apply.

Bill insert
Newsletter
Web page
Other print media

a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

Attendance at local Chamber and Rotary events seems to have the most impact.

B. Implementation

1. Does your agency keep and maintain customer participant information? (Read the Help information for a complete list of all the information for this BMP.) — Yes

2. Would your agency be willing to share this information if the CUWCC did a study to evaluate the program on behalf of your agency? — No

3. What is the total number of customer accounts participating in the program during the last year ?

CII Subsector	Number of Toilets Replaced			
4.	**Standard Gravity Tank**	**Air Assisted**	**Valve Floor Mount**	**Valve Wall Mount**
a. Offices				
b. Retail / Wholesale				
c. Hotels				
d. Health				
e. Industrial				
f. Schools:				

K to 12

g. Eating

h. Government

i. Churches

j. Other

5. Program design.

Rebate or voucher

6. Does your agency use outside services to implement this program? Yes

a. If yes, check all that apply.

Consultant

7. Participant tracking and follow-up. No follow-up

8. Based on your program experience, please rank on a scale of 1 to 5, with 1 being the least frequent cause and 5 being the most frequent cause, the following reasons why customers refused to participate in the program.

a. Disruption to business 1

b. Inadequate payback 1

c. Inadequate ULFT performance 1

d. Lack of funding 1

e. American's with Disabilities Act 1

f. Permitting 1

g. Other. Please describe in B. 9.

9. Please describe general program acceptance/resistance by customers, obstacles to implementation, and other isues affecting program implementation or effectiveness.

EVMWD customers benefit from regular program sponsored by MWD and provided to us through WMWD.

10. Please provide a general assessment of the program for this reporting year. Did your program achieve its objectives? Were your targeting and marketing approaches effective? Were program costs in line with expectations and budgeting?

The focus of our conservation program thus far has been residential. CII programs have been promoted within our service area by MWD's Save A Buck program. We support their efforts within our service area by highlighting commercial programs in monthly billing inserts and through public outreach. At this time this is not a targeted program goal for 2004-05.0

C. Conservation Program Expenditures for CII ULFT

1. CII ULFT Program: Annual Budget & Expenditure Data

	Budgeted	Actual Expenditure
a. Labor	0	0
b. Materials	0	0
c. Marketing & Advertising	0	0
d. Administration &	0	0

Overhead		
e. Outside Services	0	0
f. Total	0	0

2. CII ULFT Program: Annual Cost Sharing

a. Wholesale agency contribution	0
b. State agency contribution	0
c. Federal agency contribution	0
d. Other contribution	0
e. Total	0

D. Comments

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
Elsinore Valley MWD - Retail	**100% Complete**	**2004**

A. Implementation

Rate Structure Data Volumetric Rates for Water Service by Customer Class

1. Residential	
a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$123456
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$123456
2. Commercial	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$123456
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$123456
3. Industrial	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$123456
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$123456
4. Institutional / Government	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$123456
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$123456
5. Irrigation	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	$123456
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$123456
6. Other	
a. Water Rate Structure	Service Not Provided

b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	$0
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$0

B. Conservation Pricing Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

BMP 12: Conservation Coordinator

Reporting Unit:	BMP Form Status:	Year:
Elsinore Valley MWD - Retail	**100% Complete**	**2004**

A. Implementation

1. Does your Agency have a conservation coordinator?	yes
2. Is this a full-time position?	no
3. If no, is the coordinator supplied by another agency with which you cooperate in a regional conservation program ?	no
4. Partner agency's name:	
5. If your agency supplies the conservation coordinator:	
a. What percent is this conservation coordinator's position?	50%
b. Coordinator's Name	Mary Brown
c. Coordinator's Title	Public Affairs Representative
d. Coordinator's Experience and Number of Years	20
e. Date Coordinator's position was created (mm/dd/yyyy)	3/18/1991
6. Number of conservation staff, including Conservation Coordinator.	3

B. Conservation Staff Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	52881	54132
2. Actual Expenditures	39400	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

In the 2004 budget year, our public affairs staff added $16,500 to our rebate budget to pay for additional expenses related to the HECW rebate program. We also offer a rebate to customers who purchase waterbrooms and we give away showerheads. We also used the funds to pay for inspections for installation of ET controllers.

BMP 13: Water Waste Prohibition

Reporting Unit:	BMP Form Status:	Year:
Elsinore Valley MWD - Retail	**100% Complete**	**2004**

A. Requirements for Documenting BMP Implementation

1. Is a water waste prohibition ordinance in effect in your service area? — no

a. If YES, describe the ordinance:

Ordinance No. 97, implemented in March, 1991 provides for implementation and enforcement of mandatory water conservation measures to mitigate effects of the 1991 drought. It also amends ordinance #78 and provides in part for the modification of a moratorium on new service connections and adoption of a formal appeals procedure. Ordinance #79 will be implemented if and when the board of directors declares a water emergency and drought conditions arise.

2. Is a copy of the most current ordinance(s) on file with CUWCC? — no

a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:

City of Lake Elsinore, City of Canyon Lake, A portion of the City of Murrieta, Wildomar, Horsethief Canyon, Meadowbrook	None

B. Implementation

1. Indicate which of the water uses listed below are prohibited by your agency or service area.

a. Gutter flooding	no
b. Single-pass cooling systems for new connections	no
c. Non-recirculating systems in all new conveyor or car wash systems	no
d. Non-recirculating systems in all new commercial laundry systems	no
e. Non-recirculating systems in all new decorative fountains	no
f. Other, please name	no

2. Describe measures that prohibit water uses listed above:

For items b., c., and d. we request customers to voluntarily comply and install reticulating systems.

Water Softeners:

3. Indicate which of the following measures your agency has supported in developing state law:

a. Allow the sale of more efficient, demand-initiated regenerating DIR models.	yes
b. Develop minimum appliance efficiency standards that:	
i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used.	yes
ii.) Implement an identified maximum number of	yes

gallons discharged per gallon of soft water produced.

c. Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply. yes

4. Does your agency include water softener checks in home water audit programs? no

5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models? yes

C. Water Waste Prohibition Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Approximately 5-6 years ago there was a court case in the City of Escondido whereby the resident challenged the city water softener ordinance. The case was won and as a result, most water agencies in California cannot enforce water softener ordinances. This is the case at EVMWD, we have an ordinance however, and it is not enforceable.

BMP 14: Residential ULFT Replacement Programs

Reporting Unit:	BMP Form Status:	Year:
Elsinore Valley MWD - Retail	**100% Complete**	**2004**

A. Implementation

	Single-Family Accounts	Multi-Family Units
1. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	yes

Number of Toilets Replaced by Agency Program During Report Year

Replacement Method	SF Accounts	MF Units
2. Rebate	135	4
3. Direct Install	0	0
4. CBO Distribution	0	0
5. Other	0	0
Total	**135**	**4**

6. Describe your agency's ULFT program for single-family residences.

In January of 2001, we started the ULF toilet rebate program at EVMWD. Brochures were printed and distributed via bill inserts to approximately 20,000 customers. Single and multifamily customers were encouraged to apply. In 2002 the brochure was updated and distributed again to EVMWD customers. The ULF program is promoted on local cable TV, via regularly issued press releases, at community outreach events and in the EVMWD lobby. The Metropolitan Water District, through Western Municipal Water District, offers a $60.00 rebate per machine. We provide program administration, publicity and track rebate distribution for single and multi-family residences.

7. Describe your agency's ULFT program for multi-family residences.

See #6

8. Is a toilet retrofit on resale ordinance in effect for your service area? no

9. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

B. Residential ULFT Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective

as."

D. Comments

Budget dollars for this BMP are reflected in BMP 7 and BMP 12.

Water Supply & Reuse

Reporting Unit: Year:

Elsinore Valley MWD - Wholesale **2004**

Report Not Filed

BMP 03: System Water Audits, Leak Detection and Repair

Reporting Unit:	BMP Form Status:	Year:
Elsinore Valley MWD - Wholesale	**100% Complete**	**2004**

A. Implementation

1. Has your agency completed a pre-screening system audit for this reporting year?	no
2. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:	
a. Determine metered sales (AF)	
b. Determine other system verifiable uses (AF)	
c. Determine total supply into the system (AF)	
d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required.	0.00
3. Does your agency keep necessary data on file to verify the values used to calculate verifiable uses as a percent of total production?	no
4. Did your agency complete a full-scale audit during this report year?	no
5. Does your agency maintain in-house records of audit results or the completed AWWA audit worksheets for the completed audit?	no
6. Does your agency operate a system leak detection program?	no
a. If yes, describe the leak detection program:	

Leak detection is performed on an as needed basis.

B. Survey Data

1. Total number of miles of distribution system line.	0
2. Number of miles of distribution system line surveyed.	0

C. System Audit / Leak Detection Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No
a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."	

E. Comments

We are not privy to information on distribution lines of the retail agencies to which we supply wholesale water. We do not keep records on the wholesale water sales to verify percentages of use.

BMP 07: Public Information Programs

Reporting Unit:
Elsinore Valley MWD - Wholesale

BMP Form Status:
100% Complete

Year:
2004

A. Implementation

1. Does your agency maintain an active public information program to promote and educate customers about water conservation? yes

a. If YES, describe the program and how it's organized.

We offer the same programs and rebates to our wholesale customers. We do not separately track the data on our programs between wholesale and retail. See retail BMP 7.

2. Indicate which and how many of the following activities are included in your public information program.

Public Information Program Activity	Yes/No	Number of Events
a. Paid Advertising	yes	0
b. Public Service Announcement	yes	0
c. Bill Inserts / Newsletters / Brochures	yes	0
d. Bill showing water usage in comparison to previous year's usage	no	
e. Demonstration Gardens	no	0
f. Special Events, Media Events	yes	0
g. Speaker's Bureau	yes	0
h. Program to coordinate with other government agencies, industry and public interest groups and media	yes	

B. Conservation Information Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

We offer the same programs and rebates to our wholesale customers. We do not separately track the data on our programs between wholesale and retail. We do not separately track programs for our wholesale customers, the same programs are offered to our entire service area. See retail BMP 7. The two retail agencies we serve are not BMP signatories.

BMP 08: School Education Programs

Reporting Unit:
Elsinore Valley MWD - Wholesale

BMP Form Status:
100% Complete

Year:
2004

A. Implementation

1.Has your agency implemented a school information program to promote water conservation? yes

2. Please provide information on your school programs (by grade level):

Grade	Are grade-appropriate materials distributed?	No. of class presentations	No. of students reached	No. of teachers' workshops
Grades K-3rd	yes	0	0	0
Grades 4th-6th	yes	0	0	0
Grades 7th-8th	yes	0	0	0
High School	yes	0	0	0

3. Did your Agency's materials meet state education framework requirements? yes

4. When did your Agency begin implementing this program? 3/18/1991

B. School Education Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

All of our water education programs are offered to our service area schools. We do not track our wholesale and retail customers separately. The retail BMP 8 accurately reflects all materials, students and programs offered throughout. Currently, no locals schools are served by our wholesale customers.

Reported as of 10/2

BMP 10: Wholesale Agency Assistance Programs

Reporting Unit:	BMP Form Status:	Year:
Elsinore Valley MWD - Wholesale	**100% Complete**	**2004**

A. Implementation

1. Financial Support by BMP

BMP	Financial Incentives Offered?	Budgeted Amount	Amount Awarded	BMP	Financial Incentives Offered?	Budgeted Amount	Amount Awarded
1	yes	0	0	**8**	yes	0	0
2	yes	0	0	**9**	yes	0	0
3	No	0	0	**10**	No	0	0
4	No	0	0	**11**	No	0	0
5	yes	0	0	**12**	yes	0	0
6	yes	0	0	**13**	No	0	0
7	yes	0	0	**14**	yes	0	0

2. Technical Support

a. Has your agency conducted or funded workshops addressing CUWCC procedures for calculating program savings, costs and cost-effectiveness?	No
b. Has your agency conducted or funded workshops addressing retail agencies' BMP implementation reporting requirements?	No
c. Has your agency conducted or funded workshops addressing:	
1) ULFT replacement	yes
2) Residential retrofits	yes
3) Commercial, industrial, and institutional surveys	No
4) Residential and large turf irrigation	yes
5) Conservation-related rates and pricing	No

3. Staff Resources by BMP

Qualified Staff	No. FTE Staff		Qualified Staff	No. FTE Staff

BMP	Available for BMP?	Assigned to BMP	BMP	Available for BMP?	Assigned to BMP
1	yes	1	**8**	yes	1
2	yes	1	**9**	yes	1
3	No	0	**10**	No	0
4	No	0	**11**	No	0
5	yes	1	**12**	yes	1
6	yes	1	**13**	No	0
7	yes	2	**14**	yes	0

4. Regional Programs by BMP

BMP	**Implementation/ Management Program?**	BMP	**Implementation/ Management Program?**
1	yes	**8**	yes
2	yes	**9**	yes
3	No	**10**	No
4	No	**11**	No
5	yes	**12**	No
6	yes	**13**	No
7	yes	**14**	yes

B. Wholesale Agency Assistance Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

All of the conservation, public information and water education programs offered to our retail customers are also offered to our wholesale customers. The Farm Mutual Water Company only has 2-3 staff members. The Elsinore Water District has only 10-15 staff which are mostly field, meter reader staff. Neither district has staff to perform public information or outreach programs. We allow for wholesale customer support in all of our outreach programs and do not track separately. The two retail agencies we serve are not BMP signatories.

Reported as of 10/2

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
Elsinore Valley MWD - Wholesale	**100% Complete**	**2004**

A. Implementation

Rate Structure Data Volumetric Rates for Water Service by Customer Class

1. Residential	
a. Water Rate Structure	
b. Sewer Rate Structure	
c. Total Revenue from Volumetric Rates	$
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$
2. Commercial	
a. Water Rate Structure	
b. Sewer Rate Structure	
c. Total Revenue from Volumetric Rates	$
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$
3. Industrial	
a. Water Rate Structure	
b. Sewer Rate Structure	
c. Total Revenue from Volumetric Rates	$
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$
4. Institutional / Government	
a. Water Rate Structure	
b. Sewer Rate Structure	
c. Total Revenue from Volumetric Rates	$
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$
5. Irrigation	
a. Water Rate Structure	
b. Sewer Rate Structure	
c. Total Revenue from Volumetric Rates	$
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$
6. Other	

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$402095
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$9768

B. Conservation Pricing Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

We are not privy to information on the charges that the retail agencies impose on their customers. Our wholesale water sales to these customers are considered supplemental supply.

Reported as of 10/2

BMP 12: Conservation Coordinator

Reporting Unit:	BMP Form Status:	Year:
Elsinore Valley MWD - Wholesale	**100% Complete**	**2004**

A. Implementation

1. Does your Agency have a conservation coordinator?	yes
2. Is this a full-time position?	no
3. If no, is the coordinator supplied by another agency with which you cooperate in a regional conservation program ?	no
4. Partner agency's name:	
5. If your agency supplies the conservation coordinator:	
a. What percent is this conservation coordinator's position?	50%
b. Coordinator's Name	Mary Brown
c. Coordinator's Title	Public Affairs Representative
d. Coordinator's Experience and Number of Years	20
e. Date Coordinator's position was created (mm/dd/yyyy)	3/18/1991
6. Number of conservation staff, including Conservation Coordinator.	3

B. Conservation Staff Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	no
a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."	

D. Comments

All of the budget information is supplied in the retail BMP 12. No separation of budget or funding is made between retail and wholesale conservation services provided.

Reported as of 10/2

BMP 01 Coverage: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit:
Elsinore Valley MWD - Retail

Reporting Period:
03-04

MOU Exhibit 1 Coverage Requirement

No exemption request filed

Agency indicated "at least as effective as" implementation during report period?	No

A Reporting Unit (RU) must meet three conditions to satisfy strict compliance for BMP 1.

Condition 1: Adopt survey targeting and marketing strategy on time

Condition 2: Offer surveys to 20% of SF accounts and 20% of MF units during report period

Condition 3: Be on track to survey 15% of SF accounts and 15% of MF units within 10 years of implementation start date.

Test for Condition 1

		Single-Family	Multi-Family
Elsinore Valley MWD - Retail to Implement Targeting/Marketing Program by:		2004	
Year Elsinore Valley MWD - Retail Reported Implementing Targeting/Marketing Program:			
Elsinore Valley MWD - Retail Met Targeting/Marketing Coverage Requirement:		NO	NO

Test for Condition 2

			Single-Family	Multi-Family
Survey Program to Start by:	2003	Residential Survey Offers (%)	1.12%	
Reporting Period:	03-04	Survey Offers ≥ 20%	NO	NO

Test for Condition 3

	Completed Residential Surveys	
	Single Family	Multi-Family
Total Completed Surveys 1999 - 2004:	41	
Past Credit for Surveys Completed Prior to 1999 (Implementation of Reporting Database):	11	
Total + Credit	52	
	28,017	408

Residential Accounts in Base Year		
Elsinore Valley MWD - Retail Survey Coverage as % of Base Year Residential Accounts	0.19%	
Coverage Requirement by Year 2 of Implementation per Exhibit 1	1.50%	1.50%
Elsinore Valley MWD - Retail on Schedule to Meet 10-Year Coverage Requirement	NO	NO

BMP 1 COVERAGE STATUS SUMMARY:
Water supplier has not met one or more coverage requirements for this BMP.

BMP 02 Coverage: Residential Plumbing Retrofit

Reporting Unit: **Elsinore Valley MWD - Retail**

Reporting Period: **03-04**

MOU Exhibit 1 Coverage Requirement

No exemption request filed

Agency indicated "at least as effective as" implementation during report period? No

An agency must meet one of three conditions to satisfy strict compliance for BMP 2.

Condition 1: The agency has demonstrated that 75% of SF accounts and 75% of MF units constructed prior to 1992 are fitted with low-flow showerheads.

Condition 2: An enforceable ordinance requiring the replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts is in place for the agency's service area.

Condition 3: The agency has distributed or directly installed low-flow showerheads and other low-flow plumbing devices to not less than 10% of single-family accounts and 10% of multi-family units constructed prior to 1992 during the reporting period.

Test for Condition 1

		Single-Family		Multi-Family	
Report Year	Report Period	Reported Saturation	Saturation > 75%?	Reported Saturation	Saturation > 75%?
1999	99-00		NO		NO
2000	99-00		NO		NO
2001	01-02		NO		NO
2002	01-02		NO		NO
2003	03-04		NO		NO
2004	03-04	0.01%	NO	2.00%	NO

Test for Condition 2

Report Year	Report Period	Elsinore Valley MWD - Retail has ordinance requiring showerhead retrofit?
1999	99-00	YES
2000	99-00	YES
2001	01-02	YES
2002	01-02	YES
2003	03-04	YES
2004	03-04	YES

Test for Condition 3

Reporting Period: 03-04

1992 SF Accounts	Num. Showerheads Distributed to SF Accounts	Single-Family Coverage Ratio	SF Coverage Ratio > 10%
19,729	127	0.6%	NO

1992 MF Accounts	Num. Showerheads Distributed to MF Accounts	Multi-Family Coverage Ratio	MF Coverage Ratio > 10%

347	19	5.5%	NO

BMP 2 COVERAGE STATUS SUMMARY:
Water supplier is meeting coverage requirements for this BMP.

BMP 03 Coverage: System Water Audits, Leak Detection and Repair

Reporting Unit: **Elsinore Valley MWD - Retail**

Reporting Period: **03-04**

MOU Exhibit 1 Coverage Requirement

No exemption request filed

Agency indicated "at least as effective as" implementation during report period? No

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An agency must meet one of two conditions to be in compliance with BMP 3:

Condition 1: Perform a prescreening audit. If the result is equal to or greater than 0.9 nothing more needs be done.

Condition 2: Perform a prescreening audit. If the result is less than 0.9, perform a full audit in accordance with AWWA's Manual of Water Supply Practices, Water Audits, and Leak Detection.

Test for Conditions 1 and 2

Report Year	Report Period	Pre-Screen Completed	Pre-Screen Result	Full Audit Indicated	Full Audit Completed
1999	99-00	NO			NO
2000	99-00	NO			NO
2001	01-02	NO			NO
2002	01-02	NO			NO
2003	03-04	NO			NO
2004	03-04	NO			NO

BMP 3 COVERAGE STATUS SUMMARY:

Water supplier has not met one or more coverage requirements for this BMP.

BMP 04 Coverage: Metering with Commodity Rates for all New Connections and Retrofit of Existing

Reporting Unit:
Elsinore Valley MWD - Retail

Reporting Period:
03-04

MOU Exhibit 1 Coverage Requirement

No exemption request filed	
Agency indicated "at least as effective as" implementation during report period?	No

An agency must be on track to retrofit 100% of its unmetered accounts within 10 years to be in compliance with BMP 4.

Test for Compliance

Total Meter Retrofits Reported through 2004	
No. of Unmetered Accounts in Base Year	
Meter Retrofit Coverage as % of Base Year Unmetered Accounts	
Coverage Requirement by Year 1 of Implementation per Exhibit 1	4.5%
RU on Schedule to meet 10 Year Coverage Requirement	YES

BMP 4 COVERAGE STATUS SUMMARY:
Water supplier is meeting coverage requirements for this BMP.

BMP 05 Coverage: Large Landscape Conservation Programs and Incentives

Reporting Unit: **Elsinore Valley MWD - Retail**

Reporting Period: **03-04**

MOU Exhibit 1 Coverage Requirement

No exemption request filed

Agency indicated "at least as effective as" implementation during report period?	No

An agency must meet three conditions to comply with BMP 5.

Condition 1: Develop water budgets for 90% of its dedicated landscape meter accounts within four years of the date implementation is to start.

Condition 2: (a) Offer landscape surveys to at least 20% of its CII accounts with mixed use meters each report cycle and be on track to survey at least 15% of its CII accounts with mixed use meters within 10 years of the date implementation is to start OR (b) Implement a dedicated landscape meter retrofit program for CII accounts with mixed use meters or assign landscape budgets to mixed use meters.

Condition 3: Implement and maintain customer incentive program(s) for irrigation equipment retrofits.

Test for Condition 1

Year	Report Period	BMP 5 Implementation Year	No. of Irrigation Meter Accounts	No. of Irrigation Accounts with Budgets	Budget Coverage Ratio	90% Coverage Met by Year 4
1999	99-00	-4	693			NA
2000	99-00	-3	716			NA
2001	01-02	-2	747			NA
2002	01-02	-1	780			NA
2003	03-04		828			NA
2004	03-04	1	916			NA

Test for Condition 2a (survey offers)

Select Reporting Period:	03-04
Large Landscape Survey Offers as % of Mixed Use Meter CII Accounts	1.4%
Survey Offers Equal or Exceed 20% Coverage Requirement	NO

Test for Condition 2a (surveys completed)

Total Completed Landscape Surveys Reported through	2
Credit for Surveys Completed Prior to Implementation of Reporting Database	34
Total + Credit	36
CII Accounts in Base Year	766
RU Survey Coverage as a % of Base Year CII Accounts	4.7%
Coverage Requirement by Year of Implementation per Exhibit 1	0.7%

RU on Schedule to Meet 10 Year Coverage

Requirement YES

Test for Condition 2b (mixed use budget or meter retrofit program)

Report Year	Report Period	BMP 5 Implementation Year	Agency has mix-use budget program	No. of mixed-use budgets
1999	99-00	-4	NO	
2000	99-00	-3	NO	
2001	01-02	-2	NO	
2002	01-02	-1	NO	
2003	03-04		NO	
2004	03-04	1	NO	

Report Year	Report Period	BMP 4 Implementation Year	No. of mixed use CII accounts	No. of mixed use CII accounts fitted with irrig. meters
1999	99-00	-4		693
2000	99-00	-3		716
2001	01-02	-2		747
2002	01-02	-1		780
2003	03-04			828
2004	03-04	1		916

Test for Condition 3

Report Year	Report Period	BMP 5 Implementation Year	RU offers financial incentives?	No. of Loans	Total Amt. Loans
1999	99-00	-4	NO		
2000	99-00	-3	NO		
2001	01-02	-2	NO		
2002	01-02	-1	NO		
2003	03-04		NO		
2004	03-04	1	YES		

Report Year	Report Period	No. of Grants	Total Amt. Grants	No. of rebates	Total Amt. Rebates
1999	99-00				
2000	99-00				
2001	01-02				
2002	01-02				
2003	03-04				
2004	03-04				

BMP 5 COVERAGE STATUS SUMMARY:
Water supplier has not met one or more coverage requirements for this BMP.

BMP 06 Coverage: High-Efficiency Washing Machine Rebate Programs

Reporting Unit: **Elsinore Valley MWD - Retail**

Reporting Period: **03-04**

MOU Exhibit 1 Coverage Requirement

No exemption request filed

Agency indicated "at least as effective as" implementation during report period? No

An agency must meet one condition to comply with BMP 6.

Condition 1: Offer a cost-effective financial incentive for high-efficiency washers if one or more energy service providers in service area offer financial incentives for high-efficiency washers.

Test for Condition 1

Year	Report Period	BMP 6 Implementation Year	Rebate Offered by ESP?	Rebate Offered by RU?	Rebate Amount
1999	99-00	-4	NO	NO	
2000	99-00	-3	NO	NO	
2001	01-02	-2	NO	NO	
2002	01-02	-1	YES	YES	15.00
2003	03-04		YES	YES	15.00
2004	03-04	1	YES	YES	15.00

Year	Report Period	BMP 6 Implementation Year	No. Rebates Awarded	Coverage Met?
1999	99-00	-4		YES
2000	99-00	-3		YES
2001	01-02	-2		YES
2002	01-02	-1	7	YES
2003	03-04		120	YES
2004	03-04	1	248	YES

BMP 6 COVERAGE STATUS SUMMARY:

Water supplier is meeting coverage requirements for this BMP.

BMP 07 Coverage: Public Information Programs

Reporting Unit: **Elsinore Valley MWD - Retail**

Reporting Period: **03-04**

MOU Exhibit 1 Coverage Requirement

No exemption request filed

Agency indicated "at least as effective as" implementation during report period? No

An agency must meet one condition to comply with BMP 7.

Condition 1: Implement and maintain a public information program consistent with BMP 7's definition.

Test for Condition 1

Year	Report Period	BMP 7 Implementation Year	RU Has Public Information Program?
1999	99-00	-3	YES
2000	99-00	-2	YES
2001	01-02	-1	YES
2002	01-02		YES
2003	03-04	1	YES
2004	03-04	2	YES

BMP 7 COVERAGE STATUS SUMMARY:

Water supplier is meeting coverage requirements for this BMP.

BMP 08 Coverage: School Education Programs

Reporting Unit: **Elsinore Valley MWD - Retail**

Reporting Period: **03-04**

MOU Exhibit 1 Coverage Requirement

No exemption request filed

Agency indicated "at least as effective as" implementation during report period?	No

An agency must meet one condition to comply with BMP 8.

Condition 1: Implement and maintain a school education program consistent with BMP 8's definition.

Test for Condition 1

Year	Report Period	BMP 8 Implementation Year	RU Has School Education Program?
1999	99-00	-3	YES
2000	99-00	-2	YES
2001	01-02	-1	YES
2002	01-02		YES
2003	03-04	1	YES
2004	03-04	2	YES

BMP 8 COVERAGE STATUS SUMMARY:

Water supplier is meeting coverage requirements for this BMP.

BMP 09 Coverage: Conservation Programs for CII Accounts

Reporting Unit: **Elsinore Valley MWD - Retail**

Reporting Period: **03-04**

MOU Exhibit 1 Coverage Requirement

No exemption request filed

Agency indicated "at least as effective as" implementation during report period? No

An agency must meet three conditions to comply with BMP 9.

Condition 1: Agency has identified and ranked by use commercial, industrial, and institutional accounts.

Condition 2(a): Agency is on track to survey 10% of commercial accounts, 10% of industrial accounts, and 10% of institutional accounts within 10 years of date implementation to commence.
OR
Condition 2(b): Agency is on track to reduce CII water use by an amount equal to 10% of baseline use within 10 years of date implementation to commence.
OR
Condition 2(c): Agency is on track to meet the combined target as described in Exhibit 1 BMP 9 documentation.

Test for Condition 1

Year	Report Period	BMP 9 Implementation Year	Ranked Com. Use	Ranked Ind. Use	Ranked Inst. Use
1999	99-00	-4	YES	YES	YES
2000	99-00	-3	YES	YES	YES
2001	01-02	-2	YES	YES	YES
2002	01-02	-1	YES	YES	YES
2003	03-04		YES	YES	YES
2004	03-04	1	YES	YES	YES

Test for Condition 2a

	Commercial	Industrial	Institutional
Total Completed Surveys Reported through 2004			
Credit for Surveys Completed Prior to Implementation of Reporting Databases			
Total + Credit			
CII Accounts in Base Year	602	94	70
RU Survey Coverage as % of Base Year CII Accounts			
Coverage Requirement by Year 1 of Implementation per Exhibit 1	0.5%	0.5%	0.5%
RU on Schedule to Meet 10 Year Coverage Requirement	NO	NO	NO

Test for Condition 2a

Performance

Year	Report Period	BMP 9 Implementation Year	Performance Target Savings (AF/yr)	Performance Target Savings Coverage	Target Savings Coverage Requirement	Coverage Requirement Met
1999	99-00	-4				YES
2000	99-00	-3				YES
2001	01-02	-2				YES
2002	01-02	-1				YES
2003	03-04		1	0.1%		YES
2004	03-04	1	1	0.1%	0.5%	NO

Test for Condition 2c

Total BMP 9 Surveys + Credit	
BMP 9 Survey Coverage	
BMP 9 Performance Target Coverage	0.1%
BMP 9 Survey + Performance Target Coverage	0.1%
Combined Coverage Equals or Exceeds Coverage Requirement?	NO

BMP 9 COVERAGE STATUS SUMMARY:
Water supplier is meeting coverage requirements for this BMP.

BMP 11 Coverage: Conservation Pricing

Reporting Unit: **Elsinore Valley MWD - Retail**

Reporting Period: **03-04**

MOU Exhibit 1 Coverage Requirement

No exemption request filed

Agency indicated "at least as effective as" implementation during report period? No

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An agency must meet one condition to comply with BMP 11.

Agency shall maintain rate structure consistent with BMP 11's definition of conservation pricing. Implementation methods shall be at least as effective as eliminating non-conserving pricing and adopting conserving pricing. For signatories supplying both water and sewer service, this BMP applies to pricing of both water and sewer service. Signatories that supply water but not sewer service shall make good faith efforts to work with sewer agencies so that those sewer agencies adopt conservation pricing for sewer service.

a) Non-conserving pricing provides no incentives to customers to reduce use. Such pricing is characterized by one or more of the following components: rates in which the unit price decreases as the quantity used increases (declining block rates);rates that involve charging customers a fixed amount per billing cycle regardless of the quantity used; pricing in which the typical bill is determined by high fixed charges and low commodity charges.

b) Conservation pricing provides incentives to customers to reduce average or peak use, or both. Such pricing includes: rates designed to recover the cost of providing service; and billing for water and sewer service based on metered water use. Conservation pricing is also characterized by one or more of the following components: rates in which the unit rate is constant regardless of the quantity used (uniform rates) or increases as the quantity used increases (increasing block rates); seasonal rates or excess-use surcharges to reduce peak demands during summer months; rates based upon the longrun marginal cost or the cost of adding the next unit of capacity to the system.

Test for Condition 1

Year	Report Period	RU Employed Non Conserving Rate Structure	RU Meets BMP 11 Coverage Requirement
1999	99-00	NO	YES
2000	99-00	NO	YES
2001	01-02	NO	YES
2002	01-02	NO	YES
2003	03-04	NO	YES
2004	03-04	NO	YES

BMP 11 COVERAGE STATUS SUMMARY:

Water supplier is meeting coverage requirements for this BMP.

BMP 12 Coverage: Conservation Coordinator

Reporting Unit: **Elsinore Valley MWD - Retail**

Reporting Period: **03-04**

MOU Exhibit 1 Coverage Requirement

No exemption request filed

Agency indicated "at least as effective as" implementation during report period? No

Agency shall staff and maintain the position of conservation coordinator and provide support staff as necessary.

Test for Compliance

Report Year	Report Period	Conservation Coordinator Position Staffed?	Total Staff on Team (incl. CC)
1999	99-00	YES	2
2000	99-00	YES	2
2001	01-02	YES	2
2002	01-02	YES	2
2003	03-04	YES	3
2004	03-04	YES	3

BMP 12 COVERAGE STATUS SUMMARY:

Water supplier is meeting coverage requirements for this BMP.

BMP 13 Coverage: Water Waste Prohibition

Reporting Unit: **Elsinore Valley MWD - Retail**

Reporting Period: **03-04**

MOU Exhibit 1 Coverage Requirement

No exemption request filed

Agency indicated "at least as effective as" implementation during report period? No

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An agency must meet one condition to comply with BMP 13.

Implementation methods shall be enacting and enforcing measures prohibiting gutter flooding, single pass cooling systems in new connections, non-recirculating systems in all new conveyer car wash and commercial laundry systems, and non-recycling decorative water fountains.

Test for Condition 1

Agency or service area prohibits:

Year	Gutter Flooding	Single-Pass Cooling Systems	Single-Pass Car Wash	Single-Pass Laundry	Single-Pass Fountains	Other	RU has ordinance that meets coverage requirement
1999	yes	no	no	no	no	no	NO
2000	yes	no	no	no	no	no	NO
2001	yes	no	no	no	no	no	NO
2002	yes	no	no	no	no	no	NO
2003	yes	no	no	no	no	no	NO
2004	no	no	no	no	no	no	NO

BMP 13 COVERAGE STATUS SUMMARY:

Water supplier has not met one or more coverage requirements for this BMP.

BMP 14 Coverage: Residential ULFT Replacement Programs

Reporting Unit:

MOU Exhibit 1 Coverage Requirement

A Reporting Unit (RU) must meet one of the following conditions to be in compliance with BMP 14.

Condition 1: Retrofit-on-resale (ROR) ordinance in effect in service area.

Condition 2: Water savings from toilet replacement programs equal to 90% of Exhibit 6 coverage requirement.

An agency with an exemption for BMP 14 is not required to meet one of the above conditions. This report treats an agency with missing base year data required to compute the Exhibit 6 coverage requirement as out of compliance with BMP 14.

Status: as of

Coverage Year	BMP 14 Data Submitted to CUWCC	Exemption Filed with CUWCC	ROR Ordinance in Effect	Exhibit 6 Coverage Req'mt (AF)	Toilet Replacement Program Water Savings* (AF)

*NOTE: Program water savings listed are net of the plumbing code. Savings are cumulative (not annual) between 1991 and the given year. Residential ULFT count data from unsubmitted forms are NOT included in the calculation.

BMP 14 COVERAGE STATUS SUMMARY:

BMP 14 Coverage: Residential ULFT Replacement Programs

Reporting Unit:

BMP 14 Coverage Calculation Detail:
Retrofit on Resale (ROR) Ordinance
Water Savings

	Single Family	Multi-Family
1992 Housing Stock		
Average rate of natural replacement (% of remaining stock)		
Average rate of housing demolition (% of remining stock)		
Estimated Housing Units with 3.5+ gpf Toilets in 1997		
Average resale rate		
Average persons per unit		
Average toilets per unit		
Average savings per home (gpd; from Exhibit 6)		

Single Family Housing Units

Coverage Year	Unretrofitted Houses	Houses Sold	Houses Unsold	Sold and Retrofitted	Sold and Already Retrofitted	Unsold and Retrofitted	Gross ROR Savings (AFY)	Nat'l Replacement Only Savings (AFY)	Net ROR Savings (AFY)

Multi Family Housing Units

Coverage Year	Unretrofitted Houses	Houses Sold	Houses Unsold	Sold and Retrofitted	Sold and Already Retrofitted	Unsold and Retrofitted	Gross ROR Savings (AFY)	Nat'l Replacement Only Savings (AFY)	Net ROR Savings (AFY)

BMP 14 Residential ULFT Replacement Program

1. MOU requires implementation to start by July 1, 2004.
2. Calculated ULFT replacement program water savings at the end of each reporting should be within 10% of (equal or exceed) calculated retrofit-on-resale water savings, using Exhibit 6 methodology and water savings estimates.
3. Number of toilets replaced by rebate

Year	# SFR	# MFR
2003-2004	135	4

4. A toilet retrofit-on-resale ordinance is NOT in effect.
5. Data

	SFR	MFR	Data Source
1992 Housing Stock	19729	347	Base Year Data
Average rate of natural replacement (% of remaining stock)	4	4	MOU Exhibit 6 recommendation
Average rate of housing demolition (% of remaining stock)	0	0	assumption
Estimated Housing Units with 3.5+ gpf Toilets in 1992	19729	347	conservative estimate
Average resale rate (using 2003 data)	11.1%	11.1%	CA Department of Finance & Lake Elsinore Economic Report 2004 by John Husing
Average persons per unit	3.27	3.27	US Census Bureau
Average toilets per unit	2	2	Base Year Data
Average savings per home (gpd)	41.9	59.3	MOU Exhibit 6 Tables 1 and 2

Total Water Savings (AF) Report

Reporting Unit:
Elsinore Valley MWD - Retail

Estimated Water Savings from BMP Annual Report Data

BMP01: Water Survey Programs for Single-Family and Multi-Family Residential Customers	**3**
BMP02: Residential Plumbing Retrofit	**1**
BMP04: Metering with Commodity Rates for all New Connections and Retrofit of Existing	**0**
BMP05: Large Landscape Conservation Programs and Incentives	**5**
BMP06: High-Efficiency Washing Machine Rebate Programs	**14**
BMP09: Conservation Programs for CII Accounts	**8**
BMP09a: CII ULFT Water Savings	**0**
BMP14: Residential ULFT Replacement Programs	**87**
Total:	**117**

Water Savings (AFY) Detail Report for BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit:
Elsinore Valley MWD - Retail

Estimated Water Savings from BMP Annual Report Data

Year	Water Savings (AF)
1991	0
1992	0
1993	0
1994	0
1995	0
1996	0
1997	0
1998	0
1999	0
2000	0
2001	0
2002	1
2003	1
2004	1
2005	1
TOTAL:	**3**

Water Savings (AFY) Detail Report for BMP 02: Residential Plumbing Retrofit

Reporting Unit:
Elsinore Valley MWD - Retail

Estimated Water Savings from BMP Annual Report Data

Year	Gross Water Savings (AFY)	Water Savings (AFY) Net of Plumbing Code
1991	0	0
1992	0	0
1993	0	0
1994	0	0
1995	0	0
1996	0	0
1997	0	0
1998	0	0
1999	0	0
2000	0	0
2001	0	0
2002	0	0
2003	0	0
2004	0	0
2005	0	0
TOTALS:	**1**	**1**

Water Savings (AFY) Detail Report for
BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing

Reporting Unit:
Elsinore Valley MWD - Retail

Estimated Water Savings from BMP Annual Report Data

Year	Water Savings (AF)
1991	0
1992	0
1993	0
1994	0
1995	0
1996	0
1997	0
1998	0
1999	0
2000	0
2001	0
2002	0
2003	0
2004	0
2005	0
TOTAL:	**0**

Water Savings (AFY) Detail Report for
BMP 05: Large Landscape Conservation Programs and Incentives

Reporting Unit:
Elsinore Valley MWD - Retail

Estimated Water Savings from BMP Annual Report Data

Year	Water Savings (AF)
1991	0
1992	0
1993	0
1994	0
1995	0
1996	0
1997	0
1998	0
1999	0
2000	0
2001	0
2002	1
2003	1
2004	1
2005	1
TOTAL:	**5**

Water Savings (AFY) Detail Report for
BMP 06: High-Efficiency Washing Machine Rebate Programs

Reporting Unit:
Elsinore Valley MWD - Retail

Estimated Water Savings from BMP Annual Report Data

Year	Gross Water Savings (AFY)	Water Savings (AFY) Net of Program Freeridership Effects
1991	0	0
1992	0	0
1993	0	0
1994	0	0
1995	0	0
1996	0	0
1997	0	0
1998	0	0
1999	0	0
2000	0	0
2001	0	0
2002	0	0
2003	2	2
2004	6	5
2005	6	5
TOTAL:	**14**	**12**

Water Savings (AFY) Detail Report for BMP 09: Conservation Programs for CII Accounts

Reporting Unit:
Elsinore Valley MWD - Retail

Estimated Water Savings from BMP Annual Report Data

Year	Water Savings (AF)
1991	0
1992	0
1993	0
1994	0
1995	0
1996	0
1997	0
1998	0
1999	0
2000	0
2001	0
2002	0
2003	5
2004	3
2005	0
TOTAL:	**8**

Water Savings (AFY) Detail Report for BMP 09a: CII ULFT Water Savings

Reporting Unit:
Elsinore Valley MWD - Retail

Estimated Water Savings from BMP Annual Report Data

Year	Gross Water Savings (AFY)	Water Savings (AFY) Net of Plumbing Code	Water Savings (AFY) Net of Plumbing Code and Program Freeridership Effects
1991	0	0	0
1992	0	0	0
1993	0	0	0
1994	0	0	0
1995	0	0	0
1996	0	0	0
1997	0	0	0
1998	0	0	0
1999	0	0	0
2000	0	0	0
2001	0	0	0
2002	0	0	0
2003	0	0	0
2004	0	0	0
2005	0	0	0
TOTALS:	**0**	**0**	**0**

Water Savings (AFY) Detail Report for BMP 14: Residential ULFT Replacement Programs

Reporting Unit:
Elsinore Valley MWD - Retail

Estimated Water Savings from BMP Annual Report Data

Year	Gross Water Savings (AFY)	Water Savings (AFY) Net of Plumbing Code	Water Savings (AFY) Net of Plumbing Code and Program Freeridership Effects
1991	0	0	0
1992	0	0	0
1993	0	0	0
1994	0	0	0
1995	0	0	0
1996	0	0	0
1997	0	0	0
1998	0	0	0
1999	0	0	0
2000	0	0	0
2001	4	4	2
2002	14	14	7
2003	20	20	10
2004	24	23	11
2005	24	22	11
TOTALS:	**87**	**82**	**41**

Appendix E
EVMWD Drought Shortage Ordinances 78 and 81

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Ordinance No. 78

AN ORDINANCE OF THE BOARD OF DIRECTORS OF THE ELSINORE VALLEY MUNICIPAL WATER DISTRICT FINDING THE NECESSITY OF, AND PROVIDING FOR THE IMPLEMENTATION AND ENFORCEMENT OF MANDATORY WATER CONSERVATION MEASURES TO MITIGATE EFFECTS OF THE 1991 DROUGHT

WHEREAS, California is in the fifth consecutive year of below normal precipitation, and reduced supplies in storage will cause shortfalls in imported water deliveries to the region unless appropriate conservation measures are implemented; and

WHEREAS, more than 50% of the District's total water supply is imported from the Metropolitan Water District of Southern California; and

WHEREAS, on Tuesday, January 8, 1991 the Board of Directors of the Metropolitan Water District of Southern California adopted a Stage III drought response effective February 1, 1991, that sets a total water savings goal of 430,000 acre-feet for an overall reduction in water consumption of 17% in fiscal year '90–91; and

WHEREAS, Stage III of MWD's Incremental Interruption and Conservation Plan sets target water savings goals of 30% for interruptible deliveries and 10% for firm deliveries for the remainder of FY '90–91; and

WHEREAS, the Metropolitan Water District of Southern California has called upon its member agencies and subagencies to comply with its mandatory water conservation program to mitigate a water supply shortfall and related impacts;

WHEREAS, the Elsinore Valley Municipal Water District has the power and the authority to adopt and enforce water conservation measures within its district boundaries pursuant to Water Code Sections 350 et seq., 375 et seq., and 71640 et seq.; and

NOW THEREFORE the Board of Directors of Elsinore Valley Municipal Water District does hereby resolve, determine and order as follows:

Section 1. Definitions.

The following terms are defined for the purposes of the Ordinance:

(a) "Emergency supply shortage" means any water shortage caused by an earthquake, loss of electrical power, pipeline breakage, or any other threatened or existing water shortage caused by a disaster or facility failure which results in District inability to meet the water demands of its customers.

(b) "Waste" means any unreasonable or nonbeneficial use of water, or any unreasonable method of use of water, including, but not limited to, the specific uses prohibited and restricted by this Ordinance as hereinafter set forth.

(c) "Customer" means any person, firm, partnership, association, corporation, or local political entity using water obtained from the water system of Elsinore Valley Municipal Water District.

(d) "Water" means water supplied by Elsinore Valley Municipal Water District.

(e) "New Construction" means any construction of a previously non-existent structure requiring a discretionary or ministerial permit issued after the effective date of this Ordinance. "New Construction" shall include additions, modifications, or structural improvements which add square footage to floor space of existing structures.

(f) "IICP," or *Incremental Interruption and Conservation Plan*, is the water conservation contingency plan adopted by the Metropolitan Water District of Southern California.

(g) "MWD" is an abbreviated term for the Metropolitan Water District of Southern California.

Section 2. Purpose and Scope.

(a) The purpose of this Ordinance is to provide a mandatory water conservation plan to minimize the effect of a shortage of water supplies on the customers of the District during a water shortage emergency. Pursuant to Water Code Sections 350 et seq., 375 et seq., and 71640 et seq., The Board of Directors is authorized to declare a water shortage emergency and adopt water conservation measures to (1) protect the

health, safety, and welfare of the inhabitants and customers of the District, (2) assure the maximum beneficial use of the water supplies of the District, and (3) ensure that there will be sufficient water supplies to meet the basic needs of human consumption, sanitation and fire protection.

(b) This Ordinance adopts regulations to implement a mandatory water conservation plan consistent with the goals of Metropolitan Water District of California's *Incremental Interruption and Conservation Plan.*

(c) This Ordinance shall remain in effect until the Board of Directors finds and declares by resolution that the provisions of the Ordinance are no longer applicable to existing water supply conditions and until the supply of water available for distribution within the District's service area has been replenished or augmented.

Section 3. Declaration of Policy.

As a result of five consecutive years of drought which has depleted water reserves normally held in storage for emergency use, it is hereby declared that the general welfare requires that the existing water resources available to the District be put to the maximum beneficial use to the extent to which they are capable, and that waste or unreasonable use be prevented, and that the conservation of such water be practiced with a view to the reasonable and beneficial use thereof in the interest of the people of the District and for the public welfare.

Section 4. Authorization to Implement Water Conservation Ordinance.

(a) The Board of Directors, after compliance with the notice and hearing procedures of Water Code Sections 351 and 352, and 375 et seq., may declare a Water Emergency as set forth in the Water Conservation Ordinance whenever it finds and determines that the ordinary demands and requirements of water consumers are either under threat of being insufficient to satisfy, or cannot be satisfied, without depleting the water supply of the District to the extent that there would be insufficient water for human consumption, sanitation and fire protection (Authority: Water Code, Section 355).

(b) The Board of Directors is authorized to implement the provisions of this Ordinance, following the public hearing required by sub-Section (c), upon its determination that such implementation is necessary to protect the public welfare and safety.

(c) Prior to implementation of this Ordinance, the Board of Directors shall hold a public hearing for the purpose of determining whether a shortage exists and which measures provided by this Ordinance should be implemented. Notice of the time and place of the public nearing shall be published not less than ten (10) days before the hearing in a newspaper of general circulation within the District.

(d) The Board of Directors shall issue its determination of shortage and corrective measures by Ordinance effective immediately upon adoption and by public proclamation published in a daily newspaper of general circulation within the District. Any prohibitions on the use of water shall become effective immediately upon adoption. Any provisions requiring curtailment in the use of water shall become effective within the first full billing period commencing on or after the date of such adoption.

Section 5. Findings.

The Board of Directors finds, determines and declares that the following conditions exist:

1. Factoring for growth and historic water consumption for the area, additional imported water supplies will be needed to meet increasing seasonal demand;

2. Without regional water conservation efforts, imminent water shortages in State Water Project and MWD's Colorado River supplies and critically low levels of stored water supplies throughout the state will affect the District's ability to serve its customers;

3. The regulations set forth herein are necessary and proper to manage and protect the water supply for human consumption, sanitation and fire protection in anticipation of short-term water supply reductions or in the event of a water emergency condition.

Section 6. General Prohibition.

No customer of the District shall make, cause, use, or permit the use of water from the District in a manner contrary to any provision of this Ordinance or in an amount in excess of that use permitted by any curtailment provisions then in effect pursuant to action taken by the governing board in accordance with the provisions of this Ordinance.

Section 7. Determination of Water Condition Stages I, II and III.

The General Manager, after consultation with the Board of Directors, is hereby authorized and directed to determine when the water supply conditions prevailing in the District meet the Stage I through Stage III criteria set forth in the water conservation Ordinance. Wherever appropriate, conservation measures and target reduction goals will be consistent with regional policies set by the Metropolitan Water District of Southern California and Western Municipal Water District, which wholesale imported water to the District.

Retail Water User Measures

(a) **STAGE I. Voluntary Compliance—Water Watch**

Allows for voluntary compliance and indicates the possibility exists that the District may not be able to meet all the demands of its customers. In compliance with MWD's *Incremental Interruption and Conservation Plan*, establishes a voluntary reduction goal of 10% for firm deliveries and an unspecified voluntary conservation reduction goal in non-firm deliveries.

Elements of Stage I for retail water users:

1) Use of running water to wash driveways, sidewalks, patios, and other paved areas is prohibited, except as required for sanitary purposes;

2) Failure to repair a controllable leak is defined as "waste of water" and is prohibited;

3) Parks, school grounds, and golf courses shall be watered before 11:00 A.M. or after 5:00 P.M., with the exception of those using reclaimed water;

4) Irrigation of lawns and landscaping shall occur before 11:00 A.M. or after 4:00 P.M.;

5) Failure to prevent excessive runoff from irrigation activities is prohibited;

6) Sprinklers and irrigation systems shall be adjusted to avoid overspray, runoff, and waste. Watering on windy days is to be avoided;

7) Using a hand-held bucket or hose equipped with an automatic shut-off nozzle shall be required for car washing, unless car washing takes place at a commercial car wash or service station which utilizes reclaimed or recycled water;

8) Installation of water saving devices, such as low flow shower heads and faucet aerators, is encouraged;

9) Selection of low-water-demand shrubs, groundcovers and trees for all new landscaping is strongly encouraged;

10) Limitation of turf areas except in active areas of residential yards or public landscapes is encouraged. Use of turfgrass in medians, dividers and in other non-active areas is discouraged;

(b) **STAGE II. Mandatory Compliance—Water Alert**

Requires mandatory compliance during periods when the probability exists that the District will not meet all the demands of its customers. The following restrictions shall apply to all persons. In compliance with MWD's *Incremental Interruption and Conservation Plan*, establishes a mandatory reduction goal of 5% for firm deliveries and a 20% conservation reduction in non-firm deliveries from the base year.

Elements of Stage II for retail water users:

The restrictions listed in Stage I shall remain in effect with the additions below:

1) Using movable or permanent sprinkler systems for lawn irrigation and watering of plants, trees, shrubs or other landscaped areas is prohibited between 6:00 A.M. and 6:00 P.M.. Sprinkler operation shall be permitted no more than once every third (3rd) day. However, irrigation of lawns, gardens, landscaped areas, trees, shrubs or other plants is permitted at anytime if:

   a. A hand-held hose is used, or
   b. A hand-held bucket is used, or
   c. A drip irrigation system is used, or
   d. Reclaimed wastewater is used.

EXCEPTION: Commercial nurseries, commercial sod farmers and similarly situated establishments are exempt from Stage II irrigation scheduling restrictions, but will be required to follow all other restrictions to curtail all nonessential water use;

2) Washing of motor vehicles, trailers, boats and other kinds of mobile equipment shall be done only with a hand-held bucket or hose equipped with a positive shutoff nozzle for quick rinses, except where washing is done on the immediate premises of a commercial car wash or service station using recycled water.

EXCEPTION: Such washings are exempted from these regulations where the health, safety and welfare of the public is contingent upon frequent vehicle cleaning, such as garbage trucks and vehicles to transport food and perishables;

3) The filling, refilling or adding of water to uncovered outdoor swimming pools, wading pools or spas is prohibited except on designated irrigation days after 6:00 P.M. and before 6:00 A.M.;

4) The use of water for irrigation of golf courses is permissible after 5:00 P.M. and before 10:00 A.M.; however, the irrigation of golf courses utilizing reclaimed wastewater shall not be subject to irrigation prohibitions;

5) No new construction services or meters will be issued;

6) All restaurants, cafes, and other public food service establishments are prohibited from serving drinking water unless specifically requested by their customers;

7) The operation of any exterior ornamental fountain or similar structure is prohibited.

8) Water shall not be used to wash down sidewalks, driveways, parking areas, tennis courts, patios or other paved areas, except to alleviate immediate fire or sanitation hazards or unless reclaimed wastewater is used.

(c) **STAGE III. Mandatory Compliance—Water Warning**

Upon implementation by the District, the following restrictions shall apply to all persons. In compliance with MWD's *Incremental Interruption and Conservation Plan*, establishes a mandatory reduction goal of 10% for firm deliveries and a 30% conservation reduction in non-firm deliveries from the base year.

Elements of Stage III:

Measures addressed previously remain in effect with the following additions:

1) All sprinkler irrigation of vegetation shall occur only after 6:00 P.M. and before 6:00 A.M.. Sprinkler operation shall be permitted no more than once every fourth (4th) day. However, irrigation of lawns, gardens, landscaped areas, trees, shrubs or other plants is permitted on odd/even calendar days corresponding to the last two digits of a service address, provided:

    a. A hand-held hose is used, or
    b. A hand-held bucket is used, or
    c. A drip irrigation system is used, or
    d. Reclaimed wastewater is used.

2) The washing of private automobiles, trucks, trailers, boats, and other kinds of mobile equipment, except in the immediate interest of the public health, safety and welfare, shall be permitted only on the immediate premises of commercial car washes or commercial service stations using recycled water;

3) The filling, refilling or adding of water to uncovered outdoor swimming pools, wading pools or spas is prohibited.

4) The watering of all golf course areas, except greens, is prohibited unless done with reclaimed wastewater. Irrigation of golf greens shall occur only between the hours of 11:00 P.M. and 6:00 A.M. unless done with reclaimed wastewater;

5) Use of water from fire hydrants shall be limited to fire fighting, related activities and/or other activities necessary to maintain the health, safety and welfare of the citizenry;

6) Commercial nurseries, golf courses and other water-dependent industries shall be prohibited from watering lawn, landscaping and other turf areas more often than every third (3rd) day. Such watering shall occur between the hours of 6:00 P.M. and 6:00 A.M. only ; except that there shall be no restriction on watering using reclaimed water.

Section 8. Declaration of Water Condition Stage IV—Water Shortage Emergency.

a) **System Breakage or Failure.** The General Manager is authorized and directed to declare a Stage IV Water Emergency whenever, in his sole discretion, there has been a breakage or failure of a dam, pump, pipeline or damage to facilities causing an immediate emergency. In the event of such an emergency, the General Manager shall notify Board members of the need for Stage IV emergency measures within a reasonable period.

b) **Water Supply Shortage.** The Board of Directors, after compliance with the notice and hearing procedures of Water Code Sections 351 and 352, may declare a Stage IV Water Emergency as set forth in the Water Conservation Ordinance whenever if finds and determines that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the District to the extent that there would be insufficient water for human consumption, sanitation and fire protection (Authority: Water Code, Section 355). The regulations and restrictions under a Stage IV Water Shortage Emergency shall remain in full force and effect during the period of the emergency and until the supply of water available for distribution within the District has been replenished or augmented, all as determined by the Board of Directors (Authority: Water Code, Section 355).

(c) **STAGE IV. Mandatory Compliance—Water Emergency**

Upon implementation by the District, the following restrictions shall apply to all persons. In compliance with MWD's *Incremental Interruption and Conservation Plan*, establishes a mandatory reduction goal of 15% for firm deliveries and a 40% conservation reduction in non-firm deliveries from the base year.

Elements of Stage IV include:

Includes all measures within prior stages and the following additional measures:

1) All sprinkler irrigation of vegetation shall be allowed only between the hours of 6:00 P.M. and 6:00 A.M., unless done with reclaimed water. Sprinkler operation shall be permitted no more than once every fifth (5th) day. However, irrigation of lawns, gardens, landscaped areas, trees, shrubs or other plants is permitted on odd/even days provided:

    a. a hand-held hose is used, or
    b. a hand-held bucket is used, or
    c. a drip irrigation system is used, or
    d. reclaimed wastewater is used.

2) Commercial nurseries, golf courses, and water-dependent industries shall be prohibited from watering lawn, landscaping and other turf areas more often than every third (3rd) day between the hours of 6:00 P.M. and 6:00 A.M.; except there shall be no restriction on watering using reclaimed water;

3) The washing of private automobiles, trucks, trailers, boats, and other types of mobile equipment shall be permissible only at commercial car washes using recycled water;

4) The watering of all golf course areas, except greens, is prohibited unless done with reclaimed wastewater. Irrigation of golf greens shall occur only between the hours of 6:00 P.M. and 6:00 A.M. unless done with reclaimed wastewater;

5) Use of water from fire hydrants shall be limited to fire fighting and/or other activities immediately necessary to maintaining the health, safety and welfare of the citizenry;

6) Water shall not be used to wash down sidewalks, driveways, parking areas, except to alleviate immediate fire or sanitation hazards, or unless done with reclaimed wastewater;

7) No water shall be used for evaporative air conditioning purposes.

Section 9. Wholesale Water Users.

Elsinore Valley Municipal Water District serves wholesale water to retailers within its service area, including the Elsinore Water District and the Farm Mutual Water Company. The District's conservation plan for wholesalers consists of a direct pass through of MWD's IICP penalty payments for deliveries greater than adjusted targets for each wholesale entity. Target reduction goals for each stage of the IICP program are illustrated in the table below:

STAGE	REDUCTION IN FIRM DELIVERIES
I	Voluntary Goal 10%
II*	5%
III*	10%
IV*	15%
V*	20%
* Indicates Mandatory Compliance	

The monthly procedure for implementing MWD's IICP with each wholesale customer will be as follows:

1. The base allocation for FY '90–91 will be the actual amount of water delivered in FY '89–90 less the target reduction goal for the stage currently in effect as set by the Elsinore Valley Municipal Water District.

2. The difference between the FY '89–90 target amount and the actual amount delivered during the month will be determined.

3. If the actual usage is greater than the FY '89–90 target amount for the same monthly period, a disincentive charge, calculated at the amount of $394 per acre foot (or the prevailing rate and penalty factor set by MWD), will be added to the regular bill.

These wholesale entities are hereby urged to adopt mandatory conservation measures within their boundaries to reduce water consumption commensurate with the target

reduction goals adopted by the District, and to take immediate steps to inform their retail customers of the urgent need to conserve and protect water because of a critical shortage in the supplemental water supplies for their area.

Section 10. Retail Agricultural Water Users.

Elsinore Valley Municipal Water District serves agricultural water users within its service area, including the Temescal Division. Agricultural users are subject to the terms and conditions of MWD's interruptible water program, which was designed to provide supplemental imported water at a reduced cost subject to availability. As MWD restricts the availability of interruptible water, the District's conservation plan for agricultural water users consists of a direct pass through of MWD's IICP penalty payments for deliveries greater than adjusted reduction targets for each agricultural customer.

Target reduction goals for each stage of the IICP program are illustrated in the table below:

STAGE	INTERRUPTIBLE REDUCTION GOALS
I	Non-Specific Voluntary Savings
II*	20%
III*	30%
IV*	40%
V*	50%
* Indicates Mandatory Compliance	

The monthly procedure for implementing MWD's IICP with each agricultural customer will be as follows:

1. The base allocation for FY '90–91 will be the actual amount of water delivered in FY '89–90 less the target reduction goal for the stage currently in effect by MWD.

2. The difference between the FY '89–90 target amount and the actual amount delivered during the month will be determined.

3. If the actual usage is greater than the FY '89–90 target amount for the same monthly period, a disincentive charge, calculated at the amount of $394 per acre

foot (or the prevailing rate and penalty factor set by MWD), will be added to the regular bill.

Section 11. Moratorium on Service Commitments and Connections.

Effective at such time as may be required to ensure there will be sufficient water supplies to meet the basic needs of human consumption, sanitation and fire protection and to protect the health, safety and welfare of the inhabitants and customers of EVMWD, the District shall not make any oral or written commitments to provide new retail service and shall not approve the installation of a turnout to any new wholesale customer, until otherwise determined by this Board. Any such commitment shall be without authority from this Board and shall be void and unenforceable. Furthermore, the District's wholesale customers are urged to impose a temporary moratorium on new service commitments.

Section 12. District Actions.

The Board hereby directs staff to take immediate steps to implement water conservation measures and to intensify its public information and education programs accordingly:

1. Immediately notify all retail water users of the conservation measures required by this Ordinance;

2. Immediately provide all wholesale customers with a copy of the Ordinance, together with a letter signed by the General Manager explaining the Board's request that wholesale customers adopt similar conservation measures;

3. Develop emergency water management plans for consideration by the Board for use in the event more stringent mandatory conservation measures are required.

Section 13. Relief from Compliance.

(a) A customer may file an application for relief from any provisions of this Ordinance. The General Manager shall develop such procedures as he considers necessary to resolve such applications and shall, upon the filing by a customer of an application for relief, take such steps as he or she deems reasonable to resolve the application for relief. A customer shall have the right to appeal the General Manager's decision by writing the Board of Directors. The decision of the Board of Directors shall be final. The General Manager may delegate his duties and responsibilities under this section as appropriate.

(b) The application for relief may include a request that the customer be relieved, in whole or in part, from the water use curtailment provisions of sections 6, 7(a)–(c), and 8(c).

(c) In determining whether to grant relief, and the nature of any relief, the General Manager shall take into consideration all relevant factors including, but not limited to:

1) Whether any additional reduction in water consumption will result in unemployment;
2) Whether additional members have been added to the household;
3) Whether any additional landscaped property has been added to the property since the corresponding billing period of the prior calendar year;
4) Changes in vacancy factors in multi-family housing;
5) Increased number of employees in commercial, industrial, and governmental offices;
6) Increased production requiring increased process water;
7) Water uses during new construction;
8) Adjustments to water use caused by emergency health or safety hazards;
9) First filling of a permit-constructed swimming pool;
10) Water use necessary for reasons related to family illness or health; and
11) Livestock on property.

(d) In order to be considered, an application for relief must be filed with the District within (15) fifteen days from the date the provision from which relief is sought becomes applicable to the applicant. No relief shall be granted unless the customer shows that he or she has achieved the maximum practical reduction in water consumption other than in the specific areas in which relief is being sought. No relief shall be granted to any customer who, when requested by the General Manager, fails to provide any information necessary for resolution of the customer's application for relief.

Section 14. Failure to Comply.

Violation by any customer of the water use prohibitions of Section 6, 7(a)–(c), and 8(c), shall be penalized as follows:

a) **First Violation—Notice of Non-Compliance.** The General Manager is authorized and directed to issue a written warning notice of non-compliance to any District customer who, in the judgment of the General Manager, has failed or refused in a significant way to comply with the provisions of the water conservation ordinance. Any such warning notice shall specify the time, place and manner of non-compliance and shall specify a reasonable period to achieve compliance. Any warning notice of non-compliance shall be directed to the customer of record for the premises where the non-compliance was observed. Delivery may be by regular mail or by personal delivery with a declaration of delivery returned to the General Manager.

b) **Second Violation—Fine, Flow Restriction, or Water Service Shutoff.**

1) For a second violation by any customer of the water use curtailment provisions of Sections 7(a)–(c), or 8(c), a surcharge shall be imposed in an amount equal to the percentage of the customer's most recent water bill, excluding sewer charges, for the stage in effect upon the occurrence of the most recent violation. The penalty surcharge for each stage is shown below:

Stage II.....25%
Stage III.....50%
Stage IV.....75%

2) If a water customer fails or refuses to comply with the requirements of a warning notice of non-compliance issued according to sub-Section (a) of Section 11, or if the water customer repeats the infraction noted in a prior warning notice of non-compliance, the General Manager has discretionary authority to provide for a flow-restricting device to be installed at the meter to minimize water availability to the customer's service address. If installation of a flow restrictor is infeasible, impractical or is unlikely to induce compliance with the water conservation ordinance, the General Manager may authorize a shutoff of service to the premises involved (Authority: Water Code Sections 377 and 35423).

c) **Referral of Misdemeanor Charges.** When warranted, the General Manager may refer evidence of non-compliance to the District Attorney of Riverside County

with a request for misdemeanor prosecution as authorized by Water Code Section 377 and/or Section 35423. Pursuant to Water Code Section 377, any conviction resulting from a violation of a water conservation program restriction, prohibition or requirement published in this Ordinance shall be punishable by imprisonment in the County jail for not more than thirty (30) days or by fine not exceeding one thousand dollars ($1,000), or both.

Section 15. Hearing Regarding Violations.

(a) Any customer receiving notice of a second or subsequent violation of sections 6, 7(a)–(c), or 8(c) shall have a right to a hearing by the General Manager of the District within (15) fifteen days of mailing or other delivery of the notice of violation.

(b) The customer's timely written request for a hearing shall automatically stay installation of a flow-restricting device on the customer's premises until the General Manager renders his decision.

(c) The customer's timely written request for a hearing shall not stay the imposition of a surcharge unless within the time period to request a hearing, the customer deposits with the District money in the amount of any unpaid surcharge due. If it is determined that the surcharge was wrongly assessed, the District will refund any money deposited to the customer.

(d) The decision of the General Manager may be appealed to the Board of Directors, whose decision shall be final, except for judicial review.

(e) The General Manager may delegate his duties and responsibilities under this section as appropriate.

Section 16. Additional Water Shortage Measures—Pricing Incentives, Disincentives, and Alternative Measures.

The Board of Directors may order implementation of alternative water conservation measures in addition to those set forth in Sections 7 and 8. The need for water rate incentive or disincentive pricing to achieve target water conservation goals may also be taken into consideration by the Board of Directors at any time it is determined that existing measures may be insufficient to achieve target reductions. Such alternative water

conservation measures or pricing incentives/disincentives shall be implemented in the manner provided in Section 4(c).

Section 17. Incompatible Provisions.

To the extend any provision of this ordinance is incompatible with or at variance with any prior adopted ordinance or resolution, the provisions of this ordinance shall take precedence, and all prior ordinance shall be interpreted to harmonize with and not change the provisions of this Ordinance.

Section 18. Severability.

If any section, subsection, paragraph, sentence, clause, phrase or word of this Ordinance is declared by a court of competent jurisdiction, adjudicated to a final determination, to be void, this Board of Directors finds that said voided part is severable, and that this Board of Directors would have adopted the remainder of this Ordinance without the severed and voided part, and that the remainder of this Ordinance shall remain in full force and effect.

Section 19. Public Health and Safety Not to be Affected.

Nothing in this ordinance shall be construed to require the District to curtail the supply of water to any customer when such water is required by that customer to maintain an adequate level of public health and safety.

Section 20. Exemption from California Environmental Quality Act.

The Board of Directors hereby determines that this Ordinance is exempt from review under the California Environmental Quality Act (California Public Resources Code Section 21080 {b} {4} et seq.) because it is an action taken to mitigate a water shortage emergency. The Board of Directors hereby directs the General Manager or his designee to prepare and file a Notice of Exemption as soon as possible following adoption of this Ordinance.

APPROVED, ADOPTED AND SIGNED this 6th day of February, 1991.

GARY KELLEY, President of the Board of Directors
Elsinore Valley Municipal Water District

ATTEST

NANCY SHAFER, Secretary of the Board of Directors
Elsinore Valley Municipal Water District

I, NANCY SHAFER, Secretary-Treasurer of the Board of Directors of Elsinore Valley Municipal Water District certify that the foregoing is a full, true and correct copy of ORDINANCE NO. 78 adopted by said Board at a Special Meeting held February 6, 1991 by the following roll call vote:

AYES:	Shafer, Bryant, Kelley, Jeffries, Attridge
NOES:	None
ABSENT:	None
ABSTAIN:	None

Nancy Shafer, Secretary-Treasurer

Ordinance No. 81

AN ORDINANCE OF THE BOARD OF DIRECTORS OF THE ELSINORE VALLEY MUNICIPAL WATER DISTRICT FINDING THE NECESSITY OF, AND PROVIDING FOR THE IMPLEMENTATION AND ENFORCEMENT OF MANDATORY WATER CONSERVATION MEASURES TO MITIGATE EFFECTS OF THE 1991 DROUGHT AND AMENDING ORDINANCE NO. 79 TO PROVIDE IN PART FOR THE RESCISSION OF THE EXISTING MORATORIUM ON NEW SERVICE CONNECTIONS

WHEREAS, California is in the fifth consecutive year of below normal precipitation, and reduced supplies in storage will cause shortfalls in imported water deliveries to the region unless appropriate conservation measures are implemented; and

WHEREAS, more than 60% of the Elsinore Valley Municipal Water District's ("District") total water supply is imported from the Metropolitan Water District of Southern California ("MWD"); and

WHEREAS, on Tuesday, January 8, 1991 the Board of Directors of MWD adopted a Stage III drought response effective February 1, 1991, that sets a total water savings goal of 430,000 acre-feet for an overall reduction in water consumption of 17% in fiscal year '90-91; and

WHEREAS, Stage III of MWD's Incremental Interruption and Conservation Plan sets target water savings goals of 30% for interruptible deliveries and 10% for firm deliveries for the remainder of FY '90-91 and imposes economic penalties for failure to meet such goals; and

WHEREAS, the MWD has called upon its member agencies and subagencies to comply with its mandatory water conservation program to mitigate a water supply shortfall and related impacts; and

WHEREAS, the District has the power and the authority to adopt and enforce water conservation measures within its district boundaries pursuant to Water Code Sections 350 et seq., 375 et seq., and 71640 et seq.; and

WHEREAS, the Board of Directors of the District ("Board of Directors") adopted Ordinance No. 78 on February 6, 1991, which makes the finding of a water shortage emergency and implements a mandatory water conservation plan ("Plan") and continues in full force and effect, as amended and set forth herein; and

WHEREAS, on February 6, 1991, the District's General Manager, in consultation with the District's Board of Directors, declared and implemented Stage III of the Plan and adopted a sixty (60) day moratorium on new service connections; and

WHEREAS, on April 9, 1991, MWD implemented Stage V of its Incremental Interruption and Conservation Plan, which requires its member agencies to achieve a minimum reduction of fifty percent (50%) in the use of water for interruptible deliveries and twenty

percent (20%) for firm deliveries and imposes economic penalties for failure to meet such goals; and

WHEREAS, on March 6, 1991, the Board of Directors adopted Ordinance No. 79 which modified the moratorium on new service connections and adopted a formal appeals procedure; and

WHEREAS, due to the reduction in supply, the District currently has a water supply deficit in that it has insufficient supply for the ordinary demands and requirements of the District's existing consumers, including sufficient water for human consumption, sanitation and fire protection, but the recent rain has decreased the water supply deficit to allow some new connections without jeopardizing the public health, safety and welfare.

NOW THEREFORE the Board of Directors of Elsinore Valley Municipal Water District does hereby resolve, determine and order as follows:

Section 1. Definitions.

The following terms are defined for the purposes of the Ordinance:

(a) "Board" means the Board of Directors of the Elsinore Valley Water District.

(b) "Emergency supply shortage" means any water shortage caused by an earthquake, loss of electrical power, pipeline breakage, or any other threatened or existing water shortage caused by a disaster or facility failure which results in District inability to meet the water demands of its customers.

(c) "District" means the Elsinore Valley Municipal Water District.

(d) "Waste" means any unreasonable or nonbeneficial use of water, or any unreasonable method of use of water, including, but not limited to, the specific uses prohibited and restricted by this Ordinance as hereinafter set forth.

(e) "Customer" means any person, firm, partnership, association, corporation, or local political entity using water obtained from the water system of the District.

(f) "Water" means water supplied by the District.

(e) "New Construction" means the construction of a previously non-existent structure requiring a discretionary or

ministerial permit issued after the effective date of this Ordinance.

(f) "IICP" means the Incremental Interruption and Conservation Plan adopted by MWD.

(g) "MWD" means the Metropolitan Water District of Southern California.

Section 2. Purpose and Scope.

(a) The purpose of this Ordinance is to provide a mandatory water conservation plan to minimize the effect of a shortage of water supplies on the customers of the District during a water shortage emergency. Pursuant to Water Code Sections 350 et seq., 375 et seq., and 71640 et seq., the Board of Directors is authorized to declare a water shortage emergency and adopt water conservation measures to (1) protect the health, safety, and welfare of the inhabitants and customers of the District, (2) assure the maximum beneficial use of the water supplies of the District, and (3) ensure sufficient water supplies to meet the basic needs of human consumption, sanitation and fire protection.

(b) This Ordinance adopts regulations to implement a mandatory water conservation plan consistent with the goals of MWD's IICP and projected water supply availability.

(c) This Ordinance shall remain in effect until the Board of Directors finds and declares by ordinance that the provisions of this Ordinance are no longer applicable to existing water supply conditions and the supply of water available for distribution within the District's service area has been replenished or augmented.

Section 3. Authorization to Implement Water Conservation Ordinance.

(a) The Board of Directors, after compliance with the notice and hearing procedures of Water Code Sections 351 and 352, and 375 et seq., may declare a water emergency as set forth in this Ordinance whenever it finds and determines that the ordinary demands and requirements of water consumers are either under threat of being insufficient to satisfy, or cannot be satisfied, without depleting the water supply of the District to the extent that there would be insufficient water for human consumption, sanitation and fire protection.

(b) The Board of Directors is authorized to implement the provisions of this Ordinance, following the public hearing

required by sub-Section (c), upon its determination that such implementation is necessary to protect the public welfare and safety.

(c) Prior to implementation of this Ordinance, the Board of Directors shall hold a public hearing for the purpose of determining whether a shortage exists and which measures provided by this Ordinance should be implemented. Notice of the time and place of the public hearing shall be published not less than ten (10) days before the hearing in a newspaper of general circulation within the District.

(d) The Board of Directors shall issue its determination of shortage and corrective measures by Ordinance effective immediately upon adoption and by public proclamation published in a daily newspaper of general circulation within the District. Any prohibitions on the use of water shall become effective immediately upon adoption. Any provisions requiring curtailment in the use of water shall become effective at the start of the first full billing period commencing on or after the date of such adoption.

Section 4. Findings.

The Board of Directors finds that a drought emergency and existing water shortage exists which requires the enactment and enforcement of this Ordinance. The Board of Directors finds that the following conditions exist:

1. Factoring for growth and historic water consumption for the area, additional imported water supplies will be needed to meet increasing seasonal demand;

2. Without regional water conservation efforts, imminent water shortages in State Water Project and critically low levels of stored water supplies throughout the state will affect the District's ability to serve its customers;

3. MWD requires its member agencies to achieve a substantial reduction in water use, which will directly impact the customers of the District;

4. The regulations set forth herein are necessary and proper to manage and protect the water supply for human consumption, sanitation and fire protection in anticipation of short-term water supply reductions or in the event of a water emergency condition.

5. The ordinary demands and requirements of water consumers are either under threat of being insufficient to satisfy, or cannot be satisfied, without depleting the water supply of the District to the extent there would be insufficient water for human consumption, sanitation and fire protection, however the recent rain has decreased the water supply deficit to allow some new connections without jeopardizing the public health, safety and welfare.

Section 5. General Prohibition.

No customer of the District shall make, cause, or permit the use of water from the District in a manner contrary to any provision of this Ordinance or in excess of the amount permitted by any curtailment provisions in effect. The waste or unreasonable use of water shall be prevented.

Section 6. Determination and Declaration of Water Condition Stages I, II and III.

The General Manager, after consultation with the Board of Directors, is hereby authorized and directed to determine when the water supply conditions prevailing in the District meet the Stage I through Stage III criteria set forth in this Ordinance. Wherever appropriate, conservation measures and target reduction goals will

be consistent with regional policies set by MWD and Western Municipal Water District, which wholesale imported water to the District.

Retail Water User Measures

(a) **STAGE I. Voluntary Compliance-Water Watch**

Stage I allows for voluntary compliance and indicates that the possibility exists that the District may not be able to meet all the demands of its customers. Based on projected water supply availability, Stage I establishes a voluntary reduction goal of 10% for firm deliveries and an unspecified voluntary conservation reduction goal in non-firm deliveries. Stage I also imposes the following mandatory restrictions on water use:

Elements of Stage I for retail water users:

1) Use of running water to wash driveways, sidewalks, patios, and other paved areas is prohibited, except as required for sanitary purposes;

2) Failure to repair a controllable leak is defined as "waste of water" and is prohibited;

3) Commercial nurseries, golf courses and other water-dependent industries shall water before 11:00 a.m. or after 5:00 p.m., with the exception of those using reclaimed water;

4) All public use and governmental facilities, including but not limited to schools, churches, parks, cemeteries and hospitals shall water before 11:00 a.m. or after 5:00 p.m., except as required for sanitary purposes;

5) Irrigation of lawns, landscaping and other turf areas shall occur before 11:00 a.m. or after 4:00 p.m.;

6) Failure to prevent excessive runoff from irrigation activities is prohibited;

7) Sprinklers and irrigation systems shall be adjusted to avoid overspray, runoff and waste. Watering on windy days is to be avoided;

8) Use of a hand-held bucket or hose equipped with an automatic shut-off nozzle shall be required for car washing, except where car washing occurs on the immediate

premises of a commercial car wash or service station using reclaimed or recycled water;

9) Installation of water saving devices, such as low flow shower heads and faucet aerators, is encouraged;

10) Selection of low-water-demand shrubs, groundcovers and trees for all new landscaping is strongly encouraged;

11) Limitation of turf areas except in active areas of residential yards or public landscapes is encouraged. Use of turfgrass in medians, dividers and in other non-active areas is discouraged;

(b) **STAGE II. Mandatory Compliance-Water Alert**

Stage II requires mandatory compliance during periods when the probability exists that the District cannot meet all the demands of its customers. Based on projected water supply availability, Stage II establishes a mandatory reduction goal of 10% for all deliveries from the base year. The restrictions required by Stage II apply to all retail users.

Elements of Stage II for retail water users:

The restrictions listed in Stage I shall remain in effect with the following additions:

1) Use of movable or permanent sprinkler systems for lawn irrigation and watering of plants, trees, shrubs or other landscaped areas is prohibited between 6:00 a.m. and 6:00 p.m. Sprinkler operation shall be permitted no more than three times per week. However, irrigation of lawns, gardens, landscaped areas, trees, shrubs or other plants is permitted at anytime if:

   a. A hand-held hose is used, or
   b. A hand-held bucket is used, or
   c. A drip irrigation system is used, or
   d. Reclaimed wastewater is used.

   EXCEPTION: Commercial nurseries, commercial sod farmers and similarly situated establishments are exempt from Stage II irrigation scheduling restrictions, but will be required to follow all other restrictions to curtail all nonessential water use;

2) Washing of motor vehicles, trailers, boats, aircraft and other kinds of mobile equipment shall be done only with a hand-held bucket or hose equipped with a positive shutoff nozzle for quick rinses, except where washing occurs on the immediate premises of a commercial car wash or commercial service station using recycled or reclaimed water.

EXCEPTION: Such washings are exempted from these regulations where the health, safety and welfare of the public is contingent upon frequent vehicle cleaning, such as garbage trucks and vehicles to transport food and perishables;

3) The filling, refilling or adding of water to uncovered outdoor swimming pools, wading pools or spas is prohibited except after 6:00 p.m. and before 6:00 a.m.;

4) The use of water for irrigation of golf courses is permissible after 6:00 p.m. and before 6:00 a.m.; however, the irrigation of golf courses utilizing reclaimed wastewater shall not be subject to irrigation prohibitions;

5) Construction meters utilizing potable water shall be issued only in those instances where non-potable sources are not reasonably available to those persons who have been issued valid grading and/or building permits.

6) All restaurants, cafes, and other public food service establishments are prohibited from serving drinking water unless specifically requested by their customers;

7) The operation of any exterior ornamental fountain or similar structure is prohibited.

8) Water shall not be used to wash down sidewalks, driveways, parking areas, tennis courts, patios or other paved areas, except to alleviate immediate fire or sanitation hazards or unless reclaimed wastewater is used.

(c) **STAGE III. Mandatory Compliance-Water Warning**

Upon implementation of Stage III by the District, the following restrictions shall apply to all persons. Based on projected water supply availability, Stage III establishes a mandatory reduction goal of 20% for all deliveries from the base year.

Elements of Stage III:

The restrictions listed in Stage I and II shall remain in effect with the following additions:

1) All sprinkler irrigation of vegetation shall occur only after 6:00 p.m. and before 6:00 a.m. Sprinkler operation shall be permitted no more than two times a week. However, irrigation of lawns, gardens, landscaped areas, trees, shrubs or other plants is permitted on odd/even calendar days corresponding to the last two digits of a service address, provided:

   a. A hand-held hose is used, or
   b. A hand-held bucket is used, or
   c. A drip irrigation system is used, or
   d. Reclaimed wastewater is used.

2) The washing of private automobiles, trucks, trailers, boats, aircraft and other kinds of mobile equipment, except in the immediate interest of the public health, safety and welfare, shall be permitted only where washing occurs on the immediate premises of a commercial car wash or commercial service stations using recycled or reclaimed water;

3) The filling, refilling or addition of water to uncovered outdoor swimming pools, wading pools or spas is prohibited;

4) The watering of all golf course areas, except greens, is prohibited unless done with reclaimed wastewater. Irrigation of golf greens shall occur only between the hours of 6:00 p.m. and 6:00 a.m. unless using reclaimed wastewater;

5) Use of water from fire hydrants shall be limited to fire fighting, related activities and/or other activities necessary to maintain the health, safety and welfare of the citizenry and shall not be used for construction uses;

6) Commercial nurseries, golf courses and other water-dependent industries shall be prohibited from watering lawn, landscaping and other turf areas more often than twice a week. Such watering shall occur between the hours of 6:00 p.m. and 6:00 a.m. only; except that no such restriction on the intervals of water use shall be imposed on watering using reclaimed water;

7) All public use and governmental facilities, including but not limited to schools, churches, parks and hospitals, shall be prohibited from watering lawns, landscaping and other areas more often than twice a week. Such watering shall occur between the hours of 6:00 p.m. and 6:00 a.m. only, except that no such restriction on the intervals of water use shall be imposed on the use of reclaimed water for watering purposes;

8) No District water, with the exception of reclaimed water or as provided herein, shall be used for construction purposes except for system pressurization and/or testing.

Section 7. Declaration of Water Condition Stage IV-Water Rationing.

Pursuant to Water Code Section 355, the Board of Directors, after compliance with the notice and hearing procedures of Water Code Sections 351 and 352, is authorized and directed to declare a Stage IV Water Emergency as set forth in this Ordinance whenever it finds and determines that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the District to the extent that there would be insufficient water for human consumption, sanitation and fire protection. The regulations and restrictions under a Stage IV

Water Shortage Emergency shall remain in full force and effect during the period of the emergency and until the supply of water available for distribution within the District has been replenished or augmented, as determined by the Board of Directors.

(c) **STAGE IV. Mandatory Compliance-Water Emergency**

Upon implementation of Stage IV by the District, the following restrictions shall apply to all persons. Based on projected water supply availability, Stage IV establishes a mandatory usage limit.

Elements of Stage IV include:

The restrictions listed in Stage I, II and III shall remain in effect with the following additions:

1) Sprinkler irrigation of vegetation shall be permitted no more than once a week. However, irrigation of lawns, gardens, landscaped areas, trees, shrubs or other plants is permitted on odd/even calendar days corresponding to the last two digits of a service address, provided:
   a. A hand-held hose with automatic shut off nozzle is used, or
   b. A hand-held bucket is used, or
   c. A drip irrigation system is used, or

d. Reclaimed wastewater is used.

2) The District shall ration water to its customers by establishing allocations for each class of service based upon projected water availability to the District.

Section 8. Wholesale Water Users.

The District serves wholesale water to retailers within its service area, including the Elsinore Water District and the Farm Mutual Water Company. The District's conservation plan for wholesalers consists of a direct pass through of MWD's IICP penalty payments for deliveries greater than adjusted targets for each wholesale entity. Target reduction goals for each stage of the IICP program are illustrated in the table below:

STAGE	REDUCTION IN FIRM DELIVERIES
I	Voluntary Goal 10%
II*	5%
III*	10%
IV*	15%
V*	20%
* Indicates Mandatory Compliance	

The District will directly pass through any other Stages and corresponding reduction goals as implemented by MWD. The monthly procedure for implementing MWD's IICP with each wholesale customer will be as follows:

1. The base allocation for FY '90-91 will be the actual amount of water delivered in FY '89-90 less the target reduction goal for the stage currently in effect as set by the District.

2. The difference between the FY '89-90 target amount and the actual amount delivered during the month will be determined.

3. If the actual usage is greater than the FY '89-90 target amount for the same monthly period, a disincentive charge, calculated at the amount of $394 per acre foot (or the prevailing rate and penalty factor set by MWD), will be added to the regular bill.

These wholesale entities are required to adopt mandatory conservation measures within thirty (30) days of the effective date of this Ordinance to reduce water consumption commensurate with the target reduction goals adopted by the District, and to take steps

to inform their retail customers of the urgent need to conserve and protect water because of a critical shortage in the supplemental water supplies for their area.

Section 9. Retail Agricultural Water Users.

The District serves agricultural water users within its service area, including the Temescal Division. The agricultural users of the Temescal Division are subject to the terms and conditions of MWD's interruptible water program, subject to water availability from the Division's alternative water sources prior to implementation of MWD's program, which was designed to provide supplemental imported water at a reduced cost subject to availability. If MWD's program is implemented and restricts the availability of interruptible water, the District's conservation plan for agricultural water users consists of a direct pass through of MWD's IICP penalty payments for deliveries greater than adjusted reduction targets for each agricultural customer.

Target reduction goals for each stage of the IICP program are illustrated in the table below:

STAGE	INTERRUPTIBLE REDUCTION GOALS
I	Non-Specific Voluntary Savings
II*	20%
III*	30%
IV*	40%
V*	50%
* Indicates Mandatory Compliance	

The District will directly pass through any other stages and corresponding reduction goals as implemented by MWD. The monthly procedure for implementing MWD's IICP with each agricultural customer will be as follows:

1. The base allocation for FY '90-91 will be the actual amount of water delivered in FY '89-90 less the target reduction goal for the stage currently in effect by MWD.

2. The difference between the FY '89-90 target amount and the actual amount delivered during the month will be determined.

3. If the actual usage is greater than the FY '89-90 target amount for the same monthly period, a disincentive charge, calculated at the amount of $394 per acre foot

(or the prevailing rate and penalty factor set by MWD), will be added to the regular bill.

Section 10. Rescission of Moratorium on Service Commitments and Connections.

The District hereby declares that the moratorium on service commitments and connections is rescinded effective immediately. New service connections will be issued subject to all District rules, regulations and procedures.

Section 11. District Actions.

The Board hereby directs staff to take immediate steps to implement water conservation measures and to intensify its public information and education programs accordingly:

1. Immediately notify all retail water users of the conservation measures required by this Ordinance;

2. Immediately provide all wholesale customers with a copy of the Ordinance, together with a letter signed by the General Manager explaining the Board's request that wholesale customers adopt similar conservation measures;

3. Develop emergency water management plans for consideration by the Board for use in the event more stringent mandatory conservation measures are required.

4. Meet with appropriate cities and counties to adopt and implement water conservation measures as necessary.

5. Establish a task force, including but not limited to, representatives of the building industry, homeowner and consumer organizations and local and regional public officials, to develop ongoing measures for the implementation of water conservation programs.

Section 12. Relief from Compliance.

An applicant may file a request for relief from any provisions of this Ordinance. Such a written request shall include all information he or she deems necessary for resolution of the request. The General Manager shall review all requests for relief and may grant relief from the provisions of this Ordinance where he determines that the requested relief is necessary to protect public health, sanitation, safety or welfare of the customers and inhabitants of the District. The General Manager may at his discretion receive oral information from the person applying for relief.

The General Manager may grant, deny or modify the request for relief, or impose any conditions he deems proper. The General Manager shall make his determination within a reasonable period of time following receipt of the request for relief and shall inform the applicant of the decision in writing. The General Manager may delegate his duties and responsibilities under this section as appropriate.

An applicant shall have the right to appeal the General Manager's decision regarding his or her application to the Board of Directors or its designee. The appeal must be in writing and received by the District within ten (10) days of the date of the General Manager's written decision. The appeal shall be heard by the Board of Directors or its designee within a reasonable period of time from the date the appeal is filed. The District shall provide written notice of said hearing to applicant of the time and date of the hearing. The Board may at its discretion provide the applicant with the opportunity to be heard.

The Board of Directors or its designee, at its discretion, may affirm, reverse or modify the General Manager's decision and impose any conditions it deems proper. The decision of the Board shall be final.

Section 13. Failure to Comply.

Violation by any customer of the water use prohibitions of Sections 6, 7, and 8 of this Ordinance, shall be penalized as follows:

a) **First Violation-Notice of Non-Compliance.** The General Manager is authorized and directed to issue a written warning notice of non-compliance to any District customer who, in the judgment of the General Manager, has failed or refused in a significant way to comply with water use curtailment provisions of Sections 6, 7 and 8 of this ordinance. Any such warning notice shall specify the time, place and manner of non-compliance and shall specify a reasonable period to achieve compliance. Any warning notice of non-compliance shall be directed to the customer of record for the premises where the non-compliance was observed. Delivery may be by regular mail or by personal delivery with a declaration of delivery returned to the General Manager.

b) **Second Violation-Fine, Flow Restriction, or Water Service Shutoff.**

1) For a second violation by any customer of the water use curtailment provisions of Sections 7(a)-(c), or 8(c), a surcharge shall be imposed in an amount equal to the per-

centage of the customer's most recent water bill, excluding sewer charges, for the stage in effect upon the occurrence of the most recent violation. The penalty surcharge for each stage is shown below:

Stage II	25%
Stage III	50%
Stage IV	75%

2) If a water customer fails or refuses to comply with the requirements of a warning notice of non-compliance issued according to sub-Section (a) of Section 14, or if the water customer repeats the infraction noted in a prior warning notice of non-compliance, the General Manager has discretionary authority pursuant to Water Code Section 375 to cause a flow-restricting device to be installed at the meter to minimize water availability to the customer's service address. Pursuant to Water Code Section 35423, if installation of a flow restrictor is infeasible, impractical or is unlikely to induce compliance with this ordinance, the General Manager may authorize a shutoff of service to the premises involved.

c) **Referral of Misdemeanor Charges.** The General Manager may at his discretion refer evidence of non-compliance to the District Attorney of Riverside County with a request for misdemeanor prosecution as authorized by Water Code Section 377 and/or Section 35423. Pursuant to Water Code Section 377, any conviction resulting from a violation of a water conservation program restriction, prohibition or requirement published in this Ordinance shall be punishable by imprisonment in the County jail for not more than thirty (30) days or by fine not exceeding one thousand dollars ($1,000), or both.

Section 14. Hearing Regarding Violations.

(a) Any customer receiving notice of a second or subsequent violation of Sections 6, 7(a)-(c), or 8(c) shall have a right to a hearing by the General Manager within fifteen (15) days of mailing or other delivery of the notice of violation.

(b) The customer's written request for a hearing within the fifteen (15) day period shall automatically stay installation of a flow-restricting device on the customer's premises until the General Manager renders his decision.

(c) The customer's timely written request for a hearing shall stay the imposition of a surcharge if the customer deposits with the District money in the amount of any unpaid surcharge within such fifteen (15) day period. If it is determined that the surcharge was wrongly assessed, the District will refund any money deposited to the customer.

(d) The decision of the General Manager may be appealed to the Board of Directors, whose decision shall be final, except for judicial review.

(e) The General Manager may delegate his duties and responsibilities under this section as appropriate.

Section 15. Additional Water Shortage Measures-Pricing Incentives, Disincentives, and Alternative Measures Use Restrictions.

The Board of Directors may order implementation of alternative water conservation measures in addition to those set forth in Sections 7 and 8. The need for water rate incentive or disincentive pricing to achieve target water conservation goals may also be taken into consideration by the Board of Directors at any time it is determined that existing measures may be insufficient to achieve target reductions. Such alternative water conservation measures or

pricing incentives/disincentives shall be implemented in the manner consistent with in Section 4(c).

Section 16. Incompatible Provisions.

To the extent any provision of this Ordinance is incompatible with or at variance with any prior adopted ordinance or resolution, the provisions of this Ordinance shall take precedence, and all prior ordinance shall be interpreted to harmonize with and not change the provisions of this Ordinance.

Section 17. Severability.

If any section, subsection, paragraph, sentence, clause, phrase or word of this Ordinance is declared by a court of competent jurisdiction, adjudicated to a final determination, to be void, this Board of Directors finds that said voided part is severable, and that this Board of Directors would have adopted the remainder of this Ordinance without the severed and voided part, and that the remainder of this Ordinance shall remain in full force and effect.

Section 18. Continuing Applicability of Ordinance No. 79, as Amended.

Ordinance No. 79, as adopted on March 6, 1991, is amended as set forth herein and the provisions of Ordinance 79, except as amended

or superseded by this Ordinance No. 80, shall continue in full force and effect.

Section 19. Public Health and Safety Not to be Affected. Nothing in this Ordinance shall be construed to require the District to curtail the supply of water to any customer when such water is required by that customer to maintain an adequate level of public health and safety.

Section 20. Exemption from California Environmental Quality Act. The Board of Directors hereby determines that this Ordinance is exempt from review under the California Environmental Quality Act (California Public Resources Code Section 21080(b) (4)) because it is an action taken to mitigate a water shortage emergency. The Board of Directors hereby directs the General Manager or his designee to prepare and file a Notice of Exemption as soon as possible following adoption of this Ordinance.

APPROVED, ADOPTED AND SIGNED this 24 day of April, 1991.

GARY KELLEY, President of the Board of Directors Elsinore Valley Municipal Water District

ATTEST

NANCY SHAFER, Secretary of the
Board of Directors Elsinore Valley
Municipal Water District

I, NANCY SHAFER, Secretary-Treasurer of the Board of Directors of Elsinore Valley Municipal Water District certify that the foregoing is a full, true and correct copy of ORDINANCE NO. 81 adopted by said Board at a Special Meeting held April 24, 1991 by the following roll call vote:

AYES: Kelley, Bryant, Shafer, Attridge, Jeffries

NOES: None

ABSENT: None

ABSTAIN: None

Nancy Shafer, Secretary-Treasurer

Appendix F
Groundwater Management Plan

INCLUDED AS A CD

Appendix M2:

Regional Recycled Water Project Facilities Report_2006

Kennedy/Jenks Consultants

16855 West Bernardo Drive, Suite 360
San Diego, CA 92127
(858) 676-3620
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Elsinore Valley Municipal Water District's Regional Service Area Recycled Water Project Facilities Planning Report Final Report

August 2006

Prepared for

Elsinore Valley Municipal Water District
31315 Chaney Street
Post Office Box 3000
Lake Elsinore, CA 92531-3000

K/J Project No. 0585001

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AAF	Annual average flow
ac	acre
Acre-ft	acre-feet
ADD	Average Day Demand
ADWF	Average dry weather flow
AFY	acre-feet per year
APN	Assessor Parcel Number
AWWF	Average wet weather flow
AVP	Auld Valley Pipeline
CCF	Hundred Cubic Feet
CCR	California Code of Regulations
CDHS	California Department of Health Services
CEQA	California Environmental Quality Act
cfs	cubic feet per second
CIP	Capital Improvement Program
Cl	Chloride
COD	Chemical Oxygen Demand
CFD	Community Facilities District
CWA	Clean Water Act
DI	Ductile Iron
Dia	Diameter
District	Elsinore Valley Municipal Water District
DOF	California Department of Finance
EA	Environmental Assessment
EMWD	Eastern Municipal Water District
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EVMWD	Elsinore Valley Municipal Water District
EWD	Elsinore Water District
FONSI	Finding of No Significant Impact
fps	feet per second

GIS	Geographical Information System
gpd	gallons per day
gpm	gallons per minute
hp	Horsepower
HWL	High Water Level
I&I	infiltration and inflow
IWRP	Integrated Water Resources Plan
JLH	John Laing Homes
Kennedy/Jenks	Kennedy/Jenks Consultants
kWh	kilowatt-hour
LESJWA	Lake Elsinore and San Jacinto Watersheds Authority
lb	pound
LF	Linear foot
LS	Lift station
MDD	Maximum Day Demand
MDP	Master Drainage Plan
MWD	The Metropolitan Water District of Southern California
MG	million gallons
mgd	million gallons per day
MMRP	Mitigation Monitoring and Reporting Plan
MOU	Memorandum of Understanding
msl	mean sea level
MWC	The Farm Mutual Water Company
Na	Sodium
NPDES	National Pollution Discharge Elimination System
O&M	Operations & Maintenance

PDWF	Peak dry weather flow
PDD	Peak Day Demand
PHD	Peak Hour Demand
PEIR	Program Environmental Impact Report
PVC	Polyvinyl chloride (pipe material)
PRV	Pressure reducing valve
PWWF	peak wet weather flow
RCWD	Rancho California Water District
RWQCB	California Regional Water Quality Control Board
SAR	Santa Ana River
SAWPA	Santa Ana Watershed Projects Authority
SB	Senate Bill
SCAG	Southern California Association of Governments
SO_4	sulfate
SWRCB	California State Water Resources Control Board
TCOP	Temescal Creek Outfall Pipeline
TDH	Total Dynamic Head
TDS	Total dissolved solids
TIN	Total inorganic nitrogen
TMDL	Total maximum daily load
TN	Total nitrogen
TP	Total phosphorus
TVRWRF	Temescal Valley Regional Water Reclamation Facility (A major pipeline for conveying recycled water, owned and operated by EMWD)
USACE	U.S. Army Corps of Engineers
UWMP	Urban Water Management Plan
VCP	Vitrified clay pipe
VFD	Variable-Frequency Drives
WMWD	Western Municipal Water District
WTP	Water Treatment Plant

WRF	Water Reclamation Facility
WWMP	Wastewater Master Plan
WWTP	Wastewater Treatment Plant

Section 1: Executive Summary

The Elsinore Valley Municipal Water District (District) is preparing this recycled water study for the District's Regional Service Area, described in greater detail below with the assistance of a grant from the State Water Resources Control Board (SWRCB). This study has been prepared in accordance with the SWRCB's Recycled Water Funding Guidelines (Guidelines). The draft report was presented to the SWRCB in December 2005. This final report includes input received from the SWRCB, as well as the District and other project stakeholders.

1.1 Background

The District was formed in 1950 and provides water and wastewater services to a 96 square mile area around Lake Elsinore, located in western Riverside County. The Elsinore Valley is located within an arid region of southern California, and is situated east of the Cleveland National Forest within the San Jacinto River watershed. The service area includes the communities of Lake Elsinore, Wildomar, Canyon Lake, Alberhill, El Cariso, a portion of the city of Murrieta, and unincorporated areas of Riverside County. In general, all of these communities are experiencing rapid development and growth of residential communities, parks, school facilities with athletic fields, and commercial and industrial facilities. All of these community facilities have potential for recycled water use.

The District serves approximately 103,000 water customers and provides approximately 27,000 AFY of potable water. Water demands within the Elsinore Basin are projected to more than double by 2020 (from 23,400 AFY in 2000 to as much as 53,100 AFY in 2020). In order to meet the current and future water demands, the District will be increasingly dependent on both recycled and imported water supplies.

1.2 Regional WRF

In the areas serviced by sewers, wastewater is delivered to one of the three wastewater treatment plants: the Regional WRF; the Railroad Canyon Wastewater Treatment Plant (WWTP); and the Horsethief WWTP. The Regional WRF was expanded in 2004 to accommodate an average flow of 8.0 mgd, including tertiary treatment capabilities. Effluent from the Regional WRF meets Title 22 requirements for non-restricted recreational impoundments.

The Regional WRF currently collects and treats an average of 4.67 mgd of wastewater, while producing approximately 2.0 mgd of tertiary treated recycled water for seasonal replenishment of Lake Elsinore, and some irrigation demand at the Regional WRF site. The balance of the plant's tertiary treated effluent is currently discharged to the Temescal Wash.

The District recently completed a 2-year pilot program using approximately 2 mgd of water from the Regional WRF for replenishing Lake Elsinore water levels. The results of that program were used to evaluate the effects of using recycled water for lake replenishment as part of an overall lake level management strategy.

1.3 Market Assessment

The Regional service area has a potential recycled water demand of approximately 2,225 AFY. Service to the Wildomar system and John Laing Homes Development could utilize an additional 1,120 AFY of recycled water from the Regional WRF. However, service to the Wildomar system is expected to be intermittent, and would not include serving John Laing Homes' peak seasonal demands from the Regional system. Table 1-1 identifies the top ten potential recycled water users in the Regional service area.

Table 1-1
Regional Service Area Top Ten Recycled Water Markets

Name	Average Annual Irrigation Demand (AFY)
Rosetta Canyon Subdivision	309
Alberhill Community Plan	192
La Laguna Development	142
Lakeside High School	120
Alberhill Ranch Development	101
Terra Cotta Middle School	96
Temescal Canyon High	88
Lake Elsinore Market Place	68
Elsinore Valley Cemetery	67
Lake Elsinore Valley Development	66
TOTAL	**1,249**

1.4 Water Recycling Alternatives Evaluation

The development and analysis of the recycled water system alternatives are based on a set of planning assumptions and design criteria upon which the facilities and alternative are evaluated. The recycled water alternatives evaluations include analysis of the following recycled water system components:

- Service area and customers
- Pressure zones
- Storage
- Distribution system piping

1.4.1 Service Area and Customers

Potential uses of recycled water from the Regional WRF include:

- 5,900 AFY (average annual basis) for Lake Elsinore replenishment supply
- 2,225 AFY for recycled water markets within the Regional recycled water service area

- 1,120 AFY to serve the Wildomar system for service to John Laing Homes
- 3,342 AFY to serve agricultural users along the Temescal Canyon Agricultural Line Corridor

The total of these demands is 12,587 AFY. Accounting for maximum day demands within the Regional recycled water service area, the total maximum day demand of these potential service areas and customers is 13.3 mgd. However, projected flows to the Regional WRF are estimated to be 12.67 mgd in 2025. Given that the potential uses for recycled water from the Regional WRF exceed the projected supply availability, the service area and customer markets must be prioritized, with some service areas/markets being deferred or identified for service through other sources.

Because the Regional WRF effluent has low nutrient content, this water is preferred over other non-potable water supply sources for the purposes of lake replenishment. Providing water to the District's lake replenishment program is given the highest priority use of the four above-described service area customers.

With an average annual supply to lake replenishment of 5,900 AFY, the Regional WRF will have available capacity to ultimately supply about 8,300 AFY to other uses. However, as Table 1-2 shows, surplus recycled water will not be available from Regional WRF until about 2015, given dry year commitments for lake replenishment of 10,300 AFY (or 9.19 mgd).

Table 1-2
Availability of Recycled Water Supplies with Lake Restoration

Year	Regional Treatment Plant Flows (mgd)	Normal-Year Flows Required for Lake Restoration (mgd)	Normal-Year Available Supply for Recycled Water System (mgd)	Dry-Year Flows Required for Lake Restoration (mgd)	Dry-Year Available Supply for Recycled Water System (mgd)
2005	5.16	5.27	0	9.19	0
2010	7.08	5.27	1.81	9.19	0
2015	9.33	5.27	4.06	9.19	0.14
2016	9.678	5.27	4.41	9.19	0.48
2020	11.07	5.27	5.80	9.19	1.88
2022	11.71	5.27	6.44	9.19	2.52
2025	12.67	5.27	7.40	9.19	3.48

The second priority of service is therefore the Regional recycled water system customers. The Regional WRF will supply both average day and maximum day demands to the Regional recycled water service area customers.

An inter-tie between the Regional recycled water system and the Wildomar recycled water system will provide operational flexibility, and system redundancy. The inter-tie also allows the Regional recycled water system to deliver water to the ornamental lake being constructed as part of the John Laing Homes development. The District intends to include an inter-tie with the Wildomar recycled water system with enough capacity to supply average day demands to the John Laing Homes development, 1.0 mgd.

Using Regional WRF's recycled water to supply non-potable water to the Temescal Canyon Agricultural Line Corridor does not appear to be a preferred recycled water supply option at this time. As development in the area and flows to the Regional WRF continue to increase, the District may wish to consider reevaluating its ability to supply non-potable water to the Temescal Canyon Agricultural Line as part of future facilities planning updates.

1.4.2 Recycled Water Distribution System Alternatives

Analysis of the proposed recycled water system was performed by analyzing the potential recycled water users versus the recycled water supply sources, pump stations locations and reservoir siting needs for the Regional recycled water service area. From this review, three pipeline routing alternatives were identified. These alternatives (illustrated on Figures 7-2, 7-3, and 7-4) vary primarily in the piping routes. The pipeline routes were selected primarily to minimize the distance from the Regional WRF water source and the recycled water use sites. The pipeline sizing was determined in accordance with the design criteria for velocity, pressure, and minimum pipe diameter, with 6-inches selected as the minimum pipe size. Table 1-3 summarizes the capital, operations and maintenance costs for each of the 3 distribution system alternatives.

Table 1-3
Summary of Capital Costs by
Distribution System Alternative

	Alternative:		
Capital Cost Item	**1**	**2**	**3**
Piping Costs	$24,260,000	$24,533,000	$22,273,000
Pump Costs	$1,175,000	$1,175,000	$1,175,000
Turnout Costs	$210,000	$210,000	$210,000
Reservoir Costs	$5,840,000	$5,840,000	$5,840,000
TOTAL CAPITAL COST	**$31,485,000**	**$31,758,000**	**$29,498,000**

Based on the comparison of capital and operational costs, Alternative 3 is recommended as the least costly and preferred distribution system alternative.

1.5 Phasing Plan

The proposed phasing plan for the Regional recycled water system calls for the implementation of the Regional recycled water system in 4 phases. Table 1-4 summarizes the projected recycled water demands and estimated timing of each project phase.

Table 1-4
Recycled Water Demands by Project Phase

	Phase IA	Phase I	Phase II	Phase III
Average Annual Demand	206 AFY	260 AFY	1,409 AFY	350 AFY
Cumulative Average Annual Demand	206 AFY	466 AFY	1,875 AFY	2,225 AFY
Cumulative Maximum Day Demand	0.38 mgd	0.86 mgd	3.42 mgd	4.05 mgd
Max. Day Demand for Wildomar Inter-Tie	1.00 mgd	1.00 mgd	1.00 mgd	1.00 mgd
Cumulative Total Max. Day Demand with Wildomar Inter-Tie	1.38 mgd	1.86 mgd	4.42 mgd	5.05 mgd
Year Implemented	2016	2020	2022	2025

The phasing plan for the Regional system is such that the total peak system demands will not exceed the reclaimed water supply available from the Regional WRF with flow diversions for lake restoration totaling 9.18 mgd.

The District is entitled to 1,680 AFY of annual supplies from Eastern MWD's recycled water pipeline, which will serve the Wildomar system. Recycled water supplies for the Wildomar system exceeding 1,680 AFY will need to be purchased by the District. Currently, the cost is $165/AF. Thus, the total cost to the District for purchasing supplemental water will be about $120,000 per year for the purchase of 720 AFY of supplemental water for the Wildomar system.

Supplemental water from the Regional WRF could be supplied to the Wildomar system as water is available. This would reduce the amount of water that the District would need to purchase from Eastern MWD for the Wildomar system. For this reason, the District intends to pursue Phase IA as the first project phase of the Regional recycled water system. The inter-tie could be placed into service after 2010 to provide an interruptible supply of supplemental water to the Wildomar system. However, a reliable recycled water supply sufficient to meet both the demands of the Phase IA customers and supply water for lake restoration during dry years (9.2 mgd or 10,900 AFY) would not be available from the Regional WRF until 2016.

Table 1-5 summarizes the costs versus recycled water supplies for each project phase. Figure 7-5 on page 7-20 illustrates the proposed Regional recycled water distribution system by phase.

Table 1-5
Summary of Project Costs by Phase

	Phase IA	Phase I	Phase II	Phase III	Total
Piping Costs	$4,075,000	$7,585,000	$7,853,000	$2,760,000	$22,273,000
Pump Station Costs	$608,000		$567,000		$1,175,000
Reservoir Costs		$3,000,000	$2,620,000		$5,620,000
Turnout Costs	$105,000		$105,000		$210,000
Total Capital Cost	$4,788,000	$10,585,000	$11,145,000	$2,760,000	$29,278,000
Annualized Capital Cost	$352,000	$779,000	$836,000	$203,000	$2,170,000
O&M = 18% of ACC	$56,000	$148,000	$150,000	$37,000	$391,000
Total Annualized Cost	$365,000	$971,000	$987,000	$240,000	$2,563,000
Avoided Costs for Wildomar System Supplemental Water	-$120,000	$0	$0	$0	-$120,000
Net Annualized Cost	$295,000	$919,000	$968,000	$240,000	$2,422,000
Water Usage (AFY)	206	260	1,409	350	2,225
Cumulative Water Usage (AFY)	206	466	1,875	2,225	2,225
Cumulative Unit Cost ($/AF)	$ 1,430/AF	$ 2,610/AF	$ 1,160/AF	$ 1,090/AF	$1,090/AF

1.6 Sources and Timing of Funds for Design and Construction

The Phase IA, I, II, and III projects for the Regional service area are significant projects for the District in meeting its water needs. The District has established a recycled water capital reserve from connection fees collected from new developments. The capital reserve, in addition to issuances of certificates of participation, is critical for design and construction of these projects. The cost estimate based on the anticipated year of construction for recycled water delivery as described in Section 7.4, is presented in Table 1-6.

Table 1-6
Recycled Water Costs by Project Phase

	Estimated 2006 Costs	Estimated Year Construction Begins	Estimated Costs at Time of Construction*
Phase IA	$4,788,000	2015	$6,553,000
Phase I	$10,585,000	2019	$16,947,000
Phase II	$11,145,000	2021	$19,300,000
Phase III	$2,760,000	2024	$5,376,000

***Escalated at 4%

Section 2: Regional Service Area Characteristics

2.1 Introduction

The Elsinore Valley Municipal Water District (District) was formed in 1950 and provides water and wastewater services to a 96 square mile area around Lake Elsinore, located in western Riverside County. The Elsinore Valley is located within an arid region of southern California, and is situated east of the Cleveland National Forest within the San Jacinto River watershed. The service area includes the communities of Lake Elsinore, Wildomar, Canyon Lake, Alberhill, El Cariso, a portion of the city of Murrieta, and unincorporated areas of Riverside County. In general, all of these communities are experiencing rapid development and growth of residential communities, parks, school facilities with athletic fields, and commercial and industrial facilities. All of these community facilities have potential for recycled water use. The District's service area is illustrated on Figure 2-1.

The District serves approximately 103,000 water customers and provides approximately 27,000 AFY of potable water. Rapid growth in the Elsinore area is expected over the next 10 to 20 years based on Southern California Association of Governments (SCAG) data and as documented in the Distribution System Master Plan and Wastewater Master Plan EIR. Water demands within the Elsinore Basin are projected to more than double by 2020 (from 23,400 AFY in 2000 to as much as 53,100 AFY in 2020). In order to meet the current and future water demands, the District will be increasingly dependent on both recycled and imported water supplies. Based on the data presented in the District's 2004 Consumer Confidence Report, groundwater supply wells accounted for 36 percent of the annual water demand, 9 percent from the Canyon Lake WTP, and 55 percent was supplied by import water from Metropolitan Water District (MWD) through the Auld Valley Pipeline (AVP) and Temescal Valley Pipeline connections.

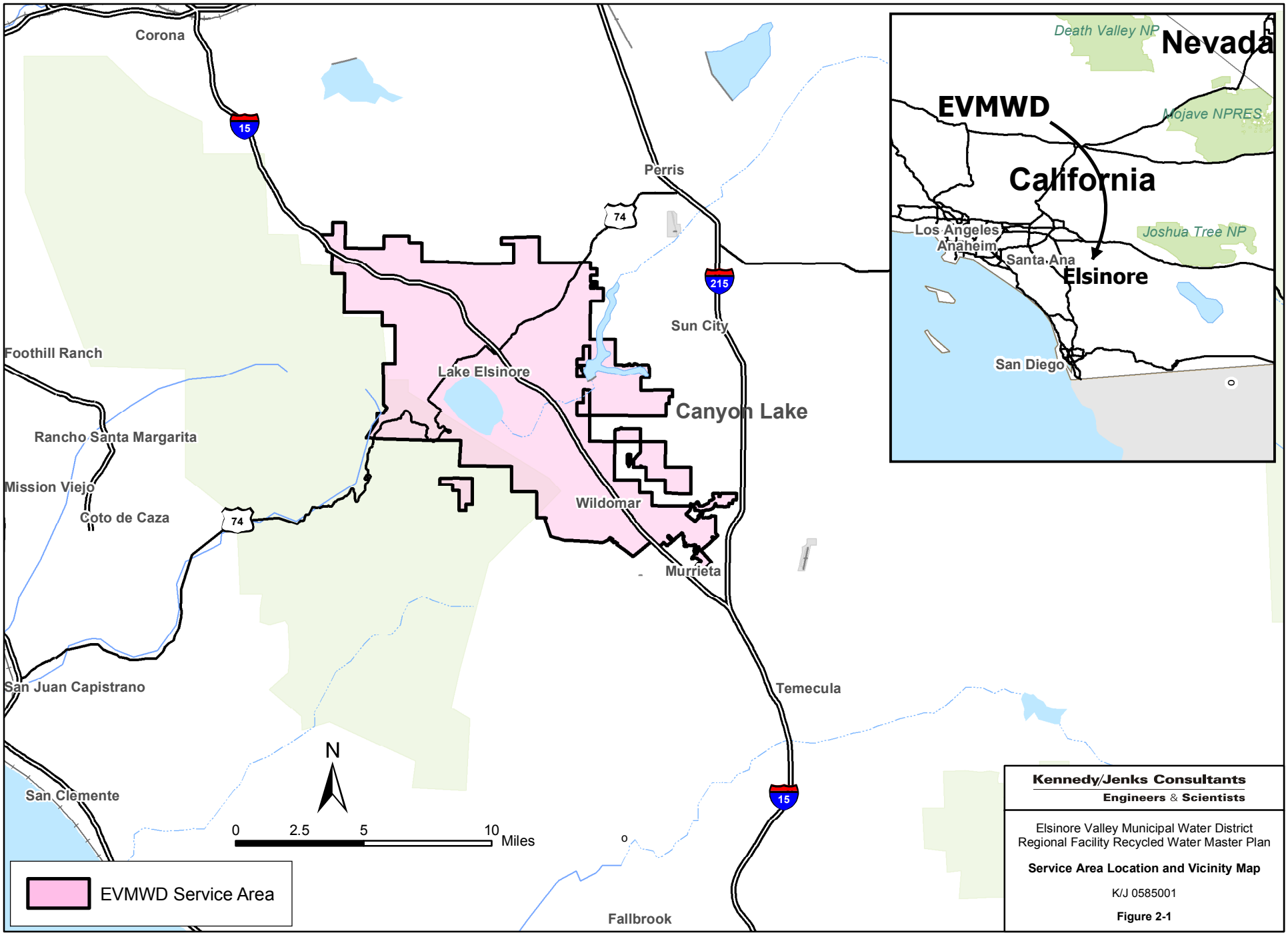
In the areas serviced by sewers, wastewater is delivered to one of the three wastewater treatment plants: the Regional WRF; the Railroad Canyon Wastewater Treatment Plant (WWTP); and the Horsethief WWTP. The Regional WRF currently collects and treats an annual average of 4.67 MGD of wastewater, while producing approximately 2.0 MGD of tertiary treated recycled water for seasonal replenishment of Lake Elsinore, and some irrigation demand at the Regional WRF site. The balance of the plant's tertiary treated effluent is currently discharged to the Temescal Wash.

2.2 Study Area Boundaries

The District intends to serve the Lake Elsinore Regional Service Area with recycled water, which includes areas around Lake Elsinore, the Alberhill area to the north and potentially along Temescal Canyon Road, the City of Lake Elsinore, and portions of the Wildomar and Lakeland Village areas. The potential service area boundaries are shown on Figure 2-2.

The District's main sanitary sewer collection system service areas are shown on Figure 3-3 of the 2002 Wastewater Master Plan. The collection system service areas are divided into the northern/western portion that flows to the Regional WRF and the southern/eastern portion that collects flows from the Wildomar area and flows south to RCWD's Santa Rosa WRF. There are

smaller sanitary sewer collection systems for the Horsethief Canyon WWTP that is the northwestern portion of the District (Horsethief Canyon Service Area) and the collection system for the Railroad Canyon WWTP that serves the Canyon Lake development (Canyon Lake Service Area).



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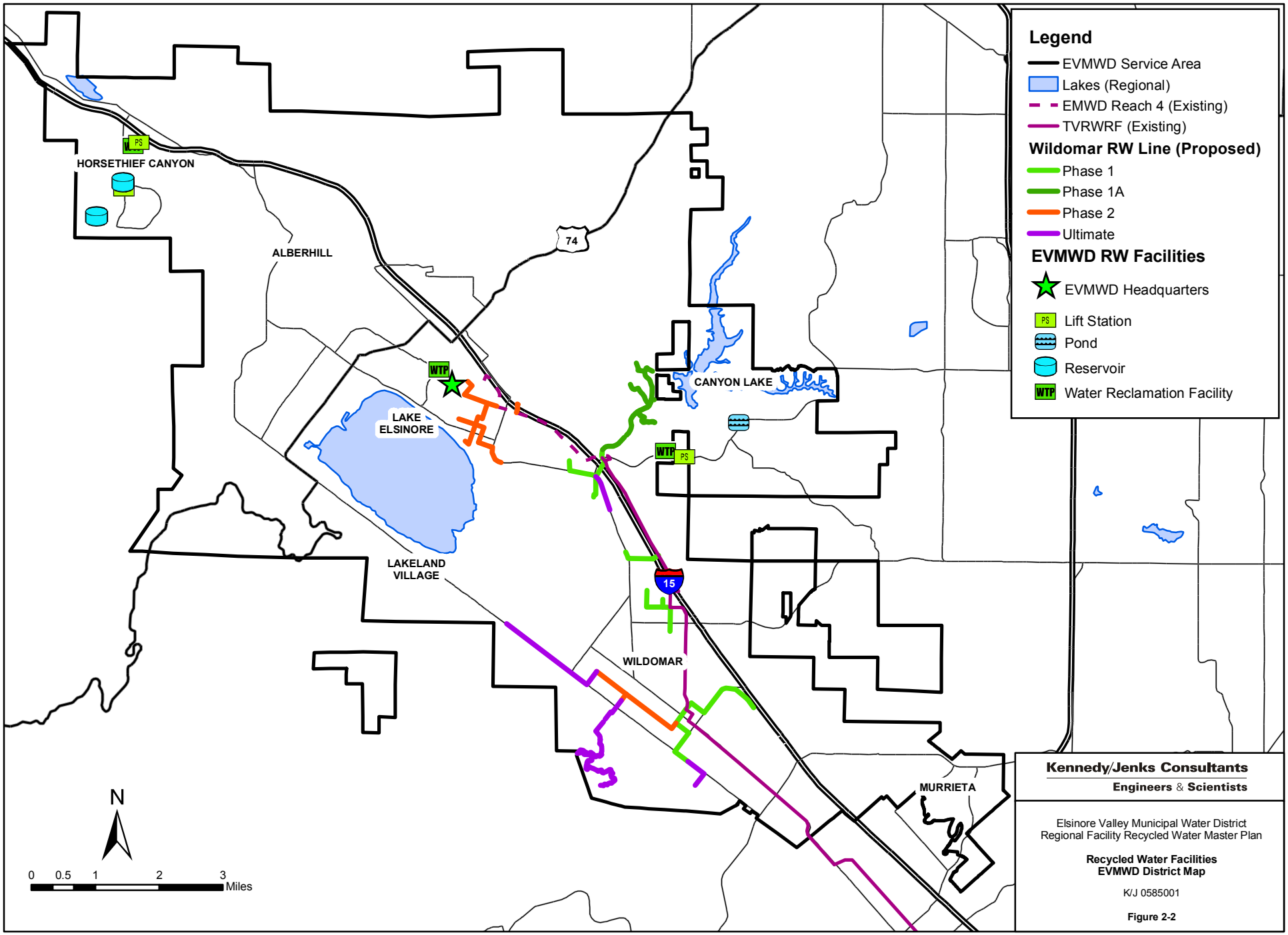
Regional Facility Recycled Water Master Plan

Service Area Location and Vicinity Map

K/J 0585001

Figure 2-1


Legend
EVMWD Service Area
Lakes (Regional)
EMWD Reach 4 (Existing)
TVRWRF (Existing)
Wildomar RW Line (Proposed)
Phase 1
Phase 1A
Phase 2
Ultimate
EVMWD RW Facilities
EVMWD Headquarters
Lift Station
Pond
Reservoir
Water Reclamation Facility
HORSETHIEF CANYON
ALBERHILL
74
CANYON LAKE
LAKE ELSINORE
LAKELAND VILLAGE
15
WILDOMAR
MURRIETA
N
0 0.5 1 2 3 Miles
Kennedy/Jenks Consultants
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Elsinore Valley Municipal Water District
Regional Facility Recycled Water Master Plan
Recycled Water Facilities
EVMWD District Map
K/J 0585001
Figure 2-2

In general, the Regional Service Area is bounded by mountains or hills on the west, north, and east side of the area. The mountains to the west are the Cleveland National Forrest. The hills to the north separate the Alberhill drainage basin from the Regional basin. Therefore, the hills provide a natural separation between the Regional Service Area and the area most likely served by the new wastewater treatment plant in the Alberhill drainage basin.

Portions of the eastern and southern Regional Service Area may be served with recycled water from the TVRWRF pipeline, which originates from the EMWD facility in Temecula. These recycled water facilities are identified on Figure 2-2. A FPR has been prepared and submitted for the Wildomar area, and a grant to perform a planning study has been approved for the Alberhill area.

2.3 Population Projections of Study Area

The District is rapidly growing with population forecasted to nearly double between 2000 and 2020. SCAG has compiled historical population and employment by census tract for selected historical years and projected them to 2000, 2005, 2010, 2015, 2020, and 2025. The District adapted this data to reflect the portion of each census tract that is contained within the District boundaries. Data for key points are summarized in Table 2-1, along with the percent change over the five year period and a total expected percent change over the total 25 year period.

Table 2-1
Population and Employment Forecasts

Year	2000	2005	Change (%)	2010	Change (%)	2015	Change (%)	2020	Change (%)	2025	Change (%)	Total Change 2000 to 2005
Population	78,596	96,351	22.6%	113,322	17.6%	128,607	13.5%	150,243	16.8%	172,346	14.7%	119.3%
Housing (du)	25,636	30,758	20.0%	36,527	18.8%	41,853	14.6%	48,485	15.8%	--	--	–
Employment	17,135	25,938	51.4%	34,950	34.7%	40,070	14.6%	44,913	12.1%	49,922	11.2%	191.3%

Reference: EIR 2005 and SCAG, 2002.

The projected overall growth rate from 2005 to 2025 is 3.0 percent per annum. Employment was projected to increase from 17,135 in 2000 to 25,938 in 2005 (8.6 percent per annum). The projected overall growth rate for employment from 2005 to 2025 is 3.3 percent per annum (WSA, 2005).

According to the current adopted SCAG projections, the population in the EVMWD Service Area is projected to grow between 13.5 to 22.6 percent every five years through 2025. This population increase will add approximately 72,000 persons by 2020, which represents a 91 percent increase in population.

2.4 Service Area Characteristics

The District serves an area of 96 square miles made up of schools, streets, commercial, industrial, residential, and recreational areas. The topography of the Regional Service Area is a combination of flat areas, rolling hill areas, and mountain ridges along the western border of the service area and within the Cleveland National Forest. Figure 2-3 displays the topographic features of the service area.

2.4.1 Hydrologic Features

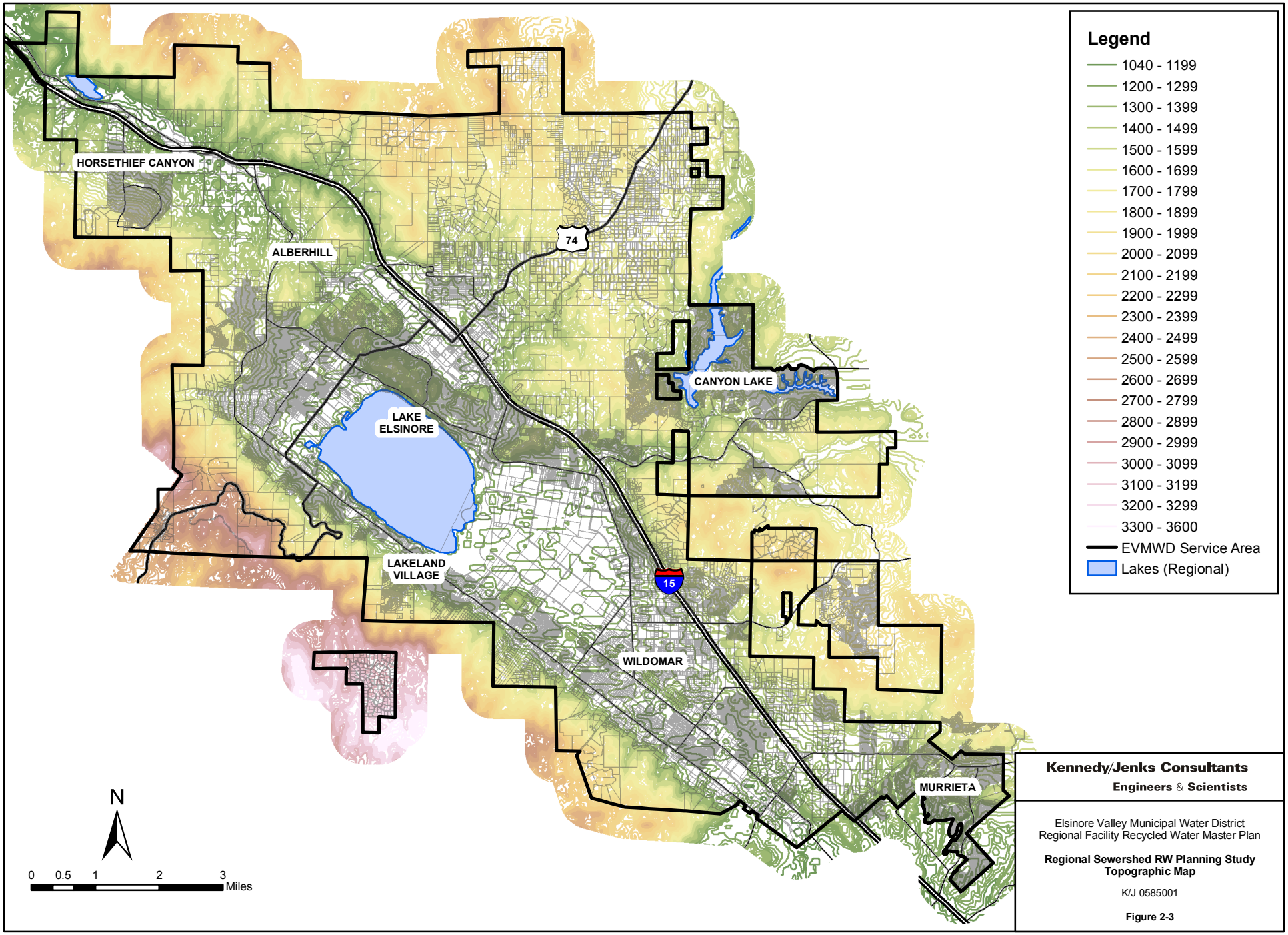
The major surface water bodies in the area are Lee Lake, Lake Elsinore and Canyon Lake, and the San Jacinto River. The San Jacinto River flows into Canyon Lake. During large storm events Canyon Lake will overflow and flow into Lake Elsinore, but this is a rare event. The Temescal Wash receives treated wastewater effluent from both the Regional WRF and excess EMWD flows, and collects stormwater runoff from the local area. On rare occasions, when there is enough stormwater flow in the Temescal Wash, the wash carries water north 28 miles to the Santa Ana River. The water level in Lake Elsinore suffers from excessive evaporation that ranges on the order of 13,000 to 15,000 AFY depending on lake level and climate conditions. The hydrologic features within and surrounding the Regional Service Area are shown on Figure 2-4, which was developed from the District's Geographic Information System (GIS).

2.4.2 Groundwater Basins

The recently completed Groundwater Management Plan (GWMP) (MWH, 2005) for the Elsinore Basin evaluated the ability of the District to meet projected demands in the future and recommended specific actions to manage the groundwater basin. Groundwater is a portion of the District's potable water supply; water supplies are further discussed in Section 3.

According to the GWMP, the Elsinore Groundwater Basin is the major source of groundwater supply for the District, Elsinore Water District (EWD) and other local groundwater producers. The basin is approximately 42 square miles with a safe yield of approximately 5,500 AFY. Surface water from McVicker Canyon, Leach Canyon, Dickey Canyon, and the San Jacinto River drains into Lake Elsinore, which covers over 3,000 acre-feet of the basin. Figure 2-5 presents the location of the groundwater basin, the tributary watershed that drains into the basin, surrounding streams and other bodies of water.

The GWMP summarizes inflows to the Elsinore Basin and includes infiltration of local precipitation, runoff from the surrounding watershed, infiltration from the San Jacinto River prior to reaching Lake Elsinore, recycled water effluent from wastewater treatment plants, and return flows from either irrigation or domestic use. Groundwater inflows are estimated to average 5,500 acre-ft/yr based on a 41-year hydrologic analysis conducted for the GWMP. This natural inflow is roughly equal to the safe yield of the basin because there are no natural outflows from the basin other than evaporation. Groundwater pumping accounts for the majority of outflows from the basin to meet demands. Additional groundwater pumping was incurred when the three Island wells (North, Middle, and South), located in Lake Elsinore, were equipped to replenish the lake and help maintain the water level above the desired operating level of 1,240 feet above mean sea level (MSL).



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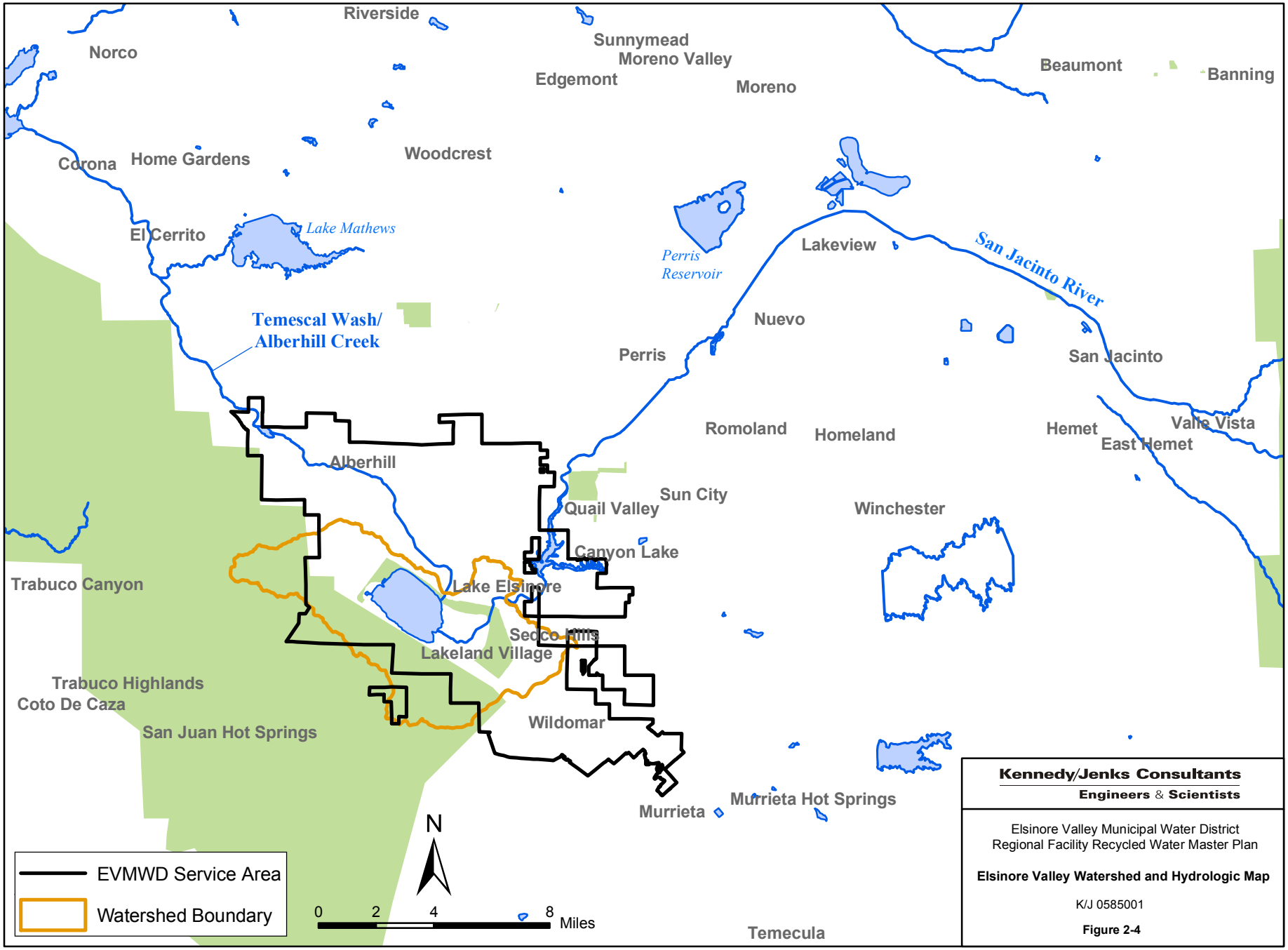
Regional Facility Recycled Water Master Plan

Regional Sewershed RW Planning Study
Topographic Map

K/J 0585001

Figure 2-3


Riverside
Norco
Sunnymead
Moreno Valley
Edgemont
Moreno
Beaumont
Banning
Corona
Home Gardens
Woodcrest
El Cerrito
Lake Mathews
Perris Reservoir
Lakeview
San Jacinto River
Temescal Wash/
Alberhill Creek
Nuevo
Perris
San Jacinto
Romoland
Homeland
Hemet
East Hemet
Valle Vista
Alberhill
Sun City
Quail Valley
Winchester
Canyon Lake
Trabuco Canyon
Lake Elsinore
Lakeland Village
Trabuco Highlands
Coto De Caza
San Juan Hot Springs
Wildomar
Murrieta
Murrieta Hot Springs
Temecula
EVMWD Service Area
Watershed Boundary
N
0 2 4 8
Miles
Kennedy/Jenks Consultants
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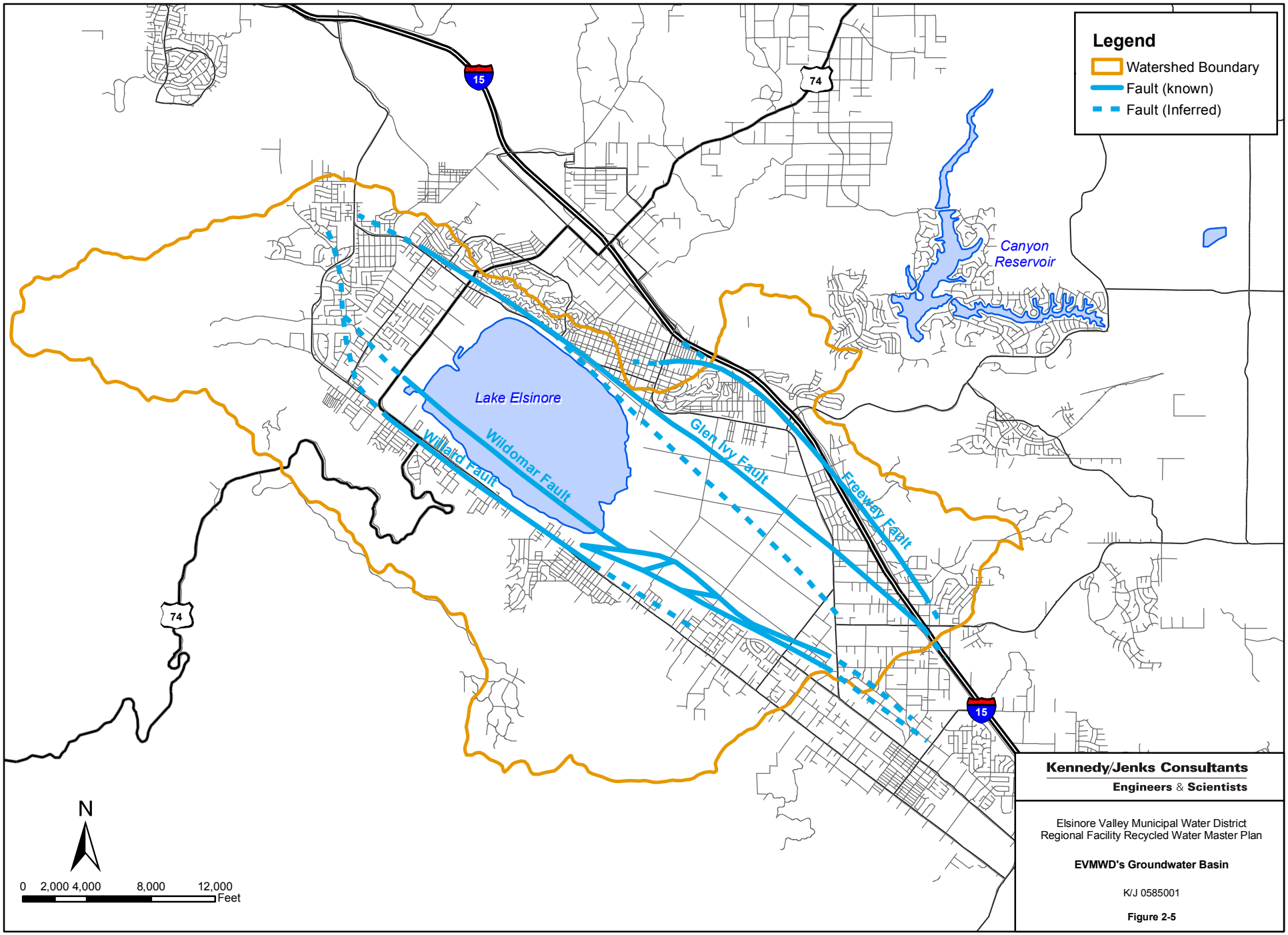
Elsinore Valley Municipal Water District
Regional Facility Recycled Water Master Plan
Elsinore Valley Watershed and Hydrologic Map
K/J 0585001
Figure 2-4


Legend
Watershed Boundary
Fault (known)
Fault (Inferred)
Canyon Reservoir
Lake Elsinore
Wildomar Fault
Willard Fault
Glen Ivy Fault
Freeway Fault
15
74
N
0 2,000 4,000 8,000 12,000
Feet
Kennedy/Jenks Consultants
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Elsinore Valley Municipal Water District
Regional Facility Recycled Water Master Plan
EVMWD's Groundwater Basin
K/J 0585001
Figure 2-5

Other less significant outflows are flows to surface water (i.e. Temescal Wash) and underflow out of the basin. The GWMP also reported that the basin could be in a state of overdraft, currently estimated at 4,400 AFY. As population increases, water demands are also projected to increase in the future. Without the implementation of the GWMP, the overdraft could reach 6,500 AFY in year 2020 (GWMP, 2003).

2.4.3 Land Use and Land Use Trends

This wastewater service area for the Regional WRF has been divided into 2 main land use areas and from there each has been sub-divided into subcategories for a total of 15 specific land use categories. The 2 main land use categories are residential and non-residential. These areas have 7 or 8 sub- categories within them. The final category is specific planned developments. Table 2-2 shows the existing and ultimate area that each category occupied as of 2003 (WWMP, 2003). Figure 2-6 shows the existing land-use distribution for the District.

Table 2-2
Percentages of Each Land Use Category by Acreage

Land Use Category	Existing Percentage of Total	Ultimate Percentage of Total
Residential	76	49
Non-Residential	9	9
Specific Plans	15	42
TOTAL	**100**	**100**

2.5 Existing Recycled Water Facilities

The District's non-potable recycled water demands are potentially supplied by tertiary treated wastewater from the Regional WRF, the Railroad Canyon WWTP, or Horsethief WWTP, as shown on Figure 2. The District owns and operates each of these facilities. Historically, the District has used the treated effluent from Railroad Canyon WWTP and Horsethief WWTP for irrigation purposes, except during some storm events where rainfall exceeds irrigation demands. Additional sources of recycled water are available to the District from EMWD through two pipeline sources. A brief description of each of these recycled water facilities is as follows and as described in the EIR and Wildomar FPR, a more detailed description is provided in Section 4:

- **Regional WRF:** The tributary area to the Regional WRF is the largest drainage basin and includes the area tributary to Lake Elsinore. The Regional WRF was recently expanded (2004) to accommodate an average flow of 8.0 mgd, including tertiary treatment capabilities. Treated effluent is normally discharged to the adjacent Temescal Wash.

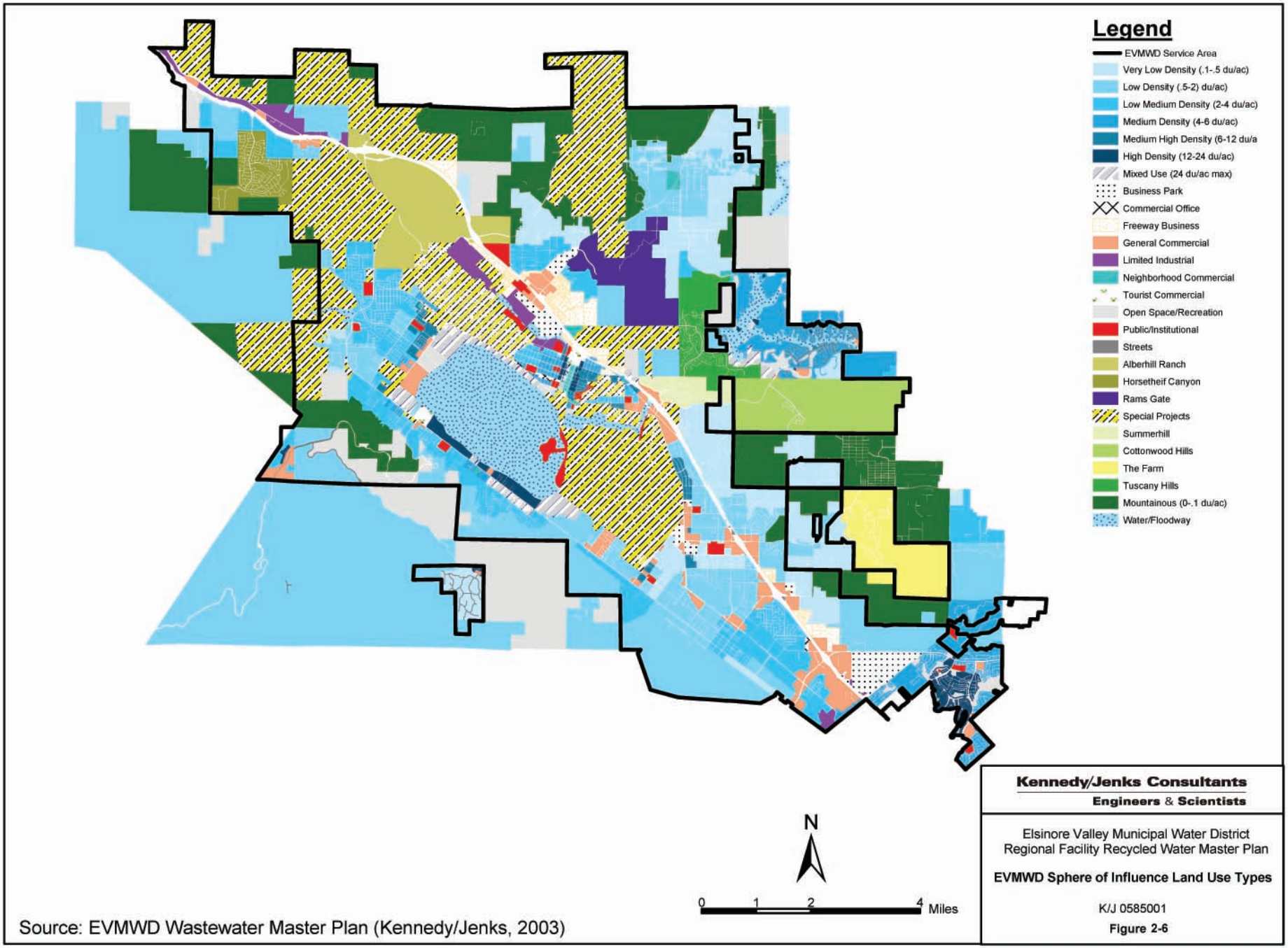
- **Horsethief Canyon WWTP:** The Horsethief Canyon service area is located in the northwestern portion of the District. The Horsethief Canyon WWTP was constructed in 1990 with a treatment capacity of 0.5 mgd.

- **Railroad Canyon WWTP:** The Canyon Lake service area is northeast of the Regional Service Area and is tributary to the Railroad Canyon WWTP. Located on Railroad Canyon Road east of Interstate 15 Freeway (I-15), the Railroad Canyon WWTP was constructed in 1984 with a treatment capacity of 1.2 mgd.

- **Temescal Pipeline:** The District has an agreement with EMWD to purchase excess recycled water from the EMWD system. This recycled water is delivered to the District through EMWD's Temescal Pipeline which parallels the San Jacinto River and terminates at the Wasson Sill**.**

Effluent from the Regional WRF is typically discharged into the Temescal Wash and has also been used to augment the level of water in Lake Elsinore. The District recently completed a 2-year pilot test program using approximately 2 MGD of water from the Regional WRF for replenishing Lake Elsinore water levels. The results of that program were used to evaluate the effects of using recycled water for lake replenishment as part of an overall lake level management strategy.

The purpose of this recycled water FPR is to evaluate the potential for recycled water use throughout the Regional Service Area, with the Regional WRF as the central hub of supply. Where necessary or convenient, the District can augment the service of recycled water through tie-ins or connections to these additional recycled water sources identified above. The District is already engaged in evaluating recycled water supply to the Wildomar, Alberhill, and Canyon Lake areas.



Source: EVMWD Wastewater Master Plan (Kennedy/Jenks, 2003)

Kennedy/Jenks Consultants
Engineers & Scientists

Elsinore Valley Municipal Water District
Regional Facility Recycled Water Master Plan

EVMWD Sphere of Influence Land Use Types

K/J 0585001

Figure 2-6

2.6 Beneficial Uses of Receiving Waters

The Regional Service Area is situated within the Regional Water Quality Control Board Santa Ana Region, as shown on Figure 2-4 and a part of the San Jacinto watershed. The Water Quality Control Plan for the Santa Ana River Basin Plan of 1995 identifies the beneficial uses of waters of the State. The Santa Ana Basin Plan describes beneficial uses and water quality objectives for surface water and groundwater within the study area. Effluent limitations and discharge prohibitions are also described in the Santa Ana Basin Plan. An updated Santa Ana Basin Plan was adopted by the Regional Board on January 22, 2004. Resolution No. R8-2004-0001 amended the Santa Ana Basin Plan to incorporate an updated Total Dissolved Solids (TDS) and Nitrogen Management Plan. The actual waste discharge limits for the Regional WRF is discussed in Section 5.

The beneficial uses for Temescal Creek are the following:

- Agricultural water supply;
- Groundwater recharge;
- Water contact recreation;
- Non-contact water recreation;
- Warm freshwater habitat;
- Wildlife habitat; and
- Rare, threatened, or endangered species.

Recycled water is also discharged to Lake Elsinore. The beneficial uses of Lake Elsinore include:

- Water contact recreation;
- Non-contact water recreation;
- Warm freshwater habitat; and
- Wildlife habitat.

The recycled water use area overlies the Elsinore Groundwater Management Zone, the beneficial uses of which include:

- Municipal and domestic supply;
- Agricultural supply; and
- Industrial process supply.

Section 3: Water Supply Characteristics and Facilities

The recycled water that is to be used for the identified purposes will primarily replace current potable water use, and potentially also replace some agricultural and other non-potable uses. To understand the relationship of recycled water to potable water, this section provides a brief background and review of the current potable system. The District's water supply is a blend of local groundwater, surface water from Railroad Canyon Reservoir (Canyon Lake), and imported water. On average, half of the District's supply is imported and total annual water demand in the Elsinore Valley Municipal Water Resources Division (Elsinore Division) is projected to be 27,678 AFY (EIR 2005). In addition, the District has acquired and now operates the Temescal Division, which supplies both potable and agricultural water.

3.1 Wholesale and Retail Entities

EVMWD, a public non-profit agency, was created on December 23, 1950 under the Municipal Water District Act of 1911. As a special district, EVMWD's powers include provision of public water service, water supply development and planning, wastewater treatment and disposal, and recycling. Currently, the district has over 24,500 water, wastewater and agricultural service connections in southwestern Riverside County.

A Board of Directors sets governing policy and is the final authority for related appeals. The Board is authorized to set rates, fees and charges for district services, operations, and debt financing of capital improvements.

EVMWD is a sub agency of the Western Municipal Water District (WMWD) and a member agency of the Metropolitan Water District of Southern California (MWD).

3.2 Sources of Water for Study Area

EVMWD's Water Supply is a blend of local groundwater, surface water from Railroad Canyon Reservoir (also known as Canyon Lake), and imported water. On average, half the supply is imported. The projected annual water demand in the Elsinore Division for 2005 is projected to be 27,678 acre-feet (EIR, Table 3-6).

The Elsinore division has eight active municipal wells that provide quality drinking water from a deep aquifer. Several additional wells are planned. Groundwater is disinfected at the wellhead and represents 40–50 percent of drinking water supplies in the Elsinore division. By late 2005 all water supplies to the Elsinore Division will be disinfected by chloramines.

EVMWD's Temescal Division was acquired in 1989 when the district purchased the Temescal Water Company. Residential customers are served from domestic wells in the Coldwater Basin. Domestic water supply is also supplemented by imported water from Lee Lake Water District. Agricultural customers in the Temescal Valley receive water from several wells in the Bunker Hill, Colton and Temescal Valley basins, and surface water from Lee Lake, which is fed by the Temescal Wash. Annual water production for this division ranges from approximately 6,000 to 7,000 acre-feet.

EVMWD owns Railroad Canyon Reservoir, also known as Canyon Lake. The reservoir impounds local runoff from the 750 square mile San Jacinto River watershed. Canyon Lake holds nearly 12,000 acre-feet of water behind Railroad Canyon Dam.

For imported water, the Colorado River Aqueduct and State Water Project provide most of southern California's water supply. EVMWD imports treated disinfected water from Lake Skinner and Lake Mathews, located in Temecula and Riverside respectively. Both treatment facilities are operated by MWD. On average, imported water accounts for 48 percent of EVMWD's supply.

Table 3-1 below, provides an overview of the capacity available from each of these water sources as well as a recent example of actual water use from 2004.

Table 3-1

Elsinore Division Existing Sources of Water Supply and Actual Use[a]

Source	Capacity		2004 Actual Use	
	(MGD)	(AFY)	%	(AFY)
Groundwater Wells	14.6	16,349	36%	9,964
Canyon Lake	9.0	10,078	9%	2,491
Imported Water via Auld Valley Pipeline	24.2	27,100	55%	15,223
Imported Water Via Temescal Valley Pipeline	12.7	14,222	0%	-
TOTALS	60.5	67,749	100%	27,678

(a) Data collected from EIR and 2004 Consumer Confidence Report.

3.2.1 Water Billing Rates

EVMWD is divided into 2 distinct divisions for the purpose of billing water rates, the Elsinore Water Division and Temescal Water Division. A majority of the District's customers are in the Elsinore division. Each division includes residential, commercial and landscape irrigation customers; each of which is billed at a different rate. Residential customers are billed on what is called a tiered or block rate program in order to promote conservation among rate payers. All water is billed in units of a 100 cubic feet (ccf), which is equal to 748 gallons.

1. **First Tier:** The first 1-5 ccf of water used. The intent of this rate is to provide a lifeline rate to all District customers.

2. **Second Tier:** The next 6 - 17 ccf (Elsinore Division) of water used (6 - 20 ccf in Temescal Division). The rate for this tier was established to reflect the average cost of water production.

3. **Third Tier:** The next 18 - 40 ccf (Elsinore Division) of water used (21 - 40 ccf in Temescal Division). The rate for this tier was established to promote conservation.

4. **Fourth Tier:** The next 41+ ccf of water used. The rate for this tier was established the cover the additional marginal cost of imported water and to promote conservation.

Directly related to the amount of water a property consumes is the Power Zone charge. This charge is for the energy required to pump water to an elevation that is appropriate to serve a home. The charge is calculated by multiplying the water consumption by a power rate charged for a particular elevation.

Every property served by the District is also charged a fixed meter charge, which is charged to cover the cost of, among other items, of maintaining meters, processing bills, posting payments and repairing water mains. The charge is prorated daily based on a 30 day charge, and the charge applies to all open accounts, whether water was used, or not. A summary of EVMWD's water billing rates is included in Table 3-2.

Table 3-2
EVMWD Water Billing Rates

Elsinore Water Division Water Commodity Rates			**Temescal Water Division Water Commodity Charges**		
Rate Classification	Current Rates as of July 1, 2005		Rate Classification	Current Rates as of July 1, 2005	
	Per ccf	Per AF		Per ccf	Per AF
Domestic			Domestic		
1 - 5 ccf	$1.00	$436	1 - 5 ccf	$1.32	$ 575
6 - 20 ccf	1.43	623	6 - 20 ccf	1.75	762
21 - 40 ccf	1.79	780	21 - 40 ccf	2.19	954
41-100 ccf	2.43	1,059	41+ ccf	2.98	1,298
100+ ccf	3.79	1,651			
Commercial	1.55	675	Irrigation	2.21	963
Political Subdivision	1.55	675	Industrial	1.90	828
Agricultural	1.55	675	Non-Potable		
Landscape Irrigation	1.81	788	Corona Upper Area	0.92	401
Hydrant Water	2.29	998	Corona Lower Area	0.92	401
Wholesale	1.45	632	Industrial	0.90	392
Reclaimed	0.97	423	Wholesale	1.22	531

Power Charges		**Power Charges**	
Zone	Current Charges (per ccf) as of July 1, 2005	Water Type	Current Charges (per ccf) as of July 1, 2005
1	$ 0.063	Potable	$ 0.26
2	0.159	Non-potable	0.08
3	0.796		

Monthly Fixed Meter Charges by Meter Capacity Unit		**Monthly Fixed Meter Charges by Meter Capacity Unit**	
Meter Size(inches)	Current Charges as of July 1, 2005	Current Charges as of July 1, 2005	
		Non-Potable	Potable
¾	$ 11.85	$ 10.00	$ 11.85
1	20.15	17.00	20.15
1-½	39.11	33.00	39.11
2	62.81	53.00	62.81
3	118.50	100.00	118.50
4	197.90	167.00	197.90
6	394.61	333.00	394.61
8	631.61	533.00	631.61
10	907.71		
12	1,303.50		
14	1,777.50		

3.3 Capacities of Present Facilities

3.3.1 Surface Water

The second water supply source for EVMWD is surface water obtained from the Railroad Canyon Reservoir, also referred to as Canyon Lake. Railroad Canyon Reservoir primarily receives runoff water delivered through a booster station that is located in the flood zone of the San Jacinto Riverbed. Through the acquisition of the Temescal Water Company, EVMWD has the rights to divert up to 15,000 AFY of natural drainage from the San Jacinto River and store that water in the Railroad Canyon Reservoir (SWRCB, 1943). Other sources of water in the Railroad Canyon Reservoir include untreated Colorado River water that is available from MWD connection WR-18A. This imported water connection has a capacity of 69 cfs (44.6 mgd).

EVMWD could purchase the imported water from MWD through WMWD, which is discharged into the San Jacinto River near Nuevo and fills the Railroad Canyon Reservoir. Because the cost of treating raw MWD water is relatively expensive, it is more cost-effective to purchase treated water from the Auld Valley Pipeline instead of purchasing untreated Colorado River water from these sources. However, EVMWD currently has the ability to supplement its Railroad Canyon Reservoir supply with raw imported water.

The Railroad Canyon Reservoir's storage capacity is approximately 4,600 acre-feet (1,500 MG). The Railroad Canyon Storage Agreement between EVMWD and Temescal Water Company that was approved in October 1955 allows EVMWD to store approximately 3,000 acre-feet of Canyon Lake's water and treat that water at the Canyon Lake WWTP before distribution. The Canyon Lake Property Owners Association leases the surface rights to the lake for recreational purposes under a 1968 agreement. Under this agreement, EVMWD is responsible for maintaining a minimum lake elevation of 1,372 ft. EVMWD typically discontinues operation of its WWTP if the lake level is expected to drop below 1,372 ft. If the level falls below 1,372 feet, EVMWD is required to purchase MWD water to maintain the minimum lake elevation.

The WWTP is located north of Railroad Canyon Dam and has a design capacity of 9 mgd (13.9 cfs). It normally operates between April and October to provide additional water for summer demands (DSWMP, 2002). Between the years of 1993 to 2002, the average water treated at the Canyon Lake WTP and distributed to the EVMWD service area is approximately 2,474 acre-feet. (WSA, 2003)

3.3.2 Imported Water

EVMWD purchases treated imported MWD water from the Western Municipal Water District (WMWD) through the Auld Valley Pipeline (AVP) and the Temescal Valley Pipeline (TVP). The AVP and the TVP are located on the southeastern and northwestern end of EVMWD's distribution system, respectively. EVMWD entered into a Water Facility Capacity Agreement for the AVP with the Eastern Municipal Water District (EMWD) in November 1986. Based on the Interagency Agreement, EVMWD has the rights to purchase or acquire a maximum flow rate of 37.5 cfs (24.2 mgd or approximately 27,100 AFY) from EMWD through the MWD Connection EM-17. EMWD sells imported water for the AVP to WMWD, which WMWD sells to EVMWD through an interagency water sales agreement (September 14, 1988). This imported water is a blend of State Water Project (SWP) and Colorado River Aqueduct water. Prior to conveyance

to the AVP, the water is treated at MWD's R.A Skinner Filtration Plant. It is then pumped into the Loop Zone and Cal Oaks Zone by the California Oaks Pumping Station located on Hancock Avenue.

In addition to the AVP, EVMWD obtains imported water from the TVP through WMWD. The source of this water is SWP water that originates from MWD's Mills Filtration Plant in Riverside. The Mills Gravity Pipeline, which is owned, operated and maintained by WMWD, runs westerly to its termination point near the intersection of Cajalco Road and Temescal Valley Road. Installation of the TVP was part of the Temescal Valley Project completed in February 2002.

EVMWD's acquisition of the Temescal Water Division in August 1989 resulted in the acquisition of water rights to Meeks and Daley Mutual Water Company's facilities and water supply sources. Following the acquisition, EVMWD received entitlements to "canal carrying rights" located in the Gage Canal and the Riverside Canal, including rights to the Palm Avenue Well that is located in Grand Terrace, Riverside County. In addition, the Meeks and Daley Company also has rights to pump 7,833 AFY of water from the San Bernardino Bunker Hill Basin. Through shareholder ownership, EVMWD's annual allotment from the basin is approximately 4,482 acre-feet (Comprehensive Annual Financial Report, 2002).

On August 23, 2001, EVMWD entered into a reciprocal use agreement with WMWD that provided EVMWD with a conditional right to use 9 cfs of capacity in the Mills Gravity Pipeline. In return for the imported water capacity, EVMWD granted WMWD entitlement to water acquired from the Meeks and Daley Rights. A separate lease agreement between EVMWD and WMWD provides EVMWD the ability to use up to 5 cfs (3.2 mgd or 3,620 AFY) of additional capacity from the Mills Gravity Pipeline on a temporary basis (EVMWD, 2001).

On August 8, 2002, the EVMWD Board of Directors approved an amendment to the lease agreement to lease an additional 7 cfs (4.5 mgd or 5,068 AFY) from the Mills Pipeline, increasing the total lease capacity to 12 cfs (7.8 mgd or 8,688 AFY) (EVMWD, 2002). In addition to the lease capacity from the Mills Pipeline, EVMWD also has an "exchange of assets" with the Temescal Water Division to supply a capacity of 9 cfs (5.8 mgd or 6,516 AFY) (Comprehensive Annual Financial Report, 2002). Thus, EVMWD can currently obtain up to 21 cfs (13.6 mgd or approximately 15,200 AFY) of water from the TVP.

Based on MWD's reliability analysis, including all water supplies under development, imported water is fully reliable through 2025 (MWD, 2003).

3.3.3 Groundwater Wells

EVMWD has nine operating groundwater wells with a total capacity of 14.6 million gallons per day (mgd) or approximately 20,048 AFY. This includes the capacity of Joy Street well, which was drilled in 2001. Groundwater supplied 33 to 57 percent of EVMWD demands in the past ten years.

Water rights for the Elsinore Groundwater Basin are not adjudicated (UWMP, 2002). According to the Groundwater Management Plan (GWMP), approximately 94 percent of groundwater produced by the basin is pumped by EVMWD, which serves a 96 mile square area in western Riverside County. Other groundwater producers include Elsinore Water District (EWD) and private well owners. EWD, which supplies water to portions north and south of Lake Elsinore,

pumps approximately five percent of groundwater from the basin. Local pumpers with private wells account for one percent of basin production (GWMP, 2003).

3.3.4 Storage Facilities

As discussed earlier, the Railroad Canyon Reservoir's (Canyon Lake) storage capacity is approximately 4,600 acre-feet (1,500 MG). Finished water from the Canyon Lake WWTP flows to a 1.0 MG steel on-site storage reservoir.

There are 49 storage reservoirs within EVMWD's system and 40 different reservoir sites. Nine of the sites contain two reservoirs each. The reservoirs range in size from 20,000 gallons to 8 MG, with a total system storage capacity of approximately 70 MG (DSMP, 2002).

3.3.5 Limitations of Existing Facilities

According to EVMWD's 2002 Distribution System Master Plan (MWH, 2003), additional water supplies consisting of six groundwater wells or 12.8 mgd of imported water will be required to meet future water demands. Also, 35 additional storage facilities are recommended along with 106 miles of pipeline.

3.4 Groundwater Management

As discussed earlier in Section 2.3, as a result of increasing potable and non-potable water demands, the Elsinore Groundwater Basin's current overdraft of 4,400 AFY is projected to increase to about 6,500 AFY in year 2020 in the absence of groundwater management (GWMP, 2003). In addition to the overdraft, water levels are also expected to decline, which could adversely impact water quality and land subsidence in the EVMWD service area. The GWMP and the Back Basin Groundwater Storage Project (BBGSP) have been developed to address the basin's overdraft condition, enhance water quality, and improve the water supply reliability by increasing EVMWD's available water supplies to meet future potable water demands.

3.5 Water Use Trends

Since EVMWD began providing potable water to the Elsinore Valley area in 1992, there has been a continuous rise in demand by its customers. In 1992, customer demand averaged 16,365 AFY. By 2002, demand was up to 24,251 AFY.

EVMWD currently has non-potable water customers in the Canyon Lake and Horsethief Canyon regions. Non-potable customers in Canyon Lake are served with tertiary-treated recycled water from the Railroad Canyon WRP. Non-potable customers in Horsethief Canyon are served with tertiary-treated recycled water from Horsethief Canyon WRP. The entire effluent flow from these two plants is used for non-potable irrigation demands, except during wet weather flows. The normalized[1] existing recycled demands in Canyon Lake are 1,104 AFY and in Horsethief Canyon are 378 AFY.

[1] Normalized flows are normalized on the number of services at each plant served that year, then trended linearly.

In 2004, EVMWD's District-Wide Water Supply Assessment projected future water demands based on the amount of projected development. For future demands, it is assumed that current uses will continue to use water at the current rate. The projected water demands are listed in Table 3-3.

Table 3-3
Summary of Elsinore Division Projected Water Demands[(a)]

Year	Projected Demands (AFY)
2000	22,828
2005	27,678
2010	35,678
2015	43,691
2020	49,955
2025	58,798

(a) From Table 3-6 of the EIR.

EVMWD is charging landscape irrigation users in the Elsinore Division $1.81/unit (unit = 100 ft^3 = 748 gallons) of potable water, based on single-family residential customer with a 3/4 inch Meter, which equates $797 per acre foot of water.

3.6 Quality of Water Supplies

EVMWD drinking water is tested extensively and results consistently show that regulated, health-related constituents either are not detected at all or are present in amounts below state and federal primary drinking water standards. EVMWD takes over 40 bacteriological samples each month from the treatment plants and distribution system. EVMWD monitors turbidity (cloudiness) and chloramines (a water disinfectant). Aluminum, predominantly a water treatment by-product, is measured at the treatment plants. Samples of naturally occurring fluoride and perchlorate are taken from source water.

EVMWD tests for more than 100 potential drinking-water constituents. Levels of many of the constituents tested for are published in EVMWD's Annual Consumer Confidence Report.

Furthermore, as a result of the high source water quality of the Elsinore groundwater basin, EVMWD's potable water supply is low in total dissolved solids and other secondary drinking water standards related to aesthetics like odor, taste, hardness, etc. EVMWD consistently meets primary drinking water standards.

3.7 Sources for Additional Water

3.7.1 MWD Programs

MWD and its member agencies have embarked on an aggressive campaign to develop additional local resources. There are promising opportunities to develop seawater desalination and expand the Local Resources Program.

Turning seawater into drinking water became more viable with the introduction of Metropolitan's Seawater Desalination Program. Launched in the summer of 2001, the program will provide financial and technical support for the development of local cost-effective seawater desalination projects. A call for proposals produced five projects proposed by member agencies, which were evaluated by Metropolitan's review committee of staff and consultants. Collectively, the projects could produce about 132,000 acre-feet of drinking water per year. The program is in its early stages with most of this production scheduled to be available by 2010, with the remainder coming on line by 2015.

MWD is promoting the development of water recycling projects that reduce demand for imported water and improve regional water supply reliability. Currently the Local Resources Program, encompassing both recycling and groundwater recovery, has implemented 53 recycled water projects yielding over 235,000 acre feet of local supply and 22 groundwater recovery projects. In accordance with the Integrated Resources Plan (IRP), MWD's regional production target is 500,000 acre-feet by 2020 for its Local Resources Program. MWD continues to provide financial incentives through its Local Resources Program to its member agencies to encourage development of local water resource process. These expected water supply benefits are incorporated into the forecasts of demand on MWD.

As additional imported supplies, local projects, conservation, storage and transfers are developed to meet the goals set forth in the IRP Update, associated costs are also expected to increase. In order to fund the projects and programs envisioned in this report, MWD's rates are forecast to increase between $76 and $100 per acre-foot between 2004 and 2013, depending on MWD's water sales.

3.7.1.1 EVMWD Specific MWD/WMWD Programs

MWD is currently in the planning stages of a number of specific projects in Riverside County that could potentially supply EVMWD with additional water supply. There are two water treatment plants (WTP) in Riverside County. A siting study is currently underway by MWD for this WTP to be located in Riverside County, possibly near the community of Eagle Valley at I-15 and the community of Cajalco. This WTP is referred to by MWD as the Central Pool Augmentation Project and will serve Riverside and Orange Counties. A siting study for a second proposed WTP project called the Riverside County WTP is underway. The Riverside County WTP is envisioned to serve only Riverside County.

In addition, the Western Municipal Water District (WMWD) has a pipeline project in the planning phases to parallel the existing MWD Mills Pipeline. The pipeline is planned to run from the existing MWD Mills WTP to the junction of Temescal Canyon Road and Cajalco Road where it will deliver water to EVMWD's existing Mills Pipeline turnout.

3.7.2 Back Basin Groundwater Storage Project

The recommended GWMP includes conjunctive use with the installation of seven new dual-purpose wells, conversion of seven existing wells, five percent water conservation, and lake replenishment with the two Island wells and recycled water. Eleven dual-purpose wells would be located in the Back Basin, while three dual-purpose wells would be located in the area north of Lake Elsinore.

The Back Basin, which is located southeast of Lake Elsinore, is primarily the floodplain for the lake and the San Jacinto River. When the lake level reaches an elevation of 1,262 feet, water spills to the Back Basin, which eventually evaporates. Only a small volume infiltrates in the groundwater basin due to substantial clay layers near the surface (GWMP, 2003).

The proposed Back Basin Groundwater Storage Project (BBGSP) will be implemented as part of the GWMP. The proposed project consists of installing six of the seven new dual-purpose wells (one dual-purpose well has already been installed but not equipped) that are identified in the recommended alternative of the GWMP. Approximately 9 mgd of additional supply capacity would be made available through the construction of these wells (both deep and shallow). During wet and average years, water will be injected into the groundwater basin, while water will be extracted from the groundwater basin during dry years.

The estimated cost of the BBGSP is approximately $18.3 million. EVMWD has requested funding for $11.9 million of grant funding under Proposition 13 and has included its share of the construction costs in its Fiscal Year 2003-2004 budget. If EVMWD receives the grant for funding, construction of the BBGSP is expected to begin in October 2004 and be completed in August 2006.

3.7.3 Alberhill Recycled Water Facilities

Wastewater flows from the Horsethief Canyon drainage basin are currently treated at the Horsethief Canyon WWTP. The Horsethief Canyon basin naturally flows into the Alberhill drainage area. It is the intention of EVMWD to abandon the Horsethief Canyon WWTP and redirect all flows from the Horsethief Canyon drainage basin to the proposed Alberhill WRF.

The Alberhill service area to be investigated is the area northwest of Lake Elsinore and naturally drains to the north, away from the Regional, or center portion of EVMWD's service area. Currently, no sewer system or treatment facility exists in the Alberhill drainage area.

Ultimate capacity of the Alberhill WWTP is proposed as 8.0 mgd, with phasing of 2-3 mgd increments. Anticipated growth in the near future (within 5 years) includes primarily residential land uses with an approximate average daily wastewater flow of 2 mgd.

EVMWD has applied for and received a facilities planning grant from the SWRCB to conduct this study which is currently underway.

3.7.4 Other Facilities

Two additional projects that EVMWD is planning to achieve additional water supplies are discussed below and include increasing the supply delivered from the TVP pipeline and a conjunctive use project with WMWD.

The TVP was designed to deliver up to 41 cfs (26.5 mgd). However, to achieve this capacity a pumping station is required to increase the hydraulic gradeline sufficiently to overcome the increased headloss associated with the higher flow rate. EVMWD has preliminarily budgeted the construction of the pumping station as part of the FY 2005-06 budget. Design is expected to begin at that time, with construction completed in FY 2006-07. EVMWD has not located a site for this pump station at this time; one possible site is at the future Alberhill WRP site. EVMWD's

total usage rights and lease capacity from the TVP connection on the Mills Gravity Pipeline is currently 21 cfs. There is currently some unallocated capacity in the Mills Gravity Pipeline. EVMWD intends to contract for additional capacity in the Mills Gravity Pipeline with WMWD when the capacity is required, and has already begun discussions with WMWD about acquiring the needed capacity. This allows EVMWD to avoid the standby charge the WMWD imposes on unused pipeline capacity.

In addition to the TVP, EVMWD is working with WMWD in the development of the Riverside-Corona Feeder. This project is being planned as a conjunctive use project. This project consists of groundwater production wells and a major feeder pipeline capable of delivering 40,000 acre feet per year of groundwater from the Bunker Hill Basin in San Bernardino to water purveyors in the northern part of Western's district. These purveyors are primarily dependent on imported water from the Metropolitan Mills Treatment Plant for water needed to support future growth. A major goal and purpose of the project is to reduce the dependence on direct delivery of imported water and thereby contribute to the Upper Santa Ana Watershed effort to "drought proof" or be self-sufficient under dry year conditions. Proposed project facilities are anticipated to include:

- Up to 20 wells located in the pressure zone of the Bunker Hill basin.
- 30 miles of feeder pipeline with diameters ranging from 36-inch to 72-inch generally paralleling the 91 Freeway from San Bernardino to Corona.
- Intertie with the Mills Gravity Pipeline near La Sierra Ave. in Riverside.
- Intertie with the Arlington, Temescal, Chino I and Chino II Desalter piping system near Home Gardens.
- Intertie with the Elsinore Valley MWD Temescal Valley Pipeline at its terminus in Corona.
- Delivery and metering facilities at connections to each participating purveyor.

During periods of wet hydrology both native and imported water are available in the Bunker Hill Basin. Through agreement with San Bernardino Valley Municipal Water District (SBVMWD) and MWD, high quality State Water Project water can be purchased during periods of surplus at reduced rates and recharged. In exchange, groundwater can be produced in the pressure zone to consistently meet demands irrespective of the periodic shortages due to dry hydrology. Similarly, abundant rainfall in the watershed can be recharged in replenishment basins or reservoirs when available and produced on demand from wells in the pressure area. In effect, this project stores water available during wet periods for domestic and municipal purposes.

A portion of the cost of this project is expected to be federally funded. HR 3334 (Calvert), which authorizes federal funding for 35 percent of the cost of the Riverside-Corona Feeder, was passed by the House of Representatives in September 2004 and is pending Senate approval.

Also, WMWD is currently preparing a Integrated Regional Water Management Plan to evaluate alternative water supplies for short-term outages as well as long-term drought to serve WMWD sub-agencies including EVMWD.

Section 4: Regional Area Wastewater Characteristics and Facilities

Recycled water for delivery to the Regional Service area could potentially be supplied by the Regional WRF, the Horsethief WWTP, the Railroad Canyon WWTP, the Temescal Pipeline, or the TVWRF recycled water pipeline. The purpose of this recycled water master plan is to identify users that can be supplied within the Regional Service Area, primarily by the Regional WRF but augmented wherever necessary or convenient by any of these other integrated sources. Potentially, the Regional recycled water system could be tied into the TVRWRF pipeline, or into the Alberhill and Wildomar service areas to provide for additional recycled source water or to provide a redundancy of supply.

The Regional WRF was originally built in 1982 to provide wastewater treatment for the City of Lake Elsinore and the surrounding areas, and is located at 14980 Strickland Avenue, Lake Elsinore, in Riverside County. The plant is owned and operated by the District. A history of the plant includes the following:

- Built in 1982 with a treatment capacity of 2 MGD;
- Expanded in 1989 to a 4 MGD capacity;
- Recently expanded to treat a peak tertiary treatment capacity of 8 MGD and treats an annual average of 4.67 MGD (~5,220 AFY).

The Regional WRF treats domestic and commercial wastes generated within the District's service area, which includes the Cities of Lake Elsinore and Canyon Lake, and the communities of Wildomar and Lakeland Village. For 2004, the average influent to the Regional WRF was 4.67 MGD (EIR 2005).

The majority of the treated effluent from the Regional WRF discharges into Reach 5 of the Temescal Creek, also called the Temescal Wash, which is tributary to Reach 3 of the Santa Ana River. Approximately 0.5 MGD of the discharged effluent flows into a channel alongside the Temescal Creek that flows into Gunerson Pond, a wetland constructed by the US Army Corps of Engineers. In 2002, the District began a pilot program whereby 2 MGD of the tertiary treated effluent was also pumped into Lake Elsinore to address lake level stabilization problems. It is planned to discharge up to 9.2 mgd (Waste Discharge Requirements, RWQCB 2005) of the tertiary treated wastewater to the Lake in the future. However, the ability to discharge into the lake will be dependent on additional effluent limitations and other possible Total Maximum Daily Load (TMDL) requirements. The District is currently evaluating these limitations and potential treatment alternatives. Currently, approximately 4.67 MGD of treated effluent is discharged to Reach 5 of Temescal Creek.

The wastewater treatment at the Regional WRF consists of the following:

1. Preliminary treatment of bar screens and grit chambers.

2. Primary sludge treatment by belt press mechanical dewatering and drying. Sludge bed dewatering and drying is also employed, especially in the summer.

3. Secondary treatment utilizing oxidation ditch technology, and anaerobic reactors for carbonaceous and nitrogenous pollutant reduction.

4. Tertiary treatment consisting of anthracite coal filtration beds, and disinfection by ultraviolet light.

The effluent from the Regional WRF meets Title 22 requirements for recycled water, and specifically for nonrestricted recreational impoundments. Treatment requirements for these uses are that the recycled water shall be at all times an adequately disinfected, oxidized, coagulated, clarified, and filtered wastewater (tertiary treated).

For discharges into the Temescal Creek and Lake Elsinore, it is required to reduce the chlorine residual level to below 0.1 mg/l. Currently, the Regional WRF utilizes UV disinfection treatment, which has many advantages and does not produce a chlorine residual. However, for distribution of recycled water for irrigation and commercial purposes, it will be desirable to chlorinate the recycled water and produce a chlorine residual. This is necessary to minimize biological growths in the recycled water system piping and infrastructure. As a part of the recycled water system, one option would be to feed liquid chlorine into the recycled water as it enters the storage reservoir, located within the Regional WRF.

A brief description of the other regionally available recycled water facilities is as follows and as described in the EIR and Wildomar FPR:

- **Horsethief Canyon WWTP:** The Horsethief Canyon service area is located in the northwestern portion of the District. The Horsethief Canyon WTTP is located near Horsethief Canyon Road in the northeastern portion of the Horsethief Canyon planned community. The Horsethief Canyon WWTP was constructed in 1990 with a treatment capacity of 0.5 mgd. Horsethief Canyon effluent is used for irrigation or stored on-site. There is no local surface discharge.

  However, current plans call for the demolition of the Horsethief Canyon Wastewater Treatment Plant (WWTP) – the objective of this project is to demolish existing wastewater treatment facilities at this location, construct a sewer pump station to transfer flows to a new Alberhill plant, and create a neighborhood park. The Alberhill sewer drainage area is separated from the Regional WRF drainage area by several hills. Therefore, recycled water uses for that drainage area are being considered under a separate study.

- **Railroad Canyon WWTP:** The Canyon Lake service area is northeast of the Regional Service Area and is tributary to the Railroad Canyon WWTP. Located on Railroad Canyon Road east of Interstate 15 Freeway (I-15), the Railroad Canyon WWTP was constructed in 1984 with a treatment capacity of 1.2 mgd. Treated effluent is used for golf course irrigation. Any excess effluent and all biosolids from the plant are piped to the Regional WWTP. There is no local surface discharge.

- **Temescal Pipeline:** The District has an agreement with EMWD to purchase excess recycled water from the EMWD system. Under this agreement, the District can purchase between 5,000 and 30,000 AFY of surplus effluent. This recycled water originates from EMWD's Moreno Valley and Perris Valley WRFs and normally available only in wet periods when EMWD's recycled water usage is low and its storage facilities

are full. This recycled water is delivered to the District through EMWD's Temescal Pipeline which parallels the San Jacinto River and terminates at the Wasson Sill.

- **TVRWRF Pipeline:** Recycled water for the Wildomar area, with potential for tie-ins to the Regional Service Area, will be provided through the EMWD Temecula Valley Regional Water Reclamation Facility (TVRWRF) Pipeline. Recycled water conveyed in the TVRWRF pipeline is a blend of recycled water from RCWD Santa Rosa Water Reclamation Facility (SRWRF) which originates from EVMWD's Southern Section and from EMWD TVRWRF.

Section 5: Treatment Requirements for Discharge and Reuse

5.1 General and Individual Recycled Water User Information & Requirements

The California Department of Health Services (DHS) establishes water quality and treatment requirements for recycled water. DHS publishes these requirements in a document called the California Health Laws Related to Recycled Water or "The Purple Book". The Purple Book provides a single comprehensive source of guidelines and requirements for recycled water usage in California. This document was last updated in June 2001.

Based on the type of recycled water use projected for the Regional Service Area, disinfected tertiary recycled water will be required for the planned irrigation areas as described in the Purple Book. The Regional WRF and the TVWRF pipeline both provide disinfected tertiary treated recycled water. These general and individual water requirements are described in the sections below.

5.2 Disinfected Tertiary Recycled Water

Disinfected tertiary recycled water is to be used for:

- Parks and playgrounds
- School yards
- Residential landscaping
- Cemeteries
- Freeway landscaping
- Ornamental nursery stock and sod farms (where access by general public is not restricted)

Disinfected tertiary recycled water is defined in Section 60301.230 of the Title 22 Code of Regulations, Division 4. Environmental Health, Chapter 3 Water Recycling Criteria (and also contained in the Purple Book) as follows:

> "The filtered wastewater has been disinfected by either:
>
> - A chlorine disinfection process following filtration that provides a CT (the product of total chlorine residual and modal contact time measured at the same point) value of not less than 450 milligram-minutes per liter at all times with a modal contact time of at least 90 minutes, based on peak dry weather design flow; or
> - A disinfection process that, when combined with the filtration process, has been demonstrated to inactivate and/or remove 99.999 percent of the plaque forming units of F-specific bacteriophage MS2, or polio virus in the wastewater. A virus that is at least as resistant to disinfection as polio virus may be used for purposes of the demonstration.
>
> The median concentration of total coliform bacteria measured in the disinfected effluent does not exceed a[n] Maximum Probable Number (MPN) of 2.2 per 100 milliliters utilizing

the bacteriological results of the last seven days for which analyses have been completed and the number of total coliform bacteria does not exceed an MPN of 23 per 100 milliliters in more than one sample in any 30 day period. No sample shall exceed an MPN of 240 total coliform bacteria per 100 milliliters."

In the Regional Service Area, all the planned irrigation areas fall under this category.

5.3 Health-related Water Quality or Treatment Requirements

Currently all areas considered for irrigation with recycled water are being irrigated with or have potable water pipes tied into their irrigation systems. Tying into the irrigation system with recycled water will require that the potable systems are separated from the recycled water sources. The Purple Book describes the different backflow preventors that are required to avoid cross-contamination of potable water with recycled water.

In addition, to keep pipes that convey recycled water distinct, the Purple Book references the requirements of the Health and Safety Code, Division 104. Environmental Health Services, Part 12. Drinking Water, Chapter 5. Water Equipment and Control, Article 2. Cross Connection Control by Water Users, Section 116815:

"All pipes installed above or below the ground, on and after June 1, 1993, that are designed to carry recycled water, shall be colored purple or distinctively wrapped with purple tape."

Since the regulations compiled in the Purple Book are intended to protect public health, compliance with these regulations should result in public health protection.

5.4 Wastewater Discharge Requirements

As discussed previously, the Regional Service Area lies within the watershed boundary of the RWQCB Santa Ana region. Also, recycled water for the Regional area will be provided through newly constructed pipelines. Recycled water for the Regional area will most likely originate from the Regional WRF, but could be from other tertiary sources where necessary or convenient. That is, it can also be supplied from any of the Regional Service Area facilities or recycled water pipelines in the area. This plan would utilize the integrated resources that exist in the Regional Service Area. The wastewater discharge requirements for the WRP are discussed below.

Discharges from the District's Regional WRF are regulated by the California Regional Water Quality Control Board Santa Ana Region Order No. R8-2005-0003, National Pollutant Discharge Elimination Systems (NPDES) Permit No. CA8000027. This permit contains the Waste Discharge Requirements (WDR). The WDR contains both flow and water quality limitations for the discharge into the Temescal Wash, a summary of which are listed in Table 5-1.

Table 5-1
Summary of Regional WRF Effluent Limitations for
Discharge to the Temescal Wash

Constituent	Units	Maximum Daily	Average Weekly	Average Monthly	12-month Average
BOD_5	mg/l		30	20	–
Total Suspended Solids (TSS)	mg/l		30	20	–
Total Dissolved Solids (TDS)	mg/l			–	700
Copper, Total	µg/l	70		35	
Cyanide, Fee	µg/l	8.5		7.2	
Nitrogen as Ammonia, Total	mg/l			4.5	
Total Inorganic Nitrogen	mg/l			13	
Coliform	MPN/100ml	[b]	[b]	[b]	
Turbidity	NTU	10[a]			
pH	Within the range of 6.5 to 8.5 pH units.				

[a] Requirements also include a 24-hour average of 2 NTU and cannot exceed 5 NTU more than 5 percent of the time within a 24-hour period.

[b] The total coliform concentration of effluent shall not exceed a most probable number (MPN) of 2.2 per 100 milliliters, based on the median results of the last 7 days for which analyses have been completed; and shall not exceed MPN of 23 per 100 milliliters in more that one sample in any calendar month. No samples shall exceed a MPN of 240/100 ml.

In addition, the discharge of wastewater or use of recycled water shall at all times be a filtered and subsequently disinfected wastewater that meets the Title 22 criteria.

5.4.1 Toxicity Related Requirements

The monitoring and reporting program contains no numeric limitation for toxicity. However, the District is required to conduct chronic toxicity monitoring as specified. If the result of any chronic toxicity test on the effluent exceeds 1.0 TU_c, then the District is required to conduct accelerated monitoring and develop an Initial Investigation Toxicity Reduction Evaluation (IITRE).

It is not anticipated that these toxicity requirements would impact the ability to supply recycled water.

5.5 Individual Recycled Water User Information Needs and Requirements

The largest group of potential users of recycled water within the Regional WRF area is the schools, followed by parks. In order to determine any specific individual needs, it was determined that the school irrigation systems would represent the most complex needs and user requirements of the recycled water system. To determine more specific concerns and issues, Kennedy/Jenks contacted Mr. Bill Fouts, Grounds Supervisor, from the Lake Elsinore Unified School District (LEUSD). The following list of requirements is based on conversations and information collected from the LEUSD.

1. In general, due to the sports field irrigation areas requiring so much water, the sites are irrigated one at a time in sequence, as opposed to irrigating all of the fields at the same time. The sports fields typically use sprinkler heads that are designed to deliver 20 gpm per sprinkler head.
2. Sites where landscape irrigation water might overspray onto cars or walkways are also irrigated during "off hours" to avoid human contact.
3. Therefore, the typical irrigation times begin at sunset around 8:00 PM and end at 6:00 AM. During the summer when higher volumes of water are required, irrigation may begin at 6:00 PM.
4. Water use is higher during the summer months.
5. On average, the School District would like 60 psi of water pressure at each school location. They indicated that they would be willing to accept lower delivered pressures and could install their own pressure booster pumps.

Due to the large volumes of potable water that the LEUSD uses and the associated high costs for purchasing that water, they are very motivated to switch to recycled water and are willing to work closely with the District. It is expected that either City or residential parks would have similar water requirements and would receive the same benefits as the schools.

5.6 Health-related Water Quality or Treatment Requirements

Currently all areas considered for irrigation with recycled water are being irrigated with or have potable water pipes tied into their irrigation systems. The Purple Book describes the different backflow preventors that are required to avoid cross-contamination of potable water with recycled water.

In addition, to keep pipes that convey recycled water distinct, the Purple Book references the requirements of the Health and Safety Code, Division 104. Environmental Health Services, Part 12. Drinking Water, Chapter 5. Water Equipment and Control, Article 2. Cross Connection Control by Water Users, Section 116815:

> "All pipes installed above or below the ground, on and after June 1, 1993, that are designed to carry recycled water, shall be colored purple or distinctively wrapped with purple tape."

Since the regulations compiled in the Purple Book are intended to protect public health, compliance with these regulations should result in public health protection.

5.7 Other Wastewater Discharge Requirements

Recycled water can also be provided through the EMWD TVRWRF Pipeline. Recycled water conveyed in the TVRWRF pipeline is a blend of recycled water from RCWD SRWRF which originates from EVMWD's Southern Section and from EMWD TVRWRF. The wastewater discharge requirements for both WRFs are discussed separately below.

Discharges from the EMWD TVRWRF are regulated by the California Regional Water Quality Control Board San Diego Region Order No. 2000-165, National Pollutant Discharge Elimination Systems (NPDES) permit No. CA8000188 issued to EMWD. This permit is more commonly

called the Waste Discharge Requirements (WDR No. 2000-165). The WDR was adopted in September 2000 and modified in January 2002, July 2003, and January 2004 and contains both flow and water quality limitations.

The existing and proposed waste discharge rates for TVRWRF are as follows:

Existing ADWF Capacity:	8.0 mgd
Proposed ADWF Capacity:	12.0 mgd

Order No. R8-2002-0009-A01 provides effluent limitations for many constituents, are listed in Table 5-2.

RCWD's SRWRF operates in accord with two discharge orders issued and monitored by the San Diego Regional Board. Regional Board Order No. 96-54 (NPDES CA0108821) provides effluent limitations for the discharge of disinfected tertiary effluent into Murrieta Creek immediately adjacent to the SRWRF site. Regional Order No. 94-92 established effluent limitations for disinfected tertiary effluent for irrigation use throughout an extensive area within RCWD boundaries. The WDP was adopted in August 1994 and modified in June 1997, November 1999, and October 2002 and contains both flow and water quality limitations.

The existing waste discharge limitations for SRWRF are for an existing ADWF capacity of 5.0 mgd. Order No. 94-92 provides effluent limitations for many constituents, are listed in Table 8.

Table 5-2
EVMWD's TVRWRF Order No. 2000-165 and
RCWD SRWRF Order No. 94-92 Effluent Limitations

Constituent	Units	12-month Average	30-day Average	Instantaneous Max
$CBOD_5$	mg/l	–	30	45
Total Suspended Solids (TSS)	mg/l	–	30	45
Total Dissolved Solids (TDS)	mg/l	750	–	825
Chloride	mg/l	200	–	250
Sulfate	mg/l	200	–	250
Manganese	mg/l	0.05	–	0.06
Iron	mg/l	0.3	–	0.4
Boron	mg/l	0.75	–	0.8[a], 0.75[b]
Coliform	MPN/100ml		*	**
Turbidity	NTU		*	**
pH	Within the limits of 6.0 to 9.0 at all times.			

[a] For EMWD's TVRWRF, the limit is 0.8.

[b] For RCWD's SRWRF, the limit is 0.75.

* The total coliform concentration of effluent shall not exceed a most probable number (MPN) of 2.2 per 100 milliliters, based on the median results of the last 7 days for which analyses have been completed; and shall not exceed MPN of 23 per 100 milliliters in more that one sample in any 30-day period. No samples shall exceed a MPN of 240/100 ml.

** The turbidity concentration of the effluent shall not exceed a daily average value of 2 NTU, shall not exceed 5 NTU more than 5 percent of the time during any 24-hour period, and shall not exceed 10 NTU at any time.

5.7.1 Water Quality Objectives (WQOs) and Effluent Limits

WQOs and Effluent Limits are included in the WDR No. 2000-165. These objectives and limitations are based on the "State Water Resources Control Board's "Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California" (the State Implementation Plan or SIP); the plans, policies and water quality objectives and criteria of the 1995 Basin Plan, California Toxics Rule, Quality Criteria for Water, applicable Federal Regulations, National Toxics Rule, National Toxics Rule Amendment, and best professional judgment as defined in the Basin Plan."

5.7.2 Applicable Water Quality Objectives

Based on discussions with the Regional Board and EMWD, EVMWD's recycled water from the TVRWRF pipeline will be governed by EMWD WDR No. 2000-165, from the San Diego Region 9 Basin Plan, which are discussed below.

The WDR No. 2000-165 includes applicable water quality objectives taken from the Basin Plan. They are as follows in Table 5-3.

Table 5-3
EVMWD's TVRWRF Order No. 2000-165 Water Quality Objectives

Constituent	Maximum Daily Concentration Limit (µg/L)	Average Monthly Concentration Limit (µg/L)	Maximum Daily Mass Emission Rate (lbs/day)	Average Monthly Mass Emission Rate (lbs/day)
Total Recoverable Chromium (VI)[7]	16.3	8.1	6.46	3.21
Total Recoverable Copper	25.6	12.8	10.14	5.07
Total Recoverable Mercury	0.08	0.04	0.03	0.016
Total Recoverable Selenium	8	4	3.17	1.58
Free Cyanide	8.5	4.3	3.37	1.7
Bis (2-ethylhexyl) phthalate	15	5.9	5.94	2.34
Limits for metals that are hardness dependent were computed based on the median of effluent flows = 138 mg/L[8]				

[7] The discharger may meet this limitation as total chromium.
[8] The hardness data used were from the Moreno Valley and Perris Valley WRFs.

The WDR No. 94-92 includes applicable water quality objectives taken from the Basin Plan. They are as follows:

"The priority pollutant criteria limitations in Order No. R9-2002-0104 have been determined using the California Permit Writer and Training Tool (CAPWTT) model, in accordance with the CTR and Implementation Policy, to adjust the applicable metals criteria, run a Reasonable Potential Analysis (RPA), and convert the resulting criteria into limitations. CAPWTT model entry parameters for all constituents include: no dilution credits, an average hardness of 200 mg/L, and using "Non-Detects." At the lowest detection limit (10 .8) for all ambient background concentrations. The results of the CAPWTT analysis indicate that seven priority pollutants have reasonable potential to cause or contribute to exceed the CTR water quality criteria." These pollutants, and their resulting effluent limitations, are listed in Discharge Specification B.6 of Order No R9-2002-0104 and are as follows in Table 10.

Table 5-4

RCWD's SRWRF Order No. 94-92 Water Quality Objectives

California Toxics Rule (CTR) Effluent Limitations			
Constituent	**Unit**	**Limit**	
		Daily Maximum	**Monthly Average**
Bis (2-Ethylhexyl) Pthalate	µg/L lb/day	3.61 60	1.8 30
Chlorodibromomethane	µg/L lb/day	0.82 0.14	0.41 0.07
Copper	µg/L lb/day	26.9 4.5	13.4 2.2
Cyanide	µg/L lb/day	8.5 1.4	4.3 0.72
Dichlorobromomethane	µg/L lb/day	1.1 0.18	0.56 0.09
Methylene Chloride	µg/L lb/day	9.4 1.57	4.7 0.78
Selenium	µg/L lb/day	7.63 1.27	4.27 0.71

Units: µg/L = micrograms per Liter lb/day = pounds per day

5.7.3 Water Quality-Related Requirements of WDR No. 2000-165

This Order contains no numeric limitation for toxicity. However, the discharger shall conduct chronic toxicity monitoring as specified in Monitoring and Reporting Program (M&RP) No. R8-2004-0065.

Section 6: Regional Recycled Water Market Assessment

The market assessment focuses on the potential recycled water users in the northern/western (N/W) portion of the Regional Sewershed, herein referred to as the Regional service area for the purposes of this study. The TVRWRF, the EMWD Reach 4 pipelines, and the proposed Wildomar recycled water facilities cover the southern/eastern (S/E) portion of the Regional Sewershed. The Regional service area has no existing recycled water distribution facilities. However, review of water uses and land use data for the area suggests that there is potentially a significant demand for recycled water for irrigation of schools, parks, a cemetery, government facilities, and residential and commercial users. Furthermore, recycled water demands should be projected to increase as new residential and commercial developments are completed. The objective of this market assessment is to identify potential recycled water customers and estimate their demand for recycled water within the Regional service area. This section presents the results of the market assessment for the Regional service area, which is to be serviced by the Regional WRF.

6.1 Market Assessment Methodology

The market assessment for the Regional service area utilized water meter records, land use information and identified development plans for the purposes of estimating potential user locations and associated recycled water demands.

The average annual water use by service meter was calculated based on District usage data for calendar years 2001 through 2004 and the first two months of 2005. The meters were sorted by average annual usage. Three (3) AFY was used as the minimum cutoff for consideration as a potential recycled water customer.

In addition, where multiple meters were tied to a single customer, these meter records were combined for the purposes of identifying suitable recycled customers and estimating their potential recycled water demands. This was accomplished by comparing the addresses and Assessor Parcel Numbers of the water meters and the customer billing data base. Combined meters that totaled more than 3 AFY were included in the market assessment.

After identifying potential irrigation users, the cutoff list was reviewed for smaller recycled water customers (those using approximately 2 AFY) to determine if these potential customers were located in close proximity to other larger recycled water users (3+ AFY). Customers of 2 AFY demand were included in the market assessment in those instances where their proximity to larger customers suggested that they could be feasibly served.

Other information that was reviewed to identify potential recycled water customers included:

- Reviewing land use information and proposed developments presented in the following documents:
    - The District's Distribution System Master Plan (MWH, May 2002),
    - Wildomar Service Area Recycled Water Master Plan (Kennedy/Jenks, June 2004), and
    - Wildomar Recycled Water Facilities Planning Report (Kennedy/Jenks, January 2005).

- Reviewing documents on proposed developments for :
  - Ramsgate Water, Wastewater, and Recycled Water Facilities Plan (Hunsaker & Associates, June 2004),
  - La Laguna Estates Development, Zone III Water System Preliminary Design Report, January 2005),
  - John Laing Homes Community Development: Water Supply Assessment Final Report (MWH, October 2003), and
  - Draft technical memorandum on Alberhill's water facilities (Kennedy/Jenks, March 2005).
- Contacting developers about proposed developments and developments currently under construction.
- Soliciting information from the City of Lake Elsinore Planning and Park departments for current/proposed/future developments and proposed/future parks, respectively.
- Performing field reconnaissance of the Regional service area to determine potential customer types and locations.
- Conversing with District staff to discuss potential future recycled water irrigation customer sites.
- Reviewing the Title 22 Engineering Report for the Temescal Division Agricultural System (MWH, August 2002).
- Developing methods and criteria to estimate annual and peak season irrigation demands for existing and future developments in the Lake Elsinore area using the best available information.

From this market assessment, a GIS-based map was produced using a base map of the Lake Elsinore area provided by the County of Riverside. From the GIS analysis, several patterns of irrigation meters emerged, including the following:

- Cluster of potential users in Downtown Lake Elsinore
- Cluster of potential users in the Northwest Lake Elsinore area
- Cluster of potential users in the Northeast Lake Elsinore area
- John Laing Homes' East Lake (discussed in the Wildomar Recycled Water Facilities Planning Report (Kennedy/Jenks, January 2005)
- The Temescal Canyon area (discussed in Title 22 Engineering Report for the Temescal Division Agricultural System, MWH, February 2004 with potential customer list updated in this report at request of the District);
- Canyon Lake (currently served by Railroad Canyon WRF and therefore not addressed in this study);
- Tuscany Hills residential development (included in the Wildomar Recycled Water Facilities Planning Report, Kennedy/Jenks, January 2005, and therefore not addressed in this study);
- Cottonwood Canyon (proposed to be served by Railroad Canyon WRF, and therefore not addressed in this study); and

- The Colony at California Oaks (served by RCWD and therefore not addressed in this study).

Of these areas, the downtown, northwest, and northeast Lake Elsinore areas have the greatest potential for recycled water service from the Regional WRF. The downtown area and service to John Laing Homes Development has potentially overlapping service with the Wildomar recycled water system. However, the District currently envisions serving the downtown area from the Regional WRF and John Laing Homes from the Wildomar Service Area. Section 7 of this report discusses the potential for an inter-tie with the Wildomar recycled water system to provide a backup water source and increase operational flexibility.

Also under consideration is the potential for connecting the recycled water pipeline proposed in this study with the EMWD Reach 4 pipeline that connects to the TVRWRF, for providing a redundancy in supply of recycled water into the overall recycled water system. The Temescal Canyon area is another potential area under consideration. This area could potentially be served through a connection into the existing agricultural Elsinore Pipeline from the Regional WRF. There is a very high demand from the Shea Homes Golf Course and industrial users such as cement and pipe manufacturers (approximately 3,300 AFY) in this area that is currently served by the agricultural line.

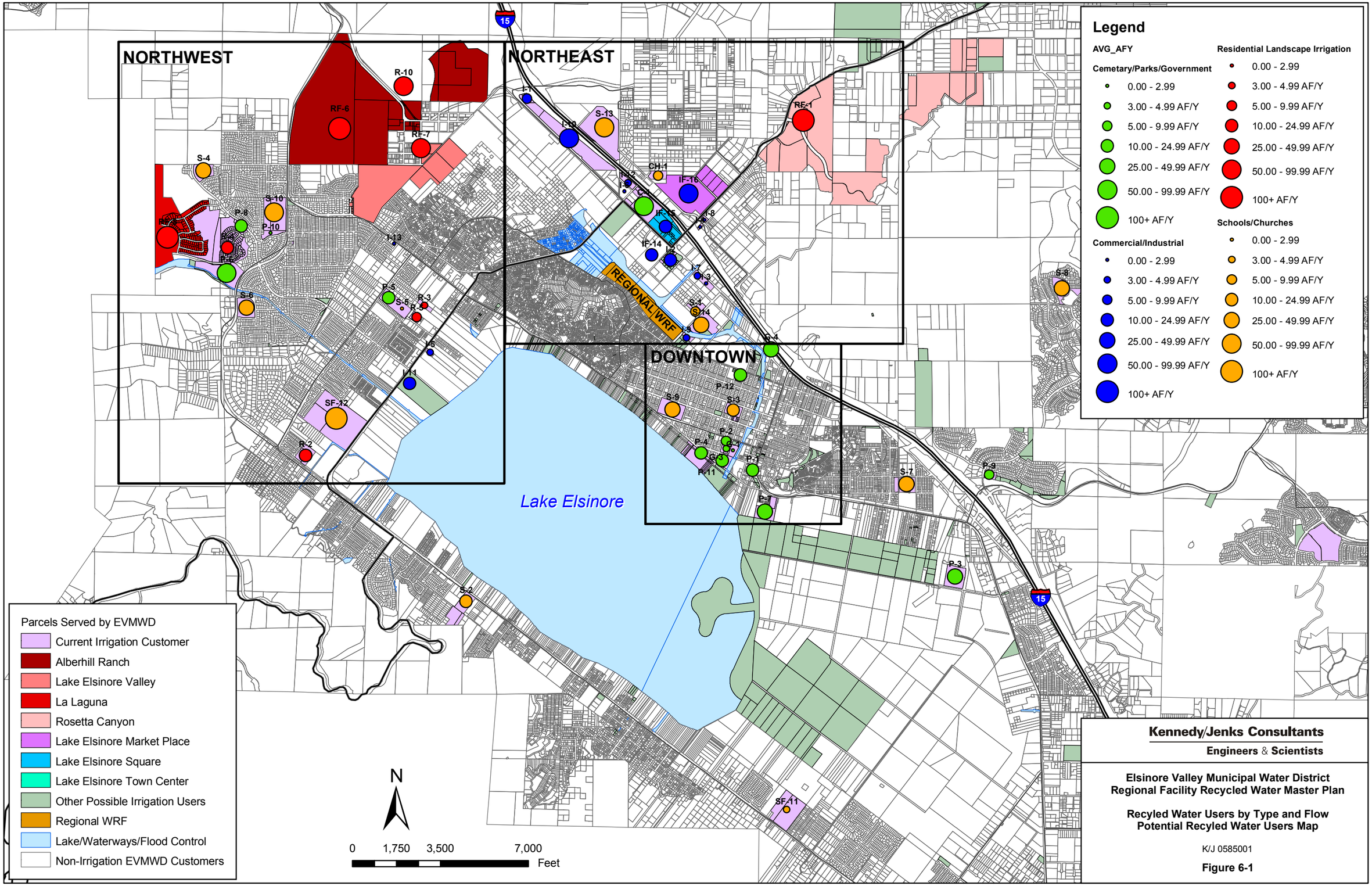
6.2 Regional Service Area Recycled Water Markets

Figure 6-1 depicts the locations of the identified recycled water markets following the recycled water market assessment methodology outlined in Section 6.1. Highlighted parcels include known irrigation users, future users, and public property owned by the Lake Elsinore Unified School District, the City of Lake Elsinore, Riverside County, and the State of California. Table 6-1 summarizes the potential recycled water demands for the identified markets. In Table 6-1, "Existing Average Annual Demand" identifies the amount of recycled water each customer could use as of 2005, if the recycled water was available. Section 7 further distinguishes recycled water markets by the timing of their potential demand relative to the phasing plan for the recycled water distribution system.

Both the figure and table identify each potential user by a site user code. For example, all schools start with "S" and then have a numeric value identifying the user or the location of the school. The codes used to categorize the types of users are the following:

- A Agriculture
- C Cemetery
- CH Church
- G Government
- I Industrial/Commercial
- IF Future Industrial/Commercial
- P Park
- R Residential
- RF Future Residential
- S School
- SF Future School

If a user or site has multiple meters or parcels, all parcels are highlighted in Figure 6-1. However, the total demand is shown as a single meter for the user or site.



Kennedy/Jenks Consultants

Engineers & Scientists

Elsinore Valley Municipal Water District
Regional Facility Recycled Water Master Plan

Recyled Water Users by Type and Flow
Potential Recyled Water Users Map

K/J 0585001

Figure 6-1

Table 6-1
Regional Service Area Potential Recycled Water Markets

Site Code	Name	Address	Existing Average Annual Demand (AFY) [a]	Future Average Annual Demand (AFY)	Subarea
C-1	Elsinore Valley Cemetery	18170 Collier Avenue	67	67	Northeast
CH-1	Latter Day Saints Church	18220 Dexter Avenue	8	8	Northeast
G-1	Sheriff Station County of Riverside	334 Limited Street	3	3	Downtown
G-2	Riverside County Fire	29405 Grand Avenue	6	6	Northwest
G-3	Riverside County Building	117 S Langstaff Street	3	3	Downtown
G-4	CalTrans District 8	516 Main Street	43	43	Downtown
I-1	ARCO AM/PM	19930 Collier Avenue	8	8	Northeast
I-10	Lake Elsinore Outlets	17600 Collier Avenue	57	57	Northeast
I-11	Pyramid Enterprises	32040 Riverside Drive	16	16	Northwest
I-12	Secured Self Storage	29135 Riverside Drive	4	4	Northeast
I-13	Star Plaza Business	16331 Lakeshore Drive	2	2	Northwest
I-2	Central Business Park	570 Central Avenue	13	13	Northeast
I-3	D and D Cattle Co	18501 Collier Avenue	2	2	Northeast
I-4	Douglas Burgers	18461 Collier Avenue	2	2	Northeast
I-5	Jack in the Box	31650 Riverside Drive	4	4	Northwest
I-6	Lake Elsinore Self Storage	29151 Riverside Drive	3	3	Northeast
I-7	Mercury Marking Devices	600 3rd Street	3	3	Northeast
I-8	Mobil Oil Co	19300 Central Avenue	3	3	Northeast
I-9	Near-Cal Corp	512 Chaney Street	4	4	Northeast
IF-14	Lake Elsinore Town Center Development	Central Avenue & Collier Avenue	8 [b]	17 [c]	Northeast
IF-15	Lake Elsinore Square Development	Central Avenue & Collier Avenue	8 [b]	21 [c]	Northeast
IF-16	Lake Elsinore Market Place Development	Central Avenue & Dexter Avenue	35 [b]	68 [c]	Northeast
P-1	City Park	243 S. Main Street	11	11	Downtown
P-10	Summer Lake Park	900 Broadway Street	0 [c]	0	Northwest
P-11	Swick & Matich Park	402 Limited Street	13	13	Downtown
P-12	Yarborough Park	419 N. Poe Street	12	12	Downtown
P-2	Lake Community Center	310 W Graham Avenue	10	10	Downtown
P-4	Elk Grove Park & Beach	Lakeshore Drive	15	15	Downtown
P-5	Machado School Park	15150 Joy Street	14	14	Northwest
P-6	McVicker Canyon Park	29355 Grand Avenue	52	52	Northwest

Table 6-1
(Continued)

Site Code	Name	Address	Existing Average Annual Demand (AFY) [a]	Future Average Annual Demand (AFY)	Subarea
P-7	Lakepoint Park	420 E. Lakeshore Drive	34	34	Downtown
P-8	Oak Tree Park	Lincoln Street	13	13	Northwest
R-2	Harbor Grand Apts	15120 Grand Avenue	14	14	Northwest
R-3	Lake Country Villas	617 Walnut Drive	4	4	Northwest
R-4	Shore Pointe Complex	Sunswept Drive & Lincoln Street	15	15	Northwest
R-5	Walnut Grove Apts	16460 Joy Street	6	6	Northwest
RF-1	Rosetta Canyon Development	Hwy 74 & Ramsgate Drive	100 [b]	309 [c]	Northeast
RF-10	Alberhill Community Plan		0	192	Northwest
RF-6	Alberhill Ranch Development	Lake Street & Coal Road	100 [b]	101 - 478 [e]	Northwest
RF-7	Lake Elsinore Valley Development	Nichols Road	40 [b]	66 [e]	Northwest
RF-8	La Laguna Development		50 [b]	142 [e]	Northwest
RF-9	JLH East Lake (Optional User)	Diamond Cir & Malaga Rd	200 [b]	1,220	Downtown
S-1	LEUSD Office	545 Chaney Street	6	6	Northeast
S-10	Terra Cotta Middle School	29291 Lake Street	96	96	Northwest
S-13	Temescal Canyon High	28755 El Toro Road	88	88	Northeast
S-14	Ortega Continuation High	520 Chaney Street	27	27	Northeast
S-3	Elsinore Elementary	501 W Sumner Avenue	17	17	Downtown
S-4	Rice Canyon Elementary	29535 Westwind Drive	31	31	Northwest
S-5	Machado Elementary	15150 Joy Street	0 [d]	0	Northwest
S-6	Withrow Elementary	30100 Audelo Street	38	38	Northwest
S-9	Elsinore Middle	1203 W. Graham Avenue	45	45	Downtown
SF-12	Lakeside High School	32693 Riverside Drive	60 [b]	120 [e]	Northwest
Downtown Area Subtotal			206	206	
Northwest Area Subtotal			561	1,309	
Northeast Area Subtotal			446	710	
Service to John Laing Homes (optional)			200	1,120	
Regional Service Area Total (w/o JLH)			1,213	2,225	
Regional Service Area Total (w/ JLH)			1,413	3,345	

The customers of special interest in this area are the existing water accounts that have separate meters or other onsite facilities for potable and irrigation uses, since they may be the easiest and most cost effective customers to convert from existing irrigation to recycled water irrigation. These accounts are zoned for landscape irrigation, agricultural, industrial, schools, or cemetery district. Detailed discussion of these users and of existing and future users is presented in the following sections.

As summarized in Table 6-1, the Regional service area has a potential recycled water demand of approximately 2,225 AFY. Service to the Wildomar system and John Laing Homes Development could utilize an additional 1,120 AFY of recycled water from the Regional WRF. However, service to the Wildomar system is expected to be intermittent, and would not include serving John Laing Homes' peak seasonal demands from the Regional system.

An additional of 3,300 AFY demand exists further north in the Temescal Canyon vicinity, which could be supplied by a connection into the agricultural Elsinore Pipeline from either the Regional WRF or the new wastewater treatment plant planned for the Alberhill area. Potential future use for recycled water is also identified, primarily in the Alberhill area or along the west side of Lake Elsinore.

Further description of the Regional recycled water service area and potential markets is provided in the following section which divides the service area into 3 zones: downtown zone, northwest zone, and northeast zone:

- The downtown zone is located south of the Regional WRF in the historic downtown area and has an estimated recycled water demand of 206 AFY. This area was previously identified in the Wildomar Recycled Water Master Plan (RWMP), but due to its proximity is more efficiently served by the Regional WRF. Included in this area are several parks and the Elsinore Middle School. Another option would be to supply the John Laing Homes East Lake Development from the Regional recycled water system. The projected recycled water use for that development is another 1,220 AFY for this zone.

- A northwest zone would include the newly constructed Lakeside High School, Terra Cotta Middle School, and McVicker Canyon Park. The estimated total annual recycled water demand for this area is 1,309 AFY.

- A northeast zone includes the Rosetta Canyon development, three new shopping centers, Temescal Canyon High School, and the outlet mall along the west side of the Interstate 15 Freeway. The estimated total average annual recycled water demand for this area is 710 AFY.

6.2.1 Downtown Zone

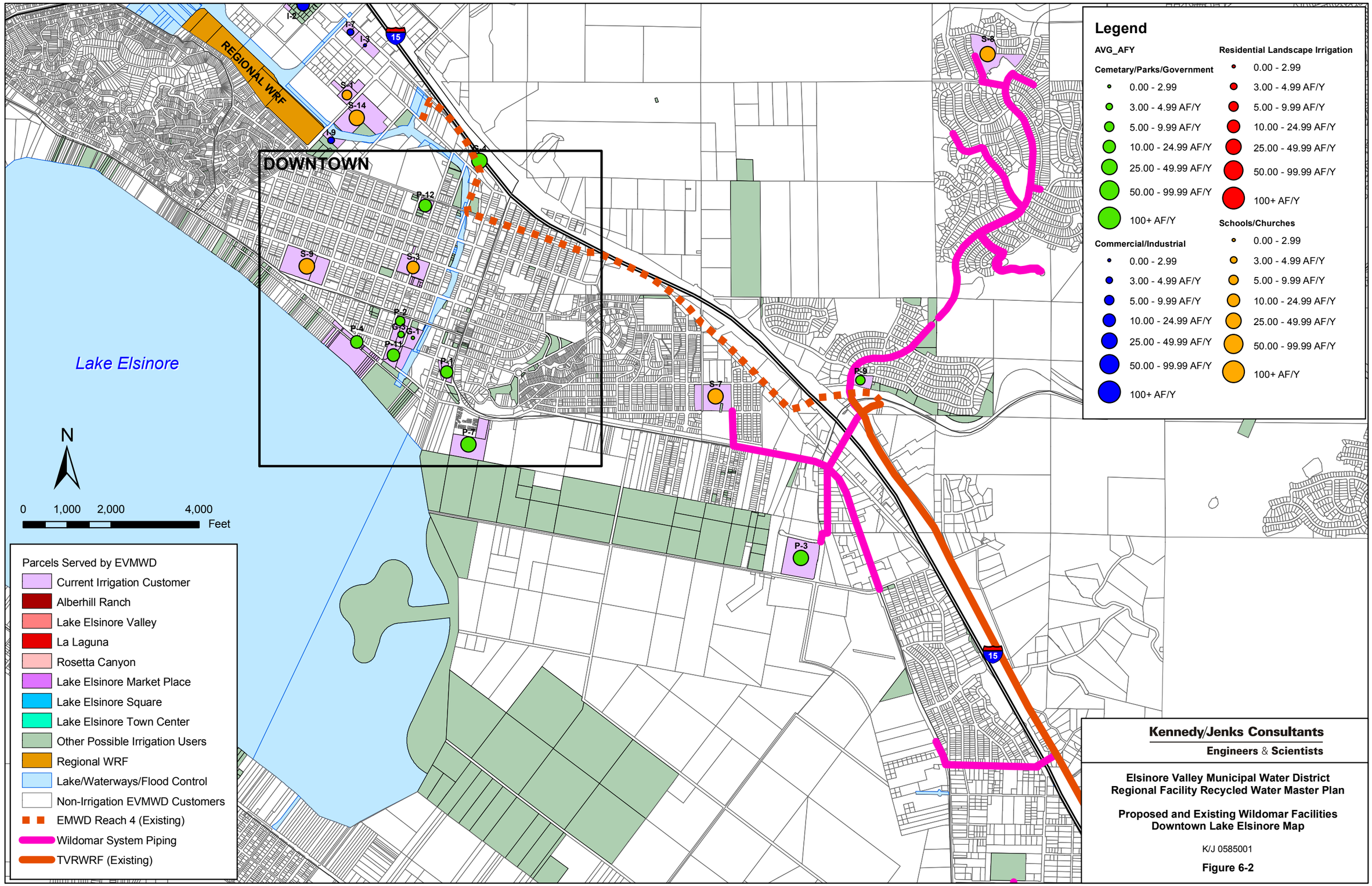
Customers in the downtown zone are shown on Figure 6-2 and listed in Table 6-2 and include parks, schools, and government entities and are located in Downtown Lake Elsinore. These customers currently use 206 AFY for irrigation, and the one major development planned for this zone is the John Laing Homes East Lake Development. Some of these potential customers were identified in the Wildomar Recycled Water Master Plan and were proposed to be connected in Phase 2 of that system. Figure 6-2 shows the proposed Wildomar facilities in the

downtown zone. Due to the close proximity of the customers to the Regional WRF, it appears more efficient to supply these downtown zone users from the Regional system.

Table 6-2
Irrigation Users in the Downtown Zone

Site Code	Name	Address	Existing Avg. Annual Irr. Demand [(a)] (AFY)	Future Avg. Annual Irr. Demand (AFY)	Distance from Regional WRF (miles)
RF-9	JLH East Lake (Optional User)	Diamond Cir & Malaga Rd	200 [(b)]	1,120	4.5
S-9	Elsinore Middle	1203 W. Graham Avenue	45	45	0.8
G-4	CalTrans District 8	516 Main Street	43	43	1.5
P-7	Lakepoint Park	420 E. Lakeshore Drive	34	34	2.0
S-3	Elsinore Elementary	501 W Sumner Avenue	17	17	1.0
P-4	Elk Grove Park & Beach	Lakeshore Drive	15	15	1.0
P-11	Swick & Matich Park	402 Limited Street	13	13	1.3
P-12	Yarborough Park	419 N. Poe Street	12	12	0.9
P-1	City Park	243 S. Main Street	11	11	1.7
P-2	Lake Community Center	310 W Graham Avenue	10	10	1.4
G-3	Riverside County Building	117 S Langstaff Street	3	3	1.3
G-1	Sheriff Station County of Riverside	334 Limited Street	3	3	1.4
TOTAL POTENTIAL DEMAND WITHOUT RF-9 (JLH):			206	206	
TOTAL POTENTIAL DEMAND WITH RF-9 (JLH):			406	1,326	

(a) Based on meter record data from January 2001 through February 2005.
(b) Existing demand is for construction water.



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Regional Facility Recycled Water Master Plan

Proposed and Existing Wildomar Facilities
Downtown Lake Elsinore Map

K/J 0585001

Figure 6-2

6.2.2 Northwest Zone

The northwest zone is bounded by Lakeshore Drive, Riverside Drive, and Grand Avenue, as shown on Figure 6-3. The irrigation customers and estimated demands in the northwest zone are listed in Table 6-3. The total potential annual demand for this area is approximately 1,309 AFY. Major customers include Terra Cotta Middle School, McVicker Canyon Park, and the Lakeside High School. Lakeside High School is currently using 67 AFY for irrigation during the construction of the school. The built-out annual usage is anticipated to be more than 100 AFY, which is higher than Temescal Canyon High School or Terra Cotta Middle School based on the planned open and field space.

Three residential developments are planned for this zone: Alberhill Ranch, Lake Elsinore Valley, and La Laguna. Although other developments are in the planning stages in the Alberhill/Horsethief area, these developments are outside the Regional study area. The Alberhill Ranch development could be supplied with recycled water by either the Regional WRF or the new WWTP planned for that area.

The Alberhill Ranch development, north of Lake Elsinore calls for a 33 acre park and a 10 acre school site. The developer did not have figures for medians, parkway, and slopes, but such features are common in new developments in Lake Elsinore. As such, the irrigation use by the park and school represent the minimum expected recycled water demand for Alberhill Ranch. A study for the Alberhill area developments (Kennedy/Jenks, October 2003) determined a demand of 478 AFY for the Alberhill Ranch development. This value will be used as a maximum demand.

The La Laguna development, as designed by Albert A. Webb Associates, has 29 acres of engineered slopes. Based on irrigation values given in the District's 2002 Master Plan, Webb Associates used an irrigation value of 3,600 gpd per acre, which is at the high end of the irrigation values, and a peaking factor of 20% to account for summer months. Based on 3,600 gpd per acre, the designer anticipates an irrigation demand of 142 AFY at build-out for the slopes, medians, and parkways.

The District recently performed a CFD study for the Alberhill area including the Lake Elsinore Valley development. In the study, Lake Elsinore Valley is listed as having 29 acres of engineered slopes. The irrigation demand is given as 2,000 gpd per acre based on the aforementioned Master Plan's recommendations. This results in an anticipated irrigation demand of 66 AFY for Lake Elsinore Valley.

Although there are several other developments in various stages of design, planning, or proposal in the Alberhill area, the aforementioned three and Rosetta Canyon (see Section 6.2.3) are the only ones that fall within the Regional study area. All other developments in the Alberhill area fall within the Alberhill/Horsethief service area.

Table 6-3
Irrigation Customers in the Northwest Zone

Site Code	Name	Address	Average Annual Irrigation Demand [a] (AFY)	Future Avg. Annual Irr. Demand (AFY)	Distance from Regional WRF (miles)
RF-6	Alberhill Ranch Development	Lake Street & Coal Road	100 [b]	478 [e]	3.3
RF-10	Alberhill Community Plan		0	192	3.4
RF-8	La Laguna Development		50 [b]	142 [e]	4.1
SF-12	Lakeside High School	32693 Riverside Drive	60 [b]	120 [e]	4.3
S-10	Terra Cotta Middle School	29291 Lake Street	96	96	3.6
RF-7	Lake Elsinore Valley Development	Nichols Road	40 [b]	66 [e]	3.3
P-6	McVicker Canyon Park	29355 Grand Avenue	52	52	3.8
S-6	Withrow Elementary	30100 Audelo Street	38	38	4.6
S-4	Rice Canyon Elementary	29535 Westwind Drive	31	31	4.8
I-11	Pyramid Enterprises	32040 Riverside Drive	16	16	2.7
R-4	Shore Pointe Complex	Sunswept Drive & Lincoln Street	15	15	4.1
P-5	Machado School Park	15150 Joy Street	14	14	3.8
R-2	Harbor Grand Apts	15120 Grand Avenue	14	14	4.1
P-8	Oak Tree Park	Lincoln Street	13	13	4.1
G-2	Riverside County Fire	29405 Grand Avenue	6	6	4.4
R-5	Walnut Grove Apts	16460 Joy Street	6	6	2.4
I-5	Jack in the Box	31650 Riverside Drive	4	4	2.4
R-3	Lake Country Villas	617 Walnut Drive	4	4	2.2
I-13	Star Plaza Business	16331 Lakeshore Drive	2	2	2.6
P-10	Summer Lake Park	900 Broadway Street	0 [c]	0	3.9
S-5	Machado Elementary	15150 Joy Street	0 [d]	0	3.8
TOTAL POTENTIAL DEMAND:			561	1,309	

(a) From January 2001 through February 2005
(b) Construction demand
(c) Shares fields with School District's Terra Cotta Middle School
(d) Shares fields with City's Machado School Park
(e) Anticipated demand

NORTHWEST

Legend

AVG_AFY

Cemetary/Parks/Government
- 0.00 - 2.99
- 3.00 - 4.99 AF/Y
- 5.00 - 9.99 AF/Y
- 10.00 - 24.99 AF/Y
- 25.00 - 49.99 AF/Y
- 50.00 - 99.99 AF/Y
- 100+ AF/Y

Commercial/Industrial
- 0.00 - 2.99
- 3.00 - 4.99 AF/Y
- 5.00 - 9.99 AF/Y
- 10.00 - 24.99 AF/Y
- 25.00 - 49.99 AF/Y
- 50.00 - 99.99 AF/Y
- 100+ AF/Y

Residential Landscape Irrigation
- 0.00 - 2.99
- 3.00 - 4.99 AF/Y
- 5.00 - 9.99 AF/Y
- 10.00 - 24.99 AF/Y
- 25.00 - 49.99 AF/Y
- 50.00 - 99.99 AF/Y
- 100+ AF/Y

Schools/Churches
- 0.00 - 2.99
- 3.00 - 4.99 AF/Y
- 5.00 - 9.99 AF/Y
- 10.00 - 24.99 AF/Y
- 25.00 - 49.99 AF/Y
- 50.00 - 99.99 AF/Y
- 100+ AF/Y

N

0 1,000 2,000 4,000 Feet

Parcels Served by EVMWD
- Current Irrigation Customer
- Alberhill Ranch
- Lake Elsinore Valley
- La Laguna
- Rosetta Canyon
- Lake Elsinore Market Place
- Lake Elsinore Square
- Lake Elsinore Town Center
- Other Possible Irrigation Users
- Regional WRF
- Lake/Waterways/Flood Control
- Non-Irrigation EVMWD Customers

15

RF-6 R-10 RF-6 RF-7 S-4 S-10 P-8 P-10 RF-9 RF-4 P-6 S-6 I-1 I-13 P-5 S-5 R-3 R-5 I-5 I-11 SF-12 R-2 REGIONAL WRF I-7 I-3 S-1 S-14 I-9 S-9

Lake Elsinore

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Regional Facility Recycled Water Master Plan

Recycled Water Users by Type and Flow
Northwest Area Potential Customers Map

K/J 0585001

Figure 6-3

6.2.3 Northeast Zone

Potential recycled water customers of the northeast zone are shown in Figure 6-4 and listed with estimated demands in Table 6-4 and include Temescal Canyon High School and the Lake Elsinore Outlets. The District's Regional WRF and offices are currently using recycled water for irrigation and treatment applications. This zone is split by the Interstate 15 Freeway. Future additions to the northeast zone include three commercial developments expected to open in 2006: Lake Elsinore Square (Square), Lake Elsinore Town Center (Town Center), and Lake Elsinore Market Place (Market Place); and one residential development, Rosetta Canyon, which is currently under construction. Based on studies and calculations, the northeast zone will have the highest growth demand for recycled water from its current usage of 446 AFY to an anticipated usage of 710 AFY by 2009.

The three commercial developments are under construction near the junction between Interstate-15 and State Highway 74 (Ortega Highway). These are the 68 acre Market Place, the 21 acre Square, and the 17 acre Town Center. The latter's developer has stated there will be landscaping, so it is assumed that these commercial sites will require landscape irrigation similar to that of the 43 acre Lake Elsinore Outlets and the 46 acre Lake Elsinore City Center. The former uses 1.33 AFY per acre of property, while the latter uses 0.67 AFY per acre. Applying these values, the Market Place is expected to use an estimated 46 to 90 AFY for irrigation, the Square is expected to use an estimated 14 to 28 AFY, and the Town Center is anticipated to use an estimated 11 to 23 AFY.

The Rosetta Canyon development (formerly called Ramsgate) calls for 20 acres of irrigated turf at a 33 acre park site, 6 acres of irrigated turf at a site reserved for a school, and 93 acres of slopes, parkway, and medians. Using a duty factor of 13 gpm/acre over a 10-hour irrigation window, Borthwick Guy Bettenhausen, the firm which modeled recycled water demands for Rosetta Canyon, calculated the recycled water PDD at ultimate build-out to be 2.2 MGD, which equates to an average annual demand of 309 AFY. The peak flow is expected to occur in 2009. This peak figure is lower than the original peak flow calculation of 1,284 gpm. The original figure was based on 20 gpm/acre usage over a 6 hour per day, 6 day per week watering period. Centex is using approximately 100 AFY for current construction of Rosetta Canyon.

If the School District does not purchase the site reserved for a school, then the land will be subdivided into additional lots. That would reduce irrigation demand by approximately 40 AFY, which is the irrigation use of an average elementary school.

NORTHEAST

15

RF-6
R-10
RF-6
RF-7
I-1
I-10
S-13
RF-1
CH-1
I-12
I-6
IF-16
C-1
IF-15
I-8
I-4
I-13
IF-14
I-7
I-3
P-6
S-5
R-3
R-5
S-1
S-14
I-9
REGIONAL WRF
P-12
S-9
S-3
P-2
S-2
G-1
P-4
P-11
P-1
S-7
S-8
15

Lake Elsinore

N

0 1,000 2,000 4,000 Feet

Legend

AVG_AFY

Cemetary/Parks/Government

- 0.00 - 2.99
- 3.00 - 4.99 AF/Y
- 5.00 - 9.99 AF/Y
- 10.00 - 24.99 AF/Y
- 25.00 - 49.99 AF/Y
- 50.00 - 99.99 AF/Y
- 100+ AF/Y

Commercial/Industrial

- 0.00 - 2.99
- 3.00 - 4.99 AF/Y
- 5.00 - 9.99 AF/Y
- 10.00 - 24.99 AF/Y
- 25.00 - 49.99 AF/Y
- 50.00 - 99.99 AF/Y
- 100+ AF/Y

Residential Landscape Irrigation

- 0.00 - 2.99
- 3.00 - 4.99 AF/Y
- 5.00 - 9.99 AF/Y
- 10.00 - 24.99 AF/Y
- 25.00 - 49.99 AF/Y
- 50.00 - 99.99 AF/Y
- 100+ AF/Y

Schools/Churches

- 0.00 - 2.99
- 3.00 - 4.99 AF/Y
- 5.00 - 9.99 AF/Y
- 10.00 - 24.99 AF/Y
- 25.00 - 49.99 AF/Y
- 50.00 - 99.99 AF/Y
- 100+ AF/Y

Parcels Served by EVMWD

- Current Irrigation Customer
- Alberhill Ranch
- Lake Elsinore Valley
- La Laguna
- Rosetta Canyon
- Lake Elsinore Market Place
- Lake Elsinore Square
- Lake Elsinore Town Center
- Other Possible Irrigation Users
- Regional WRF
- Lake/Waterways/Flood Control
- Non-Irrigation EVMWD Customers

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Regional Facility Recycled Water Master Plan

Recycled Water Users by Type and Flow
Northeast Area Potential Customers Map

K/J 0585001

Figure 6-4

Table 6-4
Irrigation Customers in the Northeast Zone

Site Code	Name	Address	Average Annual Irrigation Demand [(a)] (AFY)	Future Avg. Annual Irr. Demand (AFY)	Distance from Regional WRF (miles)
RF-1	Rosetta Canyon Development	Hwy 74 & Ramsgate Drive	100 [(b)]	309 [(c)]	2.4
S-13	Temescal Canyon High	28755 El Toro Road	88	88	2.3
IF-16	Lake Elsinore Market Place Development	Central Avenue & Dexter Avenue	35 [(b)]	68 [(c)]	1.4
C-1	Elsinore Valley Cemetery	18170 Collier Avenue	67	67	1.3
I-10	Lake Elsinore Outlets	17600 Collier Avenue	57	57	2.2
S-14	Ortega Continuation High	520 Chaney Street	27	27	0.1
IF-15	Lake Elsinore Square Development	Central Avenue & Collier Avenue	8 [(b)]	21 [(c)]	1.1
IF-14	Lake Elsinore Town Center Development	Central Avenue & Collier Avenue	8 [(b)]	17 [(c)]	1.1
I-2	Central Business Park	570 Central Avenue	13	13	1.3
CH-1	Latter Day Saints Church	18220 Dexter Avenue	8	8	1.8
I-1	ARCO AM/PM	19930 Collier Avenue	8	8	2.4
S-1	LEUSD Office	545 Chaney Street	6	6	0.2
I-9	Near-Cal Corp	512 Chaney Street	4	4	0.1
I-12	Secured Self Storage	29135 Riverside Drive	4	4	1.7
I-7	Mercury Marking Devices	600 3rd Street	3	3	0.8
I-6	Lake Elsinore Self Storage	29151 Riverside Drive	3	3	1.7
I-8	Mobil Oil Co	19300 Central Avenue	3	3	1.4
I-4	Douglas Burgers	18461 Collier Avenue	2	2	0.8
I-3	D and D Cattle Co	18501 Collier Avenue	2	2	0.8
TOTAL POTENTIAL DEMAND:			446	710	

(a) From January 2001 through February 2005
(b) Construction demand
(c) Anticipated demand

6.3 Users Sorted by Type

This section discusses the types of recycled water users expected within the Regional service area, including: parks, schools, and the anticipated top 10 users.

6.3.1 Irrigation Use for Parks

All parks in Lake Elsinore are operated by the City of Lake Elsinore Parks Department. Several parks are located within the study area and are listed along with their irrigation demands in Table 6-5. The Parks Department has stated that no new stand-alone parks will be built in the Regional service area. Instead, parks will be a component of new developments. The Alberhill and Rosetta Canyon developments will both have 33 acre parks. The City's Summer Lake Park shares athletic fields with the School District's Terra Cotta Middle School (listed under schools); therefore, the irrigation usage is included as part of the school's demand.

Table 6-5
Parks within the Regional Service Area

Site Code	Park Name	Park Address	Average Annual Irrigation Demand [(a)] (AFY)	Distance from Regional WRF (miles)
P-6	McVicker Canyon Park	29355 Grand Avenue	52	3.8 N
P-7	Lakepoint Park	420 E. Lakeshore Drive	34	2.0 S
P-5	Machado School Park	15150 Joy Street	14	3.8 N
P-4	Elk Grove Park & Public Beach	Lakeshore Drive	14	1.2 S
P-8	Oak Tree Park	Lincoln Street	13	4.1 N
P-11	Swick & Matich Park	402 Limited Street	13	1.3 S
P-12	Yarborough Park	419 N. Poe Street	12	0.9 S
P-1	City Park	243 S. Main Street	11	1.7 S
P-2	Lake Community Center	310 W Graham Avenue	10	1.4 S
P-10	Summer Lake Park	900 W. Broadway Street	0[(b)]	3.9 N
TOTAL POTENTIAL DEMAND:			**220**	

(a) From January 2001 through February 2005
(b) Shares fields with Terra Cotta Middle School

6.3.2 Irrigation Use by Schools

The open field spaces at school facilities are the largest irrigation water users in the Lake Elsinore area. The Alberhill and Rosetta Canyon developments have reserved land for schools (current sizing appears to be for elementary schools); however the School District has no current plans for a school at either site. The School District does plan to open Lakeside High School in August 2005. The school is already using 67 AFY for irrigation and construction purposes, but this is expected to increase once the fields are seeded. The School District will also be opening Ronald Reagan Elementary and Lakeland Village Middle in 2005. According to

the Wildomar Master Plan (Kennedy/Jenks, June 2004), the Ronald Reagan Elementary School is to be served by an extension of a service lateral from the TVRWRF pipeline, and the Lakeland Village Middle School is planned for ultimate service by the TVRWRF.

Table 6-6 lists the schools and their irrigation demands within the study area. As the Machado Elementary School shares athletic fields with the City's Machado School Park (listed under parks), the irrigation demands are included with the proposed park in Table 6-5.

Table 6-6
Schools in Northern Lake Elsinore Area

Site Code	School Name	School Address	Average Annual Irrigation Demand [(a)] (AFY)	Distance from Regional WRF (miles)
SF-12	Lakeside High	32693 Riverside Drive	120 [(b)]	4.3 N
S-10	Terra Cotta Middle	29291 Lake Street	96	3.6 N
S-13	Temescal Canyon High	28755 El Toro Road	88	2.3 N
S-9	Elsinore Middle	1203 W. Graham Avenue	45	0.8 S
S-6	Withrow Elementary	30100 Audelo Street	38	4.6 N
S-4	Rice Canyon Elementary	29535 Westwind Drive	31	4.8 N
S-14	Ortega Continuation High	520 Chaney Street	27	0.1
S-3	Elsinore Elementary	501 W Sumner Avenue	17	1.0 S
S-2	Butterfield Elementary	16275 Grand Avenue	15	6.2
S-1	LEUSD Office	545 Chaney Street	6	0.2
S-5	Machado Elementary	15150 Joy Street	0 [(c)]	3.8 N
TOTAL POTENTIAL DEMAND:			**473**	

(a) From January 2001 through February 2005
(b) Anticipated demand
(c) Recycled water demand included with Machado School Park

6.3.3 Top Ten Recycled Water Users in the Regional Service Area

Although much of the current irrigation water use is by the School District and the City, there are other users such as the John Laing Homes, Riverside County, CalTrans, the Elsinore Valley Cemetery, a Latter Day Saints Church, as well as residential, commercial, and industrial customers. Sizable residential landscape irrigation users include the Harbor Grand and Walnut Grove apartment complexes. The 110 lot Shore Pointe development is using approximately 15 AFY for irrigation of common areas. Other than the John Laing Homes, there are currently no

large residential irrigation users on the scale of the Tuscany Hills in the study area; however four developments including the large Rosetta Canyon subdivision are either under construction or in the planning stages.

The ten largest users in the Regional service area are listed in Table 6-7 and have an estimated demand of 1,249 AFY. This list does not include the potential recycled use of 1,220 AFY for the John Laing Homes East Lake Development.

Table 6-7
Ten Largest Irrigation Users

Site Code	Name	Address	Average Annual Irrigation Demand [(a)] (AFY)	Zone
RF-1	Rosetta Canyon Subdivision	Hwy 74 & Ramsgate Drive	309 [(b)]	NE
RF-10	Alberhill Community Plan	–-	192	NW
RF-8	La Laguna Development	–-	142 [(b)]	NW
SF-12	Lakeside High School	32693 Riverside Drive	120 [(b)]	NW
RF-6	Alberhill Ranch Development	–-	101 [(b)]	NW
S-10	Terra Cotta Middle School	29291 Lake Street	96	NW
S-13	Temescal Canyon High	28755 El Toro Road	88	NE
IF-16	Lake Elsinore Market Place	Central Avenue & Dexter Avenue	68 [(b)]	NE
C-1	Elsinore Valley Cemetery	18170 Collier Avenue	67	NE
RF-7	Lake Elsinore Valley Development	–-	66 [(b)]	NW
TOTAL POTENTIAL DEMAND:			**1,249**	

(a) Based on data collected from January 2001 through February 2005
(b) Anticipated demand

6.4 Temescal Canyon Area

Through a review of the water meter records and the Title 22 Report for the Temescal Division Agricultural System, potential recycled water users were also identified for this area and are shown on Figure 6-5. Potentially, this area could use approximately 3,300 AFY of recycled water. Currently, the majority of this is being supplied agricultural quality water through the Elsinore Pipeline. The Elsinore Line currently receives water from three sources that consist of the following:

- Surface water runoff and Regional WRF effluent flowing in the Temescal Wash, which gravity feeds into the Elsinore Line via the Holman Weir,
- Thirteen agricultural groundwater supply wells, and
- Three domestic groundwater supply wells, which are each separated from the non-potable line by an air gap.

The agricultural wells produced between 4,000 and 5,000 AFY in 2003, primarily supplying water for citrus and avocado farming, golf courses, and industrial uses as listed in Table 6-8.

Providing recycled water service to the Temescal Canyon Agricultural Line will require further consideration of Title 22 requirements including: recycled water pipeline conversion, assurance of proper gap separation from potable water, and removal of hose bibs currently connected to the agricultural line. This will require a separate study and evaluation not within the scope of this Regional study. Therefore, the infrastructure requirements to provide supply of recycled water to these customers are not further considered as part of this study.

6.5 Recycled Water Use for Lake Elsinore

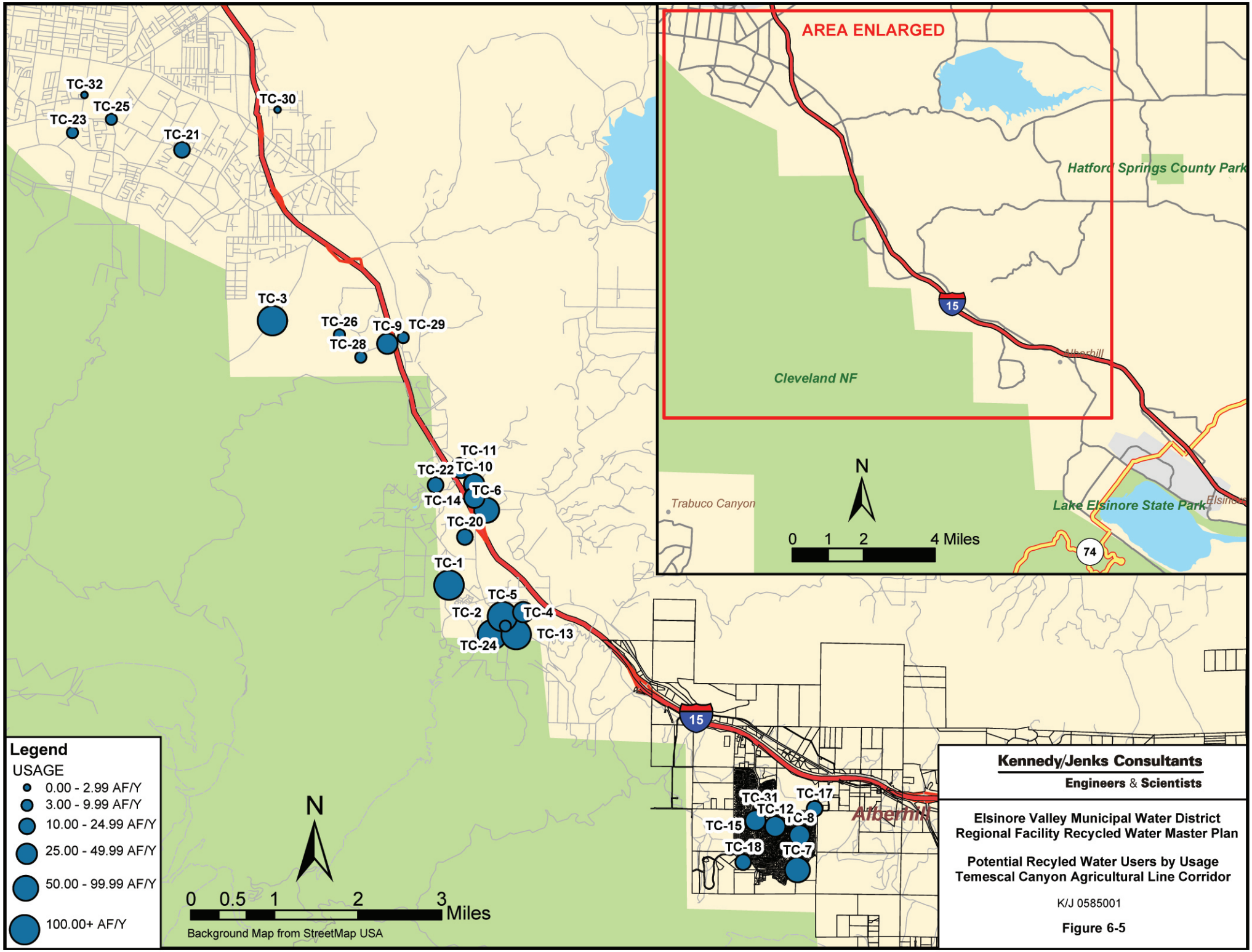
Another supply opportunity for the Regional WRF is to supply recycled water to Lake Elsinore itself as a part of a lake level restoration project. Due to the local geography of the area, Lake Elsinore is the natural low point for the San Jacinto River watershed. Rarely does water flow out of Lake Elsinore into the Temescal Wash and ultimately into the Santa Ana River. However, the area is arid and Lake Elsinore experiences an average evaporation rate of 56 inches per year. Therefore, due to evaporation, the lake tends to accumulate salts and experience low water levels. In addition, due to impacts from historical environmental runoff, Lake Elsinore has been listed on the RWQCB's 303(d) list for several constituents: namely bacteria, organic enrichment, oxygen depletion, and nutrients.

One of the potential solutions proposed for restoration of Lake Elsinore is to maintain a healthy lake level by pumping treated effluent from the Regional WRF. The District has been participating in a pilot study under a RWQCB program by pumping 1 to 2 MGD into the lake. Based on the District's new NPDES permit, they anticipate potentially discharging an average of 5.3 MGD (5,900 AFY) of recycled water into Lake Elsinore directly in order to maintain healthy lake levels. The District is currently constructing treatment facilities to provide additional phosphorus removal to meet permit and TMDL requirements for discharge to Lake Elsinore.

6.6 Market Assessment Conclusion

Based on the results of the market assessment, there is a potential to provide recycled water to the following locations:

- Serving irrigation customers in the downtown, northeast, and northwest areas of the City at a total demand of 2,225 AFY,
- Providing an inter-tie with the Wildomar system to provide up to 1,120 AFY for service to John Laing Homes.
- Delivering recycled water to the Temescal Canyon area up to approximately 3,300 AFY, although this will require additional study and evaluation beyond the scope of this study.



Kennedy/Jenks Consultants
Engineers & Scientists

Elsinore Valley Municipal Water District
Regional Facility Recycled Water Master Plan

Potential Recyled Water Users by Usage
Temescal Canyon Agricultural Line Corridor

K/J 0585001

Figure 6-5

Table 6-8

Irrigation Customers along Temescal Agricultural Line by Usage

Site Code	Name	Address	Average Annual Irrigation Demand [a] (AFY)	Number of Meters
TC-1	Shea Homes Golf Course	24120 Warm Springs Road	772	2
TC-2	Werner Corporation	25050 Maitri Road	633	4
TC-3	McMillan Farm Management	Bedford Canyon Road	623	1
TC-4	Cemex USA	24980 Maitri Road	565	3
TC-5	Chandlers Sand and Gravel	24867 Maitri Road	191	1
TC-6	Western Waste Industries	23000 Temescal Canyon Road	59	1
TC-7	William Lyon Homes	27651 Kachina Court	55	6
TC-8	Horsethief Canyon Ranch Maintenance Corp [b]	27260 Mountain Court	48	2
TC-9	Kenneth Holt	8020 Weirick Road	45	1
TC-10	Corona Clay Company	22990 Temescal Canyon Road	39	4
TC-11	Rinker/Hydro Conduit Corp	23200 Temescal Canyon Road	34	1
TC-12	Luiseno Elementary School	13500 Mountain Road	33	2
TC-13	CMS/Butterfield	24583 Wrangler Way	32	4
TC-14	Synagro Composting Company	22980 Temescal Canyon Road	30	1
TC-15	Horsethief HOA [b]	273 Horsethief Canyon Road	28	5
TC-16	Herbert Okada [c]		27	1
TC-17	Horsethief Canyon Ranch [b]	27037 Bolo Court	21	6
TC-18	Horsethief Canyon Ranch HOA [b]	13289 Mountain Road	14	1
TC-19	Lionel Rentschler [c]		14	1
TC-20	Toms Farm	23900 Temescal Canyon Road	12	1
TC-21	Stan Erickson	Chase & Thacker	11	1
TC-22	California Meadows HOA	9250 Palm Canyon Drive	11	2
TC-23	Joseph Santoro	2895 S Main Street	9	1
TC-24	C. L. Pharris	24980 Maitri Road	8	1
TC-25	Douglas Jameson	2850 Garretson at Chase	5	1
TC-26	Lonney Dunbar	7860 Weirick Road	4	1
TC-27	Templo Nueva Cida Inc. [c]	Lateral 204 W S6	4	1
TC-28	Brien Clingman	7810 Weirick Road	4	1
TC-29	Gerald Deleo	21550 Temescal Canyon Road	3	1
TC-30	Ernesto D. Gyurec	7330 Smerber Road	3	1
TC-31	Robert Sanchez	13554 Bucking Bay Drive	3	1
TC-32	Emad Abdallah	2641 Main Street	2	1
TOTAL POTENTIAL DEMAND:			**3,342**	

(a) From January 2001 through February 2005

(b) If one entity, then combined usage is 111.41 AFY, which is the 6th highest usage

(c) Address cannot be displayed in Figure 6-5

- Discharging recycled water into Lake Elsinore as part of the District's lake replenishment program. Lake replenishment demands are anticipated to range from:
    - 0 AFY during wet years (when the Lake is spilling to Temescal Wash),
    - 5,900 AFY during average years
    - 10,300 AFY during dry years

Considering average annual water deliveries for lake replenishment, these potential recycled water demands total 12,575 AFY. However, when seasonal demand variations are considered, the potential recycled water demands of these markets will exceed the recycled water supply availability from the Regional WRF's, which is estimated to be 14,200 AFY in 2025. Further consideration of the recycled water markets is provided as part of the system evaluations presented in Section 7.

Section 7: Project Alternative Analysis

7.1 Planning Assumptions and Design Criteria

The development and analysis of the recycled water project alternatives are based on a set of planning assumptions and design criteria upon which the facilities and alternative are evaluated. Section 7.1 presents the peaking factors; the pipeline, reservoir and pumping station design criteria; and the unit cost data used for the purposes of this facilities planning report.

7.1.1 Peaking Factors

Peaking factors for maximum month, maximum day, and peak hour conditions are established for the purposes of sizing pump station, storage and distribution system facilities.

Maximum month peaking factors have been established based on review of 30 years of precipitation and evapotranspiration (ET) data. Table 7-1 provides a summary of average monthly precipitation, ET, and resultant irrigation requirements.

Table 7-1
30-Year Average Precipitation and ET vs. Irrigation Requirement

Month	Average Precipitation (inches)[a]	Average ET (inches)[b]	Irrigation Requirement (ET – Precip.) (inches)
January	2.80	1.83	0
February	2.96	2.20	0
March	2.29	3.42	1.13
April	0.56	4.84	4.28
May	0.22	5.61	5.39
June	0.02	6.26	6.24
July	0.10	6.47	6.37
August	0.12	6.22	6.10
September	0.30	4.84	4.54
October	0.36	3.66	3.30
November	0.78	2.36	1.58
December	1.58	1.83	0.25
TOTAL	**12.09**	**49.54**	**39.18**

(a) Per data by National Weather Service (Weather.Com), 30-year history through 2002.
(b) From California Irrigation Management Information System (CIMIS) for Temecula and Lake Elsinore.

For the 30-year period ending in 2002, the Lake Elsinore area requires 39.18 inches of irrigation over 10 months of the year, providing an average irrigation rate of 3.92 inches per month (39.18 inches/10 months). As Table 7-1 indicates, July has the highest monthly irrigation demand at 6.37 inches. The resulting maximum month peak factor is therefore:

- MMD = (6.37 inches / 3.92 inches) = 1.63 x ADD

Maximum day demand peaking factors used for the purposes of this study have been derived through examination of peaking factors for other recycled water systems of similar characteristics and climates as the Lake Elsinore area. Maximum day demand peaking factors for these systems range from 1.18 to 1.21 times the peak month demand. Given the high summer time temperatures and ET rates in the Lake Elsinore area, a maximum day demand factor of 1.25 times the peak month demand is selected for the purposes of this study. Based on this, the ratio of maximum day demand to average day demand is therefore:

- MDD = 1.25 x MMD = 1.25 x 1.63 x ADD = 2.04 x ADD

Peak hour demand represents the anticipated maximum demand in the recycled water system. The peak hour demand will occur during the irrigation period between 9 p.m. and 6 a.m. Based on these hours of irrigation, the peak hour demand can be calculated as:

- PHD = (24 hrs. per day / 9 hours irrigation per day) x MDD = 2.67 x MDD = 5.45 x ADD

7.1.2 Pipeline Sizing Criteria

The following criteria were developed in coordination with District input, the approved potable water system design criteria established in the 2002 Distribution System Distribution System Master Plan, and the EVMWD 2004 Standard Specifications for Water and Recycled Water Requirements:

- Peak hour demands will be used to size all distribution system pipelines
- A Hazen-Williams friction coefficient of 120 is used for all pipe sizing, consistent with District design specifications
- Minimum pressure (Pmin) in the recycled water system of 40 psi is desired for nodes under peak hour demand conditions
- Maximum pressure (Pmax) in the recycled water system is 120 psi with 80 psi targeted under peak hour demand conditions
- Maximum velocities under peak hour demand conditions will differ based on transmission main (12 inches or greater) or distribution line (8 inches or less)
  - Vmax for transmission mains is 3 feet per second
  - Vmax for distribution mains is 6 feet per second

These criteria are used for analysis and sizing of all recycled water pipelines within the Regional recycled water service area.

7.1.3 Reservoir Sizing Criteria

Consistent with the District's 2004 Standard Specifications and design criteria, reservoir storage requirements are set equal to the sum of one day of maximum day demand plus operational storage (equal to 30 percent of the maximum day demand). The resulting reservoir storage criteria is therefore:

- Reservoir storage = 1.3 x Maximum Day Demand = 2.65 x Average Day Demand

Storage volume for emergency (fire) conditions is assumed to be provided through the District's potable water system, and no fire flow or emergency storage is provided in the recycled water system.

7.1.4 Pump Sizing Criteria

Pump stations are sized to meet the maximum day demands of each pressure zone while filling the reservoirs of each pressure zone. Peak hour demands are supplied through reservoir storage. Pump station sizing is based on hydraulic analyses of the recycled water distribution system. Each pump station will include a standby pump, however the pump stations will not be equipped with standby power.

7.2 Unit Costs

The capital and operations and maintenance (O&M) costs presented in this study are based on unit cost data for pipelines, pump stations, reservoirs, turnouts and related recycled water facilities. The unit costs also include allowance for engineering, administration and project contingencies as a percentage of the estimated construction costs. A factor of 20 percent of construction cost has been used to account for engineering and administrative costs, including:

- Planning and preliminary design
- Surveying and geotechnical investigations
- CEQA compliance and permitting
- Final design
- Construction administration and inspection

A planning-level project contingency of 20% has been applied to the estimated construction, engineering and administrative costs. Criteria and assumptions that were used to develop the estimates of probable costs include:

- **Pipelines:** These planning-level unit costs include pipe materials (assumed to be PVC and ductile iron pipe), excavation, bedding and backfill, and traffic control during construction, pavement replacement (assumed to be asphalt pavement), and allowances for miscellaneous site work. The unit costs do not include right-of-way acquisition. Average depth of cover is assumed to be 42 inches. Costs for distribution pipelines were taken from recent vendor quotes for both PVC and for Ductile Iron (DI) pipe. Based on the District's design criteria, piping 12-inches and smaller is assumed to be PVC. Piping 18 inches and larger is assumed to be ductile iron. Table 7-2 lists the unit costs for recycled water pipelines.

Table 7-2
Recycled Water Pipeline Unit Costs

Pipe Diameter (inches)	Material	Pipeline Unit Cost ($/foot)
4	PVC	$105
6	PVC	$133
8	PVC	$140
12	PVC	$182
18	DI	$315
20	DI	$329
24	DI	$378
27	DI	$420
30	DI	$490
36	DI	$560

- Unit costs for reservoirs were estimated from a reservoir price model for above-grade steel tanks that includes factors for site grading, yard piping, valving, fencing, landscaping, engineering, and administration.
    - 0 -1 mg: $1.30/gal
    - <2 mg: $1.10/gal
    - <5 mg: $1.00/gal
    - <10 mg: $0.90/gal
- Capital costs for pump stations include all pumping, mechanical, motor drive and electrical equipment, pump station building, grading, miscellaneous yard piping and valving, fencing, landscaping, instrumentation & controls, engineering, and administration. Pump stations are assumed to be 70 percent efficient. Based on these criteria, pump station capital costs for the purposes of this study are assumed to be:
    - Pump stations < 200HP: $3,500 per horsepower
    - Pump stations < 700HP: $2,500 per horsepower
- Turnouts will be installed where there is a potential for future growth or a desire to connect to other recycled water systems. Turnouts will be installed at a minimum of 8-inch diameter, with the same size valve, blind flange, with the following unit costs:
    - $\leq$ 12-inch diameter = $28,000
    - 16-inch to 24-inch diameter = $42,000
    - > 24-inch diameter = $50,000

The following assumptions are used for operation and maintenance costs and for lifecycle analysis:

- Service life = 20 years service life
- Interest rate = 4%
- Power costs = $0.145/kWh
- Chlorine for disinfection = $0.71 per pound
- Annual maintenance costs = 2% of capital cost

7.3 Water Recycling Alternatives Evaluation

The recycled water alternatives evaluations include analysis of the following recycled water system components:

- Service area and customers
- Pressure zones
- Storage
- Distribution system piping

7.3.1 Service Area and Customers

Section 6 identifies potential recycled water markets and uses for recycled water from the Regional WRF including:

- 5,900 AFY (average annual basis) for Lake Elsinore replenishment supply
- 2,225 AFY to serve identified recycled water markets within the Regional recycled water service area (Downtown: 206 AFY [without John Laing Homes], Northwest: 1,309 AFY, Northeast: 710 AFY)
- 1,120 AFY to serve John Laing Homes development and the Wildomar recycled water system
- 3,342 AFY to serve agricultural users along the Temescal Canyon Agricultural Line Corridor

The total of these average annual demands is 12,587 AFY. Accounting for maximum day demands within the Regional recycled water service area, the total maximum day demand of these potential service areas and customers is 14,900 AFY (or 13.3 mgd). However, the projected flows to the Regional WRF are estimated to be 12.67 mgd in 2025. Given that the potential uses for recycled water from the Regional WRF exceed the projected supply availability, the service area and customer markets must be prioritized, with some service areas/markets being deferred or identified for service through other sources.

Because the Regional WRF effluent has low nutrient content, this water is preferred over other non-potable water supply sources for the purposes of lake replenishment. Providing water to the District's lake replenishment program is given the highest priority use of the four above-described service area customers, per the District's 2005 water supply assessment. Other sources of water for lake replenishment will include Eastern MWD water (800 AFY) and water from the District's Island Wells (3,700 AFY). Per the District's 2005 Water Supply Assessment Lake replenishment demands are anticipated to range from:

- 0 AFY during wet years (when the Lake is spilling to Temescal Wash),
- 5,900 AFY during average years
- 10,300 AFY during dry years

With an average annual supply to lake replenishment of 5,900 AFY, the Regional WRF will have available capacity to ultimately supply about 8,300 AFY to other uses. However, as Table 7-3 shows, surplus recycled water will not be available from Regional WRF until about 2015, given dry year commitments for lake replenishment of 10,300 AFY (or 9.19 mgd).

Table 7-3
Availability of Recycled Water Supplies with Lake Restoration

Year	Regional Treatment Plant Flows (mgd)	Flows Required for Lake Restoration (mgd)	Available Supply for Recycled Water System (mgd)
Lake Replenishment Demands During Dry Years			
2005	5.16	9.19	0
2010	7.08	9.19	0
2015	9.33	9.19	0.14
2016	9.678	9.19	0.48
2020	11.07	9.19	1.88
2022	11.71	9.19	2.52
2025	12.67	9.19	3.48
Lake Replenishment Demands During Average Years			
2005	5.16	5.27	0
2010	7.08	5.27	1.81
2015	9.33	5.27	4.06
2016	9.678	5.27	4.41
2020	11.07	5.27	5.80
2022	11.71	5.27	6.44
2025	12.67	5.27	7.40

The second priority of service is therefore the Regional recycled water system customers as identified in Section 6 of this facilities planning report. The Regional WRF will supply both average day and maximum day demands to the Regional recycled water service area customers.

An inter-tie between the Regional recycled water system and the Wildomar recycled water system will provide operational flexibility, and system redundancy. The inter-tie also allows the Regional recycled water system to deliver water to the ornamental lake being constructed as part of the John Laing Homes development. This onsite storage allows water from the Regional recycled water system to be delivered to the John Laing Homes development at a constant flow rate and/or during off-peak hours, thereby minimizing impacts to pipeline and pump station sizing requirements, while providing the District with the desired system flexibility and reliability. For these reasons, the District intends to include an inter-tie with the Wildomar recycled water system with enough capacity to supply average day demands to the John Laing Homes development, 1.0 mgd.

The recycled water demands for lake restoration during dry years, and the maximum day demand of the Regional recycled water system service area total 15,960 AFY. These two beneficial uses of recycled water from the Regional WRF can utilize all of the 14,200 AFY available from the plant out to the 2025 planning horizon of this study. Given this, using

Regional WRF's recycled water to supply non-potable water to the Temescal Canyon Agricultural Line Corridor does not appear to be a preferred recycled water supply option at this time. As development in the area and flows to the Regional WRF continue to increase, the District may wish to consider reevaluating its ability to supply non-potable water to the Temescal Canyon Agricultural Line as part of future facilities planning updates.

7.3.2 Pressure Zones

Review of the identified recycled water users in Section 6, coupled the ground elevations of these users suggests that the Regional recycled water system will need to be served by multiple pressure zones in order to provide recycled water to its customers that is between 40 psi and 120 psi, as prescribed in the design criteria outlined in Section 7.1. The pressure zones will include:

- A 1540-foot pressure zone to serve the majority of the Regional recycled water system users, encompassing all of the northeast and downtown zones and most of the northwest zone. This pressure zone will be supplied recycled water boosted from the Regional WRF.

- A 1740-foot HGL pressure zone is required to serve recycled water users in the northwest portion of the Regional recycled water system. This pressure zone would generally serve those customers located north and west of Grand Avenue. The 1740 zone will be the highest HGL pressure zone in the Regional recycled water service area. Service to this zone will require pumping from the 1540 pressure zone.

The evaluation or the Regional recycled water system pressure zones considered a third pressure zone at a 1500-foot HGL to serve the Downtown area. Given the relatively high demand of the Downtown area (and the inter-tie to the Wildomar system for service reliability to John Laing Homes), construction of this separate pressure zone was evaluated as a potential energy cost savings measure. The following summarizes the evaluation of the 1500 versus 1540 pressure zone alternatives.

7.3.2.1 Evaluation of 1500 Versus 1540 Pressure Zones

Facilities capital and operational costs were used as the basis for evaluating separate 1540 and 1500 pressure zones versus a combined 1540 pressure zone. The average day demand for northwest and northeast portions of the recycled water system, which are supplied via the 1540 pressure zone total 1.8 mgd, and the average day demand for the potential 1500 pressure zone is 0.18 mgd. This 1500 pressure zone demand does not include the 1.0 mgd inter-tie supply to the Wildomar system / John Laing Homes. Table 7-4 summarizes the evaluation of capital and energy costs for the combined 1540 pressure zone, versus having separate 1540 and 1500 pressure zones, with the 1500 pressure zone serving the downtown area.

Table 7-4
Cost Evaluation of 1500 vs. 1540 Pressure Zones

Criteria	Combined 1540 Pressure Zone		Separate 1540 and 1500 Pressure Zones	
Pump Station Capital Cost	***Power Requirements***	***Cost***	***Power Requirements***	***Cost***
1540 Zone PS	400 HP (Max.)	$1.0 million	300 HP (Max.)	$0.75 million
1500 Zone PS	–	–	120 HP (Max.)	$0.42 million
Total Capital Cost		*$1.0 million*		*$1.17 million*
Pump Station Energy Cost	***Power Requirements***	***Cost***	***Power Requirements***	***Cost***
1540 Zone PS	137 HP (Avg.)	$0.233 million/yr	115 HP (Avg.)	$0.195 million/yr
1500 Zone PS	–	–	10 HP (Avg.)	$0.013 million/yr
Total 20 Year Present Worth		*$3.17 million*		*$3.01 million*
Present Worth		*$4.17 million*		*$4.18 million*
COST DIFFERENTIAL				**$0.01 million**

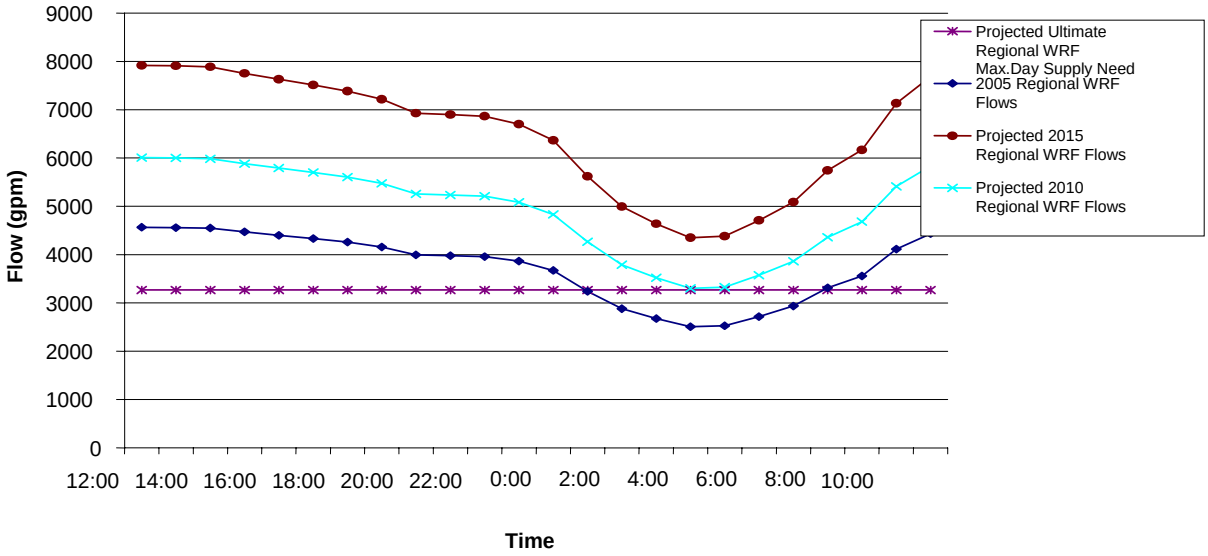
As Table 7-4 indicates, the capital costs for separate versus combined pump stations and pressure zones to serve the 1500 and 1540 pressure zones are similar. The annual energy costs show that the separating the 1500 and 1540 service areas into two pressure zones will save about $25,000 per year, versus operating the system with a combined 1540 pressure zone. However, the present worth cost of the two alternatives is nearly equivalent over a 20-year design life. Given the marginal difference in the present worth costs of the two alternatives, the use of a single 1540 pressure zone is preferable over having two separate zones for ease of operation and system flexibility. Combining the 1540 and 1500 zones would also reduce the total number of pumps needed at the Regional WRF and reduce their maintenance requirements. Therefore, a separate 1500 pressure zone is not further considered for the purposes of this planning study.

7.3.3 Storage Alternatives

An evaluation of reservoir storage requirements for each pressure zone was performed based on the design criteria identified in Section 7.1. In addition, the combined recycled water supplies from the Regional WRF and the reservoir storage must provide sufficient water to meet water deliveries over a 9-hour period, matching the anticipated pattern for most of the recycled water users, which are expected to irrigate between 9:00 p.m. and 6:00 a.m.

The recycled water inter-tie with the Wildomar system for service to John Laing Homes development is anticipated to provide up to 1 mgd of recycled water demand from the Regional recycled water system. As the water from the Regional system will be supplemental water, feeding a zone which has an ornamental lake for onsite storage, this 1 mgd demand will not be peaked. Figure 7-1 shows the anticipated diurnal variations in recycled water supply and demands for the Regional recycled water system.

Figure 7-1
Diurnal Variations in Recycled Water Supplies and Demands



As Figure 7-1 shows, the Regional WRF does not currently have enough diurnal capacity to meet the projected recycled water demands for the Regional system. However, flow rates to the Regional WRF are expected to increase through 2025. By 2015, the Regional WRF is expected to have sufficient diurnal flows to meet the recycled water demands of the Regional system, provided that recycled water for lake restoration is supplied during off-peak hours. Therefore, flow equalization storage for the purposes of meeting diurnal demand vs. supply variations does not appear needed for the Regional WRF, provided that the Regional WRF plant flows keep pace with the phasing of the Regional recycled water system. A comparison of the proposed phasing plan relative to the projected Regional WRF plant flows is further addressed in Section 7.4.

The following table summarizes the reservoir requirements by pressure zone.

Table 7-5
Summary of Reservoir Storage Requirements

Pressure Zone	Average Day Demand		Maximum Day Demand (mgd)[a]	Storage Required (mg)[b]	Storage to be Provided (mg)
	(AFY)	(mgd)			
1740 Zone	387	0.35	0.71	0.92	1.0
1540 Zone	1,838	1.64	3.35	4.35	4.4
TOTAL	**2,225**				**5.4**

Notes:
1 mgd flows to the Wildomar Service area for JLH are included in MDD calculation for the 1540 zone.
1 mgd flows to the Wildomar Service area for JLH are not included in the storage calculation for the 1540 zone.

7.3.3.1 Reservoir Storage – 1540 Pressure Zone

The 1540 pressure zone requires 4.4 million gallons of storage to meet ultimate demands of this zone. This storage volume does not provide storage for service through the proposed inter-tie with the Wildomar system for service to John Laing Homes, as this development includes onsite storage through an ornamental lake. Review of the area topography, proposed developments and site availability suggests that the required 1540 zone storage could be accommodated at either the Tri-Valley user site, Rosetta Canyon user site, or both. The following summarizes the evaluation and recommendations for 1540 zone storage, namely to provide 4.4 million gallon storage at one site, or provide two reservoirs.

The evaluation of combined or distributed reservoir storage for the 1540 zone considers the capital cost of the reservoirs, pumping and pipeline costs, as well as operational and system phasing considerations. Review of the system hydraulics suggests that for the two reservoir alternatives, the reservoirs should be sized at 1.4 MG and 3.0 MG to balance HGLs and system phasing plans.

The unit costs for the reservoir alternatives are as follows:

- Capital cost for two reservoirs:
  - 1.4 MG reservoir: $1.10/gallon x 1.4 MG = $1.54 million
  - 3.0 MG reservoir: $1.00/gallon x 3.0 MG = $3.00 million
  - Total $4.54 million
- Capital cost for one 4.4 MG reservoir: $1.00/gallon x 4.4 MG x 1 = $4.40 million

A hydraulic analysis of the two storage alternatives indicates that the use of two reservoirs for the 1540 zone reduces the total dynamic head requirements for the system. Table 7-6 provides a comparison of distribution system costs for one versus two 1540 zone reservoirs.

Table 7-6
System Requirements for Two Reservoirs versus One[1]

Item	One Reservoir Alternative	Two Reservoir Alternative
Incremental Reservoir Costs	$4.40 million	$4.54 million
Incremental Piping Costs	$8.8 million	$9.3 million
Incremental Pump Station Costs	$1.15 million	$1.00 million
SUBTOTAL CAPITAL COSTS	**$14.35 million**	**$14.84 million**

Note:
[1] Incremental costs reflect only those costs associated with reservoir storage piping and pumping requirements for the 1540 zone, and do not include system-wide costs.

Based on the cost analysis presented in Table 7-5, the use of two reservoirs increases system capital costs by about $ 0.5 million versus using one reservoir due to higher unit costs for the reservoir construction and additional piping needed to connect a second reservoir to the 1540 pressure.

However, while higher in capital cost, the use of two reservoirs may be favored by the District as it provides greater operational flexibility and allows phased construction of reservoir storage.

For the purposes of this facilities planning study, two storage reservoirs are assumed to be provided for the 1540 pressure zone.

7.3.3.2 Reservoir Storage – 1740 Pressure Zone

The maximum day demand for this zone is 0.70 mgd, requiring a storage volume of 1 million gallons. There are several potable water reservoirs located near this area. There appears to be several potential sites available to accommodate a 1 million gallon recycled water reservoir to serve the 1740 pressure zone.

7.3.4 Distribution System Piping Alternatives

Analysis of the proposed recycled water system was performed by analyzing the potential recycled water users versus the recycled water supply sources, pump stations locations and reservoir siting needs for the Regional recycled water service area. From this review, three pipeline routing alternatives were identified. These alternatives vary primarily in the piping routes, and are prepared for the purposes of evaluating the preferred piping network so as to meet the project design criteria and minimize piping costs.

7.3.4.1 Description of Distribution System Piping Alternatives

Alternative piping layouts for the Regional recycled water system were evaluated utilizing a hydraulic model (H2ONet) with service to all the recycled water users identified in the market assessment per Section 6. The pipeline routes were selected primarily to minimize the distance from the Regional WRF water source and the recycled water use sites. The pipeline sizing was determined in accordance with the design criteria for velocity, pressure, and minimum pipe diameter, with 6-inches selected as the minimum pipe size. The following describes the significant features of each of the 3 pipeline alternatives considered in this study:

- **Alternative 1:** This alternative provides service to the northwest zone from two sources: a pipeline from the northeast section; and a line from the Regional WRF. The connection to the northwest section would run over from the Outlet Mall on Collier Avenue, down Pierce Street, and then across to Lake Street. No crossing over the I-15 Freeway would be required. The southern area of the northwest zone would be fed from a pipeline running from the Regional WRF, up Trevelen Avenue, along Strickland Avenue, and then around Gunnerson. The downtown zone would be supplied from a pipeline directly from the Regional WRF along Flint Street. The northeast zone is supplied from a pipeline from the Regional WRF, following a northeast alignment along Chaney Street, along Collier Avenue to the Outlet Mall area, and crossing under the I-15 Freeway overpass on Central Avenue. Figure 7-2 provides a layout of the Alternative 1 distribution system.

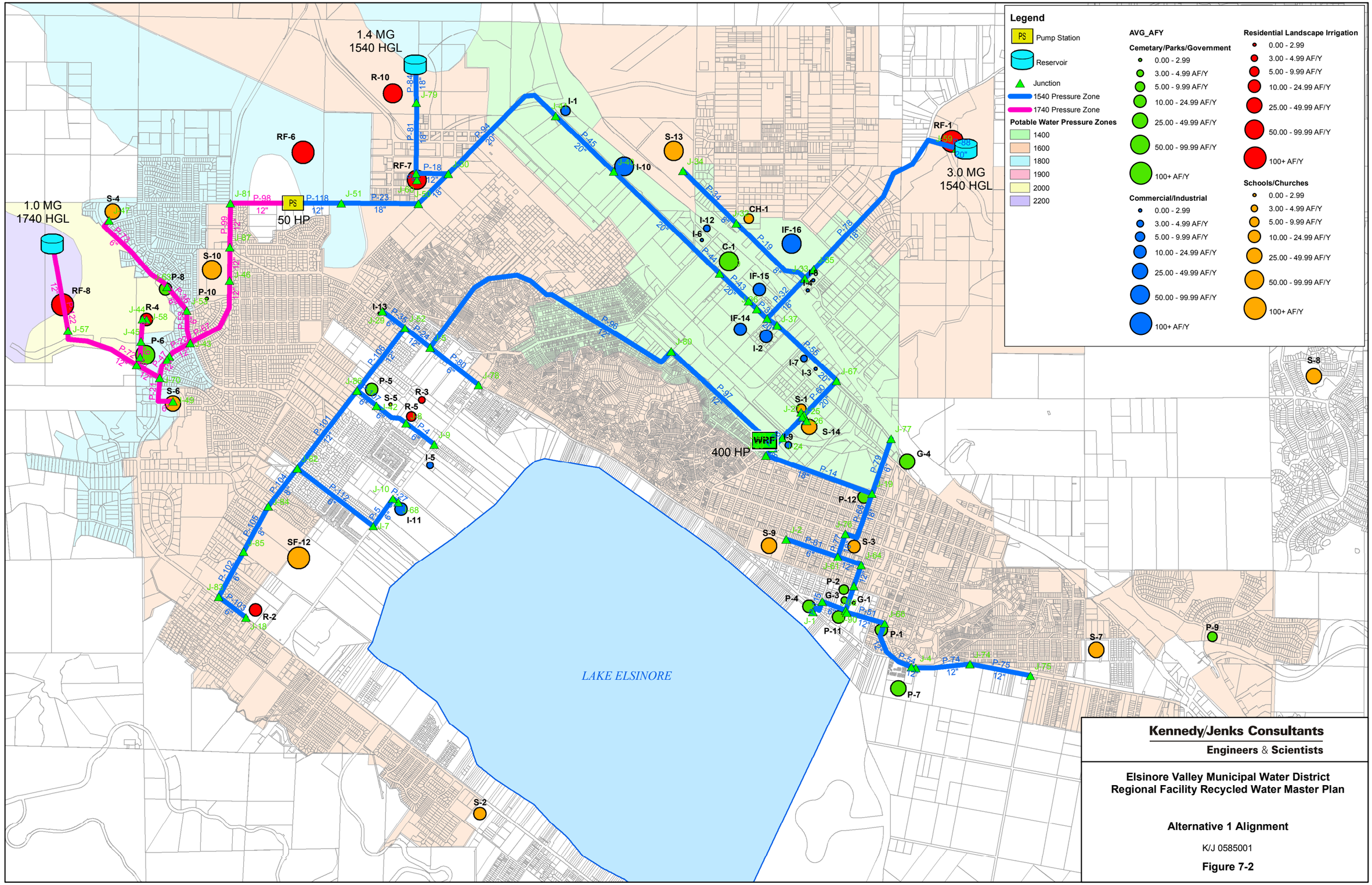
- **Alternative 2:** This alternative provides a looped distribution system to serve the northwest area. Figure 7-3 shows the proposed distribution system layout for Alternative 2.

- **Alternative 3:** This alternative provides an alternative piping configuration for providing water to the 1740 pressure zone. Figure 7-4 illustrates the proposed distribution system layout for Alternative 3.

All pressure and velocity requirements were met for each alternative.

7.3.4.2 Pumping Requirements

The evaluation of the distribution system alternatives includes evaluation of pumping requirements. Pump requirements include the main feed pump station located at the Regional WRF, which will deliver recycled water to the 1540 pressure zone and a booster pump station to supply recycled water from the 1540 pressure zone to the 1740 zone. Table 7-7 summarizes the pump station requirements for the three distribution system alternatives based on the hydraulic modeling results.



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Regional Facility Recycled Water Master Plan

Alternative 1 Alignment

K/J 0585001

Figure 7-2

1.4 MG
1540 HGL

1.0 MG
1740 HGL

3.0 MG
1540 HGL

50 HP

400 HP

WRF

PS

LAKE ELSINORE

Legend

- PS Pump Station
- Reservoir
- Junction
- Final_Sewer_MP_Parcels
- 1740 Pressure Zone
- 1540 Pressure Zone

Potable Water Pressure Zones

- 1400
- 1600
- 1800
- 1900
- 2000
- 2200

AVG_AFY

Cemetary/Parks/Government

- 0.00 - 2.99
- 3.00 - 4.99 AF/Y
- 5.00 - 9.99 AF/Y
- 10.00 - 24.99 AF/Y
- 25.00 - 49.99 AF/Y
- 50.00 - 99.99 AF/Y
- 100+ AF/Y

Commercial/Industrial

- 0.00 - 2.99
- 3.00 - 4.99 AF/Y
- 5.00 - 9.99 AF/Y
- 10.00 - 24.99 AF/Y
- 25.00 - 49.99 AF/Y
- 50.00 - 99.99 AF/Y
- 100+ AF/Y

Residential Landscape Irrigation

- 0.00 - 2.99
- 3.00 - 4.99 AF/Y
- 5.00 - 9.99 AF/Y
- 10.00 - 24.99 AF/Y
- 25.00 - 49.99 AF/Y
- 50.00 - 99.99 AF/Y
- 100+ AF/Y

Schools/Churches

- 0.00 - 2.99
- 3.00 - 4.99 AF/Y
- 5.00 - 9.99 AF/Y
- 10.00 - 24.99 AF/Y
- 25.00 - 49.99 AF/Y
- 50.00 - 99.99 AF/Y
- 100+ AF/Y

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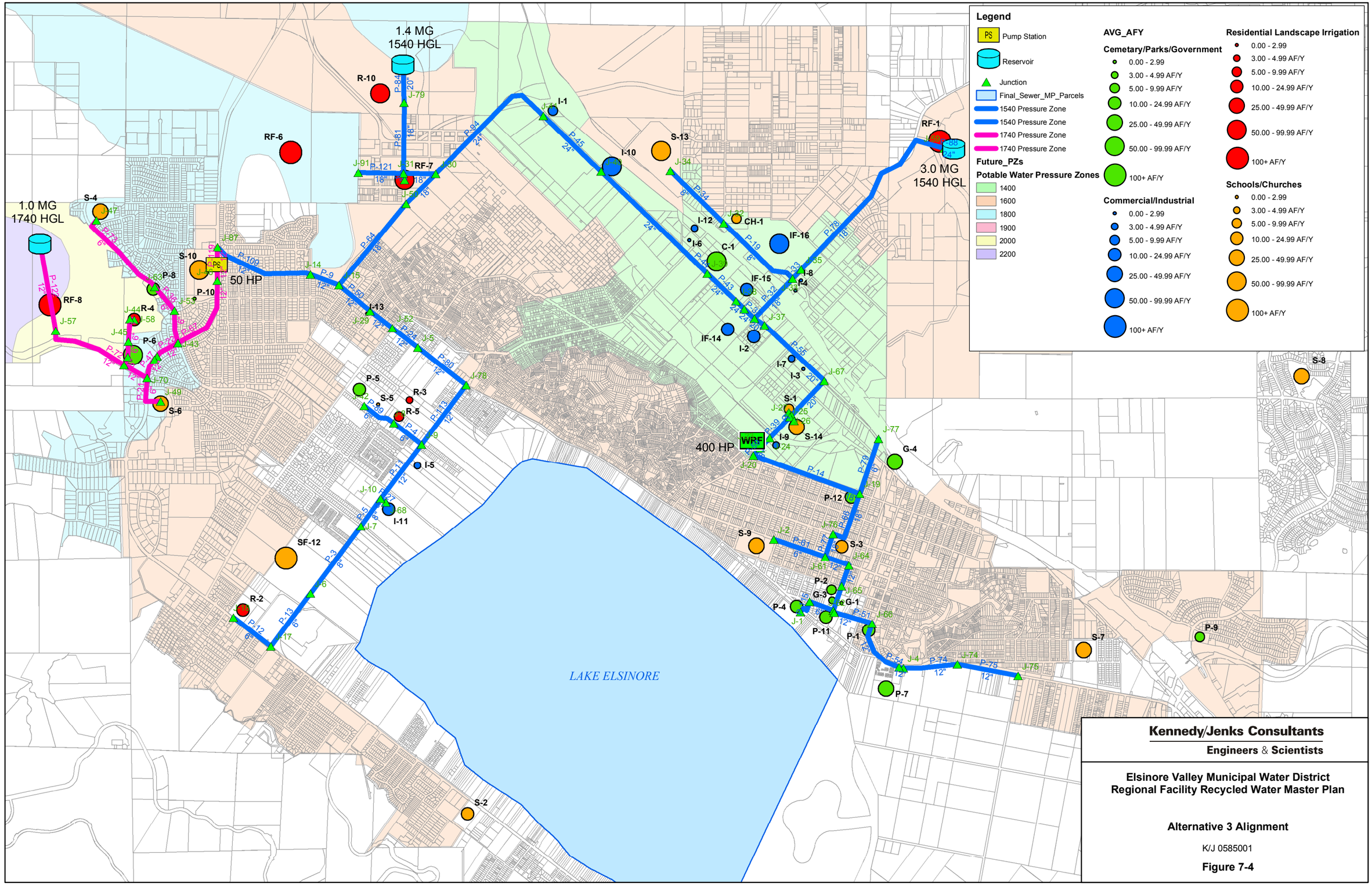
Alternative 2 Alignment

K/J 0585001

Figure 7-3



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Regional Facility Recycled Water Master Plan

Alternative 3 Alignment

K/J 0585001

Figure 7-4

Table 7-7
Recycled Water Pump Stations Requirements

Pump Station	Alternative 1	Alternative 2	Alternative 3
Regional WRF Pump Station			
Flow (gpm)	3,500	3,500	3,500
TDH (feet)	290	290	290
HP	400	400	400
Cost ($2,500/HP)	$1,000,000	$1,000,000	$1,000,000
(1540 to 1740) Booster Pump Station			
Flow (gpm)	500	500	500
Head (feet)	215	225	210
HP	50	50	50
Cost ($3,500/HP)	$175,000	$175,000	$175,000
TOTAL PUMP STATION COST	**$1,175,000**	**$1,175,000**	**$1,175,000**

7.3.4.3 Reservoir Storage Requirements

Reservoir storage is provided consistent with the evaluation and recommendations summarized in Section 7.2, that is:

- No additional forebay storage at the Regional WRF
- 4.4 MG storage located within the 1540 pressure zone provided through:
  - One 3.0 MG reservoir
  - One 1.4 MG reservoir
- One 1 MG reservoir located within the 1740 pressure zone

The configuration of the 1540 pressure zone reservoirs (3.0 MG and 1.4 MG) were selected based on the review of the distribution system hydraulics relative to the location of recycled water markets. The proposed reservoir also fits well with the proposed system phasing to be further described in Section 7.4. Table 7-8 summarizes reservoir capital costs.

Table 7-8
Recycled Water Storage Requirements

Reservoir Requirements	1540 Zone		1740 Zone	Total
Zone Storage Required	4.4 MG		1.0 MG	5.4 MG
Reservoir Size(s)	3.0 MG	1.4 MG	1.0 MG	5.4 MG
Unit Cost	$1.0/gallon	$1.1/gallon	$1.3/gallon	–
Capital Cost	$3,000,000	$1,540,000	$1,300,000	$5,840,000

7.3.4.4 Turnout Requirements

Each alternative was evaluated and requirements for turnouts were considered where major transmission lines terminated in any part of the recycled water distribution system. In addition, turnouts were considered at the corner of Chaney and Central where the recycled water distribution system can be tied into the District's existing Reach 4 line, or the TVRWRF Pipeline.

In general, these turnouts can allow the expansion of the recycled water system, or increase the flexibility for tying into other recycled water sources.

7.3.4.5 Cost Evaluation of Distribution System Piping Alternatives

Table 7-9 summarizes the capital, operations and maintenance costs for each of the 3 distribution system alternatives.

Table 7-9
Summary of Alternative Capital and Annualized Costs for Each Alternative

Capital Cost Item	Alternative:		
	1	2	3
Piping Costs	$24,260,000	$24,533,000	$22,273,000
Pump Costs	$1,175,000	$1,175,000	$1,175,000
Turnout Costs	$210,000	$210,000	$210,000
Reservoir Costs	$5,840,000	$5,840,000	$5,840,000
Subtotal Capital Cost:	**$31,485,000**	**$31,758,000**	**$29,498,000**
Annual Costs			
Annualizing Factor	0.0736	0.0736	0.0736
Annual Capital Cost	$2,317,000	$2,337,000	$2,171,000
Annual O&M	$417,000	$420,000	$390,000
Total Annual Costs	$2,734,000	$2,757,000	$2,562,000
Recycled Water Demand	2,225 AFY	2,225 AFY	2,225 AFY
Cost of Service	**$1,229/AF**	**$1,239/AF**	**$1,150/AF**

Based on the comparison of capital and operational costs, Alternative 3 is recommended as the least costly and preferred distribution system alternative.

7.3.4.6 Impact of the Wildomar System Inter-Tie and John Laing Homes

Overall, the addition of the inter-tie with the Wildomar recycled water system for service to John Laing Homes increases the cost of the Regional recycled water system by $1.8 million. These costs are due to requirements for a larger recycled water pump system at the Regional WRF, and the increased transmission pipeline diameters in the downtown area. The average day demand of the recycled water system increases from 2,225 AFY to 3,345 AFY with the addition of service to John Laing Homes.

7.3.5 Treatment Alternatives

There are no specific treatment alternatives needed for the Regional system as the recycled source waters from the Regional WRF are already of tertiary quality.

7.3.6 Market Alternatives

Alternative markets that were evaluated in the market assessment include agriculture, industry (such as cement mixing), construction irrigation, medians for highways, churches, parks, schools, common areas for homeowners associations, and cemeteries. Specific alternative markets examined were the Temsecal Canyon Area and the potential feed of recycled water into Lake Elsinore for lake level stabilization. Recommended recycled water users include those markets that can be most readily served through the Regional WRF system based on the study's design criteria and economic considerations.

7.3.7 Storage Location Alternatives

During the design phase of the project, alternative sites at the required elevations may be evaluated, if required.

7.3.8 Sub-Alternatives

There are no sub-alternatives to the recycled water alternatives presented above in Section 7.3.

7.3.9 Non-recycled Water Alternatives

7.3.9.1 Other Potentially Viable New Sources of Water

Other new sources of water are discussed in Section 3.7.

7.3.9.2 Economic Costs of New Sources of Water

Other new sources of water are discussed in Section 3.7.

7.3.9.3 Pollution Control Alternatives (if applicable)

There is no additional treatment required for the use of recycled water. Treatment for pollution control is not an alternative in this project.

7.3.9.4 No Project Alternative

Without the implementation of the proposed project, the identified customers in the Regional Service Area would continue to use potable water.

7.3.10 Economic Analysis for Each Alternative

A unit cost of service was identified for each alternative by dividing the total cost of each alternative by the total volume of recycled water expected to be delivered. These values are shown in Table 7-9.

7.3.11 Energy Analysis for Each Alternative

Energy usage associated with each alternative was incorporated into the capital and O&M costs. Annual energy was based on projected pumping costs. Construction energy is not expected to be a significant component of cost and was not considered.

7.3.12 Water Quality Impacts of Each Alternative

It is expected that the Regional service area recycled water project as proposed will improve receiving water quality by reducing the quantity of effluent being discharged to Temescal Wash. It is anticipated that the reduced flow to Temescal Wash will not result in any changes to beneficial uses because the quantity of reduction through recycled water use is relatively small compared to the overall flows to Temescal Wash.

Groundwater impacts are expected to be negligible since recycled water will be applied at agronomic rates. Nutrients are expected to be taken up by vegetation reducing the need for fertilizer applications.

7.3.13 Comparison of Alternatives and Recommended Alternative

The alternatives to be compared are the project as proposed and the non-recycled water alternative because the analysis of the project occurred using a hydraulic model to optimize delivery to the best candidate use areas. The main alternatives primarily examine different storage options, pumping configurations, and pipeline routes to the use areas.

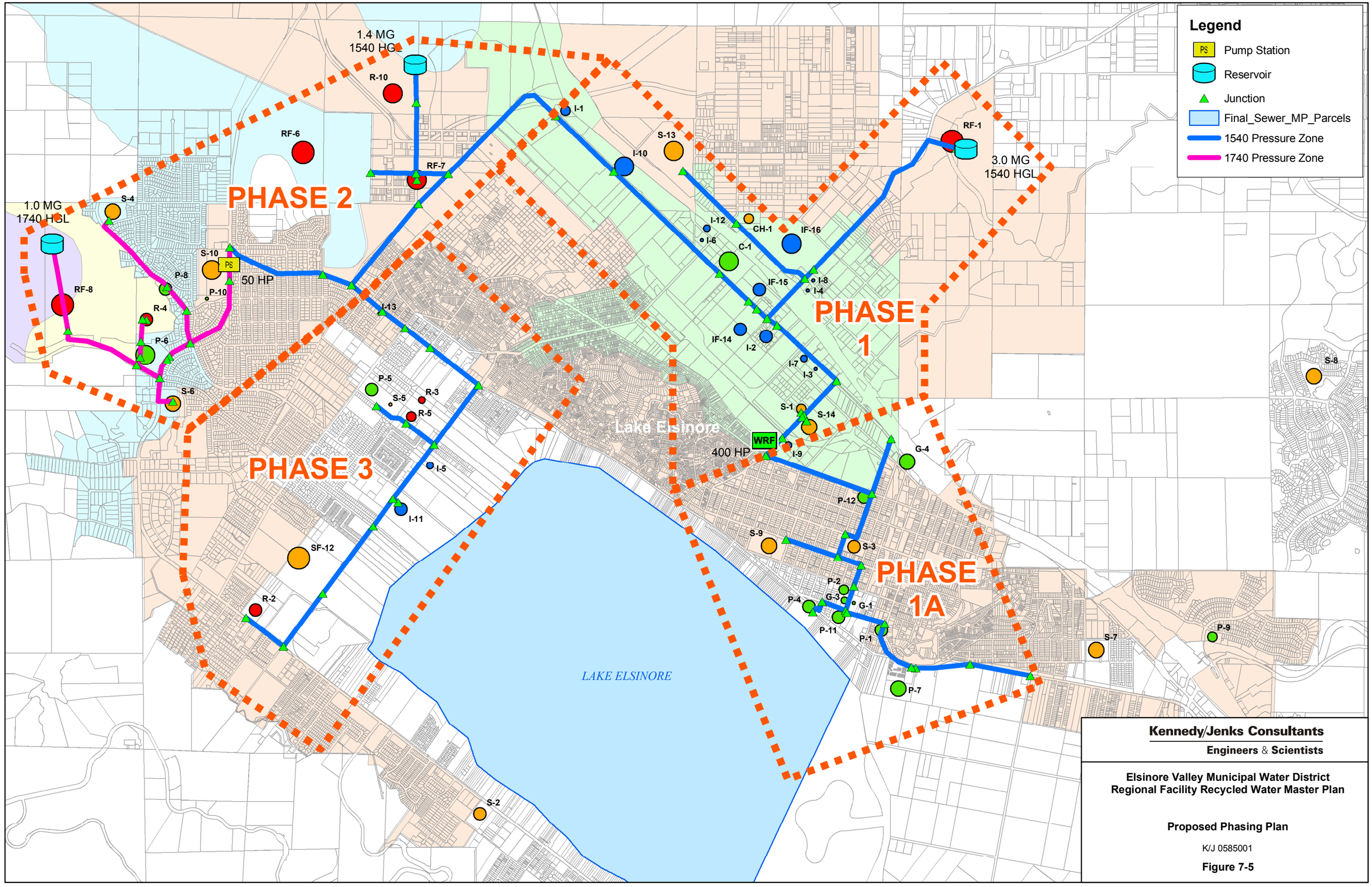
Since the recycled water is coming from an existing tertiary plant, there are no treatment alternatives for this proposed project. The District will continue with ongoing water conservation programs in addition to pursuing the proposed Regional recycled water system.

The Regional recycled water project as proposed is the recommended alternative because:

- There are a significant number of potential recycled water users in the service area with an associated significant water demand
- The proposed project reduces potable demands in an area of rapid growth
- The proposed project takes advantage of an existing water recycling facility that already produces tertiary-treated effluent that meets Title 22 requirements
- The proposed project promotes the State's policies of beneficial reuse of recycled water to replace potable water where possible
- The proposed project reduces discharges to Temescal Wash

7.4 Phasing Plan

Figure 7-5 identifies the proposed phasing plan for the Regional recycled water system. This plan calls for the implementation of the Regional recycled water system in 4 phases. Table 7-10 summarizes the projected recycled water demands and estimated timing of each project phase.



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Elsinore Valley Municipal Water District
Regional Facility Recycled Water Master Plan

Proposed Phasing Plan

K/J 0585001

Figure 7-5

Table 7-10
Recycled Water Demands by Project Phase

	Phase IA	Phase I	Phase II	Phase III
Average Annual Demand	206 AFY	260 AFY	1,409 AFY	350 AFY
Cumulative Average Annual Demand	206 AFY	466 AFY	1,875 AFY	2,225 AFY
Cumulative Average Day Demand	0.18 mgd	0.42 mgd	1.67 mgd	1.99 mgd
Cumulative Maximum Day Demand	0.38 mgd	0.86 mgd	3.42 mgd	4.05 mgd
Max. Day Demand for Wildomar Inter-Tie JLH)	1.00 mgd	1.00 mgd	1.00 mgd	1.00 mgd
Cumulative Total Maximum Day Demand with Wildomar Inter-Tie	1.38 mgd	1.86 mgd	4.42 mgd	5.05 mgd
Year Implemented	2016	2020	2022	2025

The phasing plan for the Regional system is designed such that the total peak system demands will not exceed the reclaimed water supply available from the Regional WRF (based on projected WRF flows summarized in the District's 2005 Water Supply Assessment) with flow diversions for lake restoration totaling 9.18 mgd (10,900 AFY). Installation of the Phase IA system facilitates an inter-tie with the Wildomar recycled water system. This inter-tie allows the District greater operational flexibility and system redundancy.

Recycled water demands for the Wildomar system are estimated to be 2,400 AFY for the Phase 1 and Phase 1A systems. The District is entitled to 1,680 AFY of annual supplies from Eastern MWD's recycled water pipeline, which will serve the Wildomar system. Recycled water supplies for the Wildomar system exceeding 1,680 AFY will need to be purchased by the District. Currently the cost is $165/AF. Thus, the total cost to the District for purchasing supplemental water will be about $120,000 per year for the purchase of 720 AFY of supplemental water for the Wildomar system.

Supplemental water from the Regional WRF could be supplied to the Wildomar system as water is available (such as during normal rainfall years when lake restoration flows are about 5.3 mgd, or 5,900 AFY). This would reduce the amount of water that the District would need to purchase from Eastern MWD for the Wildomar system. As Table 7-3 shows, there would be enough water available from the Regional WRF by 2010 to both meet normal-year lake restoration demands, and supply the supplemental water to the Wildomar system, such that the District would not have to purchase additional water from Eastern MWD. For these reasons, the District intends to pursue Phase IA as the first project phase of the Regional recycled water system. The pipeline between the Regional WRF and the Wildomar system inter-tie could be constructed and placed into service after 2010 to provide an interruptible supply of supplemental water to the Wildomar system. However, a reliable recycled water supply sufficient to meet both the demands of the Phase IA customers and supply water for lake restoration during dry years (9.2 mgd or 10,900 AFY) would not be available from the Regional WRF until 2016.

For a recycled water system to be eligible for state SRF funding, more than one-half of the recycled water demand must come from customers which will be on line at the time the recycled water infrastructure is phased into service. Table 7-11 summarizes the recycled water demands by phase, with recycled water demands identified at the time each project phase is implemented and at ultimate buildout. As this table shows, more than half of the recycled water demands associated with each project phase will be from customers on line at the time each project phase is implemented.

Table 7-12 summarizes the costs versus recycled water supplies for each project phase.

Table 7-11

Recycled Water Customers by Project Phase

Site Code	Name	Phase IA		Phase I		Phase II		Phase III	
		Demand at Completion of Phase IA Construction (AFY)	Ultimate Demand (AFY)	Demand at Completion of Phase I Construction (AFY)	Ultimate Demand (AFY)	Demand at Completion of Phase II Construction (AFY)	Ultimate Demand (AFY)	Demand at Completion of Phase III Construction (AFY)	Ultimate Demand (AFY)
G-1	Sheriff Station County of Riverside	3	3						
G-3	Riverside County Building	3	3						
P-2	Lake Community Center	10	10						
P-1	City Park	11	11						
P-12	Yarborough Park	12	12						
P-11	Swick & Matich Park	13	13						
P-4	Elk Grove Park & Beach	15	15						
S-3	Elsinore Elementary	17	17						
P-7	Lakepoint Park	34	34						
G-4	CalTrans District 8	43	43						
S-9	Elsinore Middle	45	45						
RF-9	JLH East Lake (Optional User)	800	1,220						
I-3	D and D Cattle Co			2	2				
I-4	Douglas Burgers			2	2				
I-6	Lake Elsinore Self Storage			3	3				
I-7	Mercury Marking Devices			3	3				
I-8	Mobil Oil Co			3	3				
I-12	Secured Self Storage			4	4				
I-9	Near-Cal Corp			4	4				
S-1	LEUSD Office			6	6				
G-2	Riverside County Fire			6	6				
CH-1	Latter Day Saints Church			8	8				
I-1	ARCO AM/PM			8	8				
I-2	Central Business Park			13	13				
IF-14	Lake Elsinore Town Center Development			8	17				

Table 7-11
(Continued)

Site Code	Name	Phase IA		Phase I		Phase II		Phase III	
		Demand at Completion of Phase IA Construction (AFY)	Ultimate Demand (AFY)	Demand at Completion of Phase I Construction (AFY)	Ultimate Demand (AFY)	Demand at Completion of Phase II Construction (AFY)	Ultimate Demand (AFY)	Demand at Completion of Phase III Construction (AFY)	Ultimate Demand (AFY)
IF-15	Lake Elsinore Square Development			8	21				
S-14	Ortega Continuation High			27	27				
I-10	Lake Elsinore Outlets			57	57				
C-1	Elsinore Valley Cemetery			67	67				
IF-16	Lake Elsinore Market Place Development			35	68				
S-13	Temescal Canyon High			88	88				
RF-1	Rosetta Canyon Development			100	309				
P-10	Summer Lake Park					0	0		
P-8	Oak Tree Park					13	13		
R-4	Shore Pointe Complex					15	15		
S-4	Rice Canyon Elementary					31	31		
S-6	Withrow Elementary					38	38		
P-6	McVicker Canyon Park					52	52		
RF-7	Lake Elsinore Valley Development					40	66		
S-10	Terra Cotta Middle School					96	96		
RF-8	La Laguna Development					75	142		
RF-10	Alberhill Community Plan					100	192		
RF-6	Alberhill Ranch Development					200	478		
S-5	Machado Elementary							0	0
I-13	Star Plaza Business							2	2
I-5	Jack in the Box							4	4
R-3	Lake Country Villas							4	4
R-5	Walnut Grove Apts							6	6

Table 7-11
(Continued)

Site Code	Name	Phase IA		Phase I		Phase II		Phase III	
		Demand at Completion of Phase IA Construction (AFY)	Ultimate Demand (AFY)	Demand at Completion of Phase I Construction (AFY)	Ultimate Demand (AFY)	Demand at Completion of Phase II Construction (AFY)	Ultimate Demand (AFY)	Demand at Completion of Phase III Construction (AFY)	Ultimate Demand (AFY)
P-5	Machado School Park							14	14
R-2	Harbor Grand Apts							14	14
I-11	Pyramid Enterprises							16	16
SF-12	Lakeside High School							60	120
	TOTAL	**1,006**	**1,426**	**452**	**716**	**660**	**1,123**	**120**	**180**
	Ultimate Demand Percentage		**29%**		**37%**		**41%**		**33%**
	System Wide: Ultimate Demand Percentage		**35%**						

Table 7-12
Recycled Water Costs by Project Phase

		Phase IA	Phase I	Phase II	Phase III
Piping Costs		$4,075,000	$7,585,000	$7,853,000	$2,760,000
Pump Station Costs					
Regional WRF Pump Station		$608,000	0	$392,000	
Booster Pump Station				$175,000	
Reservoir Costs	3.0 MG		$3,000,000		
	1.4 MG			$1,320,000	
	1.0 MG			$1,300,000	
Turnout Costs		$105,000		$105,000	
Total Capital Cost		$4,788,000	$10,585,000	$11,145,000	$2,760,000
Annualization Factor		0.0736	0.0736	0.0736	0.0736
Annualized Capital Cost		$352,000	$779,000	$836,000	$203,000
O&M = 18% of ACC		$56,000	$148,000	$150,000	$37,000
Total Annualized Cost		$365,000	$971,000	$987,000	$240,000
Avoided Costs for Supplemental Water for Wildomar System		-$120,000	$0	$0	$0
Net Annualized Cost		$295,000	$919,000	$968,000	$240,000
Water Usage (AFY)		206	260	1,409	350
Cumulative Water Usage (AFY)		206	466	1,875	2,225
Unit Cost per Phase ($/AF)		$ 1,430 /AF	$ 3,530 /AF	$ 690 /AF	$ 690 /AF
Cumulative Unit Cost ($/AF)		$ 1,430 /AF	$ 2,610 /AF	$ 1,160 /AF	$ 1,090 /AF

As shown in Table 7-12, Phase I has the highest incremental cost. This is due to the costs of constructing the backbone infrastructure (such as pump stations and reservoirs) as part of the Phase I system which is utilized by subsequent project phases.

The Phase II system provides a significant increase in the recycled water market, thus lowering the unit cost of service for the Regional recycled water system.

Table 7-12 suggests that the Phase III system infrastructure would be cost effective to include in the Regional recycled water system. However, it is important to note that the Phase III system includes the Lakeside High School (Market SF-12). The high school currently irrigates its fields and landscaped areas using well water. The economic viability of the Phase III system, and hence its timing for implementation, is tied to the high school converting to recycled water use.

Phase IA includes recycled water service to the downtown area, and the inter-tie with the Wildomar system. The pipelines and pump addition from the Regional WRF to the Wildomar System inter-tie are sized to meet the demands of the downtown area and also provided up to 1 mgd of supply through the Wildomar system inter-tie. The unit costs for service depicted in Table 7-12 include the avoided costs for purchased water from Eastern MWD. However, Table

7-12 includes only the Downtown area recycled water demands for Phase IA system–recycled water quantities supplied to the Wildomar system are not included.

7.5 Water Conservation/Reduction

7.5.1 Analysis

To address future demands, the District's Urban Water Management Plan (MWH, 2000) focused on conservation measures, which were projected to result in a three percent demand reduction when all recommendations are implemented. In the District's Distribution System Master Plan (MWH, 2002), a supply deficit was projected but future sources were not identified.

Water conservation measures that are part of the District's plan are:

- Residential plumbing retrofits
- Water system audits, leak detection and repair
- Financial incentives for large landscape irrigation
- Promotion of low water use landscaping
- Promotion of high-efficiency appliances
- ULF toilet replacement program
- Public information to increase water awareness

The District is also a signatory to the California Urban Water Conservation Council (CUWCC) Memorandum of Understanding (CUWCC MOU) for water conservation. As a signatory, the District is committing to implementation of best management practices demand management measures (DMM) to reduce potable water demands. Although use of recycled water is not a DMM, it will be significant with regard to reduction of potable water use.

7.5.2 Impact of Water Conservation/Reduction on Recycling

While conservation measures may help reduce the supply deficit, the measures will unlikely eliminate the deficit. Most likely, both water conservation and recycling will need to be encouraged and promoted in order to eliminate the District's water balance deficit.

7.5.3 Recommendation

The District should continue with their water conservation efforts to achieve its goal of three percent reduction in water supply so that additional water supplies will not be required.

7.5.4 Implementation

The water conservation implementation is outlined in the District's Urban Water Management Plan and in the CUWCC MOU.

Section 8: Recommended Plan

8.1 All Proposed Facilities and Basis for Selection

The proposed facilities as shown on Figure 7-5 are selected based on an analysis of the service area demands, topography and desired operating pressures. The proposed system distributes recycled water throughout the service area and provides a backbone system that could accommodate minimum and maximum demands and allow significant deliveries of recycled water for irrigation.

8.2 Preliminary Design Criteria and Refined Pipeline Routes

The proposed pipelines, pump stations, and storage facilities are sized to meet peak demands of the potential users for Phases IA, I, II, and III. These demands are presented in Section 6. The design criteria for all facilities were presented in Section 7.1. All pipelines will follow the most convenient and lowest cost routes which have been described previously.

8.3 Cost Estimate Based on Time of Construction

The cost estimate based on the anticipated year of construction for recycled water delivery as described in Section 7.4, is presented in Table 8-1.

Table 8-1
Recycled Water Costs by Project Phase

	Estimated 2006 Costs	Estimated Year Construction Begins	Estimated Costs at Time of Construction*
Phase IA	$4,788,000	2015	$6,553,000
Phase I	$10,585,000	2019	$16,947,000
Phase II	$11,145,000	2021	$19,300,000
Phase III	$2,760,000	2024	$5,376,000

*****Escalated at 4%

8.4 All Potential Users

The same quantity and peak demand for the potential users described in Sections 6.2 and 7.4 are being used for design purposes. The largest collective potential users are parks and schools. Because of this, agreements with the Lake Elsinore Unified School District are under discussion.

8.5 Reliability of Facilities as Compared to User Requirements

All facilities for the recycled water project will be designed and sized to meet user requirements. As part of this, an appropriate level of reliability is designed into the proposed recycled water system, such as standby pumping, appropriate use of peaking factors and other design criteria. However, the level of reliability for the recycled water system is not as high as if for potable water, which serves facilities such as hospitals or schools. For example, the recycled water system does not include fire flow storage for its reservoirs or stand by power for its pump stations.

8.6 Implementation Plan

8.6.1 Coordination with Water/Recycled Water Suppliers

As discussed in Section 4, the District owns the water reclamation facilities and the recycled water so there should already be an existing coordination protocol in place to communicate between the staff at the water reclamation facilities and staff in the field as water quality, water quantity and operation & maintenance issues arise.

8.6.2 Ability and Timing of Users to Join System

The District anticipates adopting a mandatory use ordinance for recycled water in 2006, which will be forwarded to the State Board after adoption. A copy of the draft ordinance is included in Appendix B.

8.6.3 Tentative Water Recycling Requirements of RWQCB

See Section 5.1.

8.6.4 Commitments from Potential Users

A meeting was held between the Lake Elsinore Unified School District (School District) and the District. The School District was interested in using recycled water at all of their 22 existing and 5 future school sites for irrigation. The School District's main concern was cost and to alleviate those concerns, EVMWD is planning to discount the price of recycled water and also assist customers with retrofits. The developers of the John Laing Homes project which is to occur in the future phases has indicated their interest with the letter found in Appendix C.

The District is likely to assist in funding the onsite retrofits to facilitate using the recycled water.

8.6.5 Water Rights Impact

As discussed in Section 4, the District will own the water reclamation facilities and the recycled water system so no impacts to water rights are expected. The SWRCB's Division of Water

Rights was contacted and a preliminary interview indicated that there would be no impacts concerning water rights due to the implementation of the proposed project.

8.6.6 Permits, Right-of-Way, Design, and Construction

Pipeline construction will require encroachment permits from the City of Lake Elsinore. Also, land for the proposed reservoirs will have to be purchased either from the City or negotiated with the area developers.

Encroachment permits for all work within the public rights-of-way will be needed from each involved agency prior to commencement of any construction. All traffic control requirements will be complied with.

The California DHS Title 22 review and inspection will be completed, as necessary. The District has already adopted their Recycled Water Rules and Regulations in accordance with Title 22 regulations.

The resolution adopting the environmental document as required under California Environmental Quality Act (CEQA) for the selected project is shown in Appendix D.

8.6.7 Land Use

The City of Lake Elsinore and the County of Riverside are responsible for adoption of the area's general plan. Generally, the selected project is consistent with the land use of the general plans because most of the specific plans for the developers have already been adopted by the City of Lake Elsinore and/or the County of Riverside.

8.6.8 Detailed Schedule

A detailed schedule has been prepared and is attached as Figure 8-1 for Phases IA through III.

8.7 Operational Plan

8.7.1 Responsible People

The District currently has an existing recycled water operations staff at the Horsethief Canyon WRF and Canyon Hills WWTP. To accommodate the Regional recycled water project, the existing staff will be given increased responsibility and appropriate staff will be assigned, including a backflow prevention technician. A copy of the District's recycled water system rules and regulations is included as Appendix E.

8.7.2 Necessary Equipment

Since the District already operates the recycled water, treatment facility and other recycled water systems, all the necessary equipment is already available or will be purchased as necessary for expanding the District's O&M capacity.

8.7.3 Monitoring

The Regional Board requires wastewater treatment plants (Producers) to develop and implement a water reuse monitoring program as part of the General Water Reuse Requirements Order No. 2000-165. The reuse monitoring program requirements for the Regional WRF recycled water are discussed in Section 5.7.3.

8.7.4 Irrigation Scheduling

For all potential users, irrigation scheduling should not change from the way they currently operate. The majority of the users will irrigate from 9 p.m. to 6 a.m., which will minimize interference with recreation but also minimizes evapotranspiration and improve irrigation efficiency and reduce waste. During periods of high temperatures, additional irrigation may occur outside this 9-hour window to allow for longer irrigation to compensate for higher evapotranspiration.

These irrigation schedules are discussed in detail in EVMWD's Recycled Water Rules and Regulations.

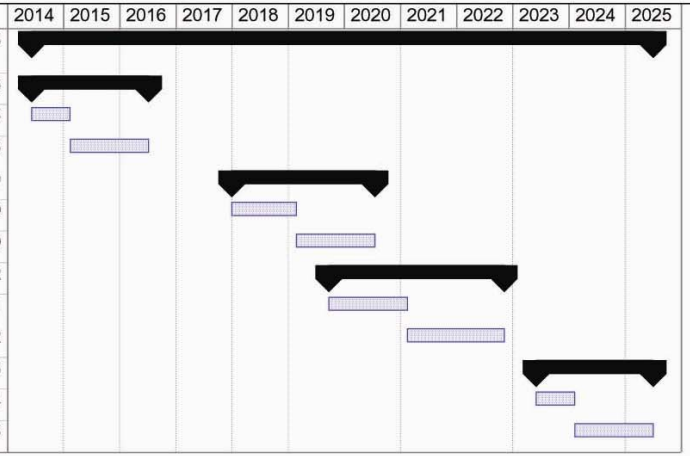
8.7.5 On-site Retrofits

Recently completed developments and all future developments identified for recycled water services (such as Rosetta Canyon and Alberhill Ranch) are being constructed with dual piping systems for irrigation using recycled water once the Regional Recycled Water System is completed.

Existing potable water customers that have not been constructed with dual piping systems will be retrofitted in compliance with all DHS requirements to allow landscape irrigation with recycled water. Future recycled water surveys will identify the piping modifications and inspections needed to ensure appropriate piping separations.

Figure 8-1
Elsinore Valley Municipal Water District
Regional Recycled Water Project Schedule
Phases IA-III

ID	Task Name	Duration	Start	Finish
1	**Schedule Design and Construction**	**2890 days**	**Mon 6/9/14**	**Fri 7/4/25**
2	**Phase IA Project**	**545 days**	**Mon 6/9/14**	**Fri 7/8/16**
3	Design	180 days	Mon 6/9/14	Fri 2/13/15
4	Construction	365 days	Mon 2/16/15	Fri 7/8/16
5	**Phase I Project**	**665 days**	**Tue 1/2/18**	**Mon 7/20/20**
6	Design	300 days	Tue 1/2/18	Mon 2/25/19
7	Construction	365 days	Tue 2/26/19	Mon 7/20/20
8	**Phase II Project**	**815 days**	**Wed 9/25/19**	**Tue 11/8/22**
9	Design	365 days	Wed 9/25/19	Tue 2/16/21
10	Construction	450 days	Wed 2/17/21	Tue 11/8/22
11	**Phase III Project**	**545 days**	**Mon 6/5/23**	**Fri 7/4/25**
12	Design	180 days	Mon 6/5/23	Fri 2/9/24
13	Construction	365 days	Mon 2/12/24	Fri 7/4/25



Project: Project1-rev1
Date: Fri 5/19/06

Task
Split
Progress
Milestone
Summary
Project Summary
External Tasks
External Milestone
External Milestone
Deadline

Section 9: Construction Financing Plan and Revenue Program

9.1 Sources and Timing of Funds for Design and Construction

The Phase IA, I, II, and III projects for the Regional service area are significant projects for the District in meeting its water needs. The District has established a recycled water capital reserve from connection fees collected from new developments. The capital reserve, in addition to issuances of certificates of participation, is critical for design and construction of these projects. A draft annual revenue program for Phases IA through III is discussed below.

9.1.1 Overview of Revenue Program and Construction Financing Plan

The District's Regional recycled water project will provide recycled water for irrigation at the facilities listed in Table 6-1.

9.1.1.1 Revenue Program for EVMWD Regional FPR

The District anticipates funding Phases IA through III of the Regional recycled water project through a combination of cash reserves specifically earmarked for recycled water projects, additional income from connection fees and interest, and from certificates of participation. Table 9-1 identifies the preliminary revenue program of the project. This revenue program does not include recycled water deliveries to the Wildomar area.

9.1.1.2 Construction Financing Plan

Table 9-2 provides a monthly cash flow that forecasts expenses during design and construction for Phases IA through III. The District will sell bonds to finance the Regional construction costs.

Table 9-1
Regional Recycled Water Project Revenue Program

Year of Operation	Calendar Year	Potable Water Rate[1] $/CCF	RW Rate[2] for All Phases $/CCF	O&M[3] Costs $000	RW[4] Revenue $000	RW Income $000	Cumulative Income $000
1	2016	2.68	2.14	103	192	89	89
2	2017	2.79	2.23	108	200	92	182
3	2018	2.90	2.32	113	208	95	276
4	2019	3.01	2.41	119	216	97	374
5	2020	3.13	2.51	402	509	107	481
6	2021	3.26	2.61	422	529	107	588
7	2022	3.39	2.71	766	2,215	1,449	2,037
8	2023	3.53	2.82	804	2,304	1,500	3,536
9	2024	3.67	2.93	845	2,396	1,551	5,087
10	2025	3.81	3.05	980	2,957	1,977	7,064
11	2026	3.97	3.17	1,029	3,075	2,046	9,109
12	2027	4.12	3.30	1,081	3,198	2,117	11,226
13	2028	4.29	3.43	1,135	3,326	2,191	13,417
14	2029	4.46	3.57	1,192	3,459	2,267	15,685
15	2030	4.64	3.71	1,251	3,597	2,346	18,030
16	2031	4.83	3.86	1,314	3,741	2,427	20,457
17	2032	5.02	4.01	1,380	3,891	2,511	22,969
18	2033	5.22	4.18	1,449	4,047	2,598	25,567
19	2034	5.43	4.34	1,521	4,208	2,687	28,254

[1] Potable water rates are based on estimates in Section 3.2.1 assuming the 2005 landscape irrigation rate in the Elsinore.

[2] Assumes recycled water rate is 80% of potable rate.

[3] Assumes Phase IA is in operation in Year 1 and Phase I, II, and III are in operation in Years 5, 7, and 10, respectively. O&M is escalated at 5%.

[4] Revenue based on sales of 206 AFY for Phase IA, 260 AFY for Phase I, 1,409 AFY for Phase II, and 350 AFY for Phase III.

Table 9-2
Monthly Cash Flow Analysis

Phase	Total Cost [(1)]	Begin Construction	End Construction	Duration (mo)	Ave. Cost per mo.	Ave. 3 mo. Cost
IA	$6,552,709	1-Feb-2015	8-Jul-2016	17	$385,453	$1,156,360
I	$16,946,926	26-Feb-2019	20-Jul-2020	17	$996,878	$2,990,634
II	$19,299,534	17-Feb-2021	8-Nov-2022	21	$919,025	$2,757,076
III	$5,376,205	12-Feb-2024	4-Jul-2025	17	$316,247	$948,742
	Phase IA	**Phase I**	**Phase II**	**Phase III**	**Total/Year**	
Feb-15	$1,156,360					
May-15	$1,156,360					
Aug-15	$1,156,360					
Nov-15	$1,156,360				$4,625,441	
Feb-16	$1,156,360					
May-16	$770,909				$1,927,267	
Feb-19		$2,990,634				
May-19		$2,990,634				
Aug-19		$2,990,634				
Nov-19		$2,990,634			$11,962,536	
Feb-20		$2,990,634				
May-20		$1,993,756			$4,984,390	
Feb-21			$2,757,076			
May-21			$2,757,076			
Aug-21			$2,757,076			
Nov-21			$2,757,076		$11,028,305	
Feb-22			$2,757,076			
May-22			$2,757,076			
Aug-22			$2,757,076		$8,271,229	
Feb-24				$948,742		
May-24				$948,742		
Aug-24				$948,742		
Nov-24				$948,742	$3,794,968	
Feb-25				$948,742		
May-25				$632,495	$1,581,237	
Totals	$6,552,709	$16,946,926	$19,299,534	$5,376,205	**$48,175,374**	

[1] Total construction costs have been escalated to the mid-point of the year of construction as shown on Table 8-1.

9.2 Pricing Policy for Recycled Water

The price that the District will charge its potential users has not been fully defined at this time, but will be discounted slightly from the price of potable water to encourage users to take advantage of the recycled water.

9.3 Water Pollution Control Costs

The water pollution control costs are already accounted for in the cost of the sanitary sewer collection and tertiary treatment facilities. No additional water pollution control cost is expected for the delivery of recycled water.

9.4 Annual Projections

9.4.1 Fresh Water Prices

The District's water pricing details are discussed in Section 3.2.1.

9.4.2 Recycled Water Used

In Section 8.6.7, the estimated dates for the construction completion for each phase are shown. This schedule assumes that funding is available to complete all phases of the project. With construction phases being completed over the course of 12 years, from 2014 to 2025, the recycled water use will increase over those years. The recycled water use for each year is shown in Table 9-3.

Table 9-3
Recycled Water Annual Use

Date	Recycled Water Use		Cumulative Recycled Water Use	
	AFY	MGD	AFY	MGD
2016[1]	206	0.18	206	0.18
2017	0	0.00	206	0.18
2018	0	0.00	206	0.18
2019	0	0.00	206	0.18
2020	260	0.23	466	0.42
2021	0	0.00	466	0.42
2022	1,409	1.26	1,875	1.67
2023	0	0.00	1,875	1.67
2024	0	0.00	1,875	1.67
2025	350	0.31	2,225	1.99
2026	0	0.00	2,225	1.99
2027	0	0.00	2,225	1.99

[1] Phase IA projected to be operating in 2016.

9.4.3 Annual Costs of Recycling Project

For approximately the first twenty years, the users will likely be paying the initial capital costs for the construction of the recycled water facilities as well as the O&M costs. Thereafter, the annual costs of the recycled water project will be the O&M costs only. These costs are described in Section 7.4.

9.4.4 Allocation of Costs to Users

The costs of the O&M for delivery of recycled water will be included in the price that potential users will pay for a unit of water. As stated in Section 9.2, this price has not yet been confirmed but is anticipated to be less than potable water. In addition, new users to the system may be charged a connection fee.

9.4.5 Unit Costs to Serve Users

The only category of users is irrigation. See Section 7.3.1.

9.4.6 Unit Price of Recycled Water

The unit price of recycled water can be expected to rise over the years as costs of operations and maintenance increases. In addition, it is likely that if the potable rate increases, the same percentage increase would be applied to the recycled water prices.

9.4.7 Sensitivity Analysis to Underutilization of Recycled Water

These projects are not particularly sensitive to the underutilization of water because all the users identified are existing users that are already using potable water. If the users do not use recycled water, they will still have to use potable water. In addition to the existing users, there are several proposed residential users, which the District has a high level of confidence will be successful in moving forward with their development to use the recycled water when available. A letter of interest from the largest developer (John Laing Homes) is found in Appendix D. Since the District is planning to serve existing users with recycled water and the area is such a high-growth area where the potable water is a limited resource, this project is not sensitive to underutilization of recycled water in Phases IA through III.

9.5 Sunk Costs and Indebtedness

The District has established funding for this project through the connection fee program. Funding to recover capital will also likely occur from commodity charges for recycled water which have yet to be set. There are minimal sunk costs currently associated with the project. The District plans to issue certificates of participation (COP) to raise funds for the project. These COPs are expected to be repaid at a rate of 4% over 30 years.

Section 10: References

2003 Consumer Confidence Report, Elsinore Valley Municipal Water District.

Administrative Draft: Draft Environmental Impact Report – Distribution System Master Plan and Wastewater Master Plan, Montgomery Watson Harza, June 2005.

California Health Laws Related to Recycled Water, "The Purple Book", Excerpts from the Health and Safety Code, Water Code, and Titles 22 and 17 of the California Code of Regulations, California Department of Health Services, June 2001.

Draft Report, Title 22 Engineering Report for the Temescal Division Agricultural System, Montgomery Watson Harza, February 2004.

District-wide Water Supply Assessment Final Report, Elsinore Valley Municipal Water District, August 2005.

EVMWD 2004 Standard Specification for Water and Recycled Water Requirements.

EVMWD Alberhill Water and Wastewater Facilities Participant Study, Kennedy/Jenks, April 2005.

EVMWD Distribution System Master Plan, MWH, May 2002.

EVMWD Groundwater Management Plan, MWH, 2005.

EVMWD John Laing Homes Community Development Water Supply Assessment, MWH, October 2003.

Plan of Study Proposal Approval; Elsinore Valley Municipal Water District (District); Regional Service Area Recycled Water Project Study (Study); Water Recycling Construction Program Project No. WRCP-3814-010, Letter from State Water Resources Control Board, July 2004.

Title 22 Engineering Report for the Regional Wastewater Reclamation Facilities Expansion to 8 MGD, Montgomery Watson Harza, August 2002.

Waste Discharge and Producer/User Water Recycling Requirements for Elsinore Valley Municipal Water District, Regional Water Reclamation Facility, Riverside County – Order No. R8-2005-0003 (NPDES CA8000027), California Regional Water Quality Control Board, Santa Ana Region, March 2005.

Wastewater Master Plan, Final Draft Report, Kennedy/Jenks, June 2003.

Water Recycling Funding Program Guidelines, State Water Resources Control Board, October 2004.

Water Quality Control Plan for Santa Ana River Basin Plan, RWQCB, 1995.

Wildomar Recycled Water Project: Facilities Planning Report, Kennedy/Jenks, January 2005.

Wildomar Service Area Recycled Water Master Plan, Kennedy/Jenks June 2004.

Appendix A

Annual and Peak Irrigation Usage of Potential Recycled Water Users

Appendix A - Annual and Peak Irrigation Usage of Potential Recycled Water Users

Site Code	Customer Name	Service Address	City	Zip Code	Meter Number	Account Number (APN)	User Code	Average CCF	Average AF/Y	Average Month MGD	Max Month Avg Day MGD	Max Month Peak Day MGD	Max Month Peak Hour MGD
	LAKE ELSINORE UNIFIED SCHOOL DISTRICT (DISTRICT OFFICE)	545 CHANEY ST	LAKE ELSINORE	92530	046-104-3	377151001	999	1445	3.32	0.004	0.006	0.010	0.027
	LAKE ELSINORE UNIFIED SCHOOL DISTRICT (DISTRICT OFFICE)	565 CHANEY ST	LAKE ELSINORE	92330	046-103-3	377151001	999	652	1.50	0.002	0.003	0.005	0.012
	LAKE ELSINORE UNIFIED SCHOOL DISTRICT (DISTRICT OFFICE)	550 BIRCH ST	LAKE ELSINORE	92530	405-1615-6	377151017	999	377	0.87	0.001	0.002	0.003	0.007
S-1								**2474**	**5.69**	**0.006**	**0.010**	**0.017**	**0.046**
S-2	BUTTERFIELD ELEMENTARY SCHOOL	16275 GRAND AVE	LAKE ELSINORE	92530	430-153-2	386140008	903	6657	15.31	0.016	0.028	0.047	0.125
	ELSINORE ELEMENTARY SCHOOL	409 W HEALD AVE	LAKE ELSINORE	92530	405-0409-1	374152003	999	2601	5.98	0.006	0.011	0.018	0.049
	ELSINORE ELEMENTARY SCHOOL	501 W SUMNER AVE	LAKE ELSINORE	92530	404-1615-1	374053025	999	1303	3.00	0.003	0.005	0.009	0.024
	ELSINORE ELEMENTARY SCHOOL	207 N LANGSTAFF ST	LAKE ELSINORE	92530	123-0207-0		999	3582	8.24	0.009	0.015	0.025	0.067
S-3								**7486**	**17.22**	**0.018**	**0.031**	**0.053**	**0.140**
S-4	RICE CANYON ELEMENTARY SCHOOL	29535 WESTWIND	LAKE ELSINORE	92530	185-938-1	391560011	999	13538	31.14	0.033	0.057	0.095	0.254
S-5	MACHADO ELEMENTARY SCHOOL *	15150 JOY ST	LAKE ELSINORE	92530	120-1043-1	379370022	999	0	0.00	0.000	0.000	0.000	0.000
S-6	WITHROW ELEMENTARY SCHOOL	30100 AUDELO ST	LAKE ELSINORE	92330	153-483-1	387030009	999	16400	37.72	0.040	0.069	0.115	0.308
S-7	RAILROAD CANYON ELEMENTARY SCHOOL	1300 MILL ST	LAKE ELSINORE	92530	039-1594-1	363540015	999	11040	25.39	0.027	0.046	0.078	0.207
	TUSCANY HILLS ELEMENTARY SCHOOL	BOX #10 30 SUMMERHILL DR	LAKE ELSINORE	92532	TH-208-3		999	13278	30.54	0.033	0.054	0.091	0.242
	TUSCANY HILLS ELEMENTARY SCHOOL	23 PONTE RUSSO	LAKE ELSINORE	92532	TH-305-1	349280032	999	5480	12.60	0.013	0.023	0.039	0.103
S-8								**18758**	**43.14**	**0.046**	**0.077**	**0.129**	**0.345**
	ELSINORE MIDDLE SCHOOL	1203 W GRAHAM AVE	LAKE ELSINORE	92530	407-9072-1	374181001	999	12297	28.28	0.030	0.051	0.086	0.231
	ELSINORE MIDDLE SCHOOL	115 N LEWIS ST	LAKE ELSINORE	92530	117-0115-2		999	7142	16.43	0.018	0.030	0.050	0.134
S-9								**19439**	**44.71**	**0.048**	**0.081**	**0.137**	**0.365**
	TERRA COTTA MIDDLE SCHOOL	29291 LAKE ST	LAKE ELSINORE	92330	110-360-4	389040063	999	31931	73.44	0.079	0.134	0.224	0.599
	TERRA COTTA MIDDLE SCHOOL	29291 ROBB RD	LAKE ELSINORE	92530	110-102-1	389040063	999	9582	22.04	0.024	0.040	0.067	0.180
S-10								**41513**	**95.48**	**0.102**	**0.174**	**0.292**	**0.779**
SF-11	EDGE DEVELOPMENT INC (LAKELAND VILLAGE MIDDLE)	18663 GRAND AVE	LAKE ELSINORE	92530	100-007-20	0	905	1811	4.17	0.004	0.007	0.012	0.033
	EDGE DEVELOPMENT, INC (LAKESIDE HIGH SCHOOL) **	32693 RIVERSIDE DR	LAKE ELSINORE	92530	100-111-27		905	8220	18.91	0.020	0.034	0.058	0.154
	EDGE DEVELOPMENT, INC (LAKESIDE HIGH SCHOOL) **	32693 RIVERSIDE DR	LAKE ELSINORE	92530	100-042-10		905	2225	5.12	0.005	0.009	0.016	0.042
	LAKESIDE HIGH SCHOOL **	32693 RIVERSIDE ST	LAKE ELSINORE	92530	130-065-5	379050031	999	18609	42.80	0.046	0.078	0.131	0.349
SF-12								**29054**	**66.83**	**0.072**	**0.122**	**0.204**	**0.545**
S-13	TEMESCAL CANYON HIGH SCHOOL	28551 EL TORO RD	LAKE ELSINORE	92530	110-718-2	389210032	999	38425	88.38	0.095	0.161	0.270	0.721
	ORTEGA CONTINUATION HIGH SCHOOL	520 CHANEY ST	LAKE ELSINORE	92530	046-1657-1	377160031	999	10480	24.10	0.026	0.044	0.074	0.197
	ORTEGA CONTINUATION HIGH SCHOOL	530 CHANEY ST	LAKE ELSINORE	92530	046-1662-1	377160033	999	1165	2.68	0.003	0.005	0.008	0.022
S-14								**11645**	**26.78**	**0.029**	**0.049**	**0.082**	**0.218**

* MACHADO ELEMENTARY SCHOOL SHARES FIELD WITH CITY OF LAKE ELSINORE'S MACHADO SCHOOL PARK

** LEUSD IS ALREADY WATERING SOME FIELDS AS EDGE DEVELOPMENT FINISHES CONSTRUCTION.

C-1	ELSINORE VALLEY CEMETERY	18170 COLLIER AVE	LAKE ELSINORE	92530	910-595-1	377050077	209	29000	66.70	0.071	0.121	0.204	0.544
	LATTER DAY SAINTS CHURCH	18220 DEXTER AVE	LAKE ELSINORE	92530	930-806-1	377040020	999	3500	8.05	0.009	0.015	0.025	0.066
	LATTER DAY SAINTS CHURCH	18220 DEXTER AVE	LAKE ELSINORE	92530	930-804-1	377040020	911	158	0.36	0.000	0.001	0.001	0.003
CH-1								**3658**	**8.41**	**0.009**	**0.015**	**0.026**	**0.069**

Appendix A - Annual and Peak Irrigation Usage of Potential Recycled Water Users

Site Code	Customer Name	Service Address	City	Zip Code	Meter Number	Account Number (APN)	User Code	Average CCF	Average AF/Y	Average Month MGD	Max Month Avg Day MGD	Max Month Peak Day MGD	Max Month Peak Hour MGD
P-1	CITY OF LAKE ELSINORE (CITY PARK)	243 S MAIN ST	LAKE ELSINORE	92530	126-9243-0	0	903	4631	10.65	0.011	0.019	0.033	0.087
P-2	CITY OF LAKE ELSINORE (COMMUNITY CENTER)	GRAHAM AVE	LAKE ELSINORE	92530	307-1288-1	374261026	999	4186	9.63	0.010	0.018	0.029	0.079
	CITY OF LAKE ELSINORE (DIAMOND FIELD)	500 DIAMOND DR	LAKE ELSINORE	92530	640-406-3	373210040	999	4486	10.32	0.011	0.019	0.032	0.084
	CITY OF LAKE ELSINORE (DIAMOND FIELD)	500 DIAMOND DR	LAKE ELSINORE	92530	640-408-3		999	4468	10.28	0.011	0.019	0.031	0.084
	CITY OF LAKE ELSINORE (DIAMOND FIELD)	500 DIAMOND DR	LAKE ELSINORE	92530	640-407-3		999	7048	16.21	0.017	0.029	0.050	0.132
	CITY OF LAKE ELSINORE (DIAMOND FIELD)	500 DIAMOND DR	LAKE ELSINORE	92530	640-406-3	0	999	0	0.00	0.000	0.000	0.000	0.000
P-3									**36.81**	**0.039**	**0.067**	**0.112**	**0.300**
	CITY OF LAKE ELSINORE (ELK GROVE PARK)	LAKESHORE DR (GREENBELT)	LAKE ELSINORE	92330	110-400-2		999	1199	2.76	0.003	0.005	0.008	0.023
	CITY OF LAKE ELSINORE (ELK GROVE PARK)	600 LAKESHORE DR	LAKE ELSINORE	92530	011-0600-2	374301002	903	3203	7.37	0.008	0.013	0.023	0.060
	CITY OF LAKE ELSINORE (ELK GROVE PARK)	LAKESHORE DR	LAKE ELSINORE	92330	110-141-1	374301006	999	414	0.95	0.001	0.002	0.003	0.008
	CITY OF LAKE ELSINORE (ELK GROVE PARK)	500 LAKESHORE DR	LAKE ELSINORE	92530	009-1711-1	374301006	999	1528	3.51	0.004	0.006	0.011	0.029
	CITY OF LAKE ELSINORE (ELK GROVE PARK)	500 LAKESHORE DR	LAKE ELSINORE	92330	222-0000-0		999	9	0.02	0.000	0.000	0.000	0.000
P-4								**6353**	**14.61**	**0.016**	**0.027**	**0.045**	**0.119**
P-5	CITY OF LAKE ELSINORE (MACHADO SCHOOL PARK)	15150 JOY ST	LAKE ELSINORE	92530	120-520-1	0	903	6196	14.25	0.015	0.026	0.044	0.116
	CITY OF LAKE ELSINORE (MCVICKER CANYON PARK)	30001 GRAND AVE	LAKE ELSINORE	92530	175-468-1	0	999	2358	5.42	0.006	0.010	0.017	0.044
	CITY OF LAKE ELSINORE (MCVICKER CANYON PARK)	29355 GRAND AVE	LAKE ELSINORE	92531	185-434-2	391260032	903	20125	46.29	0.050	0.084	0.141	0.378
P-6								**22483**	**51.71**	**0.055**	**0.094**	**0.158**	**0.422**
P-7	CITY OF LAKE ELSINORE (LAKEPOINT PARK)	420 E LAKESHORE DR	LAKE ELSINORE	92530	350-4200-1	373300027	903	14945	34.37	0.037	0.063	0.105	0.280
P-8	CITY OF LAKE ELSINORE (OAK TREE PARK)	LINCOLN ST	LAKE ELSINORE	92530	185-128-2	0	999	5715	13.14	0.014	0.024	0.040	0.107
P-9	CITY OF LAKE ELSINORE (SUMMERHILL PARK)	BOX #2 100 SUMMERHILL DR	LAKE ELSINORE	92532	TH-339-1	363263016	999	4212	9.69	0.010	0.018	0.030	0.079
P-10	CITY OF LAKE ELSINORE (SUMMER LAKE PARK)	900 W BROADWAY ST	LAKE ELSINORE	92530	185-101-2		999	589	1.35				
P-11	CITY OF LAKE ELSINORE (SWICK & MATICH PARK)	402 LIMITED	LAKE ELSINORE	92330	009-0402-0	374254002	903	5715	13.14	0.014	0.024	0.040	0.107
P-12	CITY OF LAKE ELSINORE (YARBOROUGH PARK)	419 N POE ST	LAKE ELSINORE	92530	122-0419-0	0	903	5168	11.89	0.013	0.022	0.036	0.097
	ROSETTA CANYON *	HWY 74 & TRELLIS LN	LAKE ELSINORE	92532	100-002-14	0	905	41845	96.24	0.103	0.175	0.294	0.785
	ROSETTA CANYON *	OHANA & CAMINO DEL NORTE	LAKE ELSINORE	92530	100-320-9	0	905	0	0.00	0.000	0.000	0.000	0.000
	ROSETTA CANYON *	HWY 74 & RAMSGATE DR	LAKE ELSINORE	92530	100-145-6	0	905	0	0.00	0.000	0.000	0.000	0.000
RF-1								**134106**	**309.00**	**0.103**	**0.175**	**0.294**	**0.785**
R-2	HARBOR GRAND APARTMENTS	15120 GRAND AVE	LAKE ELSINORE	92530	155-508-2	379050035	999	5970	13.73	0.015	0.025	0.042	0.112
R-3	LAKE COUNTRY VILLAS	617 WALNUT DR	LAKE ELSINORE	92587	135-112-3	379161001	999	1633	3.76	0.004	0.007	0.011	0.031
	SHORE POINTE	29191 SUNSWEPT DR	LAKE ELSINORE	92530	185-1142-2		999	4410	10.14	0.011	0.018	0.031	0.083
	SHORE POINTE	29151 1/2 GRAND AVE	LAKE ELSINORE	92530	185-1143-2		999	1992	4.58	0.005	0.008	0.014	0.037
	SHORE POINTE	29126 SUNSWEPT	LAKE ELSINORE	92530	185-1179-2		999	0	0.00	0.000	0.000	0.000	0.000
	SHORE POINTE	29117 SUNSWEPT	LAKE ELSINORE	92530	185-1180-2		999	0	0.00	0.000	0.000	0.000	0.000
	SHORE POINTE	29151 SUNSWEPT DR	LAKE ELSINORE	92530	185-1159-2		999	0	0.00	0.000	0.000	0.000	0.000
R-4								**6402**	**14.72**	**0.016**	**0.027**	**0.045**	**0.120**
	WALNUT GROVE APARTMENTS	16460 JOY ST	LAKE ELSINORE	92330	120-1011-4	379131018	999	939	2.16	0.002	0.004	0.007	0.018
	WALNUT GROVE APARTMENTS	16460 JOY ST	LAKE ELSINORE	92530	120-1012-4	379131018	999	802	1.84	0.002	0.003	0.006	0.015
	WALNUT GROVE APARTMENTS	16460 JOY ST	LAKE ELSINORE	92530	120-1010-5	379131018	999	711	1.64	0.002	0.003	0.005	0.013
R-5								**2452**	**5.64**	**0.006**	**0.010**	**0.017**	**0.046**
RF-6	ALBERHILL RANCH **		LAKE ELSINORE	92530			999	208200	478.00	0.512	0.869	1.461	3.900
RF-7	LAKE ELSINORE VALLEY **		LAKE ELSINORE	92530			999	28644	66.00	0.071	0.120	0.202	0.538
RF-8	LA LAGUNA **		LAKE ELSINORE	92530			999	61628	142.00	0.152	0.258	0.434	1.159
RF-9	JOHN LAING HOMES EAST LAKE **		LAKE ELSINORE	92530			999	531900	1221.00	1.308	2.221	3.731	9.962

* TOTAL USAGE IS ANTICIPATED DEMAND. DEVELOPMENT IS UNDER CONSTRUCTION, AND METERS LISTED ARE USED FOR CCONSTRUCTION IRRIGATION.
** ANTICIPATED DEMAND. REFER TO SECTION 5.2.2 FOR CALCULATION METHODS.

Appendix A - Annual and Peak Irrigation Usage of Potential Recycled Water Users

Site Code	Customer Name	Service Address	City	Zip Code	Meter Number	Account Number (APN)	User Code	Average CCF	Average AF/Y	Average Month MGD	Max Month Avg Day MGD	Max Month Peak Day MGD	Max Month Peak Hour MGD
I-1	ARCO AM / PM	19930 COLLIER AVE	LAKE ELSINORE	92530	910-602-1	389200030	999	3248	7.47	0.008	0.014	0.023	0.061
	CENTRAL BUSINESS PARK	601 D CRANE ST	LAKE ELSINORE	92330	046-1609-3	377410006	999	3485	8.01	0.009	0.015	0.024	0.065
	CENTRAL BUSINESS PARK	570 J CENTRAL AVE	LAKE ELSINORE	92330	046-1605-4	377410025	999	1673	3.85	0.004	0.007	0.012	0.031
	CENTRAL BUSINESS PARK	570 CENTRAL AVE	LAKE ELSINORE	92330	046-1604-3	377410037	999	499	1.15	0.001	0.002	0.004	0.009
I-2								**5657**	**13.01**	**0.014**	**0.024**	**0.040**	**0.106**
I-3	D AND D CATTLE COMPANY	18501 COLLIER AVE	LAKE ELSINORE	92530	910-931-1	377151061	999	834	1.92	0.002	0.003	0.006	0.016
I-4	DOUGLAS BURGERS #23	18461 DEXTER AVE	LAKE ELSINORE	92531	930-809-1	377030075	999	1026	2.36	0.003	0.004	0.007	0.019
I-5	JACK IN THE BOX / 003182	31650 RIVERSIDE DR	LAKE ELSINORE	92530	120-1037-2	379120012	999	1655	3.81	0.004	0.007	0.012	0.031
I-6	LAKE ELSINORE SELF STORAGE	29151 RIVERSIDE ST	LAKE ELSINORE	92330	910-480-2	377050073	999	1150	2.65	0.003	0.005	0.008	0.022
	MERCURY MARKING DEVICE	600 B 3RD ST	LAKE ELSINORE	92530	405-1668-1	377151064	999	553	1.27	0.001	0.002	0.004	0.010
	MERCURY MARKING DEVICES	600 3RD ST	LAKE ELSINORE	92530	405-1666-1	377151064	999	868	2.00	0.002	0.004	0.006	0.016
I-7								**1421**	**3.27**	**0.004**	**0.006**	**0.010**	**0.027**
I-8	MOBIL OIL SS18 AAH	29300 CENTRAL AVE	LAKE ELSINORE	92532	910-541-1	377030057	999	1107	2.55	0.003	0.005	0.008	0.021
	NEAR CAL CORPORATION	CRANE ST	LAKE ELSINORE	92530	100-113-16	377140012	905	1024	2.36	0.003	0.004	0.007	0.019
	NEAR-CAL CORPORATION	512 CHANEY ST	LAKE ELSINORE	92530	046-1654-1	377160037	999	821	1.89	0.002	0.003	0.006	0.015
I-9								**1845**	**4.25**	**0.005**	**0.008**	**0.013**	**0.035**
	PRIME OUTLETS (LAKE ELSINORE OUTLETS)	17600 BOX 20 BLDG K COLLIER AVE	LAKE ELSINORE	92530	910-596-1	389612007	999	758	1.74	0.002	0.003	0.005	0.014
	PRIME OUTLETS (LAKE ELSINORE OUTLETS)	17600 BOX 18 BLDG J COLLIER AVE	LAKE ELSINORE	92530	910-597-1	389612007	999	7995	18.39	0.020	0.033	0.056	0.150
								8753	**20.13**	**0.022**	**0.037**	**0.062**	**0.164**
	PRIME OUTLETS (LAKE ELSINORE OUTLETS)	17600 BOX 4 PH I LANDSCAPE COLLIER	LAKE ELSINORE	92530	910-561-1	389210052	999	4540	10.44	0.011	0.019	0.032	0.085
	PRIME OUTLETS (LAKE ELSINORE OUTLETS)	17600 BOX 13 PH II CRIBWALL COLLIER	LAKE ELSINORE	92530	910-560-1	389210052	999	3163	7.27	0.008	0.013	0.022	0.059
	PRIME OUTLETS (LAKE ELSINORE OUTLETS)	17600 BOX 7 PH I CRIBWALL COLLIER	LAKE ELSINORE	92530	910-563-1	389210052	999	2684	6.17	0.007	0.011	0.019	0.050
	PRIME OUTLETS (LAKE ELSINORE OUTLETS)	17600 BOX 25 PH II LANDSCAPE COLLIER	LAKE ELSINORE	92530	910-562-1	389210052	999	2540	5.84	0.006	0.011	0.018	0.048
	PRIME OUTLETS (LAKE ELSINORE OUTLETS)	17600 BOX 26 PH II COURTYARD COLLIER	LAKE ELSINORE	92530	910-575-1	389210052	999	1288	2.96	0.003	0.005	0.009	0.024
	PRIME OUTLETS (LAKE ELSINORE OUTLETS)	17600 BOX 5 PH I COURTYARD COLLIER	LAKE ELSINORE	92530	910-564-1	389210052	999	1149	2.64	0.003	0.005	0.008	0.022
	PRIME OUTLETS (LAKE ELSINORE OUTLETS)	17600 BOX 23 COLLIER AVE	LAKE ELSINORE	92530	910-582-1		999	786	1.81	0.002	0.003	0.006	0.015
								16150	**37.13**	**0.040**	**0.068**	**0.113**	**0.303**
I-10								**24903**	**57.26**	**0.061**	**0.104**	**0.175**	**0.467**
I-11	PYRAMID ENTERPRISES	32040 RIVERSIDE ST	LAKE ELSINORE	92530	120-655-3	379100015	999	7024	16.15	0.017	0.029	0.049	0.132
I-12	SECURED SELF STORAGE	29135 RIVERSIDE DR	LAKE ELSINORE	92530	910-600-1	377050067	999	1730	3.98	0.004	0.007	0.012	0.032
I-13	STAR PLAZA	16331 LAKESHORE DR	LAKE ELSINORE	92530	120-158-5	379422012	999	999	2.30	0.002	0.004	0.007	0.019
IF-14	LAKE ELSINORE TOWN CENTER *	CENTRAL AVE & COLLIER AVE	LAKE ELSINORE	92530			999	7378	17.00	0.018	0.031	0.052	0.139
IF-15	LAKE ELSINORE SQUARE *	CENTRAL AVE & COLLIER AVE	LAKE ELSINORE	92530			999	9114	21.00	0.022	0.038	0.064	0.171
IF-16	LAKE ELSINORE MARKET PLACE *	CENTRAL AVE & DEXTER AVE	LAKE ELSINORE	92530			999	29512	68.00	0.073	0.124	0.208	0.555

* ANTICIPATED DEMAND. VALUE SHOWN IS MIDPOINT OF POSSIBLE RANGE. REFER TO SECTION 5.2.3 FOR CALCULATION METHOD.

G-1	SHERIFF STATION COUNTY OF RIVERSIDE	334 LIMITED ST	LAKE ELSINORE	92530	009-1713-1	374261023	999	1141	2.62	0.003	0.005	0.008	0.021
G-2	RIVERSIDE COUNTY FIRE DEPT	29405 GRAND AVE	LAKE ELSINORE	92530	185-1002-2	391260036	999	2593	5.96	0.006	0.011	0.018	0.049
G-3	RIVERSIDE COUNTY BLDG/GROUNDS	117 S LANGSTAFF ST	LAKE ELSINORE	92530	223-1119-1	374252002	999	1398	3.22	0.003	0.006	0.010	0.026
	CALTRANS DISTRICT 8 EVMW	516 MAIN ST	LAKE ELSINORE	92530	126-9429-2		999	11460	26.36	0.028	0.048	0.081	0.215
	CALTRANS DISTRICT 8 EVMW	516 1/2 MAIN ST	LAKE ELSINORE	92530	126-9430-3		999	7420	17.07	0.018	0.031	0.052	0.139
G-4								**18880**	**43.42**	**0.047**	**0.079**	**0.133**	**0.354**

Appendix B

EVMWD Draft Recycled Water Ordinance

ORDINANCE NO. _____

AN ORDINANCE OF THE BOARD OF DIRECTORS OF THE ELSINORE VALLEY MUNICIPAL WATER DISTRICT ESTABLISHING A WATER RECYCLING MASTER PLAN AND IMPLEMENTING PROCEDURES

WHEREAS, the people of the State of California have a primary interest in the development of facilities to recycle wastewater to supplement existing surface and underground water supplies and to assist in meeting the future water requirements of the State (California Water Code, §13510 et seq.); and

WHEREAS, conservation of all available water resources requires the maximum reuse of recycled water for beneficial use (California Water Code, § 461); and

WHEREAS, the State of California has declared that continued use of potable water for irrigation of greenbelt and other areas and for certain other uses may be an unreasonable use of such water where recycled water is available (California Government Code, § 65602(e); California Water Code, § 13550 et seq.; California Code of Regulations, Title 22, § 60301 et seq.);

NOW, THEREFORE, the Board of Directors of the Elsinore Valley Municipal Water District does hereby ordain as follows:

CHAPTER 1. FINDINGS

Existing state statutes declare that the people of the State of California have a primary interest in facilities to recycle wastewater to supplement existing surface and underground water supplies and to assist in meeting the State's future water requirements. Conservation of all available water resources requires the maximum use of recycled water for beneficial use. The State of California has also declared that continued use of potable water to irrigate greenbelt and other areas and for certain other uses may be an unreasonable use of such water where recycled water is available.

Implementing the above State policies is in the Elsinore Valley Municipal Water District's (the "District's") best interest. This Ordinance is necessary to protect the region's common water supply, which is vital to public health and safety, and to prevent injury to persons and to public and private property The District is highly dependent on limited imported water for domestic, agricultural and industrial uses. The reliability of the supply of imported water is uncertain. By developing and utilizing recycled water, the need for additional imported water can be reduced. In light of these circumstances, certain potable water use may be considered unreasonable or wasteful where recycled water is available. Recycled water should also be more readily available in seasons of drought when potable water supply for nonessential uses may be uncertain.

CHAPTER 2. POLICY

It is District policy that recycled water determined to be available pursuant to Water Code Section 13550 shall be used within the jurisdiction whenever and wherever there is not an alternative higher or better use for the recycled water; its use is economically justified; its use is financially and technically feasible; and its use is consistent with legal requirements, preservation of public health, the safety and welfare of the public, and protection of the environment.

CHAPTER 3. DEFINITIONS

The following terms are defined as follows for purposes of this chapter:

3.1. Agricultural Purposes. Agricultural purposes include but are not limited to growing field and nursery crops, row crops, trees, vines, and feeding fowl and livestock.

3.2. Commercial Use. Water used in any building used for office, retail, commercial or similar purposes as toilets, urinals, decorative fountains, landscape irrigation and similar non-residential uses. (See California Water Code, §§ 13550 et seq.).

3.3. Construction Use. Approved reclaimed water use for construction activities such as soil compaction, mixing concrete, and dust control during grading.

3.4 Greenbelt Areas. Greenbelt areas include, but are not limited to, golf courses, cemeteries, parks and non-residential landscaping.

3.5. Industrial Process Water. Water used by any industrial facility with process water requirements including, but not limited to, rinsing, washing, floor trap priming, cooling and circulation, or construction, including any facility regulated by any Industrial Waste Discharge Ordinance of the District. (See California Water Code, §§ 13550 et seq.)

3.6. Lake Elsinore Replenishment. The use of recycled water to replenish Lake Elsinore.

3.7. Off-site Facilities. Facilities under District control including, but not limited to, recycled water transmission and distribution mains and pipelines, reservoirs, pumping stations, treatment plants, and other appurtenances and property. For recycled water service, offsite facilities shall be those upstream of the point of connection with the customer's onsite facilities, normally ending with the meter tailpiece.

3.8. On-site Facilities. Facilities under applicant, owner, or customer control including, but not limited to, landscape irrigation systems and agricultural irrigation systems. For reclaimed water service, the onsite facilities shall be those downstream of the reclaimed water service connection, which shall normally be the meter tailpiece.

3.9. Potable Water. Water conforming to federal, state, and local standards for human consumption.

3.10. Recycled Water. Water which, as a result of treatment of waste, is suitable for direct beneficial use or controlled use that would not otherwise occur (also, "Reclaimed Water"). (See Water Code, §13050(n).)

3.11. Recycled Water Distribution System. A piping system for the delivery of recycled water exclusively and which is separate from any potable water distribution system.

3.12. Recycled Water Use Areas: Existing or planned areas for recycled water use.

3.13. Rules and Regulations: The Rules and Regulations for Reclaimed Water Use adopted April, 2005, and as amended or revised thereafter, establishing the general rules and regulations governing the distribution and use of reclaimed (recycled) water.

CHAPTER 4. Water Recycling Master Plan.

4.1. GENERAL. The District shall prepare and adopt Recycled Water Master Plan(s) ("Master Plan(s)") to define, encourage, and develop the use of recycled water within District boundaries. The Master Plan shall be updated as necessary.

4.2 CONTENTS. Master Plan(s) shall include, but are limited to, the following:

4.2.1. Plants and Facilities. Evaluation of the location and size of and need for present and future reclamation/treatment plants, transmission and distribution mains and pipelines, pump stations, reservoirs, and other related facilities, including cost estimates and potential financing methods for any infrastructure improvements.

4.2.2. Recycled Water Areas. A designation, based on the policies set forth in Chapter 2 and the information set forth in a Master Plan, of the areas within the District that can or will be able to use recycled water in lieu of potable water. Recycled water uses may include, but are not limited to, greenbelt and agricultural irrigation, artificial lakes, Lake Elsinore replenishment, and appropriate commercial, construction, and industrial uses.

4.2.3. Mandatory Recycled Water Use. For each recycled water area, an evaluation whether greenbelt irrigation, agricultural irrigation, artificial lake filling, Lake Elsinore replenishment, commercial, construction or industrial uses shall be limited to recycled water use. As appropriate, mandate construction of recycled water distribution systems or other facilities in new and existing developments for current or future recycled water use as a condition of any development approval or continued water service if future water recycling facilities are proposed in the Master Plan that could adequately serve the development, in accordance with the procedures described in Section 5. Identify resources and adopt measures to assist water users in the financing of necessary conversions.

4.3. RULES AND REGULATIONS. The District shall establish by ordinance rules and regulations governing the use and distribution of recycled water ("District Rules and Regulations").

CHAPTER 5. Procedures.

5.1. EXISTING POTABLE WATER SERVICE

5.1.1. Preliminary Determination. Based upon the Master Plan(s), and in accordance with the District Rules and Regulations, upon the designation of each recycled water area or the commencement of the design of new recycled water facilities, the District shall make preliminary determinations as to which existing potable water customers will be converted to recycled water use. Each water customer shall be notified of the basis for a determination that conversion to recycled water service will be required, as well as the proposed conditions and schedule for the proposed conversion, and any incentives provided for such conversion.

5.1.2. Notice. The notice of the preliminary determination described in Section 5.1.1, including the proposed conditions, time schedule for conversion, and a recycled water permit application, shall be sent to the water customer by certified mail.

5.1.3. Objections; Appeals. The water customer may file a notice of objection with the District within (30) days after receipt of any notice of determination to comply, and may request reconsideration of the determination or modification of the proposed conditions or schedule for conversion. The objection must be in writing and specify the reasons for the objection. The preliminary determination shall be final if the customer does not file a timely objection. Staff shall review the objection and shall confirm, modify or abandon the preliminary determination. Upon issuance of a final determination by staff, the customer may appeal the determination by submitting a written appeal letter to the District's General Manager describing the basis of the appeal. The District's General Manager shall make the final determination regarding the appeal within 30 days of Staff's final determination.

5.2. DEVELOPMENT AND WATER SERVICE APPROVALS

5.2.1. Application as Condition of Approval. Upon application by a developer or owner of a new industrial, commercial or residential subdivision (herein referred to as "applicant") for a discretionary approval for development, District staff shall review the Master Plan(s) and make a preliminary determination whether the use of the subject property requires recycled water, and/or whether to include facilities to accommodate future recycled water use. Based upon such determination, recycled water use, and construction of recycled water distribution systems or other recycled water facilities within the development, and an application for a recycled water permit, may be required conditions of approval of any such development application, in addition to any other conditions.

5.2.2. Voluntary Application. On a case by case basis, upon application for a recycled water permit for property not otherwise covered by Sections 5.1.1 and 5.2.1, the District shall review the Master Plan(s) and determine whether the applicant property may obtain

recycled water. If the potential recycled water customer and the District cannot agree on recycled water service terms, or if the District determines that recycled water is not available for the proposed use, the District may, in its sole discretion, refuse to provide such service.

5.2.3. Notice of Determination. A notice of the basis for the preliminary determination, proposed conditions of approval, and a schedule for compliance shall be provided to the applicant prior to approving the development application.

5.3. RECYCLED WATER PERMIT PROCESS. Upon the District's final determination that a property may or shall be served with recycled water, or upon adoption of a condition of development approval requiring recycled water use or accommodation, the water customer, owner, or applicant shall obtain a recycled water permit.

5.3.1. Permit Conditions. The recycled water permit shall specify the design and operational requirements of the applicant's water distribution facilities, and schedule for compliance, based on the District Rules and Regulations, and shall require compliance with the California Department of Health Services Wastewater Reclamation Criteria (see California Code of Regulations, Title 22) and Regional Water Quality Control Board requirements.

5.3.2. Plan Approval. The District shall review plans for the recycled and non-recycled water distribution systems and perform a field inspection before granting the permit.

5.3.3. Permit Issuance. Upon approving the plans described in Section 5.3.2, the District shall issue the recycled water permit. Recycled water shall not be supplied to a property until District inspection determines that the applicant complies with the permit conditions.

5.4. TEMPORARY USE OF POTABLE WATER. At the District's discretion, potable water may be temporarily available to a site required to use recycled water, until recycled water is available. The applicant must obtain a recycled water permit before it may receive temporary potable water for new on-site distribution facilities. Prior to commencing recycled water service, the District will conduct an on-site facilities inspection to verify that the facilities have been maintained and are in compliance with the recycled water permit and current service requirements. Upon a determination that the recycled water facilities are not in compliance, the applicant shall be notified of necessary corrective actions per the District's Rules and Regulations.

5.5. RECYCLED WATER RATE. The rate charged for recycled water shall be established by District resolution.

CHAPTER 6. Enforcement and Sanctions.

6.1. PUBLIC NUISANCE. Discharge of wastes or the use of recycled water in any manner in violation of this Ordinance, the District Rules and Regulations, or of any permit issued hereunder is hereby declared a public nuisance and shall be corrected or abated as directed by District. Any person creating such a public nuisance is guilty of a misdemeanor.

6.2. CEASE AND DESIST ORDERS: When the District finds an activity, waste discharge, practice, or operation in violation of this Ordinance or the District Rules and Regulations has occurred or is likely to occur, the District may issue an order to cease and desist such activity, waste discharge, practice, or operation causing or likely to cause such violation.

6.3 CIVIL ACTIONS and INJUNCTIONS. In addition to any other available remedies, the District may enforce any violation of this Ordinance or the District Rules and Regulations by a civil action. In any such action, the District may seek, as appropriate, any or all of the following remedies:

6.3.1. A temporary and/or permanent injunction;

6.3.2. Assessment of the violator for the costs of any investigation or monitoring leading to the establishment of the violation, and for the reasonable costs to prepare and bring legal action under this section;

6.3.3. Costs incurred to remove, correct or terminate the adverse effects resulting from the violation; or

6.3.4. Compensatory damages for loss or destruction to water quality.

6.4. PERMIT REVOCATION. In addition to any other statute or rule authorizing termination of water service, the District may revoke permits issued hereunder if it finds a violation of any provision of this Ordinance or the District Rules and Regulations, or if a waste discharge or a recycled water use causes or threatens to cause a nuisance.

6.5. PENALTY. Any person or entity who violates this Ordinance or the District Rules and Regulations shall be subject to a fine not exceeding $1,000 for each day, or portion thereof, of violation. In addition, water service to the property may be discontinued. This section shall be in addition to, and shall not limit or restrict any other penalties or corrective actions granted, taken or authorized under the District Rules and Regulations.

CHAPTER 7. Validity.

If any provision of this ordinance or the application thereof to any person or circumstance is held invalid, the remainder of the ordinance and the application of such provisions to other persons or circumstances shall not be affected thereby.

I HEREBY CERTIFY that the forgoing ordinance was introduced at a regular meeting of the Board of Directors of the Elsinore Valley Municipal Water District held May 13 ,2004, by Board Member _____ who moved its adoption and passage by the following vote:

AYES:
NOES:
ABSENT:
SECONDED:

_____
President of the Board of Directors of
Elsinore Valley Municipal Water District

ATTEST:

_____
Secretary of the Board of Directors
of Elsinore Valley Municipal Water District

Appendix C

Letter of Intent for John Laing Homes

John Laing Homes
Hand crafted since 1848

January 14, 2005

Mr. Phillip M. Miller
Director of Engineering
Elsinore Valley Municipal Water District
31315 Chaney Street
Post Office Box 3000
Lake Elsinore, CA 92531-3000.

Subject: Letter of Intent to Execute a User Agreement for Recycled Water Use

Dear Mr. Miller:

We hereby confirm our commitment to use recycled water for irrigation for Laing-CP, Lake Elsinore LLC (John Laing Homes' Southerly Development) in Lake Elsinore when it is available by signing this letter of intent to execute a user agreement.

John Laing Homes understands that the Elsinore Valley Municipal Water District (District) is in the process of applying for a construction grant from the State Water Resources Control Board and requires this letter of intent to execute a user agreement from the potential users of recycled water.

We look forward to working with the District in developing a user agreement so that the Southerly Development can participate in the Recycled Water Project and reduce our dependence on potable water.

Please contact Michael A. Filler at (951) 245-9075 if you have any questions regarding this matter.

Sincerely,
John Laing Homes

Michael A. Filler
Vice President

Appendix D

Resolution Adopting CEQA Documentation

Board of Directors
Phil Williams, President
W. Ben Wicke, Vice President
Harvey R. Ryan, Treasurer
Christine Hyland, Director
Kris Anderson, Director

Elsinore Valley Municipal Water District

General Manager
Ronald E. Young
Board Secretary
Terese Quintanar
Legal Counsel
Best Best & Krieger

EVMWD BOARD ACTION:
☑ APPROVED
☐ APPROVED AS AMENDED
☐ DENIED
☐ CONTINUED
4-0 8/10/06

DATE: August 10, 2006

TO: Board of Directors

FROM: General Manager

SUBJECT: CONSIDER ADOPTION OF THE MITIGATED NEGATIVE DECLARATION FOR THE REGIONAL RECYCLED WATER MASTER PLAN

RECOMMENDATION

The General Manager and staff recommend that the Board of Directors:

1st motion

1. Determine in light of the whole record, that the project will not have a significant effect on the environment with the incorporation of mitigation measures into the project, that the Mitigated Negative Declaration reflects the independent judgment of the Board of Directors, and that the Mitigated Negative Declaration as proposed by Staff be adopted; and,

2nd motion

2. Approve the Project, and direct Staff to file and post a Notice of Determination in accordance with the District's Guidelines.

BACKGROUND

The purpose of the Regional Service Area Recycled Water Master Plan is to identify potential recycled water users that may be served from the Regional Water Reclamation Facilities (WRF), analyze the recycled water market, develop alternatives, layout the recommended facilities, identify the estimated construction costs, and determine the environmental impacts. The State Water Resources Control Board approved a grant commitment for $75,000 for the recycled water planning study.

Pursuant to the California Environmental Quality Act (CEQA), an Initial Study was prepared for the project, and based on the study; staff prepared a Draft Mitigated Negative Declaration. A Notice of Preparation of Draft Mitigated Negative Declaration has been filed with the Riverside County Clerk and State Clearinghouse, and published and posted in accordance with CEQA Guidelines. Public comments were received and the District responses to those comments are included herewith.

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Appendix E

EVMWD Rules and Regulations for Recycled Water Use

Elsinore Valley Municipal Water District

Final Report

Rules and Regulations for Recycled Water Use

July 2005

MWH

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SECTION 1
INTRODUCTION

1.1 GENERAL

The Elsinore Valley Municipal Water District (EVMWD) is located in the City of Lake Elsinore in Riverside County. EVMWD provides wastewater collection and treatment for the City of Lake Elsinore and other sewered developments in the EVMWD service area, including the adjacent unincorporated communities of Wildomar and Lakeland Village. EVMWD owns and operates several wastewater reclamation plants, which treat domestic wastewater to the State's Title 22 quality standards for recycled water use.

The California Department of Health Services (DHS) is required to establish uniform statewide recycling criteria for each type of recycled water use to protect public health. State law requires regional water quality control boards to issue water reclamation requirements or a master water reclamation permit based on the DHS statewide criteria and other permit conditions on a case-by-case basis.

EVMWD's recycled water use is regulated by the California Regional Water Quality Control Board (RWQCB), Santa Ana Region, subject to a master reclamation permit. California Water Code Section 13510-12 establishes a state policy to encourage the use of recycled water. Use of recycled water is based on the ability to adequately treat domestic wastewater to meet the requirements, set forth in Division 4, Chapter 3 of Title 22 of the California Code of Regulations ("Title 22").

The following Rules and Regulations ("Rules") govern the distribution and use of recycled water for landscape irrigation and other permitted non-potable uses.

District approval of any proposed use will be contingent upon DHS approval as required. Only those uses specified in a Recycled Water Permit as defined in Section 2 are authorized uses.

Recycled water may only be used in approved areas. District approval of any proposed use area will be contingent upon regulatory agency approval as required. Only those use areas specified in the Permit are approved use areas.

The use of "gray water" is expressly excluded from these Rules.

1.2 POLICY

The State of California through its Water Code Section 13510 encourages the development of facilities to recycle water, which formerly contained wastes, to supplement existing surface and underground water supplies and to assist in meeting the future water requirements of the state. Further, Water Code Section 461 sets forth the policy of conserving

all available water resources by requiring the maximum reuse of wastewater for beneficial use.

EVMWD's newly adopted Water Recycling Ordinance sets forth the District's policy that recycled water determined to be available pursuant to Section 13550 of the Water Code shall be used for non-potable uses within designated Recycled Water Use Areas within the District's jurisdiction. This policy will apply wherever there is not a higher alternative or better use for the recycled water, if its use is economically justified, financially and technically feasible, and consistent with legal requirements, preservation of public health, safety and welfare, and the environment.

1.3 PURPOSE

These Rules establish procedures for the distribution and use of recycled water by EVMWD within the District's designated Recycled Water Use Areas. Because recycled water is considered unsafe for human consumption, it is important that these Rules contain provisions which will minimize or eliminate the possible misuse of recycled water.

1.4 INTERPRETATION

These Rules shall be interpreted according to the purpose and policy of these Rules and the definitions set forth in Section 2 herein. To the extent these Rules depend upon or incorporate Title 22, any amendment thereto shall be incorporated by reference in these Rules accordingly.

SECTION 2
DEFINITIONS

The terms hereinafter set forth, unless otherwise specified, shall be defined as follows:

AIR-GAP SEPARATION shall mean a physical break between a supply line and a receiving vessel. The air-gap shall be at least double the diameter of the supply pipe, measured vertically above the flood rim of the vessel, and in no case less than one inch. The design shall be to the satisfaction of the Elsinore Valley Municipal Water District, and the regulatory agencies.

AMERICAN WATER WORKS ASSOCIATION ("AWWA") shall mean the American Water Works Association.

APPLICANT shall mean any person, firm, corporation, association, agency or authorized representative who applies for recycled water service under the terms of these Rules.

APPLICATION RATE shall mean the rate at which recycled water is applied to an irrigation or construction area expressed in inches per hour (or cm/hr).

APPROVED BACKFLOW PREVENTION DEVICE shall mean a device installed to protect the potable water supply from contamination and pollution as approved by DHS and the Foundation for Cross-Connection Control and Hydraulic Research, University of Southern California, School of Engineering ("USC").

APPROVED USE AREA shall mean a site, with defined boundaries, designated in a Recycled Water Permit issued by the District to receive recycled water for an approved use.

APPROVED USE shall mean the use of recycled water in a manner, and for such purpose, According to a Recycled Water Permit issued by the District and in compliance with any and all applicable regulatory agency requirements.

AS-BUILT DRAWINGS (see RECORD DRAWINGS).

AUTOMATIC SYSTEM shall mean an electronic, electrical or mechanical system, which includes automatic controllers, valves, and associated equipment required for the programming of effective water application rates when using recycled water.

COMMERCIAL USE shall mean the use of recycled water for toilets, urinals, decorative fountains, and similar non-residential uses.

CONNECTION FEE shall mean a charge imposed by the District for establishing or reestablishing recycled water service, including construction and/or installation of offsite facilities.

CONSTRUCTION USE shall mean the approved use of recycled water for construction activities such as soil compaction, mixing concrete, and dust control during grading.

CONTRACTOR shall mean a person, persons, or firm entering into a legal agreement with the Applicant, Owner, or the District for the performance of work on all or any portion of facilities subject to these regulations.

COUNTY shall mean the County of Riverside, California.

CROSS-CONNECTION shall mean any unprotected actual or potential connection between potable water system used to supply water for drinking purpose and any source or system containing unapproved water or a substance that is not or cannot be approved as safe and potable.

CROSS-CONNECTION SPECIALIST shall mean a person certified by California-Nevada Section of AWWA or approved equivalent who coordinates and monitors a cross-connection inspection and control program to prevent contamination of the potable system used to supply water for drinking purpose by any source or system containing unapproved water or a substance that is not or cannot be approved as safe and potable.

CUSTOMER shall mean any person, firm, corporation, association, or agency that holds a District Recycled Water Permit, including any agent or authorized representative thereof.

DEPARTMENT OF HEALTH SERVICES shall mean the Department of Health Services of the State of California ("DHS").

DESIGN AREA shall mean a site, with well-defined boundaries, proposed to receive recycled water for an approved use, as delineated in the application for recycled water service.

DIRECT BENEFICIAL USE shall mean the use of recycled water, which has been transported from the point of treatment or production to the point of use without an intervening discharge to waters of the State.

DISCHARGE shall mean any release or distribution of recycled water to a sewerage system, or storm drain system, any water of the State, or any other release or distribution other than for a permitted use.

DISTRICT CHARGE shall mean a one-time connection charge determined from the Schedule of Rates of the District, and payable by the Customer for obtaining recycled water. The purpose of this charge is for the expansion of recycled water facilities to serve the customers.

DISTRICT shall mean the Elsinore Valley Municipal Water District, California.

GENERAL MANAGER shall mean the General Manager of the Elsinore Valley Municipal Water District or his/her designee.

GPH shall mean the rate of recycled water delivery in gallons per hour.

GPM shall mean the rate of recycled water delivery in gallons per minute.

GRAY WATER shall mean untreated wastewater other than toilet and/or urinal ("sanitary") wastes.

HCF shall mean hundreds of cubic feet.

INDUSTRIAL PROCESS WATER shall mean recycled water used in industrial facilities for non-potable uses including rinsing, washing, cooling, circulation, or boiler feed.

INFILTRATION RATE shall mean the rate at which water will penetrate the soil surface and enter the soil profile, expressed in inches per hour or centimeters per hour.

INSPECTOR shall mean any person authorized by the District to perform inspections of either onsite or offsite facilities or areas prior to construction, during construction, after construction and during operation.

NON-POTABLE WATER shall mean water not satisfactory for drinking, culinary and domestic purposes or that does not meet the requirements of the health authority having jurisdiction. Non-potable water includes recycled water.

NON-RESTRICTED RECREATIONAL IMPOUNDMENT shall mean an impoundment of recycled water in which no limitations are imposed on body-contact water recreational activities.

OFFSITE FACILITIES shall mean facilities under the control of the District including, but not limited to, recycled water transmission mains, recycled water pipelines, reservoirs, pumping stations, treatment plants, and other appurtenances and property. For recycled water service, offsite facilities shall be those upstream of the point of connection with the Customer's onsite facilities, normally ending with the meter tailpiece.

ONSITE FACILITIES shall mean the facilities under the control of the Applicant, Owner or Customer including, but not limited to industrial water systems, landscape irrigation systems and agricultural irrigation systems. For recycled water service, the onsite facilities shall be those downstream of the recycled water service connection, which shall normally begin with the meter tailpiece.

OPERATIONS PERSONNEL shall mean any employee of the Owner, or Customer, whether permanent or temporary, or any contracted worker whose regular or assigned work involves the supervision, operation, or maintenance of equipment, facilities, or a system using recycled water.

PERMIT (see RECYLED WATER PERMIT)

PERMITTED CAPACITY OF RECYCLED WATER shall mean the amount of recycled water that the Customer is permitted to have for the use area specified in the Recycled Water Permit.

POINT OF CONNECTION shall mean the point of connection of the Customer's onsite facilities to the offsite facilities of the recycled water distribution system.

PONDING shall mean the retention of recycled water on the surface of the ground or other man-made surfaces, other than the approved use area, for a period of time following the cessation of an approved recycled water use activity such that a hazard or potential hazard to public health results.

POTABLE WATER shall mean water that is pure, wholesome and suitable for human consumption, and which conforms to the latest edition of the U.S. Environmental Protection Agency National Primary Drinking Water Regulations, the California Safe Drinking Water Act, and any other applicable standards.

RECORD DRAWINGS shall mean approved mylar drawings that correctly show the completed onsite facilities and/or offsite facilities as constructed or modified. These drawings shall show all potable water, recycled water and sewer lines, and other utility lines.

RECYCLED WATER FACILITIES shall mean systems, structures, appurtenances, etc., used in the treatment, storage, pumping, transmission and distribution of recycled water.

RECYCLED WATER SERVICE CONNECTION shall mean the connection of the Customer's recycled water line to the District recycled water service line.

RECYCLED WATER SERVICE LINE shall mean the District's pipeline between its recycled water distribution system and the point of connection.

RECYCLED WATER SITE SUPERVISOR shall mean a person designated and authorized by the Owner or Customer and who shall operate the onsite facilities and irrigation systems and be responsible for the application of the guidelines, criteria, and standards of these Rules. The designated supervisor shall be trained to operate and maintain the onsite facilities and irrigation system, and to assume the responsibilities outlined in Section 5.2.2 of these rules. The recycled water site supervisor must be certified by a District recognized recycled water site supervisor training program.

RECYCLED WATER DISTRIBUTION LINES shall mean recycled water distribution pipelines and appurtenances acquired or constructed and owned by the District, and used for the conveyance of recycled water between the recycled water transmission mains and/or reservoirs, and the recycled water service connections and/or appurtenances.

RECYCLED WATER shall have the definition set forth in Division 4, Chapter 3 of Title 22 and shall mean water which, as a result of treatment of wastewater, is suitable for a direct beneficial use or a controlled use that otherwise would not occur. "Gray water" is specifically excluded from this definition.

RECYCLED WATER PERMIT ("PERMIT") shall mean a permit issued by the District to a recycled water service Applicant after the satisfactory completion of the service application procedures set fourth in these Rules. The Permit constitutes a service agreement, which legally binds the Customer to all conditions of the Permit and these Rules.

RECYCLED WATER TRANSMISSION MAINS shall mean major recycled water pipelines and appurtenances acquired or constructed and owned by the District, used to convey recycled water between the water reclamation plant and pump station or other source, to a reservoir and/or the recycled water distribution mains.

REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY (RPP) shall mean a backflow prevention device incorporating not less than two check valves, an automatically operated differential relief valve located between the two check valves, a tightly closing shut-off valve on each side of the check valve assembly, and equipped with necessary test cocks for testing as approved by the DHS and the Foundation for Cross-Connection Control and Hydraulic Research, School of Engineering.

REGULATORY AGENCIES shall mean those public entities legally constituted by federal, state, and local statutes to protect public health and water quality.

RESTRICTED RECREATIONAL IMPOUNDMENT shall mean a body of recycled water in which recreation is limited to fishing, boating, and other non-body-contact water recreation activities.

RUN-OFF shall mean the movement of recycled water beyond the boundaries of the designated use area along the surface of the ground or other natural or man-made surfaces including, but not limited to, pedestrian walkways, streets, playground surfaces, grassy slopes and drainage courses.

RWQCB shall mean the Regional Water Quality Control Board of the State of California, Santa Ana Region.

SCHEDULE OF RATES shall mean a schedule containing fees, charges, and deposits determined and issued by the District for the uses and services of recycled water.

SEPARATION shall mean the horizontal and/or vertical distance between a recycled water pipeline and a parallel potable water pipeline, sewer pipeline, or a sludge force main. The separation shall be the clear distance between the outside faces of the pipelines in question.

SPRAY IRRIGATION shall mean application of recycled water to land to maintain vegetation or support growth of vegetation by spraying it from sprinklers or orifices in piping.

SSPWC shall mean the latest edition of the Standard Specifications for Public Works Construction, including the Regional Supplement Amendments of the County of Riverside, commonly known as the "Green Book".

SURFACE IRRIGATION shall mean application of recycled water by means other than spraying.

UNAUTHORIZED DISCHARGE shall mean any release of recycled water that violates these Rules or any applicable federal, state, or local statutes, regulations, ordinances, contracts or other requirements.

USE AREA: An area where recycled water is used.

WASTEWATER shall mean water or a combination of water and water-carried wastes discharged into or permitted to enter a public sewer.

WINDBLOWN SPRAY shall mean dispersed, airborne liquid particles of recycled water resulting from the use or discharge of recycled water and capable of being transmitted through the air to locations other than those for which the direct application of recycled water was intended.

SECTION 3
RECYCLED WATER SERVICE REQUIREMENTS

3.1 SERVICE CONDITIONS

The District shall control and schedule recycled water distribution to Customers. The provision of recycled water service and the use of recycled water by any Customer shall be subject to all the terms and conditions of these Rules.

3.2 APPLICATION PROCEDURE

3.2.1 Filing Application For Recycled Water Service

The Applicant shall meet with the District at the earliest possible date to determine whether the design area is within the District's service area. At this time, the availability of recycled water and the proximity of the site to the District's recycled water system will be reviewed.

An Applicant meeting the requirements for recycled water service seeking a Permit shall file an application for recycled water with EVMWD.

The application form shall contain detailed information concerning the Applicant as follows:

a. The Applicant's relationship to the property for which recycled water service is requested. In cases where the Applicant is not the legal owner of the property, the legal owner shall consent to the application on a supplemental notarized form.

b. The address and legal description of the property.

c. The purpose for which the property will be used.

d. The proposed use of recycled water.

e. The proposed use area on the property.

f. The Customer's estimated service requirements (flow, pressure, water quality, etc.) for recycled water.

g. A designated contact that will become the Recycled Water Site Supervisor.

h. Any special condition for service pursuant to these Rules.

The *Application Form for Recycled Water Service* is attached as Appendix A; the Checklist/Action Request Form for Obtaining Recycled Water Service is attached as

Appendix B; the Status of Application for Recycled Water Service is attached as Appendix C; Permit For Recycled Water Service is Appendix D.

The application form shall be accompanied by plans and specifications per Section 4.5, delineating the proposed recycled water use area, the proposed location, size, and type of all recycled water service connections and onsite facilities, and any areas from which recycled water must be specifically excluded.

3.2.2 Applicant Compliance with Regulatory Requirements

The Applicant for recycled water shall agree to comply with the requirements of these Rules and any and all applicable federal, state and local statutes, ordinances, regulations and any other requirements.

3.2.3 Application Fees and Other Charges

Application fees, deposits, and capacity charges shall be paid in accordance with the District schedule of rates and shall be subject to all terms and conditions of these Rules.

3.3 PERMITS

3.3.1 Permit Issuance

The District shall review the application and conduct any necessary investigation to determine whether the District will provide recycled water service. The District may prescribe written requirements including but not limited to facility design, construction, operation and conditions of service. The District shall review plans of the onsite recycled and non-recycled water systems and conduct a field inspection before the Permit is granted. (See also Section 4.5 below).

The Permit shall be issued upon approval by the District and DHS. The Permit shall incorporate all the provisions of these Rules by express reference, and any additional requirements prescribed by the District. The Permit shall not be effective until construction of all required facilities is completed, tested, and inspected, and the District determines the Applicant is in compliance with all Permit conditions.

The Permit shall specify all allowable uses of recycled water and all restrictions thereon.

The Permit shall state the quantity of recycled water available to the Customer under the Permit. Delivery of the full quantity is subject to the District's supply capabilities. The District shall make a good faith effort to supply full permitted quantity, but shall be held harmless in the event that such a volume is not available for any reason, including, but not limited to, reduced plant production, increased demand, repairs to facilities, or regulatory compliance.

A copy of the Customer's current Permit must be available for review at all times, clearly posted at the use site, and/or on file at the Customer's office.

3.3.2 Permit Renewal

The term of a Permit shall extend indefinitely and shall not require renewal, except that the District reserves the right to suspend or terminate the Permit, or to modify its terms and conditions, if any of the following occurs:

a. A change of the owner, tenant, Customer or occupant of the property covered by the Permit.

b. A change in the use of the property covered by the Permit.

c. A change in the water quality characteristics of recycled water.

d. A violation of these Rules and/or other applicable regulations.

e. A change in federal or state regulations rendering performance by the District to be impractical or impossible.

3.4 ESTABLISHING SERVICE

3.4.1 Request for Service Connection

Following the completion of construction and/or installation of the recycled water facilities as applicable, the Customer shall request the District to install the service connection.

The request for service connection shall be accompanied by all required fees for installation and connection as indicated in the current schedule of rates and as appropriate for the size and type of service.

3.4.2 Request for Service Start-up

Following final District acceptance of the onsite facilities by the District, the Customer shall request service start-up. The request for start-up shall be accompanied by any outstanding cash payments as per the current schedule of rates in addition to those indicated in Section 3.2.3.

3.4.3 Temporary Use of Potable Water

At the discretion of the District, potable water may be made available to a Customer on a temporary basis, until recycled water is made available. In such an event, the Customer will be charged the potable water rate by the District. Before the Customer receives temporary potable water service, a Permit must be obtained. Prior to commencement of temporary potable service, an inspection of the onsite facilities shall be conducted by the District to verify that the facilities comply with the Permit. Upon verification of compliance, the Customer shall request service start-up of temporary potable water service. A customer supplied Reduced Pressure Principle Backflow Prevention Assembly (RPP) must be used in any connection for temporary potable water.

3.4.4 Suspension of Service

The recycled water service is subject to suspension or termination any time the recycled water does not meet regulatory requirements at the terminal point of the District's reclamation plant.

3.5 CONDITIONS FOR RECYCLED WATER SERVICE

Permits for recycled water service and any connections for service made, as provided in the Permit issued under these Rules, shall be subject to the following conditions:

3.5.1 Adherence to Permit Conditions

Except as otherwise provided herein, all recycled water will be provided to the Customer in the condition and quantity specified in the Permit.

3.5.2 Control of Facilities (Liability)

a. The District shall have control of and maintain and repair offsite recycled water service lines and meters. The Customer shall repair and maintain the recycled water service connections, in good working condition at or beyond the point of connection, and all onsite facilities. The District shall be entitled to inspect and test all connections and onsite facilities in the manner specified in Section 6.

b. The Customer shall implement a preventative maintenance program designed to ensure the continued operation of all system elements complies with these Rules. The Customer shall be responsible for furnishing all operations and maintenance personnel with the system operating and maintenance instructions and record drawings to ensure proper system operation in accordance with system design and these regulations. At least one complete set of this information shall be kept onsite or in the nearest field office or maintenance building established by the Customer. The Customer is responsible for properly disseminating this information to all appropriate operations personnel.

c. The Customer shall indemnify and hold harmless the District, its employees, and its agents from and against all claims, damages, losses or expenses arising from the use of recycled water under the Permit, from the use of facilities by which recycled water is conveyed, or from the inability or failure of the District to provide recycled water.

3.5.3 Extension of Distribution Mains

Unless otherwise provided by written agreement between the Customer and the District, the Customer shall pay for all onsite facilities, including their installation, as well as for recycled water service lines and extension of recycled water transmission and distribution mains in order to provide recycled water service to the Customer, in accordance with the provisions of these Rules and Regulations.

3.5.3.1 Reimbursement Agreement

Where an Applicant requests recycled water service in areas where the District does not have existing recycled water transmission and distribution mains, the Applicant's request for recycled water service shall be addressed as follows.

If the District determines it is necessary to extend transmission and distribution mains to areas not included within a subdivision or area proposed by the Applicant in a Permit application, or where the District determines that oversized or additional facilities may be needed to accommodate future development, the District may grant the Permit contingent upon the Applicant financing and developing, at its sole cost and expense, such oversized service lines and facilities. In this event, the District and Applicant may enter into a reimbursement agreement whereby District will require subsequent Customers benefiting from such improvements to pay to the District an amount, to be determined by the District in accordance with the common practice, which represents the subsequent Customers' proportionate share of the costs of the improvements. The District will then pay to Applicant the amounts collected from the subsequent Customers. A reimbursement agreement may, however, contain a provision stating that the District's obligation to either directly reimburse the Applicant or collect such amounts from subsequent Customers pursuant to Section 3.5.3.1 shall expire in a given number of years from the date of execution of such reimbursement agreement.

3.5.3.2 Participation Agreement

Where the District intends to construct and develop a planned capital improvement project according to a planned timetable, and where the Customer desires to undertake to complete such planned capital improvement project prior to the District's completion date, the Customer and the District may enter into a participation agreement whereby the Customer shall agree to complete the planned capital improvement project in accordance with such design requirements and specifications of the District. The participation agreement shall provide for the equitable sharing of the costs of the capital improvement project between the Customer and the District in accordance with such mutually agreed upon terms.

3.5.4 Prohibition of Changes

The Customer shall not make any changes in, or additions to, the recycled water system without prior notification to, and permission from, the District. Any changes or alterations to existing onsite facilities, whether intentional or unintentional, shall be reported immediately to the District.

3.5.5 Services to Common Areas

The District reserves the right to supply recycled water to contiguous areas under single ownership through a single recycled water service connection.

Common areas owned or operated by homeowners' associations or similar cooperatives should have only one service connection whenever it is practical, and will be operated as a single ownership.

3.5.6 Subdividing an Approved Use Area

a. When a property provided with a recycled water service connection and water meter is subdivided, such connection and meter shall be considered as serving the lot or parcel of land on which the meter is located. Additional recycled water distribution mains and/or service lines will be required for all subdivided areas in accordance with these Rules, unless the subdivider provides covenants, conditions, and restrictions ("CC&R") properly recorded with the County Recorder for the operation of onsite recycled water facilities serving more than one lot, and also provides easements for recycled water distribution mains and/or service lines or shows easement locations in the CC&Rs.

b. All recycled water used on any premise where a meter is installed must pass through the meter. Customers shall be charged for all recycled water passing through the meters.

c. Every recycled water service connection and meter assembly shall include a curb cock or wheel valve, as approved by the District (Valve Box detail provided in Appendix E), on the inlet side of the meter, which shall be used exclusively by the District for controlling the recycled water supply through the recycled water service line. If the curb cock or wheel valve is damaged by the Customer or the Customer's use, repair and/or replacement by the District shall be at the Customer's expense.

d. Each Customer shall restrict the use of recycled water to those uses set forth in the Permit for recycled water services approved by the District.

3.5.7 Temporary Discontinuation of Recycled Water Service

By reason of circumstances beyond the control of the District, or in order to protect the facilities of the District, or for the protection of public health, safety and welfare of the residents or property owners of the District, recycled water service may be terminated under the conditions set forth below:

a. On a temporary or permanent basis in the manner provided for in Sections 11.2 and 11.3, respectively.

b. On a temporary basis, at any time the recycled water at the terminal point of the District's water reclamation plant takeoff, does not meet the requirements of the regulatory agencies, including but not limited to those prescribed in Title 22 and any permit issued by the RWQCB. Recycled water service would in such cases, be renewed at such time that recycled water at the terminal point of the water reclamation plant would again meet the requirements of the regulatory agencies or at

such time that the District would supplement the recycled water system from the potable water system in the manner provided by Section 3.4.3.

c. When the District determines that a water shortage exists or is threatened, which prevents further recycled water service.

d. Whenever such action is warranted pursuant to one of the proceedings or actions taken by the District pursuant to Section 11 of these Rules.

3.5.8 Conditions of Pressure and Service

Pressure and service shall be provided on an "as available" basis, at the Customer's meter. The District shall state the available pressure of the system in its design guide. For dual plumbed sites, optimally, the on-site recycled water supply pressure should be operated at least 10 psig lower than the potable water system pressure. All Customers shall hold the District harmless from any and all damages and liabilities caused in whole or in part by pressure conditions, water quality variations, or interruptions in service. It shall be the Customer's responsibility to install booster pumps or pressure regulating valves to adjust pressure, if necessary.

3.6 SIZE AND LOCATION OF SERVICE CONNECTIONS

The District reserves the right to determine the size and location of recycled water service lines, service connections and meters, and shall also have the right to determine the kind and size of backflow prevention devices and any and all other appurtenances to the service.

The recycled water service lines shall be extended to a curb line, or property line of the Customer's property, abutting upon a public street, highway, road, or District easement in which recycled water distribution mains are installed.

3.7 ILLEGAL CONNECTIONS

No person shall make any connection to recycled water facilities of the District without a Permit from the District. Penalties for violations may be assessed according to Section 11 of these Rules.

3.8 METER TESTING

Any Customer may request the District to test the accuracy of its recycled water meter. In such an event, the Customer shall make a request to the billing section of the District for a Meter Accuracy Test. The meter testing shall be performed in conformance with the District's Administrative Code.

3.9 CROSS-CONNECTION PREVENTION

3.9.1 Purpose

The primary purpose of this Section is to protect the District's potable water supply from possible contamination by prohibiting and preventing cross-connections between the potable water distribution system and the recycled water distribution system, in accordance with Chapter 5, Title 17 of the California Code of Regulations ("Title 17"), and between the recycle water distribution system and on-site plumbing, in accordance to Title 22 of the California Code of Regulations ("Title 22"). The secondary purpose is to protect the recycled water system from other contaminants.

These provisions are in addition to, and not in lieu of, the controls and requirements of other regulatory agencies, such as DHS.

3.9.2 Backflow Prevention

Regulations governing backflow prevention devices are intended to protect the District's potable water supplies and are not intended to protect Customers from potential hazards of cross-connections in the Customer's onsite facilities.

a. District approved backflow prevention for the District's potable water supply shall be provided by the Customer in accordance with the specifications of and as required by the District's latest edition of Standard Specifications and Drawings.

b. Provision, installation, maintenance and inspection of backflow prevention devices shall be the sole responsibility and duty of the Customer, and shall be performed at Customer expense. Inspection of backflow prevention devices shall be performed at least once a year, or more often in those instances where successive inspections indicate repeated failures. These devices shall be inspected, repaired, overhauled or replaced at the expense of the Customer whenever they are found to be defective. Records of such tests, repairs and overhauls shall be kept by the District, and such records shall be made available to any concerned regulatory agency upon request.

Installation and inspection of backflow prevention devices shall be performed by a certified tester at the Customer's expense. The certified tester shall submit to the District the original inspection reports as proof of compliance. All inspection and testing shall be performed to the District's satisfaction.

3.9.3 Type of Protection

The level of protection required is relative to the degree of hazard that the District determines exists on the premises served. Listed in increasing levels of protection, the following protective devices may be required: Reduced Pressure Principle Backflow Prevention Device (RPP) and air-gap separation. The Customer may choose a higher level of protection than required by the District. Minimum types required, relative to various situations, are listed below. The majority of situations require a RPP be installed on the potable water supply,

immediately downstream of the supply meter. Situations not listed shall be evaluated on a case-by-case basis and the appropriate level of protection required shall be determined by the District in consultation with DHS.

3.9.3.1 Degree of Hazard

a. On premises where the District's potable water system is used to supplement the recycled water supply, an air-gap separation shall be provided.

b. On premises where recycled water is used and there is no interconnection with the potable water system, a RPP separation may be used instead of an air-gap separation if approved by the District and DHS.

c. On premises where hazardous materials and toxic substances are stored, handled, or produced in any manner in which the substances may enter either the potable water and/or the recycled water systems, an air-gap separation shall be provided for the affected system. A RPP may be provided in lieu of an air-gap separation, if approved by the District and DHS.

d. On premises where entry is restricted so that cross-connection inspections cannot be made with sufficient frequency or at sufficiently short notice to assure that cross-connections do not exist, an air-gap separation shall be used.

e. On premises where there is a repeated history of cross-connections being established or re-established, an air-gap separation shall be used.

3.9.3.2 Color-Coding on Dual or Multiple Water Systems:

Where any property subject to recycled water service is served by or contains dual or multiple water systems and piping, the exposed portion of recycled water pipelines, valves, and other fittings shall be colored purple, banded or marked to distinguish clearly which is used for potable water and which is used for recycled water (see also Section 4). In addition, all new unexposed recycled water pipes installed on any such property shall be similarly colored purple and marked: "RECYCLED WATER – DO NOT DRINK" with wording facing up. All recycled water appurtenances, facilities, and valves shall be posted or tagged with the wording "RECYCLED WATER - DO NOT DRINK".

3.9.4 Customer's Designated Recycled Water Site Supervisor

The operation and surveillance of onsite systems shall be under the management of the Customer's Recycled Water Site Supervisor. The use site supervisor shall attend a District approved training program. The site supervisor or their representative shall be available during normal working hours, at an address listed with the District for the purpose of hosting inspection tours or for discussing operational aspects of the system. The designated supervisor shall be available via telephone at a number listed with the District for emergency off-hours contact.

The customer's Recycled Water Site Supervisor, whose qualifications and responsibilities are discussed in Section 5.2.2, shall be responsible for the prevention of any cross-connections on the property. In the event of a cross-connection to the potable water system, the Customer's Recycled Water Site Supervisor shall immediately shut off the main recycled water supply valve and depressurize the recycled water system to prevent further mixing with the potable supply, and shall also immediately advise the District of the occurrence of the cross-connection. The District will advise DHS so that appropriate measures may be taken to control any contamination or pollution.

The Customer shall assume all responsibilities to prevent cross-connections between the on-site facilities and any potable water supply, and shall indemnify and hold the District harmless from and against any claim of damage or loss which is caused or is alleged to have been caused, in whole or in part, by cross-connections of on-site facilities. The Customer shall be subject to these rules, including but not limited to, those allowing the District or DHS to inspect and approve all on-site recycled water facilities as provided in Sections 5.2.1. and 6.

3.10 CONVERSION TO/FROM RECYCLED WATER SERVICE

3.10.1 Conversion to Recycled Water Service

Proposals to construct a new onsite recycled water system or to retrofit an existing potable or non-potable system to serve recycled water for irrigation purposes must satisfy the requirements of these Rules. Applicants that propose to use recycled water for industrial applications or for other special uses, may be required to supply additional information on a case-by- case basis.

When a Customer seeks to convert any existing potable water irrigation system to a recycled water irrigation system, the proposed recycled water system shall be investigated for the District at Customer expense. The District and DHS shall review the as-built drawings and investigation reports, and determine the measures necessary for the existing system to comply with these Rules. The Applicant shall cooperate with the District in its efforts to obtain information, review existing documents, and inspect the onsite facilities. The Customer will be responsible for all costs associated with the conversion to recycled water system. The District or DHS may deny issuance of a Permit if either determines that the proposed conversion cannot be safely made.

3.10.1.1 Installation of Backflow Prevention Device:

The Customer shall install approved backflow prevention devices on all potable water or other water meter connections.

3.10.2 Conversion from Recycled Water Service

If, due to onsite failure of the recycled water system or use violations, the District determines it necessary to convert the onsite facilities from recycled water supply to a potable water system or other water supply, it shall be the responsibility of the Customer to pay all costs for such conversion, unless determined otherwise by the District. Conversion costs shall include, but may not be limited to the following:

3.10.2.1 Isolation of the recycled water supply

Service shall be removed and plugged by the District at the recycled water main, or abandoned in a manner approved by the District.

3.10.2.2 Installation of Backflow Prevention Device

The Customer shall install approved backflow devices on all potable water or other water meter connections.

3.10.2.3 Removal of Existing Fittings

The Customer shall be responsible for removal and replacement of all fittings with approved fittings for potable water.

3.10.2.4 Hydraulic Testing and Disinfection

The Customer shall be responsible for hydraulic testing and disinfection of the converted pipeline, service line, connection, etc. prior to initiating the connection and use of the potable water supply.

3.10.2.5 Notification

The Customer shall notify all personnel involved with the operation of the abandoned recycled water service.

3.10.2.6 Warning Labels/Signs

The Customer shall be responsible for the removal of all warning signs and labels and repainting.

3.10.2.7 Installation of Potable Water System

Provision and installation of all potable water lines and facilities and any capacity fees due therefor shall be the responsibility of the Customer.

3.11 AUTHORIZED USES OF RECYCLED WATER

The uses of recycled water may include, but are not limited to, agricultural irrigation, commercial use, construction use, enhancement of wildlife habitat, industrial processes,

landscape irrigation, and recreational impoundment. Determinations as to specific uses to be allowed shall be in accordance with Title 22. The District may, at its discretion, set forth specific requirements as conditions to providing such services and/or require specific approval from the appropriate regulatory agencies.

The use of recycled water in swimming pools is **not permitted.**

The use of recycled water for street cleaning operations is **not permitted.**

3.12 SCHEDULING RECYCLED WATER

The District will control and schedule the delivery of recycled water as necessary to maintain acceptable working pressure in the recycled water system and to safeguard the public health.

3.13 TEMPORARY/EMERGENCY CONNECTIONS TO THE POTABLE WATER SYSTEM

In the event of a present or impending emergency whereby full recycled water service is not available, the District may approve a temporary connection to the potable water system. Such temporary connection shall be made in accordance with Sections 4 and 5 of these Rules. The decision to provide temporary service from the potable water system shall be at the sole discretion of the District, and the District shall maintain and operate all connections. Any cost associated with such temporary connections shall be incurred by the Customer.

Before such temporary connection is made, the portion of use area where potable water is to be supplied shall be isolated by an air-gap separation from the remainder of the recycled water system. This isolation shall occur at either individual services or on the offsite system, as determined by the District. A District-approved backflow prevention device shall be installed on the potable water lines in accordance with Section 3 of these Rules and all applicable regulations of the governing agencies. The emergency connection shall be removed before connection is re-established to the recycled water system. Re-establishment of recycled water service must be inspected and approved by a District inspector prior to resuming delivery of recycled water.

The District may approve a temporary potable water connection for a Customer's recycled water system, without an air-gap. The temporary connection shall be designed to allow only one water source to serve the Customer's system at any given time. A District-approved backflow prevention device and meter shall be installed on the potable water service.. At no time shall the potable water system be connected to a system simultaneously served by a non-potable source. To ensure separation of the potable and recycled water supplies, the recycled water meter(s) shall be pulled prior to connecting the potable water supply.

The District, at its own discretion, may provide potable water in lieu of recycled water.

3.14 ADDITIONAL RESTRICTIONS ON THE USES OF RECYCLED WATER

3.14.1 Run-off and Ponding

a. The onsite facilities shall be designed not to exceed the peak moisture demand of the plant materials used within the design area and to apply irrigation water in a manner compatible with the infiltration rates of the approved use area.

b. Conditions that directly or indirectly cause a run-off of recycled water outside of the approved use area; cause ponding of recycled water; or permit windblown spray to pass outside of the approved use area, whether by design, construction practice, or system operation, shall be eliminated or controlled to the greatest extent possible.

3.14.2 Protection of Drinking Fountains and Public Facilities

Any and all drinking fountains located within an approved use area shall be protected from contact with recycled water, whether by windblown spray or by direct application through irrigation or other approved uses. Protection shall be by relocation or isolation with a protective structure.

Recycled water irrigation systems shall not be installed near food establishments or public facilities such as picnic tables. Design of systems near such facilities shall require DHS approval.

3.14.3 Hose Bibbs and Quick Couplers

Hose bibbs shall not be installed on the onsite recycled water system regardless of style, construction or identifications. The use of quick couplers is at the District's sole discretion and requires a separate plan review by the District. Only quick couplers with approved color and identification will be allowed.

3.14.4 Fire Hydrants

No fire hydrants or other fire services connections may be installed on any onsite system that presently operates or is designed to operate with recycled water.

3.14.5 Irrigation or Impoundment of Recycled Water near Wells

There shall be no irrigation with, or impoundment of recycled water within 100 feet of any well used for potable or irrigation water unless it is demonstrated to the satisfaction of the District and the regulatory agencies that special circumstances justify less distance. In all circumstances, the restrictions imposed by Title 22 shall apply.

3.14.6 Irrigation with Recycled Water near Residences Certain Public Places

No spray irrigation of any recycled water, other than disinfected tertiary recycled water, shall take place within 100 feet of a residence or where the public could be exposed in a manner similar to a park, playground, or schoolyard.

SECTION 4
FACILITIES DESIGN AND CONSTRUCTION

4.1 DESIGN GUIDELINES FOR OFFSITE AND ONSITE FACILITIES

Offsite recycled water facilities design, including plans and specifications, shall be supervised by an engineer registered with the State of California. The onsite recycled water facilities design, including the plans and specifications, shall supervised by appropriate professionals registered with the State of California, including a landscape architect, civil engineer or mechanical engineer. All recycled water facilities shall comply with Title 22, the AWWA (California-Nevada Section) Guidelines for Distribution of Non-potable Water, and the DHS Guidelines for Use of Recycled Water, and shall also comply with all the requirements, conditions and standards set forth in the current edition of the Standard Specifications for Public Works Construction including the Regional Amendments of the County, Elsinore Valley Municipal Water District's Standard Specifications and Drawings, the provisions of these Rules, and other applicable design standards and construction specification guidelines.

4.2 OFFSITE RECYCLED WATER FACILITIES

The costs to extend recycled water service shall be borne by the benefited property owners or the District as provided in Section 3.5.3.1 or Section 3.5.3.2 of these Rules. Such costs shall be in addition to other fees, deposits and charges.

4.2.1 Pressure Requirements

Service pressure requirements shall be determined by the District. The Customer shall design the onsite system to accommodate available pressure.

When a reasonable service pressure would not be available to onsite facilities, the Customer shall be responsible for correcting the situation. If available service pressure is too high, the Customer shall utilize pressure regulators downstream of the meter to obtain the correct pressure. If available pressure is too low, the Customer shall provide booster pumps to increase the pressure. For dual plumbed sites, a pressure regulator should be installed on the on-site recycled water system if the recycled water distribution pressure is equal to or above the potable system pressure. The pressure regulator on the recycled water system should be set at a value approximately 10 psi lower than the potable supply after the RPP backflow prevention device.

Whenever possible, the District will operate the recycled water system at a lower pressure than the potable water system.

4.2.1.1 Booster Pumps

Customers using booster pumps shall identify the pumping systems as recycled water, avoid release of recycled water in an uncontrolled manner, and provide proper drainage of the packing seal water. At least one sign in English and Spanish shall be posted on the premises of the booster pumps, which can be readily seen by all operations personnel working in the area.

4.2.1.2 Sealing Water

An air gap is required for potable sealing water on a recycled water pump.

4.2.2 Depth of Pipe Cover

The top of the pipe of transmission/distribution mains shall be a minimum of 3 feet below the finished grade unless approved otherwise. The depth of cover on service lines shall be in accordance with the District's Standards.

4.2.3 Pipe Separations to Other Utilities

The following separation criteria apply between recycled water pipelines and other utility pipelines.

4.2.3.1 Horizontal

A 10-foot separation of the recycled water pipeline shall be maintained at all times between parallel potable water pipeline and/or a sanitary sewer or sludge pipelines. Separation distance shall be measured from the outside diameter of the pipes or fittings. If a 10-foot separation is not possible, the approval for special construction requirements shall be obtained from the District and DHS prior to construction. Common trench construction is not permitted. In any situation, a horizontal separation of less than 4 feet shall not be allowed.

4.2.3.2 Vertical

On new systems, potable water, recycled water, and sewer lines shall be located from the ground surface in order of descending quality. Potable water shall be located above recycled water, which shall be located above sewer. Minimum vertical separation shall be one foot between top and bottom surfaces of pipes. Exceptions to this general rule are as follows:

a. On irrigation systems where intermittently pressurized recycled water lines (laterals) serve sprinkler heads, the potable water line(s) may be placed under the recycled water laterals. No special construction requirements are necessary provided that one-foot vertical separation is maintained.

b. On sites using pressurized irrigation laterals with valve-in-head sprinklers, the potable water line(s) may be placed under the recycled water laterals if additional protection

is provided for the potable line. Common practices include sleeving or automatic flow control/shut off devices installed and functioning properly on each lateral that crosses a potable line.

No additional special construction requirements are necessary provided that at least one foot vertical separation is maintained.

4.2.3.3 Pipe Crossings

As per the DHS Guidance Memo No. 2003-02, at places where potable and recycled water lines cross, either there should be no connection joints in the water main within eight horizontal feet of fluid pipeline or the recycled water piping should be sleeved 10 feet each side of the potable line crossing measured from the outside of the pipe. Pipe crossings shall be consistent with the District's Design and Construction Standards.

4.2.4 Color Identification of Recycled Water Pipes

All new transmission/distribution mains in the recycled water system, including service pipelines, valves and other appurtenances shall either be colored purple and embossed or be integrally stamped/marked "RECYCLED WATER - DO NOT DRINK", or be installed with a purple identification tape, or a purple polyethylene or vinyl wrap. (See also Section 4.5.5.)

Color-coded identification (caution) tape differentiating the recycled water piping from other utility lines shall be consistent throughout the District's service area. The purple color shall be Pantone #512 per AWWA Guidelines.

When converting an existing potable water pipeline to recycled water usage, the water pipeline shall be accurately located and tested in coordination with District and regulatory agency requirements, and the necessary actions taken for the pipeline and appurtenances to comply with these Rules. If the existing pipeline meets District and the regulatory agencies requirements, excepting pipe identification, the pipeline shall be approved for recycled water service. If verification of the existing pipeline is not possible, the pipeline shall be uncovered, inspected, and identified prior to use. All maintenance or new work to offsite recycled water systems shall be color-coded for identification in accordance these Rules.

4.2.5 Identification Tapes

Identification tapes which help to trace the pipeline shall have black printing on a purple field having the words "RECYCLED WATER - DO NOT DRINK". The overall width of the tape shall be at least three inches.

Identification tapes shall be installed centered above the pipe longitudinally. The identification shall be continuous in its coverage on the pipe and shall be fastened to each pipe length. Taping attached to sections of pipe before they are placed in the trench shall have overlaps sufficient for continuous coverage. Other satisfactory means of securing the tape during backfill of the trench may be used if suitable for the work, as determined by the

District. Sample tape marking and the inscriptions that go with it are as shown in the following figure.

RECYCLED WATER - DO NOT DRINK

4.2.6 Recycled Water Valve Casings

Valve casings shall be the standard steel casings with a special triangular, heavy-duty cover. All valve covers on offsite recycled water transmission lines shall not be interchangeable with potable water covers and shall contain a recognizable inscription cast on the top surface.

4.2.7 Valve Box Identification

Valve boxes shall be the standard concrete or fiberglass boxes with a special triangular, heavy-duty cover. All valve covers on offsite recycled water transmission mains shall not be interchangeable with potable water covers and shall contain a recognizable inscription cast on the top surface.

4.2.8 Color-Coding Exposed Recycled Water Facilities

All above ground, exposed recycled water facilities shall be consistently color-coded (purple) and marked to differentiate recycled water facilities from potable water and/or wastewater facilities.

4.2.9 Blow-off and Air and Vacuum Assemblies

Either in-line type or end-of-line type blow-off or drain assembly shall be installed for removing water or sediment from the pipe. Blow-off assemblies must be installed in a low point of the pipeline. The discharge of recycled water to storm drains is prohibited. If there is no sanitary sewer to receive the discharge, the RWQCB and the DHS must be consulted regarding acceptable alternatives. All regulations must be strictly adhered to regarding the discharge and disposal of recycled water in a non-approved use area.

Air vacuum and release valves must be provided in high points of the pipeline system and sized according to the manufacturer's recommendations. All appurtenances for blow-off and air vacuum and release valve assemblies must be consistently color-coded purple and marked to differentiate recycled water facilities from potable water and/or wastewater facilities.

The EVMWD's standard details on Blow-off and Air and Vacuum assemblies are provided in Appendix G.

4.2.10 Swivel Ell Connections

In the event that recycled water is not available, or a planned temporary use of potable water supply is required, a Swivel Ell connection may be used. The Swivel Ell connection prevents the interconnection of potable water and recycled water supplies.

DHS Policy Memo 2003-03, dated May 7, 2003, describes the requirements for swivel ell connections. The design, maintenance, and operation of swivel ell connections shall be in compliance with the Policy Memo 95-004. A copy of the swivel ell connection shall be submitted to the State DHS for review and approval. The District and State DHS must approve the swivel elbow before use. Otherwise, the potable water supply line shall be protected by an air-gap configuration to physically separate the potable and recycled plumbing lines.

Connections using the swivel ell must be witnessed by a District Cross-Connection Control Specialist. Swivel ell connections are illustrated in Standard Detail RW-123, *Swivel Ell for Recycled and Potable Water Supply*. In an emergency, the swivel ell is switched from the normal recycled water connection to the potable connection. This procedure is reversed once the recycled water supply is restored. In addition, the potable water supply must be protected by an approved reduced pressure principle backflow prevention device upstream of the swivel ell.

4.3 ONSITE RECYCLED WATER FACILITIES

All onsite recycled water facilities (e.g. decorative fountains, car washes, etc.), which specifically benefit the approved use area, shall be provided by the Applicant, owner or Customer at their expense. The Customer shall make, at their expense, any modification to the potable water system on the premises which is required by the District for recycled water service, including but not limited to District-approved backflow prevention devices. Onsite recycled water facilities shall be designed for recycled water use in those areas where the District has determined that recycled water will be supplied in the future, even though recycled water service is not immediately available when the design area is ready for construction. Provisions shall be made for connection to the recycled water system when it becomes available. In the interim, potable water may be supplied to the onsite facilities through an approved temporary potable water connection. Such temporary connection to the potable water system shall be provided with an approved reduced pressure backflow prevention assembly installed by the Customer to the satisfaction of the District and DHS.

Plans and specifications for Customer recycled water facilities shall be submitted to the District as specified in Sections 3.5.1 and 4.5.1 of these Rules and Regulations.

4.3.1 Identification of Onsite Pipes and Fittings

New onsite pipelines shall be identified as recycled water pipes by using a purple color code differentiating them from potable water piping.

All piping must be appropriately labeled or continuously taped with appropriate identification.

Approved use areas for recycled water service shall also be posted with precautionary notices per Section 5.3.

When converting an existing potable water line to recycled water usage, the water line shall be accurately located and tested in coordination with the District and the regulatory agencies, and the necessary actions taken to bring the water line and appurtenances in compliance with these Rules. If the existing line meets approval of the District and the regulatory agencies, except for the pipe identification, the line shall be approved for recycled water service. If verification of the existing line is not possible, the line shall be uncovered, inspected, and identified prior to use. All maintenance or new work to onsite recycled water systems shall be color-coded for identification in accordance with these Rules.

4.3.2 Warning Tapes

A warning tape with metallic backing shall be installed on all recycled water service lines. The tape shall run continuously the entire length of the pipe and shall be at least 3 inches in width (see Section 4.2.5 for tape sample and color).

4.3.3 Color-Code for Recycled Water Pipes

All recycled pressure or non-pressure pipe shall be purple with the words "RECYCLED WATER - DO NOT DRINK" embossed or integrally stamped/marked on the pipe.

The warning shall be stamped on opposite sides of the pipe, repeated every three feet.

All connections, temporary and permanent to a recycled water system shall be identified in such a manner as to differentiate them from connections to a potable water system.

4.3.4 Valve Box Identification

All new recycled water valve boxes and covers for irrigation control valves, isolation valves, quick couplers, etc., shall be color-coded purple and embossed “Recycled Water – Do Not Drink”. Existing covers may be retrofitted with a purple nameplate marked: “RECYCLED WATER – DO NOT DRINK” and permanently attached to the cover.

4.3.5 Separation

Refer to Section 4.2.3 for horizontal and vertical separations.

4.3.6 One Hundred Year Flood

4.3.6.1 Runoff and Erosion

All recycled water storage facilities owned and/or operated by recycled water Customers shall be protected against erosion, overland runoff, and other impacts resulting from 100-year frequency 24-hour-duration storms to the satisfaction of the District.

4.3.6.2 Peak Flood Levels

All recycled water storage facilities owned and/or operated by recycled water Customers shall be protected against 100-year frequency peak stream flows and flood levels, as defined by the Riverside County Flood Control District, and to the satisfaction of the District.

4.4 RECYCLED WATER FOR CONSTRUCTION USE

4.4.1 Permits

The use of recycled water for construction purposes requires approval of the District and the appropriate regulatory agencies. The Permit shall be obtained prior to beginning construction.

4.4.2 Uses

Recycled water for construction purposes may only be used for soil compaction during grading operations, dust control and consolidation and compaction of backfill in trenches for non-potable water, sanitary sewer, storm drain, gas and electric pipelines. Recycled water shall not be used for water jetting and consolidation or compaction of backfill in trenches for potable water pipelines.

4.4.3 Equipment

Vehicles used for distributing recycled water for soil compaction and dust control shall be provided with an adequate tank and plumbing system to ensure that leaks and ruptures will not occur in the course of normal use.

Control valves shall be provided such that recycled water can be applied in a controlled fashion on the approved use area, and completely retained during transit to all other areas. Spray heads or nozzles shall be provided and configured in such a way that the recycled water is uniformly applied, and runoff, ponding or windblown spray conditions are prevented.

Each tank shall be equipped with an approved air-gap separation. Above ground recycled water appurtenances shall be color-coded purple and labeled or tagged "RECYCLED WATER – DO NOT DRINK" . Labeling or tagging in Spanish is optional. Water towers and trucks utilizing recycled water shall be properly identified and clearly marked with recycled water notification to the satisfaction of the District.

Equipment operators shall be instructed about the requirements contained herein and the proper use of recycled water. Water trucks, hoses, drop tanks, etc. shall be identified as containing recycled water and not suitable for drinking water. Recycled water shall not be introduced into any domestic water piping system. No unprotected connection shall be made between equipment containing recycled water and any part of a potable water system.

4.4.4 Ponds

Ponds used for storage of recycled water for construction shall be fenced and posted to limit public access. Fences shall be in accordance with Regional Standards.

4.4.5 Equipment and Facilities Cleaning

Any equipment or facilities such as tanks, temporary piping or valves, and portable pumps which have been used with recycled water shall be cleaned and disinfected before moving to another job site. This disinfection and cleaning shall ensure the protection of public health in the event of any subsequent District-approved use.

Service connections, equipped with recycled water meters, for the construction use of recycled water shall be provided by the District at locations convenient to the Customer and at the discretion of the District. A secure fence or enclosure must be provided to prevent vandalism or unauthorized use of recycled water. This enclosure shall have an approved sign stating: "RECYCLED WATER – DO NOT DRINK" both in English and Spanish.

4.5 SUBMITTALS

The following information shall be submitted to and approved by the District prior to commencing any construction.

4.5.1 Customer's Plans and Specifications

Plans and specifications for the construction of onsite recycled water facilities shall be prepared by a civil engineer, a mechanical engineer or a landscape architect registered with the State of California, and submitted to the District and State DHS for review and approval per Sections 3.5.1 and 4.3. The plans shall delineate the proposed recycled water service area, the proposed location, size and type of all recycled water service connections and onsite facilities. The plans shall include the layout of existing potable water pipelines and facilities including any areas in which recycled water must be specifically excluded.

A declaration of responsible charge shall be included on the cover sheet as follows:

Declaration of Responsible Charge

I hereby declare that I am the _____ of work for this project, and that I have exercised responsible charges over the design of this project as defined in Section 6703 of the Business and Professions Code and design is consistent with current standards.

I understand that the check of project drawings and specifications by EVMWD and DHS is confined to a review only and does not relieve me, as the _____ of work, of my responsibilities for project design.

Firm name and address:

_____

_____

_____

Phone No: _____

By: _____ Date_____
Name

Registration No._____ Expiration Date: _____

4.5.2 Information on Customer's Plans

The following information shall be provided on the plans for every Customer applying for any recycled water service meter:

a. Application information specified in Section 3.2.1.
b. Meter size (inches) and the District to verify
c. Irrigated area to be served through the recycled water meter (square feet or acres).
d. Peak flow through the meter (gpm).
e. Estimate of the yearly recycled water requirement (acre-feet or HCF).
f. Service pressure at the meter as provided by the District (psi).
g. Topographic contours of the site (1 ft interval), or if not available, sufficient information to determine elevation differences within the site.
h. Direction of drainage.
i. Location of wells (if applicable).
j. Location of 100 Year Flood Plain (if applicable).
k. Location of potable water lines and sanitary sewers.
l. Location of storm drains.

4.5.3 Information Required for Recycled Water Irrigation Systems

If the onsite facilities include a landscape irrigation system, the following data for the materials used in the irrigation system shall be included on the plans:

a. A pipe schedule listing pipe sizes and materials of construction.

b. Valve types/sizes.

c. The following information for each type of sprinkler head:

    i. Sprinkler radius (feet).
    ii. Operating pressure (psi).
    iii. Flow (gpm or gph).
    iv. Sprinkler pattern.
    v. Manufacturer, model number and all pertinent information.

d. Drip irrigation information and all other pertinent equipment.

e. Estimates of application rate, acres to be irrigated, soil texture and soil infiltration rate, and information on pressure requirement, hourly delivery rate, and the wetting pattern of sprinklers.

4.5.4 Additional Information to be Specified on Customer's Plans

Exterior drinking fountains, potable water hose bibbs, public eating and cooking facilities, playground equipment, tot lots, outdoor swimming pools and spa locations shall be shown and identified on the plans. If no exterior drinking fountains or other public facilities are present in the design area, then it shall be specifically stated on the plans that none exist. For dual-plumbed sites, if recycled and potable lines cross, a typical cross-section must be included in the detail section of the plans.

The design and proposed locations for recycled water "DO NOT DRINK" signs shall be shown on the plans. An additional, detailed signage plan may be required by the District for unusual circumstances.

4.5.5 Standard Notes for Inclusion on Customer's Plans

Provide the following notes as applicable, on the recycled water improvement and irrigation plans under the heading "Recycled Water General Notes:"

4.6 RECYCLED WATER GENERAL NOTES

1. The contractor shall notify EVMWD at (951) 674-3146, 48 hours prior to commencement of any excavation onsite improvements.

2. All work shall be performed in accordance with these Rules and DHS requirements.

3. All public facilities such as comfort stations, drinking fountains, outdoor eating areas, etc., shall be protected from spray and/or misting by recycled water.

4. No ponding, run-off, misting or over spray is permitted. Locate or adjust all irrigation heads to prevent over spraying onto sidewalks, streets, private lots, and non-approved use areas.

5. No ponding, run-off, misting or over spray is permitted. Locate or adjust all irrigation heads to prevent over spraying onto sidewalks, streets, private lots, and non-approved use areas.

6. Non-approved use areas shall be protected from contact with recycled water, whether by windblown spray or by direct application through irrigation or other use. Lack of protection, whether by design, construction practice, or system operation is strictly prohibited.

7. Hose bibbs on recycled water systems are prohibited.

8. Cross connection between recycled water lines and potable water lines is strictly prohibited.

9. Recycled water quick coupling valves shall be designed for use on recycled water in accordance with these Rules.

10. Quick coupling valves used in recycled water systems shall conform to the following:

    a. Quick coupling valves can be 1-inch or 3/4-inch nominal size, with brass construction and a normal working pressure of 150 psi or equal.

    b. A purple rubber or vinyl locking cover shall be permanently attached to the quick coupling valves.

11. No substitution of pipe materials will be allowed without prior approval by the District and DHS.

12. All irrigation pipe shall be colored purple and stenciled with "Recycled Water Do Not Drink" . Orient the stenciling to the top of the trench for laterals. Install purple metallic tape over the recycled water mains as described in these Rules.

13. Burial of all piping shall be in accordance with these Rules for the use of Recycled Water. Provide a minimum cover of all pipe and wire in accordance with these Rules for the use of recycled water.

14. Hours for irrigation with recycled water are from 9:00 p.m. to 6:00 a.m. The hours for irrigation with disinfected tertiary recycled water may be modified by the local authority and shall be under the supervision of the Customer's Recycled Water Site Supervisor. Irrigation with water of a lesser quality than disinfected tertiary recycled water must be reviewed and approved by DHS.

15. When potable water and recycled water lines cross, the recycled water line shall be installed within a protective sleeve. The sleeve shall extend 10 feet from each side of the outside edge of the potable line.

16. Maintain separation between potable water, recycled water, and/or sewer pipelines according to the District's Rules & Regulations and DHS Guidance Memo No. 2003-02 latest revision. Measurements shall be between facing surfaces, not pipe centerlines. Install sewer line below a recycled water line and a recycled water line below a potable water line.

17. Provide a minimum of 12 inches of vertical separation between potable water, recycled water, and sewer line according to these Rules and DHS. Maintain at least 12 inches crossing separation between other utilities.

18. All public and private potable water mains including fire mains and any water wells and water courses within the recycled water project shall be shown on plans.

19. The site irrigation systems as shown on these documents may utilize potable water until such time as the District makes recycled water available to the site.

20. Install purple colored Pantone #512 material for all above ground irrigation facilities per AWWA Guidelines and Section 116815 of the California Health and Safety Code.

    a. Valve and other on-grade boxes - integral color

    b. Sprinkler heads - integral color plastic

    Above ground piping to sprinklers can be UV resistant PVC material; however, all sprinkler risers and heads must be marked for recycled water use.

21. All recycled water sprinkler control valves and other below grade facilities within boxes shall be tagged with identification tags. Tags shall be weather proof plastic 3 inches x 4 inches, purple in color, with words "RECYCLED WATER – DO NOT DRINK" and "AGUA IMPURA – NO BEBER" imprinted on one side, and the recognized symbol for do not drink on the other side. Imprinting shall be permanent and black in color. One tag shall be attached either to the valve stem directly or with plastic tie wrap, or to the solenoid wire directly or with plastic tie wrap.

22. The Applicant shall conduct a cross-connection control shutdown test and coverage test (as defined in Section 4.8 of the District's Rules) when requested by the District or DHS prior to any use of recycled water. The method of this test must be approved by the District.

23. The required cross-connection control shutdown test may be performed by an outside contractor who is a certified Cross-Connection Control Specialist as defined in the District's Rules and witnessed by the District's Cross-Connection Control Specialist. Copies of inspection reports will be forwarded to the District.

24. The design and location for recycled water "DO NOT DRINK" signs shall be in accordance with the District's Design and Construction Standards and shall be included on the plans.

25. An annual site survey shall be performed by the District subject to approval by the DHS. Copies of the inspection reports will be forwarded to the relevant parties.

26. Prior to conversion to recycled water, an on-site recycled water site supervisor shall be designated in writing as required in Section 3.9.4 of these Rules. Copies of the site supervisor's certificate of training with a 24-hour contact telephone number shall be provided to the District and DHS.

27. All maintenance personnel shall be educated on a continuous basis of the presence of recycled water. Personnel must be informed that recycled water is meant for

irrigation and DHS-approved non-potable use only. It is not approved for drinking purposes, hand washing, cleaning of tools, etc. Given the high turnover rate of employees in the landscape industry, it is important this information be disseminated on continual basis.

28. A physical separation shall be provided between areas irrigated with recycled water and those irrigated with potable water. Separation may be provided by concrete mow strips, fence or wall, or other means as approved by the District and DHS.

29. Customers and Applicants may not create or maintain any direct (pipe-to-pipe) drainage of recycled water into the storm drains.

4.7 RECORD ("AS-BUILT") DRAWINGS

The Applicant, Customer, or owner shall submit record drawings to the District before a request for service start-up is made.

Any proposed changes from the original design shall be accurately recorded on one set of drawings and submitted to the District for agreement and approval prior to recycled water service. Such changes shall be approved by the District before any changes, modifications, or additions are made.

4.8 RECYCLED WATER INSPECTION PROCEDURES

4.8.1 Coverage Test

Upon completion of the construction of any irrigation system, the system shall be inspected to determine its adequacy to meet health and safety concerns. The coverage test looks at overspray, misting, ponding, runoff, color-coding, and signage. The Cross-Connection Specialist will schedule the coverage test with the Customer site supervisor and DHS. Any punchlist is finalized by the Cross-Connection Specialist. This procedure may be performed concurrently with the shutdown test as described in the following section. On LMDs, the inspection relates to the possibility of the inhalation of recycled water irrigation spray, overspray and misting into non-approved use areas, and runoff into area storm drains. The inspection must also include the possibility of cross-connecting the irrigation system and other private potable water systems. All changes from the approved design drawings shall be marked on as-built drawings.

4.8.2 Shutdown Test

The following applies to sites using recycled water for landscape irrigation. These sites may have on-site potable services to drinking fountains, restrooms, and isolated systems using potable water. Additionally, potable water may serve on-site buildings for domestic purposes.

The initial test of new and retrofit sites with potable water services (dual-plumbed sites) is conducted using potable water high-lined to the irrigation system point of connection. A

reduced pressure principal (RPP) backflow prevention device must be used for the high-line connection, and all testing is conducted using potable water. The recycled water meter will be set, and service activated after successful completion of cross-connection testing and inspection.

The cross-connection test using pressure data loggers or recorders is designed to provide reasonable assurance that a recycled water system is not intentionally or inadvertently cross-connected to any other water system. Modifications to the following procedure may be necessary. For each site, the specific method of cross-connection testing must be approved by DHS and the District. The location and type of pressure recording equipment must be specified in the test method.

The cross-connection test begins by monitoring the recycled water system and any on-site potable water system(s) for 24 hours prior to the shutdown test. During this 24-hour period, the recycled water system is pressurized with irrigation stations running during their normal schedule. It is very important that the irrigation controller clock is set correctly, and the station schedule is noted. Usually, recycled water quick couplers are used as points of connection for pressure recording equipment. This part of the test is designed to check irrigation system operation and detect any unauthorized connections or uses of the recycled water system. Additionally, normal operating pressures for the recycled water system and potable system are recorded during this period. For the recycled water system, any spikes or dips in the pressure record that are not within the operating period of the irrigation system must be explained before proceeding.

The shutdown test starts with a shutdown of the recycled water system for at least 4 hours. During the recycled water shutdown, potable water service is left on at normal pressure while the recycled water system is shutoff at the meter service connection. After shutoff, the initial pressure of the recycled water system is lowered to approximately 30 psi at the point of connection. This pressure must hold until the first irrigation station is activated. During the recycled water system shutdown, all irrigation stations must be activated for at least two minutes per station. Additionally, any adjacent site irrigation system stations should run during the recycled water system shutdown. Any pressure spikes noted on the recycled water system pressure record must be accounted for before proceeding.

A successful recycled water system shutdown, with no pressure increases or flows noted, provides basic assurance that cross-connections do not exist.

If the site has potable water service connection(s), a minimum 4-hour potable water shutdown is conducted after the recycled water system shutdown test. During this part of the test, the recycled water system is on at normal pressure, while the potable system is off and depressurized to approximately 30 psi. On the potable system, building isolation valves should be closed first, and any occupants notified that the water is off. It is always preferable to conduct the potable water system shutdown at a time when buildings are unoccupied. After building isolation valves are closed, the potable system is shutoff at the RPP backflow prevention device using shutoff valve #1 and the system is depressurized to approximately 30 psi. Each irrigation station on the recycled water system must run at least once during the

potable water system shutdown. Since each irrigation station is operating during the potable water system shutdown, usually, the coverage test is conducted at this time.

Any increases noted during the potable water system shutdown must be investigated for cross-connection between the onsite irrigation and domestic supply or adjacent water systems.

Test valve #4 on the RPP is usually used for monitoring the potable water system during shutdown testing. For the test, the RPP must be in excellent working order with check valve #2 holding tight. The RPP must be tested at the conclusion of cross-connection testing.

4.8.3 New and Retrofit Sites Testing

Shutdown tests and use site inspections shall be conducted for both new construction (with complete sets of planning and inspection documents) and retrofit (with minimal planning and inspection documents). Because retrofit applications can pose additional challenges from unfamiliarity with the site and plumbing layout, retrofit sites must be thoroughly inspected by the District's cross-connection specialist. All available plans must be provided to the District, either as "as-builts" or as developed by the Customer. The District Cross-Connection Specialist must survey the site before final retrofit plans are submitted for District and DHS review. The District may conduct a preliminary cross-connection test to help determine the feasibility of recycled water conversion.

4.8.4 Results

The results of the cross connection test for dual-plumbed systems shall be compiled in an engineering report for the site. Test results will be provided to all concerned parties. (Reference Section 60314 of Title 22 in a format that is acceptable to DHS)

SECTION 5
FACILITIES OPERATION

5.1 OFFSITE RECYCLED WATER FACILITIES

Operation, maintenance and monitoring of all of the District's offsite recycled water systems including, but not limited to, recycled water transmission and distribution mains, service lines, valves, connections, storage facilities, and other appurtenances and properties up to and including the District's meter, shall be under the management and control of the District. No other persons except authorized representatives of the District shall have any right to enter any portion of the foregoing. No other persons except authorized representatives of the District shall have any right to operate, adjust, repair, change, alter, move or relocate any portion of the offsite recycled water system.

5.2 ONSITE RECYCLED WATER FACILITIES

5.2.1 Customer's Responsibilities

The Customer or owner shall be responsible for preventing pollution or contamination of the on-site water system and the District's distribution system from backflow.

The Customer or owner shall be responsible for the safe and efficient operation, and maintenance of their facilities. However, the District shall also have the right to monitor and inspect the onsite operation of the Customer's facilities pursuant to Section 6 of these Rules.

The Customer shall notify the District of any and all updates or proposed changes, modifications or additions to the onsite facilities. Changes require District approval and shall be designed and constructed according to these Rules and any other District requirements.

The Customer or owner shall notify the District immediately when there is a change of either owner or Customer. The District will then reassess the level of protection required and amend the existing Permit in accordance with Section 3.3.2 as necessary. Any alterations to existing onsite facilities that may affect required protection levels must also be reported directly to the District.

The Customer shall comply with any and all applicable Federal, State, and local statutes, ordinances, regulations, contracts and requirements prescribed by the District. In the event of violation, any charges and penalties shall be applied by the District in accordance with Section 11 of these Rules.

It shall be the responsibility of the Customer to notify the District of any and all failures in a recycled water system whether or not in the Customer's opinion the failures resulted in violations. It shall also be the responsibility of the Customer to notify the District of any and all violations which occur as a result of the Customer's action or the action of their operations

personnel. The Customer shall keep a written log of all system failures and violations including corrective action taken. The log shall be available for review by the District.

5.2.2 Designation/Responsibility of the Recycled Water Site Supervisor

Each recycled water Customer shall designate a Recycled Water Site Supervisor. The Recycled Water Site Supervisor shall be a person accepted and approved by the District to operate and maintain the onsite recycled water facilities and to assume the responsibilities outlined below. The Recycled Water Site Supervisor shall obtain instruction in the use of recycled water, such instruction being approved by the District. The customer must notify the District whenever the Recycled Water Site Supervisor will change. The Recycled Water Site Supervisor shall be the contact person for the Customer in all matters between the Customer and the District concerning the operation of the onsite system and the use of recycled water (see Section 3.9.4). Subsequently, the Customer shall be responsible to obtain the District's acceptance and approval of their newly designated supervisor. The Recycled Water Site Supervisor will have the following responsibilities:

a. To supervise recycled water service and maintain onsite facilities.

b. To ensure that all operations personnel are trained and familiarized with the use of recycled water, including all pertinent information contained in these Rules and Regulations and those applicable portions of the California Code of Regulations. This information shall be supplied by the District upon request by the Applicant or Customer. The Applicant shall attest that training will be provided.

c. To furnish operations personnel with operating instructions, maintenance instructions, controller changes, and record drawings to ensure proper operation in accordance with the facilities design and these Rules and all applicable permits. At least one complete set of this information shall be kept onsite or in the nearest field office or maintenance building.

d. To operate and control the Customer's recycled water system in order to prevent human consumption of recycled water, to prevent run-off, to minimize public contact, and comply with Title 22.

e. To provide a preventative maintenance program to ensure the continued optimal operation of all system elements within the requirements of these Rules.

f. To prevent cross-connections to other water systems, and also to protect the recycled water system from contamination from cross-connections to other sources.

g. To ensure that maintenance and inspection of backflow prevention assemblies is performed annually per requirements of regulatory agencies, or more often in those instances where successive inspections indicate repeated failures.

h. To report to the District any and all onsite facilities failures whether or not such failures may result in violations.

5.3 POSTING APPROVED USE AREAS

Recycled water use areas must be posted in English and Spanish to inform the public of recycled water use. All signs must meet District standards for size, wording, and installation. Signs must be located at all entrances to the site and other locations so the public and persons working at the site are adequately notified of recycled water use. For sign placement within the site, consult with the District's Cross-Connection Specialist.

For landscape irrigation systems, additional signs (4" x 8" size) and notification shown in Appendix H must be posted at each controller and booster pump.

For restricted recreational impoundments and landscape ponds or fountains, signs must be placed so the public is adequately notified that the water is unsafe to drink.

For temporary construction sites, signs must be located at all entrances to the site and any pumps, tanks, water trucks, ponds, or other equipment used for recycled water. Additional signs and recycled water tags can be required as determined by the District's Cross-Connection Specialist or DHS.

For all other authorized uses of recycled water, approval of signage must be obtained prior to using recycled water.

Required signs, labels, and tags must be installed and maintained by the customer. The customer's Recycled Water Site Supervisor shall routinely inspect signage, and ensure that missing or damaged signs are promptly replaced.

A signage plan shall be prepared and forwarded to the District and DHS for review and approval prior to using recycled water.

SECTION 6
MONITORING AND INSPECTION

The District, the DHS, the RWQCB, or authorized representatives of any of these agencies, shall have authority to monitor and inspect the entire recycled water system, including both onsite and offsite facilities. The District shall conduct monitoring programs as it deems necessary to ensure that the Customer's recycled water facilities are being operated in accordance with these Rules, including the requirement that cross-connections between potable water facilities and the recycled water facilities do not exist. In carrying out these functions, the District, DHS, RWQCB, or authorized representative of any of these agencies, shall have the right to enter any Customer's premises during reasonable hours upon presentation of proper credentials. Reasonable hours shall include hours when irrigation is being performed. The Customer shall indemnify and hold the District harmless for any damage, loss, or injury alleged to have been caused by District personnel while inspecting on-site facilities, except where the District's sole negligence is duly established. If such entry is refused or cannot be obtained, the District shall have authority to shutoff the recycled water supply and discontinue service.

Where potable and recycled water lines are on the same site and located in the same area, an annual site inspection will be required. This inspection shall be performed by the District, DHS, or a certified Cross-Connection Control Specialist. These inspections may occur more frequently at the discretion of the District, especially where potable irrigation systems have been converted to use recycled water. A copy of the inspection report will be forwarded to the relevant parties.

A sample Recycled Water Site Inspection Report form is presented in Appendix I.

SECTION 7
RECYCLED WATER CONNECTION, METER, AND SERVICE LINE CHARGES

The District shall assess charges for the installation and maintenance of all recycled water services, meters, and appurtenances thereto, and these shall remain the property of the District. Said charges, in addition to all other usual and regular charges of the District, must be paid before work will be performed. The amount of said charges shall be established by the District and shall be determined and computed in order to fully reimburse the District for the cost of materials, labor, equipment, and any other costs incidental to the performance of said services.

Whenever a Customer requires an installation covered by established District rates, the work charges will be based upon a statement of costs prepared by the District. If a required installation cannot be performed for the amount stated in the appropriate schedule of rates established by the District, owing to the peculiarity of the proposed service, the District reserves the right to perform that installation on the basis of a statement of cost.

Whenever a Customer requests the District to remove recycled water service lines, meters or other appurtenances, the charges shall be made on the basis of a statement of costs by the District.

The District may impose a fee to re-establish recycled water service terminated at the Customer's request or for Customer's violation District's requirements, including these Rules.

SECTION 8
CUSTOMER'S GUARANTEE DEPOSIT

All recycled water service Applicants must post a guarantee deposit, unless the Applicant has at least one other active water service account with the District and no record of delinquent water account payments. This deposit shall be equal to double the estimated monthly recycled water service bill, and shall in no event be less than the amount specified in the schedule of rates. Refer to the District's Administrative Code pertaining to customer deposits.

Guarantee deposits may be refunded upon customer application, after a satisfactory payment record has been established for the twenty-four (24) consecutive months after the date of deposit. The District may disallow or withhold the refund of any deposit after the twenty-four (24) month period if payment or settlement of service bills has not been timely. Where service has been permanently terminated for non-payment of service bills, the outstanding amount and the separation costs for all of the Customer's recycled water service accounts shall be settled against the deposit account, and any balance will be returned to the Customer. The service contract will then be closed.

Any request for re-establishment of a recycled water service subsequent to permanent revocation or termination of the Permit shall be handled per Section 11.4 of these Rules.

SECTION 9
RECYCLED WATER SERVICE

9.1 ESTABLISHMENT OF RATES

The District shall establish rates for recycled water service.

9.2 CHANGE OF RATES

The District reserves the right to change its rates for recycled water service, as authorized by the District Board from time to time.

9.3 DISTRICT CHARGE

The District Board shall establish a District Charge. The District Charge shall be paid before any Applicant or Customer obtains a new recycled water connection, or increase its recycled water use.

9.4 RECYCLED WATER METER

9.4.1 Meter Reading Period

Recycled water meters shall be read at the same time as the potable water meter in accordance with the applicable provisions of the District.

If a recycled water meter fails to register during any period or is known to register inaccurately, the Customer shall be charged for that period pursuant to an average daily consumption rate based upon a reading of the meter when in use and registering accurately during the same season or as close to the same season as is reasonably possible. Any Customer may request that the meter through which the recycled water is being furnished be examined and tested per Section 3.8 of these Rules.

9.4.2 Meter Protection

The Customer shall, at all times, keep the meter assembly and the area around the meter or other facilities free from deposits of oil, toxic, hazardous or contaminated liquid or waste, trash, soil, building materials or substances, objects, or obstructions. The Customer shall not allow or permit meter boxes or other facilities to become obstructed or obscured by trees, shrubs, plants or in any manner impede their use or access to them. If such substances, objects or obstructions are not cleaned and removed by the Customer, the cleaning and removal shall be performed by the District at the expense of the Customer after a reasonable time of notification.

9.5 BILLING

9.5.1 Permanent Service

The District will send recycled water bills separate from the potable water bills at rates established by the District Board.

9.5.2 Temporary Service

The District has one rate for recycled water, and thus recycled water sold through temporary meters shall be billed at the same rate as permanent meters per the rates established by the District Board.

9.6 PAYMENT OF RECYCLED WATER BILLS

Payment shall be made according to the applicable potable water bills provisions in the District's Administrative Code.

SECTION 10
SEVERABILITY

If any section, subsection, sentence, clause, phrase, part or portion of these Rules is for any reason held to be invalid or unconstitutional, such invalidity shall not affect any of the remaining portions of these Rules. The District declares that each section, subsection, sentence, clause, phrase or part of these Rules would have been adopted irrespective of the invalidity of any part. These Rules shall be interpreted so as to comply with applicable federal and state laws and regulations.

SECTION 11
ENFORCEMENT AND PENALTIES

11.1 GENERAL

The enforcement and penalty provisions for violations of these Rules are set herein. Any person, firm, corporation, association, or agency found to be violating any provision of these Rules; the terms and conditions of the Permit; or any applicable federal, state or local statute, regulation, resolution, ordinance or other requirement shall be subject to one or more of the following:

a. Public Nuisance. Any violation as described above is hereby declared a public nuisance and shall be corrected or abated as directed by the District. Any person creating such a public nuisance is guilty of a misdemeanor.

b. Administrative Enforcement Powers. Authorized District enforcement officers are authorized to issue:

1. Cease and Desist Orders. When an authorized enforcement officer finds that an activity has taken place or is likely to take place in violation of these Rules, the officer may issue an order to cease and desist such activity causing or likely to cause such violation, and direct that those persons responsible shall:

   a) Comply with all applicable requirements;
   b) Comply with a time schedule; and/or
   c) Take appropriate remedial or action to prevent the violation from occurring or recurring.

2. Written Warning. An authorized enforcement officer may issue a written warning, including a compliance date, to persons who are found or suspected of violating these Rules.

c. Civil Actions. In addition to any other remedies, any violation of these Rules may be enforced by civil action brought by the District. In any such action, the District may seek, and a court may grant any or all of the following remedies:

1. A temporary and/or permanent injunction;

2. Assessment of the violator for the costs of any investigation, or monitoring survey of a violation, and for reasonable legal costs;

3. Costs incurred in removing, correcting, or terminating the violation or adverse effects resulting from the violation; or

4. Compensatory damages for impacts to water quality.

d. Permit Revocation. In addition to any other statute or rule authorizing termination of water service, EVMWD may revoke a Permit issued hereunder if a violation of any provision of these Rules is not corrected or if a Customer's use of recycled water causes or threatens to cause a nuisance. Permit revocation shall allow the procedures set forth in Section 11.3, below.

e. Penalty. Any person or entity that violates these Rules shall, for each day of violation, or portion thereof, be subject to a fine not exceeding $1,000.

f. Appeal. Except in cases of Permit revocation (see Section 11.3), any person objecting to any enforcement action under these Rules make a request for reconsideration to the General Manager with ten (10) days of the effective date of the enforcement decision. The written request for reconsideration shall state in detail the specific facts supporting the request for reconsideration. The General Manager shall render a decision within 30 days of receiving the request for reconsideration.

Within ten (10) days of notification of the General Manager's decision, a person may file a written appeal of the General Manager's decision with the District Board of Directors. The specified filing fee must accompany any written appeal to the District Board of Directors. Upon receipt of the written appeal and the filing fee, the District shall set the matter for hearing with the District Board of Directors at the earliest available date. At that hearing, the District Board of Directors may reject, affirm or modify the General Manager's decision. The District Board of Directors decision shall be final and cannot be further appealed, and shall complete the administrative appeal process.

g. Enforcement Action by the RWQCB. If any person uses, transports, or stores recycled water in violation of these Rules, the Recycled Water Ordinance, the District's National Pollutant Discharge Elimination System permit(s), or any other applicable federal, state or local law, or acts in a manner which creates, or threatens to create conditions of pollution, contamination, or nuisance, as defined in the Water Code Section 13050, and the RWQCB, DHS, or any other federal, state or local agency takes action against the District, or revokes, suspends or terminates any District permit as a result, such person shall indemnify the District for any resulting damages, including but not limited to all reasonable attorneys' fees and costs related to defending such action or taking action against the violating Customer. This provision is in addition to any other rights the District may have against the offender.

11.2 INTERIM DISCONTINUATION OF RECYCLED WATER SERVICE

Where the emergency nature of violations requires immediate action, the District, DHS, and/or the RWQCB may immediately order the discontinuance of recycled water service, subject to timely decision on Permit revocation or suspension, pursuant to an administrative hearing. Reasons for termination include, but are not limited to:

a. Refusal to install a required backflow prevention device.

b. Refusal to test a backflow prevention device.

c. Refusal to repair or replace a faulty backflow prevention device.

d. Direct or indirect connection between any potable water system and the recycled water system.

e. Direct or indirect connection between the District's recycled water system and a system or equipment containing contaminants.

f. A situation which presents an immediate health hazard to the District's potable and/or recycled water system, as determined by the District or regulatory agency.

g. Operations contrary to restrictions resulting in overspray into non-approved use areas, excessive application rates or times, or improper grading of the soil, or improperly maintained drainage systems resulting in run-off, or ponding due to run-off on public rights-of-way or adjoining areas not approved for recycled water use.

h. Any discharge of recycled water in violation of any applicable discharge prohibitions or requirements prescribed by the RWQCB or any other federal, state or local agency, or in a manner which creates or threatens to create conditions of pollution, contamination, or nuisance, as defined in Water Code Section 13050.

11.3 PERMANENT REVOCATION

The District may revoke any Permit. Unless the District determines an emergency, a Permit may be revoked until after the Customer has been given an opportunity for an administrative hearing as hereinafter provided.

11.3.1 Serving Notice of Revocation

Where the District determines that a Permit should be revoked, the District shall prepare a written notice of revocation, which includes concise statements of the proposed action, reasons for the proposed action, and the Customers right to a public hearing. Such notice shall be sent by certified mail to the Customer's last billing address or be personally served on the Customer at least ten (10) days before the effective date of the proposed permanent revocation. If, within five (5) days after receipt of such notice, the Customer or authorized representative requests in writing an administrative hearing from the District, the District shall immediately set a hearing and give the Customer written notice of the time, date and place of such hearing, either by personal service or First Class mail. The hearing shall be held not more than thirty (30) days from the date of receipt of the request for hearing. The hearing shall be conducted by a hearing officer designated by the District. The hearing officer shall not have been involved in any way with the decision to revoke the subject Permit or contract. No hearing shall be continued except upon showing of a good cause.

Within ten (10) days after notification of the hearing officer's decision, the person may file a written appeal of the decision with the District Board. The written appeal to the District

Board of Directors and a requisite filing fee must be submitted to the District. Upon receipt of the written appeal and the requisite filing fee the District shall set the matter for hearing with the District Board of Directors at the earliest available date. At that hearing, the District Board of Directors may reject, affirm or modify the hearing officer's decision. The District Board of Directors decision shall be final and shall complete the administrative process.

11.3.2 RE-ESTABLISHMENT OF RECYCLED WATER SERVICE

Any request to re-establish service subsequent to revocation of the Permit and the termination of recycled water service shall be the same as for initially obtaining recycled water service. The District may, for good cause, deny re-establishment of service or require that an agreement of financial security conditioned upon compliance with these Rules be provided.

SECTION 12
INCORPORATION BY REFERENCE

Each and every of the foregoing provisions of these Rules are requirements of any application for service /or Permit, are agreed to in full by any Applicant or Customer, are hereby incorporated therein by reference; and shall survive any Permit except by mutual written agreement; and any and all Permits shall be subject to these Rules.

Appendix A
Application for Recycled Water Service

APPLICATION FOR RECYCLED WATER SERVICE

Applicant completes the following: (Please print or type)

Applicant Name: _____

Relationship to property: _____

Mailing Address: _____

Telephone number: _____ Office_____ Residence

Project/site name: _____

Project/site address: _____

Property owner(s): _____

Mailing address: _____

Telephone number: _____ Office_____ Residence

Recycled Water Site Supervisor:

Name: _____

Address: _____

_____

24-hour contact telephone number: _____

Legal description of property: _____

_____

(Check each use)

1. Type of use:

_____Landscape irrigation	_____Construction use
_____Commercial use	_____Wildlife habitat
_____Industrial use	_____Recreational
_____Agricultural use	_____Other
_____Impoundments	

2. Brief description of use(s): _____

_____

3. Total irrigated area: _____ acres Types of plant material: _____

_____

4. Estimated demand: Total quantity: _____100 cu. ft./yr.(HCF/yr.)
   Max. at point of connection: _____gallons per minute (Total)
   Min. pressure: _____per square inch (psi)
   Hours/Day: _____
   Days/Week: _____

5. Number of service connections: _____
   Number of meters requested: _____ Size of meters: _____

6. This is a: ____ new _____ converted system (e.g., non-potable to recycled water; potable to recycled water)

7. If a new system, how are pipes to be identified:
   _____ Color-coded with labels _____ Tape wrap

8. Are additional special construction requirements beyond the District's for Recycled Water Use? _____Yes _____No

   If yes, explain: _____

   _____

9. Date requested to begin service: _____

10. Duration of service (temporary, interim, construction use, permanent):

    _____

11. Additional information: (Include special conditions affecting service):

_____

_____

_____

Please include the following items:

(a) Items to be submitted with the initial application:

i) Location and vicinity map showing the demarcation of the recycled water use area
ii) Attachment of a properly notarized affidavit
iii) Check or money order for required fees made out to:

Elsinore Valley Municipal Water District

Although Elsinore Valley Municipal Water District may approve the Application, the Permit shall not be granted prior to the approval of the State Department of Health Services

(b) Items to be submitted subsequent to the approval of the application:

i) Drawing of the project area on one, 8½ x 11 sheet of paper which shall include and show:

- Location and vicinity map
- Demarcation of the recycled water use area
- Specific potable water use areas
- Location of service connections and sizes
- Main line locations
- Gate valve locations
- Specific recycled water use areas
- Specific potable water use areas

I, the Applicant, have read and understand the District's Rules for Recycled Water Use and agree to restrict recycled water use for the purposes described in this application. I agree to use recycled water in accordance with these Rules and all other applicable documents. I understand that recycled water may not be compatible with certain types of vegetation because of its chemical composition. I agree that the District will not be liable for damages that may occur to vegetation or for damages which may occur due to uses of recycled water for purposes not included in this application.

Applicant signature: _____ Date: _____

(The District completes the following)

STATUS OF APPLICATION:

_____ Approved
_____ Sent to State Department of Health Services for approval
_____ The Customer needs to submit required fees
_____ The Customer needs to supply additional information
_____ The Customer denied recycled water service
_____ Returned to the Applicant

Comments: _____
_____

12. Service connection(s) size approved? _____ Yes _____ No
If not, why? _____

Service location approved? _____ Yes _____ No
If no, why? _____

13. Use(s) approved? _____ Yes _____ No Comments: _____
_____

14. Can the District provide requested recycled water service with existing facilities?
_____ Yes _____ No

If not, what are the constraints? _____
_____

15. Is recycled water main extension required? _____ Yes _____ No
Comments: _____

16. Will this system be initially connected to the potable water system?
_____ Yes _____ No

17. Describe level and method of backflow protection:
_____
_____
_____

Reviewed by: _____ Date: _____

Title: _____

Appendix B
Checklist/Action Request Form for Obtaining Recycled Water Service

CHECKLIST / ACTION REQUEST FORM FOR OBTAINING RECYCLED WATER SERVICE

To:_____Date:_____

Requested by Applicant: _____

Project Name: _____

Specific Action Requested:_____

_____

Date
Completed

_____ 1. The Applicant and the District determine service availability in accordance with Rules and Regulations.

_____ 2. The Applicant submits a completed application to the District.

_____ 3. Application is approved by the District.

_____ 4. If necessary, application is sent to Department of Health Services for review.

_____ 5. Applicant submits:

_____ Completed irrigation plans
_____ Construction schedule
_____ Required review fees

_____ 6. The District reviews plans.

_____ 7. The District approves the plans & construction schedule prior to construction.

_____ 8. The District sends plans to Department of Health Services.

_____ 9. The Department of Health Services approves plans for the proposed site.

_____ 10. Preconstruction meeting with District, Applicant/Use Site Supervisor and if necessary, Department of Health Services.

_____ 11. The Applicant constructs facilities.

_____ 12. The Applicant submits as-built drawings to the District and requests final inspection.

_____ 13. The District performs final inspection and any cross-connection testing (see * below).

_____ 14. The District issues a Recycled Water Service Permit.

_____ 15. The District activates recycled water service and the Applicant becomes a recycled water Customer.

_____ 16. The District confirms service to the Department of Health Services.

HOW TO USE THIS FORM:

This form is to be used by the Applicant, the District and Department of Health Services to request specific action or items needed to complete the process for obtaining recycled water service. Complete each step in the sequence shown. Make sure the form is dated and signed. This checklist keeps all entities informed of the application process progress and the steps remaining to provide recycled water service.

* **In situations where potable water lines are on the same property and located in the same area as recycled water lines, an initial and an annual cross-connection control site inspection will be required and more frequent inspections may be required, as determined by the Department of Health Services and the Elsinore Valley Municipal Water District.**

Appendix C
Status of Application for Recycled Water Service

STATUS OF APPLICATION FOR RECYCLED WATER SERVICE

To: _____

Date: _____

We received your application for recycled water service for the project(s) listed below. The application has been reviewed by our engineers in accordance with the District's Rules and Regulations for Recycled Water Use and Distribution and the ability of our system to supply you with the quantity of recycled water you have requested. The status of the application is shown below. If you have any questions, please contact _____ _____ (review engineer) at _____ (phone #).

Project name: _____

Application reviewed on: _____

Status: _____ Your application has been approved by the District.

_____ Your application has been sent to the Department of Health Services for further review.

_____ Your application is incomplete, and we request additional information. (See comments)

_____ We require payment of fees before review can be completed.

_____ Your application has been returned. (See comments)

_____ Your application for recycled water service has been denied. (See comments)

Comments: _____

_____

_____

_____

Appendix D
Elsinore Valley Municipal Water District Permit for Recycled Water Service

ELSINORE VALLEY MUNICIPAL WATER DISTRICT
PERMIT FOR RECYCLED WATER SERVICE

Customer Account #:_____

Customer:_____ Contact: _____

Relationship to property: _____

Mailing address: _____

Project/site name: _____

Project/site address: _____

Property owner(s): _____

Mailing address: _____

Telephone number: _____Office) _____(Residence)

Recycled Water Supervisor: _____

24-hour contact telephone number: _____

Approved use(s): 1. _____

2. _____

3. _____

Approved use area(s): 1. _____

2. _____

3. _____

Total irrigated area: _____ acres

Recycled water demand:

Meter Account	Meter Size	Minimum Pressure (PSI)	Maximum Flow (GPM)	Area Serviced (HCF/yr.)	Yearly Consumption

Totals: _____ _____ _____

This is a: _____ NEW _____CONVERTED system.

Method of recycled water pipe identification:

_____ Color-coded with labels

_____ Recycled Water tape wrap

Recycled water service initiated on: _____

This is a:_____ Permanent _____Temporary _____Interim_____Construction recycled water service to stop on: _____.

Rate charged for service: _____ $/HCF plus additional base charges shown in Appendix 5.

Special requirements/conditions: _____

_____

_____

_____

Final Inspection By the District:

I have inspected the recycled water system governed by this permit and attest that the construction and operation of this system are in accordance with the District's Rules for Recycled Water Use.

Inspector: _____ Date: _____

Title: _____

Customer Agreement:

I have reviewed the District's Rules for Recycled Water Use, and agree to operate this recycled water service in accordance with all provisions of this permit and all applicable documents. I agree to be responsible for training and supervising all personnel under my control who will be involved in operating the recycled water system.

I agree that no changes to the recycled water system will be made without issuance of an amended permit. I am aware of any/all fines and penalties to be assessed for any/all violations of these Rules for recycled Water Use.

Customer's signature: _____ Date: _____

Qualifications of Customer's Recycled Water Site Supervisor:

The Customer shall attach the qualifications of the designated Recycled Water Site Supervisor.

I have reviewed the application package and approve of providing recycled water service in accordance with the provisions contained in this Permit.

Signed: _____ Date: _____

Title: _____

Appendix E
Elsinore Valley Municipal Water District
Valve Box Details

Appendix F
Elsinore Valley Municipal Water District Standard Backflow Prevention Assembly Details

Appendix G
Elsinore Valley Municipal Water District Standard Blow-Off and Air and Vacuum Assembly Details

Appendix H
Recycled Water Site Notification

Recycled Water Site Notification

RECYCLED WATER IS USED AT THIS SITE

- DO NOT DRINK -

Set the controller to irrigate between the hours of _____ PM and _____ AM.

Spot watering and sprinkler testing can be done manually when personnel are on site and monitoring use. Do not leave unattended if watering outside the normal hours of operation.

CAUTION:

- Adjust spray heads so there is no overspray outside the site.
- Minimize runoff by adjusting sprinklers, and repairing leaks promptly.
- Purple is the color code for recycled water. Use recycled water pipe and parts for repairs. Replace valve box lids, sprinkler heads, quick couplers, and pipe with the correct type.
- Use hose marked for recycled water use for spot watering.
- Report missing or damaged signs to your supervisor.
- Do not use recycled water to wash hands or tools. Wash your hands with soap and potable water (drinking water) after working with the recycled water system.
- All modifications to the irrigation system must be approved. Check with your supervisor before making changes.

CONTACTS:

Landscape Contractor: _____
Your Site Supervisor: _____
Phone Number: _____
Mobile Number: _____
Alternate: _____

Water Supplier: Elsinore Valley Municipal Water District
Specialist:
Phone Number: (951) 674-3146
Mobile Number:
Alternate Number:

Notificacion de Sitio de Agua Reciclada

SE UTILIZA AGUA RECICLADA EN ESTE SITIO

- NO BEBA EL AGUA -

Coloque el control para irrigar dentro de las horas de _____ PM y _____ AM.

Pruebas de agua y de rociadores se pueden hacer manualmente solamente cuando esté el personal en el sitio observando su uso. Si está regando fuera del horario normal de operación, no lo desatienda.

PRECAUCIÓN:

- Ajuste las cabezas para que no rieguen fuera del sitio.
- Minimice gasto de agua al ajustar los rociadores, y reparando goteras rápidamente.
- El color morado es el código para el agua reciclada. Use pipas y partes reciladas para reparaciones. Reemplace las tapas de las válvulas, las cabezas de los rociadores y las pipas con el tipo correcto.
- Use la manguera marcada para uso de agua reciclada cuando vaya a regar.
- Reporte si faltan o si están dañados los letreros a su supervisor.
- No use agua reciclada para lavarse las manos o herramienta. Lávese sus manos con jabón y agua potable (agua para beber) después de haber trabajado con el sistema de agua reciclada.
- Toda modificación al sistema de irrigación tiene que ser aprobado. Verifique con su supervisor antes de hacer cualquier cambio.

CONTACTOS:

Contratista:	_____
Su Supervisor del Sitio:	_____
Número de Tel:	_____
Número Móvil:	_____
Número Alterno:	_____
Proveedor de Agua:	Elsinore Valley Municipal Water District
Especialista:	
Número de Tel:	(951) 674-3146
Número Móvil:	
Número Alterno:	

Appendix I
Recycled Water Site Inspection Report

Elsinore Valley Municipal Water District

Recycled Water Site Inspection Report

Date: **Site Code & Name:**

A. Site Information:

Reference:

Site Location:

Last Inspection:

Type of Inspection:

___ New Construction ___ Retrofit ___ Annual Inspection ___ Re-Inspection ___ Investigation

Owner Name:

Contact Name: Title:

Address:

City: State: Postal Code:

Phone: FAX:

Landscape Contractor:

Contact Name: Title:

Office Phone: Mobile Phone:

B. Connection Information: Provide Information for each recycled and potable water connection:

No.	User Code	EVMWD Acct.	Meter Number	Size	Pressure	Backflow Prevention Device

Notes:

C. Site Supervisor Information:

Name: Title:

Company:

Phone: Extension:

Pager:

Mobile:

Training/Experience:

Alternate Contact:

Comment:

D. Document Review:

D1. As built plans available for review:	___ Acceptable	___ Unacceptable	
D2. Controller charts available:	___ Acceptable	___ Unacceptable	
D3. Modifications to irrigation system:	___ Acceptable	___ Unacceptable	___ N/A
D4. Significant structural changes:	___ Acceptable	___ Unacceptable	___ N/A
D5. Major modifications shown on plans:	___ Acceptable	___ Unacceptable	___ N/A
D6. Major modifications approved:	___ Acceptable	___ Unacceptable	___ N/A
D7. EVMWD Rules and Regulations available:	___ Acceptable	___ Unacceptable	

E. Survey:

Date of Survey: Start Time: End Time:

E1. Signage: Adequate number and placement:	___ Acceptable	___ Unacceptable	
E2. Signage: Condition:	___ Acceptable	___ Unacceptable	
E3. Signage: Signs on controllers:	___ Acceptable	___ Unacceptable	
E4. Signage: Controller instructions:	___ Acceptable	___ Unacceptable	
E5. Color Coding: Valve boxes:	___ Acceptable	___ Unacceptable	
E6. Color Coding: Irrigation heads:	___ Acceptable	___ Unacceptable	
E7. Color Coding: Valves tagged properly:	___ Acceptable	___ Unacceptable	
E8. Color Coding: Lines and fittings:	___ Acceptable	___ Unacceptable	___ N/A
E9. Connections: Quick couplers:	___ Acceptable	___ Unacceptable	

E10. Connections: Irrigation hoses: ___ Acceptable ___ Unacceptable

E11. Connections: Potable C/S valves: ___ Acceptable ___ Unacceptable

E12. Connections: Recycled Water C/S valves: ___ Acceptable ___ Unacceptable

E13. Separation Between Adjacent Properties: ___ Acceptable ___ Unacceptable

E14. Operation: Normal times of operation:

Times: ___ Acceptable ___ Unacceptable

E15. Precipitation sensor operation: ___ Acceptable ___ Unacceptable ___ N/A

F. Coverage Test:

F1. Ponding: ___ Acceptable ___ Unacceptable

F2. Overspray (Drinking fountains/Eating areas): ___ Acceptable ___ Unacceptable ___ N/A

F3. Spray outside site boundaries: ___ Acceptable ___ Unacceptable

F4. Run off: ___ Acceptable ___ Unacceptable

F5. Misting (eg: Impact of spray with trees.): ___ Acceptable ___ Unacceptable

F6. Leaks: ___ Acceptable ___ Unacceptable

Comment:

G. Cross-Connection Control:

G1. Backflow prevention on potable water services: ___ Acceptable ___ Unacceptable ___ N/A

G2. Protection of potable hose bibbs with AVB's: ___ Acceptable ___ Unacceptable ___ N/A

G3. Separation of Recycled and Potable system: ___ Acceptable ___ Unacceptable ___ N/A

Was a cross-connection test performed at the site? ___ Yes ___ No

Attach records of the test, and summarize the results:

H. Results of Survey and Certification:

According to the results of this survey, is recycled water being used properly at this site?

___ Yes ___ No ___ N/A

Remarks:

Specialist	Signature	AWWA Certif. Number	Date
On-site Supervisor	Signature	Date Received	
Owner Representative	Signature	Date Received	

Number of Attached Pages: ____

Original: Elsinore Valley Municipal Water District

Copy to: ___ SDHS, Drinking Water Field Operations
___ Site Supervisor
___ Owner or Customer

Appendix M3:

Water Distribution System Master Plan_2008

Water Distribution System Master Plan

Final Report

February 2008

MWH Project Number 1342593

Prepared for:
Elsinore Valley Municipal Water District
31315 Chaney Street
P.O. Box 3000
Lake Elsinore, CA 92531-3000

Prepared by:
MWH
618 Michillinda Avenue, Suite 200
Arcadia, CA 91007

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LIST OF ABBREVATIONS

Abbreviation	Explanation
AC	Acre
ACRE-FT	Acre-feet
ACRE-FT/MO	Acre-feet per Month
ACRE-FT/YR	Acre-feet per Year
ADD	Average Day Demand
ADP	Average Day Production
APN	Assessor's Parcel Number
AVE	Avenue
AVP	Auld Valley Pipeline
AWWA	American Water Works Association
BLVD	Boulevard
CCI	Construction Cost Index
CFD	Community Facilities District
CFS	Cubic Feet per Second
CIP	Capital Improvement Program
COMM/IND	Commercial/Industrial
CT	Court
CYN	Canyon
DEM	Digital Elevation Model
DHS	Department of Health Services
DISTRICT or EVMWD	Elsinore Valley Municipal Water District
DPR	Department of Parks and Recreation
DR	Drive
DSMP	Distribution System Master Plan
DU	Dwelling Unit
DU/ACRE or DU/AC	Dwelling Unit per Acre
EMWD	Eastern Municipal Water District
ENR	Engineering News Record
EPS	Extended Period Simulation
ESRI	Environmental Systems Research Institute, Inc.
EWD	Elsinore Water District
FF	Fire Flow
FT	Feet
FWY	Freeway
FY	Fiscal Year
FPS	Feet per Second
GIS	Geographic Information System
GPD	Gallons per Day
GPD/ACRE	Gallons per Day per Acre
GPD/DU	Gallons per Day per Dwelling Unit
GPM	Gallons per Minute
HDR	High Density Residential

List of Abbreviations (Continued)

Abbreviation	Explanation
HGL	Hydraulic Grade Line
HP	Horsepower
HRS	Hours
HWL	High Water Level
HwY	Highway
IN	Inch
ISO	Insurance Services Organization
IWCS	Imported Water Conveyance System
JLH	John Laing Homes
LDR	Low Density Residential
LMDR	Low Medium Density Residential
LU	Land Use
LN	Lane
MDD	Maximum Day Demand
MDP	Maximum Day Production
MDR	Medium Density Residential
MG	Million Gallons
MGD	Million Gallons per Day
MHDR	Medium High Density Residential
MinDD	Minimum Daily Demand
MW	Montgomery Watson
MWC	Mutual Water Company
MWDSC or MWD	Metropolitan Water District of Southern California
MWH	Montgomery Watson Harza
PHD	Peak Hour Demand
Pl	Place
PRV	Pressure Reducing Valves
PS	Pump Station
PSI	Pounds per Square Inch
PVC	Polyvinyl Chloride
PVP	Perris Valley Pipeline
RCIP	Riverside County Integration Plan
RD	Road
REQ'D	Required
SCADA	Supervisory Control and Data Acquisition
SCE	Southern California Edison
SOI	Sphere of Influence
SS	Steady-state
SQMI	Square mile
ST	Street
TDH	Total Dynamic Head

List of Abbreviations (Continued)

Abbreviation	Explanation
TDSA	Temescal Domestic Service Area
TH	Tuscany Hills
THM	Trihalomethanes
TM	Technical Memorandum
TOU	Time of Use
TVP	Temescal Valley Pipeline
UBC	Uniform Building Code
USGS	United States Geological Survey
UWMP	Urban Water Master Plan
VFD	Variable Frequency Drive
WDF	Water Duty Factor
WDSMP	Water Distribution System Master Plan
WMWD	Western Municipal Water District
WRMP	Water Resources Management Plan
WSA	Water Supply Assessment
WTP	Water Treatment Plant
WY	Way

Executive Summary

The objectives of this Water Distribution System Master Plan are to provide the Elsinore Valley Municipal Water District (District) with an evaluation of the District's water system under existing and future demand conditions through year 2030. This report is prepared as an update to the District's previous Water Distribution Master Plan completed in year 2002. This evaluation includes determining needs to address existing system deficiencies and facility requirements to meet rising demands over the next twenty years. The report also provides details for a proposed Capital Improvement Program (CIP) for the water system, including prioritization and construction cost estimates.

EXISTING WATER SYSTEM

The District's water system is divided into two divisions, the Elsinore Division and the Temescal Domestic Service Area (TDSA). The water system currently includes 33 pressure zones. Within these zones, there are approximately 3,063,000 feet (580 miles) of pipelines ranging in diameter from 3 inches to 42 inches, 67 storage reservoirs with an approximate total storage capacity of 83 million gallons (MG) and 46 booster pump stations. The District currently obtains its water from 13 groundwater wells, the Canyon Lake Water Treatment Plant (WTP), and imported water from Metropolitan Water District (MWD) through the Auld Valley and Temescal Valley Pipelines. The District's existing water system facilities are described in detail in Section 4.

PROJECT APPROACH

Using the District's Geographical Information System (GIS) as the basis, the existing H_2OMAP Water hydraulic model created for the previous Master Plan is updated as part of this project. The model includes all facilities within the District's water system such as transmission and distribution pipelines, storage reservoirs, booster pumps, pressure regulating valves (PRV) and groundwater wells. The majority of the data is obtained from the District's GIS, while other information such as pump curves, pump test data, production records, and billing records are provided by the District personnel. Elevations and demands are input into the hydraulic model using various ArcGIS routines. Production and consumption records are used to evaluate existing demands, and future demands through year 2030 are projected using general plan land use, specific plans, and other information on specific developments.

The model is calibrated based on information gathered by the District during two days, September 21 and 28, 2006, including fire hydrant test data and reservoir levels from the SCADA system. The data collected on these two days is used to confirm that the model reasonably simulates real-world field conditions. The model is modified to run 24-hour extended-period simulations, under average day demands (ADD), maximum day demands (MDD), and MDD plus fire flow demands.

The existing system is evaluated using the model, to investigate high and low pressure locations, pipeline velocities, storage reservoir capacities, booster pump station capacities, and source water capacities. Planning and evaluation are based on criteria outlined in Section 6.

Recommendations are made to address deficiencies in the existing water system. Following the existing system evaluation, future demands are added to the model. The size and location of transmission pipelines, storage reservoirs, booster pump station, and water source capacities necessary to meet future demands are determined. Recommendations for all improvements, existing and future, are prioritized according to system needs, including construction cost estimates.

PROJECTED WATER DEMANDS

A review of existing and future development within the District's Elsinore Division is presented in Section 2. There are many large residential development projects planned or currently in construction, mostly located along Interstate 15 Freeway. Based on the growth projections, projected water demands have been prepared. Water demands for future scenarios are determined based on water duty factors (WDF) and future projected growth. Maximum day demands were determined by applying a peaking factor of 2.0 to the anticipated average day demands. **Table ES-1** summarizes the projected water demands.

Table ES-1
Projected Water Demands

Year	Water Demands		
	Average Annual		Maximum Day
	(acre-ft/yr)	(mgd)	(mgd)
2005	28,113	25.1	50.2
2010	34,538	30.8	61.7
2015	40,985	36.6	73.2
2020	47,020	42.0	84.0
2025	51,468	46.0	91.9
2030	55,197	49.3	98.6
Buildout (2070)	77,172	68.9	137.9

DISTRIBUTION SYSTEM IMPROVEMENTS

Details of the existing system analysis are discussed in Section 7. The future system is evaluated in Section 8, listing improvements needed to meet future (2030) demands. Future storage reservoirs, booster pump stations, transmission pipelines, and water sources are recommended.

Under existing conditions, fifteen low pressure locations (below 40 psi) and fifteen high pressure locations (above 125 psi) are identified under a 24-hour MDD run. Pressures at the low pressure locations should be increased, where possible, by serving these areas from higher pressure zones.

To meet rising future demands, additional water source capacities are also required. As discussed in the Water Resources Management Plan, five new groundwater wells are recommended as well as a major imported source of supply entering at the east side of the District's system.

In the existing system, the District's available storage capacity is 83 MG, while the total storage volume required is approximately 81 MG, yielding a storage surplus of 2 MG. However, 24 zones show storage deficits in existing system; most of these zones are located at higher elevations. In the future system (2030), the total storage volume required is approximately 146.1 MG. An additional 63 MG is needed to meet future demands. A total of 63.1 MG of storage capacity is recommended for the District, located at 31 different locations.

For booster pump stations (PS), the existing system capacities are sufficient for most zones. To meet existing system deficiencies and future growth-related demand, the following items are recommended: three PS replacements, twelve new PS and 12 PS expansions. Pump stations are needed for the majority of new developments, located at higher elevations along the hillsides. A pump station is also required along the Temescal Valley Pipeline in order to use the full capacity of the pipeline. A pump station is also recommended from the proposed new imported water supply to the 1601 Zone.

Three major transmission pipelines are also recommended in this Master Plan. A 24-inch diameter pipeline is recommended in Grand Ave. on the west side of Lake Elsinore. For future demands, a 48-inch diameter pipeline is recommended through the Loop Zone between Lake Street Reservoir and Baker Street Reservoir, parallel to the existing 30-inch pipeline, to convey water from the Temescal Valley Pipeline (TVP) to the central part of the District's system. Also, to accommodate the proposed new imported water supply, a series of 30 to 42-inch diameter pipelines are necessary in the 1434 Zone in Railroad Canyon Road from the Canyon Lake WTP to Mission Trail, and in the 1601 Zone along the east side of I-15 Freeway from Railroad Canyon Road to Third Avenue.

A summary of the recommended improvements is in **Table ES-2**.

Table ES-2
Summary of Recommendations by Facility Type

Facility Type	Existing	Additional Recommended
Water Treatment Plant	1	0
Wells (operating)	13	5
Storage Reservoirs	67	31
Booster Stations	46	28
Pressure Regulating Stations	53	1
Pipeline (miles)	580	68[1]

Note: 1. Does not include growth-related distribution mains.

CAPITAL IMPROVEMENT PROGRAM

The Capital Improvement Program (CIP) lists the improvements needed by the District to address existing system deficiencies and meet future growth. Capital improvement projects are phased according to system needs. Projects impacting pending growth, the greatest deficiencies, the largest number of individuals or important facilities are given the highest priority. Future system recommendations are predicated on the projected growth identified in Section 3. The timing of the implementation of the proposed recommendations may vary if growth within the

District's service area occurs at a different rate. Future system facilities must be installed prior to the demand increase so that water will be available continuously.

A summary of the recommended CIP by project type and by funder are shown in **Table ES-3** and **Table ES-4**, respectively, with a total cost of $488,700,000.

Table ES-3
Summary of Capital Improvement Program by Project Type (Year 2008 Dollars)

Phase	Water Supply (million $)	Storage Tanks (million $)	Pump Stations (million $)	Pipelines (million $)	Incremental Cost (million $)	Cumulative Cost (million $)
2007-2010	$7.6	$43.6	$12.9	$49.7	$113.6	$113.6
2011-2015	$0.0	$42.3	$18.6	$76.8	$137.6	$251.2
2016-2020	$76.3	$6.8	$9.9	$37.1	$130.0	$381.2
2021-2025	$0.0	$23.9	$5.7	$37.7	$67.2	$448.4
2026-2030	$3.5	$13.8	$0.8	$22.2	$40.3	$488.7
Total	**$87.4**	**$130.4**	**$47.9**	**$154.0**	**$488.7**	**$488.7**

Table ES-4
Summary of Capital Improvement Program by Funder (Year 2008 Dollars)

Phase	Existing Ratepayers (million $)	Developer Funded (million $)	Future CIP (million $)	Incremental Cost (million $)	Cumulative Cost (million $)
2007-2010	$26.9	$50.0	$36.8	$113.6	$113.6
2011-2015	$3.8	$90.6	$43.3	$137.6	$251.2
2016-2020	$0.1	$19.1	$110.8	$130.0	$381.2
2021-2025	$40.6	$4.9	$21.7	$67.2	$448.4
2026-2030	$29.2	$0.0	$11.1	$40.3	$488.7
Total	**$100.6**	**$164.6**	**$223.7**	**$488.7**	**$488.7**

Section 1
Introduction

This section provides overview of the project and an outline of the master plan. A brief background of the master planning work conducted to date, a discussion of the objectives and scope of work, a description of the report sections to follow, and a listing of abbreviations and definitions used in this report are included in this section.

1.1 PROJECT BACKGROUND

The intent of this study is to develop a calibrated, 24-hour Extended Period Simulation (EPS) model of Elsinore Valley Municipal Water District's (EVMWD or District) entire water system for existing and 2030 conditions to be used for existing system evaluation and future facilities planning.

The District's last water master plan was completed by MWH in May 2002. The water master plan covered historical and projected demands through 2020, and evaluated supplies, storage, pumping and the distribution system. Several of the recommendations from this place have been implemented. Since completion of the last master plan, the District has experienced continued growth and facilities improvements, thereby requiring the need to develop a new hydraulic model and master plan that reflects the changes in facilities and planning that has occurred since the 2002 plan.

Concurrent to this report, MWH is developing the Water Resources Management Plan (WRMP) which provides a comprehensive analysis of twenty eight potential supply sources to meet District demand through year-2030 (MWH, 2006). Out of these alternatives, a water supply strategy is recommended that incorporates several local resources as well as a new imported connection to Metropolitan Water District's (MWD) proposed Perris Valley Pipeline (PVP). This new supply source is assumed to connect to the eastern portion of the District's system along Newport Road. Implementation of this strategy will allow the District to meet year-2030 MDD with its largest well out of service, and year-2030 ADD with its largest supply source (the Mills Water Treatment Plant) out of service. This master plan also incorporates the recommendations from the updated WRMP.

1.2 OBJECTIVE AND SCOPE OF WORK

The "District's mission is to manage its natural resources to provide reliable, cost efficient, high quality water and wastewater services for the communities they serve, while promoting conservation, environmental responsibility, education, community interaction, ethical behavior, and recognizing employees as highly valuable assets." This water master plan has been developed to assist the District in achieving these objectives for their water system. The scope of work for this water master plan includes the following tasks.

- Analysis of Existing Water Demands
- Projection of Future Water Demands
- Development of Peaking Factors and Diurnal Curve
- Hydraulic Model Creation (Importing pipelines, allocating demands, interpolating elevations, etc.)
- Hydraulic Model Calibration (Steady-State and Extended Period Simulation)
- Hydraulic Model Simulations
- Evaluation of Existing System
- Evaluation of Future System
- Development of Capital Improvement Program (CIP)

1.3 DATA SOURCES

In preparation of this water master plan, the District staff supplied many reports, studies and other sources of information. In addition, material was obtained from other sources such as United States Geographical Survey (USGS), Environmental Systems Research Institute, Inc. (ESRI), and others. Pertinent materials included water system maps, planning and development information, historical records, billing data and detailed facility information. Numerous meetings were held with the District staff. In addition, extended interactions were held with the District's operational staff during the hydraulic model development and calibration stages to utilize their knowledge and information.

1.4 AUTHORIZATION

This water master plan has been developed in accordance with a purchase requisition between the District and MWH (Montgomery Watson Harza) dated August 22, 2006.

1.5 ACKNOWLEDGMENTS

MWH wishes to acknowledge and thank all of the District’s staff for their support and assistance in completing this project with special thanks to Ron Young, General Manager; Phil Miller, District Engineer; Julius Ma, Water Resources Manager; and Greg Kowalski, Civil Engineer.

1.6 PROJECT STAFF

The following MWH staff was principally involved in the preparation of this water master plan:

Principal-in-Charge:	Ajit Bhamrah, P.E.
Project Manager:	Matthew Huang, P.E.
Project Engineers:	Ganesh Krishnamurthy
	Philip Wegge
	James Yoon
	Rui Zhang
Technical Review:	David Bouck, P.E.
	David Ringel, P.E.

1.7 MASTER PLAN OUTLINE

The following sections of this water master plan describe the existing and future systems, water sources and recommended system modifications.

Section 2 discusses the study area, land use and development within the District. Section 3 focuses on the District's water production and demands. Section 4 entails the existing water facilities. Section 5 describes the model development and calibration while Section 6 illustrates the planning and evaluation criteria. Section 7 and 8 discuss the existing and future system evaluations, respectively. Section 9 describes the financial impacts of both existing system modifications and future capital improvements.

Section 2
Study Area and Land Use

This section provides a general overview of the study area, existing and future land use, and the demographics of the District.

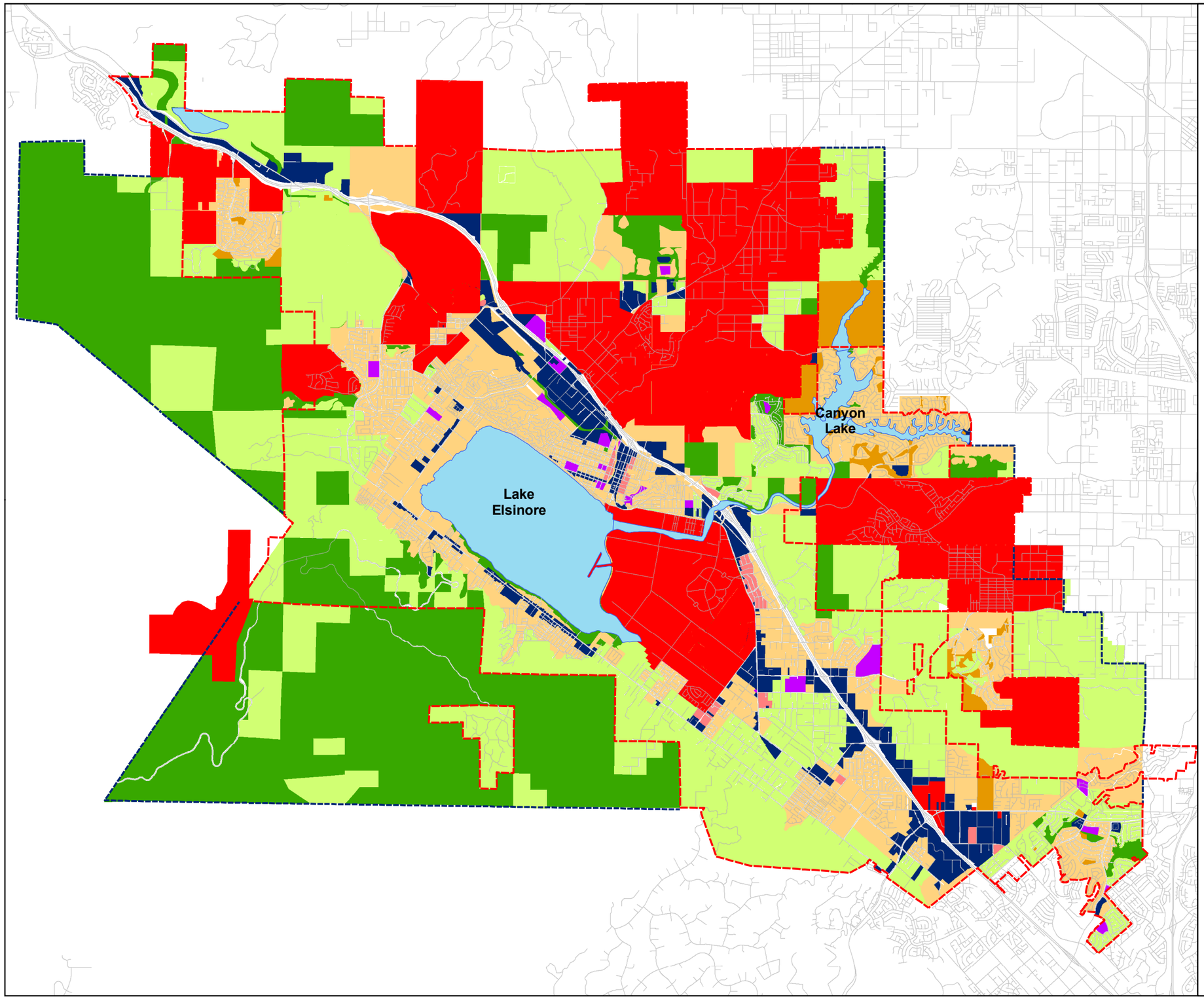
2.1 STUDY AREA

Located in southwestern Riverside County, California, the District's service area encompasses the Cities of Lake Elsinore and Canyon Lake and portions of the City of Murrieta (California Oaks), and the unincorporated communities of Wildomar, The Farm, Meadowbrook, Lakeland Village, Cleveland Ridge, Rancho Capistrano–El Cariso Village, Horsethief Canyon, Sedco and Temescal Canyon. The District provides water service in both the Elsinore and Temescal Valleys, which extend from Murrieta to Corona. The District's service area is broken into two divisions, the Elsinore Division and the Temescal Division (also known as Temescal Domestic Service Area). The division between the two valleys is approximately two miles north of Lake Elsinore, near the intersection of Love Lane and Temescal Canyon Road (where the Temescal Wash flows north). The service area consists of residential, commercial and industrial developments, as well as open space with golf courses and various mixed agriculture, namely citrus and avocado groves. Municipal and industrial uses are concentrated near the City of Lake Elsinore and scattered along Interstate 15, with many new residential neighborhoods.

2.2 LAND USE

Land use designations used for this report are primarily based upon the City of Lake Elsinore's 1990 General Plan (Lake Elsinore, 1990). The update process to the 1990 General Plan was initiated in January 2005 and is yet to be completed. Preliminary alternative maps from the City's General Plan update indicate that changes in land use will have relatively minor impact on water demand projections. Land use designations were also developed as part of the County of Riverside's General Plan (County, 2003). Information from the County's General Plan is used to classify land uses for unincorporated areas of Riverside County that fall within the District's service boundaries. The District's ultimate land use based upon these plans is presented in **Figure 2-1**, which shows land uses categorized into the following seven general types:

- Low Density Residential (< 2 dwelling units/acre)
- Medium Density Residential (2 to 8 dwelling units/acre)
- High Density Residential (> 8 dwelling units/acre)
- Commercial and Industrial
- Schools and Public Facilities
- Open Space Conservation
- Open Space Recreation



Legend

- District Boundary
- Sphere of Influence
- Water Bodies
- Streets

Land Use Category

- Commercial and Industrial
- Open Space Conservation
- Low Density Residential
- Medium Density Residential
- High Density Residential
- Open Space Recreation
- Schools and Public Facilities
- Specific Plan Areas

References:
1990 City of Lake Elsinore General Plan (Lake Elsinore, 1990)
2003 Riverside County Integrated Plan (County, 2003)
Various Development Specific Plans and Water Master Plans

N

MWH

0 1 2 4 Miles

Figure 2-1
District Land Use

2.3 DEVELOPMENTS

In addition to the land use information presented on **Figure 2-1**, several specific plan developments are proposed throughout the District service area. These include Cottonwood, East Lake (including John Laing Homes and Lumos), Lake Edge, Alberhill CFD, Alberhill Ranch, CFD 98-2, La Laguna, Ramsgate (and surroundings), North Peak, The Preserve, La Strada, Tuscany Hills North, Sunset Ridge, Lakeside Palms, County Water Co, and Canyon Hills Estates. For those areas where a specific plan exists, the specific plan is referred to for land use information rather than the City or County's General Plan. The land use designations for each of the specific plans is summarized in **Table 2-1**.

The District's potable water demands are expected to increase due to new developments within its service boundaries, such as those with specific plans listed above. These developments, along with their anticipated years of phasing, are presented on **Figure 2-2**. To estimate their future water demands, the developments have been categorized into two categories: developments with specific plans and other developments. The two types of developments are described below.

Developments with Specific Plans

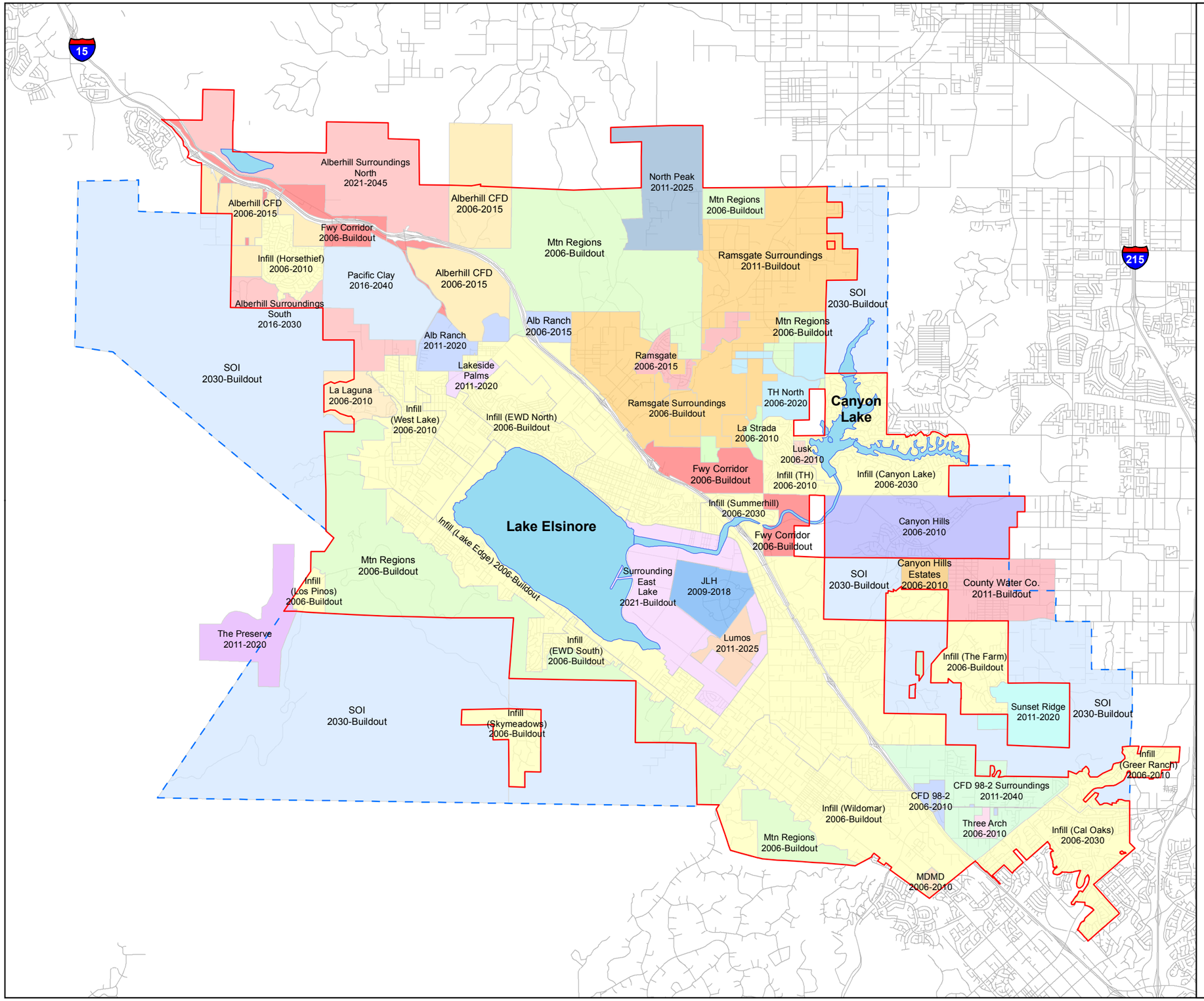
Developments with specific plans are defined as those that are planned as a distinct unit with a specific plan that details the proposed development for the region. Within the District, they include Cottonwood, East Lake (including John Laing Homes and Lumos), Lake Edge, Alberhill CFD, Alberhill Ranch, CFD 98-2, La Laguna, Ramsgate (and surroundings), North Peak, The Preserve, La Strada, Tuscany Hills North, Sunset Ridge, Lakeside Palms, County Water Co, and Canyon Hills Estates. Demands for several of these developments were originally calculated in the 2002 Distribution System Master Plan (DSMP) and further updated in the 2005 District-Wide Water Supply Assessment (WSA) and 2005 Urban Water Management Plan (UWMP). In this study, the demands are modified according to more recent studies and based upon updated water duty factors (WDFs), which are discussed later in this section. The relevant references for each of the listed developments is included in **Appendix A**.

The phasing for each development is based upon information provided in the studies where available. For developments without any phasing information, the phasing assumptions are based on engineering judgment, discussions with District staff, and information provided by developers where available.

Table 2-1
Specific Plan – Land Use

Description[1]	LDR[2] <2 du/ac (du)	LMDR 2-4 du/ac (du)	MDR 4-6 du/ac (du)	MHDR 6-12 du/ac (du)	HDR >12 du/ac (du)	Comm. / Ind. (acres)	Irrigation (acres)	Schools and Public Facilities (acres or capita)	Mixed Use (ac)
The Preserve	210						30.4	245 capita	
La Strada	17	269					40.8		
La Laguna		600					29		
Tuscany Hills North	221	939	221						
Alberhill Ranch			1,174		550	76	79	10.4 acres	
Alberhill CFD	56		2,386	283	1,091	16.3	184.5	25 acres	
Sunset Ridge	82		572	537			23.1		
Ramsgate		2,368				13.4		14.3 acres	
Ramsgate Surroundings	4,859								
Cottonwood[3]	173	564	735	1,686		23.9	113.7	5.2 acres	
John Laing Homes			977	908	515		329		
Lumos				858	938		197.8		
Remaining East Lake		1,454	0	1,227	1,341	145	19		213
North Peak	69	1,082	44	118				1000 acres	
CFD 98-2		220				62.5			
Canyon Hills Estates		361							
Lakeside Palms		369					39.1		
County Water Co	474	1,200	103						

1. See **Appendix A** for list of references of the various developments
2. Abbreviations: LDR – Low Density Residential, LMDR – Low Medium Density Residential, MDR – Medium Density Residential, MHDR – Medium High Density Residential, HDR – High Density Residential, Comm/Ind – Commercial/Industrial
3. Also referred to as Canyon Hills as shown on **Figure 2-2**



Legend

- District Sphere of Influence
- District Service Boundary
- Water Bodies
- 2030 — Development Areas and Phasing
- Other Infill Areas
- Streets

N

0 0.5 1 2 3 4 Miles

MWH

Figure 2-2
Phasing of Developments Areas

Other Developments

Other developments are defined as those for which no specific plan exists. For demand estimating purposes, the other developments are separated into the following three groups: future developments without specific plans, in-fill developments, and sphere of influence (SOI) developments.

Future Developments without Specific Plans

This category includes various undeveloped areas throughout the District service area consisting of more than a single, isolated parcel. These areas include Alberhill Surroundings (North), Alberhill Surroundings (South), Pacific Clay, CFD 98-2 Surroundings, Lusk, MDMD, Three Arch, Freeway Corridor, and Mountain Regions. The demand for these areas is estimated based upon the updated water duty factors and land use designations. The phasing of these future developments is based upon engineering judgment and discussions with District staff.

In-fill Developments

As part of the 2002 DSMP, in-fill locations within the District's service boundary were identified as vacant parcels within areas that are already developed. Demand for these in-fill locations was estimated by multiplying the WDFs (based on the General Plan land use) with the area of vacant parcels. In this study, demand projections for in-fill developments from the DSMP are recalculated by using the updated WDFs. In addition, certain regions that have been recently developed (e.g. Greer Ranch, Tuscany Hills, etc.) have been added to the list of in-fill developments.

For the phasing of in-fill developments, it is assumed that development occurs linearly from 2006 to an estimated buildout year (based upon engineering judgment) for the region.

Sphere of Influence (SOI) Developments

These developments are defined as undeveloped regions located outside of the District's existing service boundary but within the District's sphere of influence. The demand for these developments is calculated by multiplying WDFs (based on the Riverside Country Integration Plan (RCIP)) with the area of vacant parcels. The phasing of the SOI developments is assumed to occur linearly from 2030 to Buildout.

Open Space and Conservation Habitat

In additional to the development areas listed above, a large area within the District's service area is designated as Open Space or Conservation Habitat (shown on **Figure 2-1**). These areas are assumed to have no future water demand.

2.4 POPULATION GROWTH

Population growth for Riverside County was recently projected by the Riverside County Center for Demographic Research (County, 2007). These projections were performed on a census tract basis. For this analysis, the projections within the District's service area are determined by calculating area percentages of census tracts which fall within the District's service boundary. The projections for the Elsinore Division are shown in **Table 2-2**, and the projections for the Temescal Division are shown in **Table 2-3**.

Table 2-2
Demographic Projections – Elsinore Division

Description	2005	2010	2015	2020	2025	2030	2035
Population	102,603	119,488	136,102	151,394	166,436	178,907	189,646
Housing	34,589	40,600	46,009	51,800	57,014	61,607	65,281
Employment	19,763	23,870	27,710	31,712	35,713	39,602	42,843

Table 2-3
Demographic Projections – Temescal Division

Description	2005	2010	2015	2020	2025	2030	2035
Population	421	478	502	507	521	530	542
Housing	129	148	156	161	164	168	172
Employment	58	67	76	85	94	104	109

Note: Temescal Division projections may be inaccurate because the area consists of a small region of a much larger census tract.

Section 3
Water Production and Demand

An analysis of the historical quantity of water produced and projection of future water requirements is presented in this section. In addition, a detailed evaluation of water demands within the District's primary service area is presented. The water demand projections are based on land use information, specific plans, and anticipated timing of developments.

3.1 HISTORICAL WATER PRODUCTION

The District obtains its water from the following three sources:

- Canyon Lake WTP
- Imported Water (through the Auld Valley and Temescal Valley Pipelines)
- Groundwater Wells

Historically, the wells have produced between 40 and 60 percent of the water demand needs, although in recent years, this trend is beginning to shift due to increasing water demands and decreasing water table levels. Surface water production at Canyon Lake has occassionally been very productive during periods of high runoff. However, this source has been variable. In addition, imported treated water is purchased from the Western Municipal Water District (WMWD), which is conveyed to the District via the Auld Valley Pipeline (AVP) and the Temescal Valley Pipeline (TVP). The AVP conveys water to the District from the Metropolitan Water District of Southern California's (MWD) Skinner Water Treatment Plant (WTP), and the TVP conveys water from MWD's Mills WTP.

In 2006, approximately 65 percent of the water produced was purchased from MWD through the AVP and TVP, 3 percent of the water was supplied through the Canyon Lake WTP, and 32 percent was supplied by groundwater, as shown in **Table 3-1**. A monthly summary of historical annual production, from 2002 to 2006, is presented in **Table 3-2** and a graphical summary is shown on **Figure 3-1**. The average monthly production from the years 2002 to 2006 is shown on **Figure 3-2**.

Table 3-1
Year 2006 Production by Source

Source	Production (acre-ft/yr)	Percentage of Total
Wells	9,868	32%
AVP (Skinner WTP)	15,918	51%
TVP (Mills WTP)	4,428	14%
Canyon Lake WTP	782	3%
Total	**30,995**	**100%**

Table 3-2
Total Monthly Production 2002-2006 (acre-ft)

Month	Year				
	2002	2003	2004	2005	2006
Jan	1,142	1,517	1,530	1,119	1,790
Feb	1,336	1,115	1,313	1,058	1,765
Mar	1,647	1,208	1,737	1,385	1,416
Apr	1,810	1,609	2,051	2,202	1,665
May	2,250	2,208	2,844	2,582	2,787
Jun	2,580	2,538	2,892	2,986	3,405
Jul	2,925	3,069	3,243	3,587	3,992
Aug	2,865	3,136	3,255	3,500	3,670
Sep	2,677	2,853	3,052	3,002	3,351
Oct	2,100	2,550	2,133	2,463	2,831
Nov	1,582	1,514	1,543	2,219	2,409
Dec	1,252	1,536	1,484	2,032	1,913
Annual Totals	**24,169**	**24,853**	**27,076**	**28,137**	**30,995**

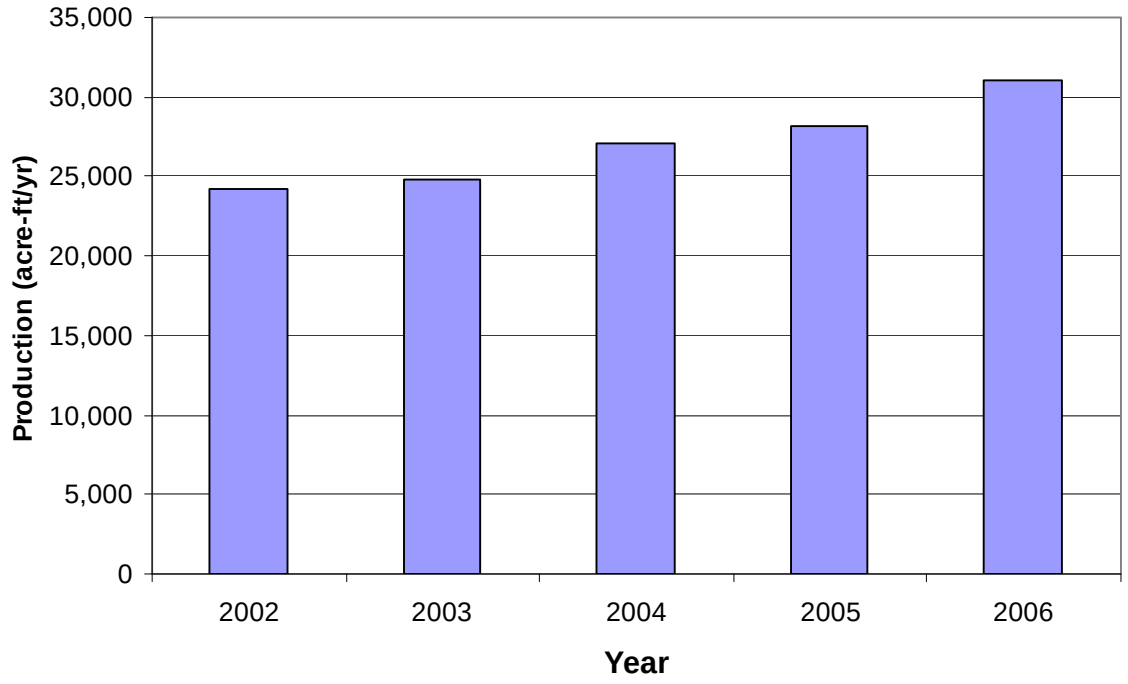


Figure 3-1
Annual Production 2002-2006 (acre-ft/year)

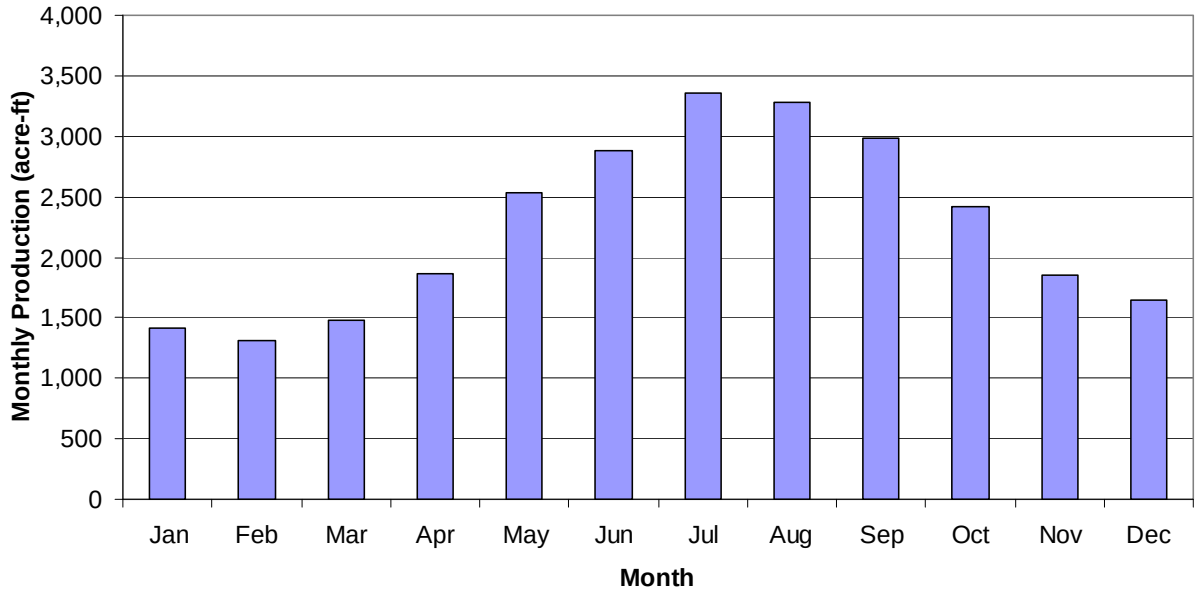


Figure 3-2
Average Monthly Production 2002-2006 (acre-ft/year)

3.2 HISTORICAL WATER DEMANDS

The District's historical potable water demands from 1992 through 2006 are presented in **Table 3-3**. The historical potable water demands are determined from the total production from the District's potable water sources. Hence, water demands are equal to production and include water loss, which is defined as the difference between water demand and water consumption. These demands are normalized to remove the effects of cool wet years and hot dry years by computing the normalized demand per service connection. Multiplying the normalized demand per connection by the number of connections gives the normalized demand for each year. The variation between the actual and normal water demands represents the range in demand due to weather variations. By identifying the maximum variations of the actual demands to the normal demands over the recorded 14 year period (1992-2006), it is calculated that dry year annual demands are approximately 9 percent above average year annual demands, and wet year annual demands are approximately 10 percent below average year demands.

Table 3-3
Historical Potable Water Demands

Year	System Demand (acre-ft/yr)	Number of Service Connections	Demand per Connection (acre-ft/yr)	Normalized Demand per Connection (acre-ft/yr)	Normalized System Demands (acre-ft/yr)
1992	16,365	19,499	0.839	0.812	15,839
1993	16,505	20,185	0.818	0.812	16,391
1994	17,137	20,923	0.819	0.812	16,986
1995	16,994	21,758	0.781	0.812	17,659
1996	17,848	22,868	0.780	0.811	18,555
1997	19,195	23,790	0.807	0.811	19,297
1998	17,953	24,576	0.731	0.811	19,929
1999	21,902	25,453	0.860	0.811	20,635
2000	23,392	26,358	0.887	0.810	21,363
2001	21,915	27,427	0.799	0.810	22,223
2002	24,251	28,861	0.840	0.810	23,378
2003	24,851	31,537	0.788	0.810	25,539
2004	26,939	33,374	0.807	0.810	27,019
2005	27,584	34,735	0.794	0.809	28,113
2006	30,995	36,000[1]	0.861	0.809	29,128

1. Estimated Based Upon 2005/2006 FY Billing Data

3.3 POTABLE WATER DEMAND PROJECTIONS

The potable water demand projections are based on a combination of:

- Development characteristics (land use type, area, and phasing)
- Water duty factors (WDFs)
- Peaking factors

The WDFs, peaking factors, and the demand projection summary are described below.

3.3.1 Water Duty Factors

A water duty factor is defined as the daily water use per some specified unit (e.g. acre, person, dwelling unit) for a given land use type. The City of Lake Elsinore's 1990 General Plan developed WDFs that have been used in several of the District's planning studies since that time, including the District's previous WDSMP. An analysis of these WDFs versus actual usage over the past several years indicates that several of them are too low and do not accurately reflect actual water consumption trends. A comparison of the District's existing WDFs against those of other cities and public agencies in similar locations also confirms this observation.

For the purpose of this report, the WDFs have been updated based upon FY 2005-2006 consumption data. The methodology involved behind updating the WDFs involves overlaying historical water consumption data with designated land use type to calculate an actual water user per acreage. For residential developments, this calculation is performed primarily in recently developed areas, since it is assumed any new development in the District will more likely follow

the water usage trends of these newer developments. For general land use categories (e.g. commercial, business, etc.), various sample areas are selected to perform the calculation. Based upon this methodology, the updated WDFs are presented in **Table 3-4.** For those cases in which the number of dwelling units for a residential development is known, separate WDFs are used. These WDFs are presented on **Table 3-5**.

Table 3-4
Water Duty Factors

Land Use Category	WDF (2002 DSMP)	WDF (Updated)	Unit
Business Park	900	1,200	gpd/acre
Commercial Office	2,200	3,000	gpd/acre
Freeway Business	1,300	1,300	gpd/acre
General Commercial	1,700	2,500	gpd/acre
Industrial	3,000	3,000	gpd/acre
Limited Industrial	700	900	gpd/acre
Neighborhood Commercial	1,000	1,000	gpd/acre
Tourist Commercial	750	2,500	gpd/acre
Schools	4,000	4,000	gpd/acre
Parks/Landscaping	4,000	4,000	gpd/acre
Open Space/Recreation/Slopes	200	2,000	gpd/acre
Public Institutional	1,200	2,300	gpd/acre
Mountainous Residential (0-.1 du/ac)	150	250	gpd/acre
Very Low Density Residential (.1-.5 du/ac)	200	400	gpd/acre
Low Density Residential (.5-2 du/ac)	650	800	gpd/acre
Low Medium Density Residential (2-4 du/ac)	1,400	2,000	gpd/acre
Medium Density Residential (4-6 du/ac)	1,500	2,300	gpd/acre
Medium High Density Residential (6-12 du/ac)	1,750	3,000	gpd/acre
High Density Residential (12-24 du/ac)	1,750	5,000	gpd/acre
Mixed Use (24 du/ac max)	1,700	2,300	gpd/acre

Table 3-5
Water Duty Factors for Residential Dwelling Units

Land Use Category	Range	Unit	WDF (2002 DSMP)	WDF (Updated)	Unit
Low Density Residential	<2	du/ac	500	750	gpd/du
Low Medium Density Residential	2.0-4.0	du/ac	500	600	gpd/du
Medium Density Residential	4.0-6.0	du/ac	400	500	gpd/du
High Medium Density Residential	6.0-12.0	du/ac	400	450	gpd/du
High Density Residential	12.0-24.0	du/ac	300	350	gpd/du

3.3.2 Peaking Factors

The Maximum Day Production (MDP) is the highest combined daily production of all sources during a year based on the historical production data provided by the District between July 01, 2004 and June 30, 2006. **Table 3-6** shows peaking factors between Average Day Production (ADP) and MDP for 2005 and 2006. The historical data from the last two years show a MDP:ADP peaking factor of 1.9. Since only two years of data have been analyzed and to remain consistent with the previous DSMP and the District's Water and Sewer Construction Standards, a maximum day demand (MDD) factor of 2.0 times the average day demand (ADD) was chosen as the factor used for subsequent analyses.

Table 3-6
Peaking Factors for MDD based upon Production Data

Year	ADP (mgd)	MDP (mgd)	MDP:ADP Ratio
2004-2005	23.27	44.77	1.92
2005-2006	26.45	47.58	1.80

3.3.3 Demand Projection Summary

The potable water demand projections are based upon the general plan and specific plan information and revised WDFs as discussed previously. Build out conditions in the District are assumed to occur around 2070 to obtain a reasonable demand project curve. The demand projections also account for conversion of existing potable water use to recycled water use, which are based upon recently developed Recycled Water Master Plans for the Alberhill, Regional, and Wildomar areas (KJ 2004, KJ 2005b, KJ 2005c).

The demand projections by development are presented in **Table 3-7**. The projected demand through 2030 are compared to the projections prepared for previous studies as shown on **Figure 3-3**. The demands projected in this study are similar to those in previous projections.

The total projected ADD and MDD for the District in 5-year increments through 2030 and through buildout is presented in **Table 3-8**.

Table 3-7
Demand Projections by Development

Name	Existing Demand (acre-ft/yr)	Projected Growth in Demand (acre-ft/yr)	2010 (acre-ft/yr)	2015 (acre-ft/yr)	2020 (acre-ft/yr)	2025 (acre-ft/yr)	2030 (acre-ft/yr)	Buildout (acre-ft/yr)
Future Developments with Specific Plans								
The Preserve	0	360	0	180	360	360	360	360
La Strada	0	378	378	378	378	378	378	378
La Laguna	489	41	530	530	530	530	530	530
Tuscany Hills North	0	940	313	627	940	940	940	940
Alberhill Ranch	122	1,295	122	769	1,417	1,417	1,417	1,417
Sunset Ridge	0	751	0	375	751	751	751	751
Ramsgate	105	1,569	889	1,674	1,674	1,674	1,674	1,674
Ramsgate Surroundings	838	3,253	1,088	1,339	1,589	1,839	2,089	4,091
Alberhill CFD	1	2,185	1,093	2,186	2,186	2,186	2,186	2,186
Canyon Hills	878	1,722	2,600	2,600	2,600	2,600	2,600	2,600
John Laing Homes	0	1,485	297	1,039	1,485	1,485	1,485	1,485
Lumos	10	1,277	10	436	861	1,287	1,287	1,287
Surrounding East Lake	564	3,983	564	564	564	962	1,361	4,547
North Peak	0	879	0	293	586	879	879	879
CFD 98-2	52	274	326	326	326	326	326	326
Lakeside Palms	0	335	0	168	335	335	335	335
County Water Co.	0	1,262	0	105	210	315	421	1,262
Canyon Hills Estates	0	242	242	242	242	242	242	242
Subtotal		***22,230***	***8,454***	***13,830***	***17,033***	***18,505***	***19,259***	***25,289***
Future Developments without Specific Plans								
Alberhill Surroundings (North)	5	1,177	5	5	5	240	476	1,182
Alberhill Surroundings (South)	29	420	29	29	169	309	449	449
Pacific Clay	29	3,447	29	29	718	1,408	2,097	3,476
CFD 98-2 Surroundings	879	2,015	879	1,215	1,551	1,886	2,222	2,894
Lusk	88	34	122	122	122	122	122	122
MDMD	0	94	94	94	94	94	94	94
Three Arch	0	79	79	79	79	79	79	79
Freeway Corridor	90	1,529	208	325	443	560	678	1,619
Mountain Regions	58	2,834	276	494	712	930	1,148	2,892
Outside District Boundary (SOI)	0	2,373	0	0	0	0	0	2,373
Subtotal		***14,002***	***1,720***	***2,392***	***3,892***	***5,629***	***7,365***	***15,180***
Infill Development								
Cal Oaks	3,633	139	3,661	3,689	3,716	3,744	3,772	3,772
Canyon Lake	2,771	816	2,934	3,097	3,260	3,423	3,587	3,587
Elsinore Water District (EWD)	1,061	1,074	1,144	1,226	1,309	1,391	1,474	2,135
Greer Ranch	1,007	0	1,007	1,007	1,007	1,007	1,007	1,007
Horsethief	1,796	69	1,865	1,865	1,865	1,865	1,865	1,865
Lake Edge	856	1,496	971	1,086	1,201	1,316	1,431	2,352
Los Pinos	60	24	62	64	65	67	69	84

Table 3-7 (Continued)
Demand Projections by Development

Name	Existing Demand (acre-ft/yr)	Projected Growth in Demand (acre-ft/yr)	2010 (acre-ft/yr)	2015 (acre-ft/yr)	2020 (acre-ft/yr)	2025 (acre-ft/yr)	2030 (acre-ft/yr)	Buildout (acre-ft/yr)
Skymeadows	78	62	83	88	92	97	102	140
Summerhill	499	160	531	563	595	627	659	659
The Farm	407	1,137	494	582	669	757	844	1,544
Tuscany Hills	1,543	29	1,572	1,572	1,572	1,572	1,572	1,572
West Lake	1,391	24	1,415	1,415	1,415	1,415	1,415	1,415
Wildomar	1,408	2,695	1,615	1,823	2,030	2,237	2,445	4,103
TDSA	535	279	628	721	814	814	814	814
Other	8,436	6,723	8,953	9,470	9,987	10,505	11,022	15,159
Subtotal	78	62	83	88	92	97	102	140
Conversions to Recycled Water								
Downtown Zone	0	(206)	(103)	(206)	(206)	(206)	(206)	(206)
Northwest Zone	0	(311)	(156)	(311)	(311)	(311)	(311)	(311)
Northeast Zone	0	(295)	(148)	(295)	(295)	(295)	(295)	(295)
Wildomar	0	(1,054)	(527)	(1,054)	(1,054)	(1,054)	(1,054)	(1,054)
Alberhill	0	(33)	(33)	(33)	(33)	(33)	(33)	(33)
Subtotal		***(1,899)***	***(966)***	***(1,899)***	***(1,899)***	***(1,899)***	***(1,899)***	***(1,899)***
TOTAL SYSTEM ADD (acre-ft/yr)	**28,113**	**77,172**	**34,538**	**40,985**	**47,020**	**51,468**	**55,197**	**77,172**
TOTAL SYSTEM MDD (mgd)	**50.2**	**137.9**	**61.7**	**73.2**	**84.0**	**91.9**	**98.6**	**137.9**

Figure 3-3
Potable Water Demand Projections

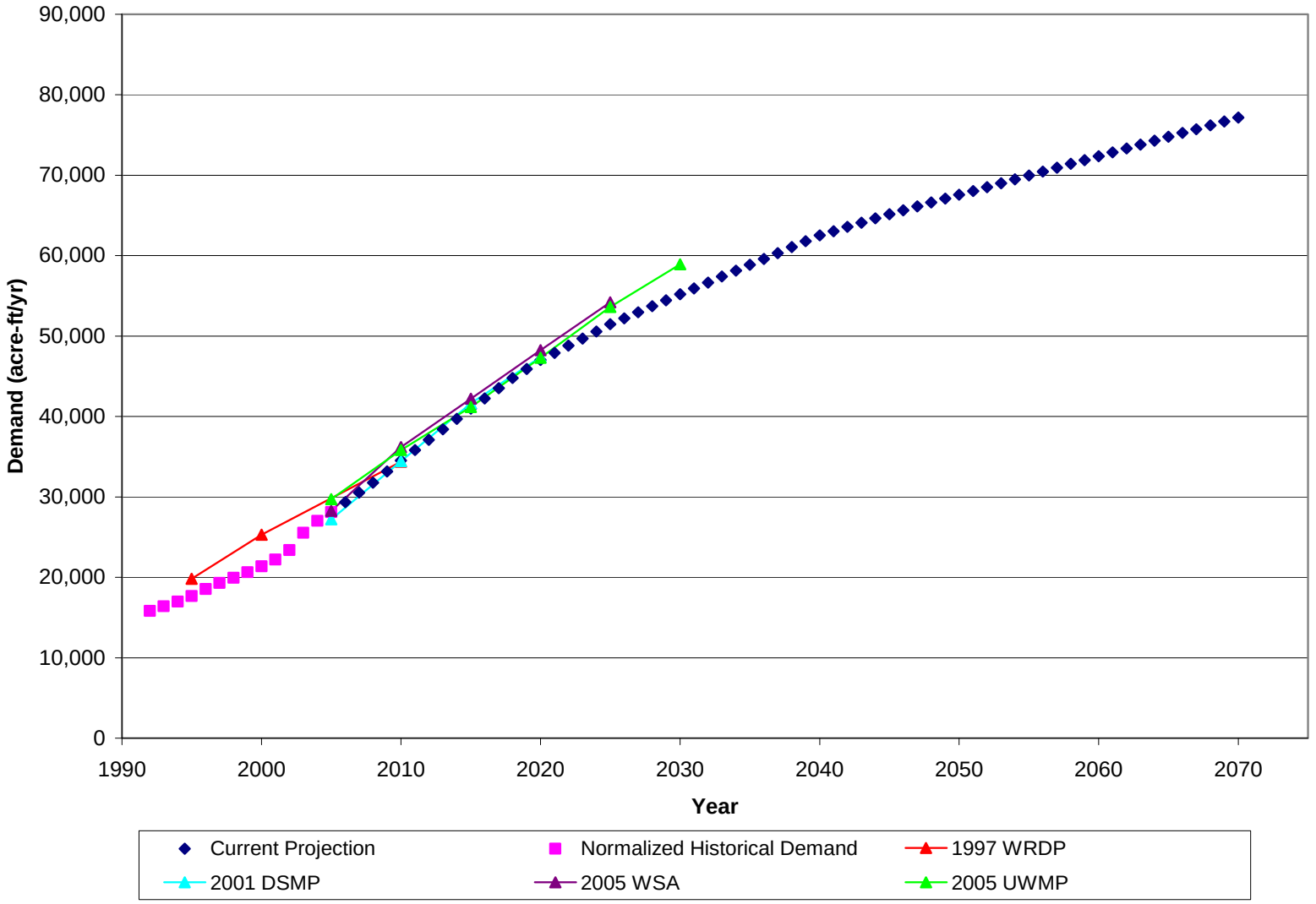


Table 3-8
Total Potable Water Demand Projection

Year	Average Annual Demand (acre-ft/yr)	Below Normal Annual Demand[(1)] (acre-ft/yr)	Above Normal Annual Demand[(2)] (acre-ft/yr)	Average Day Demand (mgd)[(3)]	Maximum Day Demand (mgd)
2005	28,113	25,302	30,699	25.1	50.2
2010	34,538	31,084	37,715	30.8	61.7
2015	40,985	36,886	44,755	36.6	73.2
2020	47,020	42,318	51,346	42.0	84.0
2025	51,468	46,321	56,203	46.0	91.9
2030	55,197	49,677	60,275	49.3	98.6
Buildout (2070)	77,172	69,454	84,271	68.9	137.9

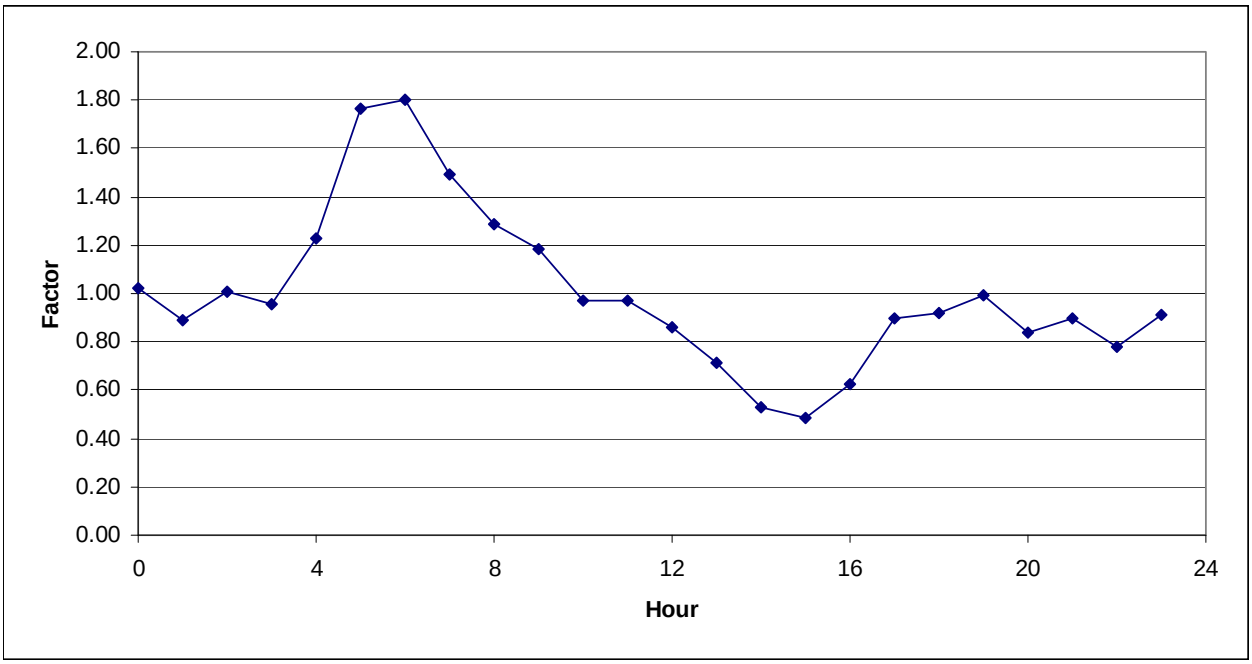
(1) Below normal is based on 10 percent below average year demands
(2) Above normal is based on 9 percent above average year demands
(3) mgd = million gallons per day

As shown in **Table 3-8**, potable water demand is expected to nearly double by 2030. It is estimated that approximately 73 percent of the developments with specific plans will be completed by 2030, while only 45 percent of the other developments will have reached buildout conditions. The remaining development is expected to occur between 2030 and buildout. As shown in **Table 3-8,** the MDD is projected to reach 98.6 mgd by 2030, and 137.9 mgd by buildout (estimated at year 2070).

3.4 DIURNAL CURVE DEVELOPMENT

For analyses purposes, a 24-hour flow pattern is required for model runs. Field data measurements of flows and reservoir levels are used to create such a 24-hour flow pattern. Hourly flows are determined for source water production, and for the contributions to the distribution system from storage reservoirs. A decrease in storage tank level from one hour to the next indicates that water leaves the distribution system during that hour. Volumes of water entering or leaving the system due to storage changes have been calculated for each of the storage tanks and added to, or subtracted from, the system total. A diurnal curve is created for the entire system based upon the District's SCADA data for September 21, 2006. This data includes production at each of the sources and storage tank levels by 10-minute intervals. The diurnal curve that is developed from this data is shown on **Figure 3-4**. The peak hour demand factor of 1.8 occurs at 6:00 AM while the minimum peaking factor of 0.48 occurs at 3:00 PM.

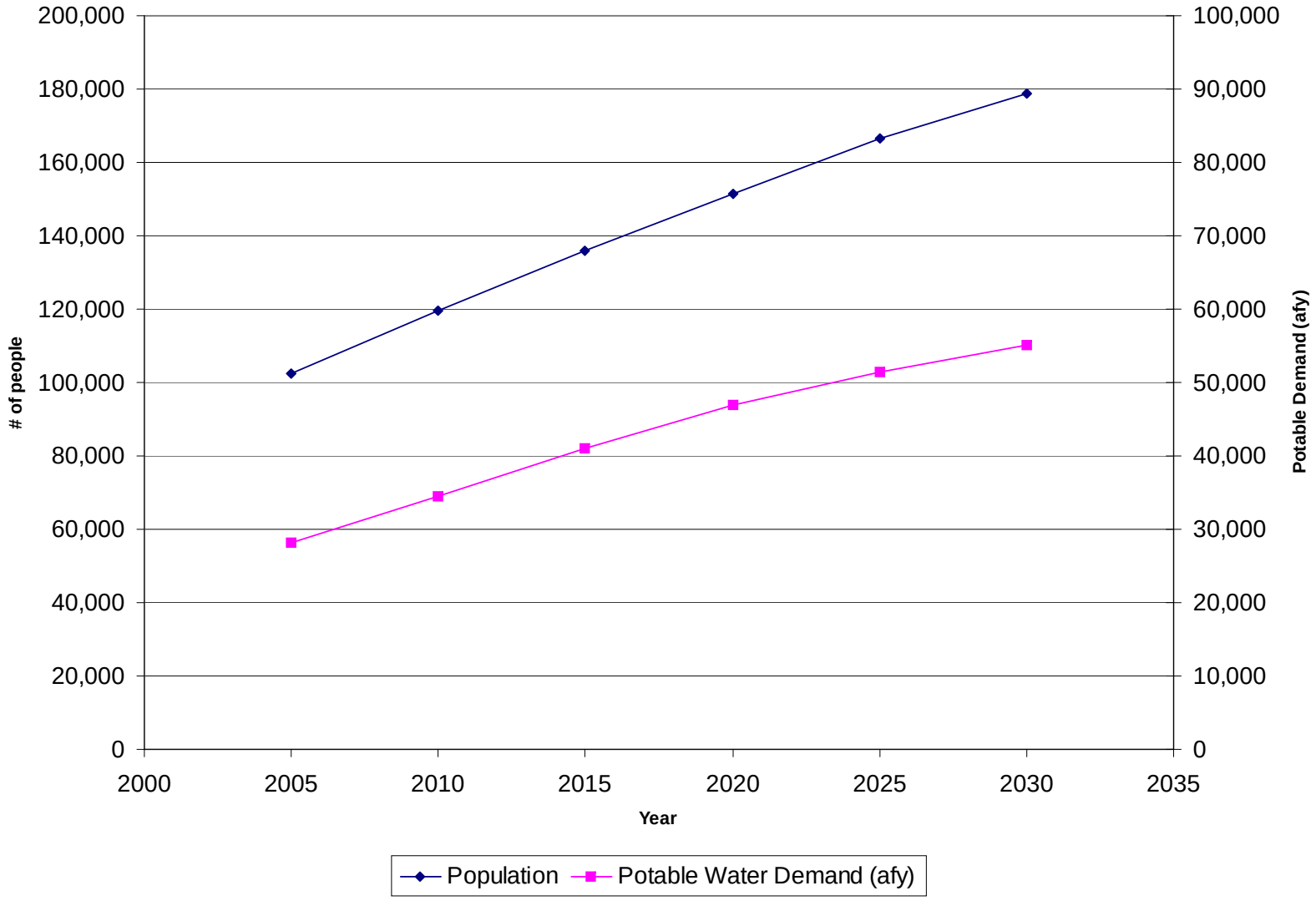
Figure 3-4
Diurnal Curve



3.5 DEMAND AND POPULATION

In **Section 2**, population within the District Service Area was projected based upon recent studies performed by the Riverside County Center for Demographic Research. A graph comparing the District's projected population growth with its demand growth is shown on **Figure 3-5**. The graph indicates a slight increase in the rate of population growth versus rate of water demand growth.

Figure 3-5
Population and Demand Projection



Section 4
Existing Water System

This section describes the existing system facilities and provides an overall understanding of the existing system operations. The District's Temescal Division is discussed in **Section 9**, and is not covered in this Section. The existing system consists of 67 storage reservoirs, 46 booster pump stations, 10 groundwater wells, 53 pressure reducing stations and a number of other facilities, as shown in **Table 4-1**. **Figure 4-1** depicts an overview of the facility locations within the District and **Figure 4-2** is a schematic representation of all of the facilities and their interactions. All facilities that are currently under construction in mid 2007 are assumed to be "existing."

Table 4-1
District Facilities

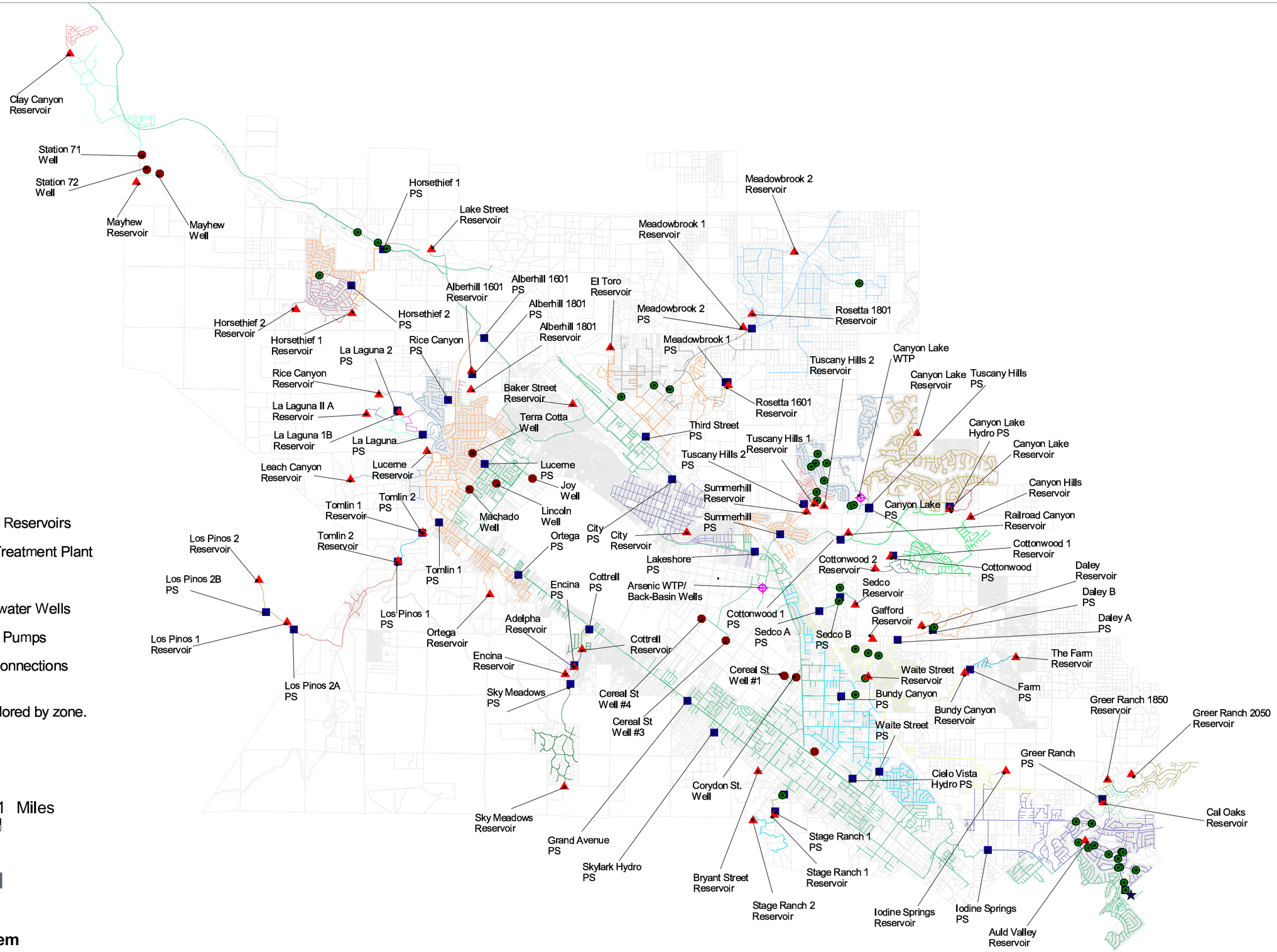
Facility Type	Number
Water Treatment Plant	1
Wells (Operating)	10
Storage Reservoirs	68
Booster Pump Stations	49
Hydropneumatic Pumps	6
Pipeline (ft)	3,063,491
Pressure Regulating Stations	53
Valves	14,324
Fire hydrants	5,816
Air/Vacuum Stations	1,504
Sample Stations	100
Blow-offs	492

A new hydraulic model of the existing system has been developed, to identify areas for existing system improvements, and to evaluate alternative system improvements. The methodology of the model's construction and a detailed description of the investigations and analyses are presented in Section 5 of this Master Plan. Part of the model development involved "skeletonizing" the existing system to develop model inputs. Therefore, not all system elements are modeled; but the modeling detail is adequate we believe to accurately represent the water distribution system operations.

4.1 PRESSURE ZONES

There are 33 primary pressure zones within the District, and each zone is labeled by the high water level (elevation above mean sea level) of the storage reservoir in the zone. **Figure 4-3** shows the approximate pressure zone boundaries throughout the District.

The 1601, 1800 and 1801 pressure zones consist of two or more service areas that are hydraulically isolated from one another due to lack of substantial transmission between the areas.



Legend

- Storage Reservoirs
- Water Treatment Plant
- PRVs
- Groundwater Wells
- Booster Pumps
- MWD Connections

Note: Pipelines colored by zone.

N

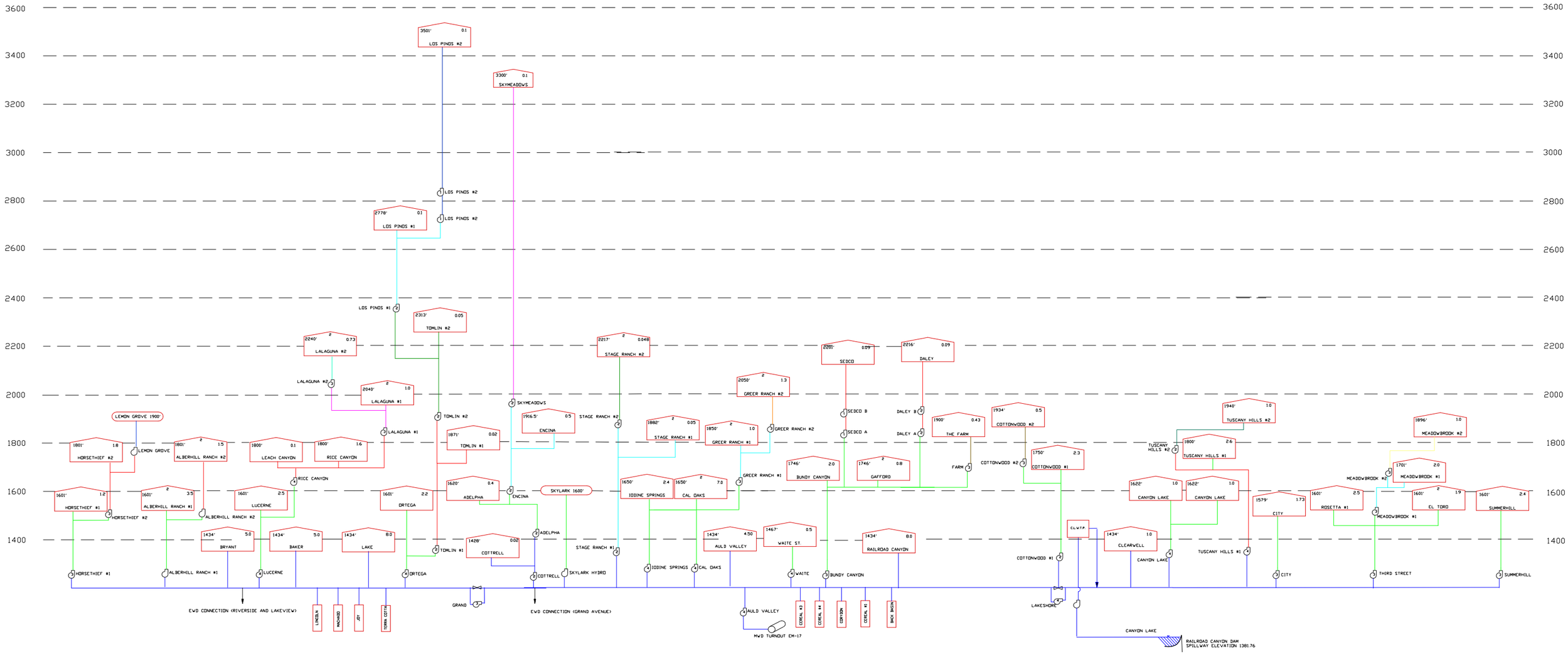
1 0 1 Miles

MWH

Figure 4-1
Existing System

HYDRAULIC SCHEMATIC OF WATER SUPPLY SYSTEM

ELEVATION IN FEET ABOVE MSL



LEGEND

- HYDROPNEUMATIC SYSTEM
- PRV ZONE
- SHUT-OFF VALVE
- WATER TREATMENT PLANT
- WELL
- NUMBER OF TANKS (IF GREATER THAN 1)
- OVERFLOW ELEVATION — RESERVOIR CAPACITY (MG)
- 1450' 0.50 NAME
- (2) BOOSTER PUMP STATION (WITH NUMBER OF PUMPS FOR EXISTING STATIONS)

FIGURE 4-2
EXISTING SYSTEM
HYDRAULIC SCHEMATIC

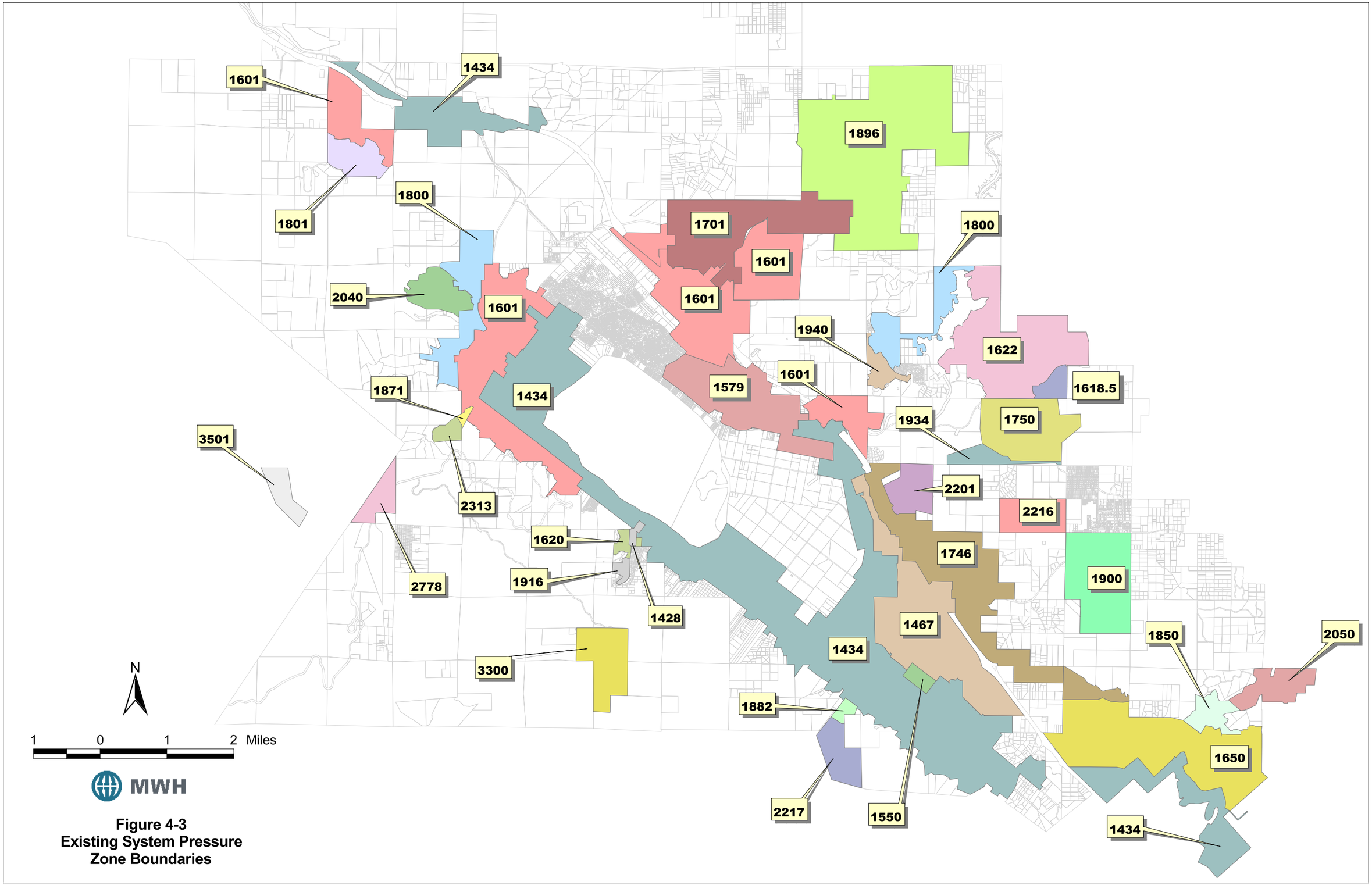


Figure 4-3
Existing System Pressure Zone Boundaries

4.2 WATER SUPPLY

The District has three principal sources of water supply:

- Local groundwater pumped from District-owned wells (approximately 25 percent of supply capacity)
- Surface water from Canyon Lake Reservoir and treated by the Canyon Lake WTP (approximately 10 percent of supply capacity)
- Imported water Purchased from MWD through WMWD (approximately 65 percent of supply capacity)

4.2.1 Groundwater Wells

There are ten operating production wells within the District. A summary of the physical and operational data of the wells currently in service is presented in **Table 4-2**. The location of the wells are shown in **Figure 4-1** and shown schematically on **Figure 4-2**. All of the ten wells are powered by electricity.

In the Elsinore Division, the total capacity of active wells is 14.2 mgd (21.97 cfs), and the firm capacity, with the largest well (Cereal No. 4) out of service, is 12.0 mgd (18.57 cfs). All well water is chlorinated for disinfection before discharge to the distribution system. All of the wells utilize constant speed pumps and they have been tested within the last three years by SCE regarding their operations and efficiencies. SCE tests have been obtained where available, and pump design points have been used where SCE tests did not provide sufficient information to develop complete pump curves.

The Elsinore Valley is underlain by two principal aquifers, the shallow lake and floodplain deposits and the deeper Pauba formation. The mountainous terrain surrounding the valley is underlain by bedrock formations that do not yield significant quantities of water. The floodplain deposits are composed primarily of sand, silt, clay, and gravel layers and do not yield significant quantities of water. The Pauba formation includes layers of sandstone, siltstone, and clay.

Elsinore Valley is divided by eight major fault lines, which generally extend from northwest to southeast. Reportedly, the faults may represent barriers to groundwater flow. Therefore, water stored in any one fault block may not be available to wells in adjacent fault blocks.

A study to determine the reliable yield of the entire groundwater basin underlying Elsinore Valley has not been performed, so it is not known how many additional wells might be feasible or whether the groundwater will eventually be depleted. However at some wells the District has experienced some significantly reduced production capacity and decline in groundwater levels. The Corydon Well drilled in 1983 near Mission Trail and Corydon Street had an initial capacity of about 4,500 gpm, but production declined dramatically as the water table dropped. Other wells have held their capacities since 1988, so the situation is uncertain.

The scope of this report does not include determination of a safe yield or perennial yield for the groundwater basin. No comprehensive hydrogeological investigation has been performed to confirm that an adequate long-term water supply can be obtained. Groundwater rights in the area

have not been adjudicated. A 1981 report for the Department of Parks and Recreation (DPR) indicated that the natural replenishment to the aquifer is insignificant and that, at an annual extraction of 7,200 acre-feet (2346 MG), the DPR wells would fully deplete the aquifer in 85 years. The DPR wells were used for stabilization of the Lake Elsinore water level. The DPR report did not anticipate the increased groundwater use by the District since 1981, which intuitively would decrease aquifer life.

The District is implementing a conjunctive use program in relationship with the Metropolitan Water District (MWD), recharging the aquifer with imported water during winter months and pumping the water out of the groundwater basin during summer months and dry years. Four existing wells in the Back Basin (Cereal 1, Cereal 3, Cereal 4, and Corydon) have been converted for dual-purpose use, and three additional dual-purpose wells, two in the back basin and one in the north side of the basin (Terra Cotta), are currently under construction.

4.2.2 Canyon Lake

The District owns Railroad Canyon Reservoir (Canyon Lake), with approximately 4,600 acre-feet (about 1,500 MG) of useful storage volume. The diversion rights for natural drainage to the reservoir are also owned by the District. Additionally, untreated Colorado River water can be purchased from the Western Municipal Water District (WMWD) and discharged to the San Jacinto River at the Colorado River Aqueduct crossing near Nuevo. The river conveys the imported water to storage in Canyon Lake. The District minimizes the importation of MWD raw water at Canyon Lake due to excessively high loss of water along the San Jacinto River. Historically, the cost of purchasing the raw water and treating it at Canyon Lake WTP is approximately the same as the price of MWD treated water received from Lake Skinner through the Auld Valley pipeline. The raw water is approximately $100 per acre-ft cheaper than MWD imported treated water, but there are also treatment costs. However, it should also be mentioned that historical records show that up to 16 percent of the volume of raw water released into the San Jacinto River is lost through percolation before the water reaches Canyon Lake. Thus, economics favor the purchase of treated water.

The Canyon Lake Water Treatment Plant, which is located near the southwest dam abutment of Canyon Lake, provides conventional treatment to surface water impounded in the lake. The treatment plant has a design capacity of 9 mgd (13.9 cfs). However, during periods of increased raw water turbidity associated with high winter inflows to the lake, the plant operators typically treat only 4.5 mgd (7.0 cfs). The treatment processes include coagulation, flocculation, sedimentation, filtration, and disinfection. The raw water pumping station, which pumps from the lake to the plant, operates manually. A steel reservoir tank at the plant temporarily stores the treated water, which also provides the required detention time for chlorination prior to conveyance of the water to the distribution system.

Finished water flows to a 2.0 MG steel ground storage reservoir via pumping. The reservoir has an overflow elevation of 1434 and a sidewater depth of 32 feet. Water flows by gravity from the reservoirs to the Loop service level.

Table 4-2
Well and Pump Facilities

Name	Location	Discharge Zone	Motor (hp)	Total Dynamic Head[1] (ft)	Discharge Capacity[1] (gpm)	Standing Water Level[2] (ft)	Discharge Head (psi)	Year Installed
Cereal St. Well 1	33520 Cereal St	1434	400	674	1,689	482	76	1987
Cereal St. Well 3	18801 Cereal St	1434	350	636	1,448	n/a	81	1993
Cereal St. Well 4	18301 Cereal St	1434	400	636	1,482	449	71	1993
Corydon St. Well	31642 Corydon St	1434	500	756	1008	n/a	63	1983
Joy St. Well	16751 Joy Ave	1434	250	693	1,000	754	65	2003
Lincoln St Well	15157 Lincoln St	1434	150	474	358	204	56	n/a
Machado Well	32227 Machado St	1434	200	425	1,154	226	41	2001
Mayhew Well	25050 Martri Rd	1358	125	446	628	310	54	1982
Station 71	25150 Martri Rd	1358	60	472	322	243	83	1982
Station 72	25400 Maitri Rd	1358	60	420	249	n/a	10	1982

Notes:
1. TDH and discharge capacities based on most recent SCE test report (SCE, 2005 and SCE, 2006).
2. Measured from ground surface level to water level below.

4.2.3 MWD Imported Water

The District also buys treated water from Eastern Municipal Water District (EMWD) treated at MWD's Skinner Filtration Plant. This water is a blend of primarily Colorado River water and a small percentage of State Project water. The purchased supply is conveyed through the Auld Valley pipeline and pumped into the Loop Zone and Cal Oaks Zone by the California Oaks Pumping Station, located near the District's southeast boundary on Hancock Avenue east of Cal Oaks Road. The District has rights to a maximum flow rate of 37.5 cfs (24.2 mgd) through this connection, which is named MWD Connection EM-17.

The District completed the Temescal Valley Pipeline (TVP) in late 2001. The District delivers water purchased from Western Municipal Water District (WMWD) treated at MWD's Mills Filtration Plant. Water is transferred to the TVP from the Imported Water Conveyance System (IWCS) at the Woodcrest Vault, located in Corona at the intersection of Temescal Canyon Road. and La Gloria Street. At design capacity, with 41 cfs (26.5 MGD) through the Woodcrest Connection, the District receives water at a minimum HGL of 1,461 ft.

4.3 BOOSTER PUMPING STATIONS

There are 46 booster pump stations located within the District, some of which are only used on an as-needed basis, with two to four booster pumps located at each booster pump station. The booster pumps vary in size from 10 to 250 hp and boost water to all of the primary pressure zones. Controls for the booster pumps, i.e., criteria for when the pumps are either on or off, are given later in this section. **Table 4-3** shows a summary of booster pump information. The booster pump locations are shown in **Figure 4-1** and are schematically represented in **Figure 4-2**. Southern California Edison (SCE), the local electricity purveyor, implements a different electricity rate structure for users of large quantities of electricity. This rate structure includes higher rates during peak electricity usage times and is referred to as a time of use (TOU) rate structure. The majority of the booster pumps run on such TOU rate structures.

All of the water booster stations utilize constant speed pumps, and the majority of them have been tested within the last three years by SCE regarding their operations and efficiencies. SCE tests have been obtained where available and entered into the model. Where SCE tests did not provide sufficient information to develop complete pump curves, design capacities have been used.

4.4 STORAGE RESERVOIRS

There are 67 storage reservoirs within the District's system, and 51 different storage reservoirs sites. Sixteen of the sites contain two reservoirs, and nine of the reservoirs were recently built but have not yet been connected to the distribution system. The reservoirs range in size from 20,000 gallons to 8 MG, with a total system storage reservoir capacity of approximately 85 MG. **Table 4-4** shows a summary of storage reservoir information. The storage reservoir locations are shown in **Figure 4-1** and are schematically represented in **Figure 4-2**. The District also has three hydropneumatic tanks.

Table 4-3
Booster Pump Summary

Name	Unit No.	Location	Suction Zone	Discharge Zone	Pump (hp)	Year Installed	Total Dynamic Head (ft)	Flow Capacity (gpm)	Firm Capacity (gpm)
Adelpha	1	Adelpha & Cottrell	1428	1620	30	1990	198	327	317
Adelpha	2	Adelpha & Cottrell	1428	1620	30	1990	202	266	
Alberhill Ranch 1	1	No Data	1434	1601	No Data	2007	215	5,715	4,286
Alberhill Ranch 2	1	No Data	1601	1801	No Data	2007	236	1,667	1,250
Auld Valley	5	24281 Hancock Avenue	AVP	1434	250	1989	72	4,977	16,323
Auld Valley	6	24281 Hancock Avenue	AVP	1434	250	1989	83	6,528	
Auld Valley	7	24281 Hancock Avenue	AVP	1434	250	1989	77	5,236	
Auld Valley	8	24281 Hancock Avenue	AVP	1434	250	1989	78	5,251	
Bundy Canyon	1	21785 Bundy Canyon Road	1434	1746	125	1994	342	1,099	1,728
Bundy Canyon	2	21785 Bundy Canyon Road	1434	1746	100	1994	327	903	
Bundy Canyon	3	21785 Bundy Canyon Road	1434	1746	100	1994	338	849	
Cal Oaks	1	24281 Hancock Avenue	1380	1650	100	1989	292	1,030	3,320
Cal Oaks	2	24281 Hancock Avenue	1380	1650	100	1989	295	1098	
Cal Oaks	3	24281 Hancock Avenue	1380	1650	100	1989	326	986	
Cal Oaks	4	24281 Hancock Avenue	1380	1650	100	1989	293	1,045	
Canyon Lake	1	202 Via De La Valle	1434	1622	100	No Data	206	1,379	4,173
Canyon Lake	2	202 Via De La Valle	1434	1622	100	No Data	208	1,405	
Canyon Lake	3	202 Via De La Valle	1434	1622	100	No Data	209	1,458	
Canyon Lake	4	202 Via De La Valle	1434	1622	100	No Data	209	1,299	
Canyon Lake Hydro	1	No Data	1622	1850	25	1970	No Data	No Data	n/a
Canyon Lake Hydro	2	No Data	1622	1850	25	1970	No Data	No Data	
Cielo Vista Hydro	1	35197 Orange Street	1434	1550	20	No Data	191	226	n/a
Cielo Vista Hydro	2	35197 Orange Street	1434	1550	20	No Data	193	196	
City	1	521 N. Langstaff Street	1434	1579	50	No Data	195	809	1,646
City	2	521 N. Langstaff Street	1434	1579	50	No Data	175	916	
City	3	521 N. Langstaff Street	1434	1579	50	No Data	195	882	
Cottonwood 1	1	No Data	1434	1746	200	n/a	342	1,667	1,382
Cottonwood 1	2	No Data	1434	1746	200	n/a	342	1,667	
Cottonwood 2	2	No Data	1750	1934	No Data	2001	226	580	457
Cottonwood 2	2	No Data	1750	1934	No Data	2001	226	580	
Cottrell	1	Deeble Entrance & Kniffin	1434	1428	10	No Data	45	383	439
Cottrell	2	Deeble Entrance & Kniffin	1434	1428	10	No Data	47	410	
Daley A	1	23245 Crab Hollow Circle	1746	2216	15	No Data	258	94	134
Daley A	2	23245 Crab Hollow Circle	1746	2216	15	No Data	269	94	
Daley B	1	22749 Lost Road	2216	2216	15	No Data	332	94	
Daley B	2	22749 Lost Road	2216	2216	15	No Data	323	103	
El Toro	1	18021 Carmela Center	1434	1601	20	No Data	191	196	390
El Toro	2	18021 Carmela Center	1434	1601	25	No Data	189	235	
Encina	1	Adelpha & Encina	1620	1916	20	1957	276	238	228
Encina	2	Adelpha & Encina	1620	1916	25	1957	277	232	
Grand Avenue	1	18861 Grand Avenue	1434	1434	125	1989	97	3,074	3,117
Grand Avenue	2	18861 Grand Avenue	1434	1434	100	1989	80	2,885	
Grand Avenue	3	18861 Grand Avenue	1434	1434	100	1989	130	2,669	
Greer Ranch 1	1	Nutmeg & Evandel	1650	1850	No Data	No Data	234	551	1,176
Greer Ranch 1	2	Nutmeg & Evandel	1650	1850	No Data	No Data	229	557	
Greer Ranch 1	3	Nutmeg & Evandel	1650	1850	No Data	No Data	228	554	
Greer Ranch 2	1	Nutmeg & Evandel	1650	2050	No Data	No Data	424	580	1,195
Greer Ranch 2	2	Nutmeg & Evandel	1650	2050	No Data	No Data	429	602	
Greer Ranch 2	3	Nutmeg & Evandel	1650	2050	No Data	No Data	426	591	
Horsethief 1	1	13630 Mountain Rd	1434	1601	125	2000	176	1,795	3,682
Horsethief 1	2	13630 Mountain Rd	1434	1601	125	2000	174	1,767	
Horsethief 1	3	13630 Mountain Rd	1434	1601	125	2000	179	1,905	
Horsethief 1	4	13630 Mountain Rd	1434	1601	125	2000	No Data	No Data	
Horsethief 2	1	27260 Horsethief	1601	1801	75	1991	225	909	1,963
Horsethief 2	2	27260 Horsethief	1601	1801	75	1991	225	912	
Horsethief 2	3	27260 Horsethief	1601	1801	75	1991	226	869	
Inland Valley	1	Prielipp & Inland Valley	1434	1650	No Data	2007	205	756	2,190
Inland Valley	2	Prielipp & Inland Valley	1434	1650	No Data	2007	205	756	
Inland Valley	3	Prielipp & Inland Valley	1434	1650	No Data	2007	205	756	
Inland Valley	4	Prielipp & Inland Valley	1434	1650	No Data	2007	205	756	
La Laguna 1	1	McVicker Canyon Park Rd	1801	2040	No Data	No Data	245	639	1,196
La Laguna 1	2	McVicker Canyon Park Rd	1801	2040	No Data	No Data	257	693	
La Laguna 1	3	McVicker Canyon Park Rd	1801	2040	No Data	No Data	261	693	
La Laguna 2	1	No Data	2040	2240	No Data	2007	209	269	554
La Laguna 2	2	No Data	2040	2240	No Data	2007	209	269	
La Laguna 2	3	No Data	2040	2240	No Data	2007	235	100	
Lakeshore	1	2087 Lakeshore	1434	1434	100	1991	53	4,433	9,894
Lakeshore	2	2087 Lakeshore	1434	1434	100	1991	69	3,112	

Table 4-3 (Continued)
Booster Pump Summary

Name	Unit No.	Location	Suction Zone	Discharge Zone	Pump (hp)	Year Installed	Total Dynamic Head (ft)	Flow Capacity (gpm)	Firm Capacity (gpm)
Lakeshore	3	2087 Lakeshore	1434	1434	100	1991	43	4,754	
Lakeshore	4	2087 Lakeshore	1434	1434	100	1991	50	3,411	
Lemon Grove	1	No Data	1801	1900	No Data	No Data	No Data	No Data	No Data
Los Pinos 1	1	n/a	2246	2748	50	n/a	586	289	280
Los Pinos 1	2	n/a	2246	2748	50	n/a	587	297	
Los Pinos 2A	1	39251 Gen Pinchot	2778	3501	15	No Data	357	101	104
Los Pinos 2A	2	39251 Gen Pinchot	2778	3501	15	No Data	425	93	
Los Pinos 2B	1	39251 Gen Pinchot	2778	3501	15	No Data	385	110	104
Los Pinos 2B	2	39251 Gen Pinchot	2778	3501	15	No Data	386	109	
Lucerne	1	15070 Lincoln	1434	1601	75	1989	187	1,011	3,177
Lucerne	2	15070 Lincoln	1434	1601	75	1989	167	1,068	
Lucerne	3	15070 Lincoln	1434	1601	75	1989	168	1,208	
Lucerne	4	15070 Lincoln	1434	1601	75	1989	174	1,123	
Meadowbrook 1	1	77 Conrad - 74	1434	1701	100	1962	144	1,141	1,233
Meadowbrook 1	2	77 Conrad - 74	1434	1701	100	1962	144	1,151	
Meadowbrook 1	3	77 Conrad - 74	1434	1701	100	1962	144	1,141	
Meadowbrook 2	1	77 El Toro - 74	1701	1896	40	1962	216	518	943
Meadowbrook 2	2	77 El Toro - 74	1701	1896	40	1962	221	575	
Ortega	1	15171 Anchor Way	1434	1601	75	1990	200	974	2,694
Ortega	2	15171 Anchor Way	1434	1601	75	1990	199	991	
Ortega	3	15171 Anchor Way	1434	1601	75	1990	200	1,008	
Ortega	4	15171 Anchor Way	1434	1601	75	1990	No Data	No Data	
Rice Canyon	1	16482 Orange Grove Way	1601	1800	75	1988	214	960	2,730
Rice Canyon	2	16482 Orange Grove Way	1601	1800	75	1988	214	1,017	
Rice Canyon	3	16482 Orange Grove Way	1601	1800	75	1988	215	979	
Rosetta Cyn 2	1	3rd & Collier	1434	1601	No Data	2006	178	3,445	6,543
Rosetta Cyn 2	2	3rd & Collier	1434	1601	No Data	2006	178	3,445	
Rosetta Cyn 2	3	3rd & Collier	1434	1601	No Data	2006	178	3,445	
Sedco A	1	32550 Highway - 71	1746	2201	20	No Data	335	209	178
Sedco B	1	32660 Highway - 71	2201	2201	20	No Data	325	209	
Skylark Hydro	1	19613 Grand Avenue	1434	1600	10	No Data	No Data	No Data	No Data
Skylark Hydro	2	19613 Grand Avenue	1434	1600	10	No Data	No Data	No Data	
Skymeadows	1	33850 Encina Drive	1916.5	3300	100	No Data	1466	150	149
Skymeadows	2	33850 Encina Drive	1916.5	3300	100	No Data	1466	137	
Stage Ranch 1	1	33440 Hixon Street	1434	1882	75	1977	434	462	472
Stage Ranch 1	2	33440 Hixon Street	1434	1882	75	1977	434	462	
Stage Ranch 2	1	34250 Enderlein Street	1882	2217	100	1977	470	598	690
Stage Ranch 2	2	34250 Enderlein Street	1882	2217	100	1977	443	583	
Summerhill	1	31636 Canyon Estates	1434	1601	100	1990	188	1,176	2,624
Summerhill	2	31636 Canyon Estates	1434	1601	100	1990	188	1,230	
Summerhill	3	31636 Canyon Estates	1434	1601	100	1990	190	1,213	
The Farm	1	23810 Bundy Canyon	1746	1900	100	1989	258	999	565
The Farm	2	23810 Bundy Canyon	1746	1900	60	1989	No Data	No Data	
The Farm	3	23810 Bundy Canyon	1746	1900	125	1989	No Data	No Data	
Tomlin 1	1	15049 Grand Avenue	1601	1871	50	No Data	295	156	450
Tomlin 1	2	15049 Grand Avenue	1601	1871	60	No Data	296	173	
Tomlin 2	1	No Data	1871	2246	50	No Data	508	288	287
Tomlin 2	2	No Data	1871	2246	50	No Data	502	250	
Tuscany Hills 1	1	200 Via De La Valle	1434	1800	125	1989	392	966	3,025
Tuscany Hills 1	2	200 Via De La Valle	1434	1800	125	1989	387	966	
Tuscany Hills 1	3	200 Via De La Valle	1434	1800	125	1989	391	966	
Tuscany Hills 1	4	200 Via De La Valle	1434	1800	125	1989	382	917	
Tuscany Hills 2	1	21 Bel Lucia	1800	1940	75	1990	190	1,228	1,273
Tuscany Hills 2	2	21 Bel Lucia	1800	1940	75	1990	193	1,193	
Waite	1	31820 Central	1434	1467	10	1988	No Data	No Data	3,677
Waite	2	31820 Central	1434	1467	50	1988	78	1,465	
Waite	3	31820 Central	1434	1467	50	1988	56	1,184	
Waite	4	31820 Central	1434	1467	50	1988	47	1,028	

Table 4-4
Storage Reservoir Summary

Name/Description	Volume (MG)	Pressure Zone Served	Diameter (ft.)	Height (ft.)	Bottom Elevation (ft.)	Overflow Elevation (ft.)	Year Installed
Adelpha	0.02	1620	16.0	10	1604.0	1614.0	Temporary
Alberhill Ranch 1A	1.50	1601	95.1	33	1570.0	1601.0	2006
Alberhill Ranch 1B	1.50	1601	95.1	33	1570.0	1601.0	2006
Alberhill Ranch 2A	0.63	1801	67.1	28	1772.6	1801.0	2006
Alberhill Ranch 2B	0.63	1801	67.1	28	1772.6	1801.0	2006
Auld Valley	4.50	1434	155.0	32	1402.0	1434.0	1989
Baker Street	5.00	1434	148.7	38.5	1395.5	1434.0	1986
Bryant Street	5.00	1434	148.7	38.5	1395.5	1434.0	1987
Bundy Canyon	2.00	1746	110.0	32	1714.5	1746.0	1988
Cal Oaks 1	3.50	1650	122.0	40	1610.0	1650.0	1988
Cal Oaks 2	3.50	1650	122.0	40	1610.0	1650.0	1990
Canyon Hills 1	1.10	1750	78.0	32	1718.0	1750.0	2006
Canyon Hills 2	1.10	1750	78.0	32	1718.0	1750.0	2006
Canyon Lake N 1	1.00	1622	70.0	40	1581.0	1622.0	1979
Canyon Lake N 2	1.00	1618.5	73.0	32	1586.5	1618.5	1970
City	1.73	1579	96.0	32	1547.0	1579.0	1995
Clay Canyon 1	0.12	1258.4	26.0	32	1228.8	1258.0	1982
Clay Canyon 2	0.06	1258.4	20.0	24	1234.8	1258.3	1982
Clearwell	1.00	1434	80.0	29	1405.0	1434.0	2006
Cottonwood 2	0.50	1934	53.0	32	1932.0	1934.0	2003
Cottonwood 1A	1.20	1750	82.0	32	1718.0	1750.0	2002
Cottonwood 1B	1.10	1750	76.5	32	1718.0	1750.0	2002
Cottrell	0.02	1428	22.1	7	1421.0	1428.0	1990
Daley	0.88	2309	25.0	22	2287.0	2309.0	1998
El Toro 1	0.25	1601	42.0	24	1577.0	1601.0	1988
El Toro 2	0.40	1601	53.0	25	1576.0	1601.0	1996
Encina	0.50	1916.5	47.5	46	1877.0	1916.5	1992
Gafford Street 1	0.10	1746	30.0	30	1716.0	1746.0	1984
Gafford Street 2	0.61	1746	59.0	30	1716.0	1746.0	1973
Greer Ranch 1A	0.50	1850	61.5	19	1831.8	1850.0	2004
Greer Ranch 1B	0.50	1850	61.5	19	1831.8	1850.0	2004
Greer Ranch 2A	0.65	2050	58.9	33	2019.0	2050.0	2004
Greer Ranch 2B	0.65	2050	58.9	33	2019.0	2050.0	2004
Horsethief 1	1.20	1601	80.0	32	1569.0	1601.0	1994
Horsethief 2	1.80	1801	98.0	32	1769.0	1801.0	1986
Inland Valley	2.40	1650	101.0	40	1610.0	1650.0	2007
La Laguna 1A	0.47	2040	61.6	23	2017.2	2040.0	2005
La Laguna 1B	0.47	2040	61.6	23	2017.2	2040.0	2005
La Laguna 2A	0.54	2240	49.0	26	2213.6	2240.0	2006
La Laguna 2B	0.54	2240	49.0	26	2212.2	2240.0	2006
Lake Street	8.00	1434	200.0	32	1402.0	1434.0	1999
Leach Canyon	0.11	1801	34.2	16	1784.0	1800.0	1984
Los Pinos 1	0.10	2778	27.0	24	2754.1	2778.0	1967
Los Pinos 2	0.10	3501	27.0	24	3477.0	3501.0	1967
Lucerne	2.50	1601	118.0	32	1569.7	1601.0	1991
Mayhew	0.20	1358.7	32.0	30	1330.5	1358.7	1982
Meadowbrook 1	2.00	1701	103.2	32	1669.0	1701.0	1989
Meadowbrook 2	1.00	1896	85.0	27	1872.0	1896.0	1998
Ortega	2.20	1601	110.0	32	1570.7	1601.0	1990
Railroad Canyon	8.00	1434	200.0	33	1402.5	1434.0	1995
Ramsgate 1	0.70	1801	64.4	33	1770.5	1801.0	2006
Ramsgate 2A	0.70	1801	64.4	33	1770.5	1801.0	2006
Ramsgate 2B	2.50	1601	117.0	31	1572.0	1601.0	2006
Rice Canyon	1.61	1801	106.9	24	1776.0	1800.0	1992
Sedco	0.88	2196	25.0	22	2174.0	2196.0	1998
Skymeadows	0.10	3300	27.0	24	3276.0	3300.0	1969
Stage Ranch 1A	0.05	1882	22.0	16	1862.0	1882.0	1977
Stage Ranch 1B	0.05	1882	22.0	16	1862.0	1882.0	1977
Stage Ranch 2A	0.05	2217	22.0	16	2201.0	2217.0	1977
Stage Ranch 2B	0.05	2217	22.0	16	2201.0	2217.0	1977
Summerhill	2.35	1601	114.0	32	1570.0	1601.0	1992
The Farm	0.43	1900	67.7	16	1884.0	1900.0	1975
Tomlin 1	0.30	1871	19.6	23.8	1847.2	1871.0	2003
Tomlin 2	0.30	2313	19.6	23.8	2289.2	2313.0	2003
Tuscany Hills 1A	1.30	1801	84.0	34	1768.0	1800.0	1990
Tuscany Hills 1B	1.30	1801	84.0	34	1768.0	1800.0	1990
Tuscany Hills 2	1.00	1940	85.0	24	1916.0	1940.0	1990
Waite Street	0.50	1467	60.0	24	1423.0	1467.0	1968

Note: Waite Street Reservoir has a limit of 17 feet in the reservoir due to structural damage.

4.5 PRESSURE REDUCING STATIONS

There are 53 pressure regulating stations and other pressure relief stations within the District. Most of the pressure regulating stations have two PRVs; a main valve and a second, smaller valve referred to as a bypass valve. The smaller valve is given a slightly higher pressure setting than the main valve to allow it to respond to small pressure changes in the system without opening the larger valve. If the second valve cannot pass enough water and the downstream pressure continues to decline, the main valve will open to pass additional water. The pressure relief station consists of a relief valve that relieves excess pressure to the downstream pressure zone. The PRV settings are checked by the District's operation staff on a quarterly basis and, besides minor adjustments to the settings, the stations have not required intensive maintenance. **Table 4-5** shows a summary of pressure reducing station information. The modeled pressure regulating station locations are schematically represented in **Figure 4-2**.

4.6 PIPELINES

The District's water distribution pipelines range between 3-inch and 42-inch in diameter and the majority of the pipelines are constructed of polyvinyl chloride (PVC) material (49.6 percent of total pipeline by length). The remainder is constructed of steel (7.7 percent), asbestos cement (26.1 percent), cement mortar (7.7 percent) and ductile iron (6.2 percent). Copper and concrete comprise a small percentage of the pipe material. Also, 1.7 percent of District pipelines are of unknown material. Summary of the total lengths of pipelines by material type is shown in **Table 4-7**. **Table 4-6** summarizes the total lengths of pipelines in the District, by pipe size, as of November of 2000. **Figures 4-4 and 4-5** show the pipelines in the model colored by diameter and by material, respectively.

Table 4-5
Pressure Reducing Valve Summary

Name/Description	Valve Size (in)	Zone	High Pressure (psi)[3]	Low Pressure (psi)[3]	Year Installed
10th / Conard	2/4/8	1701	100	60	1997
11th / Dexter: Pressure Relief Valve	8	1701	n/a	n/a	1997
Allen St / HWY 74	2/6	1701	145	55	n/a
Bella Firenze / Summerhill	2/4/8	1940	120	94	1990
Bella Lucia / Bella Catarina	2/4/8	1940	90	65	1990
Bolina Dr. / Pantera	2/8	1545	88	62	1993
California Quail	2/8	1650	110	72	1990
Concordia Ranch RD	2/4/8	1434	180	80	1991
Crimson Lasso Dr	2/4/6	1650	n/a	n/a	2004
Crimson Pillar Ln	2/4/8	1801	n/a	n/a	2005
Cupeno / Falconer	2/8	1650	90	70	1990
Darcy Pl & Nutmeg St	2/4/6	1850	n/a	n/a	2004
Elsinore Heights Road	2/6	2201	185	90	n/a
Falconer / Cal Oaks Rd.	2/8	1650	102	90	1988
Falconer / Nutmeg	2/8	1650	112	91	1988
Gateway Dr & Solstice Ct	2/4/6	2040	n/a	n/a	2005
Gingerbread	2/4/8	1650	125	107	1998
Golden Pheasant / Nutmeg	2/12	1650	124	75	1989
Greer Rd and Darcy St	2/4/6	1850	n/a	n/a	2004
Greer Ranch 2050/1850	2/4/6	2050	300	150	2004
Hoofprint Dr	2/4/8	1650	n/a	n/a	2004
Horsetail St & Iceplant Ln	2/4/6	2050	n/a	n/a	2003
Laguna Ave/Trabuco Dr	4/8	1601	80	65	2001
Lemon St / Gafford	6	1746	70	35	1996
Lower Meadowbrook Pump Station	2/4/8	1701	150	100	2003
Lower Tuscany Hills Pump Station	6	1800	200	30	n/a
Manresa / Cal Oaks Rd.	2/8	1650	107	61	1990
Morning Dove / Cal Oaks Rd.	2/8	1650	137	95	1990
Mountain Rd / Horsethief Canyon Rd1	6/6	1801	130	n/a	1983
Nutmeg & Jameson	2/8	1650	n/a	n/a	2003
Orange / Bundy Canyon Rd.	4/6/8	1746	165	80	1990
Orchid Tree Ave & Pumpkin St	2/4/6	2050	n/a	n/a	2002
Pointe Russo / Pointe Loren2	2/4/8	1800	80	46	1993
Railroad Canyon Rd	n/a	1750	n/a	n/a	1990
River Rd	2/6	1896	135	45	n/a
Sarradella / Cal Oaks Rd.	2/8	1650	165	91	n/a
Sedco	2/6	2201	185	90	n/a
Skylink Dr	2.5/8	n/a	n/a	n/a	n/a
Spinning Wheel Dr.	2/4/6	1650	95	78	1990
Stage Ranch Lower Pump Station	2/6	1882	250	60	1977
Temescal Canyon / Hostetler Rd	4/8	1434	180	75	n/a
Terragona / Cal Oaks Rd.	2/8	1650	137	91	1988
Tinder Box Way	2/4/8	1650	78	52	1990
Trellis Ln / Hwy 74	2/4/8	1701	n/a	n/a	2005
2B Los Pinos Pump Station	3/2	3501	165	120	2001
Via De La Valle / Via De Lago	4/6/8	1800	125	42	1989
Via De Lago / Via de La Valle	2/6	1800	125	95	1988
Villa Milano / Summerhill	2/6/12	1800	112	105	1990
Villa Roma / Villa Millano	3/6	1800	103	54	n/a
Villa Valtelena / Via De La Valle	2/6/12	1800	80	72	1990
Waite St Reservoir PRV	2/4	1746	130	55	1988
Windtree	6	1746	100	50	n/a
Woodcreek / Victorian Ln	6	1746	100	45	n/a

Notes:
1. PRV Station status is Disabled
2. Future PRV Station
3. High pressure is the approximate suction pressure of the water entering the PRV. Low pressure is the approximate pressure setting for the PRV.

Table 4-6
Pipeline by Diameter Summary

Pipeline Diameter (inches)	Total Length of Pipeline (feet)
3	3,421
4	193,062
6	517,924
8	1,117,373
10	129,209
11	149
12	583,416
14	33,790
16	131,854
18	10,386
20	49,752
21	22,166
24	83,716
27	6,820
30	78,079
33	13,305
36	54,226
42	34,843
Total	**3,063,491**

Table 4-7
Pipelines by Material Summary

Pipeline Material	Total Length (feet)
Asbestos Concrete	800,410
Concrete	25,990
Copper	490
Cement Mortar	237,029
Ductile Iron	191,339
Polyvinyl Chloride	1,519,164
Steel	236,562
Unknown	52,507
Total	**3,063,491**

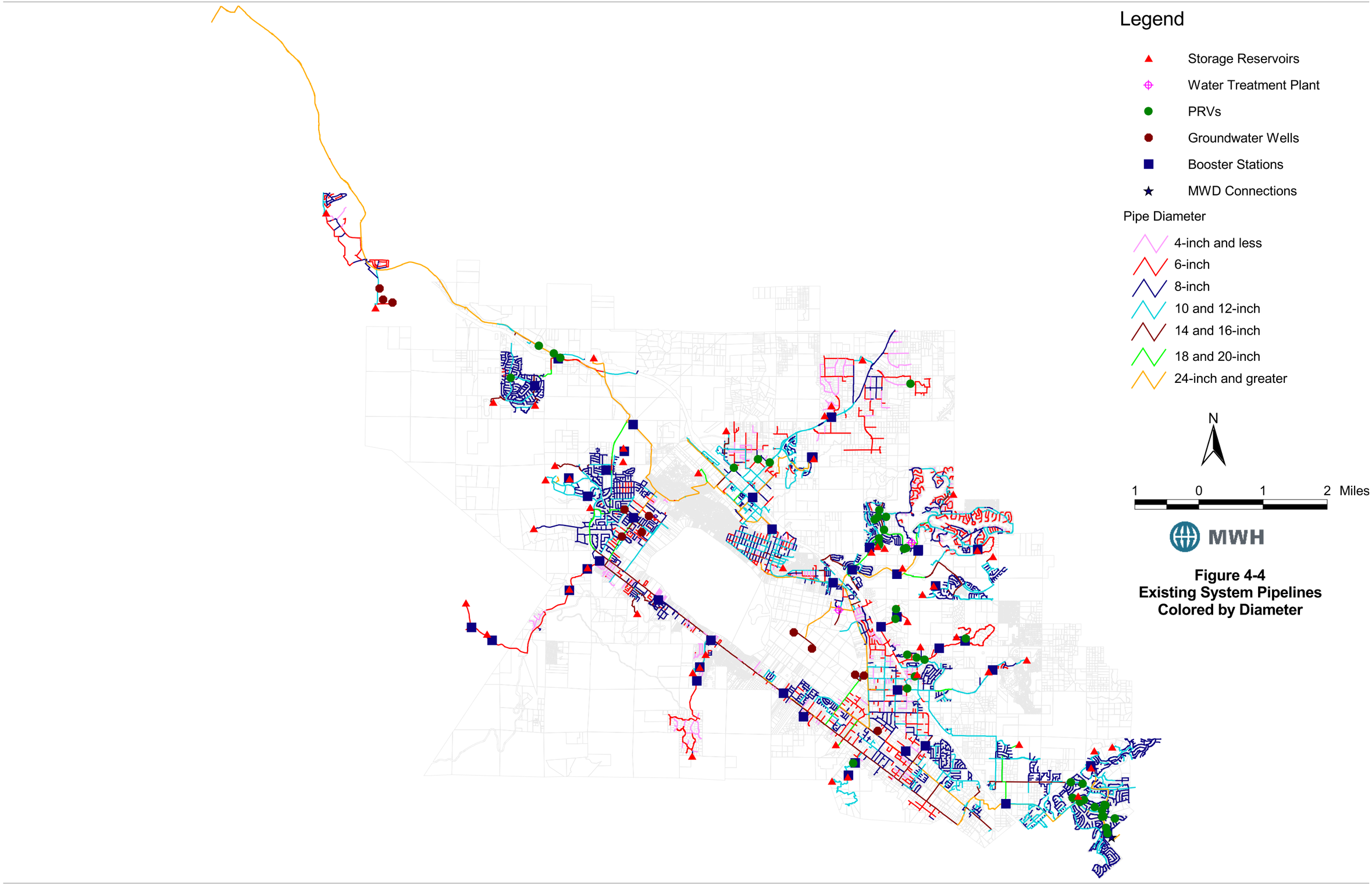


Figure 4-4
Existing System Pipelines
Colored by Diameter

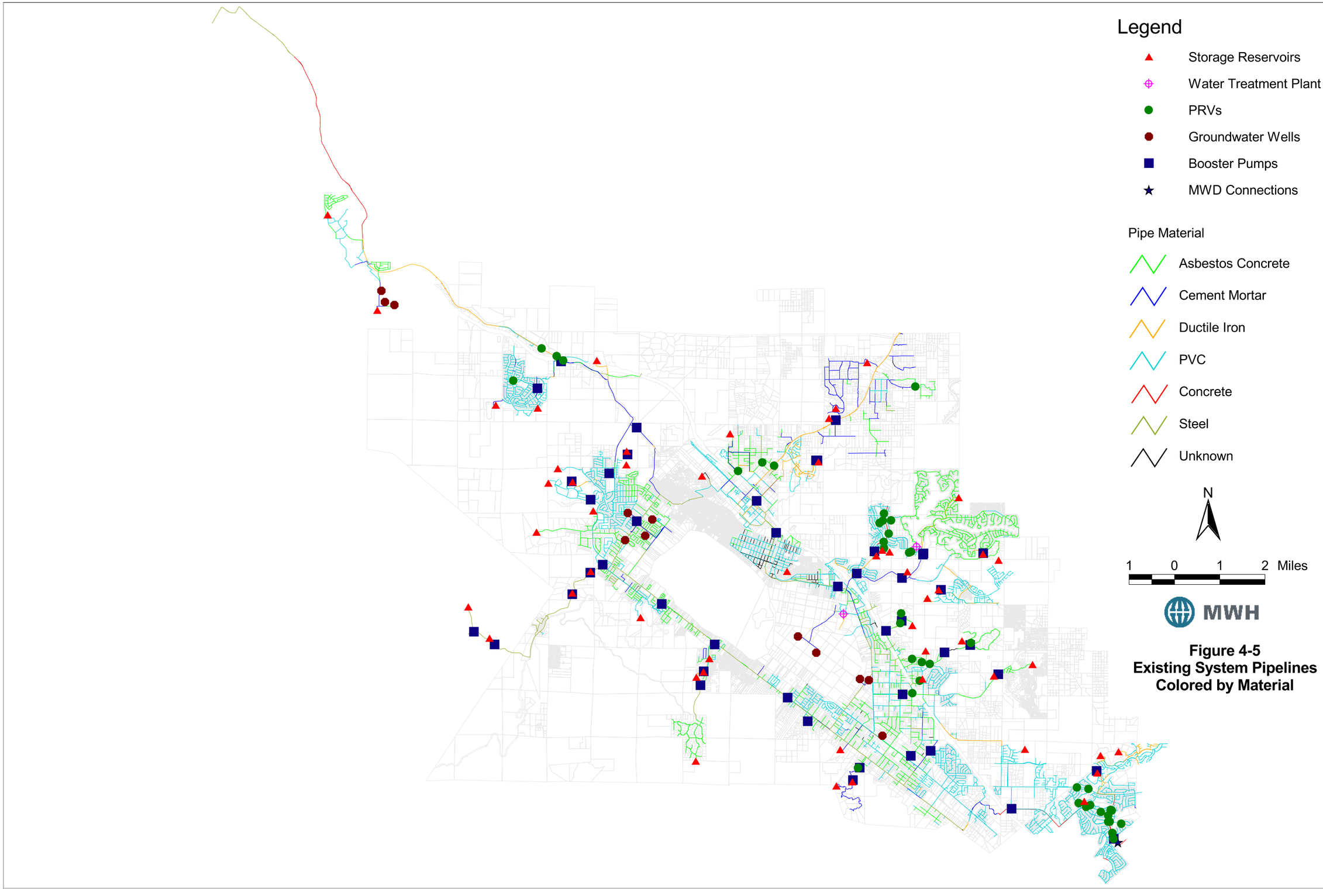


Figure 4-5
Existing System Pipelines
Colored by Material

Section 5
Model Development and Calibration

The methods used to develop the District's water system hydraulic model are described in this section, including model creation and model calibration. The model is subsequently used to identify deficiencies within the existing and the future system in meeting water demand conditions. This evaluation guides the development of a Capital Improvement Program (CIP) for existing and future system conditions.

5.1 MODEL DEVELOPMENT METHODOLOGY

The hydraulic model is developed using *H_2OMAP Water*, a stand-alone hydraulic modeling software by MWH Soft. The software is capable of transferring data to and from the District's water system GIS, which is integrated using *ArcMap GIS* as part of this Water Master Plan. The model includes all water pipelines 4-inches in diameter and greater, groundwater wells, storage reservoirs, booster stations, imported water connections, pressure regulating valves, and other water distribution facilities within the system. Water pipelines and their parameters (e.g. diameter, year of installation, material, etc.) are imported from the District's GIS into *H_2OMAP Water* to form the initial pipe network. Spatial data such as ground elevations, water demands and other necessary modeling data are also incorporated into the model using both *ArcMap GIS* and *H_2OMAP Water*.

5.1.1 Data Sources

The District provided detailed information that was required for the development of the hydraulic model for this master planning effort. In addition, data collected during the previous master planning effort was referred to where applicable. Key information included:

- GIS files (water system facilities, street centerlines, contours, parcels, etc.)
- Specific plans for new development areas
- Historical water production and billing records
- As-built drawings for new facilities/pipelines not shown on GIS
- Water system hydraulic schematic
- Electronic aerial orthophotography coverage
- Pump curves and performance test reports (performed by Southern California Edison)
- Water level and drawdown elevations at wells
- Inlet/outlet level, high water level, bottom elevations of storage reservoirs
- Pump controls and settings of pressure regulating valves
- Well and booster operational controls
- 24 hour SCADA information recorded on September 21, 2006 and September 28, 2006.
- District design standards

Additional data have been gathered over the course of the project as needed for the model development and calibration. These data include drawings and reports for projects currently under planning, design, or construction.

5.1.2 Integration of GIS Data

The initial pipe network is created by importing network data from the District's GIS to *H_2OMAP Water*. The network is reviewed and updated for completeness and correctness prior to adding facilities and controls in the model. The review tasks include checking of pipeline information (e.g. location, year of installation, material and diameter) and fixing of pipeline connectivity errors.

Developed from the District's GIS data, the model is projected to the same coordinate system (NAD 83, California State Plane Zone VI) as the District's GIS. This makes it possible to overlay the GIS layers from the District and those created in the model either in *H_2OMAP Water* or *ArcMap GIS*.

5.2 MODEL CONSTRUCTION

The following is a chronological order of steps taken to create the model from the District's updated GIS:

- The pipeline shapefile from the District's GIS containing only the potable water mains and their attribute information, including diameter, year of installation, material, and zone, are imported into *H_2OMAP Water* to form the initial pipe network.
- Junctions are added at both ends of pipelines by the "Convert Polyline" feature of *H_2OMAP Water* using a five feet search radius. This automated process creates a junction joining any pipeline endpoints within a five feet radius of one another.
- All pipes with a diameter of 2.5 inches or less are deleted from the model (along with resulting "orphan" nodes).
- Overlapped junctions and/or those within a five feet radius are merged into a single junction (and resulting "orphan" pipelines are deleted).
- Disconnected pipelines are identified by the "Split-pipe candidate" feature of *H_2OMAP Water* using a five feet search radius. This automated process resolves disconnected pipe issues that result when pipes are not snapped properly in the GIS files.
- Nodes are added that connect crossing/intersecting pipelines using the "crossing/intersecting pipelines" feature of *H_2OMAP Water*.
- Overlapping pipelines are identified using the "parallel pipes" process in *H_2OMAP Water*. One of the pipelines is deleted if they represent the same pipeline.
- All dead-end pipelines with length less than 100 feet are deleted from the model.
- *H_2OMAP Skeletonizer* is used to reduce the number of pipes from approximately 54,000 to 9,000. *H_2OMAP Skeletonizer* combines pipe segments in series and with the same parameters into a single pipeline (diameter, material, year of installation, and pressure zone are used in this case).
- Missing pipelines are added based upon information provided by District staff.

- The zone designation provided in the GIS files for pipelines is reviewed and verified based upon known pressure zone boundaries and the location of pump stations. Appropriate zone designations are assigned to all created nodes based upon the pipelines they are connected to.
- Other facilities (wells, booster pumps, valves, and reservoirs) are added to the model based on the GIS and data collected from the District.

5.2.1 Distribution System

As previously discussed, the District's distribution system network is created using the District's GIS converted into an *H_2OMAP Water* network. The updated distribution model contains a total of 8,599 pipe segments, totaling approximately 580 miles. The hydraulic model includes all potable water mains 4-inches in diameter and greater. Additional pipe segments with diameters smaller than 4-inches are also included to complete loops within certain areas of the distribution system. **Table 5-1** presents the total length of pipes by diameter.

Table 5-1
Pipeline Lengths by Diameter

Diameter (inches)	Length (miles)
3	0.6
4	36.6
6	98.1
8	211.3
10	24.5
11	0.0
12	110.5
14	6.4
16	25.0
18	2.0
20	9.3
21	4.2
24	15.9
27	1.3
30	14.8
33	2.5
36	10.3
42	6.6
Total	**579.9**

Pipes with closed isolation valves in the distribution system are identified in the model using the GIS information. Some of these pipes with closed isolation valves are also assumed based on zoning boundaries.

5.2.2 Water Facilities

The District's existing water system contains 68 storage reservoirs, 49 booster pumping stations, 7 active potable groundwater wells in the Elsinore Basin, 3 active potable groundwater wells in

the Coldwater Basin to serve the Temescal Domestic Service Area (TDSA), 53 pressure regulating stations, 2 imported water connections, and 1 water treatment plant. These water facilities are modeled based upon the GIS data and additional information provided by the District. Additional information gathered include piping schematics, the location and settings of valves, outlet elevations of reservoirs, and the operational controls for booster stations and wells. A detailed description of the modeled facilities is described below.

Wells

The District has 10 active groundwater wells, 7 located in the Elsinore Basin and 3 located in the Coldwater Basin. The District's 10 potable water wells are included in the hydraulic model. Each well is represented as a tank and a pump. The tanks represent the groundwater aquifer and are modeled as fixed grade reservoirs with an initial water level equal to the pumping groundwater level. These pumping levels are obtained from recent District well soundings, which are performed on a monthly basis. The pumps are modeled with multiple point curves, which are based upon the original pump curve modified to reflect the most recent SCE test flows.

Booster Pumping Stations

All 49 of the booster pumping stations, as listed in **Section 4**, are included in the hydraulic model database. The database information for each booster pumping station includes head-capacity curve information for each pump that is developed from the actual pump manufacturer's curve data (if available), or from the SCE pumping test results. The SCE pump test results are also used to update the pump curve data to account for the decrease in mechanical performance associated with age. The pump controls have been added to the hydraulic model database, based on information provided by the District.

Reservoirs

All the reservoirs listed in **Section 4** are included in the hydraulic model. The model parameters of each reservoir (ground elevation, height, and diameter) are determined from the District's GIS files and verified with the hydraulic model created for the previous master plan. The reservoirs are modeled as cylindrical tanks. Multiple tanks at a site are modeled as a single tank with an equivalent diameter. Non-cylindrical reservoirs are modeled as variable area tanks.

Pressure Regulating Stations and Transfer Valves

All pressure regulating stations and zone transfer valves within the District's distribution system are included in the hydraulic model. Adjustments are made to the location of the stations so that they are consistent with the pressure zone boundaries. The PRV and transfer valve settings and initial status (open/closed) are included in the model database.

Imported Water Connections

The District's imported water connections via the TVP and AVP are modeled as fixed head reservoirs at their respective HGLs. The flow at both connections is modeled to remain within

their respective capacities by either a flow control valve or pump station controls, whichever is more appropriate for the scenario being modeled.

Water Treatment Plant

The Canyon Lake WTP is modeled as a fixed head reservoir with a flow control valve that limits the flow rate to 9 mgd. The model also includes the clearwell tank at the discharge end of the flow control valve.

5.2.3 Pressure Zones

There are 33 primary pressure zones within the District's water distribution system. The District's GIS files have zone designations for each pipeline which are transferred to the model in the creation process. These zone designations are reviewed for accuracy and modified where necessary. Pressure zone designations are added to all model nodes based upon the pipelines its connected to. Pipes connecting two pressure zones are closed to prevent flow from the upper to lower zone.

5.2.4 Elevation Allocation

The elevations of all nodes in the model are established from the District's 5-foot elevation contours provided in GIS shapefile format. The contours are interpolated onto the model nodes by using the "elevation interpolation" feature in *H2OMAP Water*. The District's sewer manhole elevations (also provided in GIS format) are used to review and verify the accuracy of the contour interpolation. The elevations in the hydraulic model range from 858 feet along the TVP to 3,202 feet in the Skymeadows area.

5.2.5 Demand Allocation

The existing water demands in the hydraulic model are allocated using actual water usage information obtained from the District's fiscal year (FY) 2005-2006 customer billing records. The future water demands are allocated using the year 2030 demand projections calculated based upon specific plan and land use information as discussed in **Section 3**. The allocation of both existing and future water demands to the model nodes is described below.

Allocation of Existing Demands

The water demands for existing conditions are based on actual customer usage information (billing data) provided by the District. The billing data covers the water usage of approximately 36,000 accounts for the FY 2005-2006. The average water usage for each account for the calendar year is calculated and scaled to the water production of the same year to include unaccounted for water in the model. Each billing record is geographically located in GIS by comparing the parcel's APN number included in the billing data with a parcel's shapefile provided by the District. The location of approximately 90 percent of the users is identified in this manner. The remaining users are located by comparing their addresses to the address ranges of streets in the District service area (provided in the District's centerline shapefile). Through a process called "geocoding", the remaining users are placed along the appropriate street

centerlines. Users in the billing data with no APN or address data are manually added to the model using the best available information. The end product of this process is a GIS shapefile with each of the users represented as a point, which can be imported into *H2OMAP Water*.

To allocate the water demands in the hydraulic model, demand nodes are selected that include all model nodes except those connected to water facilities or transmission pipes. After the selection of approximately 6,200 demand nodes, each of the point demands is allocated to its nearest demand node in the model using the "Demand Allocator" extension in *H2OMAP Water*. The demand allocator extension uses an advanced algorithm to locate and allocate point demands to the nearest model junction.

The large demand customers are individually checked to verify that these large demands are assigned to the correct location. This procedure is used to verify the spatial accuracy of the demand allocation, since these customers sometimes have different billing addresses than their physical locations (i.e., corporate offices different from physical operations). Adjustments are made when the meter locations/addresses and the billing addresses do not correspond.

Allocation of Future Demands

The allocation of future demands is split into four categories: specific plans, infill, wholesale, and others.

The allocation of specific plans is performed manually on a development by development basis. For each of the proposed developments, a single demand node is manually input into the model for each zone in the development. The demand for each future year is input into the model as calculated in **Section 3** of this report.

Infill demands are input into the model using a similar process as the existing demands. A point GIS shapefile is created, with each point representing a vacant parcel in a developed region with an associated demand (calculated by multiplying the acreage of the vacant parcel with the WDF). These point demands are then assigned to the model using the "Demand Allocator" extension.

Future wholesale demands are input into the model by manually identifying the District's existing wholesale connections and inputting the future demand to its nearest model demand node.

For all other future demands, which primarily consist of projected growth in the District's mountainous regions, single demand nodes are manually input into the model for each zone in which new development is expected.

Diurnal Demand Curve

The demand curve determined in **Section 3** is input in the model as a pattern to simulate the water demand variations over a 24-hour period. The pattern is uniformly applied to all demands throughout the model. For the District's current system, the maximum peaking factor of 1.80 occurs at 6 AM, while the minimum peaking factor of 0.48 occurs at 3 PM.

5.3 MODEL CALIBRATION

Steady State Calibration

Steady State calibration of the hydraulic model was performed based upon fire hydrant tests conducted on September 28, 2006.

Fire hydrant tests were conducted at 14 locations throughout the distribution system. Tank levels and pump on/off statuses were obtained from the SCADA system for times of the fire flow tests. During the fire hydrant tests, static pressures were measured prior to opening a fire hydrant, and residual pressures were measured after opening an adjacent fire hydrant (along with the flow at the adjacent fire hydrant).

To reflect actual field conditions, several settings in the model are adjusted for the steady state calibration runs including water levels in storage tanks, pump run times, and PRV settings. In addition, discrepancy in results often also leads to the discovery and correction of modeling input errors (e.g. disconnected pipelines, open pipelines between zones, etc.). The steady state calibration is also used to determine the suitability of the pipeline C-factors being used in the model, which are typically a function of pipeline diameter, material, and age.

Once all of the significant model settings and input errors have been addressed, the results of the actual field tests are compared to the model runs. The 14 hydrant test locations with the test data and model results are summarized in **Table 5-2**.

The results of the field data versus the modeled data are within an acceptable degree of accuracy. For the fire flow tests, the model results are an average difference of 1.7 percent for static pressures and 3.6 percent for residual pressures.

Table 5-2
Fire Flow Test Comparison of Field and Model Pressure Readings

Test No.	Zone/Location	Field Data		Model		Static		Residual	
		Static Pressure (psi)	Residual Pressure (psi)	Static Pressure (psi)	Residual Pressure (psi)	Difference (psi)	Difference (percent)	Difference (psi)	Difference (percent)
1	1358/Stageline&Bandit	107	81	110	84	3	3%	3	4%
2	1801/Edgebrook Dr/colt Dr	117	105	118	106	1	1%	1	1%
3	1601/Chambord&Marquise	61	57	62	53	1	2%	-4	-7%
4	1801/Regatta&Starborad	111	101	111	104	0	0%	3	3%
5	1434/Madison	57	39	52	39	-5	-9%	0	0%
6	1601/Lake Terrace& Tempe	117	39	117	40	0	0%	1	3%
7	2778/Los Pinos	165	87	165	85	0	0%	-2	-2%
8	3300/Monterey&El niguel	109	75	107	71	-2	-2%	-4	-5%
9	1800/Bella Vista&Del Fiore	95	89	94	92	-1	-1%	3	3%
10	1622/Giant Fir&Yosemite	39	19	39	22	0	0%	3	16%
11	1750/Sprucewood&Poppy WY	101	92	101	93	0	0%	1	1%
12	1746/Vally Vista&Autumn sage	139	95	142	94	3	2%	-1	-1%
13	1434/Union & Sexton	79	69	78	70	-1	-1%	1	1%
14	2050/Pumpkin&Crabapple	81	59	79	57	-2	-2%	-2	-3%
Average Differences of Absolute Value						**1.4**	**1.7%**	**2.1**	**3.6%**

EPS Calibration

In addition to the steady state calibration, an extended period simulation (EPS) calibration is performed to verify the model's ability to reproduce accurate results over the course of a 24-hour period. One of the primary applications of the EPS calibration is to identify and correct model input errors such as open pipes between zones, incorrect facility sizes, and booster pump controls.

September 21, 2006 is chosen as test calibration day; the District has provided all available SCADA field measurements for the selected day. These measurements include tank levels, booster run times, booster discharge pressures, booster suction pressures, booster flows, well run times, well discharge pressures, well flows, treatment plant flows, and imported connection flows at 10 minute intervals. Not all of the listed parameters are available for every facility in the District, so comparisons are only conducted where SCADA data is available. In addition, the SCADA appears to be erroneous for certain readings (for example negative pressure readings and consecutive readings of the same value), and these are also disregarded during the comparison. After the identification and correction of errors that occurred during the model creation process, the calibrated model produces field results within an acceptable degree of accuracy. Difference frequency plots between field and modeled results for booster flows, pressures, and tank levels are shown on **Figure 5-1** through **Figure 5-3**. In addition, graphs showing the comparison between actual measurements and modeled results at each of the test points are included in **Appendix B**.

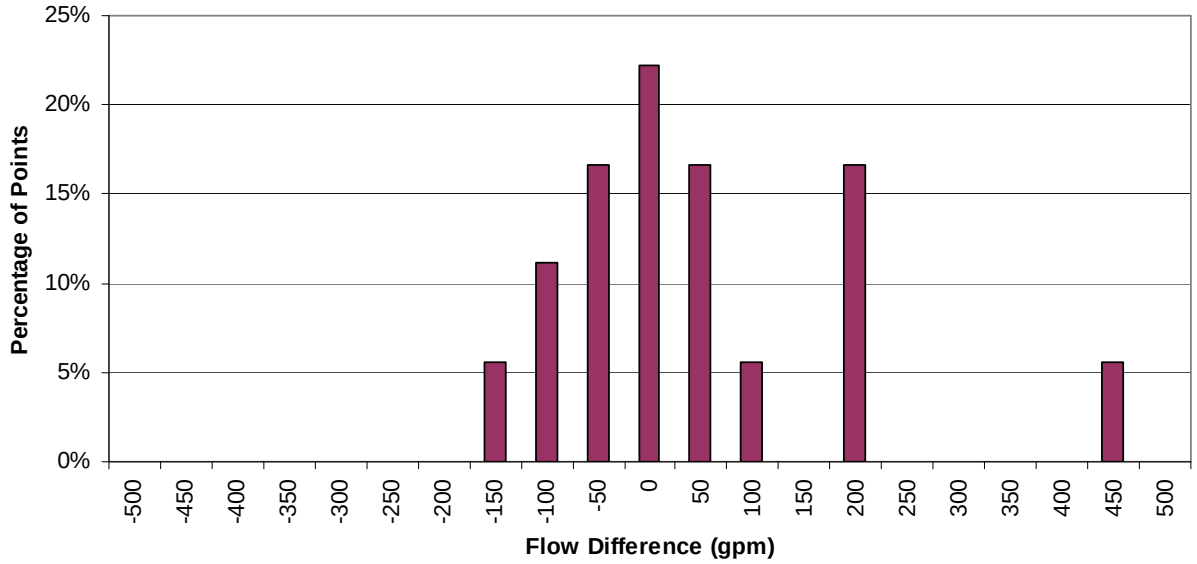


Figure 5-1
Booster Flow Difference Frequency Plot

Figure 5-2
Pressure Difference Frequency Plot

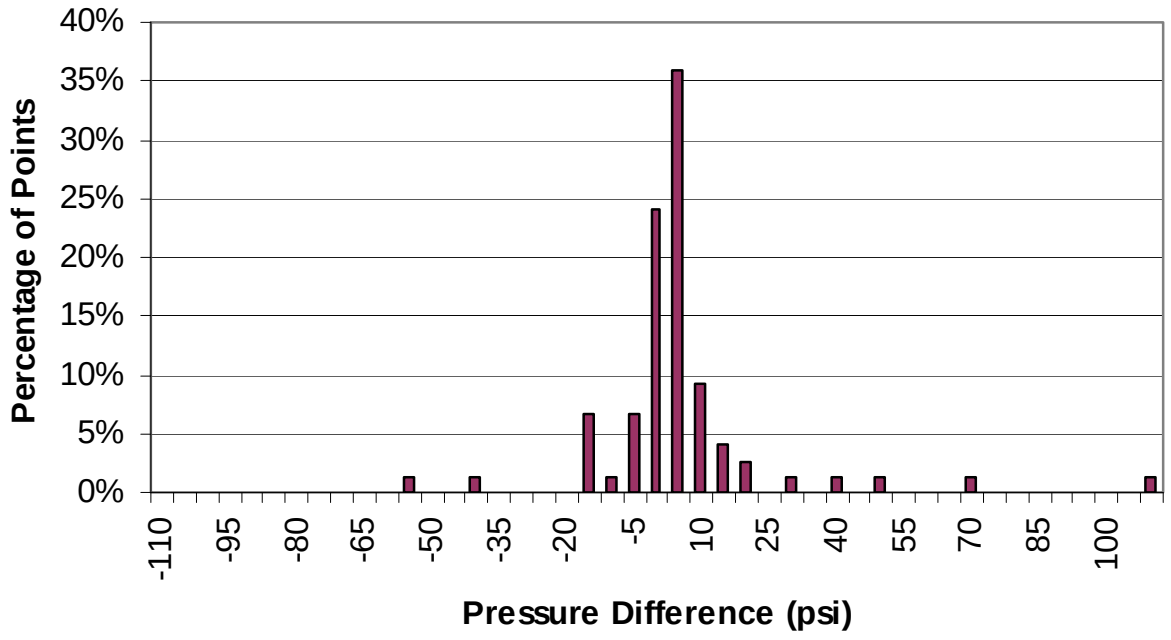
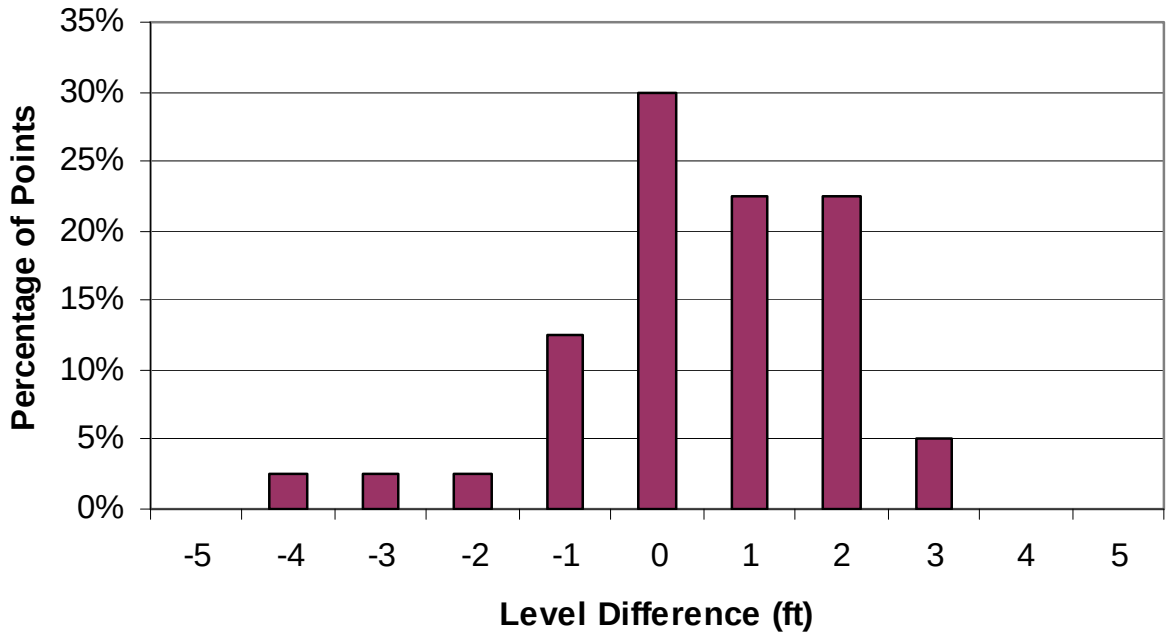


Figure 5-3
Tank Level Difference Frequency Plot



Field and Model Discrepancies

There are several possible causes of the small discrepancies between the model results and field data observed during calibration, some of which include:

- Fire flow tests in the model are based on flow at the nearest model node. The hydrant piping branch run and losses through the hydrant are not included in the model.
- Pressure meters and flow meters used for the fire flow testing have some level of inaccuracy, both in the actual measuring and reading of such meters.
- Demand varies temporally between various days. The diurnal curve created for calibration day is used to determine demand at each hour for the fire flow tests. However, the actual demand pattern varies from day to day.
- Demand varies spatially between different times. The demand allocation spatially distributes the demand using annual average billing data. All demand nodes are assigned the same diurnal curve.
- The elevation data contains possible inaccuracies, both in the source contours and the interpolation process.
- The SCADA data potentially contains inaccurate measurements. SCADA information is disregarded where it is readily apparent the equipment is not working properly, but there are nonetheless potential error in the data that is included for comparison.
- Pressure meters and flow meters used for the fire flow testing have some level of inaccuracy.
- Groundwater levels fluctuate. A nominal groundwater level is used in the model, which may not accurately represent the calibration day.

Despite the discrepancies, the model nonetheless demonstrates close reproduction of the field measured results for both the Steady State and EPS calibration, and is therefore considered suitable for the planning purposes of this report.

Section 6
Planning and Evaluation Criteria

This section presents the planning criteria and methodologies for analysis used to evaluate both the existing system and the future system facilities and planning level opinions of probable costs.

6.1 PLANNING AND EVALUATION CRITERIA

Planning criteria are used in the evaluation of both the existing and future system hydraulic models. Typical planning criteria were used from the District's Design and Construction Standards for Water (December 1992), referring specifically to the standard requirements for design of water facilities (Section 1.16). The criteria are developed using typical planning criteria used in the systems of similar water purveyors, local codes, engineering judgment, commonly accepted industry standards, and input from District staff. The "industry standards" are typically ranges of acceptable values for the criteria in question and therefore, they are utilized as a check to confirm that the values being developed are reasonable. A list of planning criteria used in the evaluation of the District's system is shown in **Table 6-1**.

Table 6-1
Planning and Evaluation Criteria

Description	Value	Units
Maximum Pressure (Evaluation)		
Peak Hour	125	psi
Minimum Pressure (Evaluation)		
Peak Hour	40	psi
Maximum Day + Adjacent to a Fire	20	psi
Maximum Pressure (Planning)		
Peak Hour	120	psi
Minimum Pressure (Planning)		
Peak Hour	45	psi
Maximum Day + Adjacent to a Fire	20	psi
Maximum Pipeline Velocity		
Transmission Pipelines (12-inch dia. and greater)	3	fps
Distribution Pipelines (<12-inch dia.)	6	fps
Fire Fighting Capabilities (Duration assumed for 4 hours)		
Parks	1,000	gpm
Single Family Residential (1 du/acre or less)	500	gpm
Single Family Residential (1-2 du/acre)	750	gpm
Single Family Residential (greater than 2 du/acre)	1,000	gpm
Medium Residential	1,500	gpm
Multi-Family Residential	2,500	gpm
Commercial and Industrial	2,500	gpm
Schools and Public Facilities	4,000	gpm
Emergency Reservoir Storage Volume	1 MDD	-
Operational Reservoir Storage Volume	30% MDD	-

6.1.1 Water Sources

According to the American Water Works Association (AWWA) and the Department of Health Services (DHS), a water system should have adequate source water to supply the maximum day demand (MDD) for the distribution system with the single largest source out of service. Demands greater than MDD will be supplied from reservoir storage.

6.1.2 System Pressures

Node pressures are evaluated under two scenarios: peak hour and maximum day plus fire. The peak hour is assumed to occur at 6:00 AM during the maximum day. Model output is evaluated for demand nodes with minimum pressures less than 40 psi for peak hour conditions and 20 psi for maximum day conditions plus fire flow. Only demand nodes were used in the pressure analysis because only locations where customers are served need to meet such pressure requirements. Nodes with pressures that could not be brought within acceptable parameters are identified and are presented as part of the analysis of both the existing and future scenarios in Sections 7 and 8.

6.1.3 Pipeline Velocities

For future planning, it is recommended that pipelines be designed at lower velocity criteria than those for existing pipelines. Lower velocities are recommended in order to reduce head loss (and pumping costs) and to minimize surge in pipelines. Under normal conditions, a planning criterion of 6 fps is typical for water distribution system. In the Loop zone, however, the District has five reservoirs, all with high water levels of 1434 feet. To allow water to flow from one reservoir to the next, bi-directionally, without excessively draining the reservoirs, lower flow velocities are needed across the Loop zone for the major transmission pipelines to minimize head loss. For this reason, the planning criteria for velocity is 3 fps for transmission pipelines (12-inch diameter and greater) and 6 fps for distribution pipelines (less than 12-inch diameter) for future planning purposes. For pumped zones, such low criteria for transmission pipelines may not be necessary.

6.1.4 Fire Flow Criteria

Fire requirements are based on the Uniform Building Code (UBC, 1999), which states that all newly constructed single-family residences of less than 3,600 sq. ft. shall require fire flow requirements of 1,000 gpm. Generalized fire flow criteria were determined by land use type based on this requirement. Fire flow criteria selected are shown in **Table 6-1** above.

6.1.5 Storage Volumes

The total required volume of storage in a water system consists of water for operational, emergency, and fire fighting uses. Original water sources, such as water from the treatment plant and the groundwater wells, and storage sources, such as storage tanks throughout the system, are both utilized in determining quantities of water available to meet customer demands. Available storage is calculated as the total storage volumes in tanks, plus well peaking capacities above maximum day production requirements.

Operational Storage

Operational storage is the quantity of water required to moderate daily fluctuations in demand beyond the capabilities of the production facilities. The production rates of the water sources and the available storage capacity are coordinated to provide a continuous treated water supply. Based on economic considerations, systems are often designed to produce the average flow on the day of maximum demand. Water must be stored to supply the peak flows, which exceed the maximum day production rate. Operational storage is then replenished during off-peak hours when the demand is less than the production rate. The quantity of this operational storage is a judgment decision based on knowledge of the District and on knowledge of other similar systems. A typical recommendation by the American Water Works Association is to supply a volume ranging one-quarter to one-third of the demand experienced during one maximum day. It is therefore recommended that the District have 30 percent of maximum day demands available in storage tanks for operational storage.

Fire Protection Storage

Storage requirements are based on fire flow requirements shown in **Table 6-1**. If there is a school within the zone, the fire flow demand is set at 0.96 MG (4,000 gpm for 4 hours). If there is a commercial area within the zone, the fire flow demand is set at 0.6 MG (2,500 gpm for 4 hours). If there is only residential land uses within the zone, the fire flow storage is set at a lower amount, depending on the type of residential land use within the zone.

According to the Insurance Services Organization (ISO), required fire flows may be met by a combination of pumping and storage. Since the District requires all fire flow requirements meet a 4 hour-long duration, a 1,250 gpm fire flow requires 300,000 gallons stored, a 2,000 gpm fire requires 480,000 gallons stored, a 2,500 gpm fire requires 600,000 gallons stored, and a 4,000 gpm fire requires 960,000 gallons stored.

Emergency Storage

The volume of water allocated for emergency uses is typically determined based on the historical record of emergencies experienced and on the amount of time expected to lapse before the emergency can be corrected. Possible emergency situations include events such as water contamination, earthquakes, the loss of electrical power, several simultaneous fires and other unplanned events. Because the occurrence and magnitude of an emergency situation is not subject to accurate evaluation, the volume of emergency storage is generally based upon engineering judgment or utility policy. An emergency supply volume equivalent to the demand experienced during one maximum day is determined to be appropriate for the District.

During an emergency, electronic and print media notices can be distributed to inform the public of the situation and to discourage all extraneous water uses. By utilizing these communications, customers in other districts have been known to reduce their water consumption by one-half to two-thirds. Therefore, an emergency volume of one maximum day demand could result in three or more days of water supply during an emergency situation.

6.1.6 Pump Capacity

Booster pump filling capacity is analyzed based on the ability of the booster pumps to fill reservoirs to acceptable levels. Booster pumps should be able to fill reservoirs such that levels at the end of the day are the same or higher than those at the beginning of the day, based on MDD.

6.2 METHODOLOGY

Analyses for source water, storage requirement quantities, and inter-zone water transfer capabilities are conducted outside of the computer hydraulic model. The total source water requirements for the District's system as a whole are determined based on anticipated maximum day demands for the existing system and for the years 2010, 2015, 2020, 2025 and 2030. As evaluated in the District's 2006 Water Resources Management Plan, adequate source water should be available to provide maximum day demands with the largest source of water out of service (MWH, 2006). Future supply sources are implemented into the evaluation and model as recommended in this recent study.

Storage water requirements, or requirements for storage reservoir volumes, are evaluated on a system-wide as well as on zone-by-zone basis. Criteria discussed in this section are used to determine existing system deficiencies and to project future system storage needs. The storage requirements are compared with existing and anticipated storage volumes to develop recommendations for any additional recommended reservoir facilities.

Pump station capacity, the ability to transfer water to higher zones from lower zones, are evaluated on a zone-by-zone basis. Maximum day demands are compared with pump station capacities, with the largest unit out of service.

The existing system and anticipated future system configurations are evaluated with respect to the optimum locations for the recommended improvements in storage facilities and booster pumps. Each zone is analyzed to determine how water at adequate quantities and pressure will be provided from the available source waters and storage volumes to meet the demands.

Computer hydraulic model runs are made for the existing and future systems after the completion of the analyses described above. The model runs include recommended facilities such as additional groundwater wells, imported water connections, storage reservoirs, booster pumps, and PRVs. Model runs are made using a 24-hour extended-period simulation (EPS) run to evaluate anticipated system pressures and pipeline velocities. Pipeline recommendations are made to provide adequate pressure to all users, maintain acceptable pipeline velocities, and provide adequate conveyance for the reservoirs within zones to cycle and balance.

Model runs were completed using the following three conditions:

- Average day demand (ADD) conditions, 24-hour EPS simulation
- Maximum day demand (MDD) conditions, 24-hour EPS simulation
- Maximum day demand conditions with fire flow demands (MDD + FF), steady-state simulation

The maximum day demand plus fire flow situations are evaluated at every demand node in the existing and future distribution system. Each demand node is given a fire flow criterion based on the maximum fire flow requirement for the land use type that each demand node represents. Using the model, each demand node is evaluated to determine if the fire flow requirement can be met at that node while maintaining pressure at 20 psi at all demand nodes in that pressure zone. Where fire flow criteria can not be met using a single node and fire flow demand is above 1,250 gpm, then the fire flow analysis is done using two neighboring node. The Fire Department requirements allow fire flows above 1,250 gpm to be met from two adjacent hydrants. Nodes with fire flow requirements that could not be brought within acceptable parameters are identified and are presented as part of the analysis of both the existing and future scenarios in Sections 7 and 8.

6.3 COST ESTIMATING BASIS

Cost estimates are presented in Sections 7 through 9 for each of the recommended improvements. Capital cost assumptions are developed based on costs obtained from industry manufacturers, MWH's experience on similar water master planning projects and data provided by the District. Pipeline costs have been calculated using recent cost data for work completed by MWH in other communities. Costs for groundwater wells including well pumps are also derived from cost data of past projects and are based on the pump horsepower and the depths of water level. All estimates have been adjusted to an Engineering News Record (ENR) Construction Cost Index (CCI) for February 2008 (Los Angeles) and are consistent with the American Association of Cost Engineers guidelines for developing reconnaissance-level estimates which should range between 50 percent above and 30 percent below actual capital expenditures.

As more details regarding construction issues become apparent and the recommended projects proceed through the design process, many of the unknown issues will be resolved and the contingency can be lowered. A 30 percent contingency is included in the cost estimates. The engineering, administration, and legal costs are estimated to be 25 percent of construction costs. The engineering, administration, and legal costs also include typical services such as inspection, materials testing and construction management. The contractor's overhead and profit are included in the cost estimates. Costs for land acquisitions, rights-of-way and easements are not included.

Section 7
Existing System Evaluation

This section evaluates the existing water distribution system, identifies deficiencies, and makes recommendations to address the deficiencies. The system evaluation is based on the criteria as described in **Section 6**.

7.1 WATER SOURCE ANALYSIS

Based on 2006 demand and production data from **Section 3**, the District's existing demand is 29,128 acre-ft/yr, with a maximum day demand (MDD) of 52.0 mgd. The District has an existing supply capacity of 56.7 mgd, as shown in **Table 7-1**. With the largest well out of service (2.2 mgd), the District has an existing supply capacity of 54.5 mgd. Under existing demand conditions, the District therefore has sufficient source water capacity to meet MDD with its largest well out of service. However, with a rapidly growing population, the District's potable water demand is expected to exceed its existing supply capacity sometime within the next few years.

Table 7-1
Existing Source Water Capacity

Water Supply Source	Maximum Capacity (mgd)	Average Year (acre-ft/yr)	Single Dry Year (acre-ft/yr)	Multiple-Dry Years (acre-ft/yr)	Single Wet Year (acre-ft/yr)
Existing Supplies					
Canyon Lake N (Natural Runoff)[1]	5.2	2,700	700	1,900	6,600
Groundwater[2]	13.3	5,500	5,500	5,500	5,500
TVP[3]	12.7	14,190	14,190	14,190	14,190
AVP[3]	24.2	27,100	27,100	27,100	27,100
Coldwater Basin[4]	1.3	700	700	700	700
Total - Existing Supplies	**56.7**	**50,190**	**48,190**	**49,390**	**54,090**

1. Canyon Lake N flows are based on historical runoff for the Lake. Data developed as part of WSA (MWH, 2005).
2. Capacity of existing groundwater wells (see **Section 4**).
3. Capacity of imported connections.
4. Limited by the existing demands in the TDSA. While additional capacity exists, the flow is not available to the Elsinore Division without modifications to existing facilities.

7.2 SYSTEM PRESSURE ANALYSIS

The hydraulic model is used to evaluate the system pressures for the following scenarios:

1. Meet Peak Hour Demand (PHD) while maintaining a minimum system pressure of 40 psi
2. Meet Minimum Day Demand (MinDD) while not exceeding a maximum system pressure of 125 psi
3. Meet Maximum Day Demand (MDD) and fire flow while maintaining a minimum system pressure of 20 psi

The results of these analyses are discussed below.

7.2.1 Minimum Pressure during PHD

The majority of the service connections throughout the water distribution system exceed the PHD evaluation criterion of 40 psi. However, based on a 24-hour model run under existing MDD conditions, there are a few demand nodes having pressures lower than 40 psi. The system evaluation criteria are outlined in **Section 6**. The low pressure locations are listed in **Table 7-2** and shown on **Figure 7-1**. Based on the hydraulic model runs, there are 15 locations with pressures below 40 psi during PHD conditions.

Table 7-2
Low Pressures - PHD Conditions

No	Location	Zone	Pressure Range (psi)	Comments
1	Riverside St. & Missouri Tr.	1701	9 to 36	Low pressures are due to higher elevations relative to the HGL of 1,701 ft. It is recommended that these service connections be served from the 1801 Ramsgate development.
2	Golden Horn Rd. & Silver Stirrup Dr.	1801	14 to 37	Low pressures are due to high elevations relative to the HGL of 1,801 ft. Homes have individual booster pumps in the garages to increase pressures.
3	Machado St. north of Grand Ave.	1434	30 to 38	This area has historically had low pressure issues. It is recommended that these service connections be served from the 1601 (Lucerne) Zone.
4	Loop zone near suction of Skylark Hydropneumatic PS	1434	30 to 40	A few homes at the end of cul-de-sacs have pressures below 40 psi due to high elevations relative to the HGL of 1,434 ft.
5	Hixon St. near suction of Stage Ranch 1 PS	1434	22 to 36	A few homes at the end of cul-de-sacs have pressures below 40 psi due to high elevations relative to the HGL of 1,434 ft.
6	Gafford Rd. and Hillcrest Ct.	1746	24 to 37	A few homes at the end of cul-de-sacs have pressures below 40 psi due to high elevations relative to the HGL of 1,746 ft.
7	Canyon Lake Shopping Center; Big Tee Dr. & Skylink Dr.	1622	30 to 40	Low pressures are due to high elevations relative to the HGL of 1,622 ft. It is recommended that these service connections be served from the 1746 (Cottonwood) Zone.
8	Vacation Drive	1622	29 to 35	Low pressures are due to high elevations relative to the HGL of 1,622 ft. It is recommended that these service connections be served from the 1746 (Cottonwood) Zone.
9	Villa Scenica & Vista Palermo	1800	25 to 40	Low pressures are due to high elevations relative to the HGL of 1,800 ft. It is recommended that these service connections be served from the 1940 Zone.
10	Lost Rd. & Dial Rd.	1746	30 to 40	A few homes at the end of Dial Rd. have low pressures due to high elevations relative to the HGL of 1,746 ft.

Table 7-2
Low Pressures - PHD Conditions (Continued)

No	Location	Zone	Pressure Range (psi)	Comments
11	Various locations	1467	20 to 40	Low pressures are due to high head losses under MDD and PHD conditions. The District is planning to abandon the existing Waite Street Reservoir and construct a new storage reservoir at a HGL of 1,601 ft. It is assumed that system pressures would significantly increase under a proposed HGL of 1,601 ft. No recommendations are made to address this deficiency.
12	Encina Dr. and Granado St.	1916.5	20 to 40	Low pressures are due to high head losses under MDD and PHD conditions in the existing 4-inch pipeline. It is recommended that the existing pipeline be replaced with a 6-inch pipeline.
13	Riverside Dr. and Walnut Dr.	1434	30 to 40	Low pressures are at dead-end locations due to head losses in the system. It is recommended that a new 8-inch pipeline be installed to create a loop at Parkview Pl.
14	Gafford Rd. and Lost Rd/ Gafford Rd. and Winding Wy.	1746	20 to 40	Low pressures are mainly due to high head losses in the existing 8-inch pipeline that is connected to the Gafford Reservoir. It is recommended that additional transmission capacity be provided at this site by constructing a parallel 12-inch transmission pipeline from the reservoir.
15	Casino Dr. & Malaga Rd.	1434	28 to 39	This area has historically had low pressure issues. It is recommended that these service connections be served from the 1601 (Summerhill) Zone.

Note:
1. Location numbers indicated in **Table 7-1** match the low pressure locations shown on **Figure 7-1.**
2. If rezoning increases the pressure at a service connection to more than 80 psi, the District will need to install an inline PRV or a PRV at each service to reduce the pressure at the service connection to less than 80 psi.

7.2.2 Maximum Pressure during MinDD

The majority of the service connections throughout the District's water distribution system fall within the evaluation criteria of 45 psi and 120 psi.. However, based on a 24-hour model run under existing MinDD conditions, there are a few demand nodes having pressures higher than 120 psi. These high pressure locations are listed in **Table 7-3** and shown on **Figure 7-1**. Based on the hydraulic model runs, there are 15 locations with pressures above 120 psi during MinDD conditions. In general, no recommendations are made to address the deficiencies.

Table 7-3
High Pressures – MinDD Conditions

No	Location	Zone	Pressure Range (psi)	Comments
A	West of Lake St.	1801	125 to 152	High pressures in some areas of Zone 1801 (Rice Canyon) are due to lower elevations relative to the HGL. No recommendations are made to address this issue as service connections in these areas have individual PRVs to maintain a desired pressure range.
B	Ortega Hwy. & Calle de los Robles	2778	125 to 133	High pressures occur due to high head losses along the existing 6-inch pipeline when booster station Los Pinos No. 1 is operational. It is recommended that this pipeline be replaced by a 12-inch pipeline between Los Pinos #1 PS and storage reservoir to reduce pressures to acceptable levels.
C	South of Grand Ave.	1601	125 to 130	High pressures in some areas of Zone 1601 (Ortega) are due to lower elevations relative to the HGL. No recommendations are made to address this issue as service connections in these areas have individual PRVs to maintain a desired pressure range.
D	Bundy Canyon Rd. & Monte Vista Dr.	1746	125 to 175	High pressures in some areas of Zone 1746 are due to lower elevations relative to the HGL. No recommendations are made to address this issue as service connections in these areas have individual PRVs to maintain a desired pressure range
E	Railroad Canyon Rd. & Summerhill Dr.	1601	125 to 132	High pressures in some areas of Zone 1601 are due to lower elevations relative to the HGL. No recommendations are made to address this issue as service connections in these areas have individual PRVs to maintain a desired pressure range
F	South of Lakeshore Dr. between High St. & Diamond Dr.	1579	125 to 135	It is recommended that these areas be served from Zone 1434 if such high pressures are unacceptable.
G	Lakeshore Dr. west of Main St.	1579	125 to 132	It is recommended that these areas be served from Zone 1434 if such high pressures are unacceptable.

Table 7 3 (Continued)
High Pressures – MinDD Conditions

No	Location	Zone	Pressure Range (psi)	Comments
H	Ellis St. & Chestnut St. between Lakeshore Dr. & Interstate 15 Fwy.	1579	125 to 130	No recommendations are made as the pressures are only minimally high.
I	Hwy. 74 between Allan St. & Ramsgate Dr.	1701	125 to 165	Serve high pressure regions from Zone 1601 (Ramsgate).
J	Horsethief Canyon region, south of Mountain Rd.	1601	125 to 170	High pressures in some areas of Zone 1801 are due to lower elevations relative to the HGL. No recommendations are made to address this issue as service connections in these areas have individual PRVs to maintain a desired pressure range.
K	South of Clinton Keith Rd.	1650	125 to 170	High pressures in some areas of Zone 1650 are due to lower ground surface elevations relative to the HGL.
L	North of Porras Rd. and La Estrella St.	1746	125 to 150	High pressures in some areas of Zone 1746 are due to lower ground surface elevations relative to the HGL.
M	South of Catt Rd. and George Ave	1650	125 to 130	High pressures in some areas of Zone 1650 are due to lower ground surface elevations relative to the HGL.
N	South of Canyon Hills Rd.	1934	125 to 170	High pressures in some areas of Zone 1934 are due to lower ground surface elevations relative to the HGL.
O	South of Canyon Hills Rd.	2309	150 to 185	High pressures in some areas of Zone 2309 are due to lower ground surface elevations relative to the HGL.

7.2.3 Minimum Pressure with MDD plus Fire Flow

The hydraulic model is also used to evaluate the impact of fire flows on the distribution system. For this analysis, the *H_2OMAP Water Fireflow Simulation* is used, which can simultaneously check the available fire flow at each model node on a system-wide basis. Fire flows ranging from 500 to 4,000 gpm are applied to the model to evaluate if the system could meet the fire flow demand under MDD conditions, while maintaining a minimum pressure of 20 psi (residual pressure). Fire flow demands are applied to the model nodes, based on the District's existing land use category. The fire flow requirements for each land use type are listed in **Table 6-1**. Demand nodes that cannot supply MDD plus fire flow at a minimum pressure of 20 psi are deficient.

The model simulation results show that the fire flow demands can be met at 86 percent of the demand nodes, while maintaining the minimum pressure criteria of 20 psi. However, 14 percent of the demand nodes were deficient, but in reality, fire fighting often takes place by using multiple fire hydrants. To identify the actual locations with fire flow deficiencies, a detailed

investigation for each of the deficient nodes was conducted. This investigation consisted of the following adjustments and additional model runs:

- The location of each deficient node was checked with the location of hydrants in the distribution system using the District's GIS information. Only those demand nodes that are located near a fire hydrant were considered in the analysis.
- In some cases, "incorrect" fire flow demands are initially assigned to the demand nodes, due to the multiple land use types that fall within a demand polygon. For example, all nodes that are located within a demand polygon that covers both residential and commercial areas are assigned the commercial fire flow demand. However, the nodes in residential streets should be evaluated using a residential fire flow demand. The appropriate fire flow demand was manually verified using the land use map in GIS. Where appropriate, the fire flow demand at that node was revised and the model simulation was repeated with the adjusted fire flow demand.
- As shown in **Table 6-1,** some of the land use categories have a fire flow requirement that is greater than 2,500 gpm. These high fire flow demands are typically not met through a single hydrant. To simulate the use of multiple hydrants, the fire flow demand was divided among multiple hydrants and the model simulation was repeated. If the use of multiple hydrants satisfies the demand, then no recommendations are made.
- Some of the deficient nodes were observed to fall on dead end pipelines or cul-de-sacs. This is typical in a water distribution network as these pipelines can receive water only from a single direction resulting in larger headloss as opposed to looped configurations. In such cases, a check is made to determine if the demand can be met by making use of multiple hydrants from adjacent water mains. If the use of multiple hydrants satisfies the demand, then no recommendations are made. Otherwise, pipeline upsizing is recommended for the pipeline that connects to these dead end pipelines.

Proposed fire flow pipeline improvements are summarized in **Table 7-4**. All fire flow pipeline recommendations are shown graphically on **Figure 7-3** through **Figure 5** and are labeled with an identification (ID) prefix "FF" and a number. These IDs link with the fire flow improvement recommendations listed in **Table 9-6**. Approximately 32 miles of pipeline improvements are recommended to address fire flow deficiencies. To minimize the number of recommendations, pipelines with the same diameter that are located in series in the same street are typically assigned a common improvement ID. There have been 255 fire flow improvements identified.

Table 7-4
Summary of Fire Flow Improvements

Recommended Diameter (inch)	Length (feet)	Length (miles)
6	107,000	20.3
8	27,000	5.1
10	1,000	0.2
12	22,000	4.2
16	10,000	1.9
Total[1]	**167,000**	**31.6**

1. Length in feet rounded to the nearest 1000 feet.

7.2.4 Pipeline Recommendations

To meet existing system pressure deficiencies, two pipeline projects are recommended. These include a parallel 12-inch transmission pipeline from the Gafford Reservoir to Gafford Rd to improve low pressures in the 1746 zone and a replacement 8-inch distribution pipeline along Encina Drive from Adelpha Street to Granado Street to improve low pressures in the 1916.5 zone. These pipelines are described in **Table 7-5**, and their locations are shown on .

Table 7-5
Pipeline Recommendations to Meet Existing Deficiencies

Description	Diameter (in)	Length (ft)	Type
Zone 1746 pipeline from Gafford Rd to Gafford Reservoir	12	1,600	Parallel
Zone 1916.5 pipeline from Adelpha Street to Granado Street along Encina Drive	8	1,800	Replacement

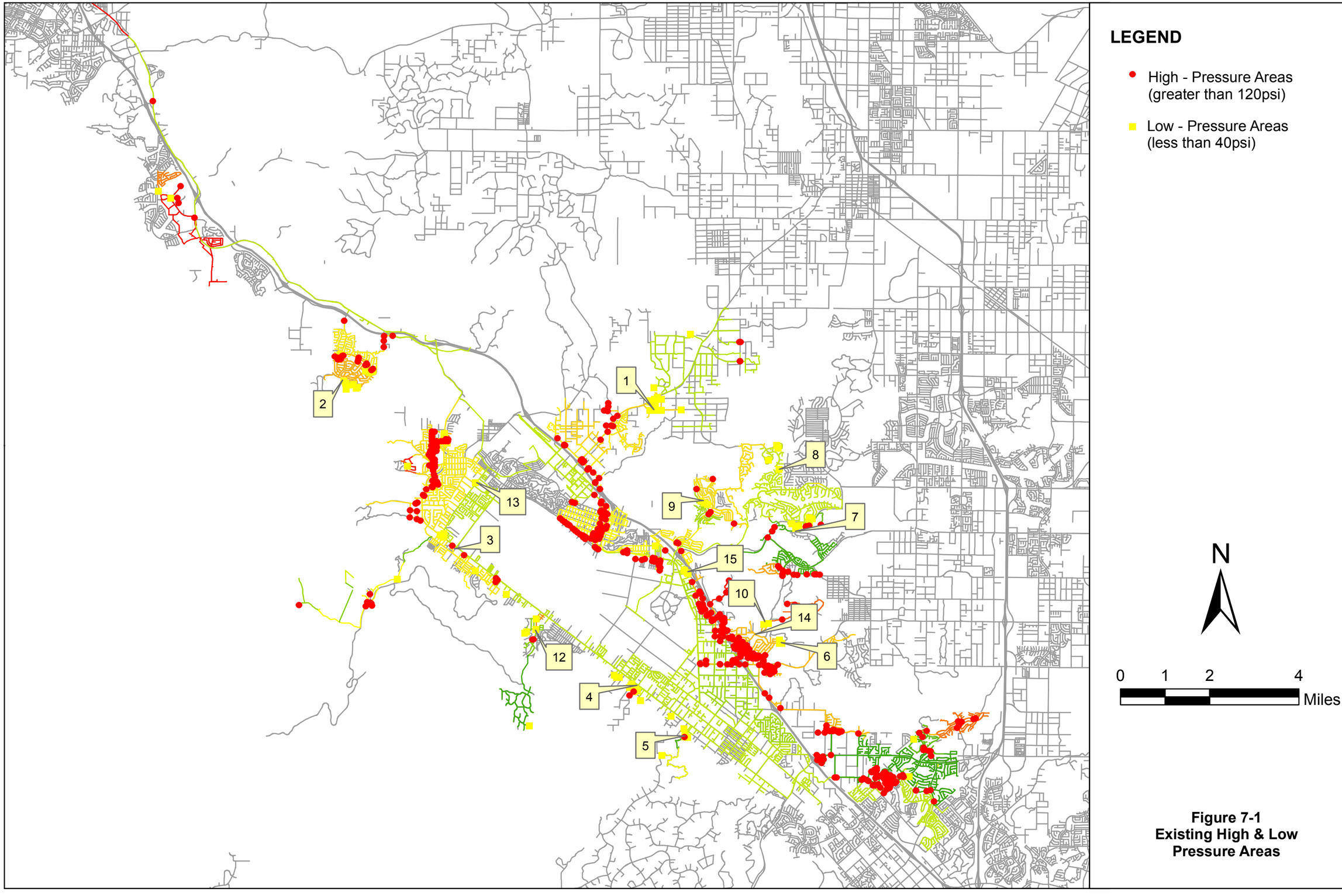
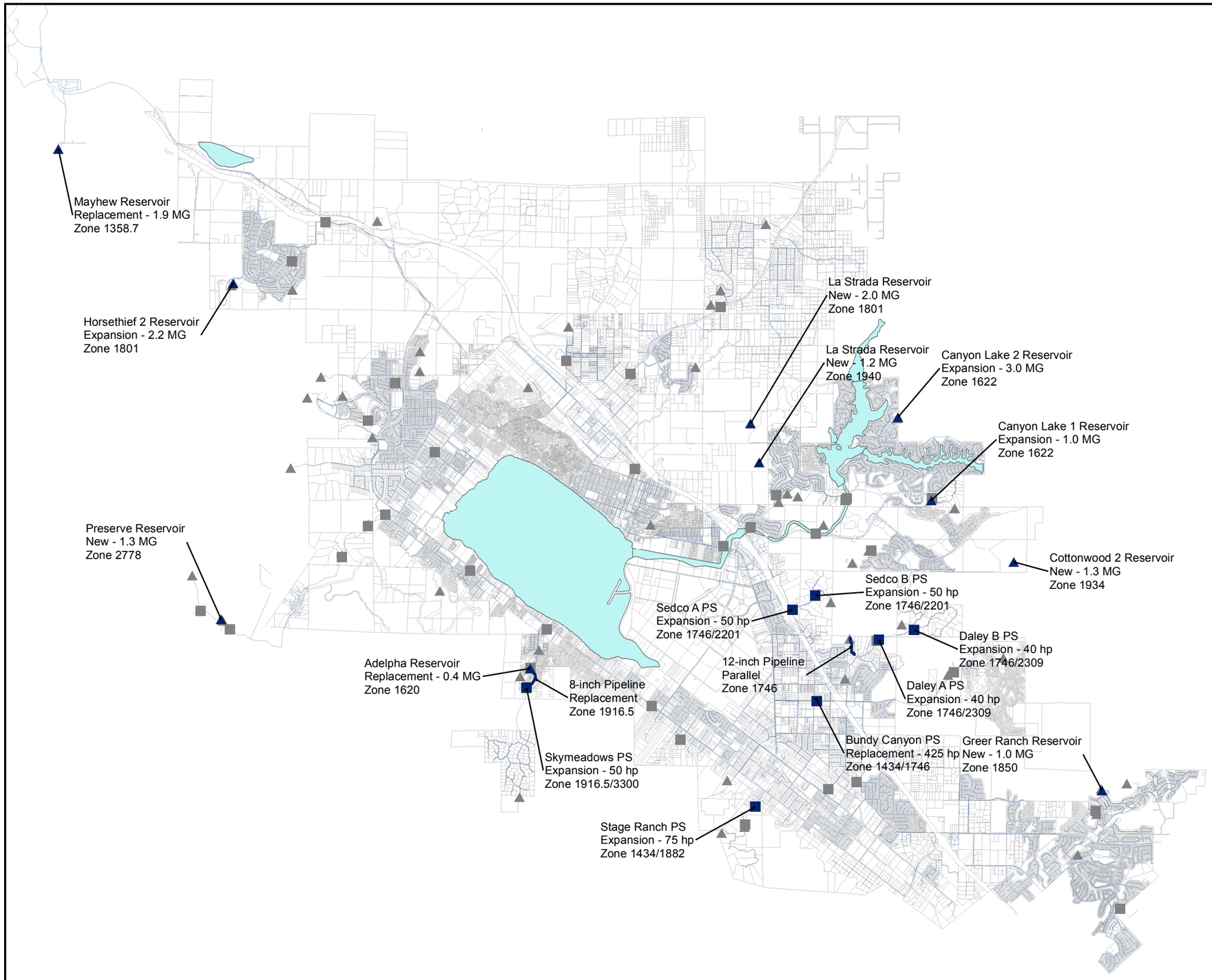


Figure 7-1
Existing High & Low Pressure Areas



Legend

- Proposed Storage Tanks
- Proposed Pump Stations
- Proposed Pipelines
- Existing Storage Tanks
- Existing Pump Stations
- Existing Pipelines
- Water Bodies

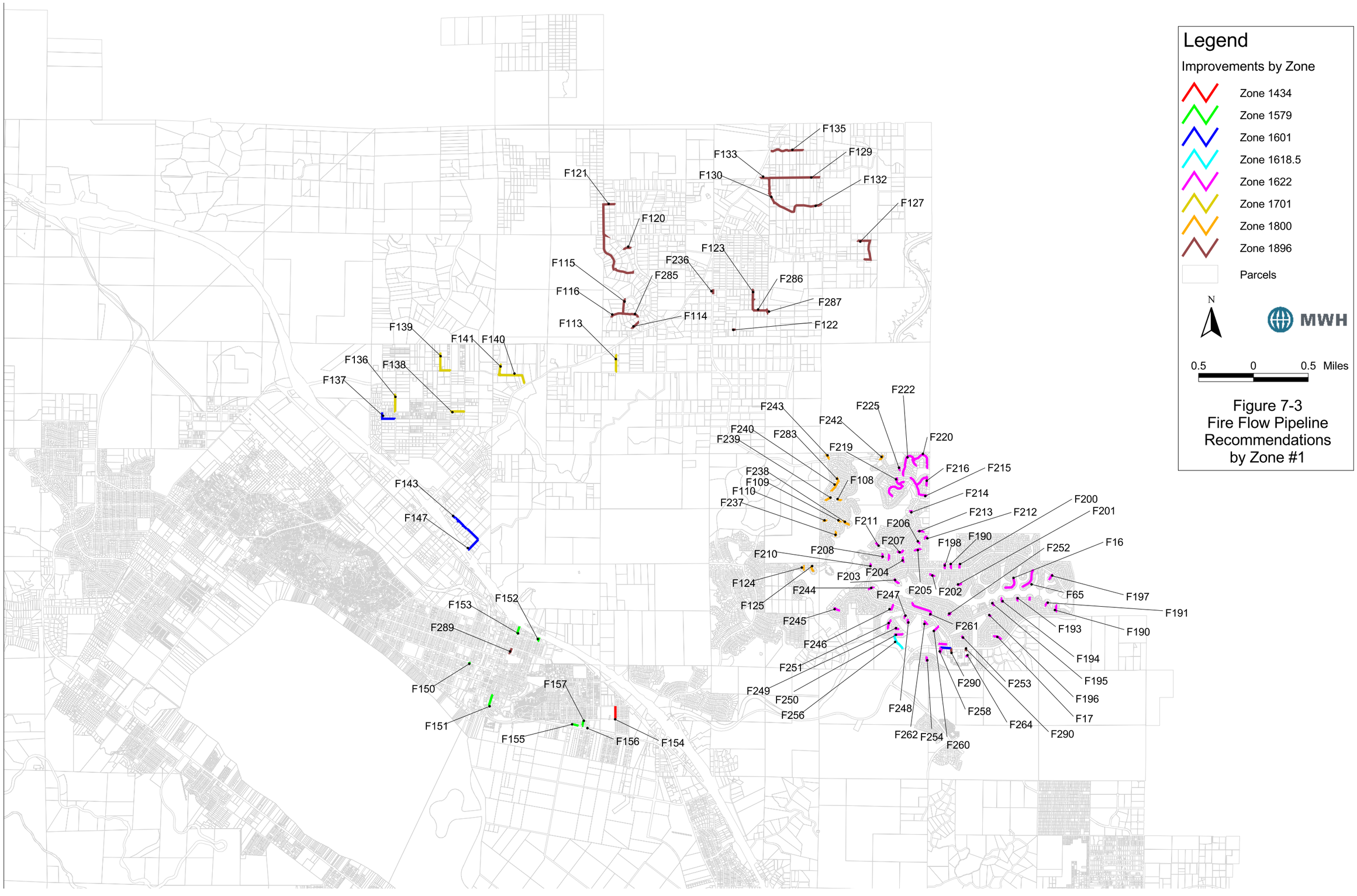
*Note: Facility recommendations shown are sized to account for future demand growth as well as meet existing deficiencies

N

0 1 2 4 Miles

MWH

Figure 7-2
Existing System Deficiency Facility Recommendations



Legend

Improvements by Zone

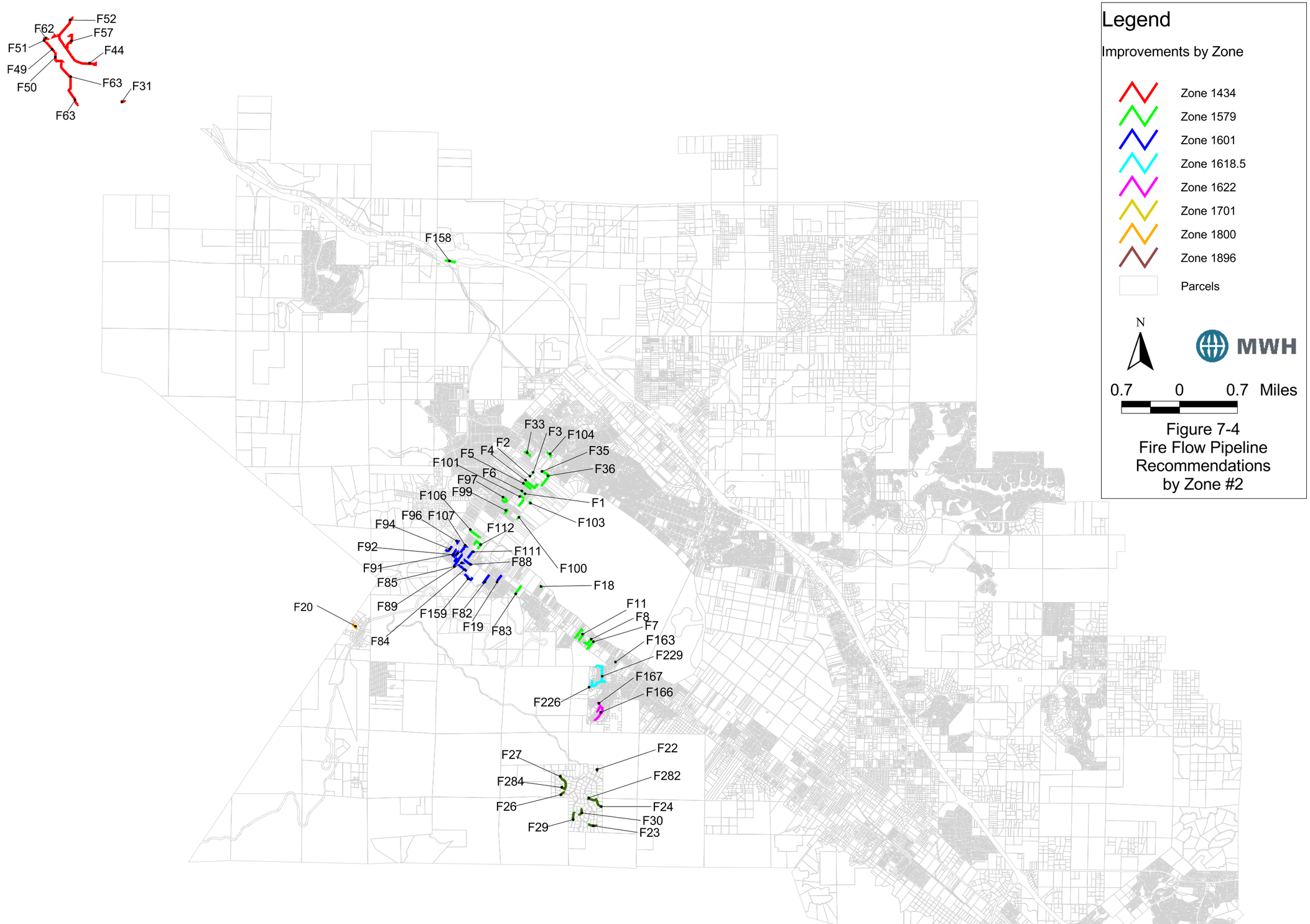
- Zone 1434
- Zone 1579
- Zone 1601
- Zone 1618.5
- Zone 1622
- Zone 1701
- Zone 1800
- Zone 1896
- Parcels

N

MWH

0.5 0 0.5 Miles

Figure 7-3
Fire Flow Pipeline
Recommendations
by Zone #1



Legend

Improvements by Zone

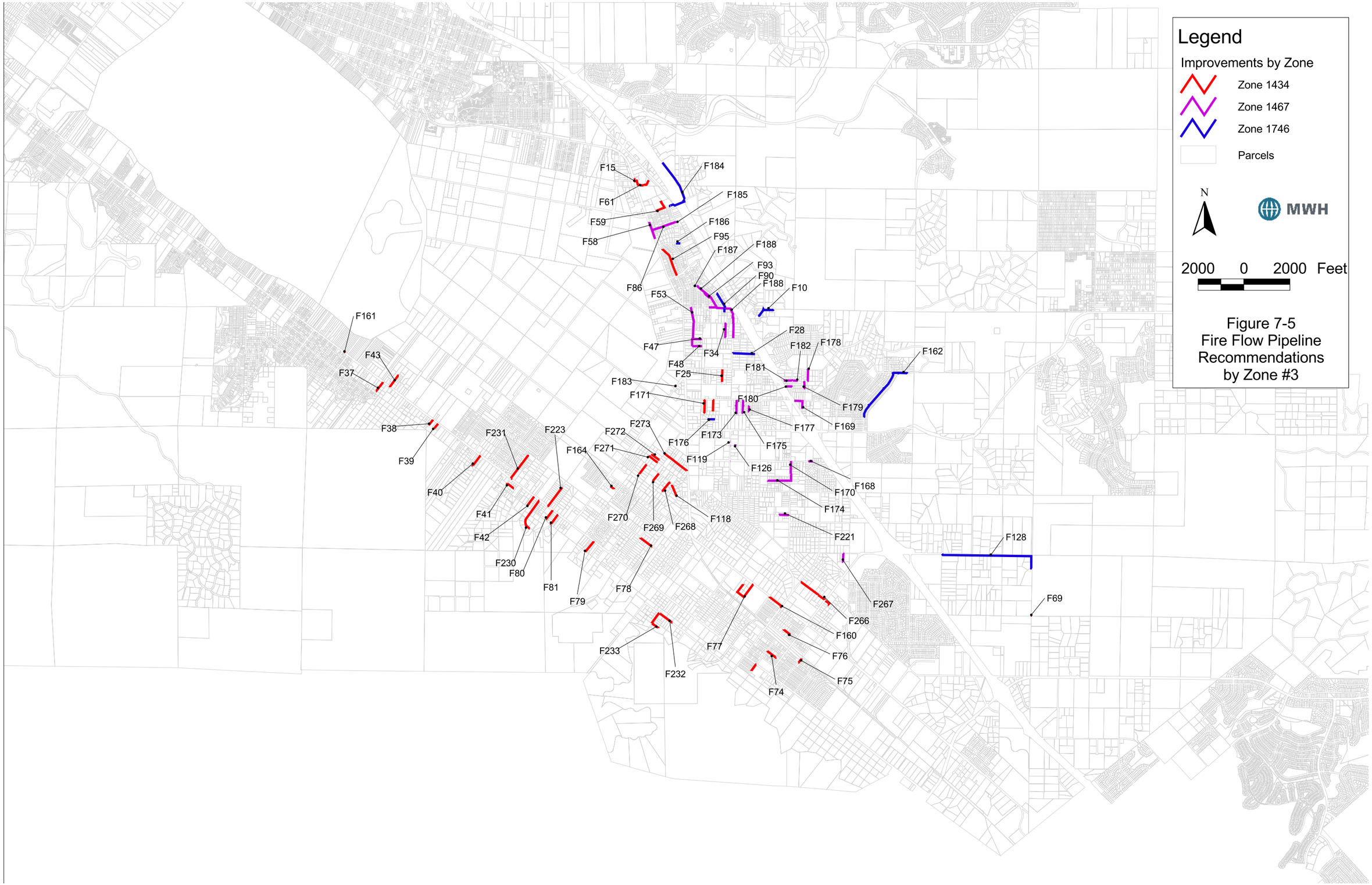
- Zone 1434
- Zone 1579
- Zone 1601
- Zone 1618.5
- Zone 1622
- Zone 1701
- Zone 1800
- Zone 1896
- Parcels

N

MWH

0.7 0 0.7 Miles

Figure 7-4
Fire Flow Pipeline Recommendations by Zone #2



Legend

Improvements by Zone

- Zone 1434
- Zone 1467
- Zone 1746
- Parcels

N

MWH

2000 0 2000 Feet

Figure 7-5
Fire Flow Pipeline Recommendations by Zone #3

7.3 STORAGE VOLUME

7.3.1 Storage Volume Analysis

The District currently has 68 storage tanks, located throughout the District's 33 pressure zones. For those pressure zones that are broken into two hydraulically isolated sections, the storage and emergency supply analyses are performed individually for each section.

According to the planning criteria discussed in **Section 6**, the operational storage requirement is 30 percent of MDD, the fire flow requirement is 4 hours of fire flow at a rate dependant upon land use type, and the emergency storage requirement is 1 MDD. A total and per zone analysis of the existing storage volumes required and of the storage volumes available is presented on **Table 7-6**. The analysis indicates that the District has several zones that are deficient on storage. Across the entire system, the total storage volume required is approximately 81.1 MG and the available storage capacity is 84.9 MG, yielding a storage surplus of 3.6 MG. The 1434 zone shows a storage surplus of approximately 14.7 MG, which is reserved to meet future growth in the 1434 zone rather than provide storage capacity (via pumping) to higher zones.

7.3.2 Storage Recommendations

To meet existing system storage requirements, several new tanks are recommended in zones with significant storage deficiencies (see **Table 7-7**). All of the zones in which new tanks are recommended show both a deficiency under existing conditions and year-2030 conditions. For the sizing of the recommendations, year-2030 conditions are used to account for future demand growth in addition to the existing deficiency (see **Section 8** for details). The recommendations include new tanks in the Mayhew (1358.7), Adelpha (1620), Canyon Lake (1622), Bundy Canyon (1746), 1801 West, 1801 East, Greer Ranch 1 (1850), Cottonwood (1934), Tuscany Hills (1940), and Los Pinos 1 (2778) zones. These recommendations are briefly summarized below:

- **Mayhew (1358.7 Zone)** – A new 1.9 MG tank is recommended to replace the existing 0.2 MG tank to serve both the 1358.6 Zone and 1258.7 Zone (by PRV). The tank sizing accounts for the existing deficiencies and future growth in both the 1358.6 and 1258.7 zones. The existing .08 MG tank in the 1258.7 zone would remain in service.
- **Adelpha (1620 Zone)** – A 0.4 MG tank is recommended to replace the existing .02 MG tank. A preliminary design report has already been completed for this project. The replacement Adelpha tank would be sized to meet storage requirements for both the Adelpha and Cottrell zones.
- **Canyon Lake (1622 Zone)** - The 1622 zone is known to have a significant existing storage deficit. Two existing tank sites are already located within the zone. To meet part of the existing deficiency, construction of a 3.0 MG tank is recommended at the existing Canyon Lake 2 site, and a 1.0 MG tank is recommended in the future at the Canyon Lake 1 site to meet the additional existing deficiency as well as account for future growth. The location of the two tanks is recommended based upon the geographical distribution of demands within the zone.
- **Bundy Canyon (1746 Zone)** – A 3.2 MG tank is recommended at the existing 2.3 MG tank site to meet existing deficiency in the 1746 zone.

- **1801 West Zone** – An existing deficiency of 1.1 MG exists in the 1801 West Zone (west of Interstate 15). Under the existing configuration, the Horsethief 1801 zone is hydraulically separated from the Rice Canyon 1801 zone. However, they will eventually be connected with transmission pipelines and are therefore evaluated as a single hydraulic unit. To meet the existing deficiency as well as account for future growth, a new 2.2 MG tank is recommended at the existing Horsethief 2 site. The existing Leach Canyon site is also considered for the location of a new tank, but is not selected since most of the future demand growth is anticipated to occur further north towards the Rice Canyon and Horsethief areas.
- **1801 East Zone** – To meet the existing deficiency in the 1801 east zone as well as account for future growth, a new 2.0 MG tank is recommended in the proposed La Strada development. A site for this new tank has already been identified in a separate water master plan for the La Strada development. This tank will be connected to the rest of the 1801 East zone (Rosetta Canyon 2) with transmission pipelines to the north.
- **Greer Ranch 1 (1850 Zone)** - A 1.0 MG tank is recommended at the existing .84 MG tank site to meet existing deficiency in the 1850 zone.
- **Cottonwood 2 (1934 Zone)** – A 1.3 MG tank is recommended at a new site in the southeast of the Cottonwood development to meet the existing deficiency and account for future growth in the 1934 zone. A site has already been identified in the Cottonwood water master plan. This tank will be connected to the rest of the 1934 zone through transmission pipelines to the south.
- **Tuscany Hills 2 (1940)** – A 1.2 MG tank is recommended at a new site in the proposed La Strada development to meet the existing deficiency as well account for future growth in the 1940 zone. A site has already been identified in a separate water master plan for the La Strada development. The tank would be connected to the rest of the 1940 zone through a new transmission pipeline running to the north and south.
- **Los Pinos 1 (2778), Tomlin 2 (2313), Tomlin 1 (1871)** – A 1.3 MG tank is recommended at the existing Los Pinos 1 site to meet existing deficiencies as well as account for future growth in the Los Pinos 1, Tomlin 2 (by PRV), and Tomlin 1 (by PRV) zones. This site has already been identified in the Preserve water master plan as a site for a future tank to meet storage requirements for the proposed Preserve development.

As described above, new tanks are proposed to be located at existing sites or at new sites identified in other preliminary design reports or planning documents. These site locations are checked against the District's elevation contours (see **Section 5**) to confirm that the high water operating levels of the proposed tanks are consistent with their zones.

In addition to the zones in which new tanks are recommended, there are also several smaller zones throughout the District that show an existing supply deficiency. Typically these are isolated, high elevation (foothill) zones in which little future growth is anticipated. For these zones, it is deemed more cost effective to provide additional pumping to compensate for an existing storage deficiency, rather than build a new storage tank. To calculate the additional pumping capacity required, the existing storage tank is assumed to provide 30% of MDD for operational storage, and the remaining volume is assumed to provide flow for a 4-hour fire. The additional pump capacity required is calculated by assuming the pump station (with all pumps running) is sized to meet peak hour demand (PHD) plus fireflow, with a portion of the fireflow being served from storage as determined using the methodology described above. Any pumping capacity necessary beyond that of the existing pump station serving the zone is recommended to

meet this criteria for smaller, isolated zones. Using this methodology, new pumps are required at Stage Ranch 1 (1882), Sedco (2201), Daley (2216), and Skymeadows (3300) to account for the existing storage deficiency. The analysis is performed for both existing and 2030 demand conditions to avoid the potential of having to add additional pumps in the future. The existing pumps at Greer Ranch 2 (2050), Stage Ranch 2 (2217), and Los Pinos 2 (3501) are sufficient to meet the existing storage deficiency under this criteria.

The Waite Street Zone (1467) shows an existing storage deficiency of 3.8 MG. However, plans have been developed to convert this zone to the 1601 zone, and therefore no recommendations have been made to account for the existing deficiency. The zone conversion is reflected in the future system analysis.

The recommendations for existing storage deficiencies are summarized in **Table 7-7**, and their locations on **Figure 7-2**.

Table 7-6
Existing Storage Analysis of Pressure Zones

Pressure Zone (Name)	Water Production for 2006 (MG)				Operational Storage 30% of MDD (MG)	Fire Storage (MG)	Emergency Storage (equal to 1 MDD)	Total Volume Required (MG)	Existing Storage Tank Volumes (MG)	Surplus Storage (MG)
	ADD (mgd)	MDD (mgd)	Fire Flow Req'd (gpm)	Fire Duration (hrs)						
1258.4 (Clay Canyon 2)	0.21	0.41	500	4	0.12	0.12	0.41	0.66	0.08	-0.58
1358.7 (Mayhew)	0.25	0.49	500	4	0.15	0.12	0.49	0.76	0.18	-0.58
1428 (Cottrell)	0.03	0.06	1,000	4	0.02	0.24	0.06	0.31	0.02	-0.29
1434 (Loop Zone)	6.09	12.18	4,000	4	3.65	0.96	12.18	16.79	31.5	14.71
1467 (Waite)	1.30	2.60	4,000	4	0.78	0.96	2.60	4.34	0.5	-3.84
1579 (City)	0.92	1.84	4,000	4	0.55	0.96	1.84	3.35	1.73	-1.62
1601(El Toro/Ramsgate 1)	0.26	0.51	4,000	4	0.15	0.96	0.51	1.63	3.14	1.51
1601 (Horsethief 1/Ortega/Lucerne/Alberhill Ranch 1)	3.20	6.41	4,000	4	1.92	0.96	6.41	9.29	9.6	0.31
1601 (Summerhill)	0.50	1.00	4,000	4	0.30	0.96	1.00	2.26	2.35	0.09
1620 (Adelpha)	0.05	0.09	1,000	4	0.03	0.24	0.09	0.36	0.02	-0.34
1622 (Canyon Lake)	1.86	3.72	2,500	4	1.12	0.6	3.72	5.44	2	-3.44
1650 (Cal Oaks)	2.43	4.85	4,000	4	1.46	0.96	4.85	7.27	9.4	2.13
1701 (Meadowbrook 1)	0.24	0.49	2,500	4	0.15	0.6	0.49	1.23	2	0.77
1746 (Bundy Canyon/Gafford)	1.11	2.22	4,000	4	0.67	0.96	2.22	3.85	3.04	-0.81
1750 (Cottonwood 1)	0.54	1.08	4,000	4	0.32	0.96	1.08	2.37	2.4	0.03
1800/1801 (Leach Cyn/Rice Cyn/Horsethief 2/Alberhill Ranch 2)	2.12	4.23	2,500	4	1.27	0.6	4.23	6.11	5.01	-1.10
1800/1801 (Tuscany Hills 1/Ramsgate 2)	1.34	2.67	4,000	4	0.80	0.96	2.67	4.44	4.2	-0.24
1850 (Greer Ranch 1)	0.36	0.72	4,000	4	0.22	0.96	0.72	1.89	0.84	-1.05
1871 (Tomlin 1)	0.00	0.00	500	4	0.00	0.12	0.00	0.12	0.05	-0.07
1882 (Stage Ranch 1)	0.01	0.02	1,000	4	0.01	0.24	0.02	0.26	0.1	-0.16
1896 (Meadowbrook 2)	0.41	0.82	2,500	4	0.25	0.6	0.82	1.67	1	-0.67
1916.5 (Encina)	0.01	0.03	1,000	4	0.01	0.24	0.03	0.28	0.5	0.22
1934 (Cottonwood 2)	0.25	0.50	2,500	4	0.15	0.6	0.50	1.24	0.53	-0.71
1940 (Tuscany Hills 2)	0.47	0.93	1,500	4	0.28	0.36	0.93	1.57	1	-0.57
2040 (LaLaguna 1)	0.07	0.14	1,000	4	0.04	0.24	0.14	0.43	1.03	0.60
2050(Greer Ranch 2)	0.47	0.93	1,000	4	0.28	0.24	0.93	1.45	1.34	-0.11
2201 (Sedco)	0.02	0.03	1,000	4	0.01	0.24	0.03	0.28	0.09	-0.19
2216 (Daley)	0.02	0.04	1,000	4	0.01	0.24	0.04	0.29	0.09	-0.20
2217 (Stage Ranch 2)	0.08	0.16	500	4	0.05	0.12	0.16	0.33	0.1	-0.23
2240 (La Laguna 2)	0.00	0.00	1000	4	0.00	0.24	0.00	0.24	0.73	0.49
2313 (Tomlin 2)	0.00	0.00	500	4	0.00	0.12	0.00	0.12	0.05	-0.07
2778 (Los Pinos 1)	0.03	0.06	500	4	0.02	0.12	0.06	0.20	0.1	-0.10
3300 (Skymeadows)	0.07	0.14	500	4	0.04	0.12	0.14	0.30	0.1	-0.20
3501 (Los Pinos 2)	0.02	0.05	500	4	0.01	0.12	0.05	0.18	0.1	-0.08
Entire System	**24.72**	**49.44**	**--**	**--**	**14.83**	**16.80**	**49.44**	**81.07**	**84.92**	**3.61**

Table 7-7
Existing Storage Recommendations

Description	Pressure Zone	Storage Deficiency (MG)	Facility Recommendation[1]
Mayhew	1358.7	0.58	Replace existing 0.2 MG tank with 1.9 MG tank to meet storage requirements for 1358.7 and 1258.7 Zones
Adelpha	1620	0.34	Replace existing .02 MG tank with 0.4 MG tank
Canyon Lake	1622	3.44	Build new 3.0 MG tank at Canyon Lake 2 site, and later build 1.0 MG tank at Canyon Lake 1 site to meet additional deficiency
Bundy Canyon	1746	0.81	Build new 3.2 MG tank at Bundy Canyon site
1801 West	1801	1.10	Build new 2.2 MG tank at Horsethief 2 site, and build 2.2 MG tank later at Rice Canyon 1 site to meet additional deficiency
1801 East	1801	0.24	Build new 2.0 MG tank at La Strada site
Greer Ranch 1	1850	1.05	Build new 1.0 MG tank at existing Greer Ranch 1 site
Tomlin 1	1871	0.07	Meet deficiency by adding a new PRV from Los Pinos 1 (2778) Zone.
Stage Ranch 1	1882	0.16	Provide additional 600 gpm pumping capacity at Stage Ranch 1 pump station, provide partial fire flow from storage and remaining from upgraded pump station
Meadowbrook 2	1896	0.67	No additional facilities required; provide full fire flow from storage
Cottonwood 2	1934	0.71	Build new 1.3 MG tank at Cottonwood site (southeast of development)
Tuscany Hills 2	1940	0.57	Build new 1.2 MG tank at La Strada site
Greer Ranch 2	2050	0.11	No additional facilities required; expected deficiency is minimal, relative to size of the zone
Sedco	2201	0.19	Provide additional 700 gpm pumping capacity at Sedco A and Sedco B pump stations each, provide partial fire flow from storage and remaining from upgraded pump station
Daley	2216	0.20	Provide additional 530 gpm pumping capacity at Daley A and Daley B pump stations each, provide partial fire flow from storage and remaining from upgraded pump station
Stage Ranch 2	2217	0.23	No additional facilities required, provide partial fire flow from storage and remaining from existing pump station
Tomlin 2	2313	0.07	Meet deficiency by adding a new PRV from Los Pinos 1 (2778) Zone.

Table 7-7 (Continued)
Existing Storage Recommendations

Description	Pressure Zone	Storage Deficiency (MG)	Facility Recommendation[1]
Los Pinos 1	2778	0.10	Build new 1.3 MG tank at Preserve Site to meet deficiencies in Los Pinos 1, Tomlin 2, and Tomlin 1 Zones (See Section 8 for sizing adjustment based upon future demands)
Skymeadows	3300	0.20	Provide additional 140 gpm pumping capacity at Skymeadows pump station; provide partial fire flow from storage and remaining from the upgraded pump station
Los Pinos 2	3501	0.08	No additional facilities required, provide partial fire flow from storage and remaining from the existing pump station

1. Facilities sized to meet year-2030 conditions to account for future growth as well as the existing deficiency.

7.4 BOOSTER PUMP CAPACITY

7.4.1 Booster Pump Capacity Analysis

As discussed in the planning criteria in **Section 6**, the booster pumps should be able to maintain the water levels in tanks under maximum day demands. The booster stations for zones with storage should therefore be able to meet MDD with the largest pump out of service. For zones without storage, the booster stations are sized to meet peak hour demand plus fire flow. Based on this criteria, the existing booster capacity surplus/deficit for each zone is shown in **Table 7-5**. The analysis indicates that the District has one zone that is deficient on booster pump capacity, Bundy Canyon (1746).

7.4.2 Booster Pump Recommendations

To meet existing system pumping capacity requirements, one new pump stations is required. The pump station is sized to meet the existing deficiency as well as provide capacity for future growth within the 1746 zone. The recommended pump station is described briefly below:

- Bundy Canyon (1746 Zone) – A 5,000 gpm pump station is recommended at the existing Bundy Canyon pump station site. This pump station is to replace the existing Bundy Canyon pump station and is sized to meet the existing deficiency as well as account for future demand growth (see **Section 8**).

The existing system booster pump recommendations is summarized in **Table 7-9**, and its locations is shown on . As with the storage recommendations, this booster pump station recommendation is sized to meet the existing pumping deficiency and also account for future growth within the zone.

Table 7-8
Existing Booster Pumping Capacity Analysis (gpm)

Pressure Zone (Name)	In-Zone MDD	Higher Zone MDD	Total MDD	Firm Pumping capacity	Pumping Surplus
1428 (Cottrell)	40	181	221	439	218
1467 (Waite)	1,805	0	1,805	3,677	1,872
1579 (City)	1,279	0	1,279	1,646	367
1600 (Skylark)[1]	503	0	503	Not known	-
1601(El Toro/Ramsgate 1)	356	911	1,267	6,543	5,276
1601 (Horsethief 1)	1,104	1,005	2,109	3,682	1,573
1601 (Ortega)	730	75	805	2,694	1,889
1601 (Summerhill)	695	0	695	2,624	1,929
1601 (Lucerne/Alberhill Ranch 1)	2,620	2,037	4,658	7,463	2,805
1620 (Adelpha)	64	117	181	317	136
1622 (Canyon Lake)	2,588	0	2,588	4,173	1,585
1650 (Cal Oaks)	3,373	1,146	4,518	5,510	992
1701 (Meadowbrook 1)	339	572	911	1,233	322
1746 (Bundy Canyon/Gafford)	1,546	552	2,099	1,728	-371
1750 (Cottonwood 1)	752	345	1,097	1,382	285
1800 (Leach Cyn/Rice Cyn)	1,881	100	1,981	2,730	749
1801 (Tuscany Hills 1)	1,858	647	2,505	3,025	520
1801 (Horsethief 2)	859	146	1005	1963	958
1801 (Alberhill Ranch 2)	57	0	57	1,250	1,193
1850 (Greer Ranch 1)	498	647	1,146	1,176	30
1871 (Tomlin 1)	2	72	75	450	375
1882 (Stage Ranch 1)	12	113	125	472	347
1896 (Meadowbrook 2)	572	0	572	943	371
1900 (Farm)	504	0	504	565	61
1900 (Lemon Grove)[1]	1146	0	1146	Not known	-
1916.5 (Encina)	20	97	117	228	111
1934 (Cottonwood 2)	345	0	345	457	112
1940 (Tuscany Hills 2)	647	0	647	1,273	626
2040 (LaLaguna 1)	100	0	100	1,196	1,096
2050(Greer Ranch 2)	647	0	647	1,195	548
2201 (Sedco)	23	0	23	178	155
2216 (Daley)	26	0	26	134	108
2217 (Stage Ranch 2)	113	0	113	690	577
2240(LaLaguna 2)	0	0	0	554	554
2313 (Tomlin 2)	0	72	72	287	215
2778 (Los Pinos 1)	41	32	72	280	208
3300 (Skymeadows)	97	0	97	149	52
3501 (Los Pinos 2)	32	0	32	104	72
Entire System	**35,861**	**8,869**	**35,639**	**62,410**	**26,711**

1. Pumps also sized to meet fire flow for zones without storage. Firm capacity of hydropneumatic pumps are not available.

Table 7-9
Booster Pump Recommendations to Meet Existing Deficiencies

Description	Zone	Pumping Deficiency (gpm)	Facility Recommendation[1]
Bundy Canyon	1746	371	Replace existing Bundy Canyon PS with a new 5,000 gpm PS[1]

1. Facilities sized to meet year-2030 conditions to account for future growth as well as the existing deficiency.

7.4.3 Conclusion

Under the facility recommendations presented above, the existing system can sufficiently meet the evaluation criteria set forth in **Section 6**. For the future system analysis in **Section 8**, the recommendations made for the existing system are resized to account for future demand growth, which are the sizes reflected in the District's capital improvement program in **Section 9**.

Section 8
Future System Evaluation

This section describes the engineering and hydraulic evaluation of the District's future water distribution system. It also identifies the infrastructure needed to address the increased demands for water which will result from future growth through the year 2030 as presented in **Section 3**. The analyses are based on the system evaluation criteria presented in **Section 6**. The hydraulic model, described in **Section 5**, is used to evaluate the hydraulic performance of the distribution system. Recommended improvements are summarized at the end of this section, while the Capital Improvement Program (CIP) with cost estimates and proposed phasing for these improvements is presented in **Section 9**. It is assumed that all improvements recommended to address existing system deficiencies, discussed in **Section 7**, are implemented; therefore, those facilities are included in this future system evaluation.

8.1 WATER SOURCE ANALYSIS

As part of the District's Water Resources Management Plan Update, a comprehensive analysis of twenty eight potential supply sources was evaluated to meet District demand through year-2030 (MWH, 2006). Out of these alternatives, a water supply strategy was recommended that incorporated several local resources as well as a new imported connection to Metropolitan Water District's (MWD) proposed Perris Valley Pipeline (PVP). This new supply source is assumed to connect to the eastern portion of the District's system along Newport Road. Implementation of this strategy will allow the District to meet year-2030 MDD with its largest well out of service, and year-2030 ADD with its largest supply source (the Mills Water Treatment Plant) out of service as recommended in the 2007 WRMP. The District's future supply sources are shown in **Table 8-1**.

Table 8-1
Water Supply Sources – Year 2030 Conditions

Water Supply Source	Capacity (mgd)
Existing	
Canyon Lake (Natural Runoff)	5.2
Groundwater	13.3
TVP	12.7
AVP	24.2
Coldwater Basin	1.3
Subtotal	**56.7**
Future	
Back Basin Groundwater Storage Project	9.4
North Elsinore Basin Aquifer Storage and Recovery Project	1.4
Supplement Canyon Lake WTP with Raw MWDSC Imported Water (WR-31)	3.8
Obtain Mills WTP water via the TVP Pump Station	13.8
Obtain Mills WTP water via the PVP	16.0
Subtotal	**44.4**
TOTAL	**101.1**
TOTAL (with largest source out[1])	**58.6**

1 Largest single source is the Mills WTP.

8.2 FUTURE PRESSURE ZONES

The District's existing water system is divided into 33 pressure zones. Considering the growth forecast for the District's service area, establishment of boundaries for the pressure zone is necessary to provide potential developers with a HGL to design water system pipelines and other facilities. Due to the uneven topography within the District's service area, static pressures vary from less than 30 psi in some areas to over 150 psi in other areas. High pressures can cause water system leaks and pipe bursts while low pressures can cause water quality problems and reduced reliability during emergencies such as fires. Therefore, prior to the hydraulic evaluation of the District's water system for future growth, the new pressure zones are delineated to maintain a desired range of pressures within the District's water system.

Based on MWH's prior planning experience for the District's system and taking into consideration the topography, future pressure zones are identified such that the minimum static pressure is above 40 psi and the maximum static pressure does not exceed 140 psi. However, small isolated areas that do not meet the above pressure criterion are not delineated as separate zones in order to eliminate very small PRV fed or hydropneumatic zones that do not facilitate easy system operations. **Figure 8-1** depicts the pressure zone boundaries for year 2030 conditions. **Figure 8-2** represents the hydraulic schematic of the District's water system under year 2030 conditions.

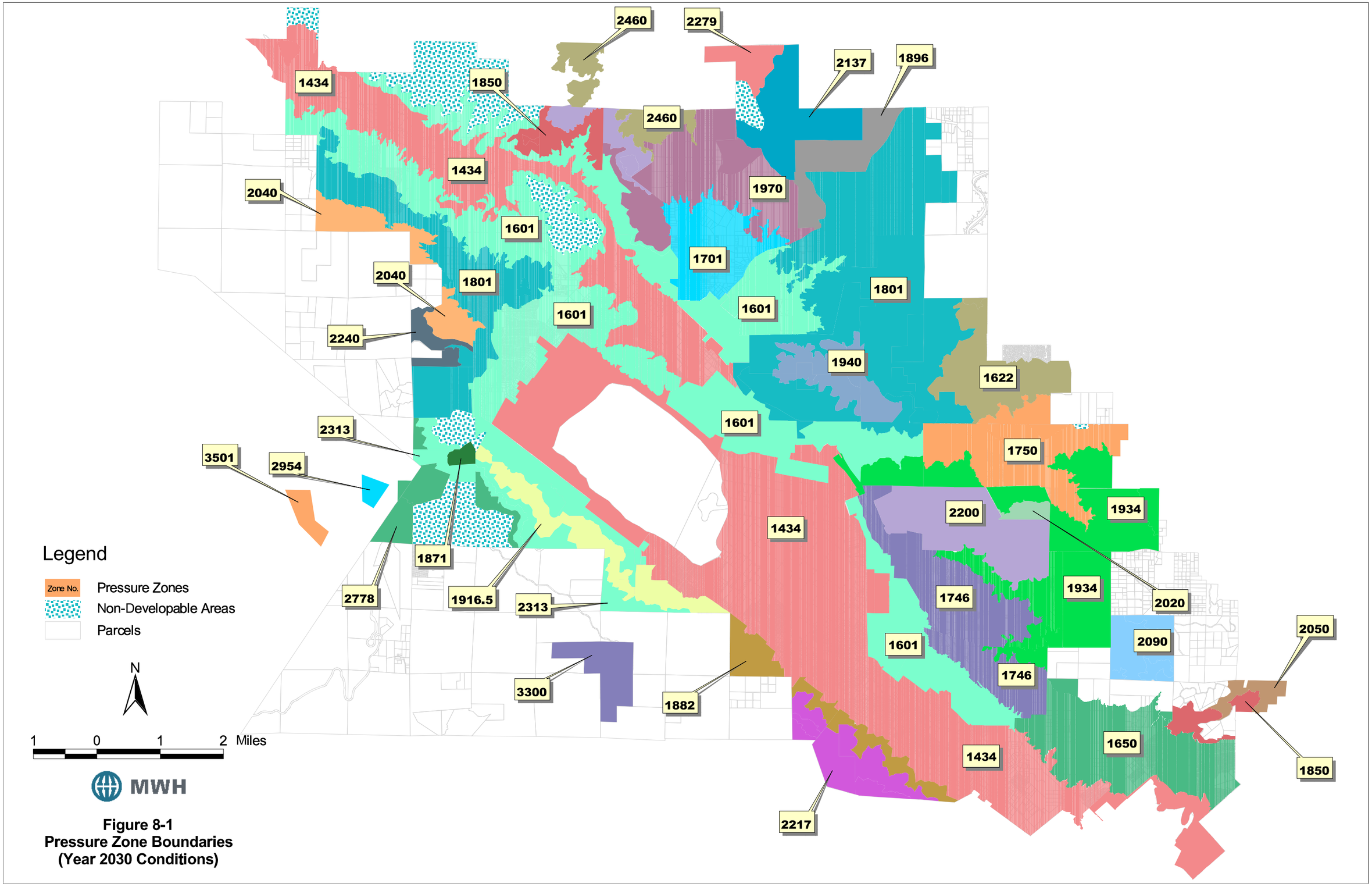
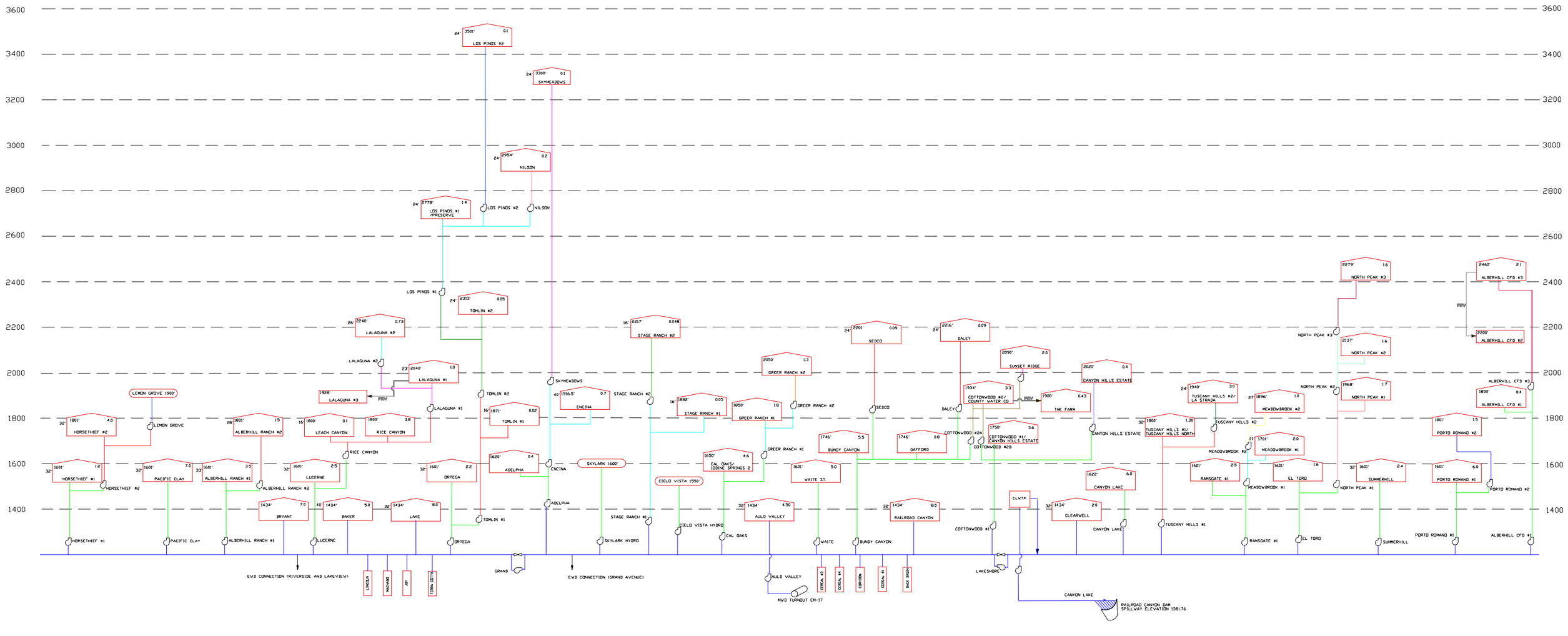


Figure 8-1
Pressure Zone Boundaries
(Year 2030 Conditions)

HYDRAULIC SCHEMATIC OF WATER SUPPLY SYSTEM

ELEVATION IN FEET ABOVE MSL



LEGEND

- HYDROPNEUMATIC SYSTEM
- PRV ZONE
- SHUT-OFF VALVE
- WATER TREATMENT PLANT
- WELL
- NUMBER OF TANKS (IF GREATER THAN 1)
- OVERFLOW ELEVATION
- RESERVOIR CAPACITY (MG)
- NAME
- BOOSTER PUMP STATION (WITH NUMBER OF PUMPS FOR EXISTING STATIONS)

FIGURE 8-2
FUTURE SYSTEM
HYDRAULIC SCHEMATIC

8.3 STORAGE VOLUME ANALYSIS – YEAR 2030 CONDITIONS

As listed in **Table 6-1** earlier, the operational storage volume criterion is 30 percent of MDD. Fire flow storage should provide sufficient water for the highest fire flow requirement of the zone evaluated. Emergency storage volume is equal to 100 percent of MDD. The required storage volume is compared with the actual available storage for the entire system and by pressure zone. A summary of the required and available storage volumes for each pressure zone are presented in **Table 8-2**. This table indicates that the District's system has a deficit of approximately 63 MG in its storage capacity under year 2030 demand conditions. The storage analysis assumes that the MDD is provided by the water sources and therefore additional storage water is needed for operational peaking, emergencies, and fire fighting uses only.

Across the entire system, the total storage volume required in year 2030 is approximately 146 MG. The net storage volume deficit in year 2030 is approximately 63 MG (includes both, existing and future deficiencies). As shown in **Table 7-6**, approximately 14 MG of storage capacity is recommended to meet existing system deficiencies. Therefore, an additional storage capacity of approximately 49 MG is required to meet the future system needs. Recommendations made to address storage deficiencies are discussed later in this section. All storage improvements are either recommended at existing tank sites or at new locations identified in other preliminary design reports or planning documents. In addition, the ground elevation at all proposed tank sites is verified with the elevation contour data provided by the District to ensure that the HWLs of the proposed tanks are consistent with the HGLs of each pressure zone. Proposed storage reservoir recommendations are listed in **Table 8-4** and shown on **Figure 8-3**.

8.4 PUMPING CAPACITY EVALUATION – YEAR 2030 CONDITIONS

The District's system is evaluated for the adequacy of booster pumping capacity under year 2030 demand conditions. As discussed in the planning criteria in **Section 6**, for pressure zones with reservoir storage, there should be adequate booster pumping capacity to provide firm pumping capacity to meet MDD. For zones without storage, there should be adequate booster pumping capacity to meet PHD and fire demand. A summary of the pumping capacity evaluation is presented in **Table 8-3**. Pump station capacities include the demand requirements of the higher zones that must be pumped through that intermediate zone. Across the entire system, the total booster pump capacity required is approximately 75,000 gpm and the total available firm pumping capacity is approximately 59,000 gpm, yielding a deficit in pumping capacity of approximately 16,000 gpm. Recommendations made to address pumping capacity deficiencies are listed in **Table 8-5** and shown on **Figure 8-3**. The TDH and the flow rate listed in **Table 8-4** are estimates based on pumping capacity evaluation.

Table 8-2
Storage Analysis of Pressure Zones – Year 2030 Conditions

Pressure Zone (Name)	Water Production for 2006 (MG)				Operational Storage 30% of MDD (MG)	Fire Storage (MG)	Emergency Storage (equal to 1 MDD)	Total Volume Required (MG)	Existing Storage Tank Volumes (MG)	Surplus Storage (MG)
	ADD	MDD	Fire Flow Req'd	Fire Duration						
	(mgd)	(mgd)	(gpm)	(hrs)						
1258.4 (Clay Canyon 2)	0.20	0.41	500	4	0.12	0.12	0.41	0.65	0.20	**-0.45**
1358.7 (Mayhew)	0.49	0.99	500	4	0.30	0.12	0.99	1.40	0.20	**-1.20**
1434 (Loop Zone)	12.85	25.69	4,000	4	7.71	0.96	25.69	34.36	31.50	**-2.86**
1601(El Toro/Ramsgate 1/Porto Romano 1)	3.58	7.16	4,000	4	2.15	0.96	7.16	10.26	3.14	**-7.12**
1601 (Horsethief 1/Pacific Clay/Ortega/Lucerne/Alberhill Ranch 1; includes City demand)	6.02	12.04	4,000	4	3.61	0.96	12.04	16.62	9.60	**-7.02**
1601 (Summerhill)	0.65	1.30	4,000	4	0.39	0.96	1.30	2.65	2.35	**-0.30**
1601 (Waite)	1.45	2.91	4,000	4	0.87	0.96	2.91	4.74		**-4.74**
1620 (Adelpha)	0.07	0.15	1,000	4	0.04	0.24	0.15	0.43	0.02	**-0.41**
1622 (Canyon Lake N)	2.15	4.31	2,500	4	1.29	0.60	4.31	6.20	2.00	**-4.20**
1650 (Cal Oaks)	3.66	7.33	4,000	4	2.20	0.96	7.33	10.49	9.40	**-1.09**
1701 (Meadowbrook 1)	0.35	0.70	2,500	4	0.21	0.60	0.70	1.51	2.00	**0.49**
1746 (Bundy Canyon/Gafford)	2.03	4.06	4,000	4	1.22	0.96	4.06	6.23	3.04	**-3.19**
1750 (Cottonwood 1)	1.88	3.76	4,000	4	1.13	0.96	3.76	5.85	2.40	**-3.45**
1800/1801 (Leach Canyon/Rice Canyon /Horsethief 2/Alberhill Ranch 2)	3.21	6.43	2,500	4	1.93	0.60	6.43	8.95	5.01	**-3.94**
1800/1801 (Tuscany Hills 1/Ramsgate 2)	3.39	6.78	4,000	4	2.03	0.96	6.78	9.78	4.20	**-5.58**
1801 (Porto Romano 2)	0.15	0.30	4,000	4	0.09	0.96	0.30	1.35		**-1.35**
1850 (Greer Ranch 1)	0.36	0.71	4,000	4	0.21	0.96	0.71	1.89	0.84	**-1.05**
1850 (Alberhill CFD 1)	0.06	0.11	1,000	4	0.03	0.24	0.11	0.38		**-0.38**
1871 (Tomlin 1)	0.01	0.03	500	4	0.01	0.12	0.03	0.15	0.05	**-0.10**
1882 (Stage Ranch 1)	0.15	0.29	1,000	4	0.09	0.24	0.29	0.62	0.10	**-0.52**
1896 (Meadowbrook 2)	0.24	0.47	2,500	4	0.14	0.60	0.47	1.21	1.00	**-0.21**
1900 (Lemon Grove)	0.00	0.00	1,000	4	0.00	0.24	0.00	0.24		
1916.5 (Encina)	0.17	0.33	1,000	4	0.10	0.24	0.33	0.68	0.50	**-0.18**
1934 (Cottonwood 2)	0.86	1.71	2,500	4	0.51	0.60	1.71	2.83	0.53	**-2.30**
1940 (Tuscany Hills 2)	0.72	1.43	1,500	4	0.43	0.36	1.43	2.22	1.00	**-1.22**
1968 (North Peak #1)	0.28	0.56	4,000	4	0.17	0.96	0.56	1.69		**-1.69**
2020 (Canyon Hills Estates)	0.04	0.07	1,000	4	0.02	0.24	0.07	0.34		**-0.34**
2040 (La Laguna 1)	0.27	0.55	1,000	4	0.16	0.24	0.55	0.95	1.03	**0.08**
2050(Greer Ranch 2)	0.46	0.93	1,000	4	0.28	0.24	0.93	1.45	1.34	**-0.11**
2090 (Sunset Ridge 1)	0.67	1.34	1,000	4	0.40	0.24	1.34	1.98		**-1.98**
2137 (North Peak #2)	0.36	0.72	2,500	4	0.21	0.60	0.72	1.53		**-1.53**
2201 (Sedco)	0.05	0.10	1,000	4	0.03	0.24	0.10	0.37	0.09	**-0.28**
2216 (Daley)	0.02	0.04	1,000	4	0.01	0.24	0.04	0.29	0.09	**-0.20**
2217 (Stage Ranch 2)	0.06	0.13	500	4	0.04	0.12	0.13	0.29	0.10	**-0.19**
2240(La Laguna 2)	0.05	0.10	1,000	4	0.03	0.24	0.10	0.38	0.73	**0.35**
2279 (North Peak #3)	0.32	0.64	2,500	4	0.19	0.60	0.64	1.43		**-1.43**
2313 (Tomlin 2)	0.07	0.14	500	4	0.04	0.12	0.14	0.30	0.05	**-0.25**
2460 (Alberhill CFD 3)	0.58	1.17	500	4	0.35	0.12	1.17	1.64		**-1.64**
2778 (Los Pinos 1)	0.35	0.71	500	4	0.21	0.12	0.71	1.04	0.10	**-0.94**
2954 (Nilson)	0.02	0.04	500	4	0.01	0.12	0.04	0.17		**-0.17**
3300 (Skymeadows)	0.09	0.18	500	4	0.06	0.12	0.18	0.36	0.10	**-0.26**
3501 (Los Pinos 2)	0.02	0.05	500	4	0.01	0.12	0.05	0.18	0.10	**-0.08**
Entire System	**48.43**	**96.85**	**--**	**--**	**29.06**	**20.16**	**96.85**	**146.07**	**82.81**	**-63.02**

Note: Surplus is positive and deficit is negative

Table 8-3
Booster Pumping Capacity Evaluation – Year 2030 Conditions (gpm)

Pressure Zone (Name)	In-Zone MDD	Higher Zone MDD	Total MDD	Firm Pumping capacity	Pumping Surplus
1258.4 (Clay Canyon 2)	285	--	--	--	--
1358.7 (Mayhew)	686	--	--	--	--
1434 (Loop Zone)	17,856	--	--	--	--
1550 (Cielo Vista)		0	0		0
1600 (Skylark)		0	0		0
1601 (Pacific Clay 1)	1,382	0	1,382		-1,382
1601(El Toro/Ramsgate 1)	3,174	3,993	7,167	6,543	-624
1601 (Horsethief 1)	1,452	1,386	2,839	3,682	843
1601 (Ortega)	1,031	661	1,692	2,694	1,002
1601 (Summerhill)	901	0	901	2,624	1,723
1601 (Lucerne/Alberhill Ranch 1)	4,506	3,532	8,037	7,463	-574
1601 (City)	1,489	0	1,489	1,646	157
1601 (Waite)	2,020	0	2,020		-2,020
1601 (Porto Romano 1)	310	207	517		-517
1620 (Adelpha)	103	361	464	317	-147
1622 (Canyon Lake N)	2,995	0	2,995	4,173	1,178
1650 (Cal Oaks)	5,094	1,140	6,234	5,510	-724
1701 (Meadowbrook 1)	488	328	816	1,233	417
1746 (Bundy Canyon/Gafford)	2,819	3,260	6,079	1,728	-4,351
1750 (Cottonwood 1)	2,614	1,243	3,857	1,382	-2,475
1800 (Leach Cyn/Rice Cyn)	2,551	453	3,003	2,730	-273
1800 (Tuscany Hills 1)	2,870	996	3,866	3,025	-841
1801 (Porto Romano 2)	207	0	207		-207
1801 (Horsethief 2)	1,386	1,000	2,386	1,963	-423
1801 (Alberhill Ranch 2)	528	0	528	1,250	722
1801 (Ramsgate 2)	1,843	0	1,843		-1,843
1850 (Greer Ranch 1)	496	644	1,140	1,176	36
1850 (Alberhill CFD 1)	77	810	888		-888
1871 (Tomlin 1)	18	643	661	450	-211
1882 (Stage Ranch 1)	204	90	294	472	178
1896 (Meadowbrook 2)	328	0	328	943	615
1900 (Farm)	1,044	931	1,975	565	-1,410
1900 (Lemon Grove)	1,000	0	1,000		-1,000
1916.5 (Encina)	233	128	361	228	-133
1934 (Cottonwood 2)	1,191	0	1,191	457	-734
1940 (Tuscany Hills 2)	996	0	996	1,273	277
1968 (North Peak #1)	391	943	1,334		-1,334
2020 (Canyon Hills Estates)	52	0	52		-52
2040 (LaLaguna 1)	380	72	453	1,196	743
2050(Greer Ranch 2)	644	0	644	1,195	551
2090 (Sunset Ridge)	931	0	931		-931
2137 (North Peak #2)	497	446	943		-943
2201 (Sedco)	69	0	69	178	109
2216 (Daley)	26	0	26	134	108
2217 (Stage Ranch 2)	90	0	90	690	600
2240(LaLaguna 2)	72	0	72	554	482
2279 (North Peak #3)	446	0	446		-446
2313 (Tomlin 2)	94	549	643	287	-356
2460 (Alberhill CFD 3)	810	0	810		-810
2778 (Los Pinos 1)	493	56	549	280	-269
2954 (Nilson)	25	0	25		-25
3300 (Skymeadows)	128	0	128	149	21
3501 (Los Pinos 2)	31	0	31	104	73
Entire System	**69,355**	**23,873**	**74,402**	**58,294**	**-16,108**

8.5 INFRASTRUCTURE RECOMMENDATIONS – YEAR 2030 CONDITIONS

Infrastructure improvements required to meet the planning criteria discussed in **Section 6** are discussed below. Recommendations made to address this storage deficit (shown in **Table 8-2**) are listed in **Table 8-4. Table 8-5** summarizes the improvements recommended to offset the pumping capacity deficiencies under year 2030 demand conditions. The sizing of storage tanks in **Table 8-4** is calculated to off-set the year 2030 storage deficiencies for each pressure zone. For zones with more than one recommended storage tank (primarily the 1601 and 1801 zones), the recommended capacity is allocated to the different tanks based upon consideration of the geographic demand distribution of the zone and the availability of space at the existing or recommended site. Specific recommendations are discussed in more detail in the individual zone descriptions presented later in this section. Details regarding recommended transmission pipelines required under year 2030 demand conditions are presented in **Table 8-6**. Pipeline improvements are recommended to improve supply transfer capacity and system pressures at various locations in the system. These improvements include pipeline upgrades at the suction and the discharge ends of the proposed booster pumping stations and pipeline upgrades at reservoir sites in order to provide improved transmission capacity. Most of the pipeline infrastructure recommended for the proposed future developments serve as a backbone network for these developments. These recommendations also include the pipelines that are identified as part of the various development specific master plans and other pipeline improvements that are currently being planned by the District. **Figure 8-3** shows the future system improvements within the District. Based on their location, a brief discussion on the recommended system improvements is presented below.

Table 8-4
Summary of Storage Recommendations – Year 2030 Conditions

Map ID	Name	Size (MG)	Phasing	Type
S01	Pacific Clay Reservoir (1601)	7.0	2021-2025	New
S02	Horsethief 2 Reservoir (1801)	2.2	2007-2010	Expansion
S03	Rice Canyon 1 (1801)	2.2	2011-2015	Expansion
S04	El Toro Reservoir (1601)	1.2	2021-2025	Expansion
S05	North Peak Reservoir (1968)	1.7	2011-2015	New
S06	North Peak Reservoir (2137)	1.6	2011-2015	New
S07	North Peak Reservoir (2279)	1.6	2016-2020	New
S08	Preserve Reservoir (2954)	0.2	2011-2015	New
S09	Preserve Reservoir (2778)	1.3	2016-2020	New
S10	Adelpha Reservoir (1620)	0.4	2007-2010	Replacement
S11	Encina Reservoir (1916.5)	0.2	2021-2025	Expansion
S12	Porto Romano Reservoir (1601)	6.0	2011-2015	New
S13	Porto Romano Reservoir (1801)	1.5	2007-2010	New
S14	Greenwald Reservoir (1801)	3.6	2011-2015	New
S15	Tuscany Hills North Reservoir (1801)	2.0	2007-2010	New
S16	La Strada Reservoir (1940)	1.2	2007-2010	New
S17	Canyon Lake N 2 Reservoir (1622)	1.0	2007-2010	Expansion
S18	Canyon Lake N 1 Reservoir (1622)	3.0	2026-2030	Expansion
S19	Canyon Hills Estates Reservoir (1750)	1.4	2007-2010	New
S20	**Canyon Hills Estates Reservoir (2020)**	**0.4**	**2007-2010**	New

Table 8-4 (Continued)
Summary of Storage Recommendations – Year 2030 Conditions

Map ID	Name	Size (MG)	Phasing	Type
S21	County Water Co Reservoir (1934)	1.0	2011-2015	New
S22	Cottonwood 2 Reservoir (1934)	1.3	2007-2010	New
S23	Sunset Ridge Reservoir (2090)	2.0	2011-2015	New
S24	Bundy Canyon Reservoir (1746)	3.2	2007-2010	Expansion
S25	Waite Reservoir (1601)	5.0	2007-2010	New
S26	Iodine Springs 2 Reservoir (1650)	1.1	2021-2025	New
S27	Greer Ranch 1 Reservoir (1850)	1.0	2021-2025	Expansion
S28	Village Reservoir (1850)	0.4	2011-2015	New
S29	Village Reservoir (2460)	2.1	2011-2015	New
S30	Mayhew Reservoir (1358.7)	1.9	2021-2025	Replacement
S31	Bryant 2 Reservoir (1434)	4.4	2026-2030	Expansion
Total		**63.1**		

Note:
Map IDs indicated in **Table 8-4** match proposed storage reservoir locations shown on **Figure 8-3**
Individual fire pumps rather than storage tanks are recommended for Zone 2201, Zone 2216, and Zone 3300

Zone 1434 (Loop Zone)

All of the District's water sources (existing and future), except for the proposed Terra Cotta well, supply water directly into Zone 1434. Based on input from the District staff and due to the uncertainty of the future PVP connection, it is planned that the 16 mgd future water supply will be connected to the system at the existing 33-inch diameter pipeline along Railroad Canyon Road, west of the Zone 1746 – Cottonwood pump station, at a HGL of 1434 feet. The existing pipeline infrastructure in this zone is not adequately sized to deliver this capacity. The entire water supply from the PVP can be received and distributed from Zone 1434 only if adequately sized transmission pipelines and pumping infrastructure are constructed. A summary of the various pipeline projects identified for this zone is discussed below.

Additional transmission capacity from the future source to Summerhill Drive along Railroad Canyon Road is necessary and a 42-inch diameter parallel pipeline (T28) is recommended. In addition, to improve transmission capacity from the Railroad Canyon Reservoir to Railroad Canyon Road, a 42-inch diameter parallel pipeline (T21) is recommended. Under year 2030 MDD conditions, when the Canyon Lake Treatment Plant is operating at full capacity (9 mgd), the existing 30-inch diameter pipeline prevents the Clearwell Reservoir from cycling due to inadequate transmission capacity. As a result, the plant has to run at some reduced capacity below 100 percent. A 30-inch diameter parallel pipeline (T23) is recommended to provide additional transmission capacity from the Canyon Lake water treatment plant to the Zone 1434 distribution system and to facilitate the cycling of the Clearwell Reservoir.

The northwestern portion of this zone is fed from the TVP connection by the existing 30-inch TVP inter-tie pipeline located on Lake Street. When the proposed TVP pump station becomes operational, it will become necessary to provide additional transmission capacity in this area to distribute future water demands. Without additional transmission capacity, the Lake Street

Reservoir will not cycle during future demand conditions. In addition, the Baker Street reservoir will not cycle during maximum demand conditions. Therefore, a 48-inch diameter pipeline (T04) is recommended from Temescal Canyon Road to Nichols Road along Lake Street and another 48-inch diameter pipeline (T05) is recommended from Lake Street to Terra Cotta Road along Nichols Road.

Another major pipeline improvement in this zone includes a 24-inch diameter pipeline (T27) from Machado Street to Gregory Pl. along Grand Avenue which replaces the existing 14-inch pipeline. Based on its year of installation (1956) and leak history, it is recommended that the existing 14-inch pipeline be replaced. The recommended pipeline also improves transmission and reduces head loss along Grand Avenue. In addition, a 4.4 MG reservoir is recommended in this zone at the existing Bryant Reservoir site to meet infill growth.

Zone 1601 and Zone 1801 Planning Methodology

Future growth and development within the District's service area is primarily concentrated within Zone 1601 and Zone 1801. Under existing system conditions, although there are areas within the District that operate under the same HGL (for example:1601-Horsethief and 1601-Waite), these areas are geographically isolated and are hydraulically independent. It is assumed that under year 2030 conditions, these zones would be integrated to provide greater flexibility in system operations. In order to determine the geographic distribution of the future storage requirements in Zone 1601 and Zone 1801, the two zones are sub-divided based on their locations with respect to the I-15 freeway that passes through the District's service area. Zone 1601 is divided into two portions - east and west of the I-15 freeway. Likewise, Zone 1801 is divided into two portions. Demands in the western portion of Zone 1601 are comprised of the future demands at Horsethief, Pacific Clay, Ortega, Lucerne, and Alberhill Ranch while demands in the eastern half of Zone 1601 are comprised of the future demands at El Toro, Ramsgate, and Porto Romano. Similarly, demands in the western portion of Zone 1801 are comprised of the future demands at Leach Canyon, Rice Canyon, Horsethief, and Alberhill Ranch while demands in the eastern half of Zone 1801 are comprised of the future demands at Tuscany Hills and Ramsgate. Rather than computing an overall deficiency in storage volume for the zone, this approach helps to identify the geographic areas within the zone that would require storage reservoirs under future demand conditions.

Zone 1601

Based on the storage evaluation, it is recommended that 7 MG of storage capacity be constructed to meet the storage requirements in the western portion of Zone 1601. This storage capacity is recommended at the Pacific Clay site. Based on demand calculations for the intermediate years (between existing and year 2030), it is recommended that this tank be constructed between year 2021 and year 2025. A 16-inch diameter pipeline (T01) from the proposed storage reservoir to Lake Street on the east and to Mountain Road on the west will provide the necessary backbone infrastructure in the Pacific Clay area. This pipeline will also connect Zone 1601-Horsethief to Zone 1601 – Alberhill Ranch and will provide additional looping within the system.

Although most of the pump station improvements are recommended to offset system deficiencies, some of the recommendations are also intended to provide the District flexibility in system operations by providing added redundancy. The proposed pump station at Railroad Canyon (P06), parallel to existing Summerhill pump station, is sized to transfer approximately 10,200 gpm of the PVP water supply to Zone 1601. This reduces the size of the required transmission mains within Zone 1434 and results in substantial cost savings for the District. In addition, this pump station also provides added pumping capacity redundancy within Zone 1601.

A 30-inch diameter pipeline (T25) from Grunder Drive to Porto Romano and a 36-inch diameter pipeline (T26) from Canyon View Drive to Railroad Canyon Drive along Canyon Estates Drive provide transmission capacity at the discharge side of the proposed pump station P06. These pipelines facilitate the delivery of the PVP water supply to Zone 1601 while also serving as a backbone system for the proposed Porto Romano and Spyglass developments.

Storage capacity of 7.2 MG will be required in the eastern portion of Zone 1601 to meet the storage requirements under year 2030 conditions. It is recommended that a 6 MG tank be constructed at the Porto Romano area and 1.2 MG of storage capacity be provided at the existing El Toro tank site. Based on demand calculations for the intermediate years, it is recommended that the Porto Romano reservoir be constructed between year 2011 and year 2015. The 30-inch pipeline (T25) will provide the necessary backbone infrastructure in the Porto Romano area. This pipeline will also connect Zone 1601-Summerhill to Zone 1601–Ramsgate and will provide additional looping within the system. In addition, this pipeline will provide adequate transmission capacity to distribute the PVP water supply within the zone received from the proposed Railroad Canyon pump station (P06).

Zone 1801

Future storage requirements in the western portion of Zone 1801 are met by the proposed storage reservoirs at the existing Horsethief and Rice Canyon tank sites. It is recommended that a storage reservoir with a capacity of 2.2 MG be constructed at each existing tank site. Based on the demand projections, it is recommended that the proposed reservoir at the Horsethief tank site be constructed between year 2007 and year 2011 and the future reservoir at the Rice Canyon tank site be constructed between year 2011 and year 2015. A 12-inch pipeline (T29) from the Rice Canyon tank site to Mountain Road is proposed to connect Zone 1801–Rice Canyon to Zone 1801–Horsethief and will provide additional looping within the system.

Future storage requirements in the eastern portion of Zone 1801 are met by proposed storage reservoirs at the Ramsgate, the Porto Romano, and the Tuscany Hills North developments. Storage requirements at Zone 1801–Porto Romano are met by a 1.5 MG storage tank. This zone is isolated from the rest of the eastern portion of Zone 1801 and receives water supply from Zone 1601–Porto Romano via the proposed Porto Romano pump station (P14). Storage requirements in Zone 1801–Ramsgate are met by the proposed 3.6 MG storage reservoir while the proposed 2 MG reservoir meets the storage requirements in the Tuscany Hills North area. A 16-inch diameter pipeline (T12) is proposed to connect Zone 1801–Ramsgate and Zone 1801–Tuscany Hills North and will provide additional looping within the system. Demands in the Zone 1801-Ramsgate area are met by the proposed Ramsgate pump station (P15), which has a total capacity

of 4,000 gpm and is located at the Zone 1601-Ramsgate tank site. A 20-inch diameter pipeline (T11) is proposed to deliver this water to Zone 1801.

Table 8-5
Summary of Pumping Station Recommendations – Year 2030 Conditions

Map ID	Name	TDH (feet)	Total Capacity (gpm)	Type	Phase
P01	Daley A Fire Pump	300	530	Expansion	2021-2025
P02	Daley B Fire Pump	300	530	Expansion	2021-2025
P03	Skymeadows Fire Pump (3300)	1,410	140	Expansion	2021-2025
P04	North Peak PS (1968)	403	1,790	New	2011-2015
P05	Farm PS (1934)	270	1,410	Expansion	2016-2020
P06	Railroad Canyon PS (1601)	180	10,200	New	2016-2020
P07	North Peak PS (2137)	204	1,270	New	2011-2015
P08	North Peak PS (2279)	177	600	New	2016-2020
P09	Tomlin 1 PS (1871)	306	210	Expansion	2016-2020
P10	Tomlin 2 PS (2313)	477	350	Expansion	2011-2015
P11	Los Pinos 1 PS (2778)	500	270	Expansion	2011-2015
P12	Preserve PS (2954)	211	40	New	2011-2015
P13	Encina PS (1916.5)	333	140	Expansion	2016-2020
P14	Porto Romano PS (1801)	236	280	New	2007-2010
P15	Ramsgate PS (1801)	236	4,000	New	2007-2010
P16	Ramsgate PS (1701)	136	800	New	2007-2010
P17	Canyon Hills Estates PS (2020)	305	80	New	2007-2010
P18	Sunset Ridge PS (2090)	191	1,270	New	2011-2015
P19	Waite PS (1601)	263	4,800	Replacement	2007-2010
P20	Cottonwood 1 PS (1750)	320	2,740	Expansion	2007-2010
P21	Village PS (1850)	450	1,200	New	2011-2015
P22	Village PS (2460)	645	1,080	New	2011-2015
P23	Bundy Canyon PS (1746)	330	5,000	Replacement	2011-2015
P24	Adelpha PS (1620)	223	670	Replacement	2016-2020
P25	Stage Ranch 1 PS (1882)	485	600	Expansion	2021-2025
P26	Sedco A Fire Pump (2201)	240	700	Expansion	2021-2025
P27	Sedco B Fire Pump (2201)	240	700	Expansion	2021-2025
P28	Iodine Springs PS (1650)	205	730	Expansion	2026-2030

Note:
Map IDs indicated in **Table 8-5** match proposed booster station locations shown on **Figure 8-3**

Table 8-6
Summary of Pipeline Recommendations – Year 2030 Conditions

Map ID	Name	Dia (in)	Length (ft)	Type	Phase
T01	Pacific Clay Pipeline (1601) from Horsethief to Alberhill Ranch	16	13,700	New	2016-2020
T02	Zone 1601 Pipeline from Porto Romano to 3rd Street and Dexter Avenue	30	8,500	New	2016-2020
T03	Porto Romano Reservoir Pipeline (1601)	16	3,000	New	2011-2015
T04	Zone 1434 pipeline from Temescal Canyon Road to Nichols Road along Lake Street	48	6,500	Parallel	2011-2015
T05	Zone 1434 pipeline from Lake Street to Terra Cotta Road along Nichols Road	48	4,100	Parallel	2007-2010
T06	Zone 1434 pipeline from Terra Cotta Road to Baker Reservoir along Nichols Road	36	7,700	New	2007-2010
T07	Zone 1601 pipeline from Terra Cotta Road to El Toro Reservoir along Nichols Road	20	11,400	New	2011-2015
T08	North Peak Pipeline (1968)	16	7,000	New	2011-2015
T09	North Peak Pipeline (1968)	16	6,200	New	2011-2015
T10	Porto Romano Pipeline (1601) from Rosetta to Main Street and First Street	16	7,500	New	2007-2010
T11	Zone 1801 pipeline from Rosetta Canyon 2 Reservoir to Rosetta Canyon 2 PS along Wasson Canyon Road	20	13,800	New	2007-2010
T12	Zone 1801 pipeline from proposed Greenwald 1801 Reservoir to Vacation Drive along Greenwald Avenue	16	20,100	Parallel	2011-2015
T13	Tuscany Hills North Pipeline (1801)	16	9,500	New	2007-2010
T14	Zone 1601 Pipeline from Porto Romano to Flint Street along Main Street	16	1,700	New	2016-2020
T15	Zone 1934 pipeline from Bundy Canyon Reservoir to Edward Avenue along Bundy Canyon Road	20	6,900	New	2011-2015
T16	Zone 1746 pipeline from Bundy Canyon PS to Bundy Canyon Reservoir along Bundy Canyon Road	20	12,400	Parallel	2011-2015
T17	Zone 1434 pipeline from Corydon Street to Hidden Trail along Diamond Drive	16	8,700	New	2011-2015
T18	Zone 1601 pipeline from Waite Reservoir to Waite Street along Cherry Street and Lemon Street	24	2,700	New	2007-2010
T19	Zone 1434 pipeline from Palomar Street to Waite St. PS along Central Avenue	16	2,400	Parallel	2007-2010
T20	Zone 1601 pipeline from Rosetta Canyon Drive to Wasson Canyon Road along Elsinore Hills Road	12	1,000	Parallel	2016-2020
T21	Zone 1434 pipeline from Railroad Canyon Reservoir to Railroad Canyon Road	42	2,600	Parallel	2016-2020
T22	Zone 1601 pipeline from Grand Avenue to Machado Street along Lancashire Drive	24	2,600	Replace	2021-2025
T23	Canyon Lake WTP Pipeline to Railroad Canyon Road	30	5,100	Parallel	2016-2020
T24	Zone 1601 pipeline from Baxter Road to Waite St. PS along Central Avenue	18	2,200	Parallel	2007-2010
T25	Zone 1601 Pipeline from Grunder Ave to Porto Romano	30	4,200	New	2011-2015
T26	Zone 1601 pipeline from Canyon View Drive to Railroad Canyon Drive along Canyon Estates Drive	36	3,600	Parallel	2016-2020
T27	Zone 1434 pipeline from Machado Street to Gregory Pl. along Grand Avenue	16	25,700	Parallel	2021-2025
T28	Zone 1434 pipeline from future PVP supply to Summerhill Drive and Railroad Canyon Road	42	7,700	Parallel	2016-2020
T29	Mountainous Northwest Pipeline (1801)	12	10,900	New	2016-2020
T30	Zone 1746 pipeline from Gafford Rd to Gafford Reservoir	12	1,600	Parallel	2026-2030
T31	**North Peak Reservoir Pipeline (2137)**	**12**	**6,100**	**New**	2011-2015

Table 8-6 (Continued)
Summary of Pipeline Recommendations – Year 2030 Conditions

Map ID	Name	Dia (in)	Length (ft)	Type	Phase
T32	North Peak Pipeline (2279)	12	4,400	New	2016-2020
T33	Zone 1871 pipeline from Lancashire Drive to Tomlin 1 Reservoir	12	2,100	Replace	2011-2015
T34	Preserve Pipeline (2313)	12	3,200	New	2011-2015
T35	Preserve Pipeline (2778)	12	20,400	New	2011-2015
T36	Preserve Pipeline (2954)	12	2,200	New	2011-2015
T37	Los Pinos 2 Pipeline (3501)	12	6,100	Replace	2011-2015
T38	Porto Romano Pipeline (1801)	12	1,400	New	2011-2015
T39	Tuscany Hills North Pipeline (1801)	12	1,500	New	2007-2010
T40	La Strada Pipeline (1940)	12	9,400	New	2007-2010
T41	Canyon Hills Estates Pipeline (1750)	12	9,600	New	2007-2010
T42	Canyon Hills Estates Pipeline (2020)	12	3,400	New	2007-2010
T43	County Water Co Pipeline (1934)	12	12,600	New	2011-2015
T44	Zone 1934 pipeline from Cottonwood Canyon Road to proposed Cottonwood 2 Reservoir	12	5,300	New	2007-2010
T45	Zone 1750 pipeline from Canyon Hills Road to Cottonwood Canyon Road	12	8,100	New	2007-2010
T46	Sunset Ridge Pipeline (1934)	12	6,300	New	2011-2015
T47	Sunset Ridge Pipeline (2090)	12	2,000	New	2011-2015
T48	Zone 1601 pipeline from Bundy Canyon Road to Baxter Road along Orange/Cherry/Waite Street.	16	8,000	Parallel	2007-2010
T49	Zone 1601 pipeline from Webley Street to Orange Street along Laguna Road	12	1,700	New	2007-2010
T50	Zone 1601 pipeline from Waite Street PS on Central Avenue to Gierson Avenue	12	2,700	New	2007-2010
T51	Village Pipeline (1434)	12	1,300	New	2011-2015
T52	Village Pipeline (1850)	12	8,600	New	2011-2015
T53	Village Pipeline (2460)	12	7,300	New	2011-2015
D01	Zone 1916.5 pipeline from Adelpha Street to Granado Street along Encina Drive	8	1,800	Parallel	2021-2025
Total Length (feet)			**356,500**		

Zone 1746/Zone 1750/Zone 1900/Zone 1934 (Cottonwood/Bundy Canyon)

It is recommended that the existing Bundy Canyon Reservoir be expanded by adding 3.2 MG of storage capacity to meet future system demands. In addition, it is recommended that the existing Bundy Canyon pump station feeding this zone be replaced with a new pump station (P23) having a total pumping capacity of 5,000 gpm. In order to deliver the additional water supply from the new pump station, a 20-inch diameter parallel pipeline along Bundy Canyon Road (T16) is recommended to improve transmission capacity from the pump station to the Bundy Canyon reservoir. Other operational changes recommended include expansion of the existing Zone 1900-Farm pump station to transfer water directly from Zone 1746 to Zone 1934. The proposed 20-inch diameter pipeline (T15), from the Bundy Canyon Reservoir to Edward Avenue along Bundy Canyon Road, will act as the discharge pipeline to the Zone 1934-Farm pump station and allows for the transfer of water from Zone 1746 to Zone 1934 In this recommended configuration, Zone 1900 will be supplied via an altitude valve from Zone 1934. Zone 2090 – Sunset Ridge will be fed via a pump station from Zone 1934.

The feasibility of pumping water from the PVP connection to Zone 1750 is also investigated. Such an option would provide added flexibility in system operations and would eliminate the need to upsize the pump station at Bundy Canyon to meet future demands in Zone 1746 and Zone 1934. However, future development in this area occurs prior to the proposed construction of the PVP connection and therefore, it is recommended that the District explore this option at a later date. In addition, it is recommended that the Zone 1750 – Cottonwood 1 pump station be expanded with the addition of two pumping units delivering an additional 2,800 gpm to this zone. Based on the intermediate demand projections, it is recommended that these units be added between the years 2007 and 2011.

A 1.0 MG storage reservoir is proposed to meet the storage requirements of Zone 1934 – County Water Company. A 12-inch diameter pipeline (T43) will connect Zone 1934 – County Water Company to Zone 1934 – Cottonwood 2 and will provide additional looping within the system. This pipeline will connect to the proposed 20-inch diameter pipeline (T15) to provide supply from the Zone 1746 – Farm pump station.

Zone 1968/Zone 2137/Zone 2279 (North Peak)

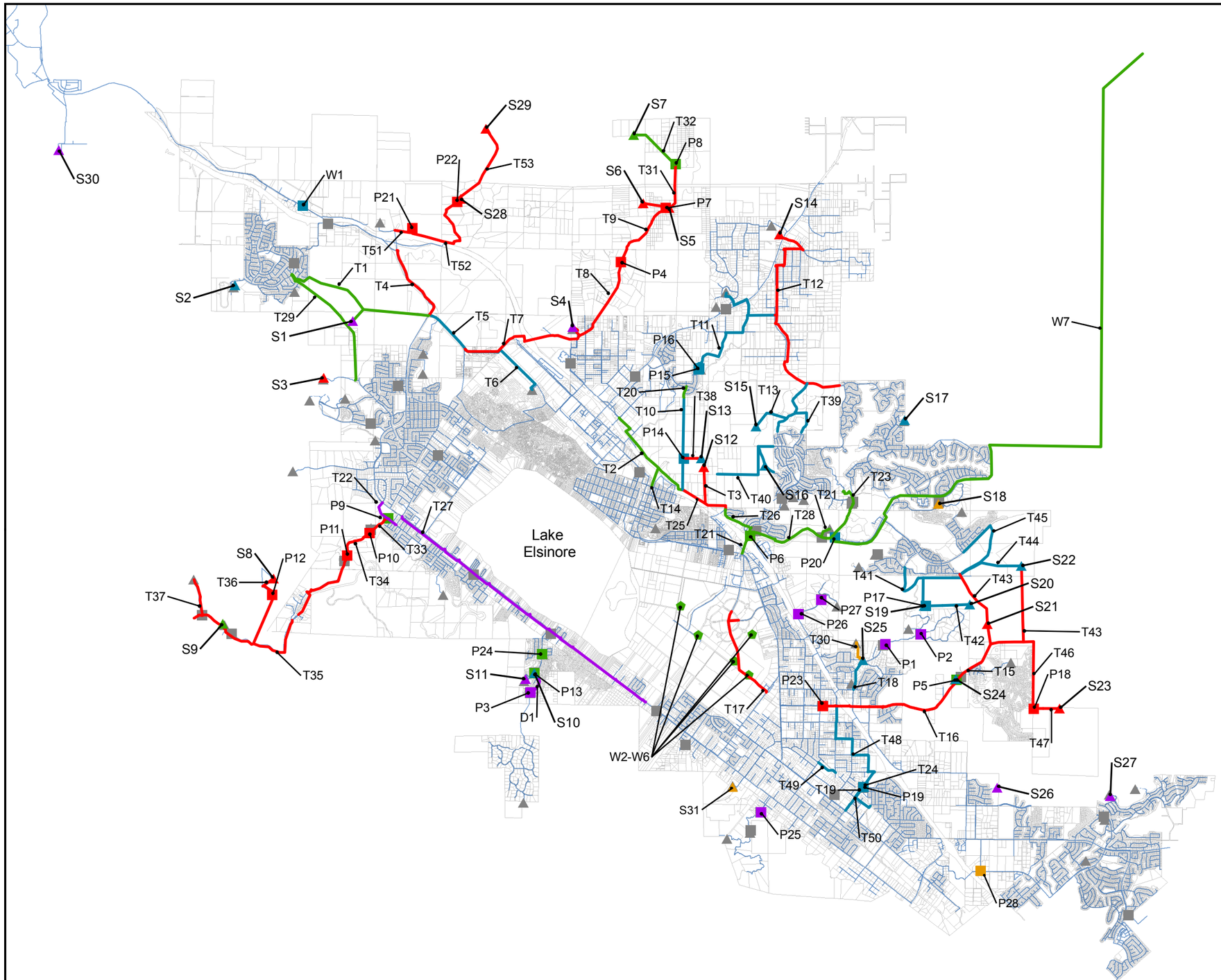
The North Peak area is located in the northeast section of the District. Three new pressure zones are identified for this region, Zone 1968, Zone 2137, and Zone 2279, as shown in **Figure 8-1**. North Peak is expected to be developed between the years 2011 and 2020. The North Peak development will be fed from the Zone 1601 – El Toro. Information regarding storage reservoirs and pump stations required to serve this area is provided in **Table 8-4** and **Table 8-5** respectively.

Zone 1850/Zone 2200/Zone 2460 (The Village)

The North Peak area is located in the northwest section of the District. Three new pressure zones are identified for this region, Zone 1850, Zone 2200, and Zone 2460, as shown on **Figure 8-1**. Each zone will have a booster pump station feeding the zone and a storage reservoir. The Village is expected to be developed between the years 2011 and 2015. The Village development should be fed from the Zone 1434 – Lake Street Reservoir, with the suction side of the Zone 1850 pump station at the Lake Street Reservoir. Zone 1850 is an intermediate zone recommended for possible growth in this region. Zone 2200 will be fed via PRVs from Zone 2460. Information regarding storage reservoirs and pump stations required to serve this area is provided in **Table 8-4** and **Table 8-5** respectively.

Zone 2954/ Zone 2778 (The Preserve)

The Preserve area is located in the southwest section of the District. Two new pressure zones are identified for this region, Zone 2778, and Zone 2954 as shown on **Figure 8-1**. The Preserve is expected to be developed between the years 2011 and 2020, with the area within Zone 2778 developing by year 2015. The Village development will be fed from the Zone 2313 – Tomlin. Booster stations at the Zone 2313-Tomlin tank will deliver water to Zone 2778. Zone 2954 will receive water from Zone 2778 via a proposed booster station at Zone 2778-Los Pinos tank site. Information regarding storage reservoirs and pump stations required to serve this area is provided in **Table 8-4** and **Table 8-5** respectively.



Legend

- Proposed Storage Tanks (Sxx)
- Proposed Pump Stations (Pxx)
- Proposed Wells (Wxx)
- Proposed Pipelines (Txx)
- Existing Storage Tanks
- Existing Pump Stations
- Existing Pipelines
- Water Bodies
- Year 2007-2010 Facility Improvements
- Year 2011-2015 Facility Improvements
- Year 2016-2020 Facility Improvements
- Year 2021-2025 Facility Improvements
- Year 2026-2030 Facility Improvements

*Note: "Wxx" is categorized as a water supply source. W1 is the TVP Pump Station, W2-W6 are the Back Basin Wells, and W7 is the Perris Valley Pipeline Extension. Refer to Table 9-3.

N

0 1 2 4 Miles

MWH

Figure 8-3
Summary of Proposed Recommendations
Year 2030 Conditions

Section 9
Capital Improvement Program

This section presents the recommended Capital Improvement Program (CIP) for the District through year 2030. The recommended projects allow the District to address existing system deficiencies and provide the facilities necessary to meet future growth.

9.1 PHASING

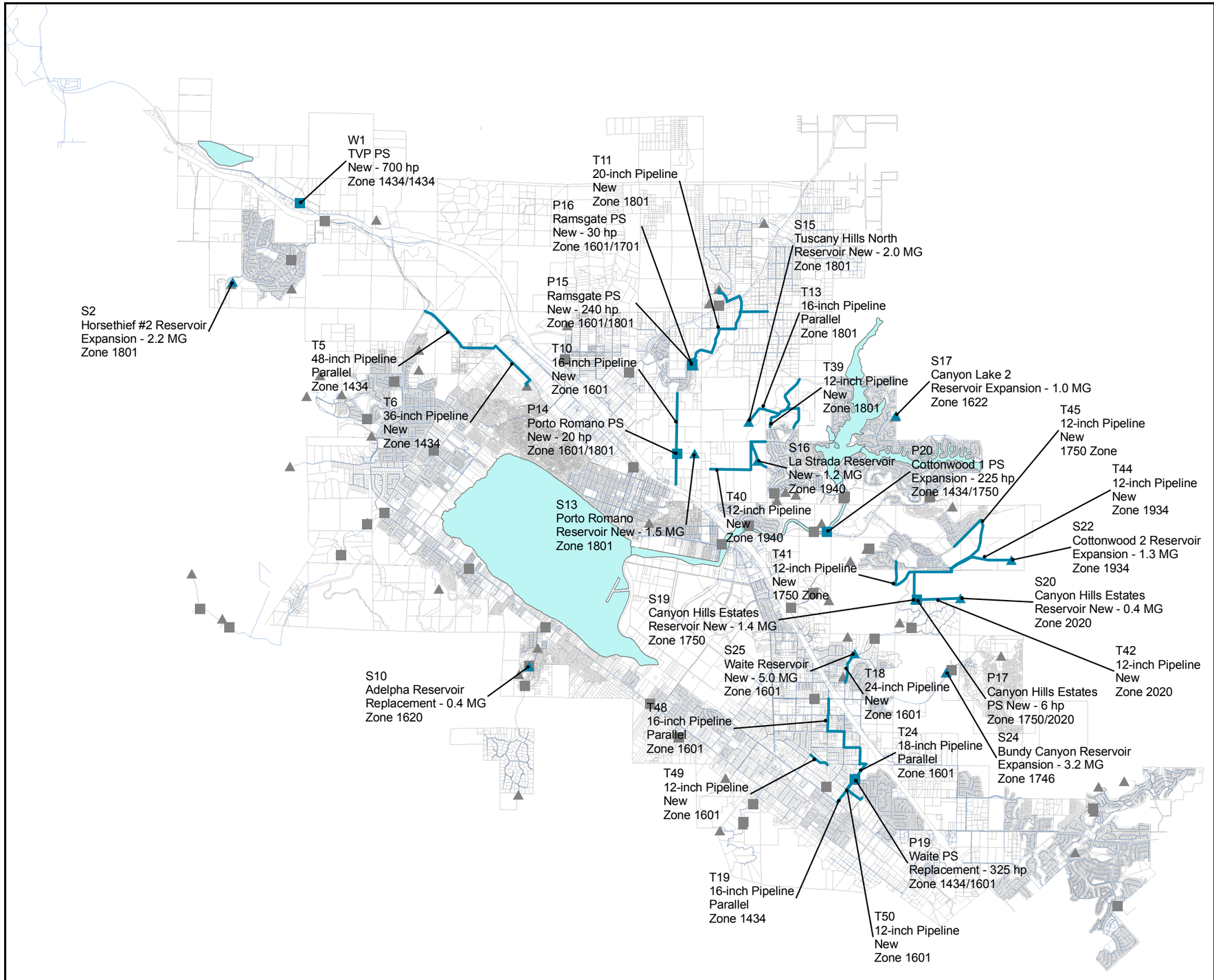
The system improvements are phased based upon the following considerations: anticipated construction of future land developments, the need to meet existing system deficiencies, improvement of the water system reliability, and cost allocation to obtain feasible annual CIP costs. In addition, the storage and booster pumping calculations presented in **Section 7** and **Section 8** for existing and year-2030 scenarios are also performed for all intermediate phases to identify the phase in which a deficiency occurs. All projects developed in the existing and future system analysis are prioritized and phased accordingly. Certain facilities that are required in order for a development to be connected to the distribution system are given a high priority for the phase in which the development is anticipated to come online. Existing system deficiencies that seriously affect the ability of the District to provide a reliable water supply to its customers are also given a high priority, while those existing system deficiencies that are not considered critical are placed in a later phasing category. The prioritizing of projects provides the District with a CIP that can be implemented with feasible annual costs. Without this prioritization, costs would be unreasonably high during the earlier phases to address all existing deficiencies as well as provide new facilities for growth. The phasing of all projects presented is only approximate, as the need for additional facilities is highly dependent upon the actual rate of demand growth and construction of new developments. The phasing of the recommended improvements is shown on **Figure 9-1** through **Figure 9-4**.

9.2 COST ESTIMATING BASIS

As discussed in **Section 6**, the opinions of probably construction costs are based on costs obtained from industry manufacturers as well as MWH's experience on similar water master planning projects. All unit costs are scaled to a February 2008 Engineering News Record (ENR) construction cost index for the Los Angeles region. A 30 percent contingency is included in the cost estimates. The engineering, administration, and legal costs are estimated to be 25 percent of construction costs. The engineering, administration, and legal costs also include typical services such as inspection, materials testing and construction management. The contractor's overhead and profit are included in the cost estimates. Costs for land acquisitions, rights-of-way and easements are not included.

9.3 RECOMMENDED CAPITAL IMPROVEMENT PROGRAM

A summary of the recommended CIP is shown in **Table 9-1**, with a total cost of approximately $489,000,000. The table shows a breakdown of costs into facility type (supply, storage, pump stations, pipelines) along with an incremental cost per phase and a total cost by each phase. The total cost by type and phase is shown graphically on and the total cost by funder and phase is shown graphically on Error! Reference source not found.. Approximately 76 percent of all recommended projects through 2030 (on a cost basis) are being required over the next fifteen years. The significant portion of projects phased for the earlier half of the planning period reflects the anticipated strong growth of new developments throughout the District service area over the next fifteen years.



Legend

- Proposed Storage Tanks (Sxx)
- Proposed Pump Stations (Pxx)
- Proposed Wells (Wxx)
- Proposed Pipelines (Txx)
- Existing Storage Tanks
- Existing Pump Stations
- Existing Pipelines
- Water Bodies
- Year 2007-2010 Facility Improvements
- Year 2011-2015 Facility Improvements
- Year 2016-2020 Facility Improvements
- Year 2021-2025 Facility Improvements
- Year 2026-2030 Facility Improvements

N

0 1 2 4 Miles

MWH

Figure 9-1
Facility Improvements
Year 2007-2010

T53
12-inch Pipeline
New
Zone 2460

S29
Village Reservoir
New - 2.1 MG
Zone 2460

T31
12-inch Pipeline
New
Zone 2137

S28
Village Reservoir
New - 0.4 MG
Zone 1850

S6
North Peak Reservoir
New - 1.6 MG
Zone 2137

S5
North Peak Reservoir
New - 1.7 MG
Zone 1968

P21
Village PS
New - 140 hp
Zone 1434/1850

T9
16-inch Pipeline
New
Zone 1968

S14
Greenwald Reservoir
New - 3.6 MG
Zone 1801

P22
Village PS
New - 180 hp
Zone 1850/2460

P7
North Peak PS
New - 65 hp
Zone 1968/2137

T51
12-inch Pipeline
New
Zone 1434

T52
12-inch Pipeline
New
Zone 1850

T12
16-inch Pipeline
Parallel
Zone 1801

T4
48-inch Pipeline
Parallel
Zone 1434

P4
North Peak PS
New - 200 hp
Zone 1601/1968

S3
Rice Canyon 1 Reservoir
Expansion - 2.2 MG
Zone 1801

T8
16-inch Pipeline
New
Zone 1601

T7
20-inch Pipeline
New
Zone 1601

S12
Porto Romano Reservoir
New - 6.0 MG
Zone 1601

T38
12-inch Pipeline
New
Zone 1801

P10
Tomlin 2 PS
Expansion - 45 hp
Zone 1871/2313

T33
12-inch Pipeline
Replacement
Zone 1871

T3
16-inch Pipeline
New
Zone 1601

S8
Preserve Reservoir
New - 0.2 MG
Zone 2954

T34
12-inch Pipeline
New
Zone 2313

T25
30-inch Pipeline
New
Zone 1601

T43
12-inch Pipeline
New
Zone 1934

T36
12-inch Pipeline
New
Zone 2954

P11
Los Pinos 1 PS
Expansion - 40 hp
Zone 2313/2778

S21
County Water Co
Reservoir New - 1.0 MG
Zone 1934

T46
12-inch Pipeline
New
Zone 1934

T15
20-inch Pipeline
New
Zone 1934

P12
Preserve PS
New - 2 hp
Zone 2778/2954

T37
12-inch Pipeline
Replacement
Zone 3501

T17
16-inch Pipeline
New
Zone 1434

S23
Sunset Ridge Reservoir
New - 2.0 MG
Zone 2090

T35
12-inch Pipeline
New
Zone 2778

P23
Bundy Canyon PS
Replacement - 425 hp
Zone 1434/1746

T16
20-inch Pipeline
Parallel
Zone 1746

T47
12-inch Pipeline
New
Zone 2090

P18
Sunset Ridge PS
New - 65 hp
Zone 1934/2090

Legend

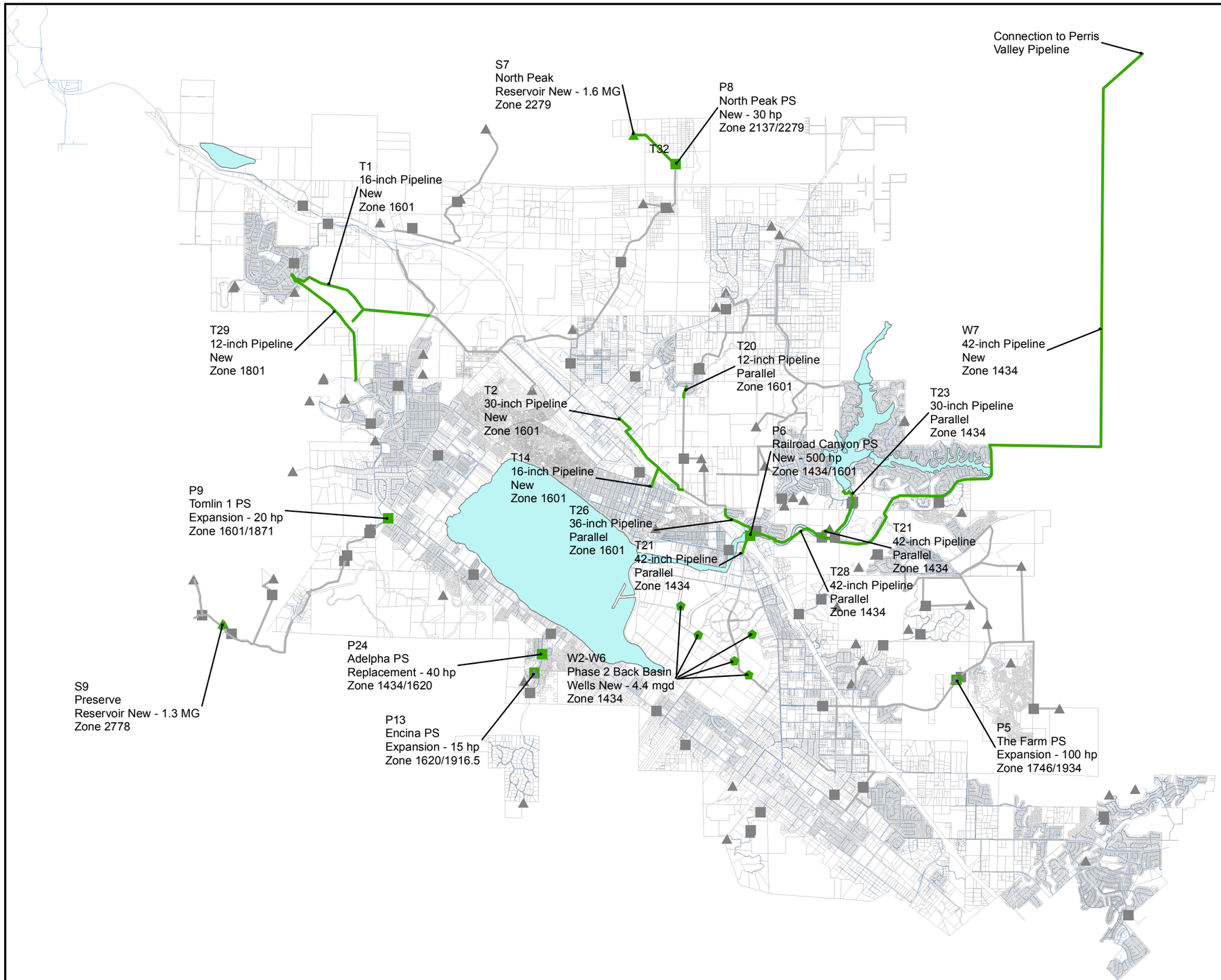
- Proposed Storage Tanks (Sxx)
- Proposed Pump Stations (Pxx)
- Proposed Wells (Wxx)
- Proposed Pipelines (Txx)
- Proposed Pipelines (Previous Phases)
- Existing Storage Tanks (includes previous phases)
- Existing Pump Stations (includes previous phases)
- Existing Pipelines
- Water Bodies
- Year 2007-2010 Facility Improvements
- Year 2011-2015 Facility Improvements
- Year 2016-2020 Facility Improvements
- Year 2021-2025 Facility Improvements
- Year 2026-2030 Facility Improvements

N

0 1 2 4 Miles

MWH

Figure 9-2
Facility Improvements
Year 2011-2015



Legend

- Proposed Storage Tanks (Sxx)
- Proposed Pump Stations (Pxx)
- Proposed Wells (Wxx)
- Proposed Pipelines (Txx)
- Proposed Pipelines (Previous Phases)
- Existing Storage Tanks (includes previous phases)
- Existing Pump Stations (includes previous phases)
- Existing Pipelines
- Water Bodies
- Year 2007-2010 Facility Improvements
- Year 2011-2015 Facility Improvements
- Year 2016-2020 Facility Improvements
- Year 2021-2025 Facility Improvements
- Year 2026-2030 Facility Improvements

N

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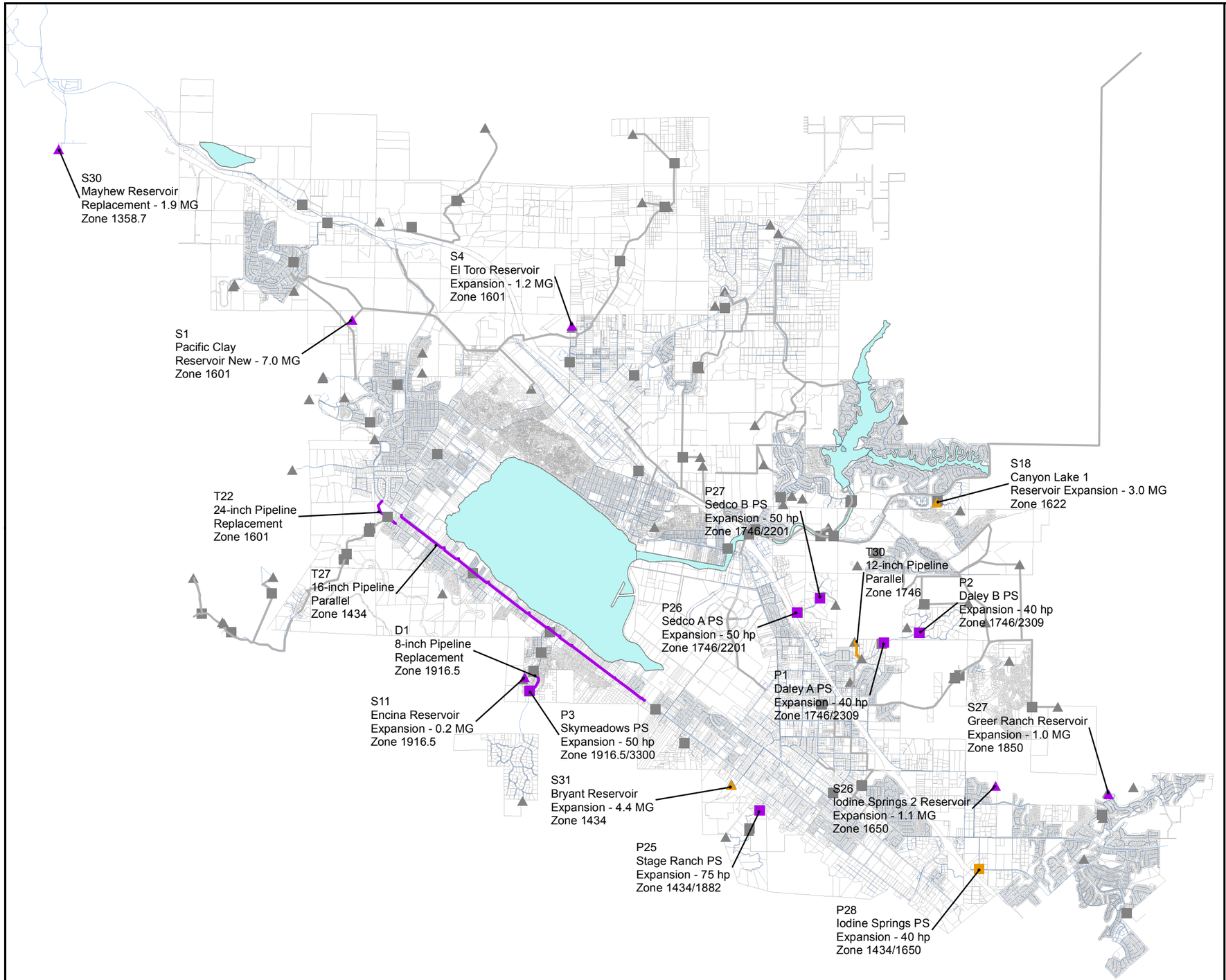
MWH

Figure 9-3
Facility Improvements
Year 2016-2020



Legend

- Proposed Storage Tanks (Sxx)
- Proposed Pump Stations (Pxx)
- Proposed Wells (Wxx)
- Proposed Pipelines (Txx)
- Proposed Pipelines (Previous Phases)
- Existing Storage Tanks (includes previous phases)
- Existing Pump Stations (includes previous phases)
- Existing Pipelines
- Water Bodies
- Year 2007-2010 Facility Improvements
- Year 2011-2015 Facility Improvements
- Year 2016-2020 Facility Improvements
- Year 2021-2025 Facility Improvements
- Year 2026-2030 Facility Improvements

N

0 1 2 4 Miles

MWH

Figure 9-4
Facility Improvements
Year 2021-2030

Table 9-1
Summary of Capital Improvement Program Costs by Project Type (2008 Dollars)

Phase	Water Supply (rounded)	Storage Tanks (rounded)	Pump Stations (rounded)	Pipelines (rounded)	Incremental Cost (rounded)	Cumulative Cost (rounded)
2007-2010	$7,600,000	$43,600,000	$12,900,000	$49,700,000	$113,600,000	$113,600,000
2011-2015	$0	$42,300,000	$18,600,000	$76,800,000	$137,600,000	$251,200,000
2016-2020	$76,300,000	$6,800,000	$9,900,000	$37,100,000	$130,000,000	$381,200,000
2021-2025	$0	$23,900,000	$5,700,000	$37,700,000	$67,200,000	$448,400,000
2026-2030	$3,500,000	$13,800,000	$800,000	$22,200,000	$40,300,000	$488,700,000
Total	**$87,400,000**	**$130,400,000**	**$47,900,000**	**$223,500,000**	**$488,700,000**	**$488,700,000**

Table 9-2
Summary of Capital Improvement Program Costs by Funder (2008 Dollars)

Phase	Existing Ratepayers (rounded)	Developer Funded (rounded)	Future CIP (rounded)
2007-2010	$26,900,000	$50,000,000	$36,800,000
2011-2015	$3,800,000	$90,600,000	$43,300,000
2016-2020	$100,000	$19,100,000	$110,800,000
2021-2025	$40,600,000	$4,900,000	$21,700,000
2026-2030	$29,200,000	$0	$11,100,000
Total	**$100,600,000**	**$164,600,000**	**$223,700,000**

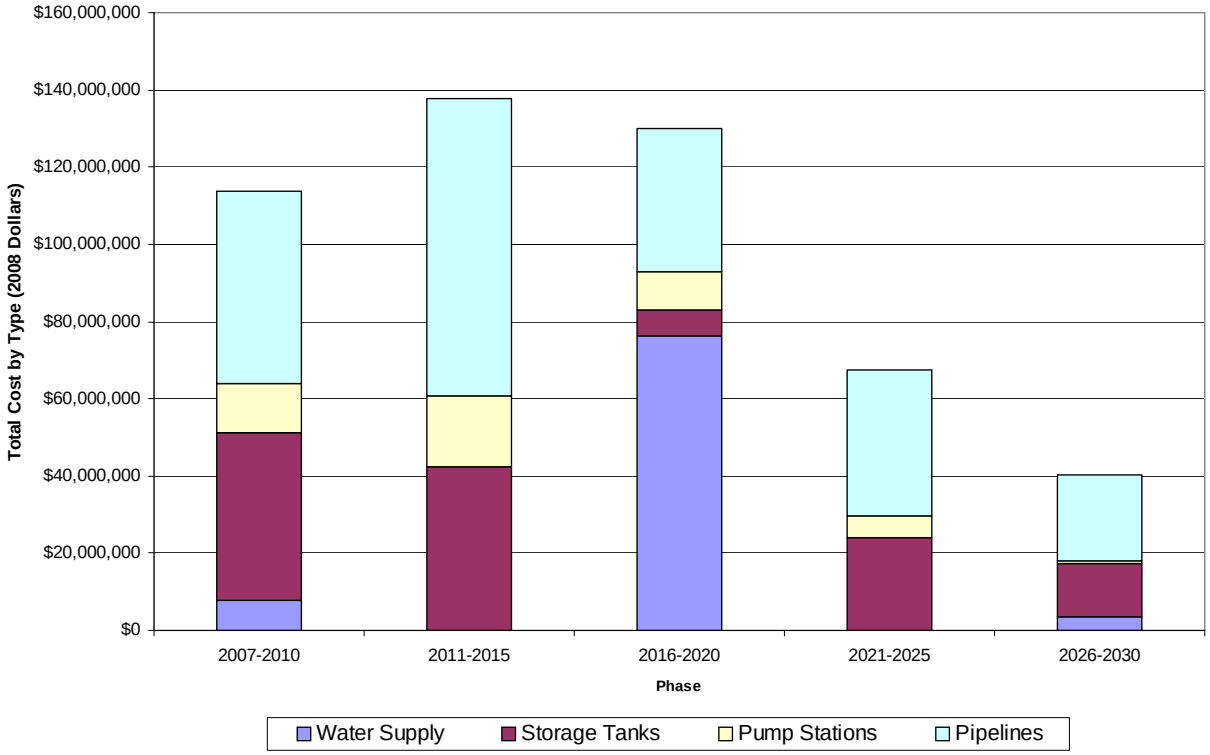


Figure 9-5
CIP Cost by Project Type and Phase

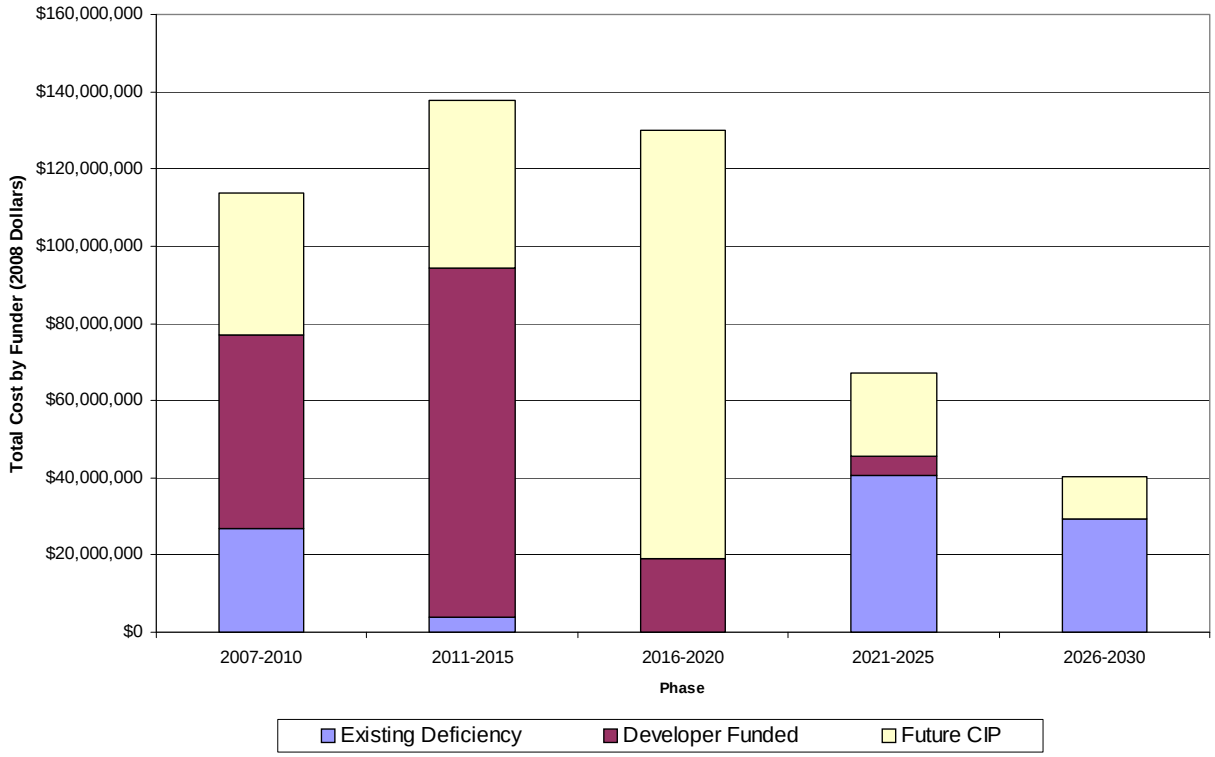


Figure 9-6
CIP Cost by Funder and Phase

The phasing and cost allocation of each individual project is shown on **Table 9-3** through **Table 9-6**. The tables are separated by facility type. To identify the recommendations geographically, each project has an ID which corresponds to the labels on **Figure 9-1** through **Figure 9-4**.

Table 9-3
CIP – Water Supply Facilities in Year 2008 Dollars

Map ID	Description	Phase	Quantity	Unit	Cost/Unit	Construction Cost	Contingency (30%)	Engineering & Admin (15%)	Construction Mgmt (10%)	Total Cost (rounded)	Existing Ratepayers (rounded)	Developer Funded (rounded)	Future CIP (rounded)
W1	TVP Pump Station[1]	2007-2010	700	hp	$7,000	$4,900,000	$1,470,000	$735,000	$490,000	$7,600,000	$0	$0	$7,600,000
W2-W6	Back Basin Phase 2 Wells (5 wells)	2016-2020	5	well	$1,210,300	$6,052,000	$1,816,000	$908,000	$606,000	$9,390,000	$0	$0	$9,390,000
W7	Perris Valley Pipeline Extension (42-inch diameter)	2016-2020	60,400	feet	$714	$43,126,000	$12,938,000	$6,469,000	$4,313,000	$66,850,000	$0	$0	$66,850,000
W8	Fluoridation	2026-2030	15	well	$150,000	$2,250,000	$675,000	$338,000	$225,000	$3,490,000	$0	$0	$3,490,000
Total						**$56,400,000**	**$16,900,000**	**$8,500,000**	**$5,700,000**	**$87,400,000**	**$0**	**$0**	**$87,400,000**

1. TWP Pump Station size and cost are due to change due to changing negotiations with Western MWD regarding use of this pipeline.

Table 9-4
CIP – Storage Reservoirs in Year 2008 Dollars

Map ID	Name	Size (MG)	Type	Phase	Unit	Cost/ Unit	Construction Cost	Contingency (30%)	Engineering & Admin (15%)	Construction Mgmt (10%)	Total Cost (rounded)	Existing Ratepayers (rounded)	Developer Funded (rounded)	Future CIP (rounded)
S01	Pacific Clay Reservoir (1601)	7.0	New	2021-2025	gal	$1.00	$7,000,000	$2,100,000	$1,050,000	$700,000	$10,850,000	$0	$3,370,000	$7,480,000
S02	Horsethief 2 Reservoir (1801)	2.2	Expansion	2007-2010	gal	$1.50	$3,300,000	$990,000	$495,000	$330,000	$5,120,000	$2,560,000	$0	$2,560,000
S03	Rice Canyon 1 (1801)	2.2	Expansion	2011-2015	gal	$1.50	$3,300,000	$990,000	$495,000	$330,000	$5,120,000	$0	$0	$5,120,000
S04	El Toro Reservoir (1601)	1.2	Expansion	2021-2025	gal	$1.50	$1,800,000	$540,000	$270,000	$180,000	$2,790,000	$0	$0	$2,790,000
S05	North Peak Reservoir (1968)	1.7	New	2011-2015	gal	$1.50	$2,550,000	$765,000	$383,000	$255,000	$3,960,000	$0	$1,980,000	$1,980,000
S06	North Peak Reservoir (2137)	1.6	New	2011-2015	gal	$1.50	$2,400,000	$720,000	$360,000	$240,000	$3,720,000	$0	$3,310,000	$410,000
S07	North Peak Reservoir (2279)	1.6	New	2016-2020	gal	$1.50	$2,400,000	$720,000	$360,000	$240,000	$3,720,000	$0	$3,720,000	$0
S08	Preserve Reservoir (2954)	0.2	New	2011-2015	gal	$3.00	$600,000	$180,000	$90,000	$60,000	$930,000	$0	$930,000	$0
S09	Preserve Reservoir (2778)	1.3	New	2016-2020	gal	$1.50	$1,950,000	$585,000	$293,000	$195,000	$3,030,000	$1,050,000	$1,980,000	$0
S10	Adelpha Reservoir (1620)	0.4	Replacement	2007-2010	gal	$3.00	$1,200,000	$360,000	$180,000	$120,000	$1,860,000	$1,580,000	$0	$280,000
S11	Encina Reservoir (1916.5)	0.2	Expansion	2021-2025	gal	$3.00	$600,000	$180,000	$90,000	$60,000	$930,000	$0	$0	$930,000
S12	Porto Romano Reservoir (1601)	6.0	New	2011-2015	gal	$1.00	$6,000,000	$1,800,000	$900,000	$600,000	$9,300,000	$0	$690,000	$8,610,000
S13	Porto Romano Reservoir (1801)	1.5	New	2007-2010	gal	$1.50	$2,250,000	$675,000	$338,000	$225,000	$3,490,000	$0	$3,490,000	$0
S14	Greenwald Reservoir (1801)	3.6	New	2011-2015	gal	$1.20	$4,320,000	$1,296,000	$648,000	$432,000	$6,700,000	$450,000	$2,160,000	$4,100,000
S15	Tuscany Hills North Reservoir (1801)	2.0	New	2007-2010	gal	$1.50	$3,000,000	$900,000	$450,000	$300,000	$4,650,000	$0	$4,650,000	$0
S16	La Strada Reservoir (1940)	1.2	New	2007-2010	gal	$1.50	$1,800,000	$540,000	$270,000	$180,000	$2,790,000	$0	$2,790,000	$0
S17	Canyon Lake N 2 Reservoir (1622)	1.0	Expansion	2007-2010	gal	$1.50	$1,500,000	$450,000	$225,000	$150,000	$2,330,000	$1,030,000	$0	$1,300,000
S18	Canyon Lake N 1 Reservoir (1622)	3.0	Expansion	2026-2030	gal	$1.50	$4,500,000	$1,350,000	$675,000	$450,000	$6,980,000	$6,980,000	$0	$0
S19	Canyon Hills Estates Reservoir (1750)	1.4	New	2007-2010	gal	$1.50	$2,100,000	$630,000	$315,000	$210,000	$3,260,000	$0	$3,260,000	$0
S20	Canyon Hills Estates Reservoir (2020)	0.4	New	2007-2010	gal	$3.00	$1,200,000	$360,000	$180,000	$120,000	$1,860,000	$0	$1,860,000	$0
S21	County Water Co Reservoir (1934)	1.0	New	2011-2015	gal	$1.50	$1,500,000	$450,000	$225,000	$150,000	$2,330,000	$0	$0	$2,330,000
S22	Cottonwood 2 Reservoir (1934)	1.3	New	2007-2010	gal	$1.50	$1,950,000	$585,000	$293,000	$195,000	$3,030,000	$440,000	$1,760,000	$830,000
S23	Sunset Ridge Reservoir (2090)	2.0	New	2011-2015	gal	$1.50	$3,000,000	$900,000	$450,000	$300,000	$4,650,000	$0	$4,650,000	$0
S24	Bundy Canyon Reservoir (1746)	3.2	Expansion	2007-2010	gal	$1.50	$4,800,000	$1,440,000	$720,000	$480,000	$7,440,000	$1,880,000	$0	$5,560,000
S25	Waite Reservoir (1601)	5.0	New	2007-2010	gal	$1.00	$5,000,000	$1,500,000	$750,000	$500,000	$7,750,000	$5,950,000	$0	$1,800,000
S26	Inland Valley Springs 2 Reservoir (1650)	1.1	New	2021-2025	gal	$1.50	$1,650,000	$495,000	$248,000	$165,000	$2,560,000	$0	$0	$2,560,000
S27	Greer Ranch 1 Ranch Reservoir (1850)	1.0	Expansion	2021-2025	gal	$1.50	$1,500,000	$450,000	$225,000	$150,000	$2,330,000	$2,330,000	$0	$0
S28	Village Reservoir (1850)	0.4	New	2011-2015	gal	$3.00	$1,200,000	$360,000	$180,000	$120,000	$1,860,000	$0	$1,860,000	$0
S29	Village Reservoir (2460)	1.6	New	2011-2015	gal	$1.50	$2,400,000	$720,000	$360,000	$240,000	$3,720,000	$0	$3,400,000	$320,000
S30	Mayhew Reservoir (1358.7)	1.9	Replacement	2021-2025	gal	$1.50	$2,850,000	$855,000	$428,000	$285,000	$4,420,000	$3,300,000	$0	$1,120,000
S31	Bryant Reservoir (1434)	4.4	Expansion	2026-2030	gal	$1.00	$4,400,000	$1,320,000	$660,000	$440,000	$6,820,000	$0	$0	$6,820,000
Total							**$84,020,000**	**$25,206,000**	**$12,606,000**	**$8,402,000**	**$130,300,000**	**$27,600,000**	**$45,900,000**	**$57,000,000**

Table 9-5
CIP – Booster Pump Stations in Year 2008 Dollars

Map ID	Name	Type	Phase	Size / Capacity	Unit	Cost/Unit	Construction Cost	Contingency (30%)	Engineering & Admin (15%)	Construction Mgmt (10%)	Total Cost (rounded)	Existing Ratepayers (rounded)	Developer Funded (rounded)	Future CIP (rounded)
P01	Daley A PS (2309)	Expansion	2021-2025	40	hp	$12,000	$480,000	$144,000	$72,000	$48,000	$750,000	$750,000	$0	$0
P02	Daley B PS (2309)	Expansion	2021-2025	40	hp	$12,000	$480,000	$144,000	$72,000	$48,000	$750,000	$750,000	$0	$0
P03	Skymeadows PS (3300)	Expansion	2021-2025	50	hp	$12,000	$600,000	$180,000	$90,000	$60,000	$930,000	$930,000	$0	$0
P04	North Peak PS (1968)	New	2011-2015	200	hp	$10,000	$2,000,000	$600,000	$300,000	$200,000	$3,100,000	$0	$2,530,000	$580,000
P05	Farm PS (1934)	Expansion	2016-2020	100	hp	$11,000	$1,100,000	$330,000	$165,000	$110,000	$1,710,000	$0	$0	$1,710,000
P06	Railroad Canyon PS (1601)	New	2016-2020	500	hp	$8,000	$4,000,000	$1,200,000	$600,000	$400,000	$6,200,000	$0	$0	$6,200,000
P07	North Peak PS (2137)	New	2011-2015	65	hp	$12,000	$780,000	$234,000	$117,000	$78,000	$1,210,000	$0	$1,140,000	$80,000
P08	North Peak PS (2279)	New	2016-2020	30	hp	$12,000	$360,000	$108,000	$54,000	$36,000	$560,000	$0	$560,000	$0
P09	Tomlin 1 PS (1871)	Expansion	2016-2020	20	hp	$12,000	$240,000	$72,000	$36,000	$24,000	$380,000	$0	$380,000	$0
P10	Tomlin 2 PS (2313)	Expansion	2011-2015	45	hp	$12,000	$540,000	$162,000	$81,000	$54,000	$840,000	$0	$840,000	$0
P11	Los Pinos 1 PS (2778)	Expansion	2011-2015	40	hp	$12,000	$480,000	$144,000	$72,000	$48,000	$750,000	$0	$750,000	$0
P12	Preserve PS (2954)	New	2011-2015	2	hp	$12,000	$24,000	$8,000	$4,000	$3,000	$40,000	$0	$40,000	$0
P13	Encina PS (1916.5)	Expansion	2016-2020	15	hp	$12,000	$180,000	$54,000	$27,000	$18,000	$280,000	$0	$0	$280,000
P14	Porto Romano PS (1801)	New	2007-2010	20	hp	$12,000	$240,000	$72,000	$36,000	$24,000	$380,000	$0	$380,000	$0
P15	Ramsgate PS (1801)	New	2007-2010	240	hp	$10,000	$2,400,000	$720,000	$360,000	$240,000	$3,720,000	$0	$520,000	$3,210,000
P16	Ramsgate PS (1701)	New	2007-2010	30	hp	$12,000	$360,000	$108,000	$54,000	$36,000	$560,000	$0	$0	$560,000
P17	Canyon Hills Estates PS (2020)	New	2007-2010	6	hp	$12,000	$72,000	$22,000	$11,000	$8,000	$120,000	$0	$120,000	$0
P18	Sunset Ridge PS (2090)	New	2011-2015	65	hp	$12,000	$780,000	$234,000	$117,000	$78,000	$1,210,000	$0	$1,210,000	$0
P19	Waite PS (1601)	Replacement	2007-2010	325	hp	$9,000	$2,925,000	$878,000	$439,000	$293,000	$4,540,000	$4,540,000	$0	$0
P20	Cottonwood 1 PS (1750)	Expansion	2007-2010	225	hp	$10,000	$2,250,000	$675,000	$338,000	$225,000	$3,490,000	$0	$2,380,000	$1,120,000
P21	Village PS (1850)	New	2011-2015	140	hp	$11,000	$1,540,000	$462,000	$231,000	$154,000	$2,390,000	$0	$1,950,000	$450,000
P22	Village PS (2460)	New	2011-2015	180	hp	$11,000	$1,980,000	$594,000	$297,000	$198,000	$3,070,000	$0	$2,780,000	$300,000
P23	Bundy Canyon PS (1746)	Replacement	2011-2015	425	hp	$9,000	$3,825,000	$1,148,000	$574,000	$383,000	$5,930,000	$3,320,000	$0	$2,620,000
P24	Adelpha PS (1620)	Replacement	2016-2020	40	hp	$12,000	$480,000	$144,000	$72,000	$48,000	$750,000	$550,000	$0	$210,000
P25	Stage Ranch 1 Ranch PS (1882)	Expansion	2021-2025	75	hp	$12,000	$900,000	$270,000	$135,000	$90,000	$1,400,000	$1,400,000	$0	$0
P26	Sedco A PS (2201)	Expansion	2021-2025	50	hp	$12,000	$600,000	$180,000	$90,000	$60,000	$930,000	$930,000	$0	$0
P27	Sedco B PS (2201)	Expansion	2021-2025	50	hp	$12,000	$600,000	$180,000	$90,000	$60,000	$930,000	$930,000	$0	$0
P28	Inland Valley Springs PS (1650)	Expansion	2026-2030	40	hp	$12,000	$480,000	$144,000	$72,000	$48,000	$750,000	$0	$0	$750,000
Total							**$30,696,000**	**$9,211,000**	**$4,606,000**	**$3,072,000**	**$47,700,000**	**$14,100,000**	**$15,600,000**	**$18,100,000**

Table 9-6
CIP – Pipelines in Year 2008 Dollars

Map ID	Name	Diameter (in)	Length (ft)	Type	Phase	Unit	Cost/ Unit	Construction Cost	Contingency (30%)	Engineering & Admin (15%)	Construction Mgmt (10%)	Total Cost (rounded)	Existing Ratepayers (rounded)	Developer Funded (rounded)	Future CIP (rounded)
T01	Pacific Clay Pipeline (1601) from Horsethief to Alberhill Ranch	16	13,700	New	2016-2020	ft	$288	$3,946,000	$1,184,000	$592,000	$395,000	$6,120,000	$0	$6,120,000	$0
T02	Zone 1601 Pipeline from Porto Romano to 3rd Street and Dexter Avenue	30	8,500	New	2016-2020	ft	$450	$3,825,000	$1,148,000	$574,000	$383,000	$5,930,000	$0	$3,170,000	$2,760,000
T03	Porto Romano Reservoir Pipeline (1601)	16	3,000	New	2011-2015	ft	$288	$864,000	$260,000	$130,000	$87,000	$1,350,000	$0	$1,350,000	$0
T04	Zone 1434 pipeline from Temescal Canyon Road to Nichols Road along Lake Street	48	6,500	Parallel	2011-2015	ft	$864	$5,616,000	$1,685,000	$843,000	$562,000	$8,710,000	$0	$2,910,000	$5,800,000
T05	Zone 1434 pipeline from Lake Street to Terra Cotta Road along Nichols Road	48	4,100	Parallel	2007-2010	ft	$864	$3,543,000	$1,063,000	$532,000	$355,000	$5,500,000	$0	$1,840,000	$3,660,000
T06	Zone 1434 pipeline from Terra Cotta Road to Baker Reservoir along Nichols Road	36	7,700	New	2007-2010	ft	$576	$4,436,000	$1,331,000	$666,000	$444,000	$6,880,000	$0	$0	$6,880,000
T07	Zone 1601 pipeline from Terra Cotta Road to El Toro Reservoir along Nichols Road	20	11,400	New	2011-2015	ft	$320	$3,648,000	$1,095,000	$548,000	$365,000	$5,660,000	$0	$4,250,000	$1,410,000
T08	North Peak Pipeline (1601)	16	7,000	New	2011-2015	ft	$288	$2,016,000	$605,000	$303,000	$202,000	$3,130,000	$0	$3,130,000	$0
T09	North Peak Pipeline (1968)	16	6,200	New	2011-2015	ft	$288	$1,786,000	$536,000	$268,000	$179,000	$2,770,000	$0	$2,770,000	$0
T10	Porto Romano Pipeline (1601) from Rosetta to Main Street and First Street	16	7,500	New	2007-2010	ft	$288	$2,160,000	$648,000	$324,000	$216,000	$3,350,000	$0	$2,790,000	$560,000
T11	Zone 1801 pipeline from Rosetta Canyon 2 Reservoir to Rosetta Canyon 2 PS along Wasson Canyon Road	20	13,800	New	2007-2010	ft	$320	$4,416,000	$1,325,000	$663,000	$442,000	$6,850,000	$0	$5,140,000	$1,710,000
T12	Zone 1801 pipeline from proposed Greenwald 1801 Reservoir to Vacation Drive along Greenwald Avenue	16	20,100	Parallel	2011-2015	ft	$288	$5,789,000	$1,737,000	$869,000	$579,000	$8,980,000	$0	$7,480,000	$1,500,000
T13	Tuscany Hills North Pipeline (1801)	16	9,500	New	2007-2010	ft	$288	$2,736,000	$821,000	$411,000	$274,000	$4,250,000	$0	$4,250,000	$0
T14	Zone 1601 Pipeline from Porto Romano to Flint Street along Main Street	16	1,700	New	2016-2020	ft	$288	$490,000	$147,000	$74,000	$49,000	$760,000	$0	$0	$760,000
T15	Zone 1934 pipeline from Bundy Canyon Reservoir to Edward Avenue along Bundy Canyon Road	20	6,900	New	2011-2015	ft	$320	$2,208,000	$663,000	$332,000	$221,000	$3,430,000	$0	$0	$3,430,000

Table 9 6 (Continued)
CIP – Pipelines in Year 2008 Dollars

Map ID	Name	Diameter (in)	Length (ft)	Type	Phase	Unit	Cost/ Unit	Construction Cost	Contingency (30%)	Engineering & Admin (15%)	Construction Mgmt (10%)	Total Cost (rounded)	Existing Ratepayers (rounded)	Developer Funded (rounded)	Future CIP (rounded)
T16	Zone 1746 pipeline from Bundy Canyon PS to Bundy Canyon Reservoir along Bundy Canyon Road	20	12,400	Parallel	2011-2015	ft	$320	$3,968,000	$1,191,000	$596,000	$397,000	$6,160,000	$0	$0	$6,160,000
T17	Zone 1434 pipeline from Corydon Street to Hidden Trail along Diamond Drive	16	8,700	New	2011-2015	ft	$288	$2,506,000	$752,000	$376,000	$251,000	$3,890,000	$0	$3,890,000	$0
T18	Zone 1601 pipeline from Waite Reservoir to Waite Street along Cherry Street and Lemon Street	24	2,700	New	2007-2010	ft	$360	$972,000	$292,000	$146,000	$98,000	$1,510,000	$1,510,000	$0	$0
T19	Zone 1434 pipeline from Palomar Street to Waite St. PS along Central Avenue	16	2,400	Parallel	2007-2010	ft	$288	$692,000	$208,000	$104,000	$70,000	$1,080,000	$1,080,000	$0	$0
T20	Zone 1601 pipeline from Rosetta Canyon Drive to Wasson Canyon Road along Elsinore Hills Road	12	1,000	Parallel	2016-2020	ft	$240	$240,000	$72,000	$36,000	$24,000	$380,000	$0	$0	$380,000
T21	Zone 1434 pipeline from Railroad Canyon Reservoir to Railroad Canyon Road	42	2,600	Parallel	2016-2020	ft	$714	$1,857,000	$558,000	$279,000	$186,000	$2,880,000	$0	$0	$2,880,000
T22	Zone 1601 pipeline from Grand Avenue to Machado Street along Lancashire Drive	16	2,600	Parallel	2021-2025	ft	$288	$749,000	$225,000	$113,000	$75,000	$1,170,000	$0	$0	$1,170,000
T23	Canyon Lake WTP Pipeline to Railroad Canyon Road	30	5,100	Parallel	2016-2020	ft	$450	$2,295,000	$689,000	$345,000	$230,000	$3,560,000	$0	$0	$3,560,000
T24	Zone 1601 pipeline from Baxter Road to Waite St. PS along Central Avenue	18	2,200	Parallel	2007-2010	ft	$306	$674,000	$203,000	$102,000	$68,000	$1,050,000	$1,050,000	$0	$0
T25	Zone 1601 Pipeline from Grunder Ave to Porto Romano	30	4,200	New	2011-2015	ft	$450	$1,890,000	$567,000	$284,000	$189,000	$2,930,000	$0	$1,570,000	$1,360,000
T26	Zone 1601 pipeline from Canyon View Drive to Railroad Canyon Drive along Canyon Estates Drive	36	3,600	Parallel	2016-2020	ft	$576	$2,074,000	$623,000	$312,000	$208,000	$3,220,000	$0	$0	$3,220,000
T27	Zone 1434 pipeline from Machado Street to Gregory Pl. along Grand Avenue	24	25,700	Replace	2021-2025	ft	$360	$9,252,000	$2,776,000	$1,388,000	$926,000	$14,350,000	$7,180,000	$0	$7,180,000
T28	Zone 1434 pipeline from future PVP supply to Summerhill Drive and Railroad Canyon Road	42	7,700	Parallel	2016-2020	ft	$714	$5,498,000	$1,650,000	$825,000	$550,000	$8,530,000	$0	$0	$8,530,000
T29	Mountainous Northwest Pipeline (1801)	12	10,900	New	2016-2020	ft	$240	$2,616,000	$785,000	$393,000	$262,000	$4,060,000	$0	$0	$4,060,000
T30	Zone 1746 pipeline from Gafford Rd to Gafford Reservoir	12	1,600	Parallel	2026-2030	ft	$240	$384,000	$116,000	$58,000	$39,000	$600,000	$600,000	$0	$0
T31	North Peak Reservoir Pipeline (2137)	12	6,100	New	2011-2015	ft	$240	$1,464,000	$440,000	$220,000	$147,000	$2,280,000	$0	$2,280,000	$0

Table 9 6 (Continued)
CIP – Pipelines in Year 2008 Dollars

Map ID	Name	Diameter (in)	Length (ft)	Type	Phase	Unit	Cost/ Unit	Construction Cost	Contingency (30%)	Engineering & Admin (15%)	Construction Mgmt (10%)	Total Cost (rounded)	Existing Ratepayers (rounded)	Developer Funded (rounded)	Future CIP (rounded)
T32	North Peak Pipeline (2279)	12	4,400	New	2016-2020	ft	$240	$1,056,000	$317,000	$159,000	$106,000	$1,640,000	$0	$1,640,000	$0
T33	Zone 1871 pipeline from Lancashire Drive to Tomlin 1 Reservoir	12	2,100	Replace	2011-2015	ft	$240	$504,000	$152,000	$76,000	$51,000	$790,000	$0	$790,000	$0
T34	Preserve Pipeline (2313)	12	3,200	New	2011-2015	ft	$240	$768,000	$231,000	$116,000	$77,000	$1,200,000	$0	$1,200,000	$0
T35	Preserve Pipeline (2778)	12	20,400	New	2011-2015	ft	$240	$4,896,000	$1,469,000	$735,000	$490,000	$7,590,000	$0	$7,590,000	$0
T36	Preserve Pipeline (2954)	12	2,200	New	2011-2015	ft	$240	$528,000	$159,000	$80,000	$53,000	$820,000	$0	$820,000	$0
T37	Los Pinos 2 Pipeline (3501)	12	6,100	Replace	2011-2015	ft	$240	$1,464,000	$440,000	$220,000	$147,000	$2,280,000	$0	$2,280,000	$0
T38	Porto Romano Pipeline (1801)	12	1,400	New	2011-2015	ft	$240	$336,000	$101,000	$51,000	$34,000	$530,000	$0	$530,000	$0
T39	Tuscany Hills North Pipeline (1801)	12	1,500	New	2007-2010	ft	$240	$360,000	$108,000	$54,000	$36,000	$560,000	$0	$560,000	$0
T40	La Strada Pipeline (1940)	12	9,400	New	2007-2010	ft	$240	$2,256,000	$677,000	$339,000	$226,000	$3,500,000	$0	$3,500,000	$0
T41	Canyon Hills Estates Pipeline (1750)	12	9,600	New	2007-2010	ft	$240	$2,304,000	$692,000	$346,000	$231,000	$3,580,000	$0	$3,580,000	$0
T42	Canyon Hills Estates Pipeline (2020)	12	3,400	New	2007-2010	ft	$240	$816,000	$245,000	$123,000	$82,000	$1,270,000	$0	$1,270,000	$0
T43	County Water Co Pipeline (1934)	12	12,600	New	2011-2015	ft	$240	$3,024,000	$908,000	$454,000	$303,000	$4,690,000	$0	$0	$4,690,000
T44	Zone 1934 pipeline from Cottonwood Canyon Road to proposed Cottonwood 2 Reservoir	12	5,300	New	2007-2010	ft	$240	$1,272,000	$382,000	$191,000	$128,000	$1,980,000	$0	$1,980,000	$0
T45	Zone 1750 pipeline from Canyon Hills Road to Cottonwood Canyon Road	12	8,100	New	2007-2010	ft	$240	$1,944,000	$584,000	$292,000	$195,000	$3,020,000	$0	$3,020,000	$0
T46	Sunset Ridge Pipeline (1934)	12	6,300	New	2011-2015	ft	$240	$1,512,000	$454,000	$227,000	$152,000	$2,350,000	$0	$2,350,000	$0
T47	Sunset Ridge Pipeline (2090)	12	2,000	New	2011-2015	ft	$240	$480,000	$144,000	$72,000	$48,000	$750,000	$0	$750,000	$0
T48	Zone 1601 pipeline from Bundy Canyon Road to Baxter Road along Orange/Cherry/Waite Street.	16	8,000	Parallel	2007-2010	ft	$288	$2,304,000	$692,000	$346,000	$231,000	$3,580,000	$3,580,000	$0	$0
T49	Zone 1601 pipeline from Webley Street to Orange Street along Laguna Road	12	1,700	New	2007-2010	ft	$240	$408,000	$123,000	$62,000	$41,000	$640,000	$640,000	$0	$0
T50	Zone 1601 pipeline from Waite Street PS on Central Avenue to Gierson Avenue	12	2,700	New	2007-2010	ft	$240	$648,000	$195,000	$98,000	$65,000	$1,010,000	$1,010,000	$0	$0

Table 9 6 (Continued)
CIP – Pipelines in Year 2008 Dollars

Map ID	Name	Diameter (in)	Length (ft)	Type	Phase	Unit	Cost/ Unit	Construction Cost	Contingency (30%)	Engineering & Admin (15%)	Construction Mgmt (10%)	Total Cost (rounded)	Existing Ratepayers (rounded)	Developer Funded (rounded)	Future CIP (rounded)
T51	Village Pipeline (1434)	12	1,300	New	2011-2015	ft	$240	$312,000	$94,000	$47,000	$32,000	$490,000	$0	$490,000	$0
T52	Village Pipeline (1850)	12	8,600	New	2011-2015	ft	$240	$2,064,000	$620,000	$310,000	$207,000	$3,210,000	$0	$3,210,000	$0
T53	Village Pipeline (2460)	12	7,300	New	2011-2015	ft	$240	$1,752,000	$526,000	$263,000	$176,000	$2,720,000	$0	$2,720,000	$0
D01	Zone 1916.5 pipeline from Adelpha Street to Granado Street along Encina Drive	8	1,800	Parallel	2021-2025	ft	$176	$317,000	$96,000	$48,000	$32,000	$500,000	$500,000	$0	$0
Fxx[1]	Various Fireflow Improvements	Various	176,900	Various	2021-2030	ft	N/A	$26,921,000	$8,192,000	$4,157,000	$2,805,000	$43,190,000	$43,190,000	$0	$0
Total								$142,856,000	$42,996,000	$21,572,000	$14,421,000	$223,290,000	$60,390,000	$91,300,000	$71,700,000

1. Detailed List of Fireflow Improvements included in Appendix D.

Appendix A
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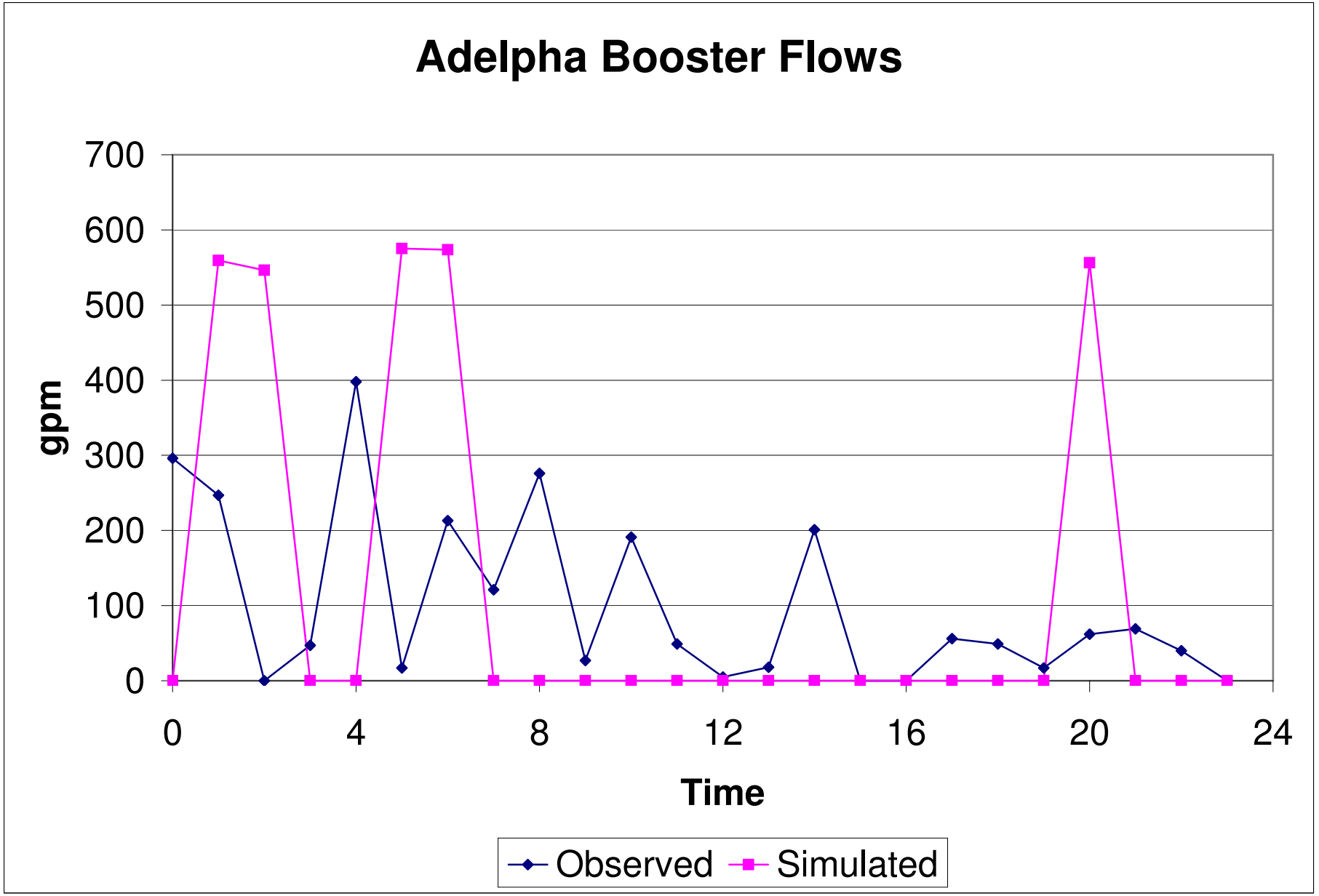
Appendix B
EPS Calibration Comparison Charts


Adelpha Booster Flows
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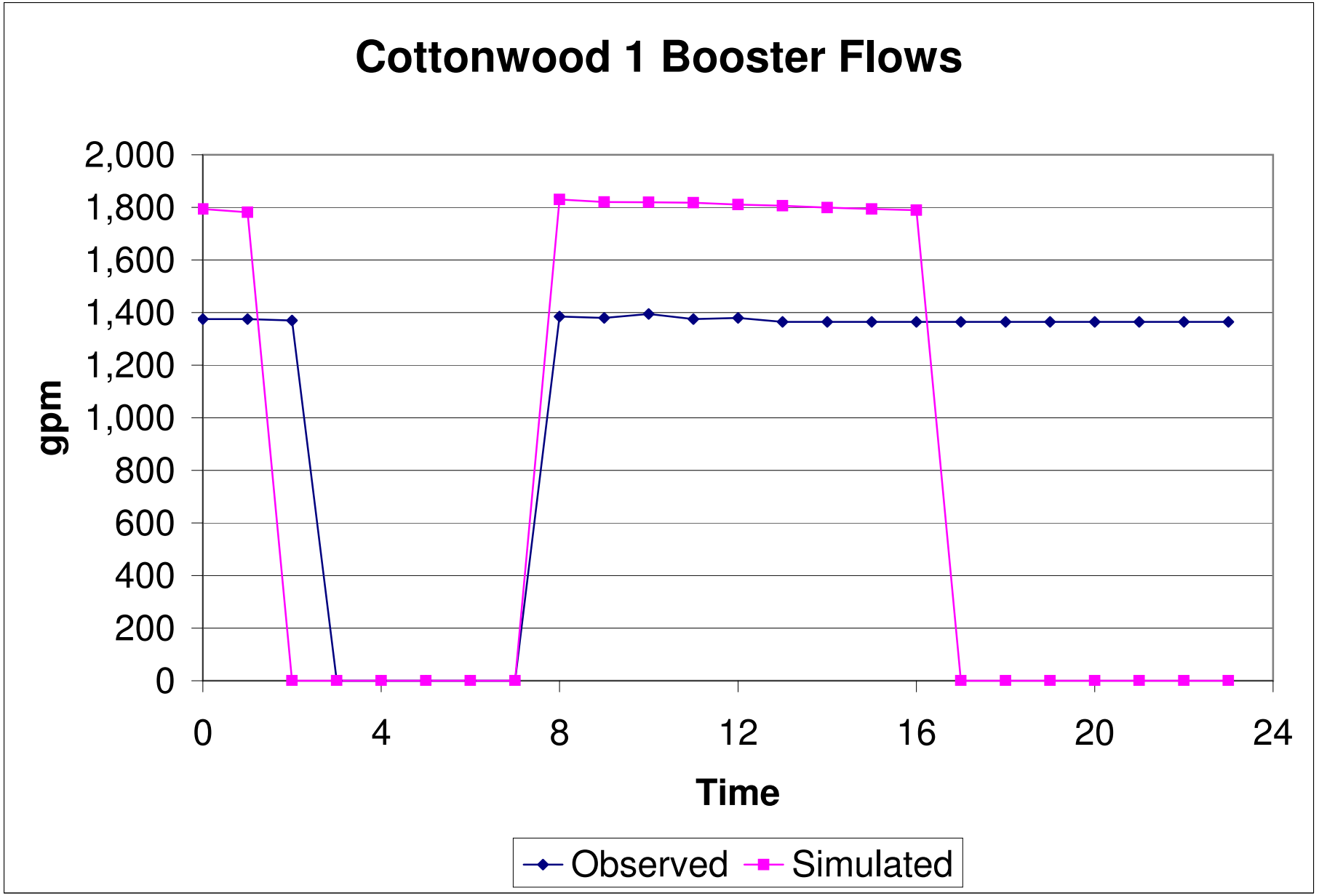
400
300
200
100
0
gpm
0
4
8
12
16
20
24
Time
Observed
Simulated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1,800
1,600
1,400
1,200
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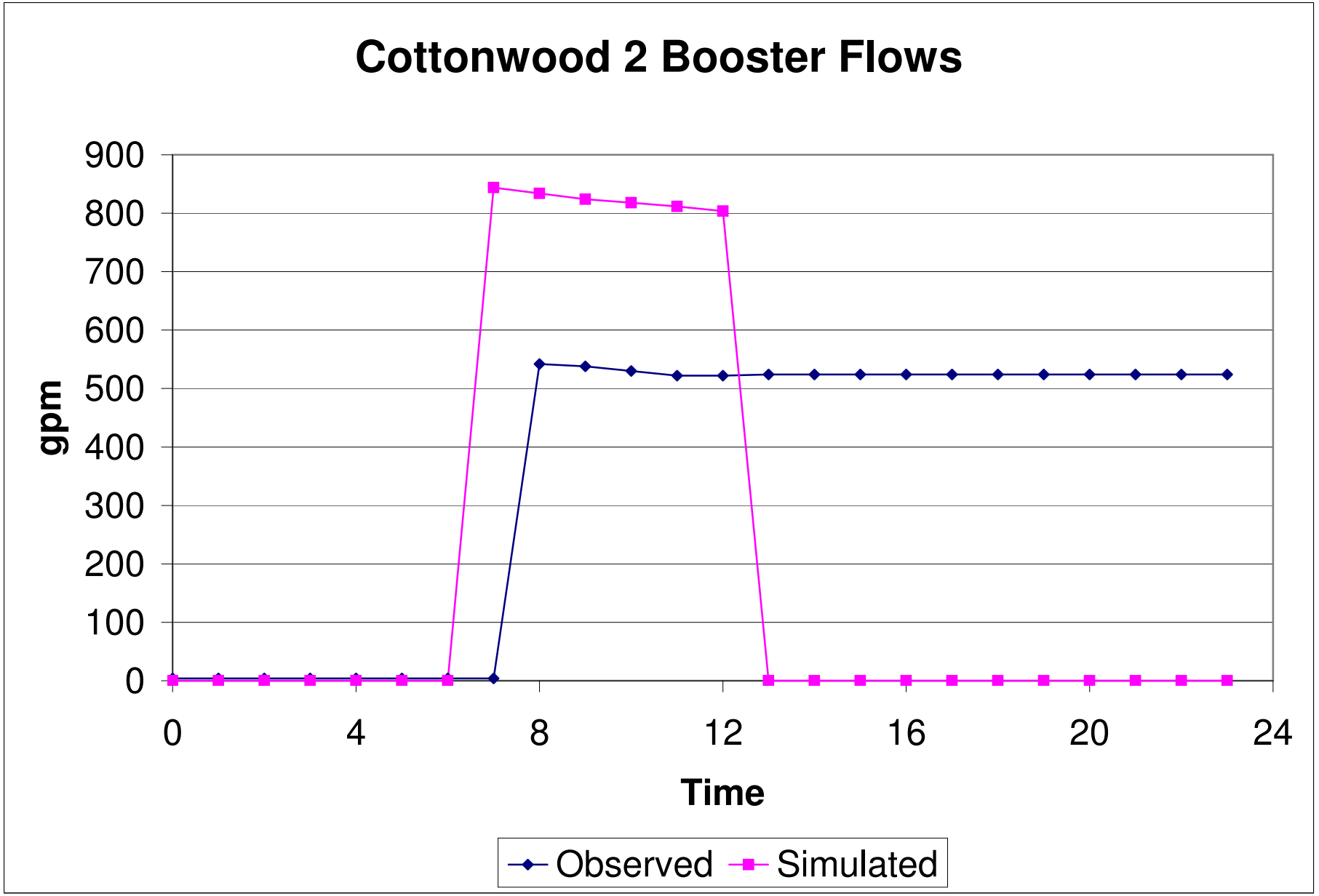
800
600
400
200
0
gpm
0
4
8
12
16
20
24
Time
Observed
Simulated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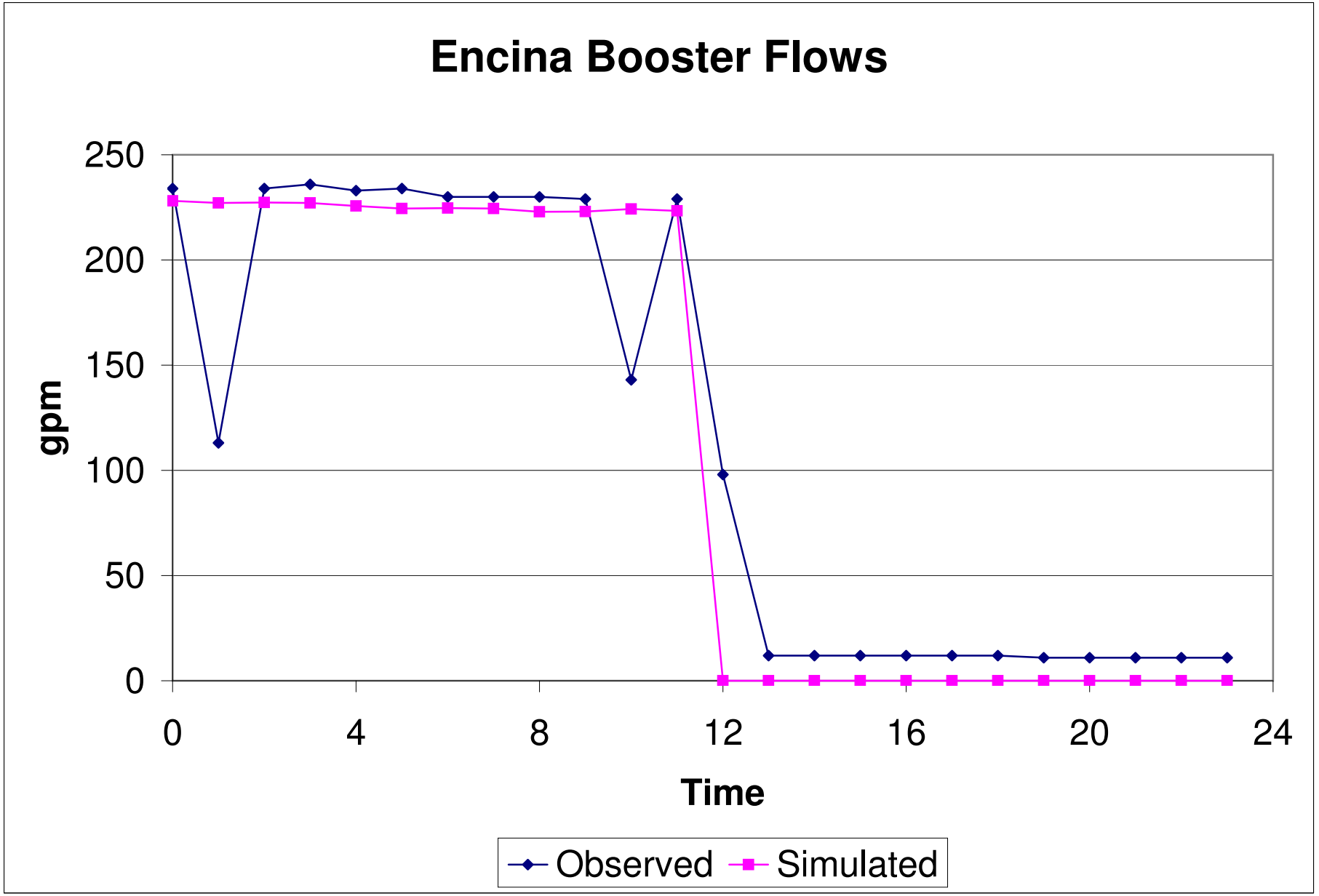
gpm
0
4
8
12
16
20
24
Time
Observed
Simulated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150
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gpm
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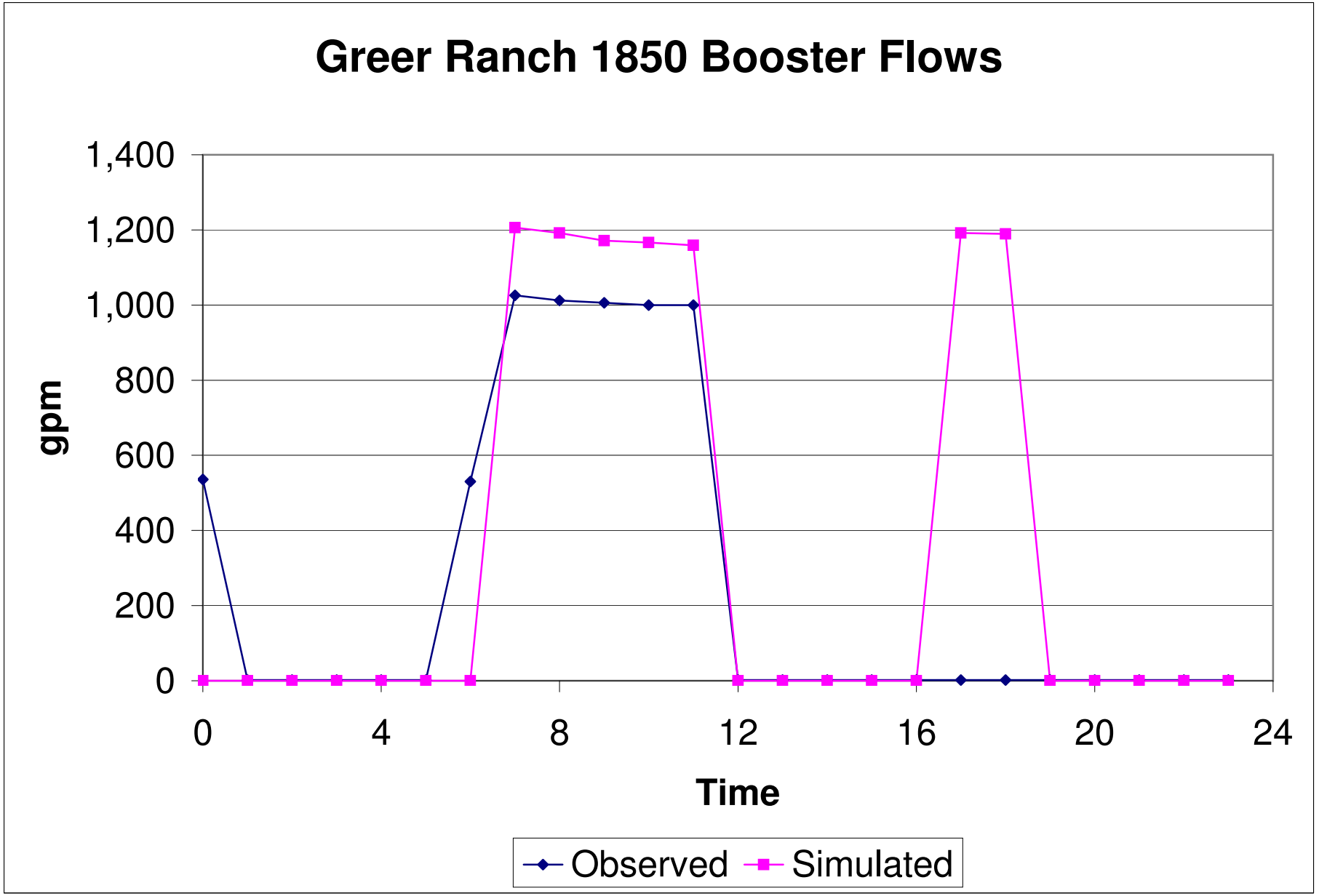
4
8
12
16
20
24
Time
Observed
Simulated


Greer Ranch 1850 Booster Flows
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800
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200
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gpm
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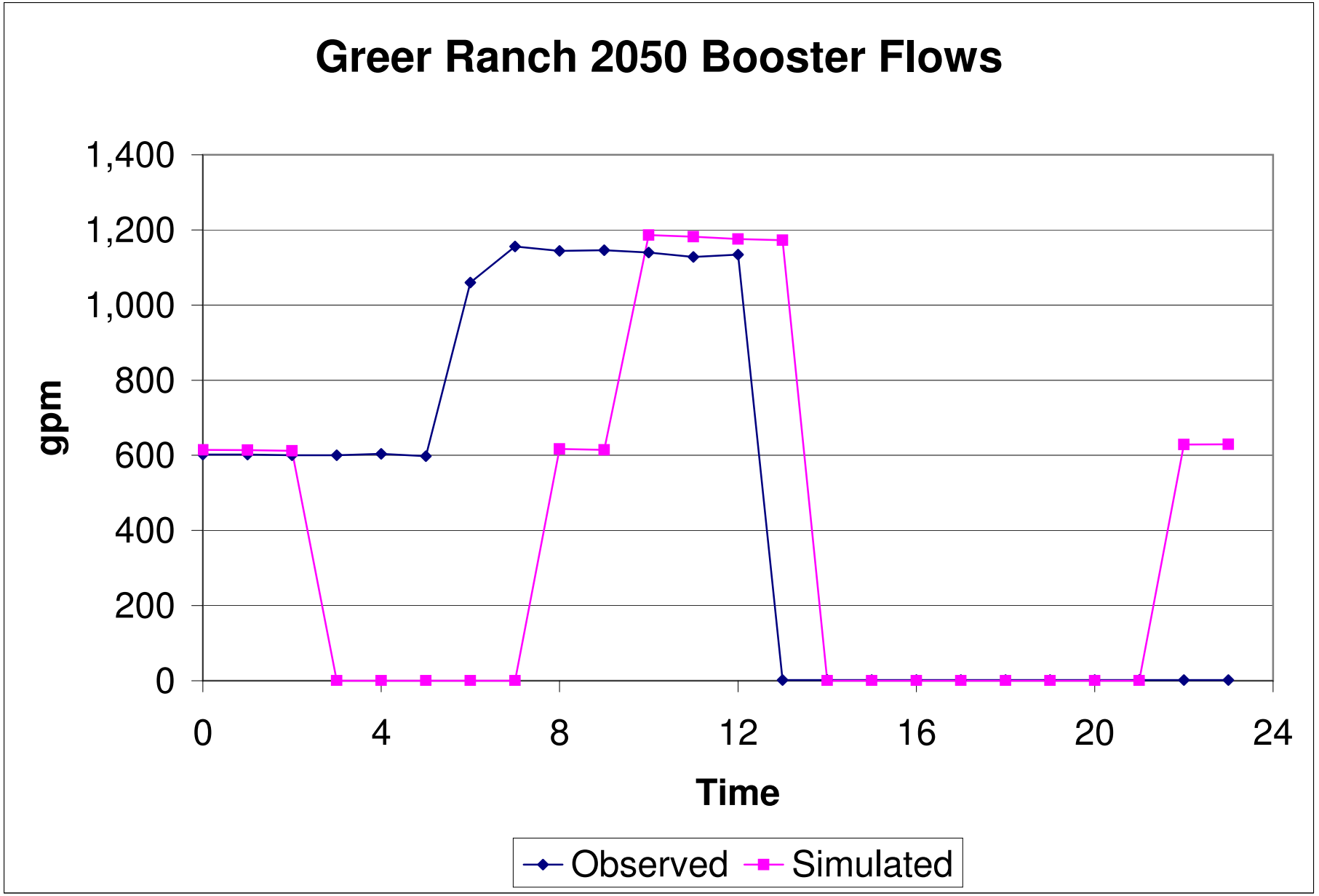
8
12
16
20
24
Time
Observed
Simulated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gpm
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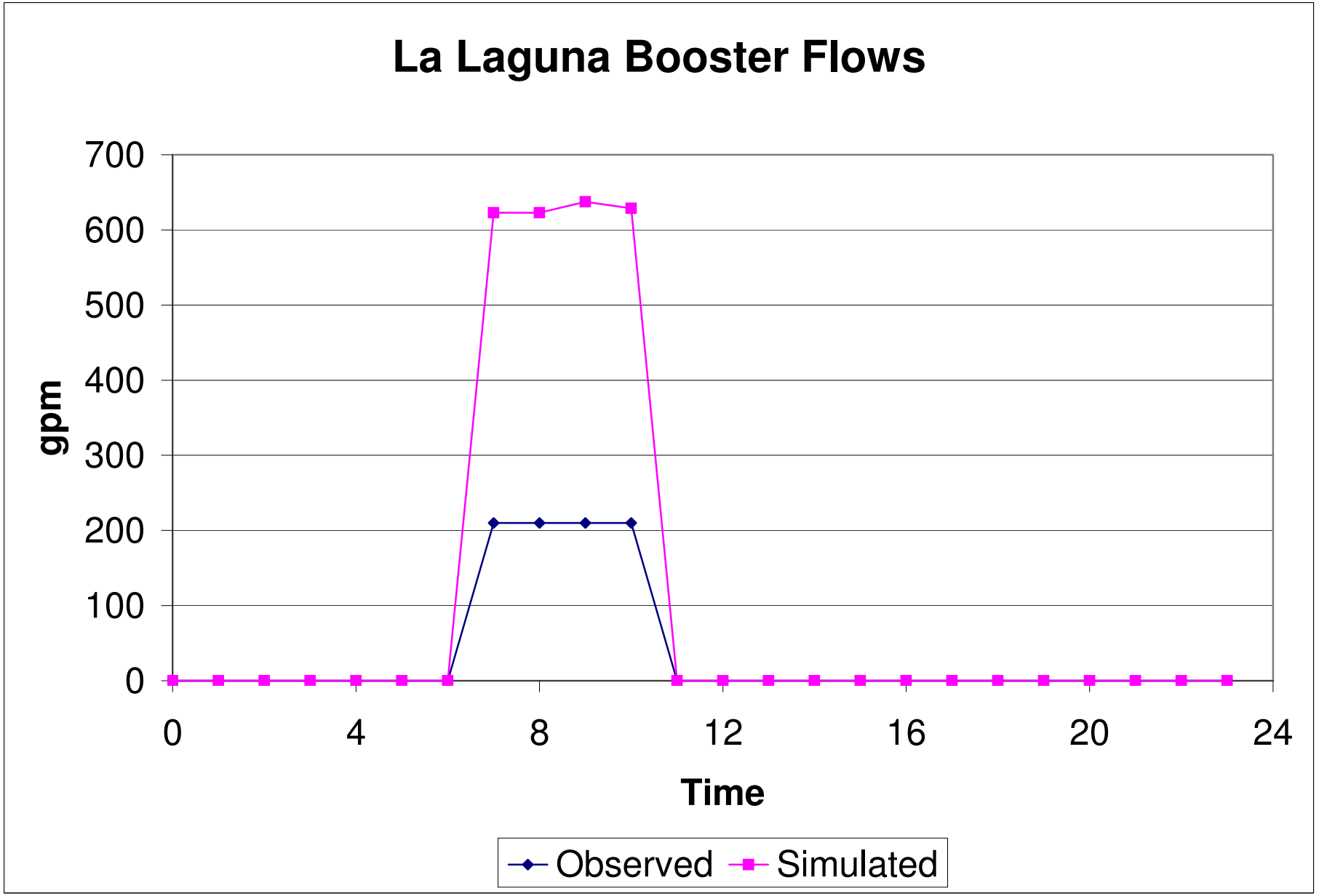
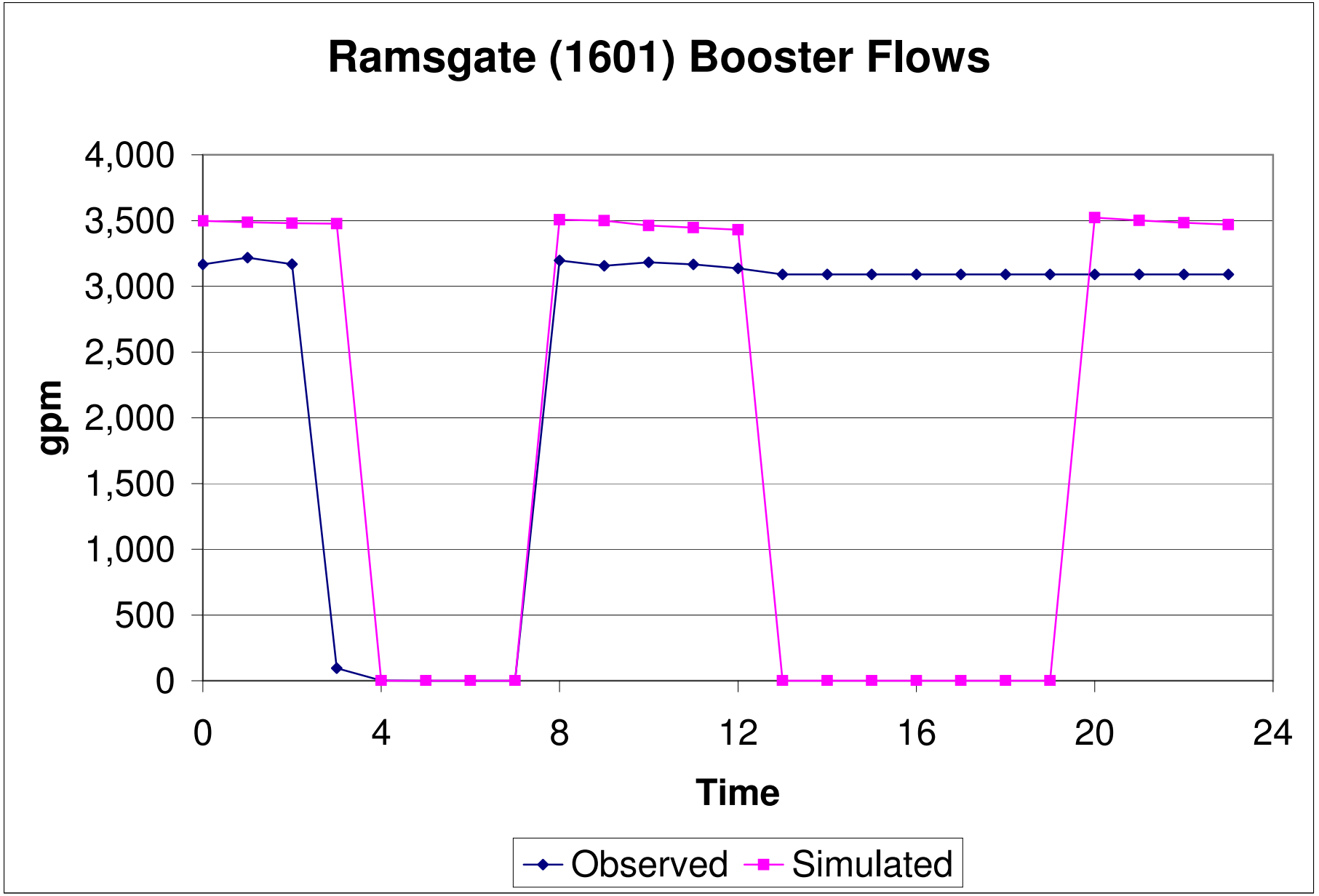
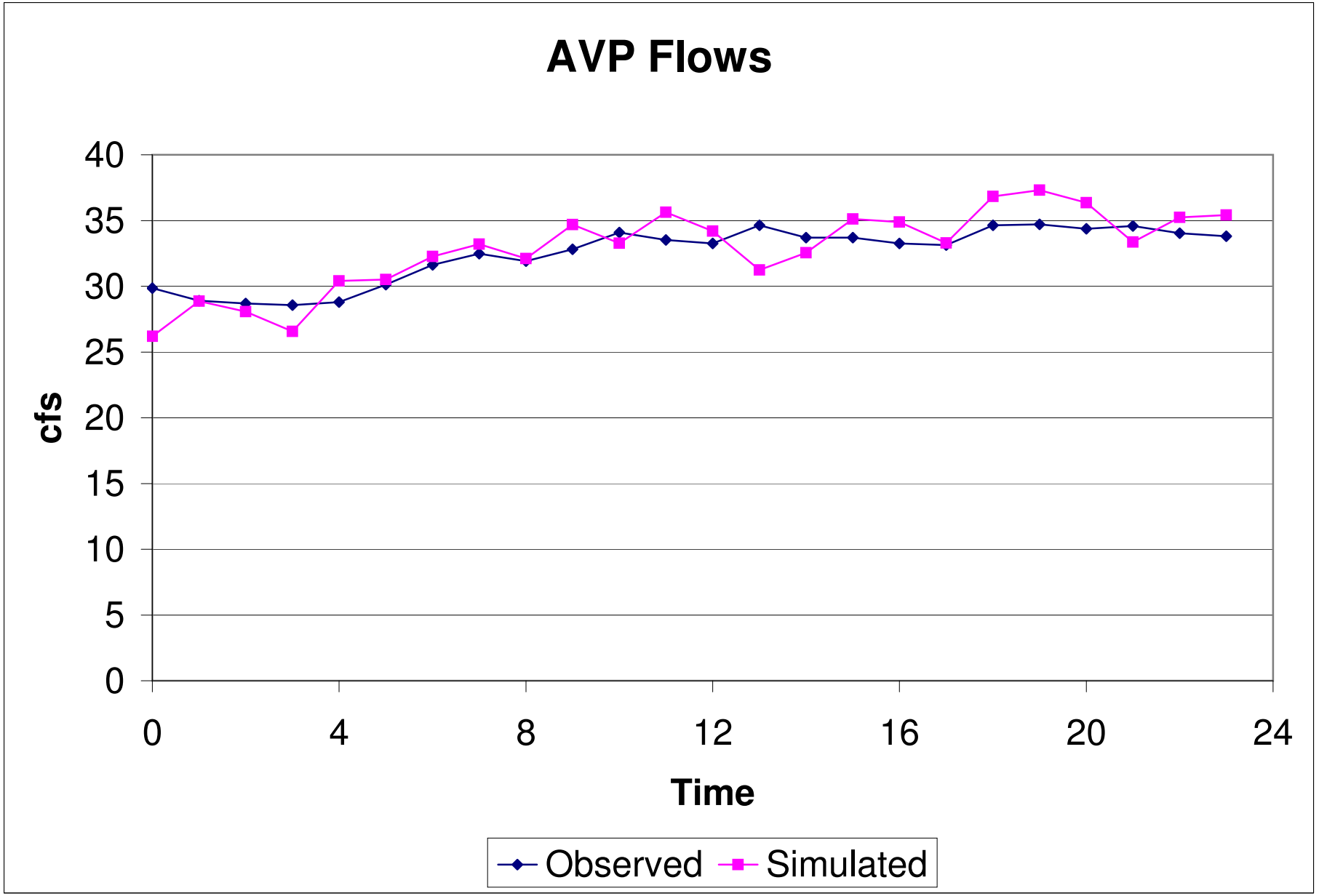
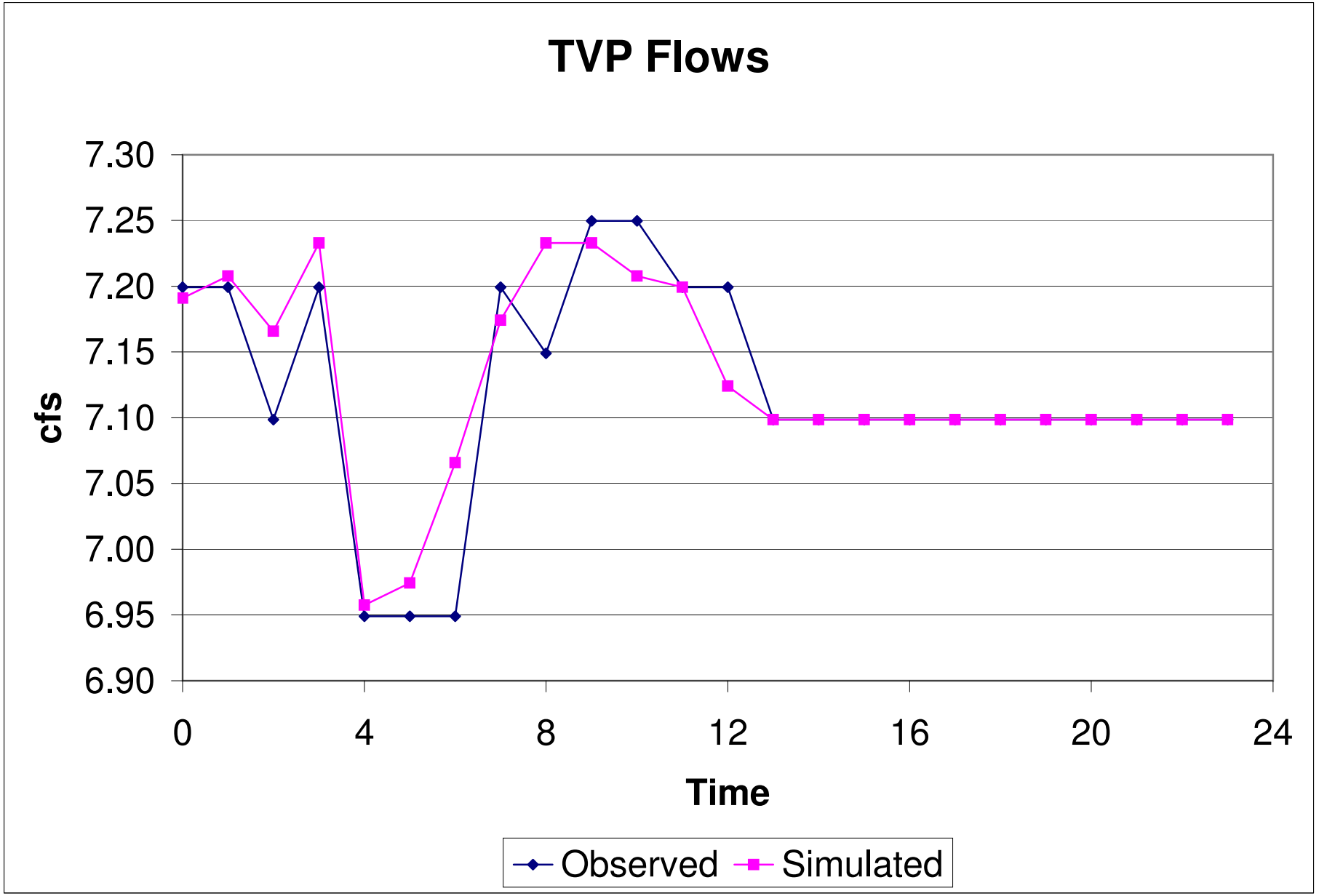
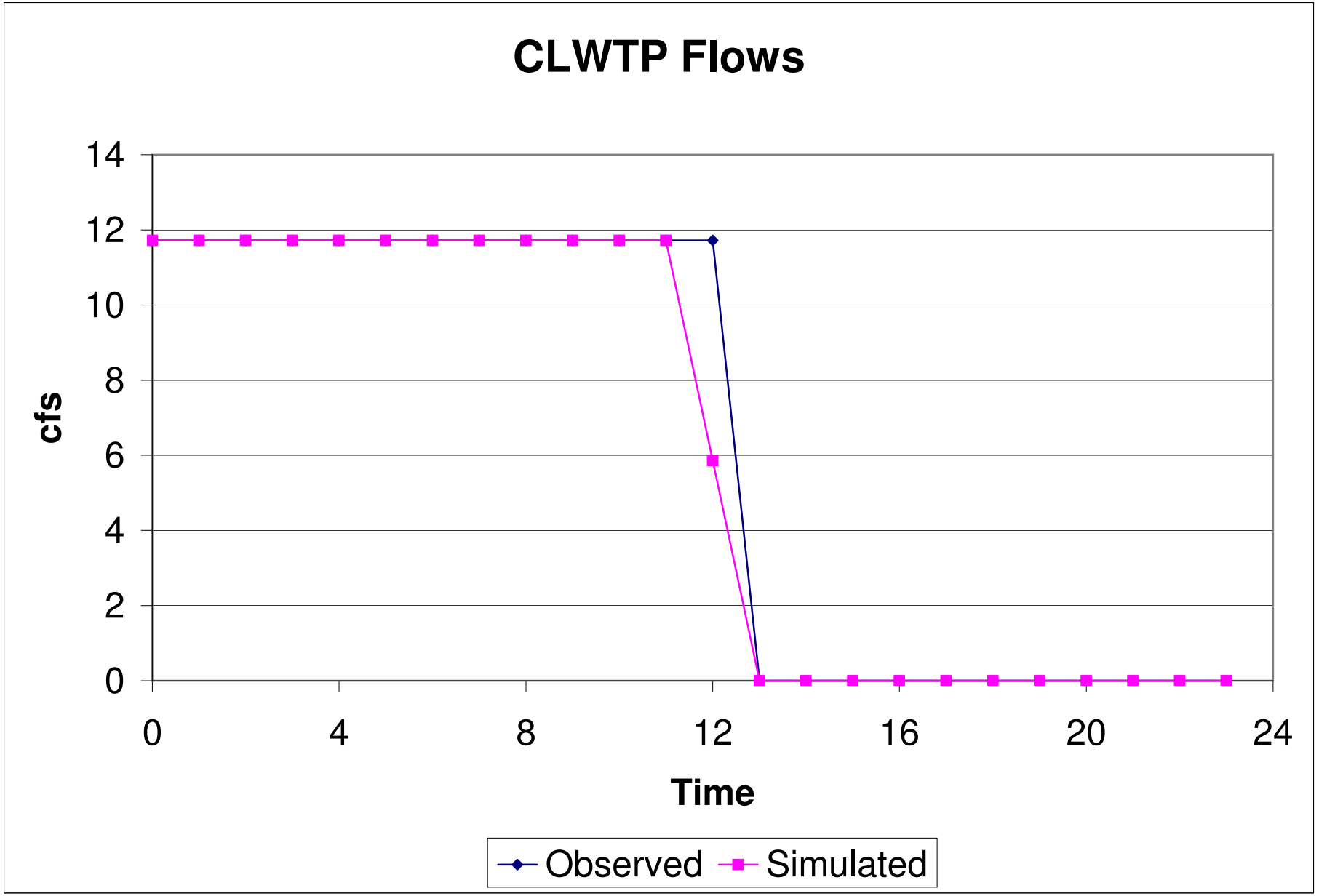
16
20
24
Time
Observed
Simulated

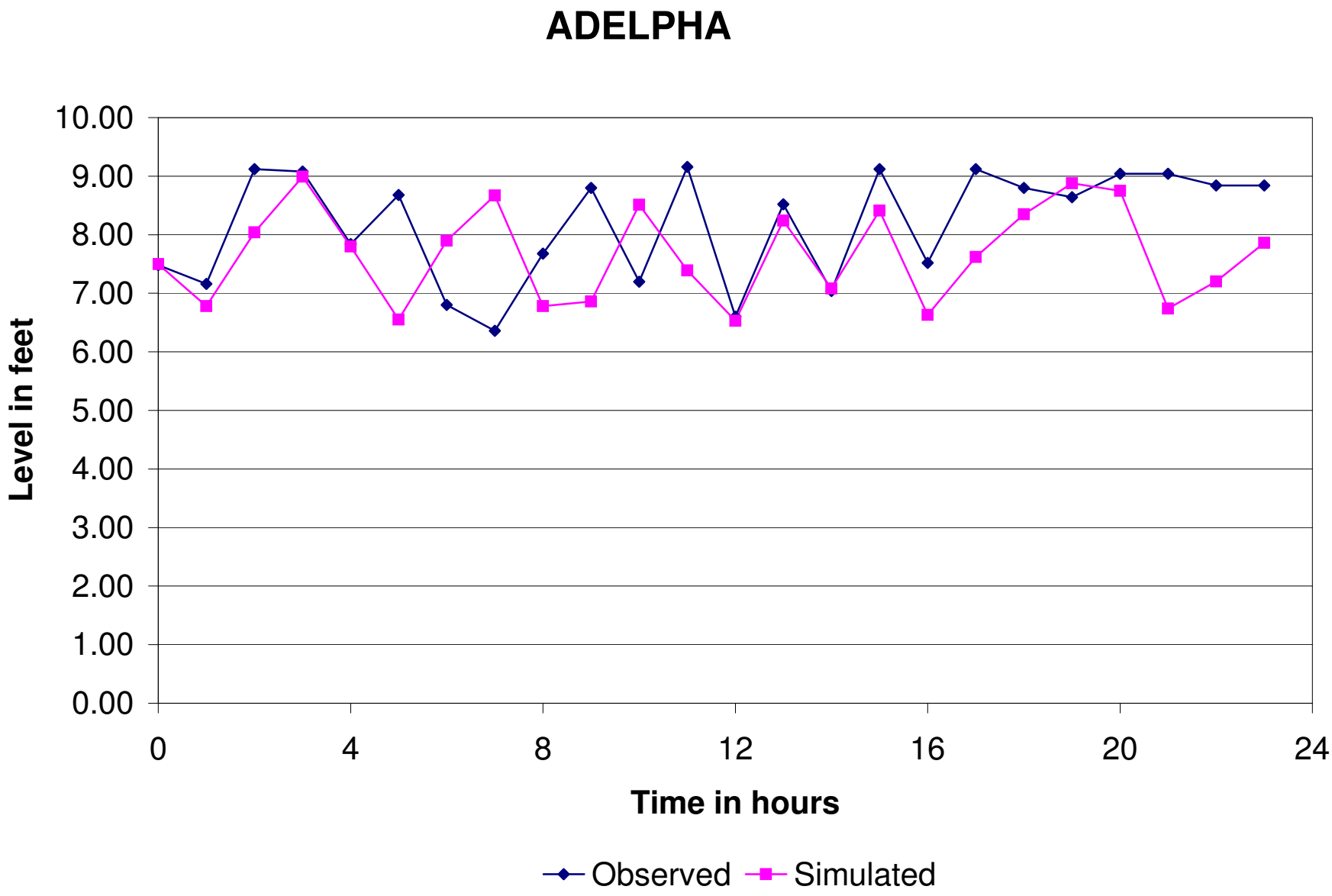

La Laguna Booster Flows
700
600
500
400
300
200
100
0
gpm
0
4
8
12
16
20
24
Time
Observed
Simulated

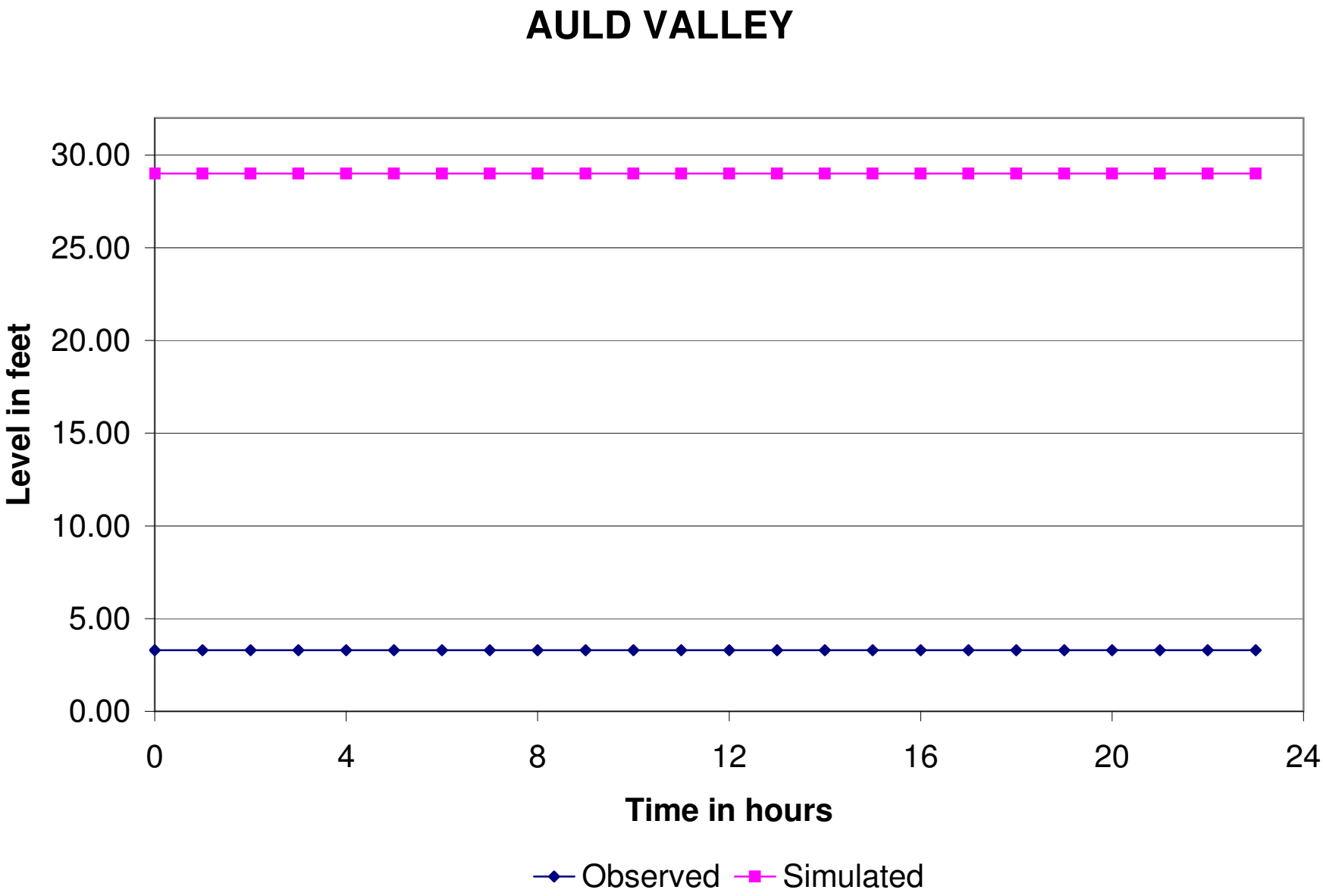

Ramsgate (1601) Booster Flows
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
gpm
0
4
8
12
16
20
24
Time
Observed
Simulated

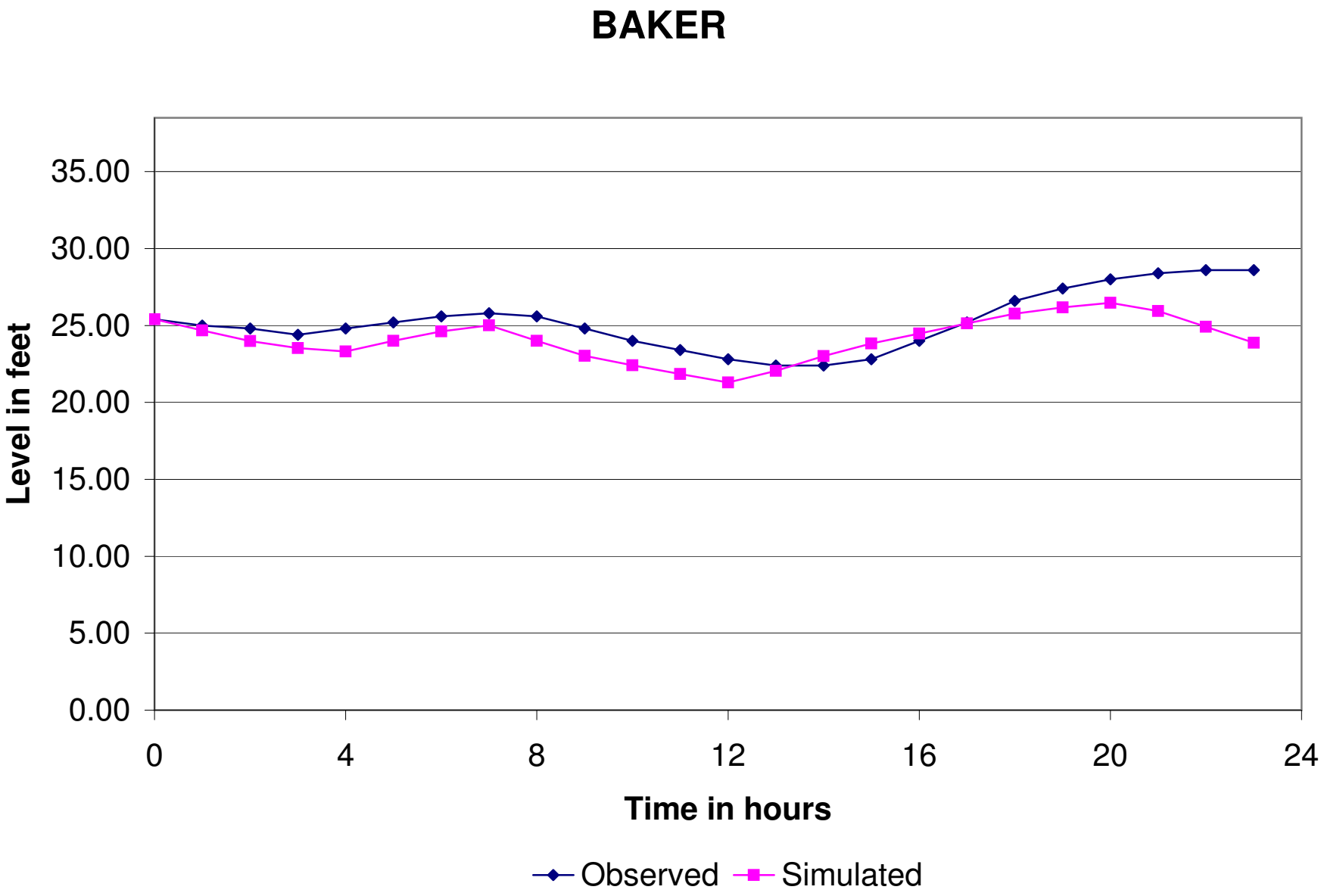

AVP Flows
cfs
40
35
30
25
20
15
10
5
0
0
4
8
12
16
20
24
Time
Observed
Simulated

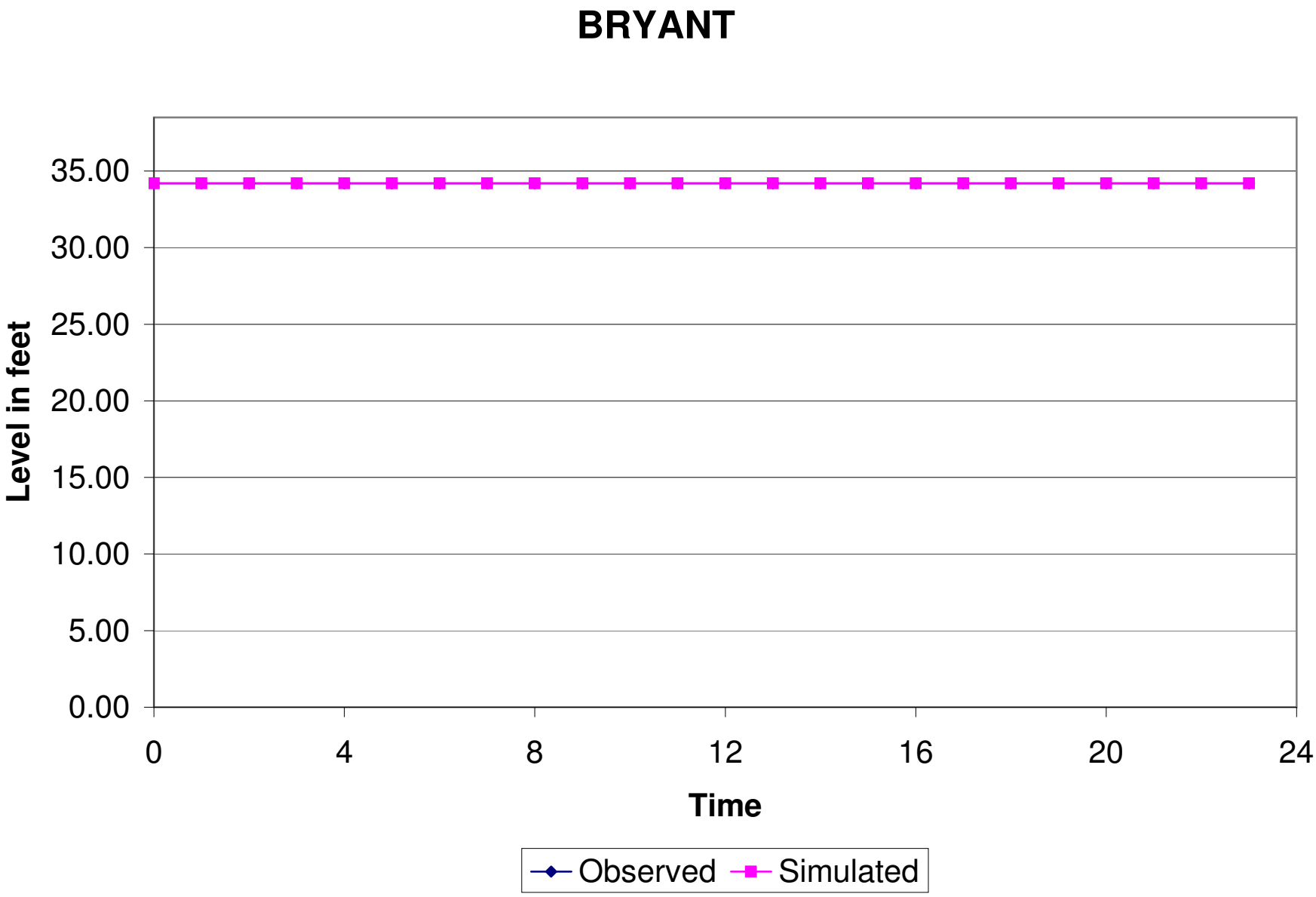

TVP Flows
7.30
7.25
7.20
7.15
7.10
7.05
7.00
6.95
6.90
cfs
0
4
8
12
16
20
24
Time
Observed
Simulated

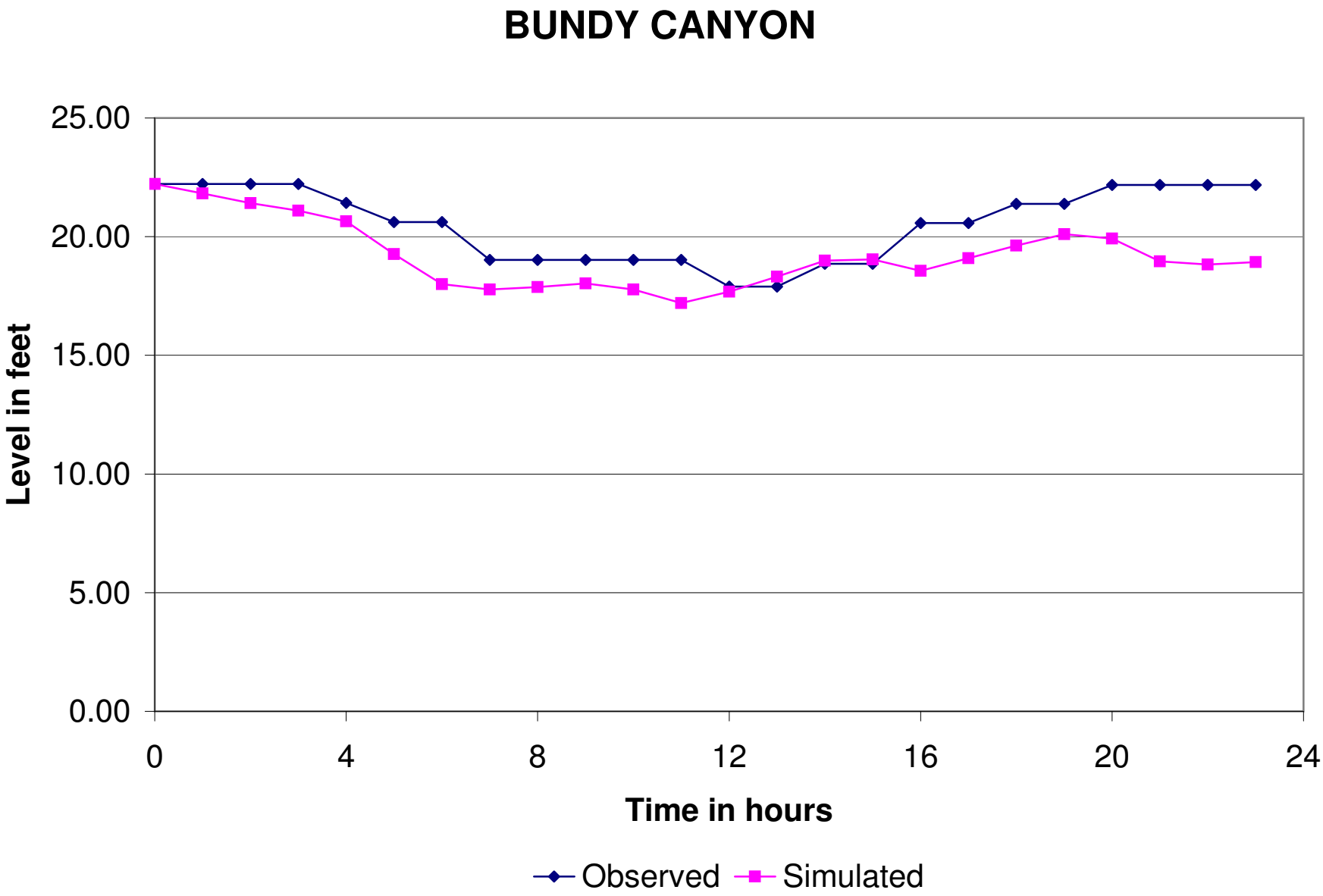

CLWTP Flows
cfs
14
12
10
8
6
4
2
0
0
4
8
12
16
20
24
Time
Observed
Simulated

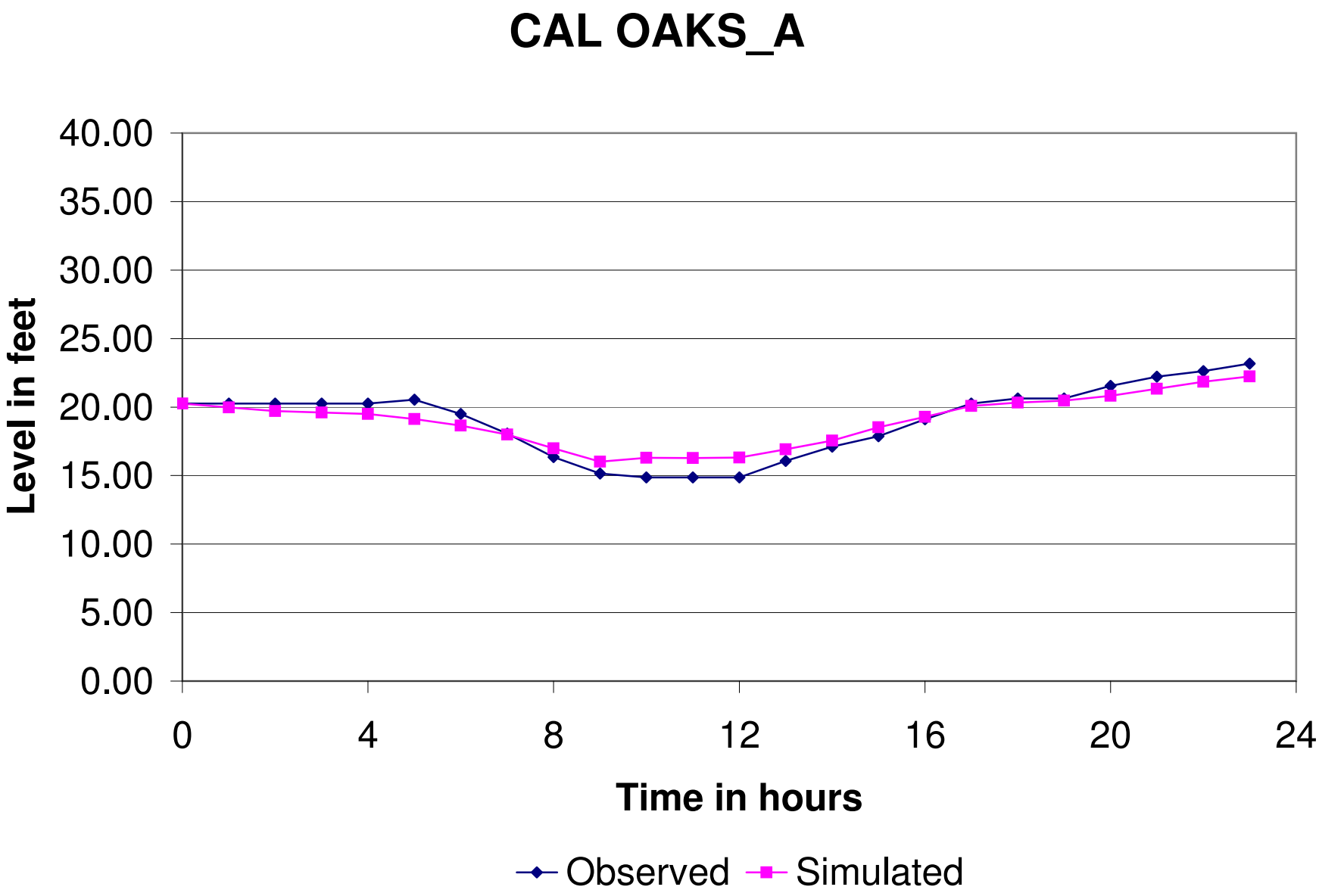

ADELPHA
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
Level in feet
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

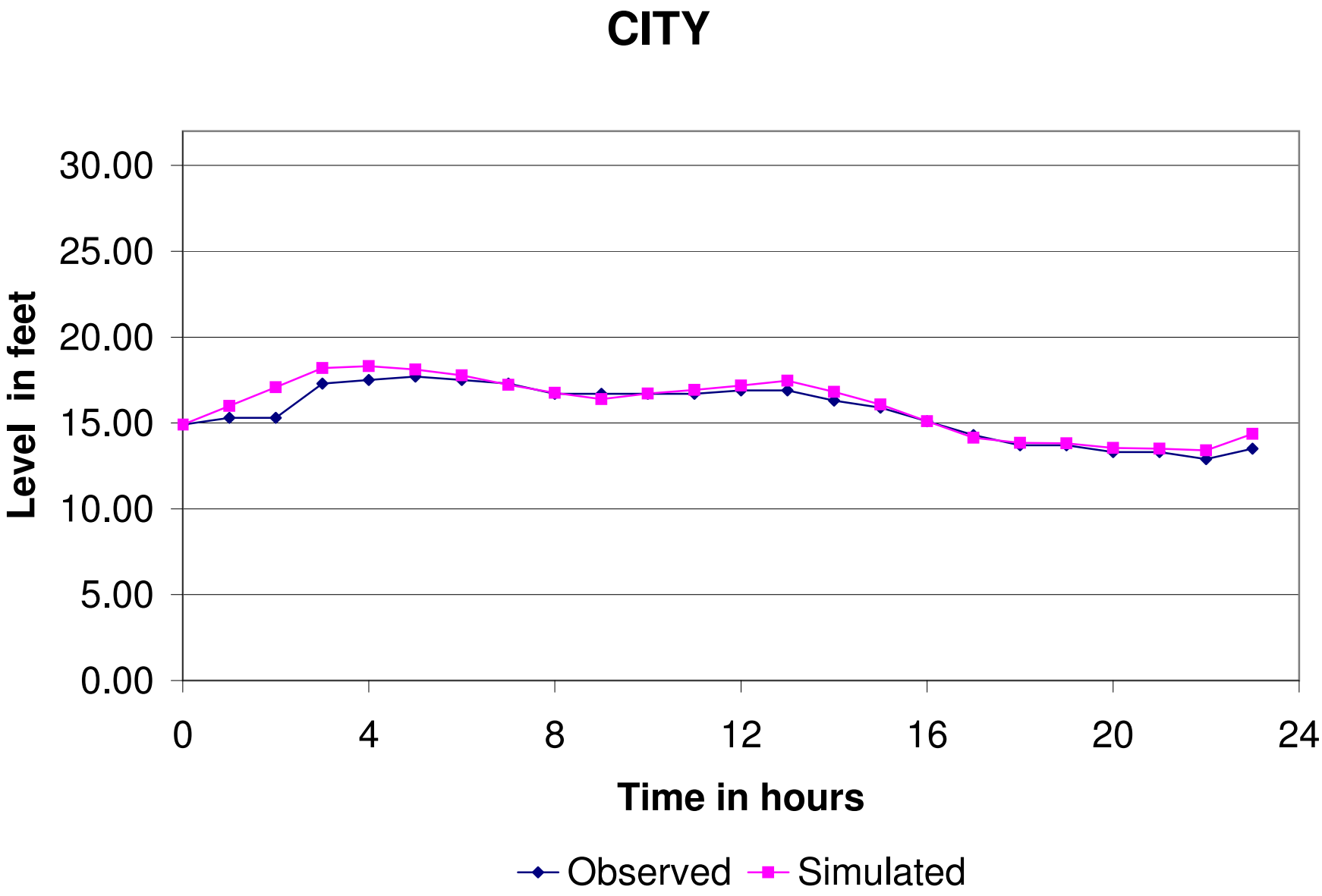

AULD VALLEY
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Level in feet
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

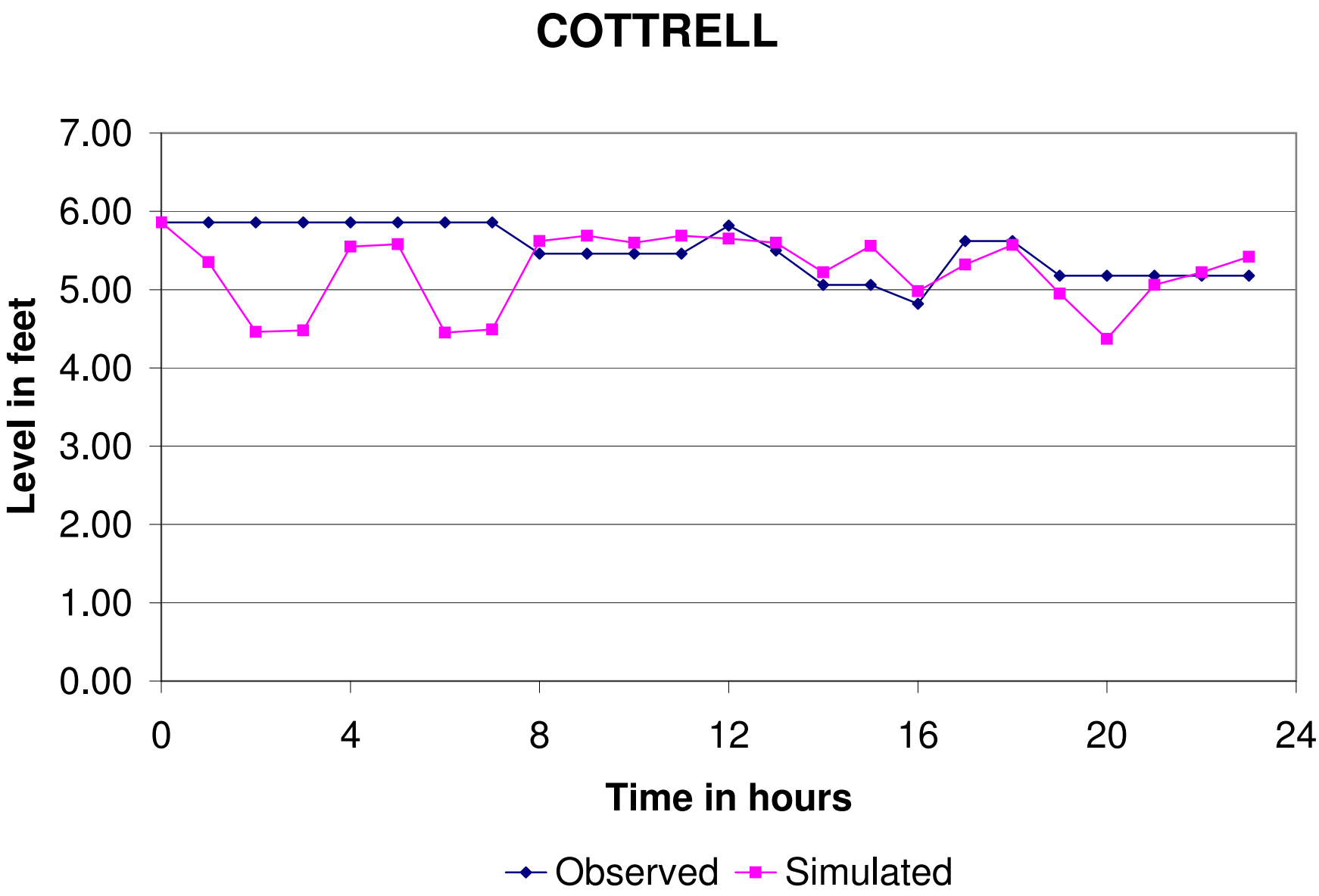

BAKER
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Level in feet
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

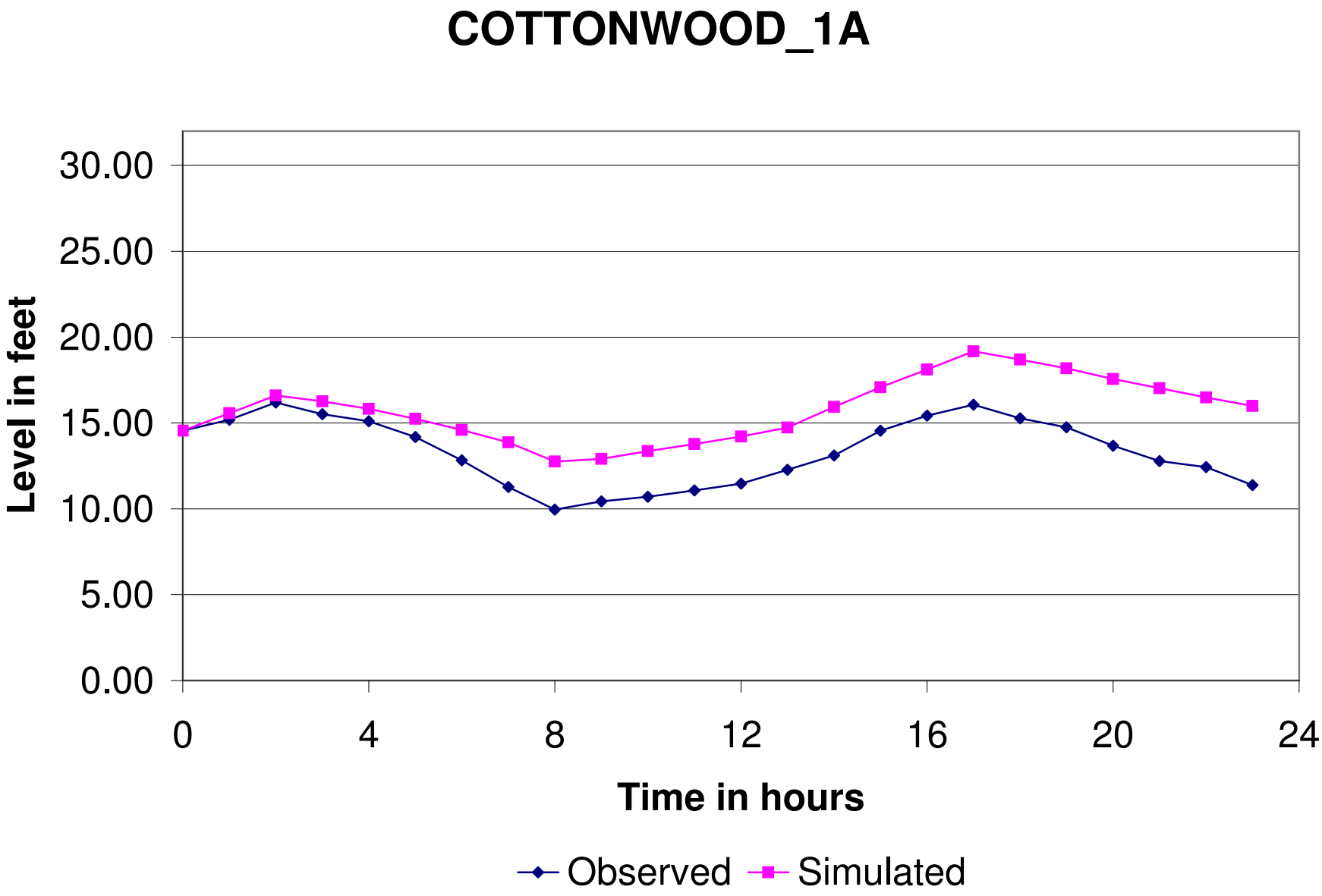

BRYANT
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Level in feet
0
4
8
12
16
20
24
Time
Observed
Simulated

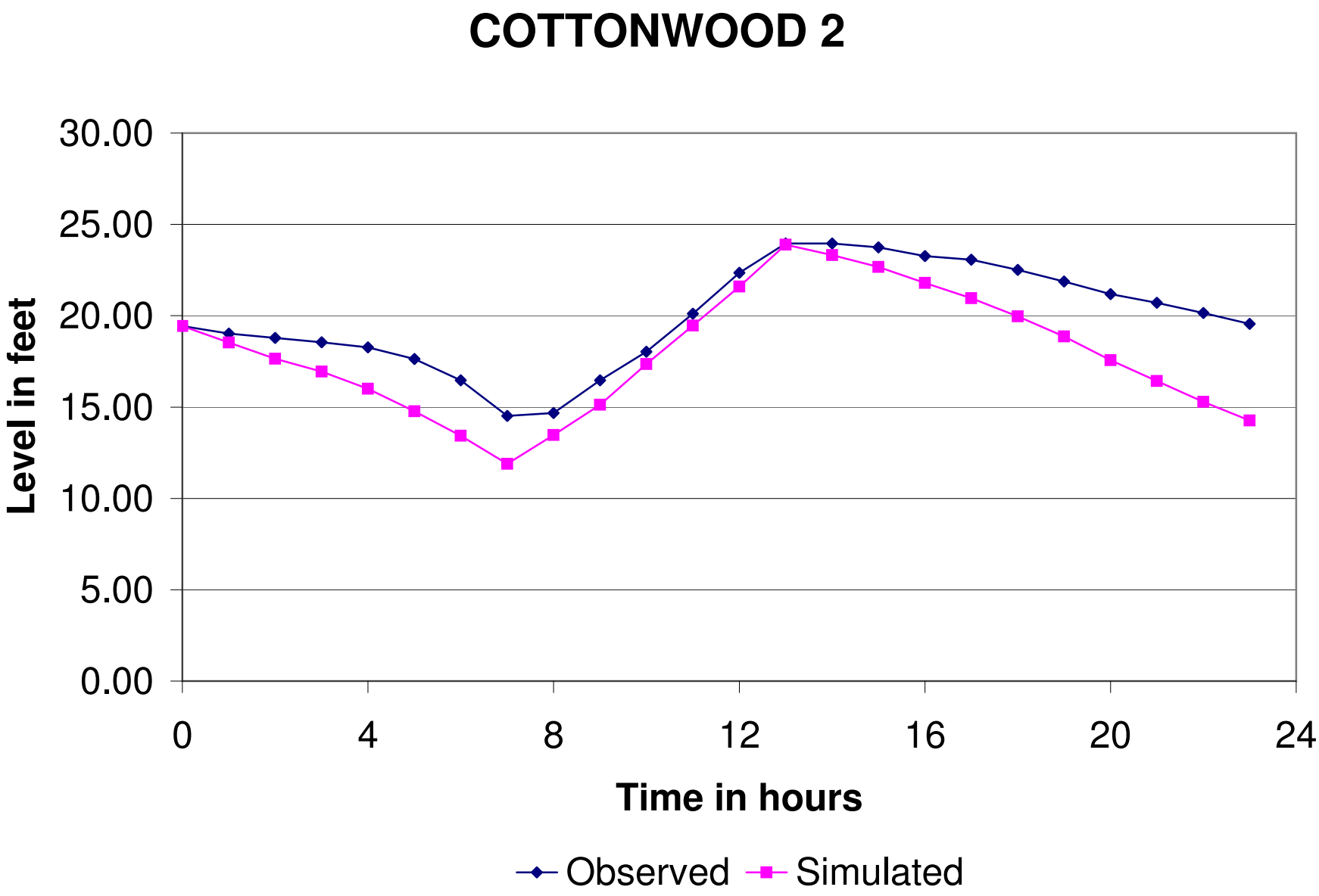

BUNDY CANYON
25.00
20.00
15.00
10.00
5.00
0.00
Level in feet
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

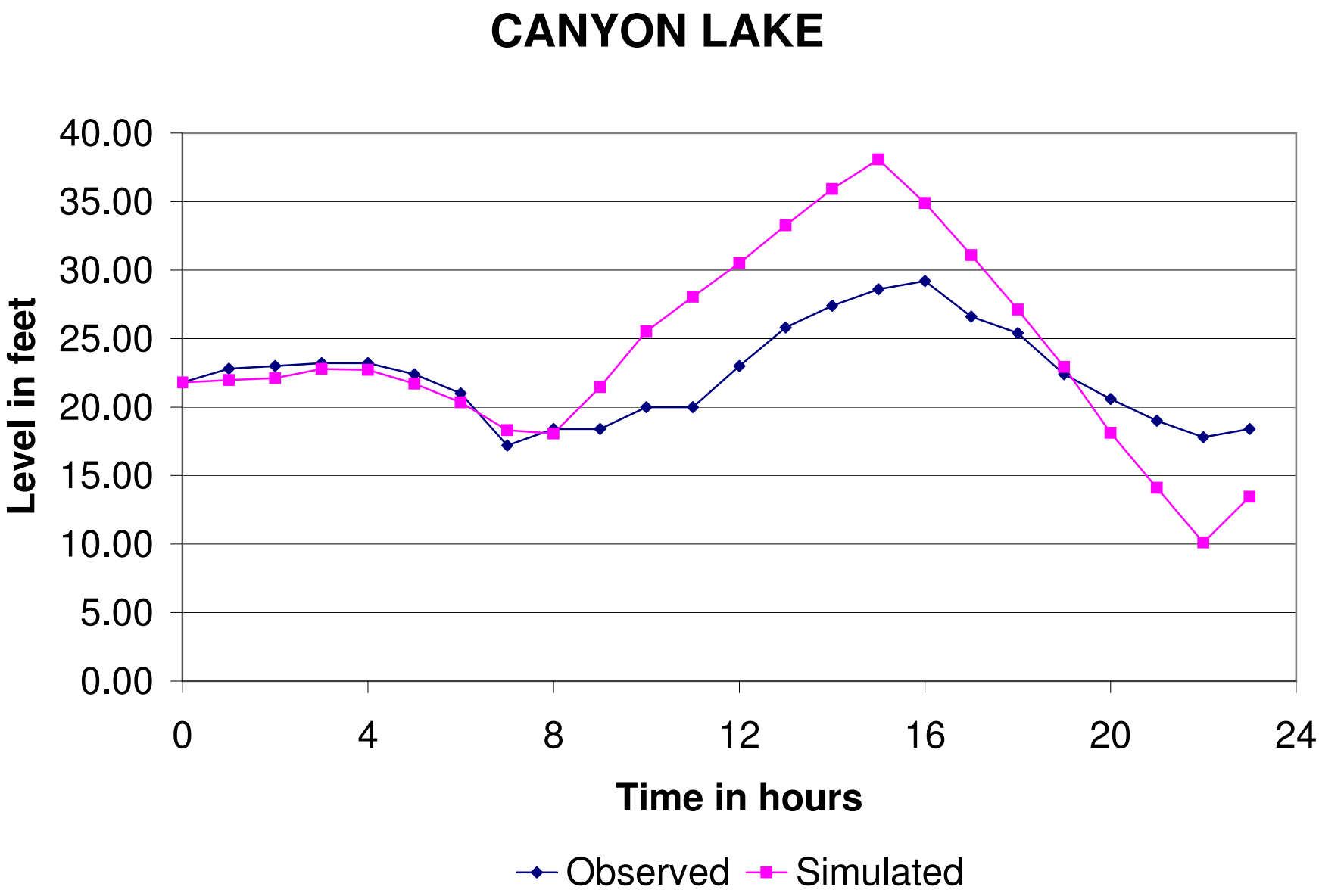

CAL OAKS_A
Level in feet
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

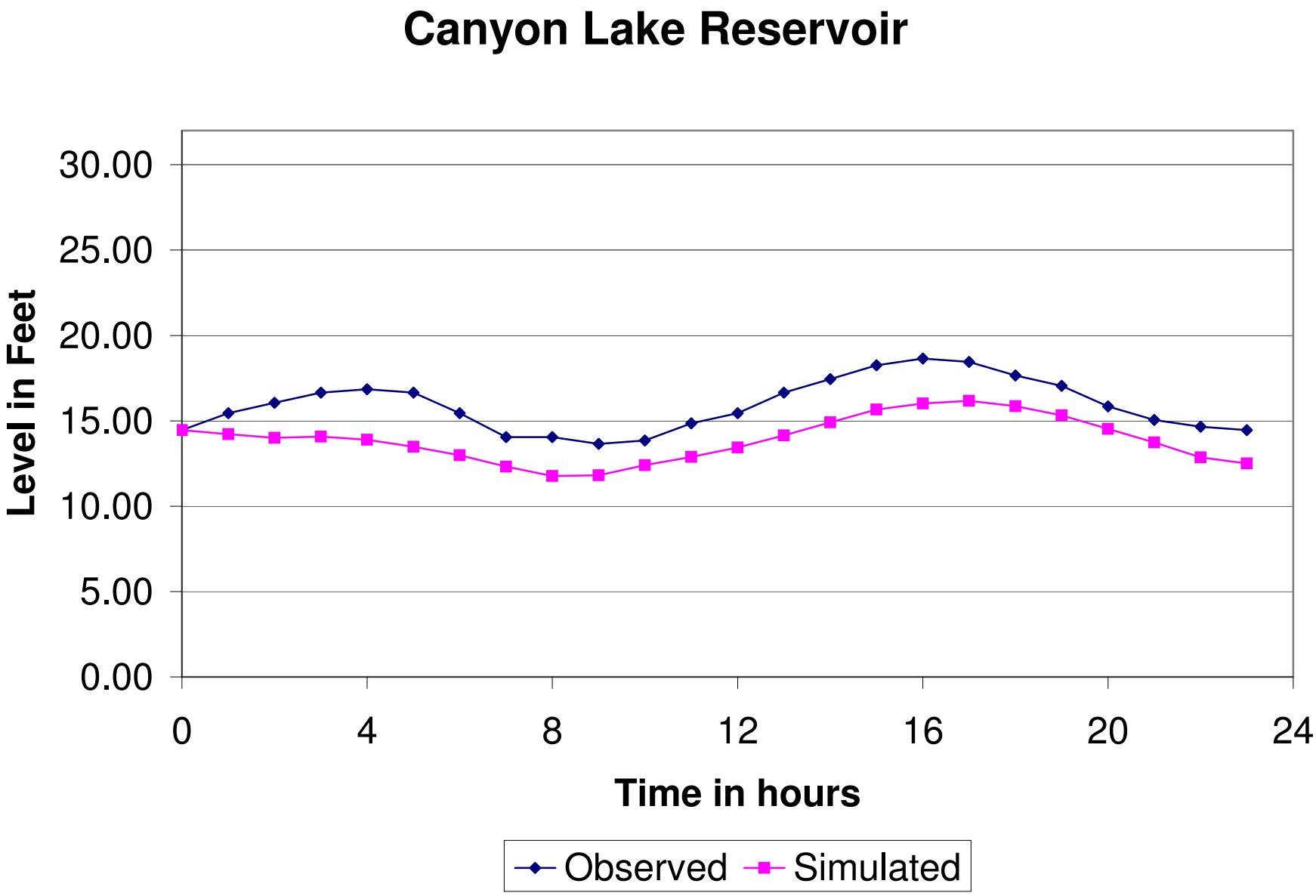

CITY
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Level in feet
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

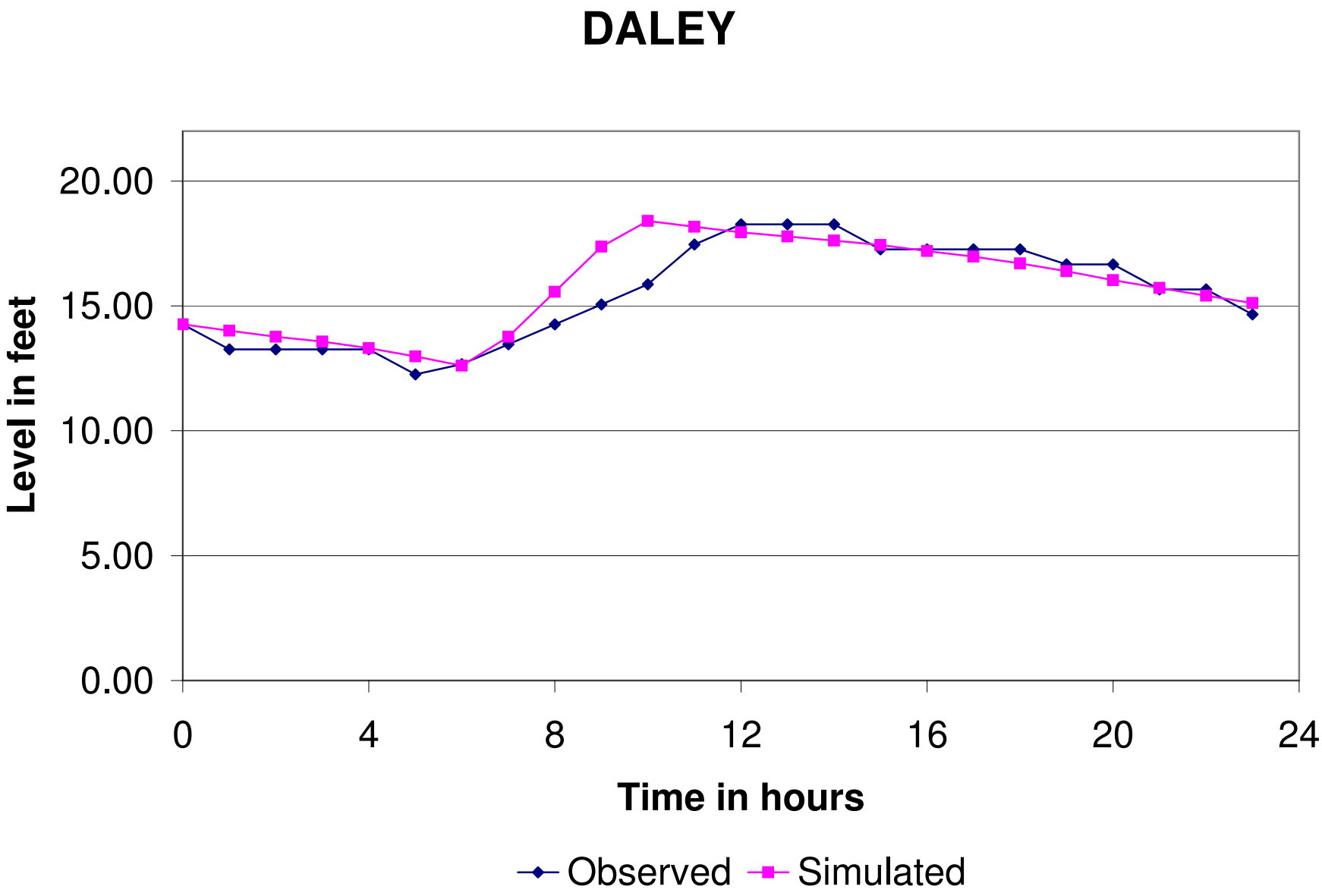

COTTRELL
Level in feet
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

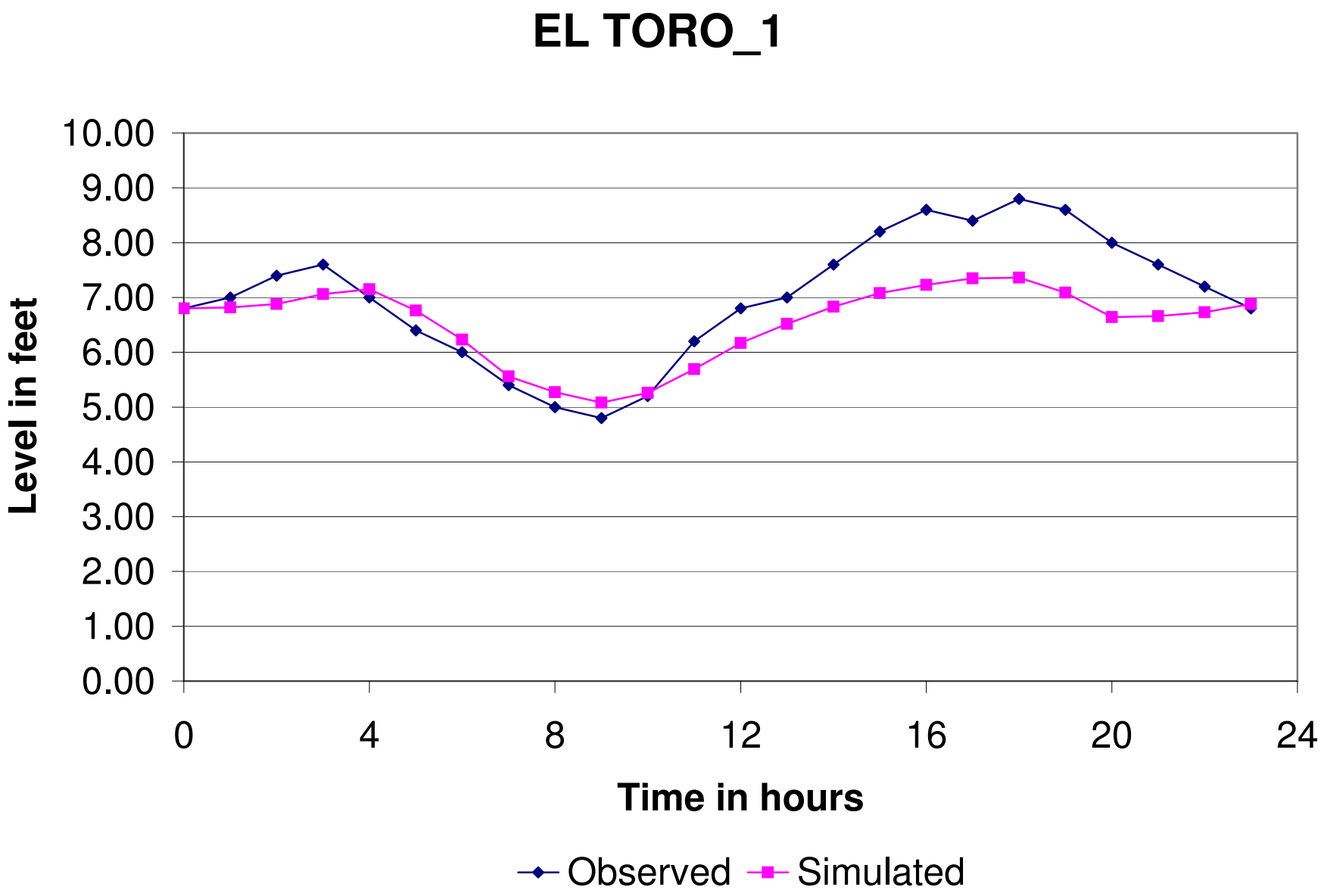

COTTONWOOD_1A
Level in feet
30.00
25.00
20.00
15.00
10.00
5.00
0.00
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

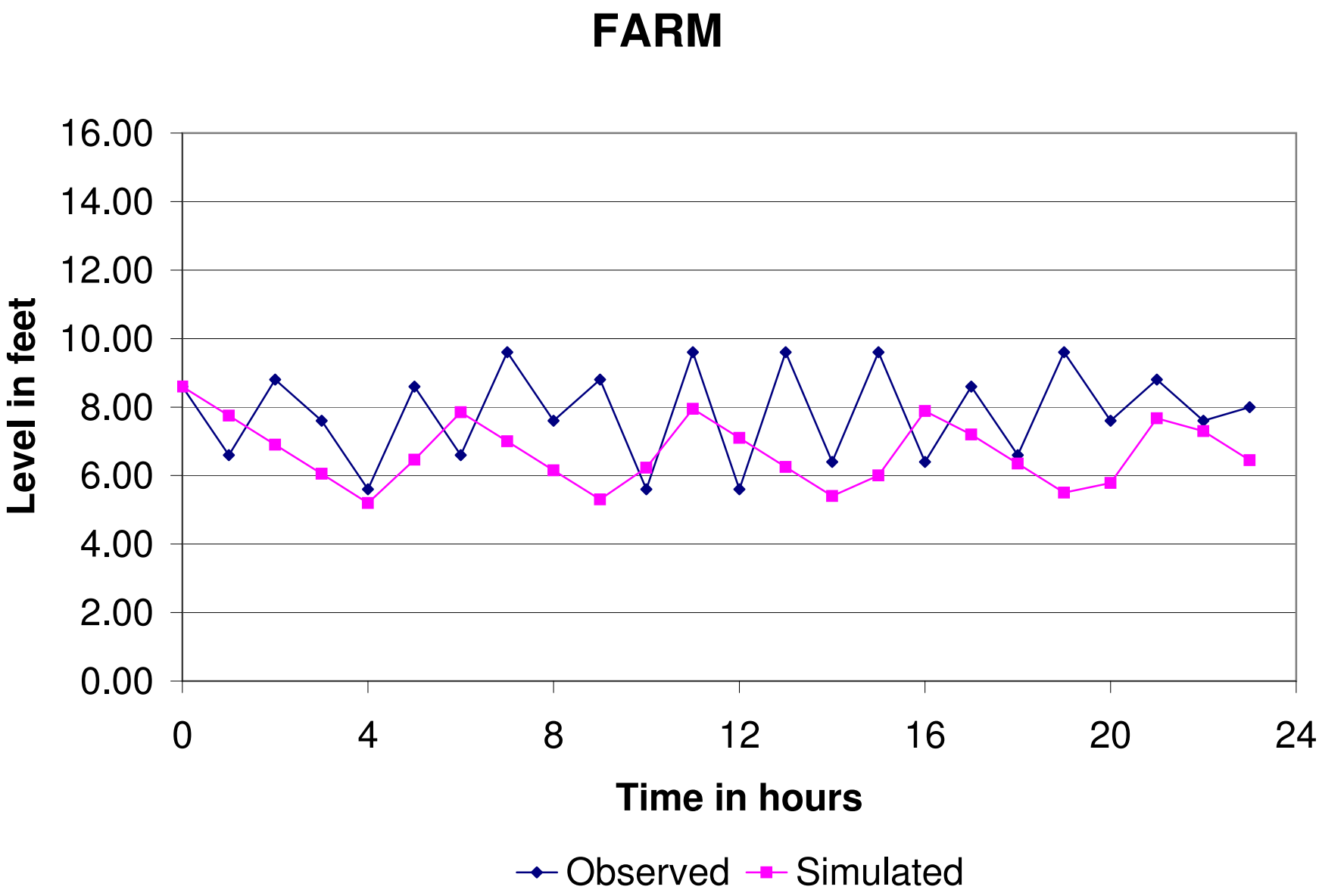

COTTONWOOD 2
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Level in feet
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

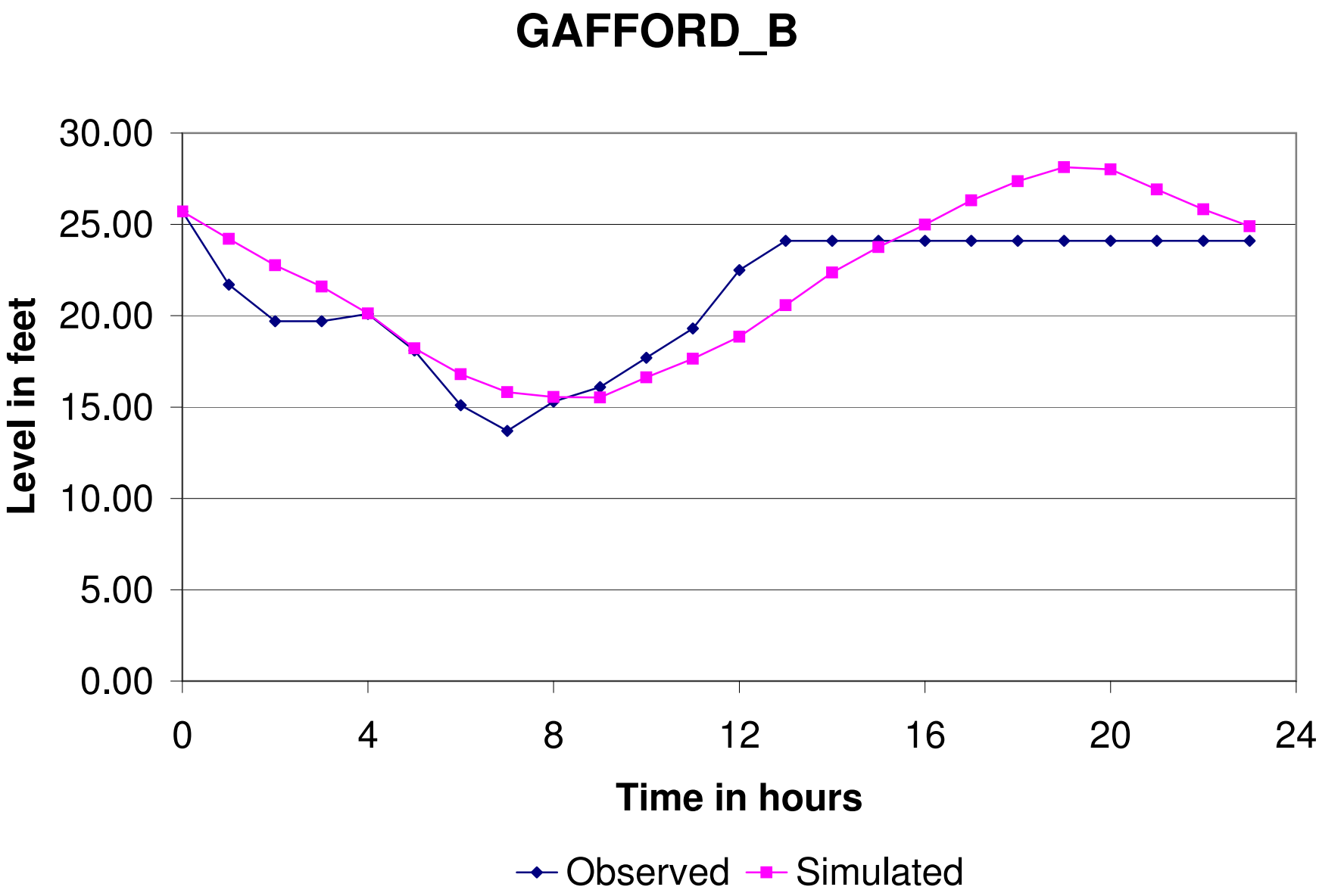

CANYON LAKE
Level in feet
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

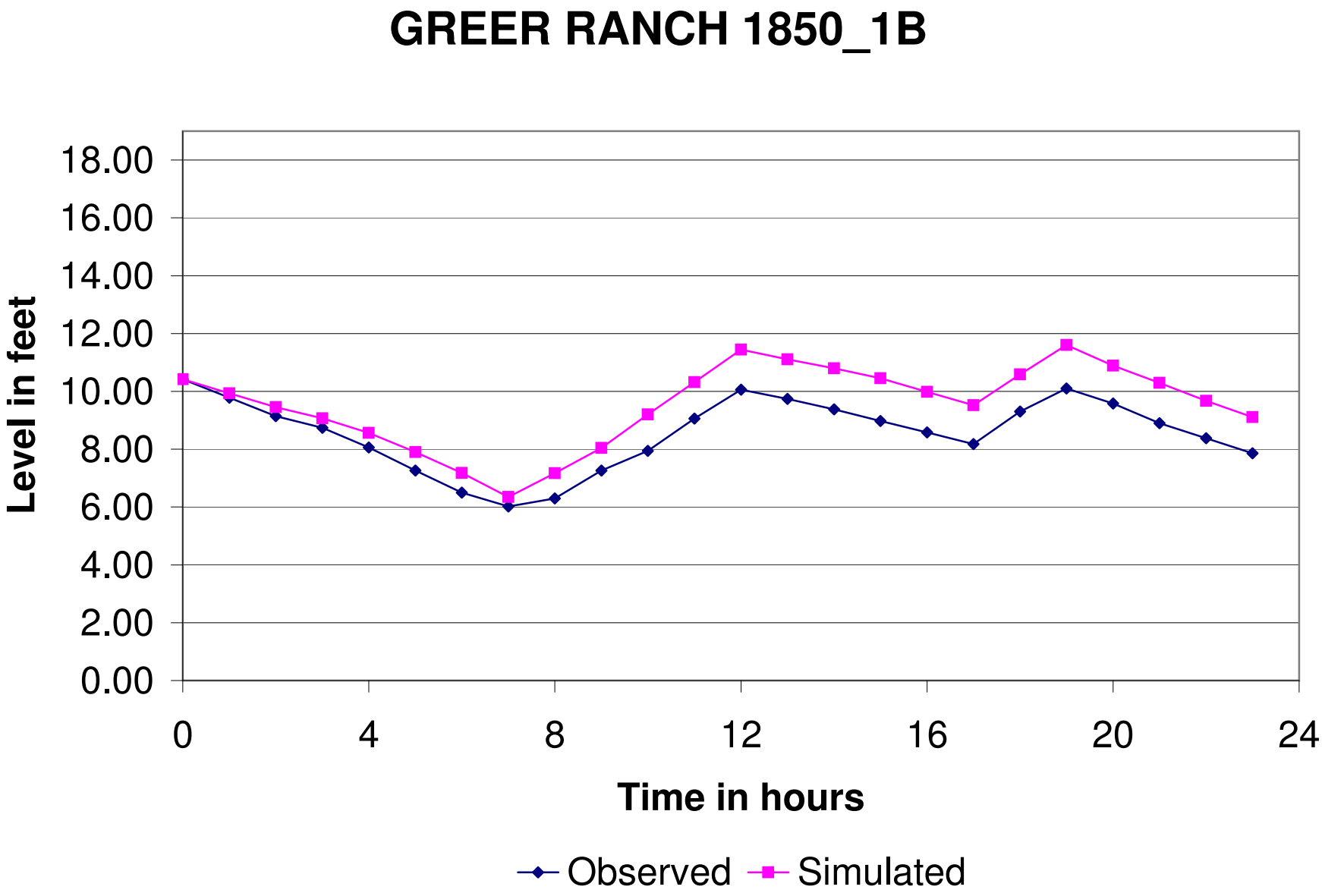

Canyon Lake Reservoir
Level in Feet
30.00
25.00
20.00
15.00
10.00
5.00
0.00
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

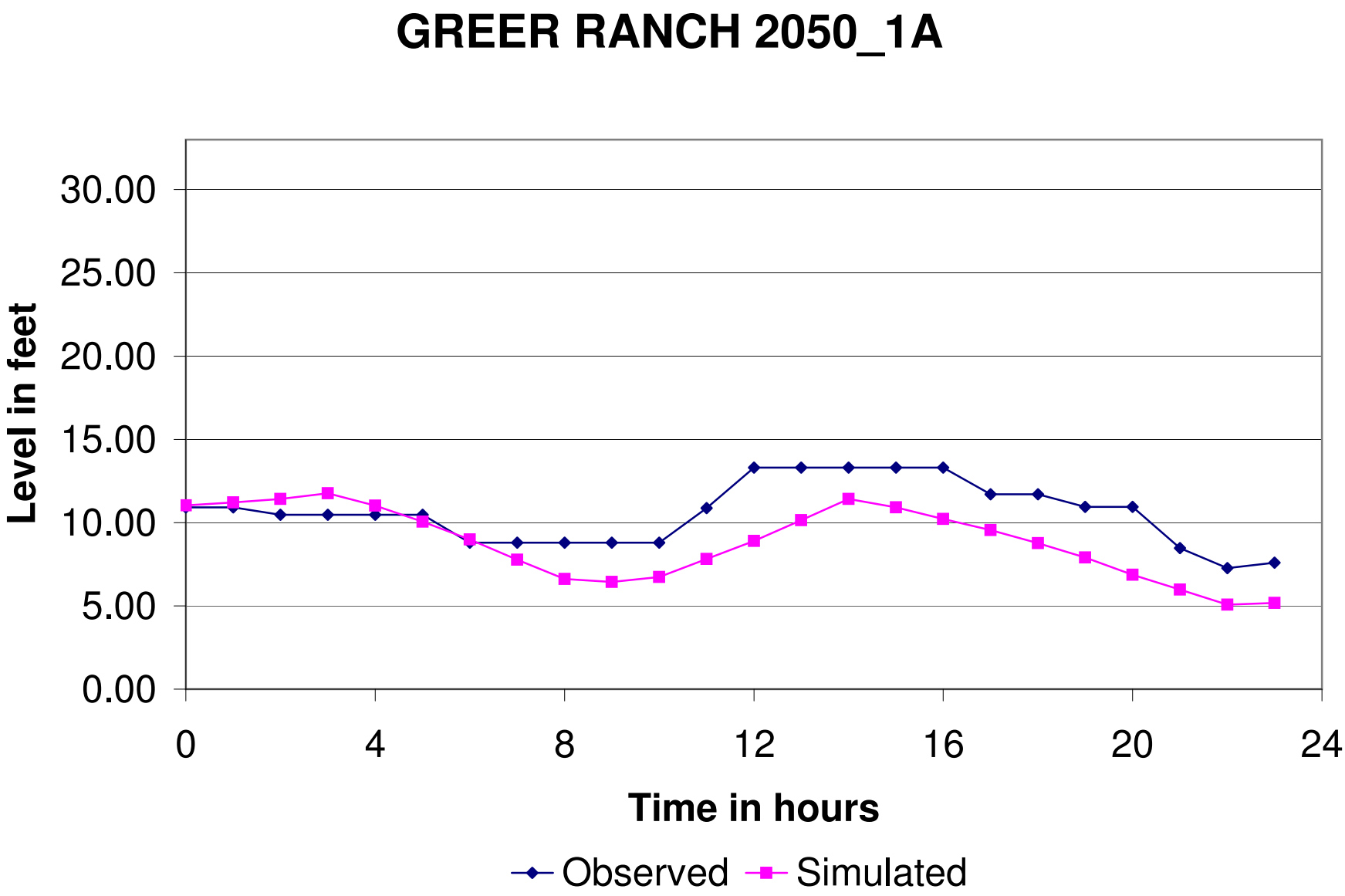

DALEY
Level in feet
20.00
15.00
10.00
5.00
0.00
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

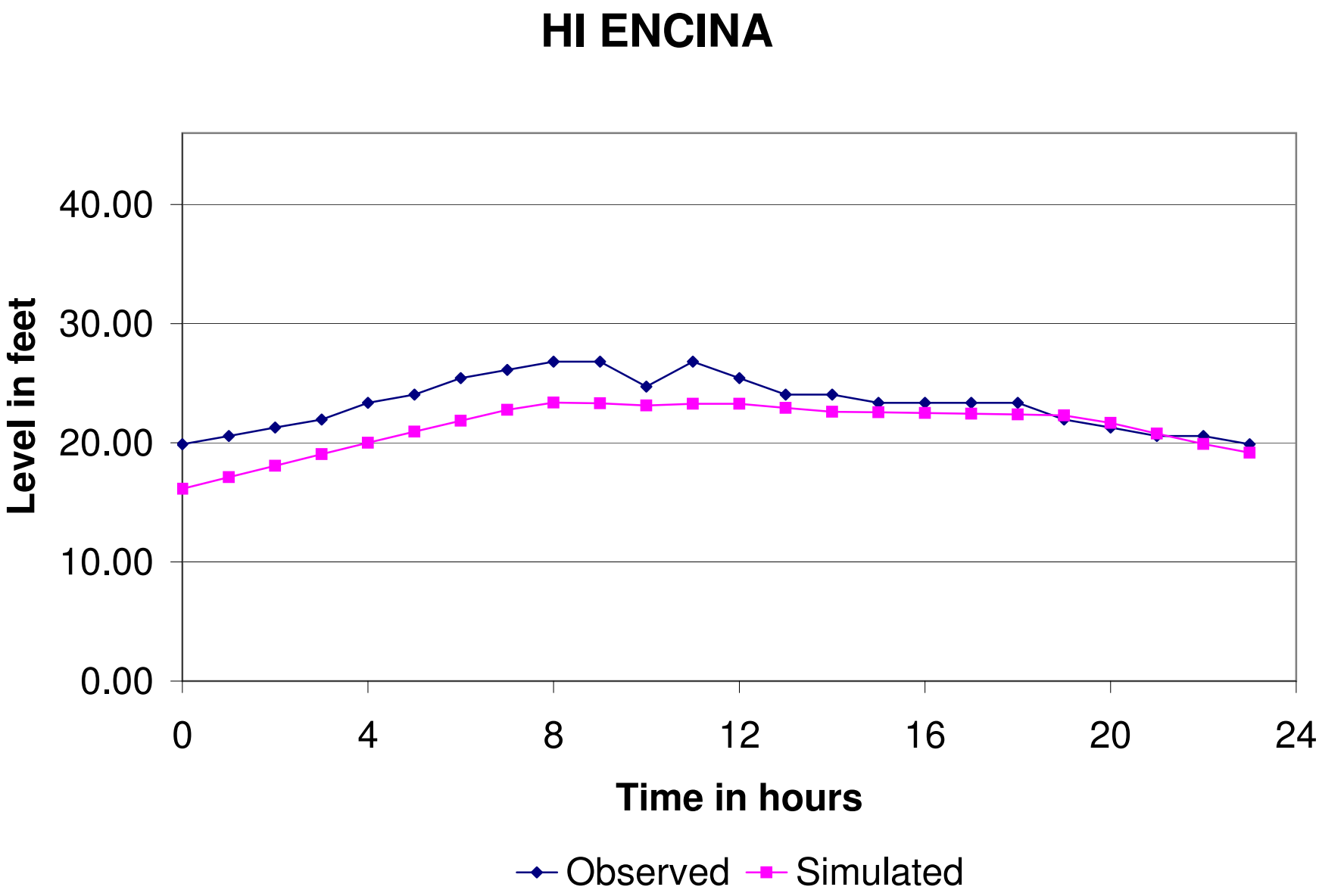

EL TORO_1
Level in feet
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

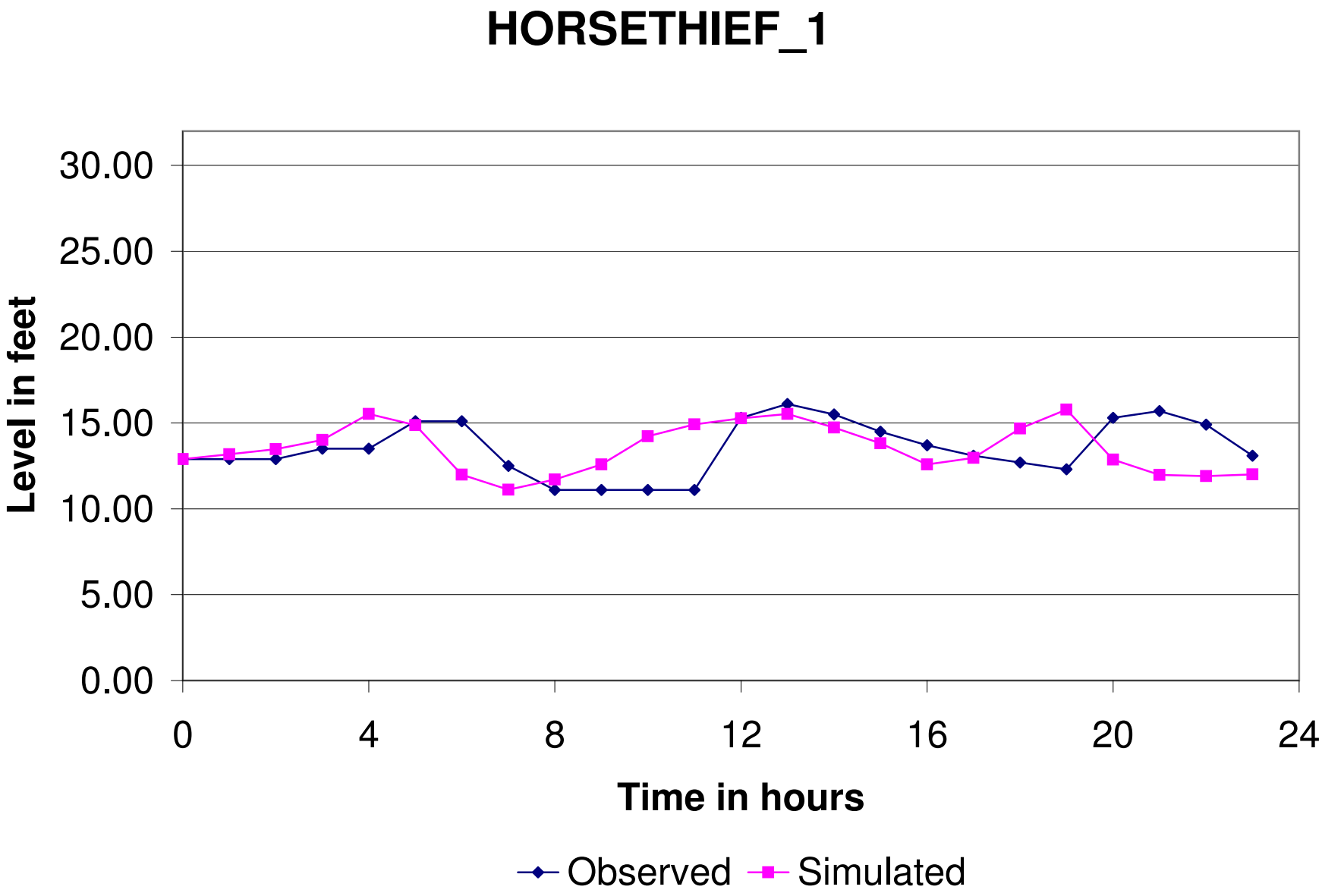

FARM
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Level in feet
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

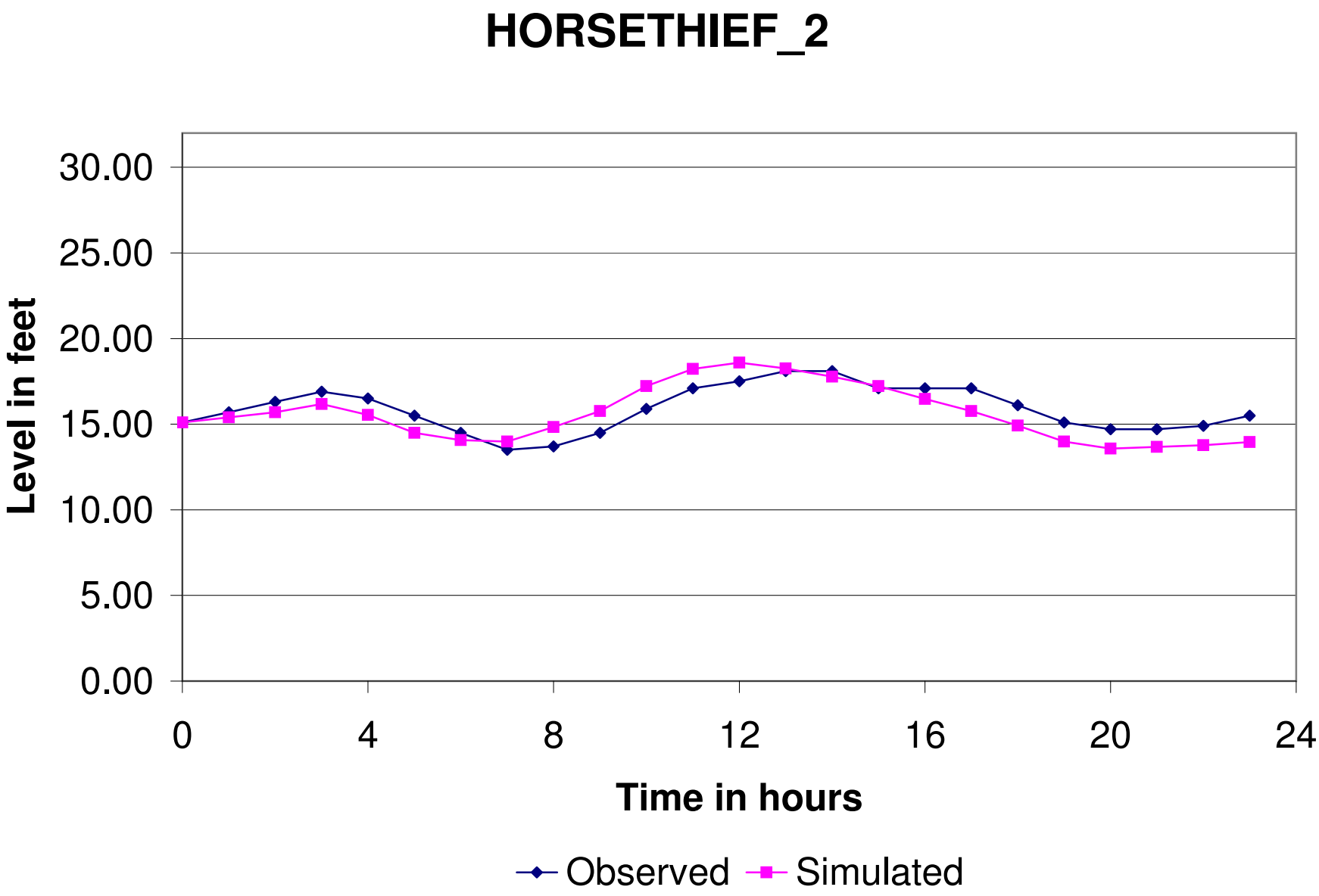

GAFFORD_B
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Level in feet
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

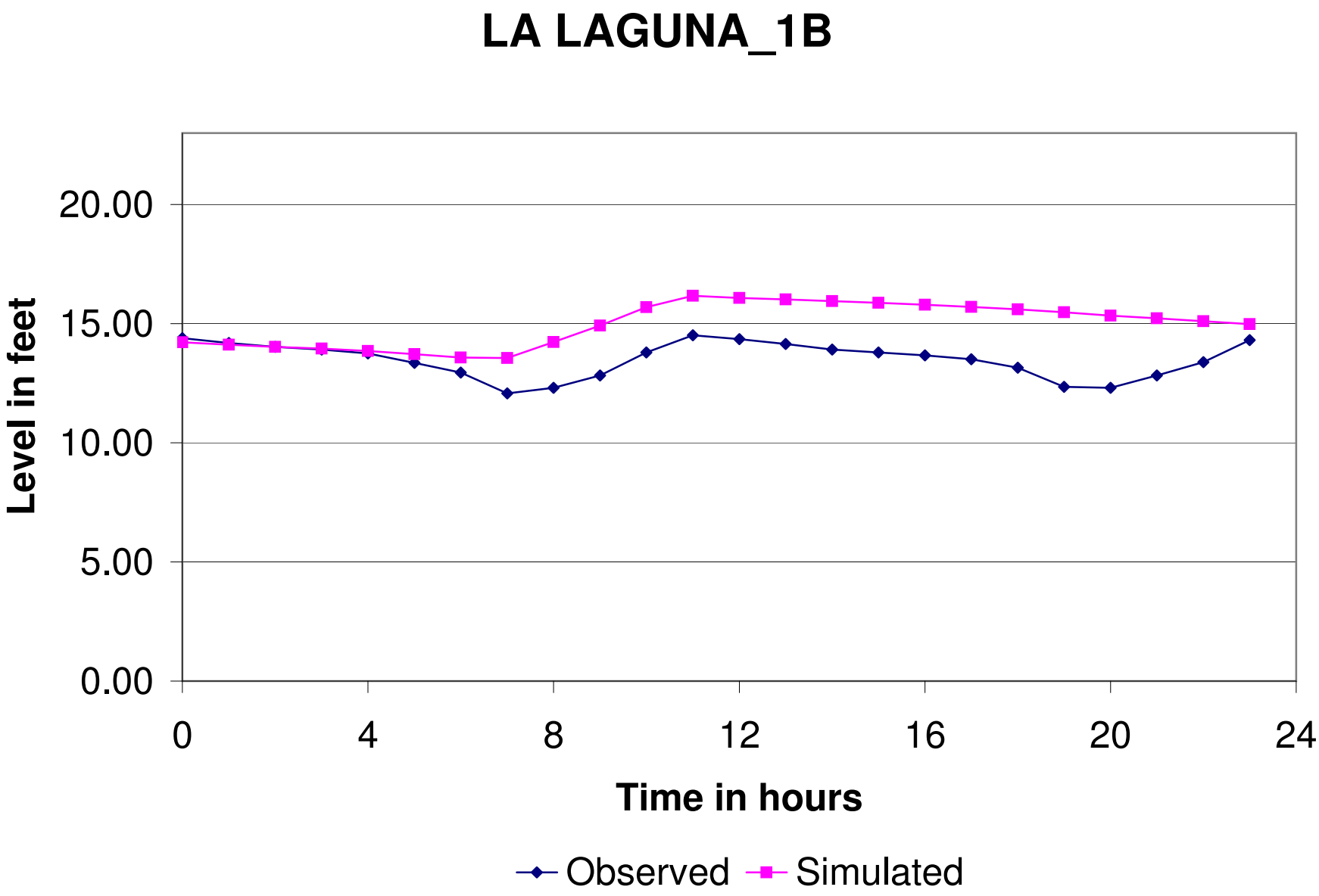

GREER RANCH 1850_1B
Level in feet
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

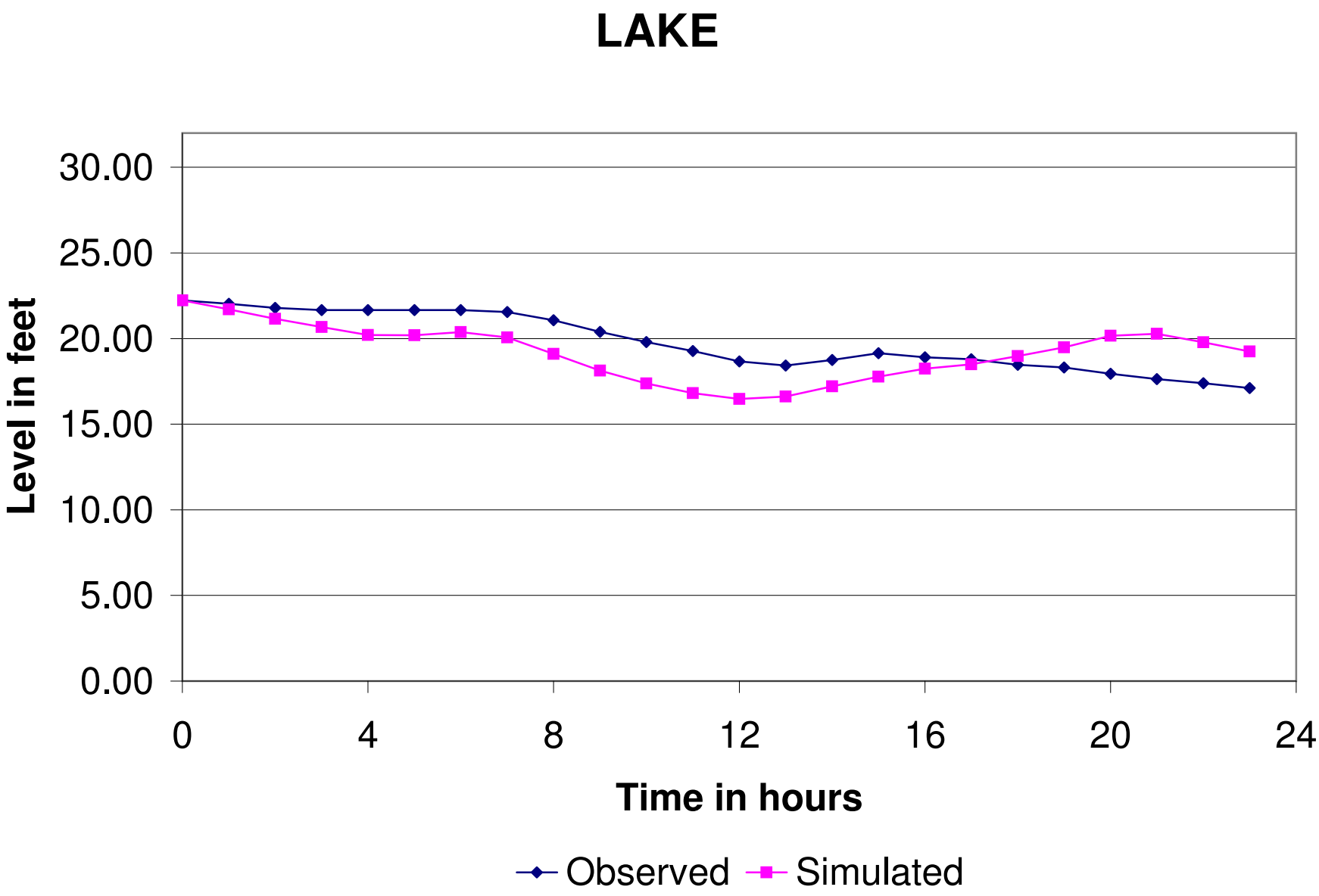

GREER RANCH 2050_1A
Level in feet
30.00
25.00
20.00
15.00
10.00
5.00
0.00
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

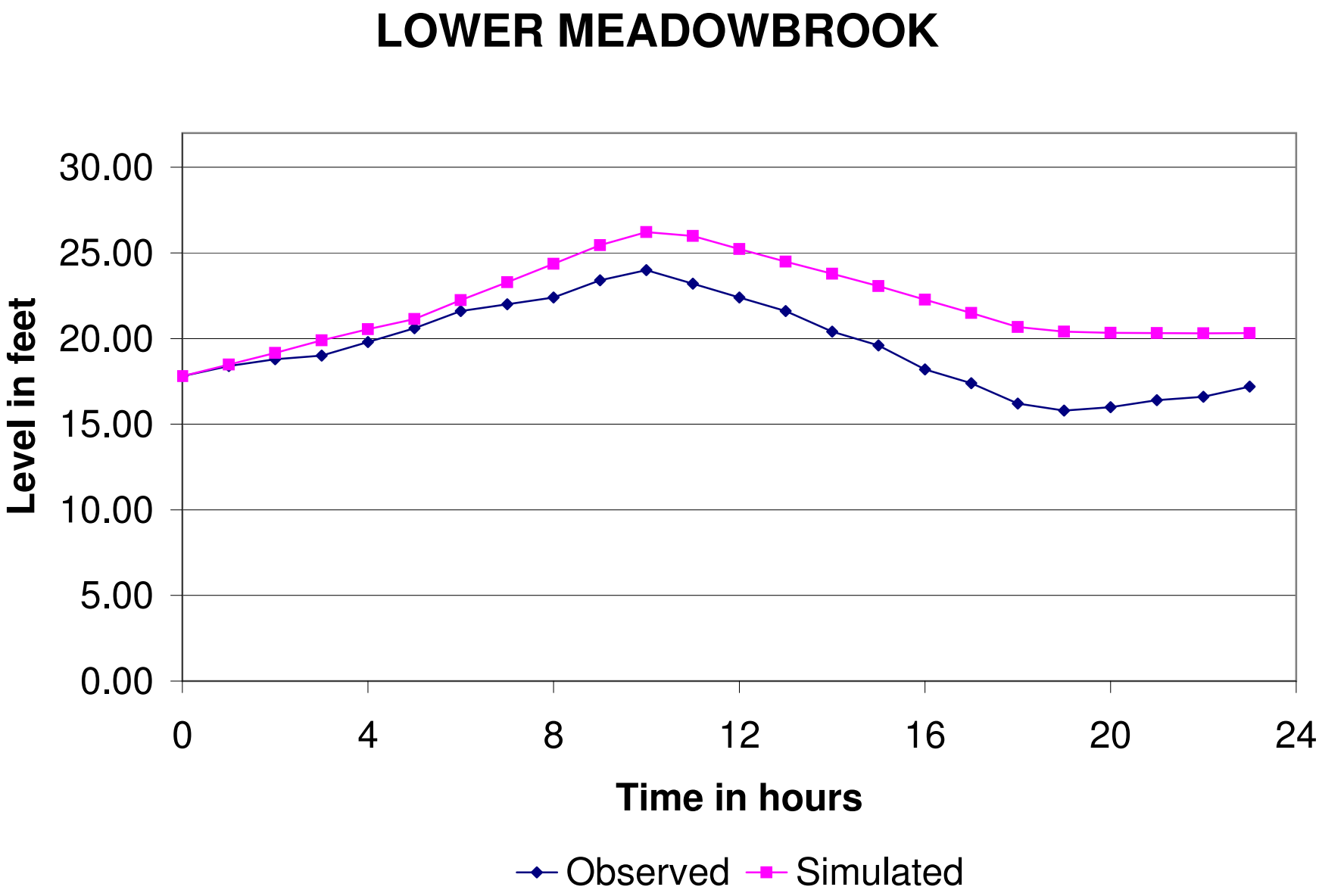

HI ENCINA
Level in feet
40.00
30.00
20.00
10.00
0.00
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

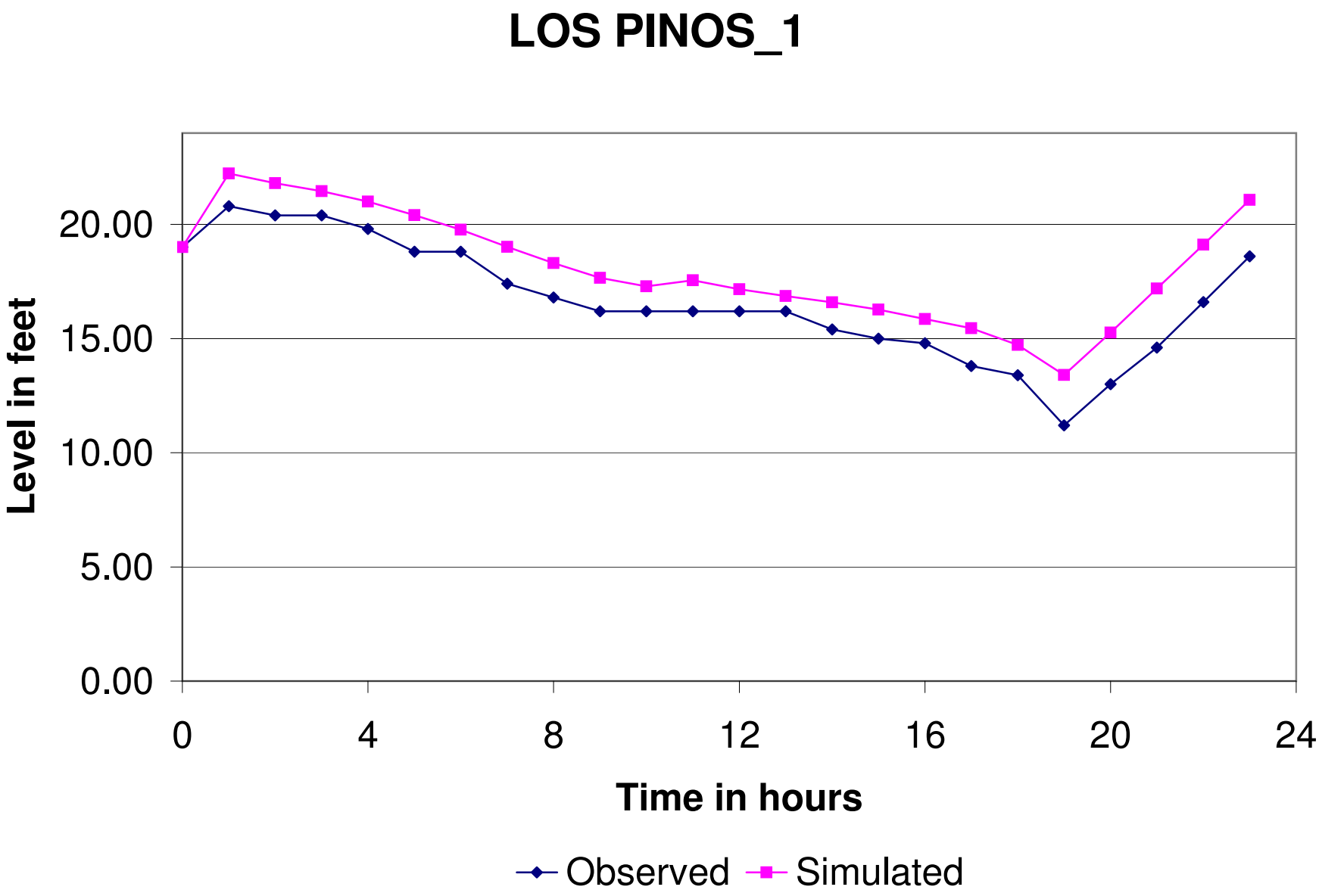

HORSETHIEF_1
Level in feet
30.00
25.00
20.00
15.00
10.00
5.00
0.00
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

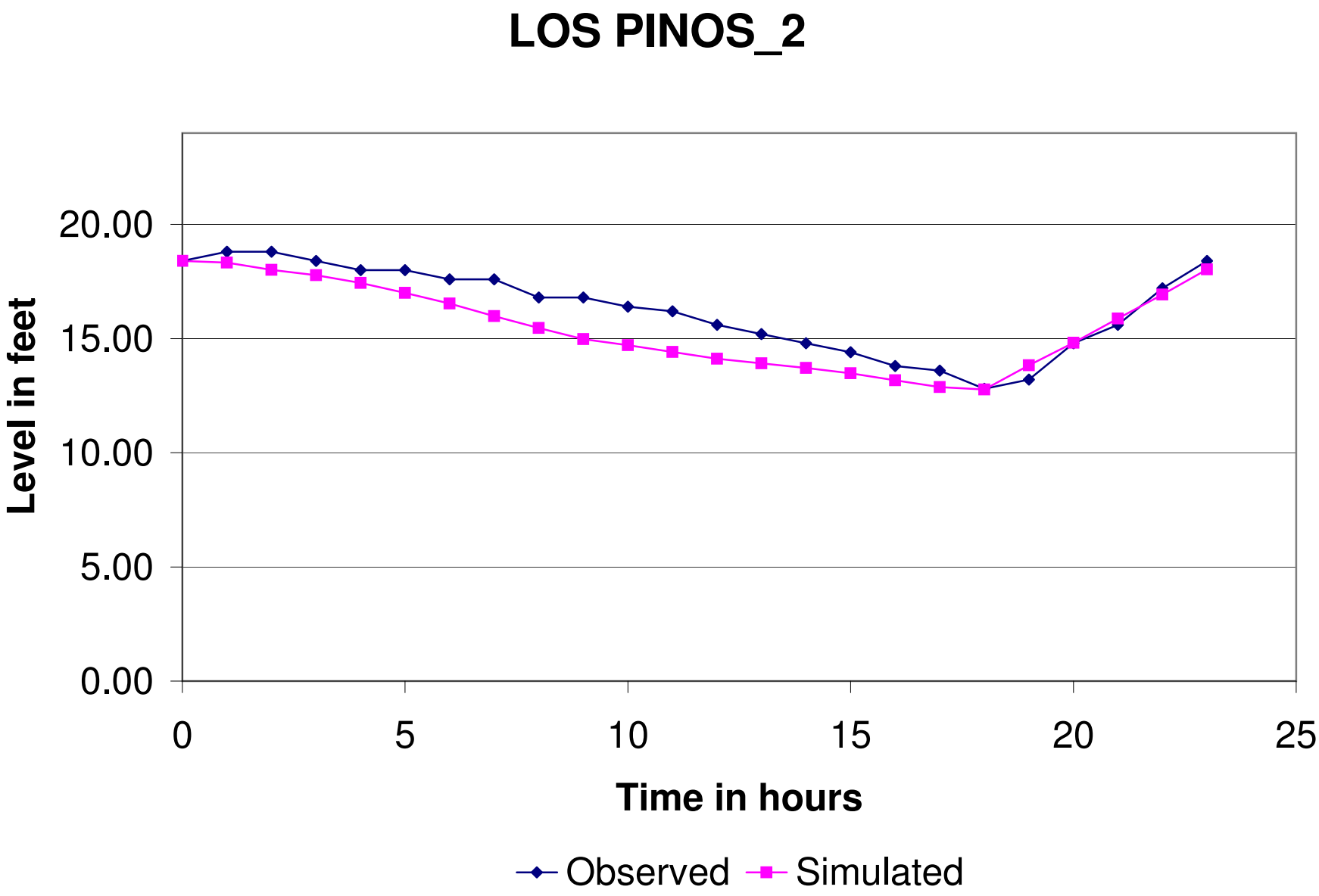

HORSETHIEF_2
Level in feet
30.00
25.00
20.00
15.00
10.00
5.00
0.00
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

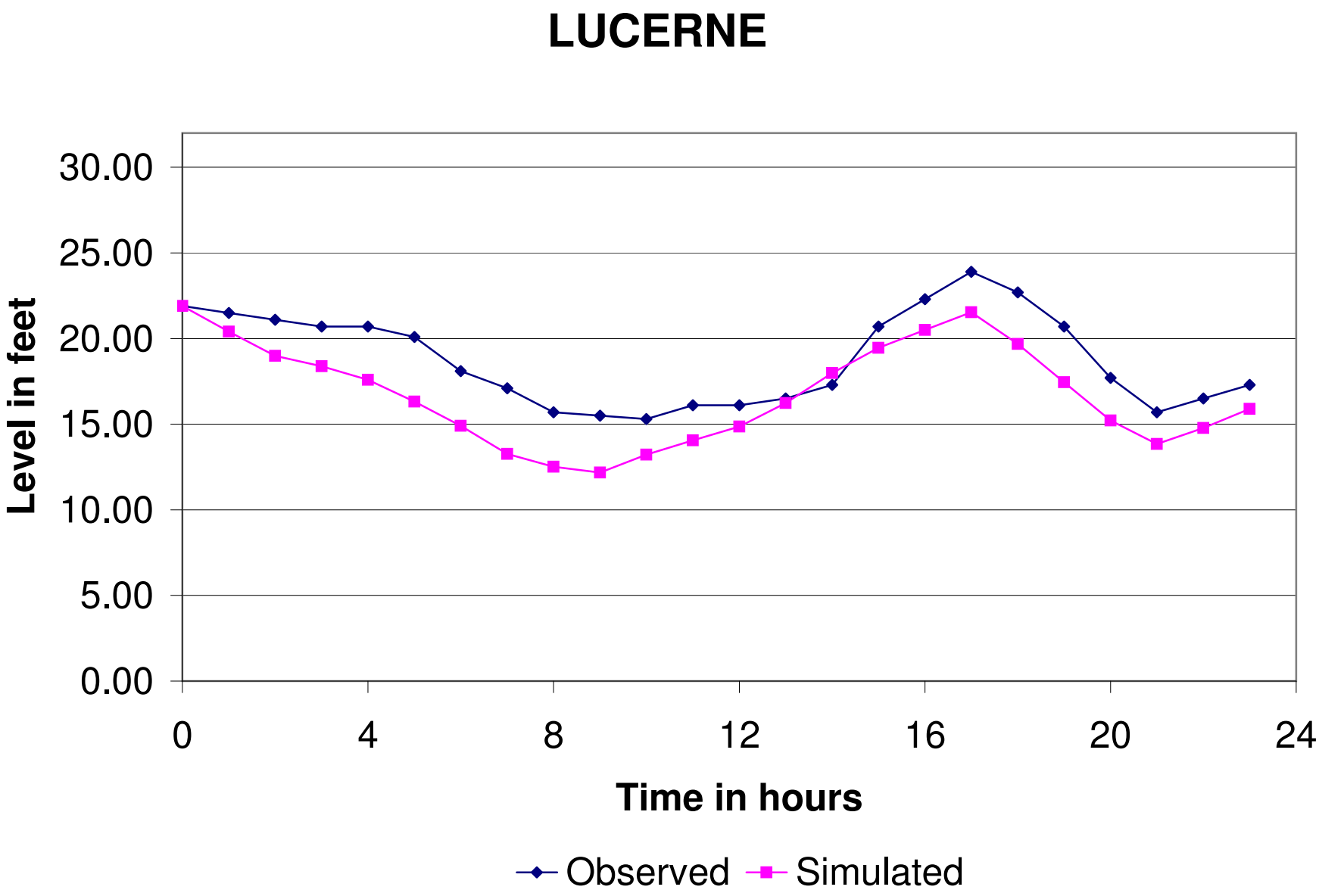

LA LAGUNA_1B
Level in feet
20.00
15.00
10.00
5.00
0.00
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

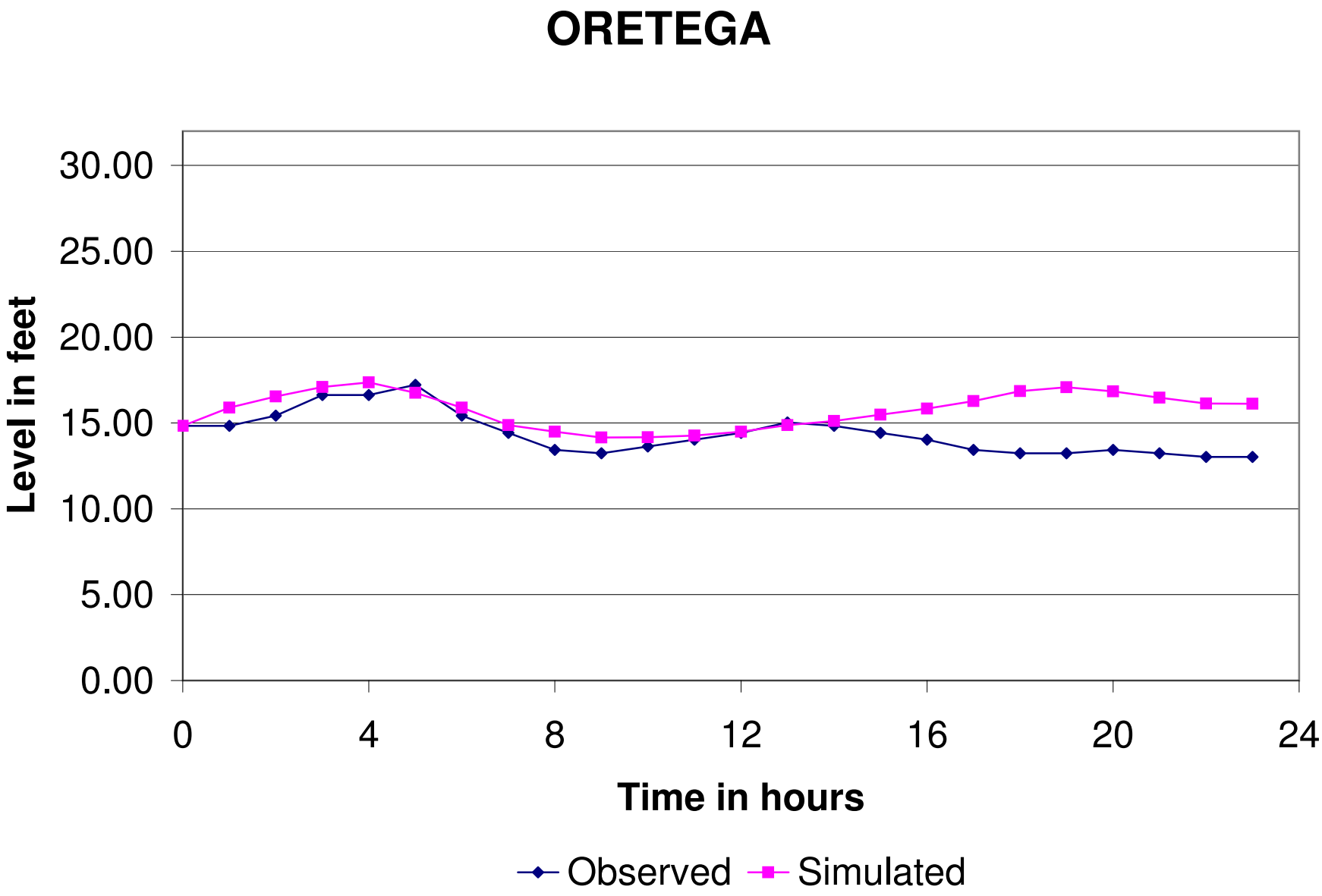

LAKE
Level in feet
30.00
25.00
20.00
15.00
10.00
5.00
0.00
0
4
8
12
16
20
24
Time in hours
Observed
Simulated


LOWER MEADOWBROOK
Level in feet
30.00
25.00
20.00
15.00
10.00
5.00
0.00
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

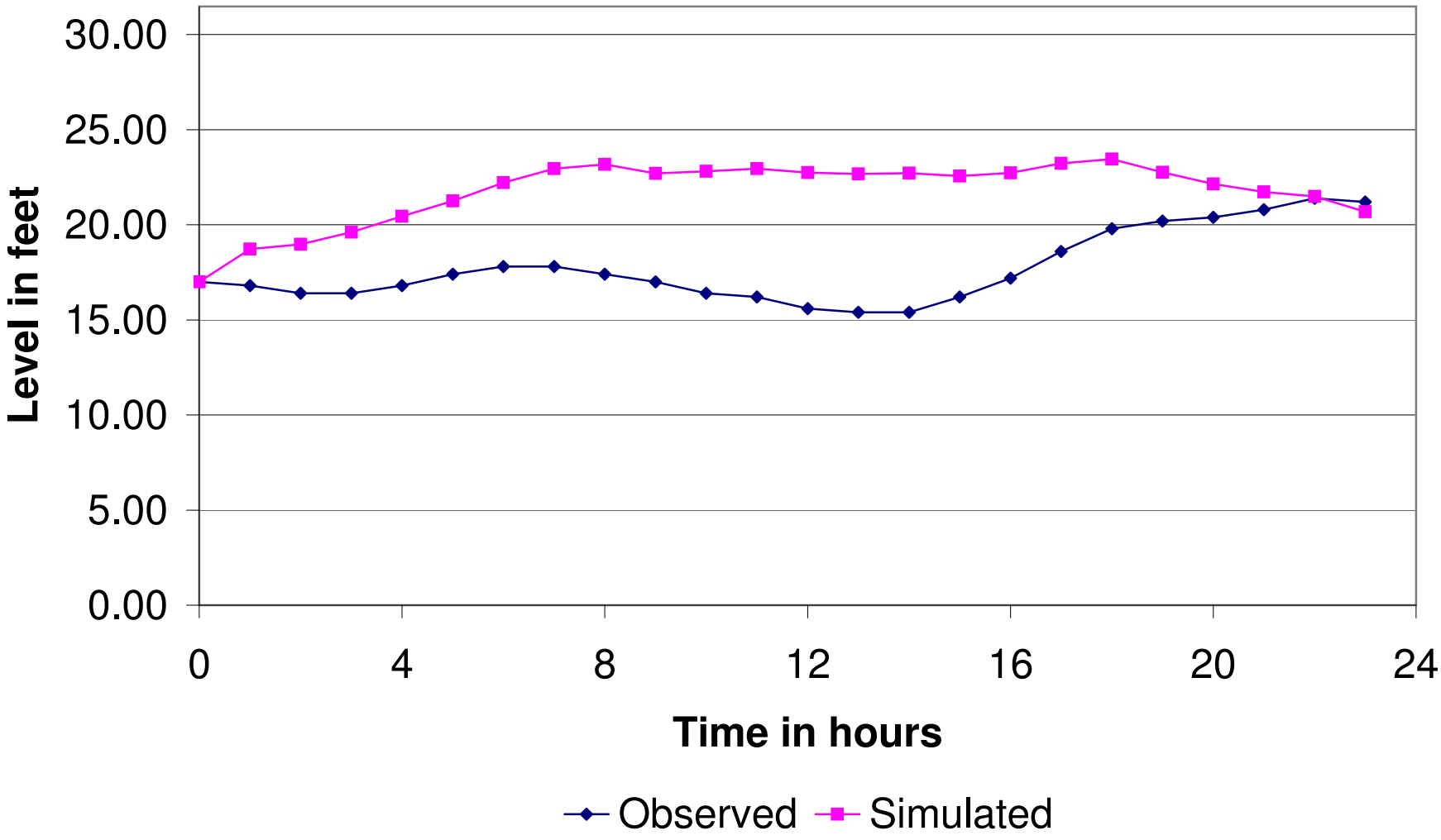

LOS PINOS_1
Level in feet
20.00
15.00
10.00
5.00
0.00
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

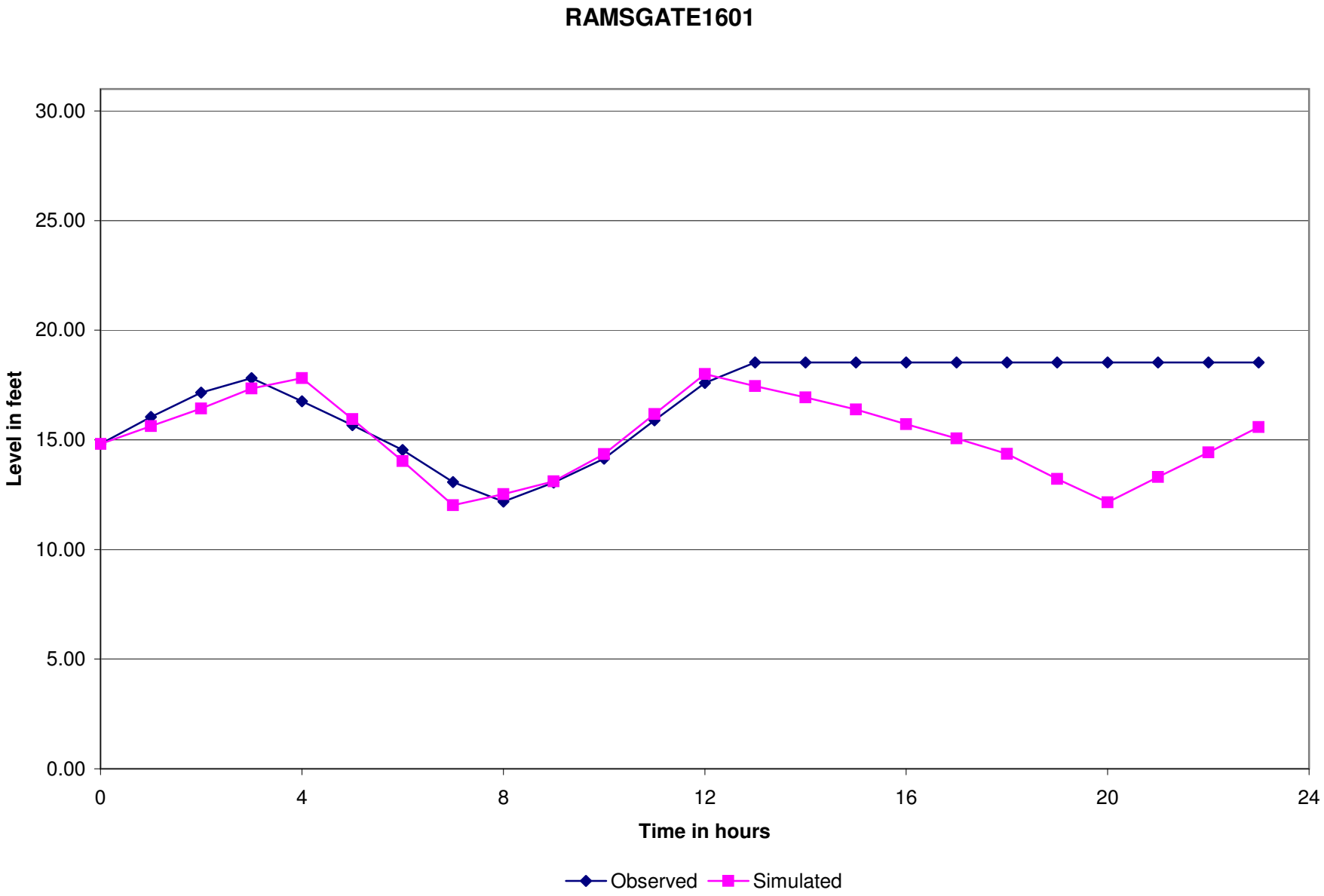

LOS PINOS_2
Level in feet
20.00
15.00
10.00
5.00
0.00
0
5
10
15
20
25
Time in hours
Observed
Simulated

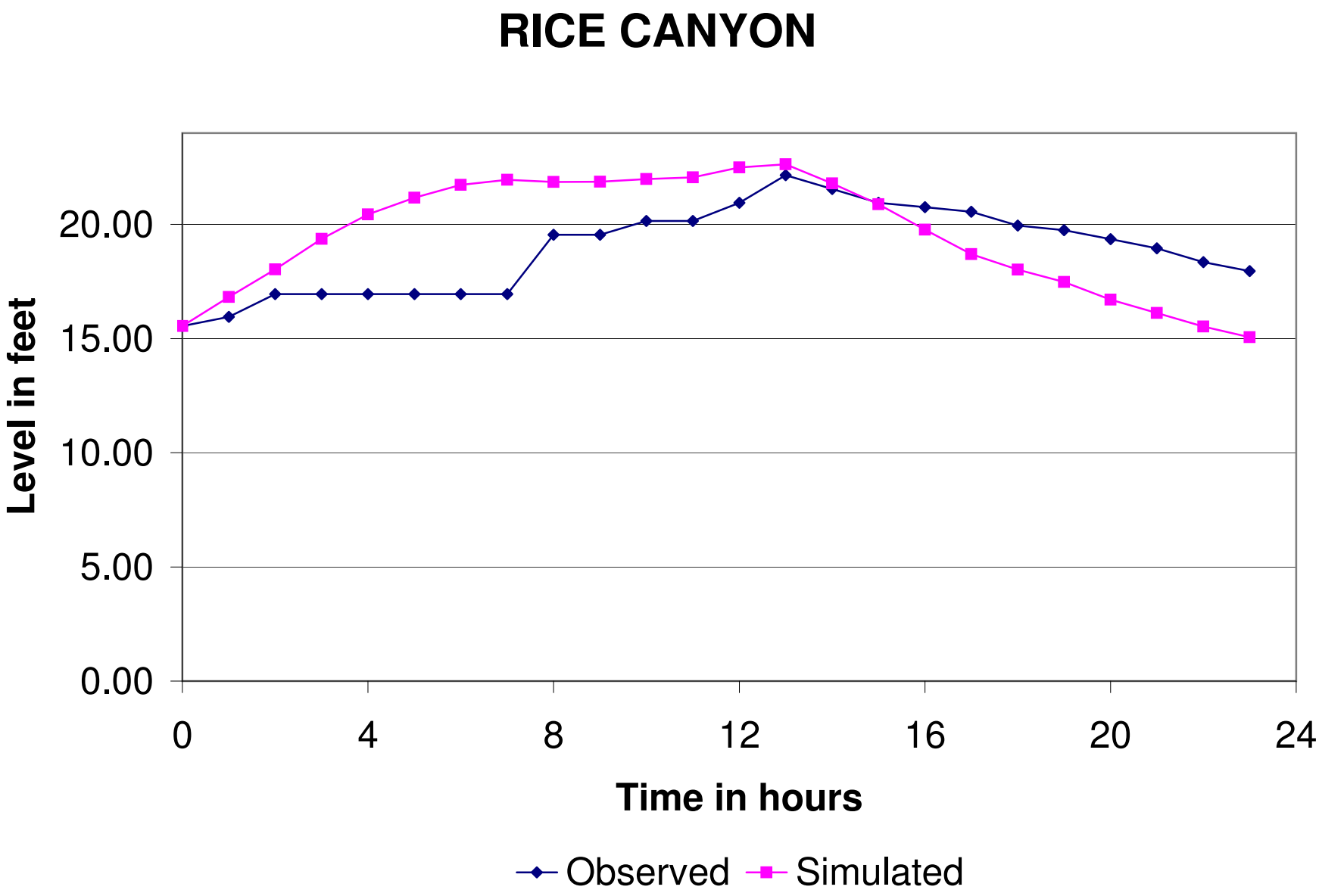

LUCERNE
Level in feet
30.00
25.00
20.00
15.00
10.00
5.00
0.00
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

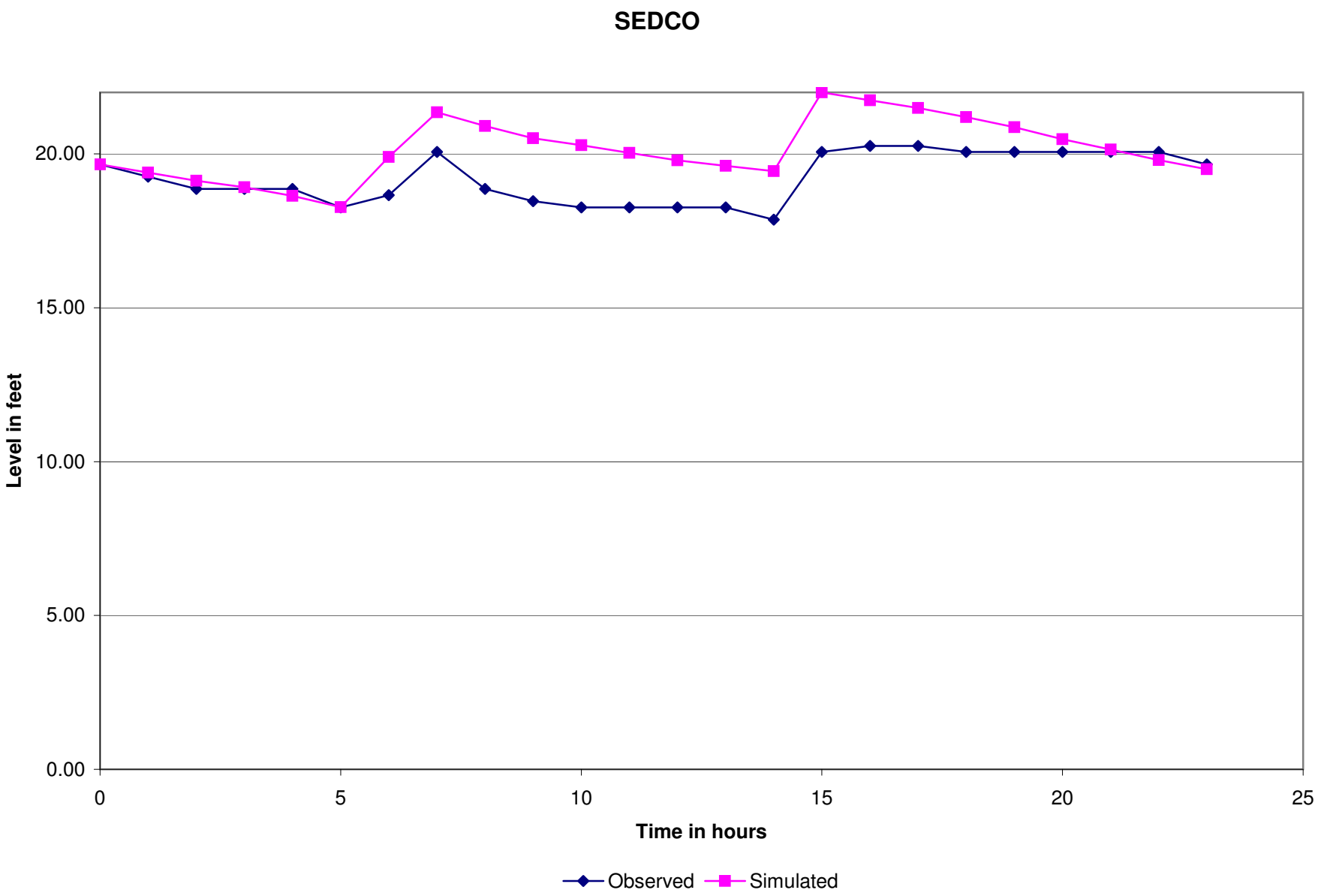

ORETEGA
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Level in feet
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

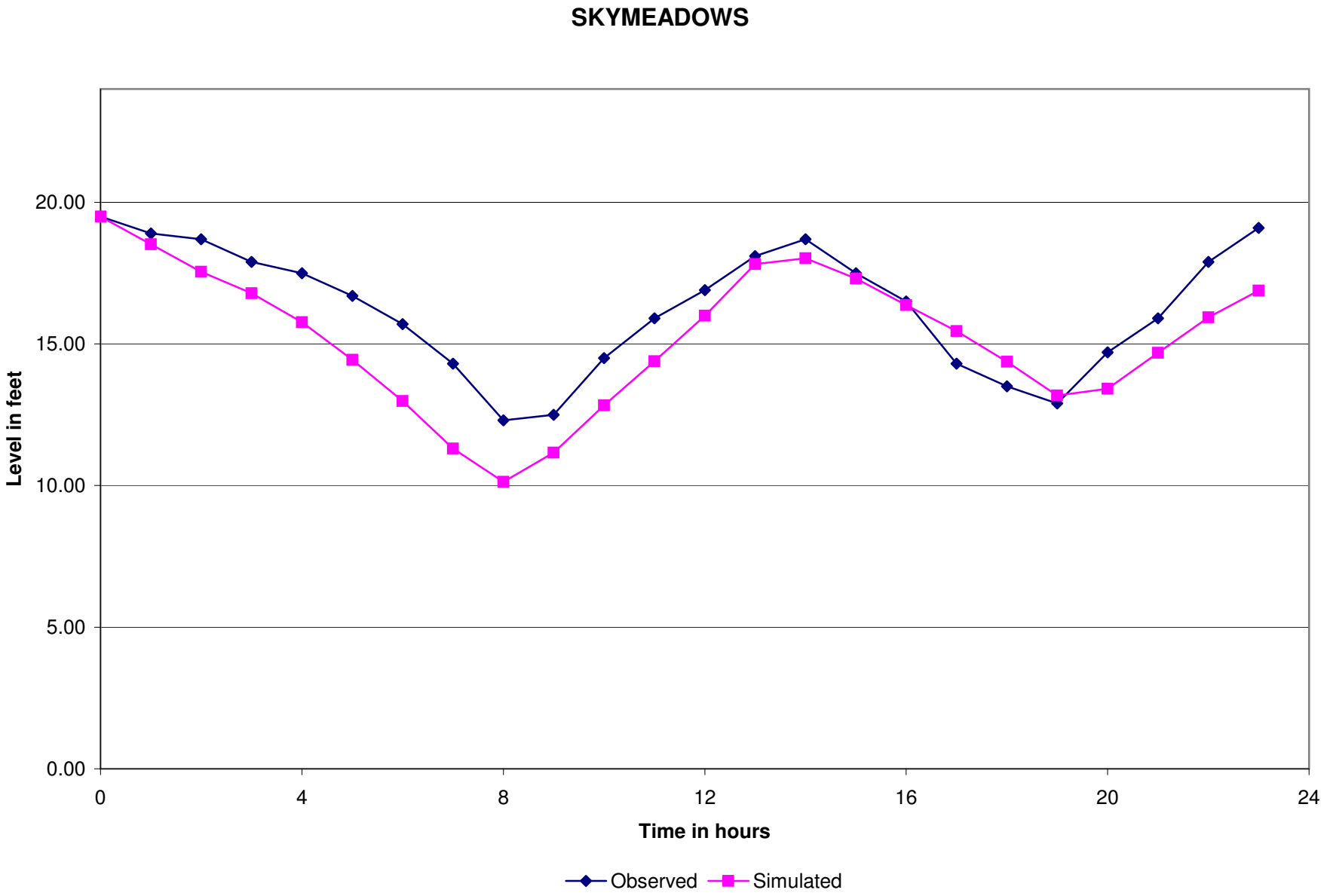
RAIL ROAD CANYON

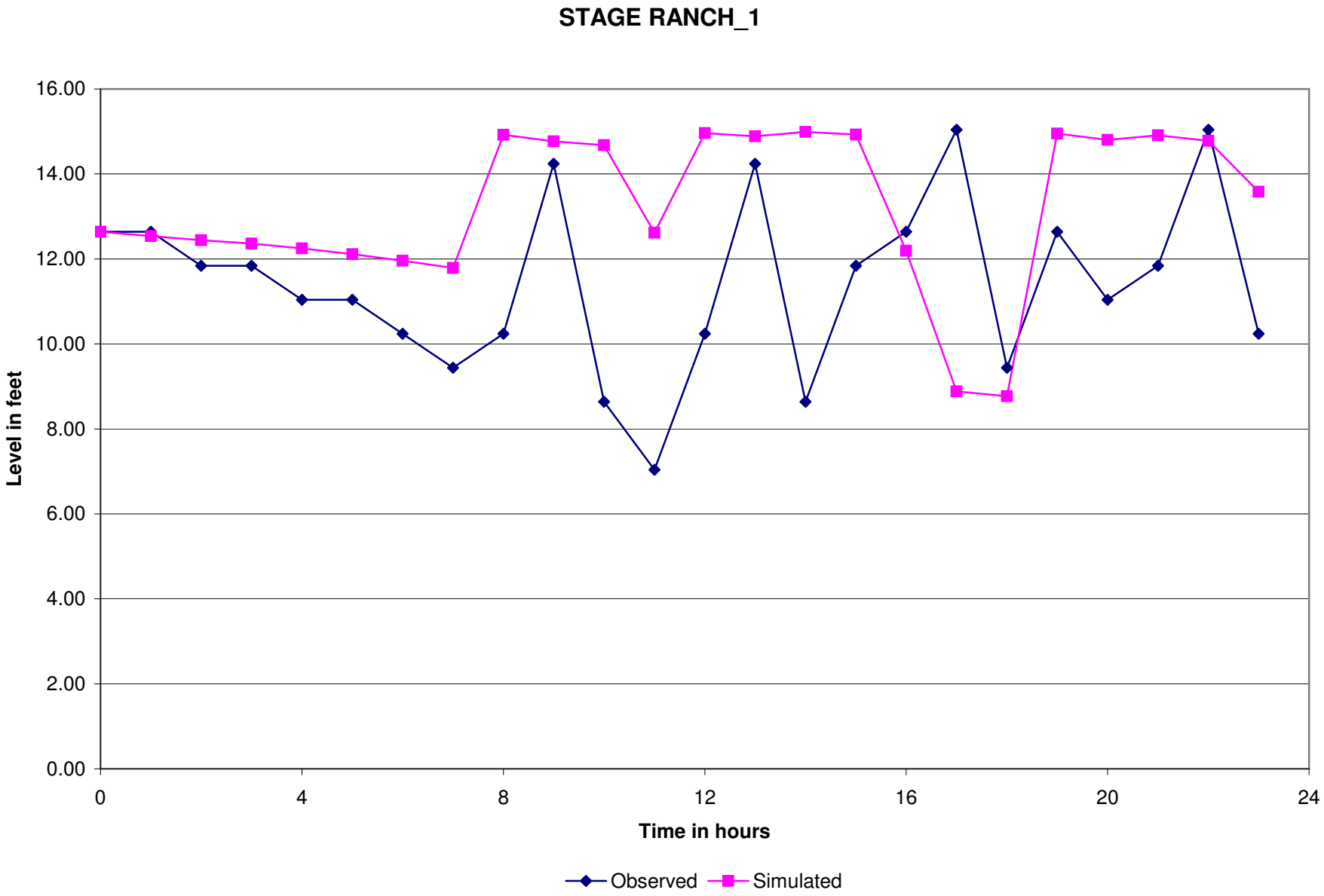


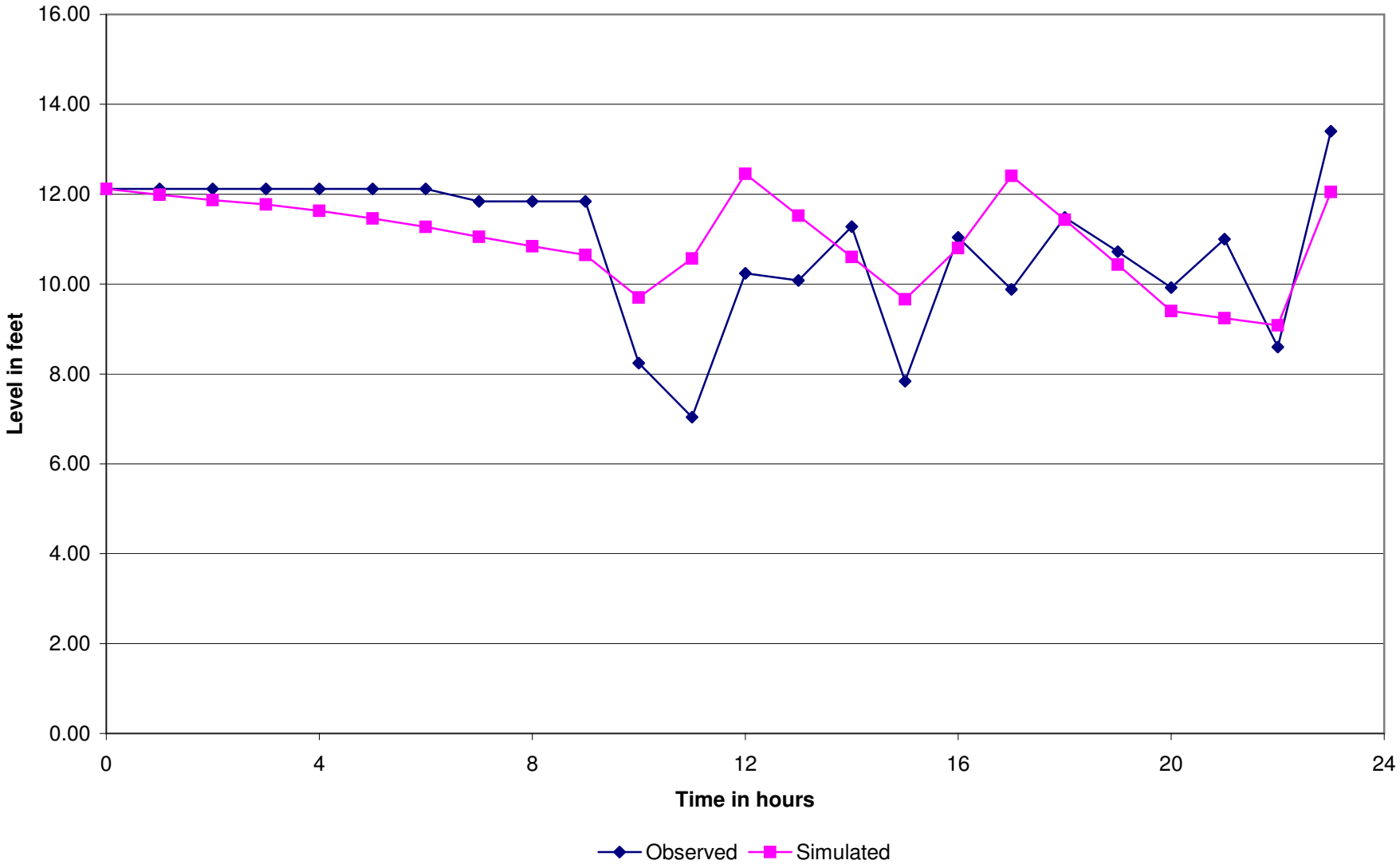

RAMSGATE1601
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Level in feet
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

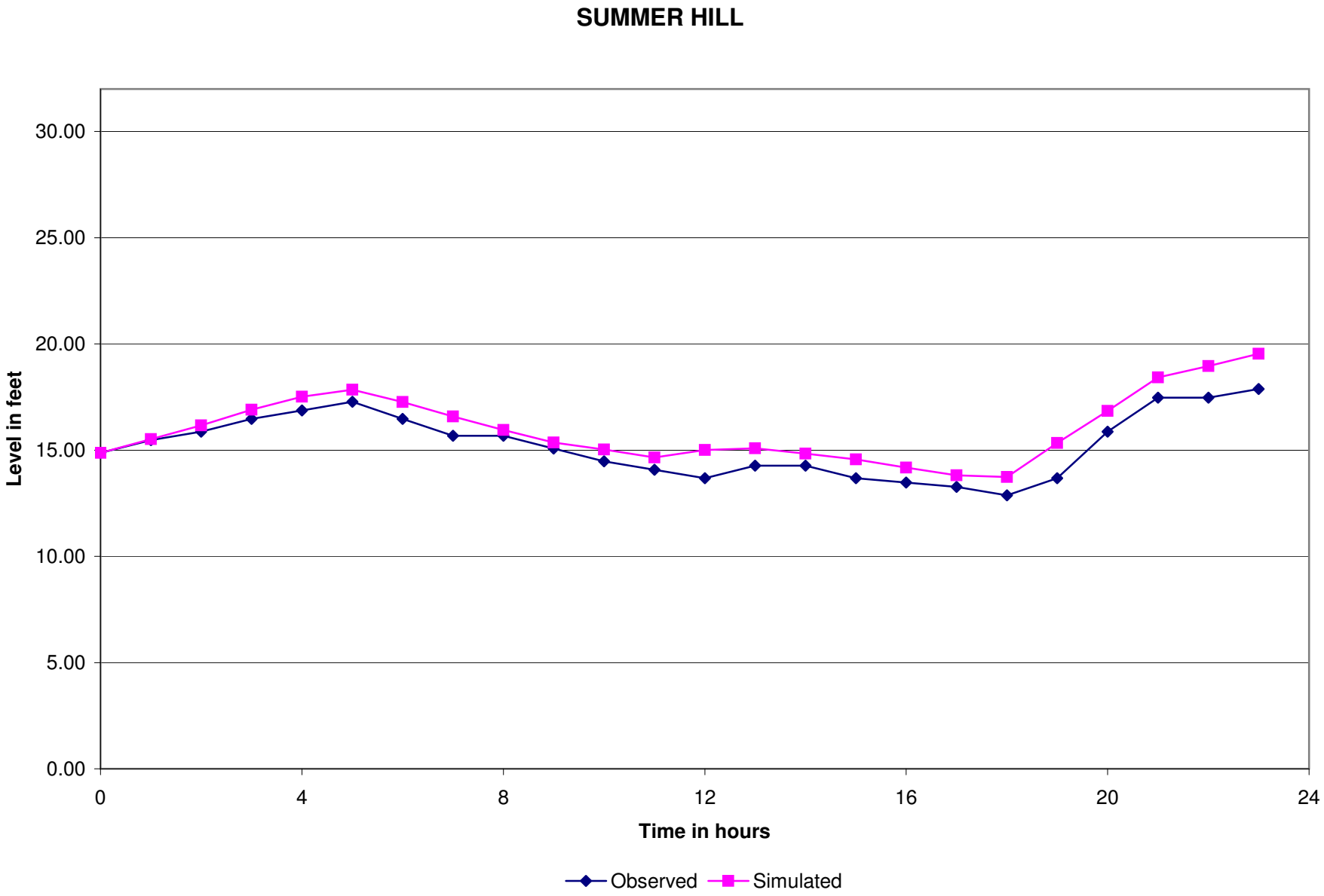

RICE CANYON
Level in feet
20.00
15.00
10.00
5.00
0.00
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

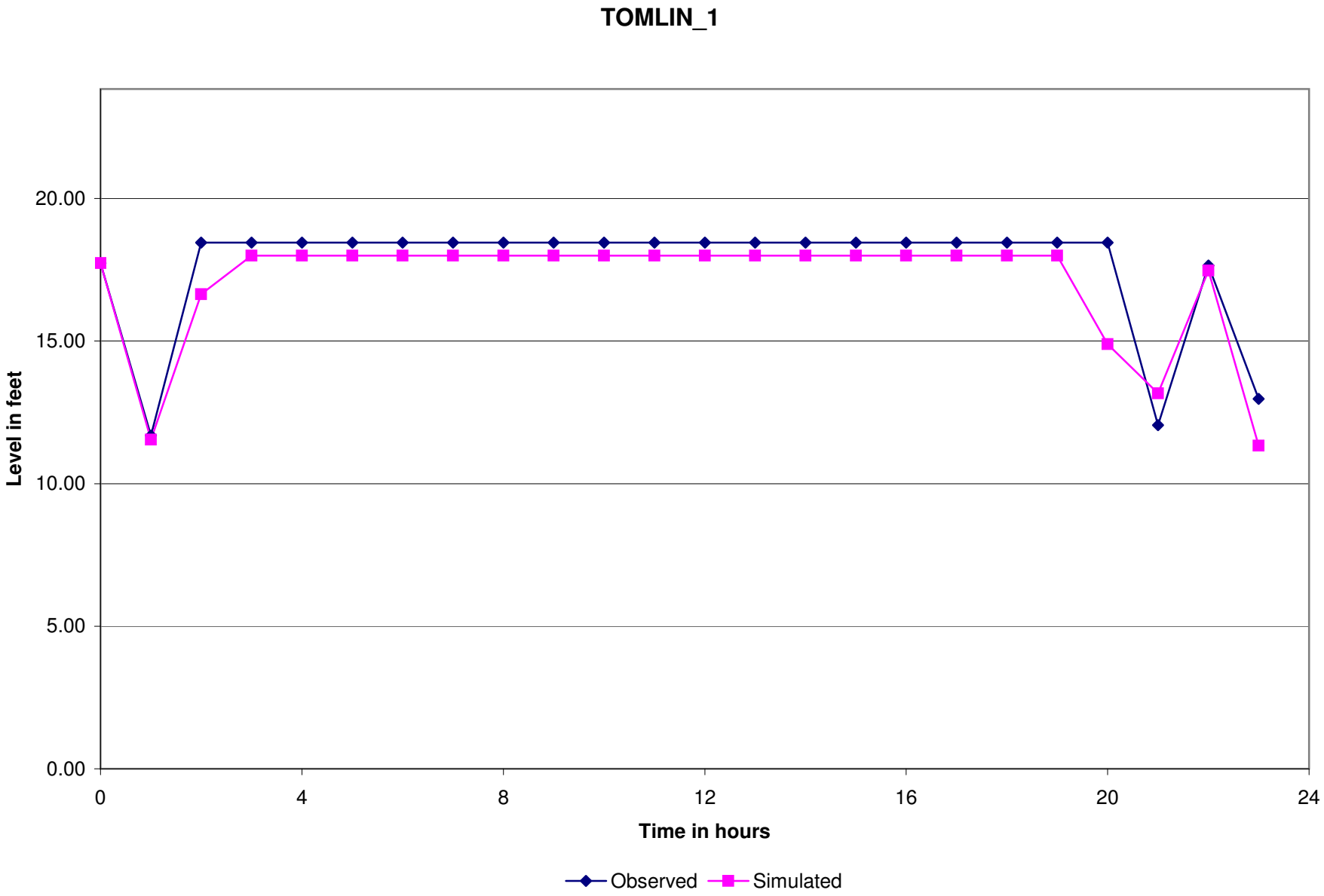

SEDCO
Level in feet
20.00
15.00
10.00
5.00
0.00
0
5
10
15
20
25
Time in hours
Observed
Simulated

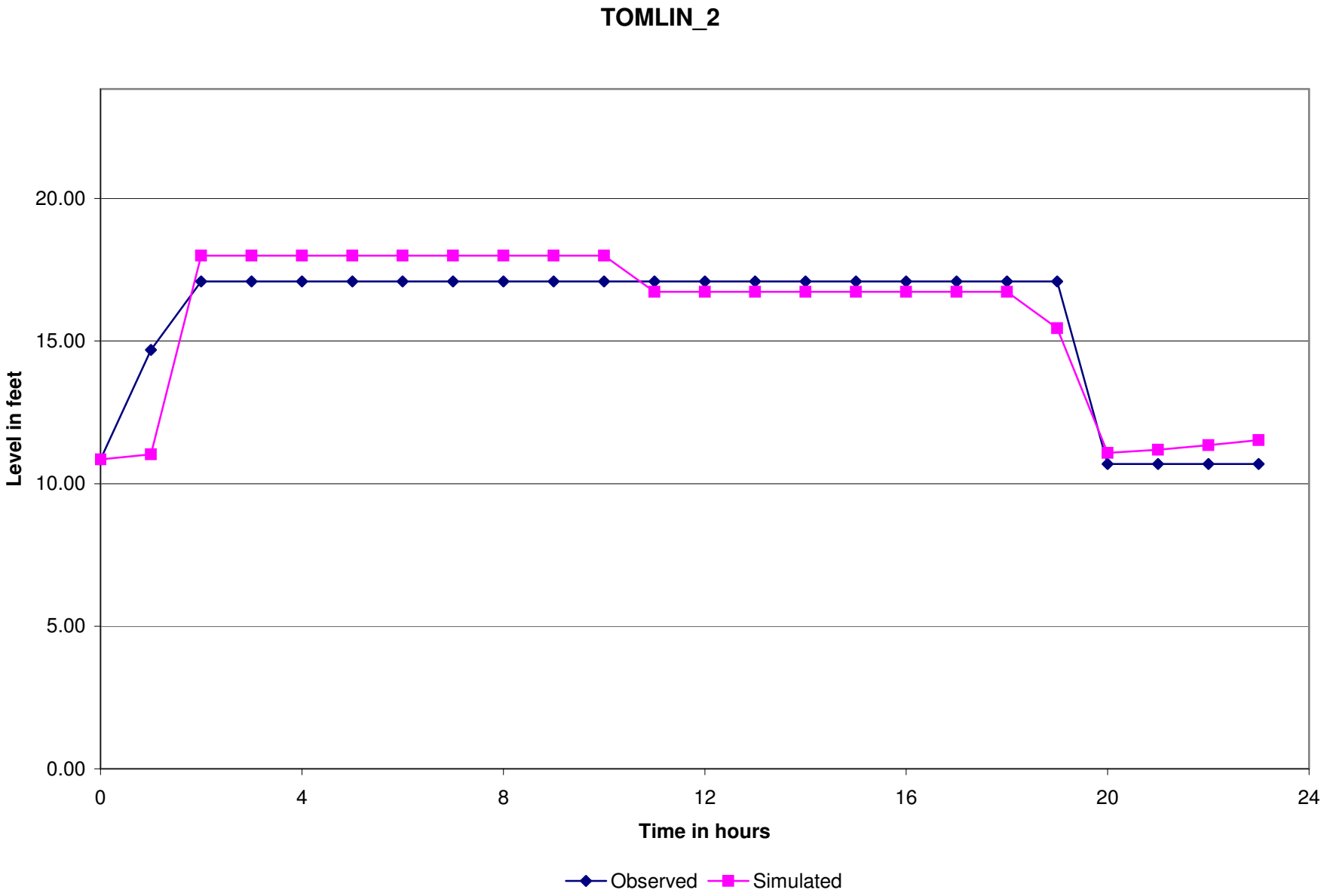

SKYMEADOWS
Level in feet
20.00
15.00
10.00
5.00
0.00
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

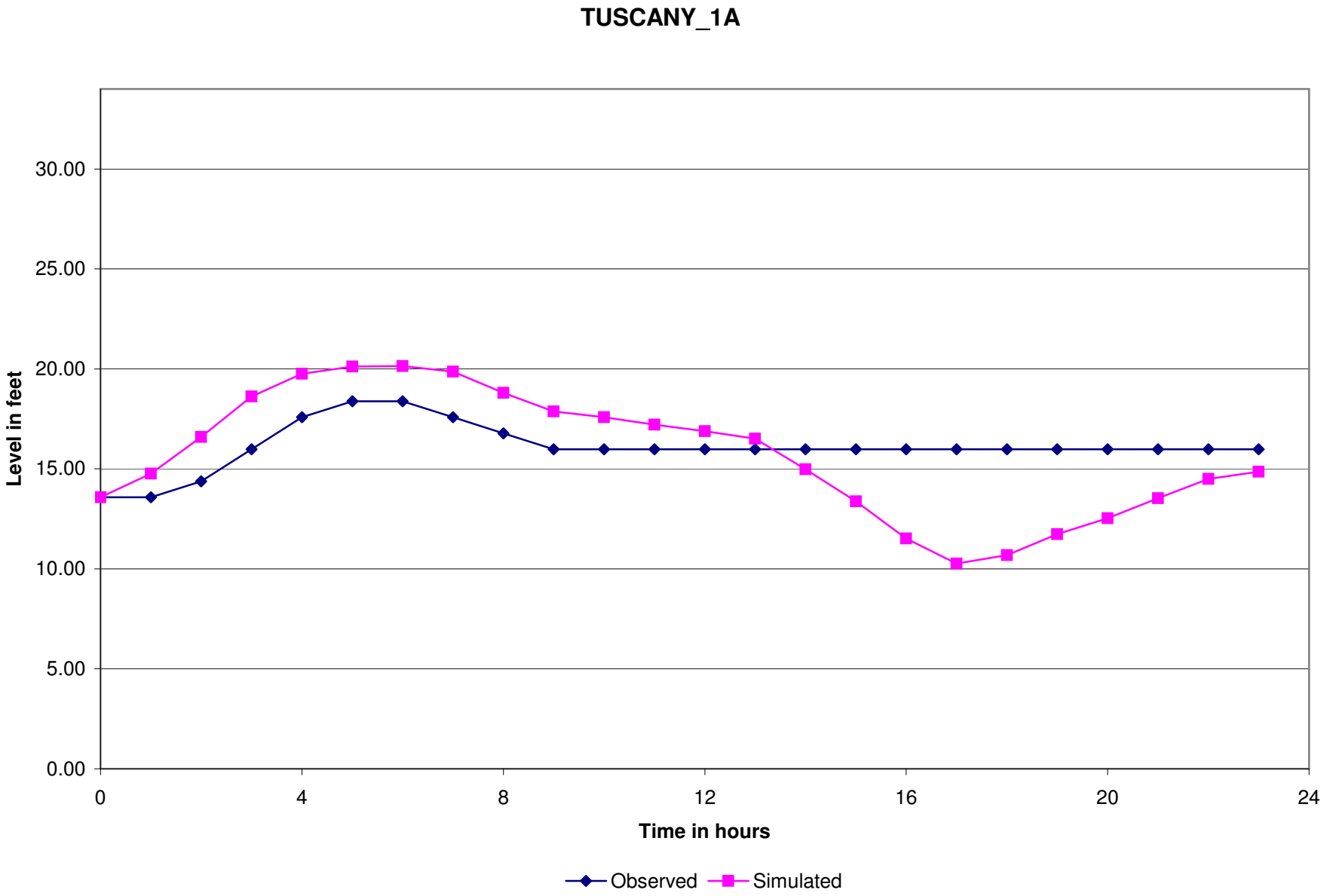

STAGE RANCH_1
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Level in feet
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

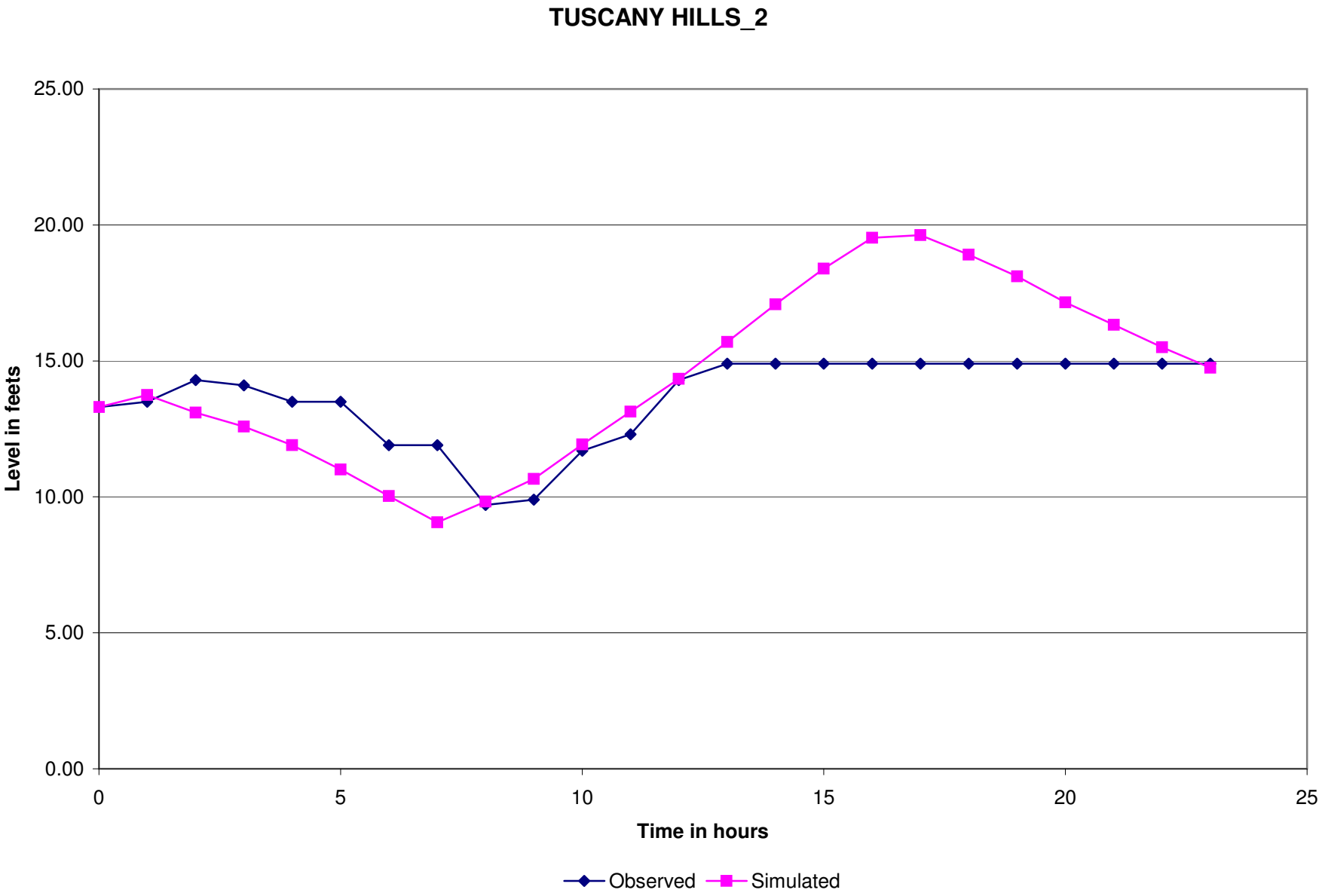

STAGE RANCH_2A
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Level in feet
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

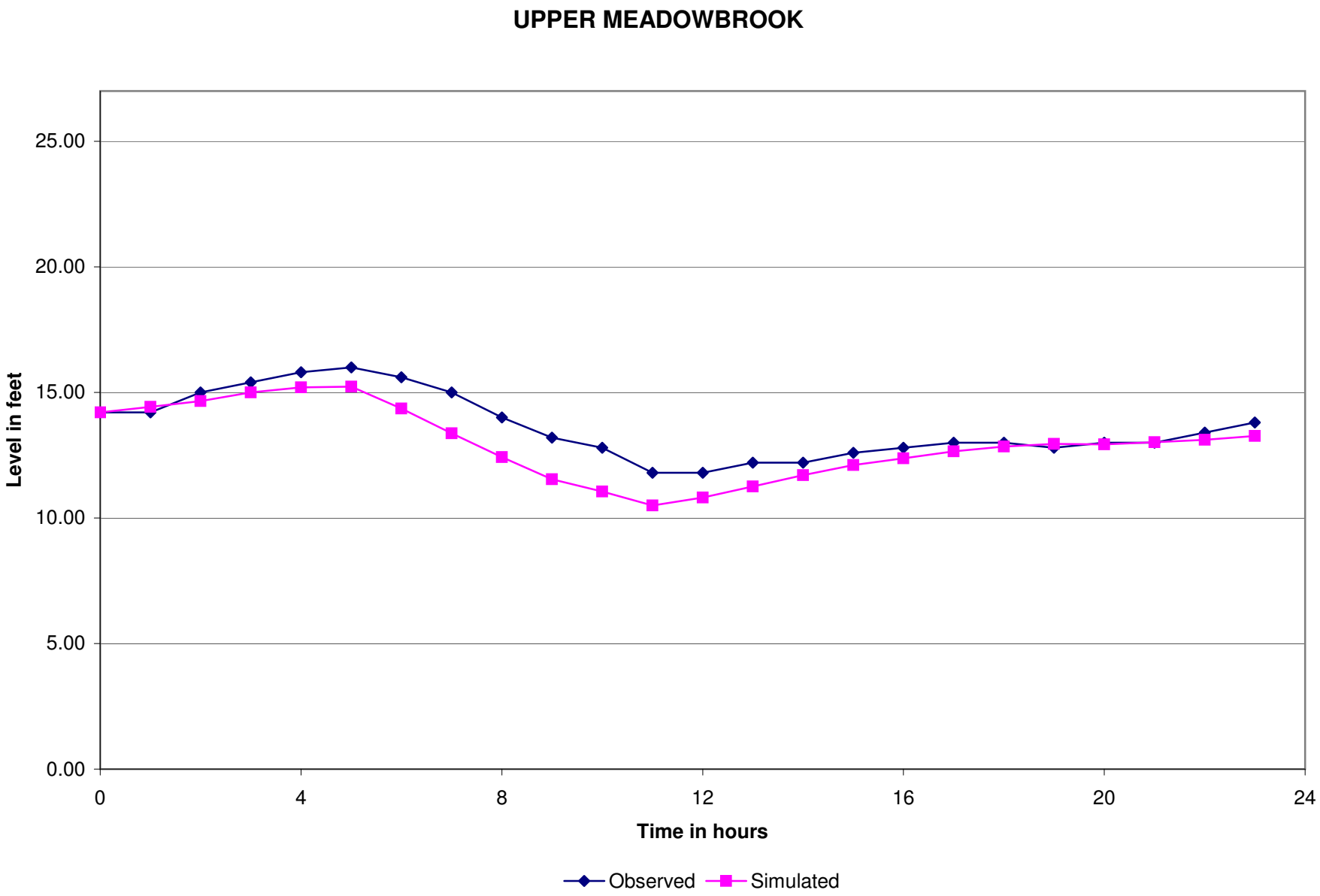

SUMMER HILL
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Level in feet
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

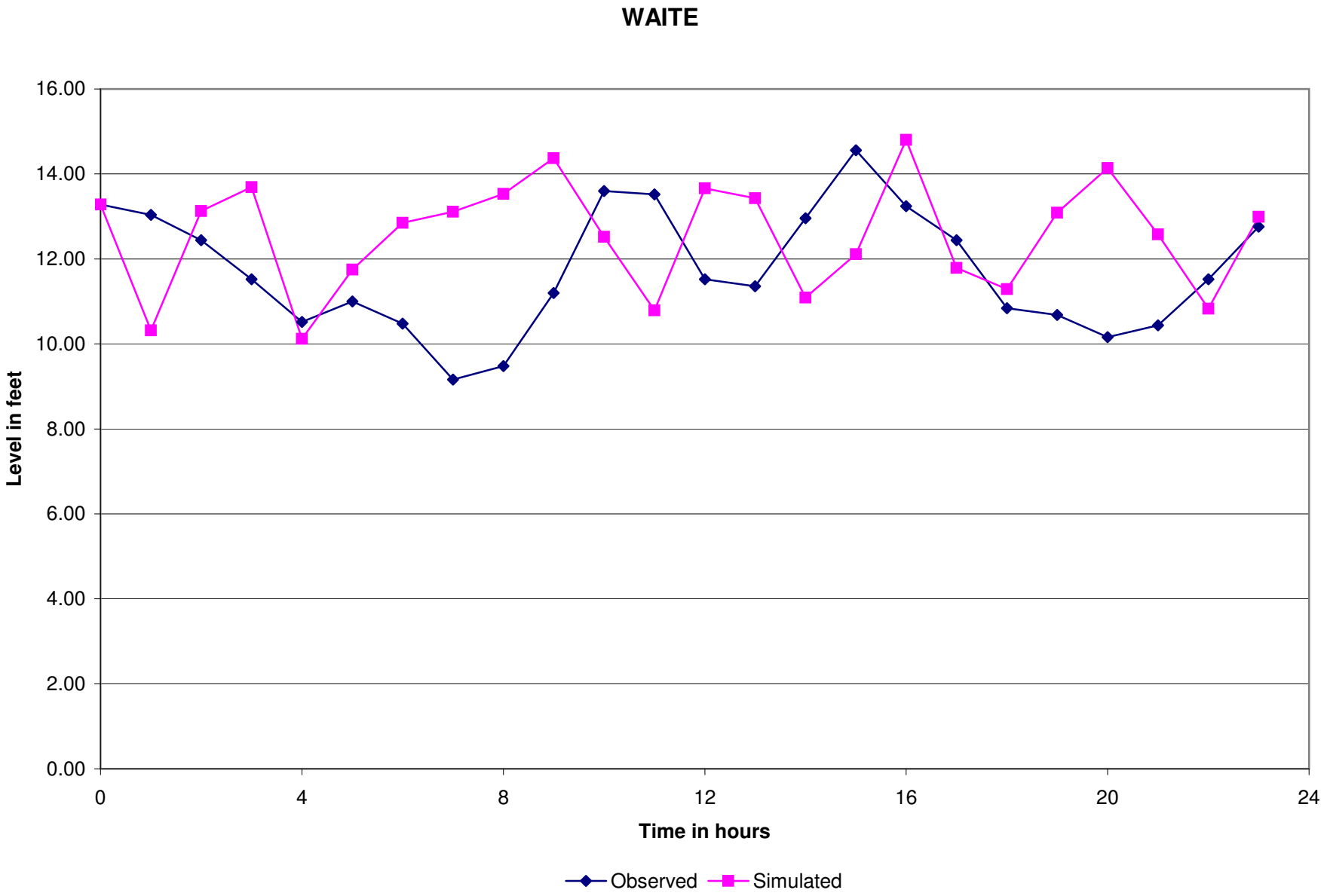

TOMLIN_1
20.00
15.00
10.00
5.00
0.00
Level in feet
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

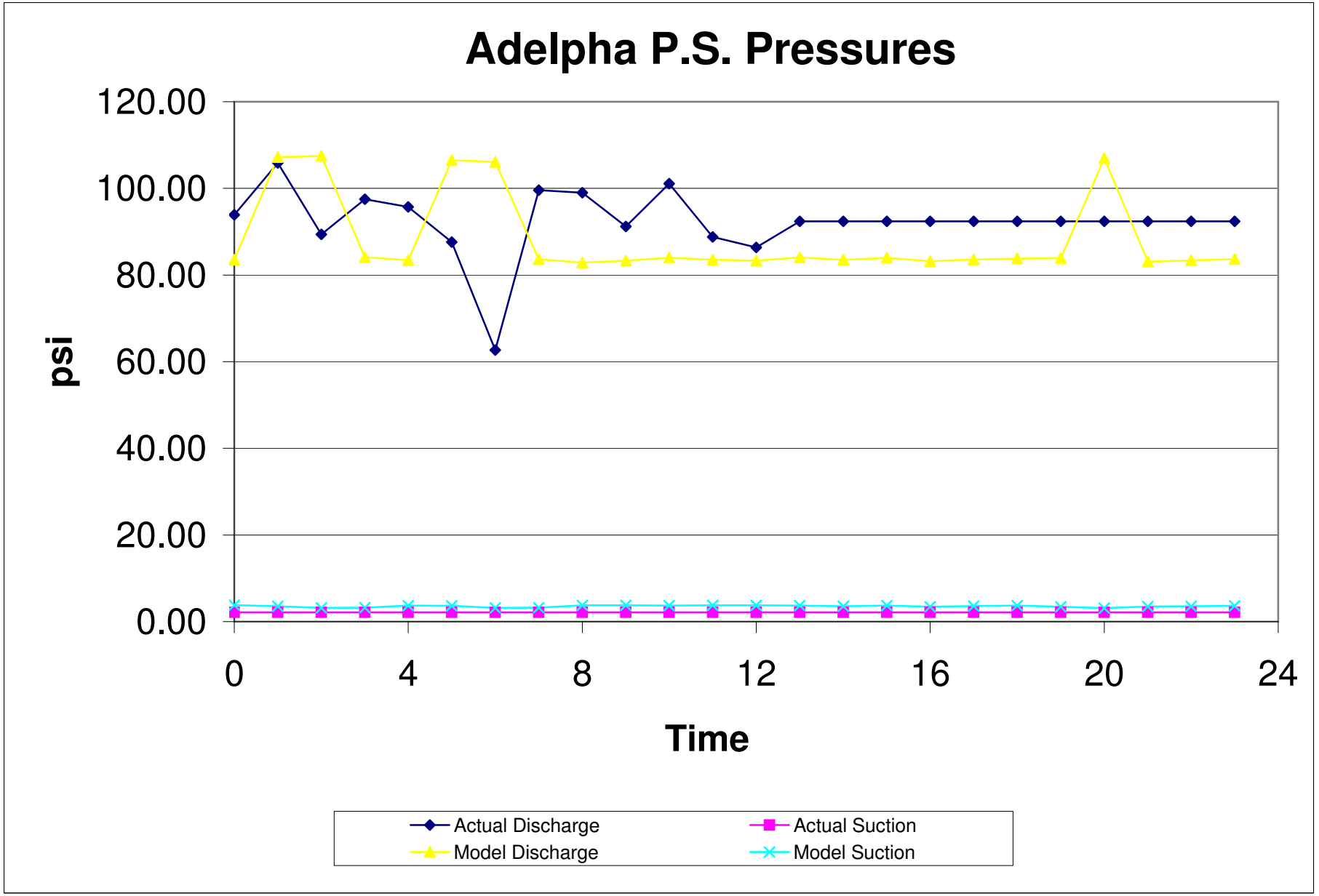

TOMLIN_2
20.00
15.00
10.00
5.00
0.00
Level in feet
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

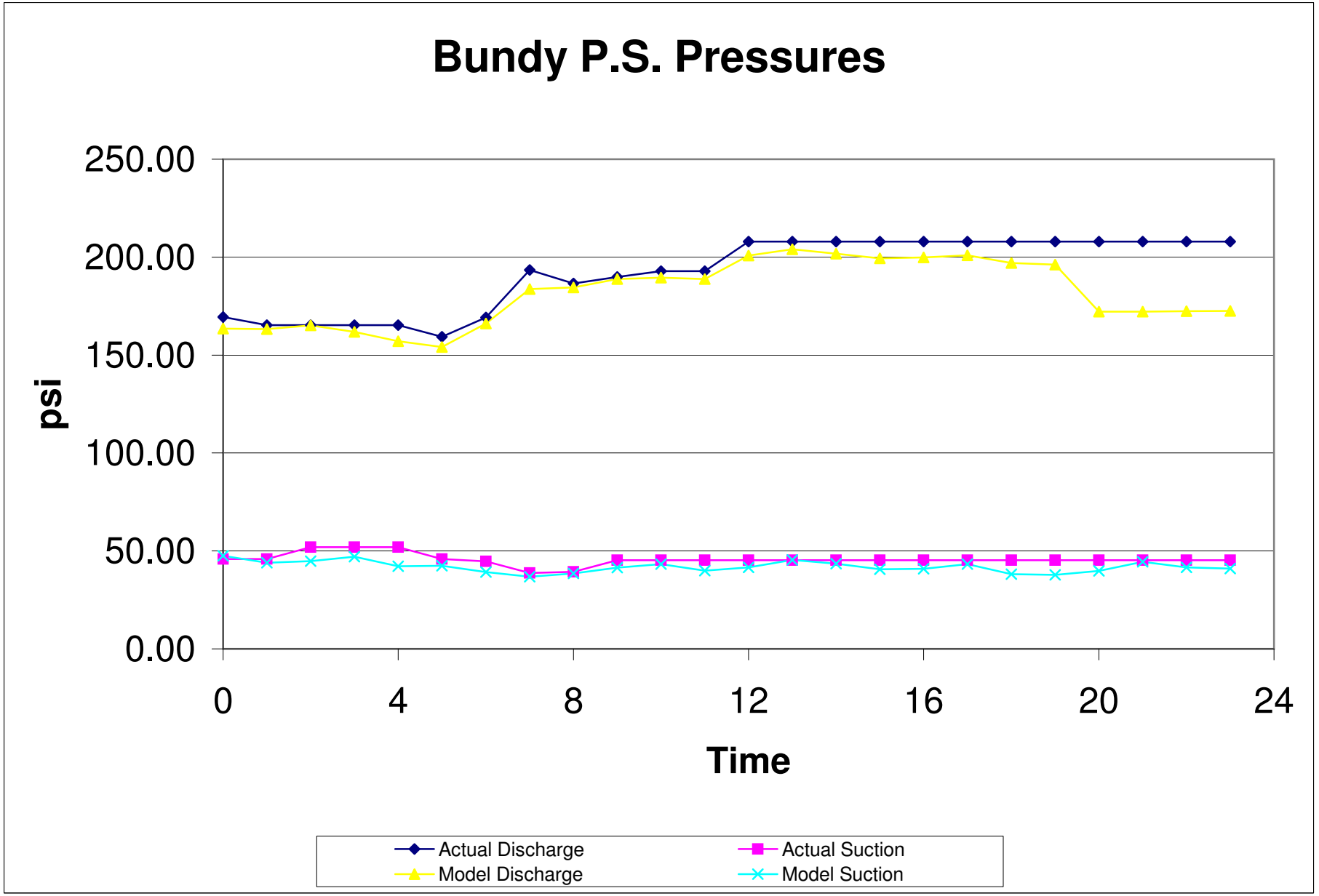

TUSCANY_1A
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Level in feet
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

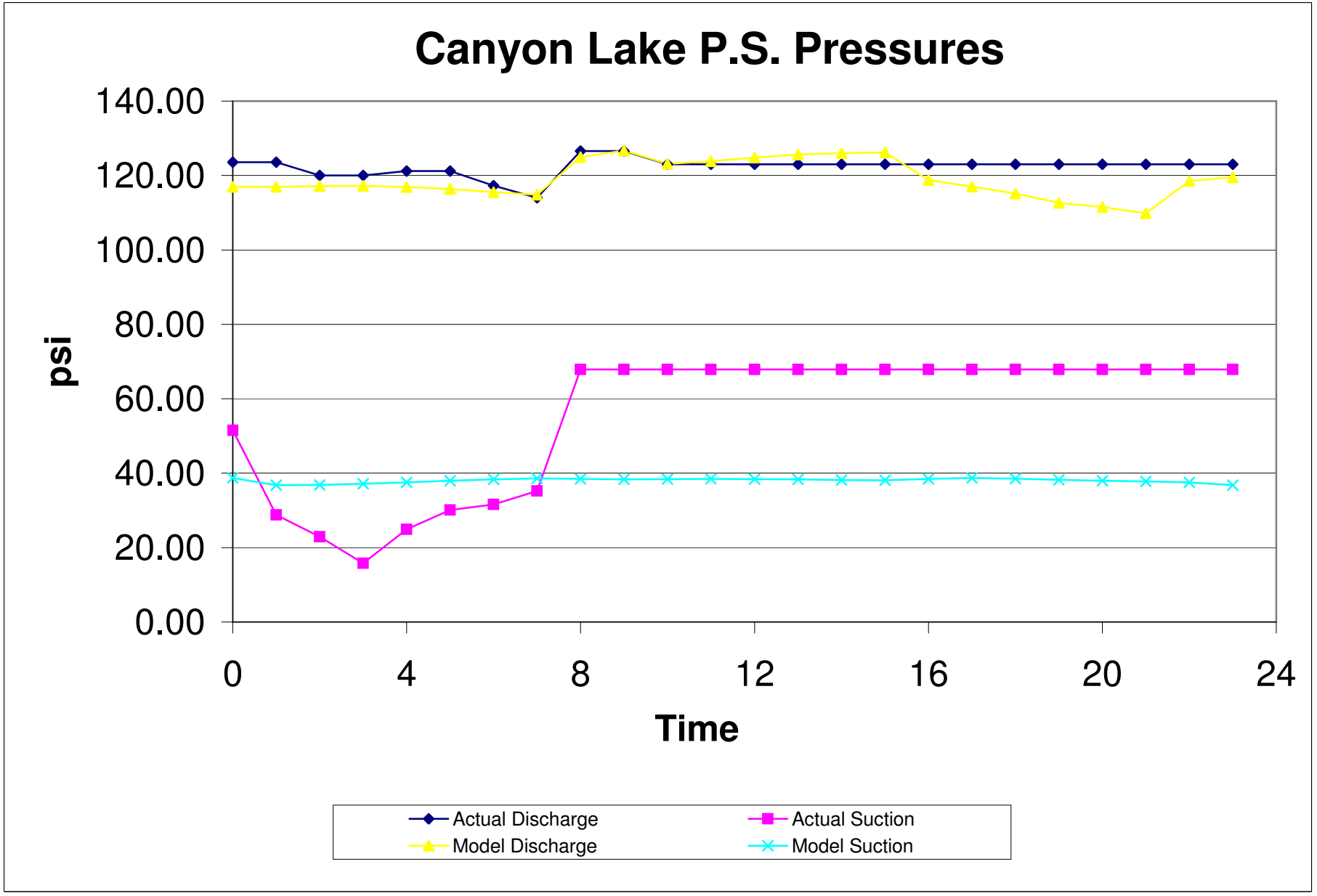

TUSCANY HILLS_2
25.00
20.00
15.00
10.00
5.00
0.00
Level in feets
0
5
10
15
20
25
Time in hours
Observed
Simulated

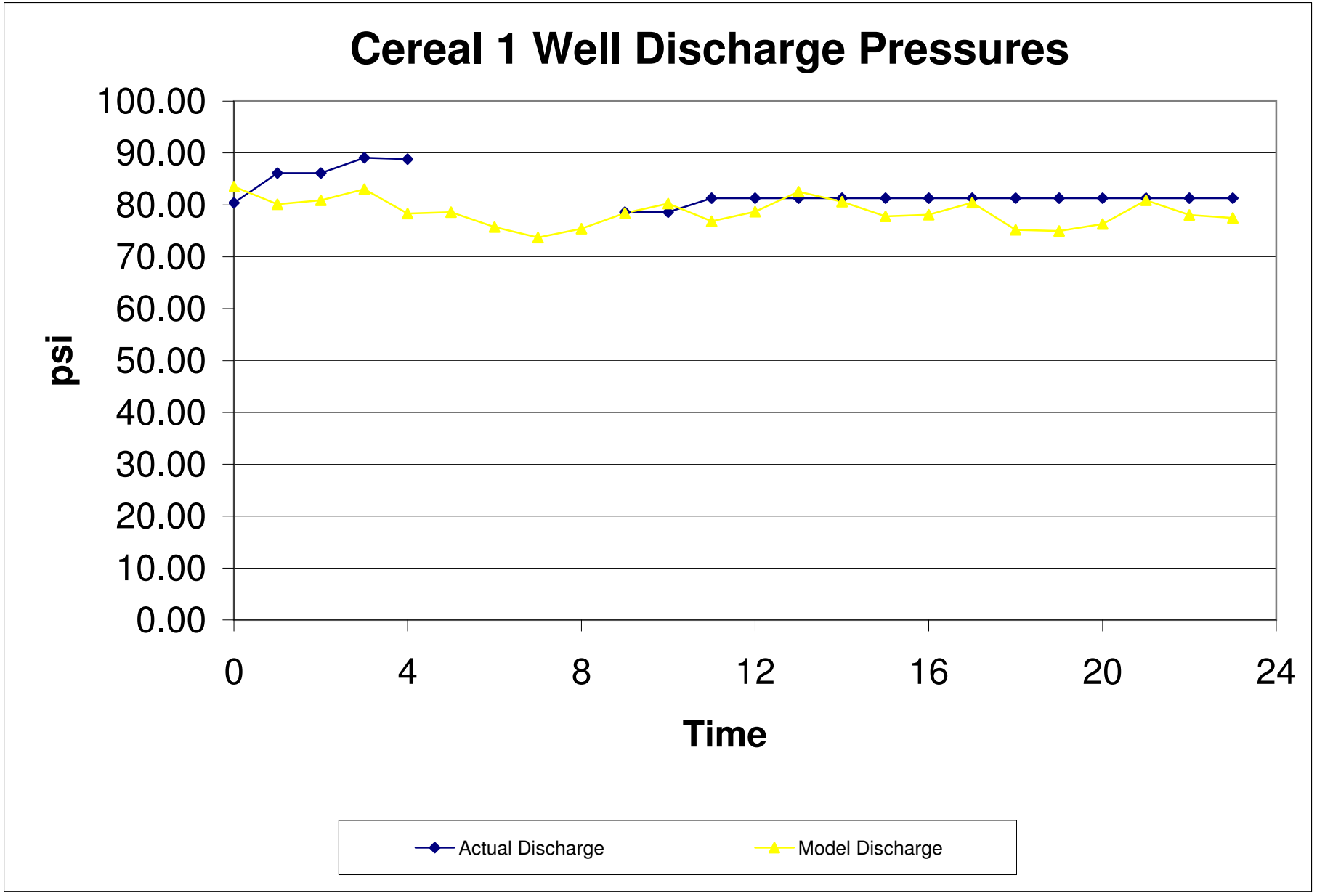

UPPER MEADOWBROOK
25.00
20.00
15.00
10.00
5.00
0.00
Level in feet
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

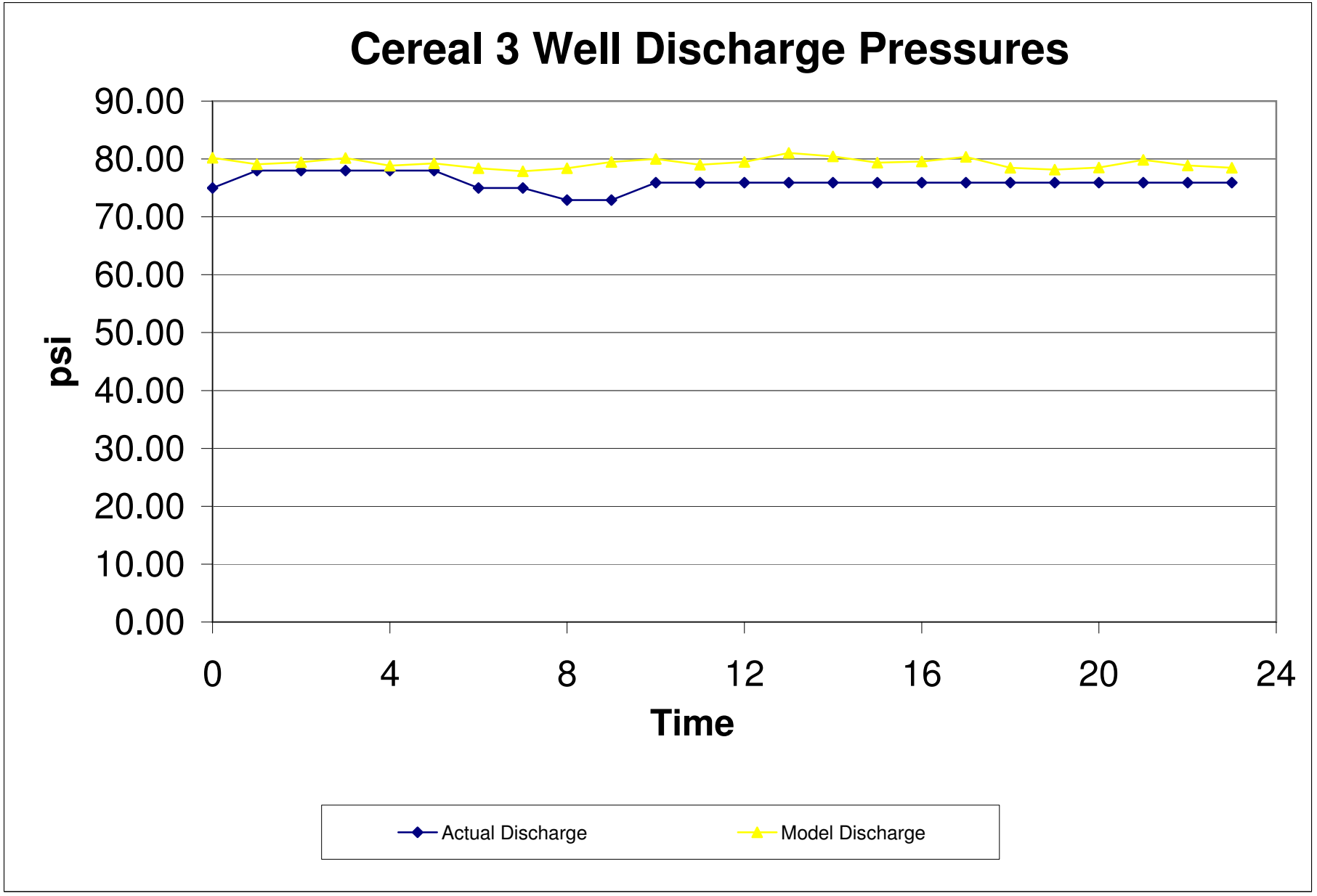

WAITE
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Level in feet
0
4
8
12
16
20
24
Time in hours
Observed
Simulated

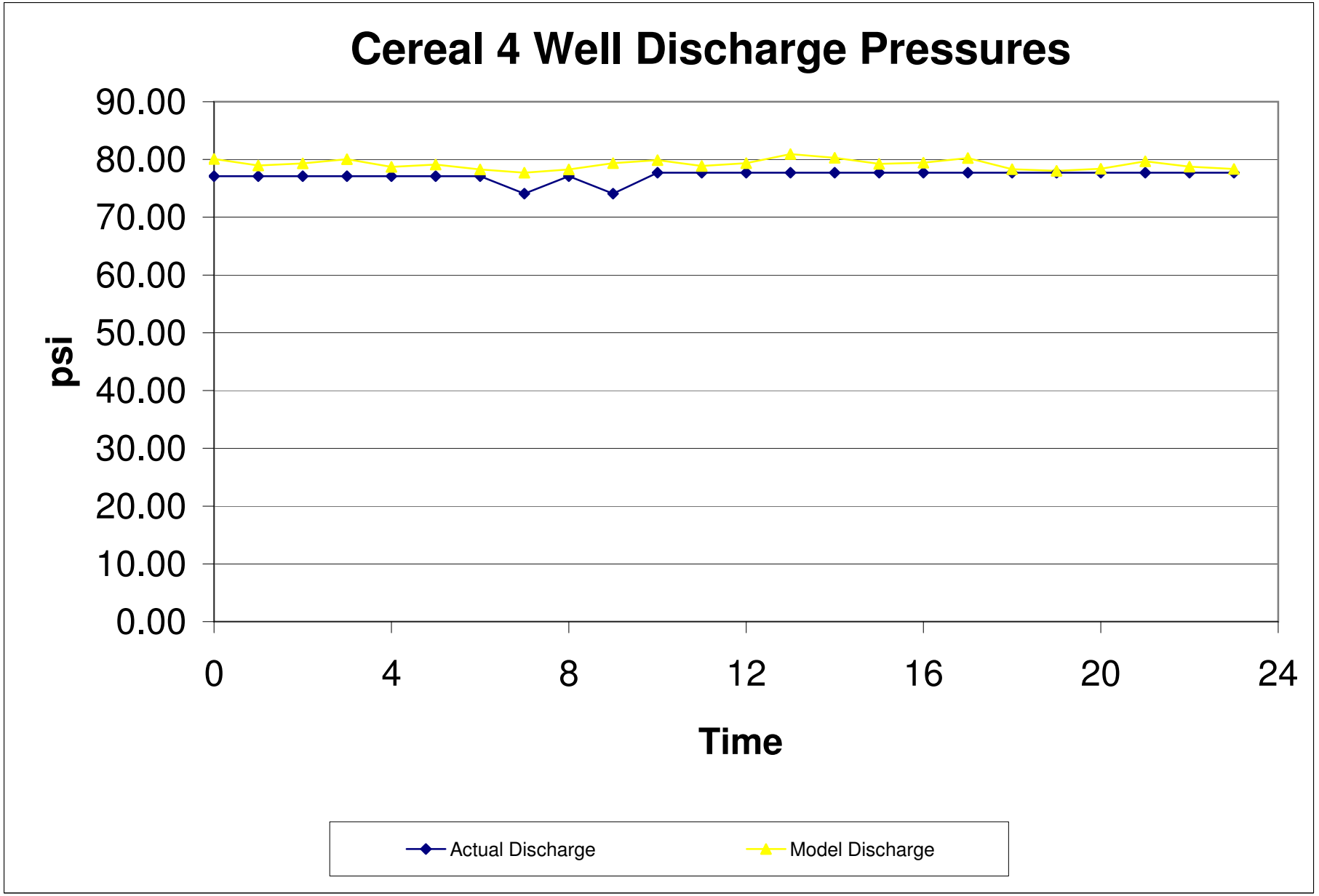

Adelpha P.S. Pressures
120.00
100.00
80.00
60.00
40.00
20.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction
Model Discharge
Model Suction

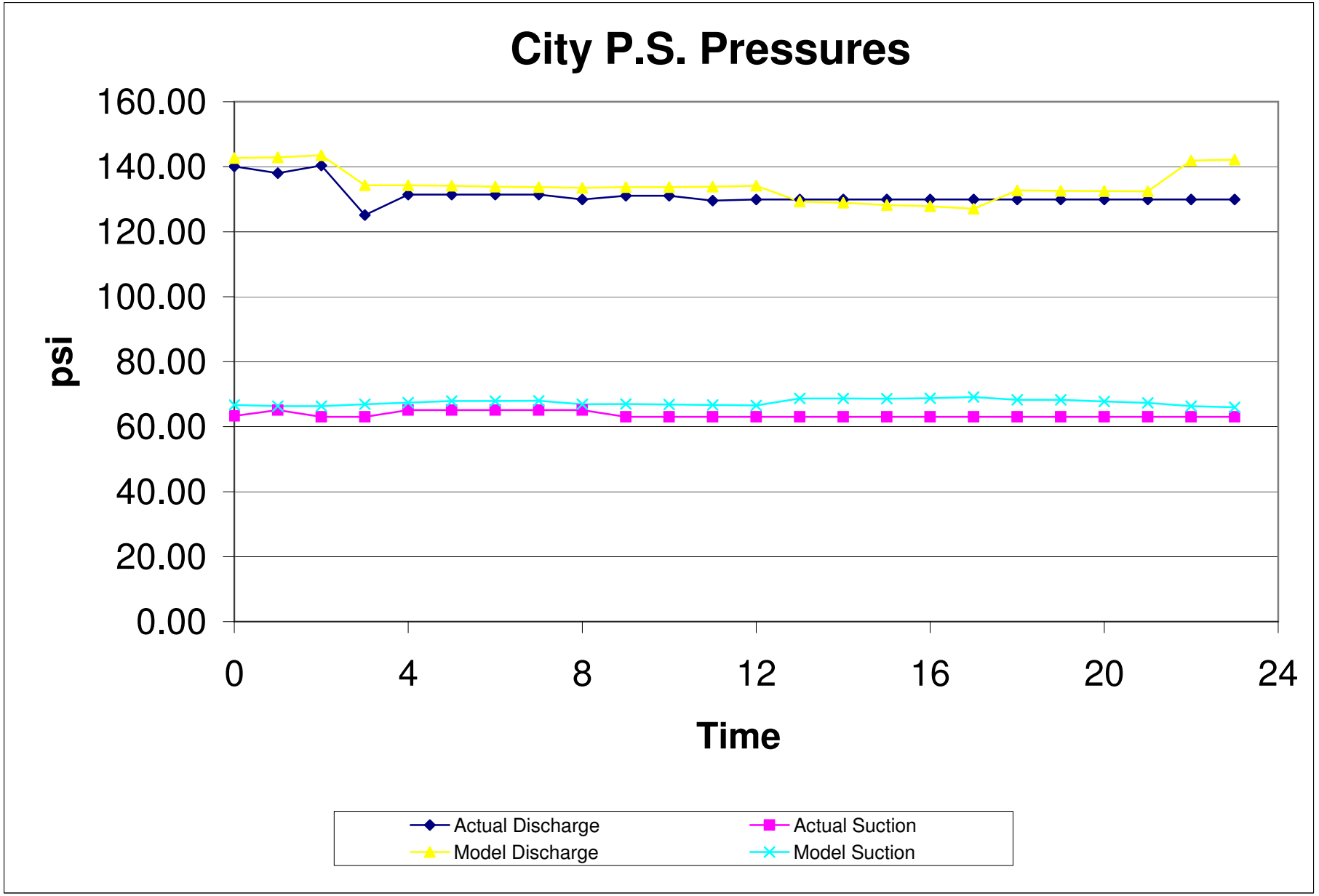

Bundy P.S. Pressures
250.00
200.00
150.00
100.00
50.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction
Model Discharge
Model Suction

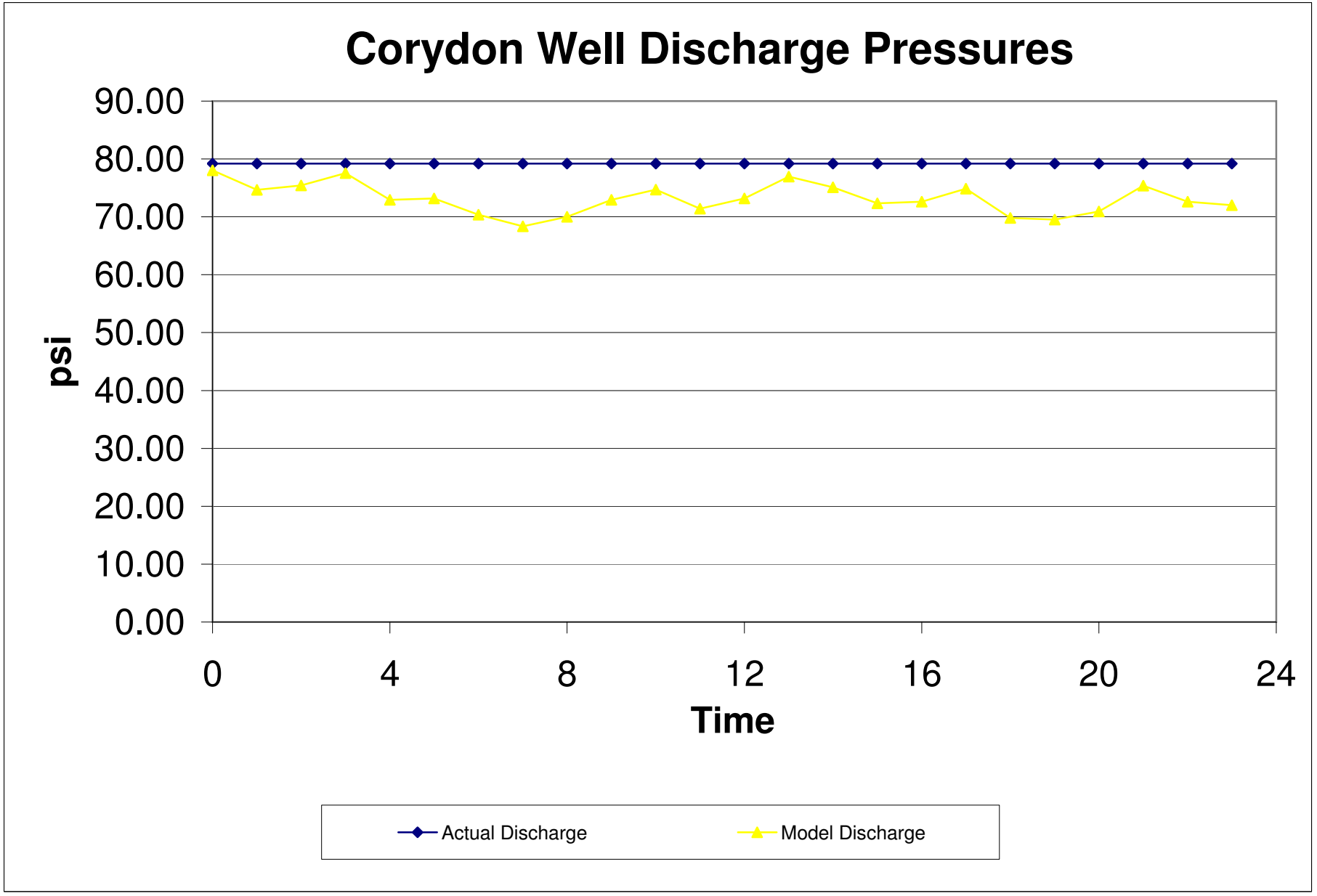

Canyon Lake P.S. Pressures
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction
Model Discharge
Model Suction

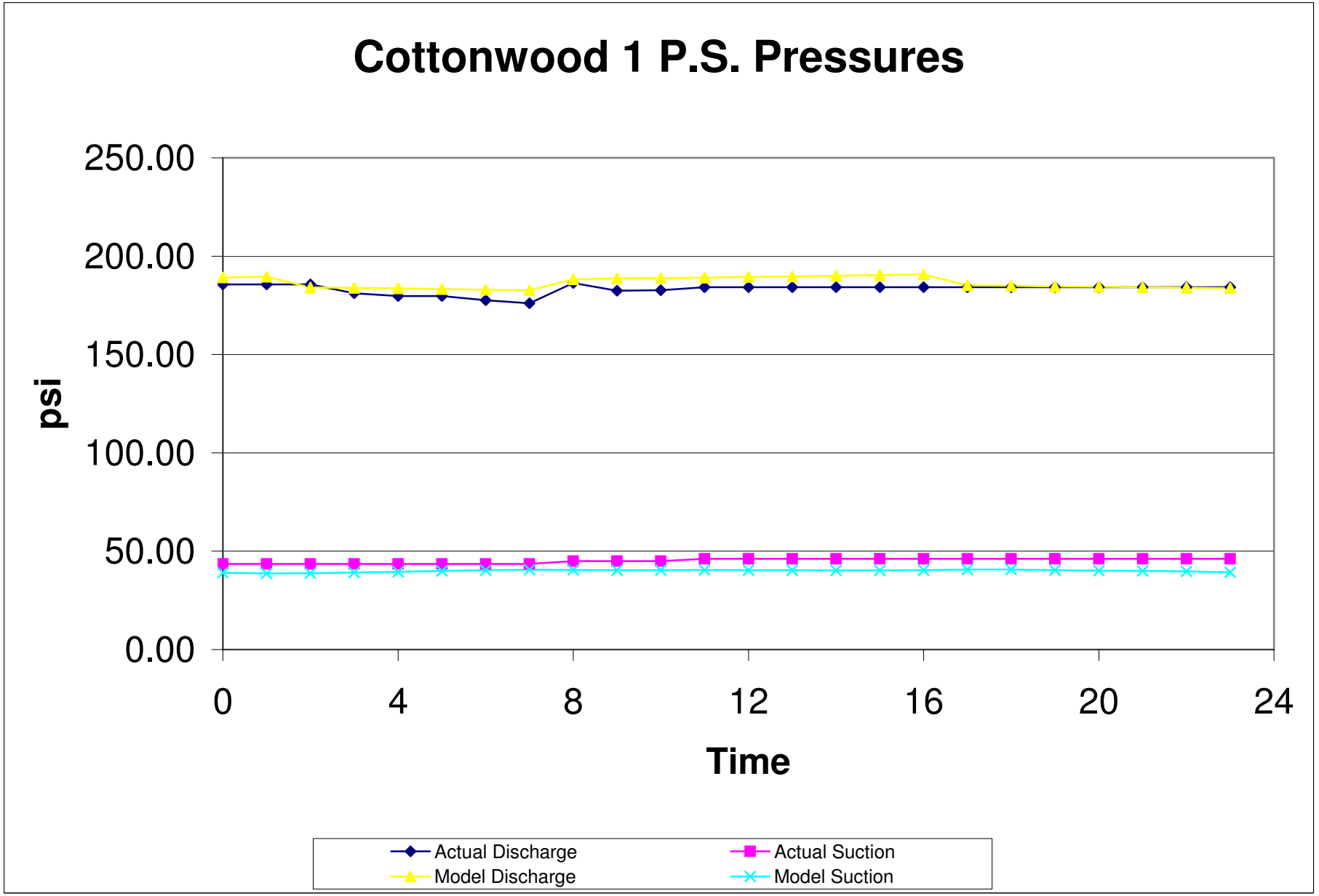

Cereal 1 Well Discharge Pressures
100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Model Discharge

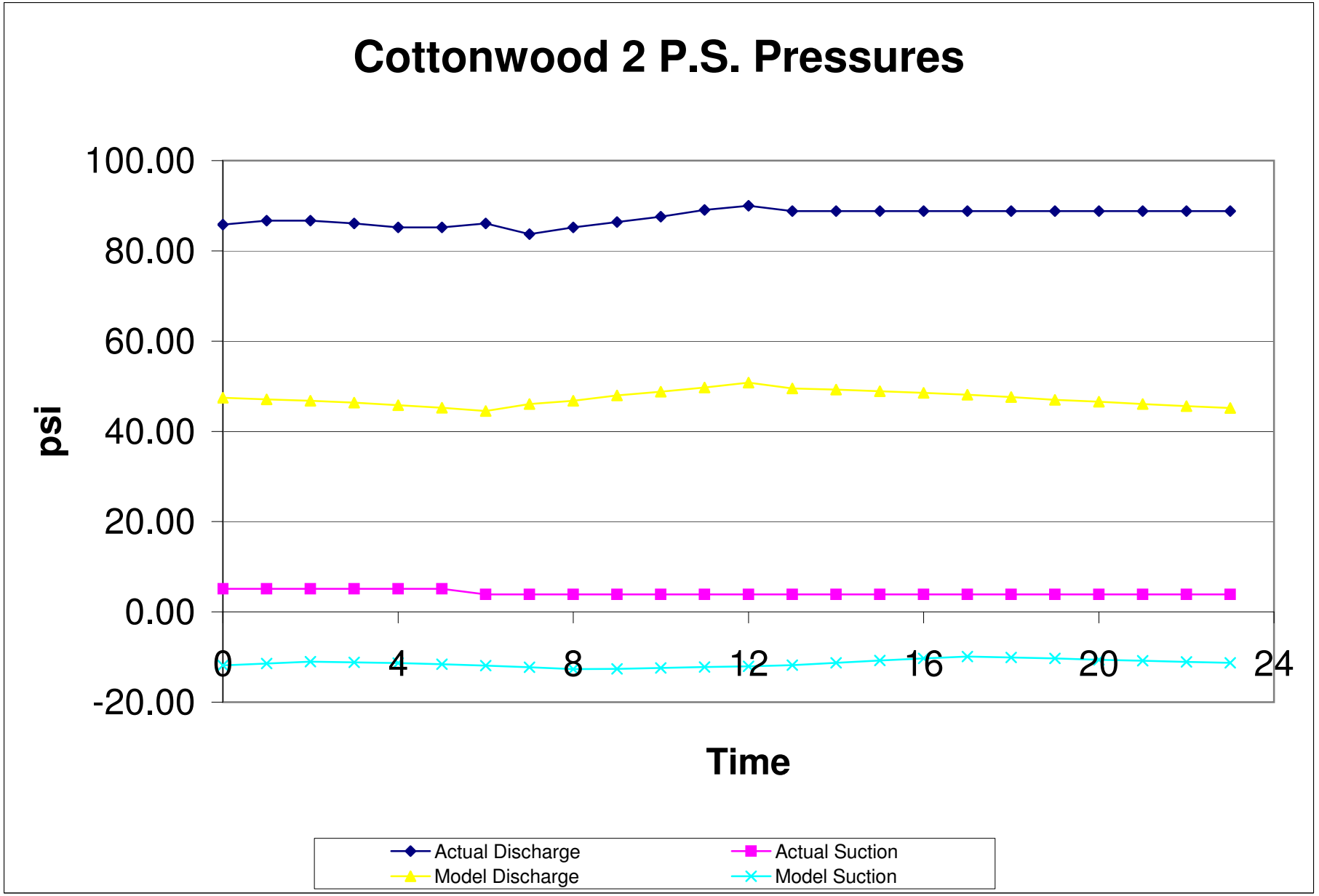

Cereal 3 Well Discharge Pressures
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Model Discharge

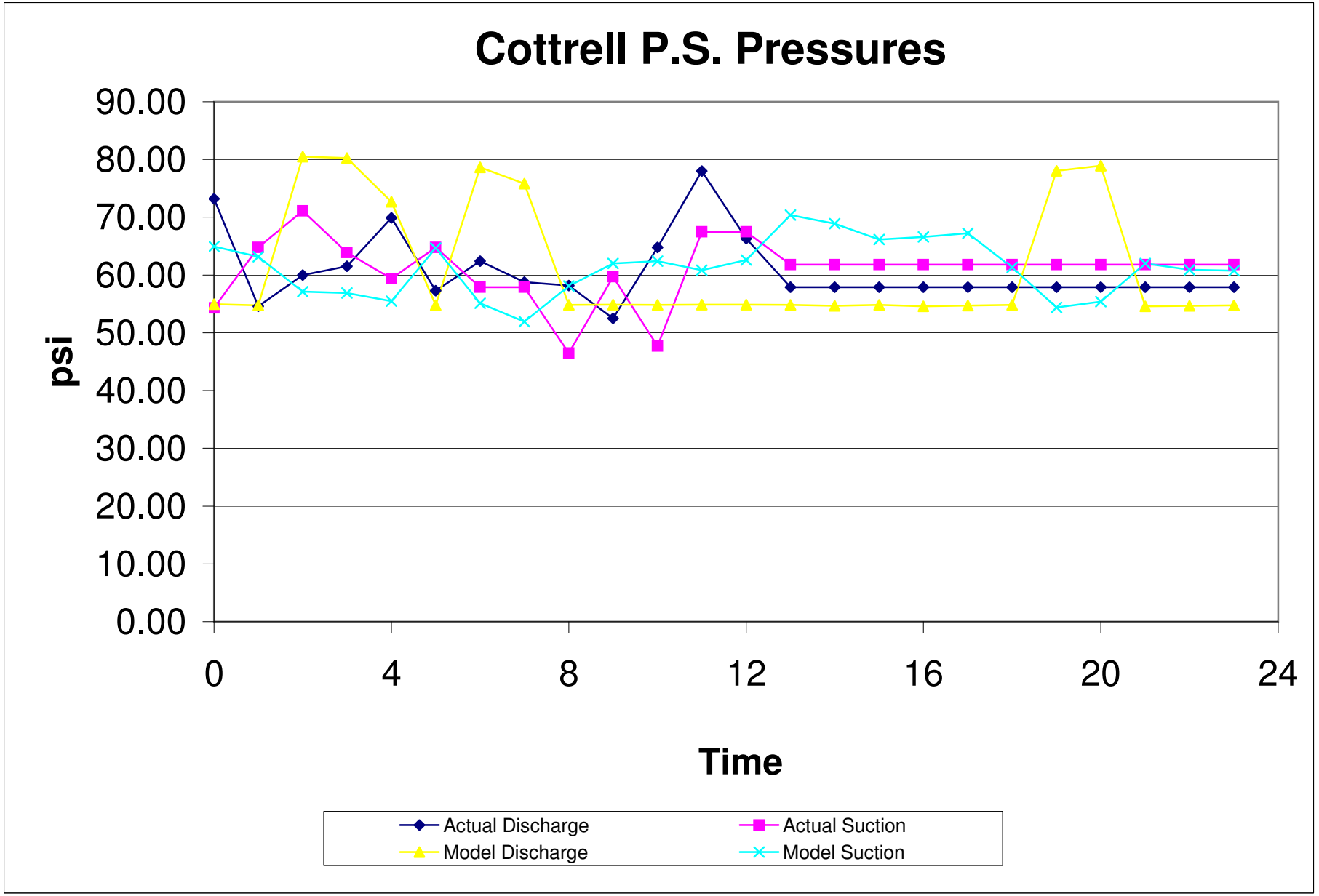

Cereal 4 Well Discharge Pressures
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Model Discharge

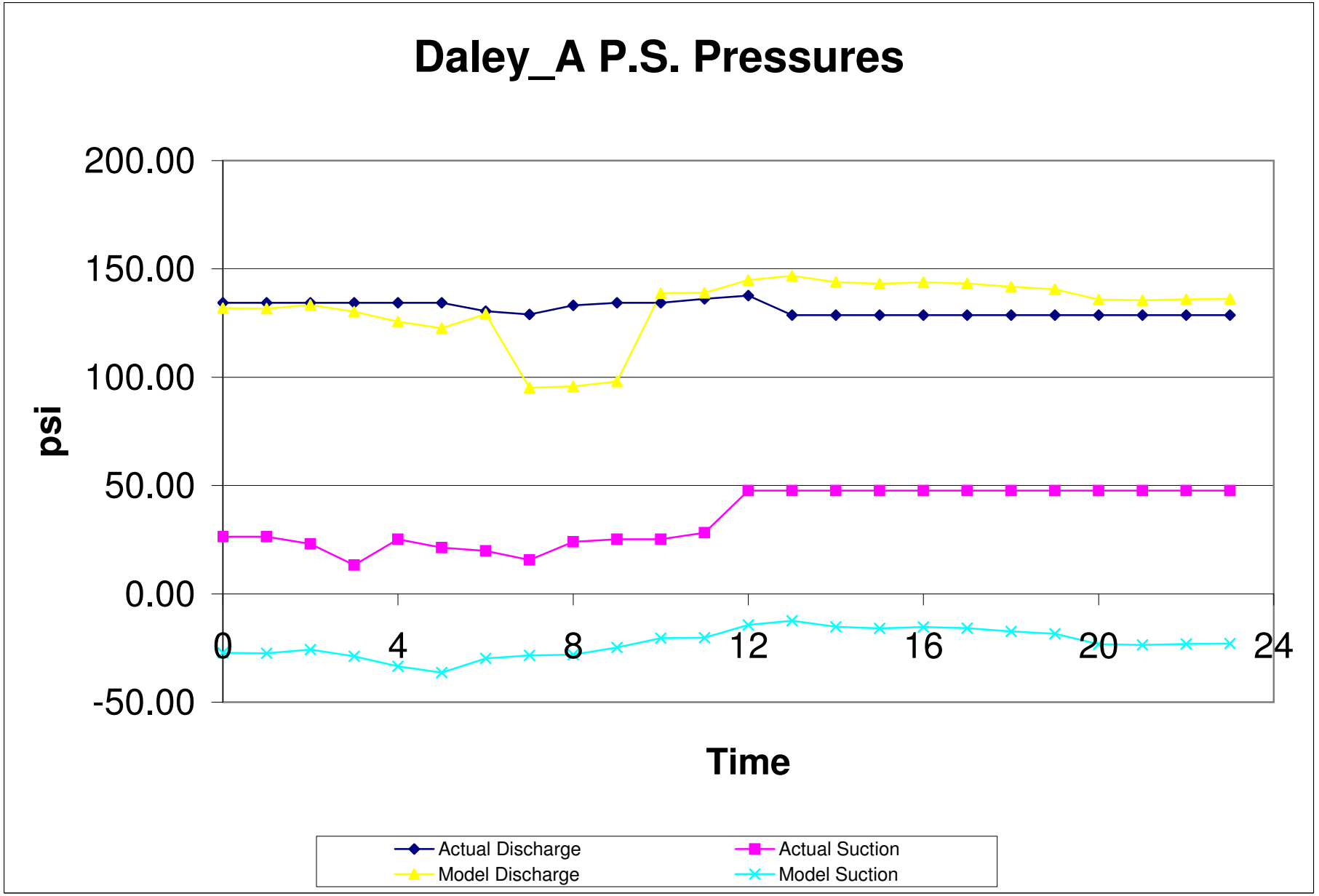

City P.S. Pressures
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction
Model Discharge
Model Suction

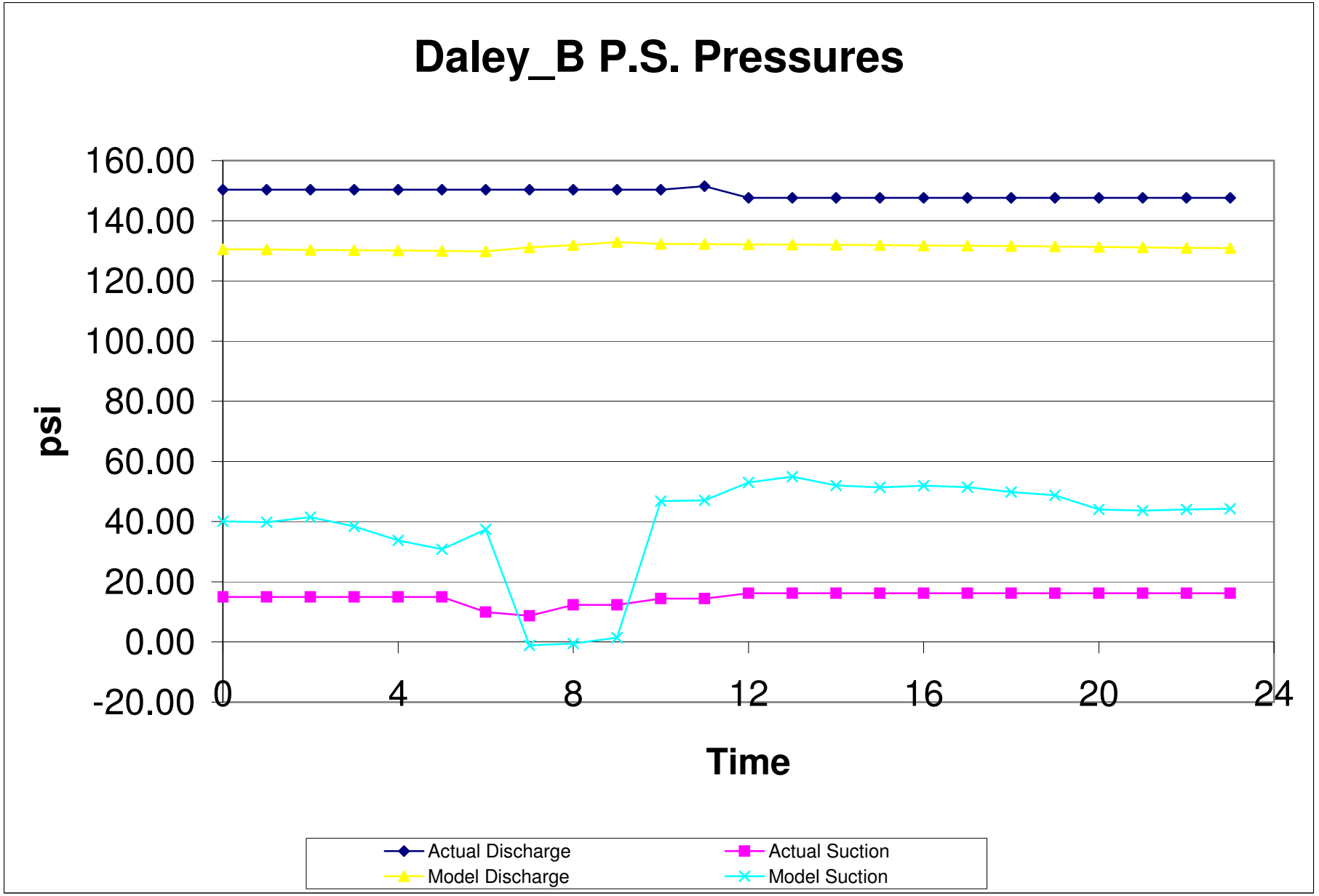

Corydon Well Discharge Pressures
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Model Discharge

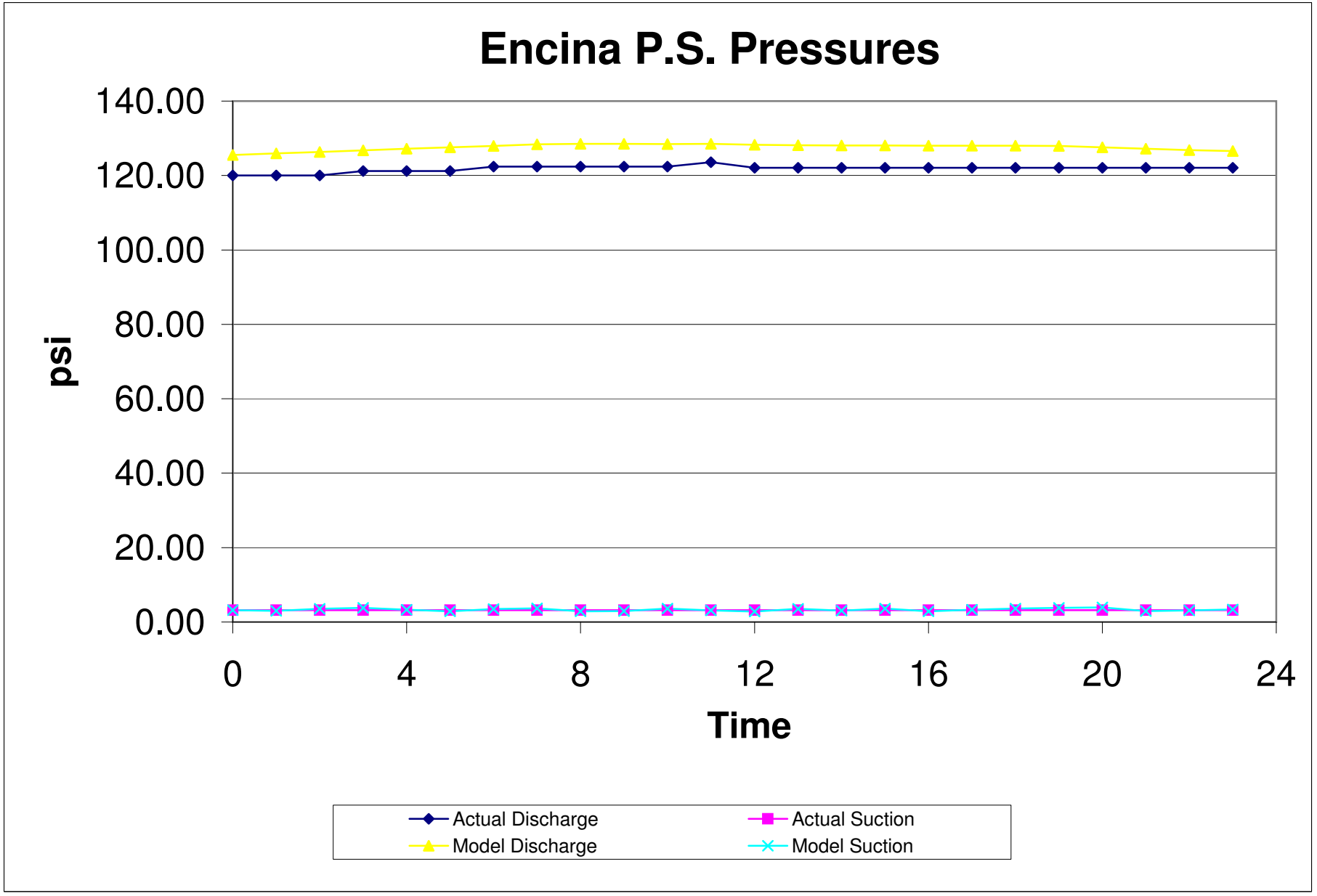

Cottonwood 1 P.S. Pressures
250.00
200.00
150.00
100.00
50.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction
Model Discharge
Model Suction

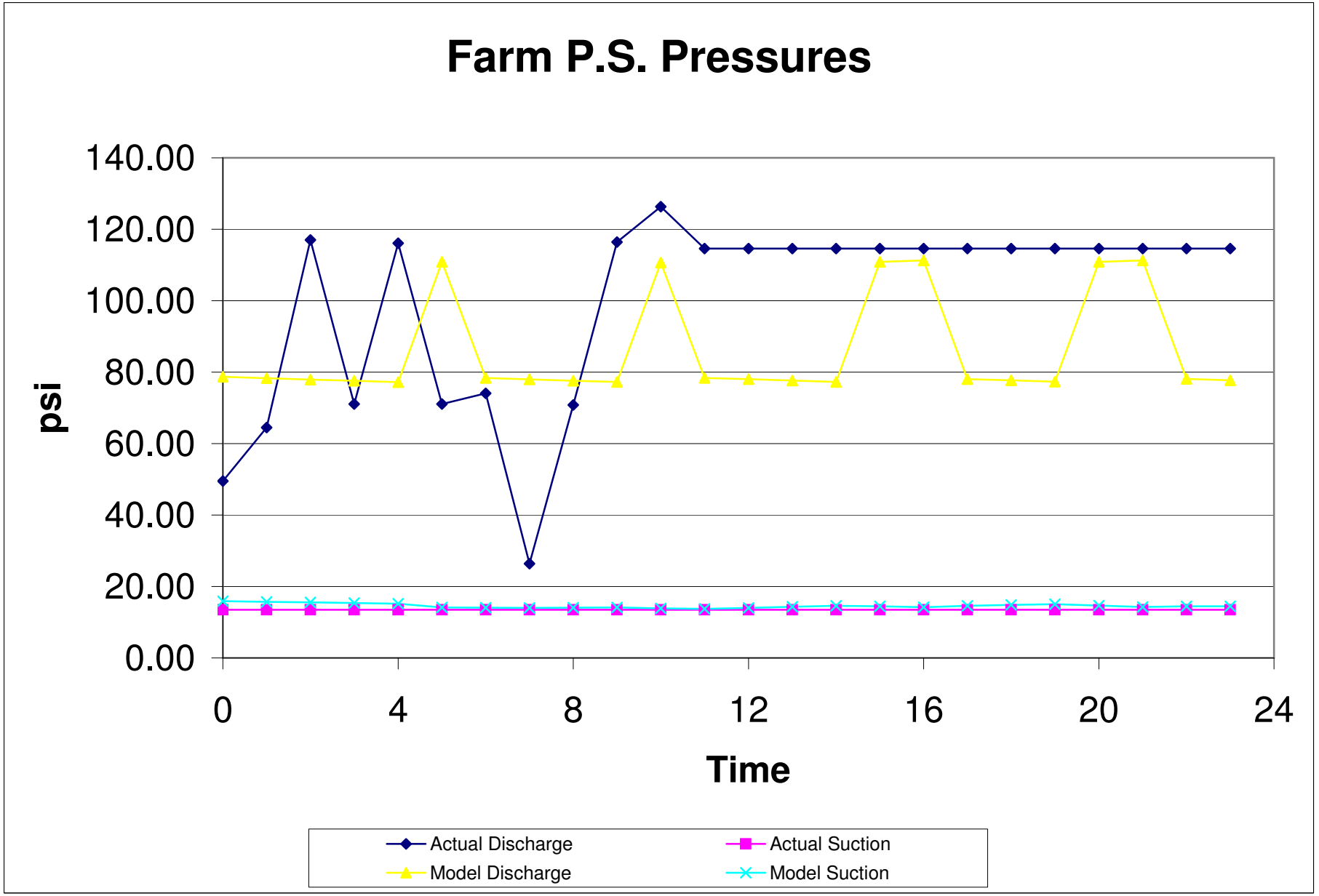

Cottonwood 2 P.S. Pressures
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction
Model Discharge
Model Suction

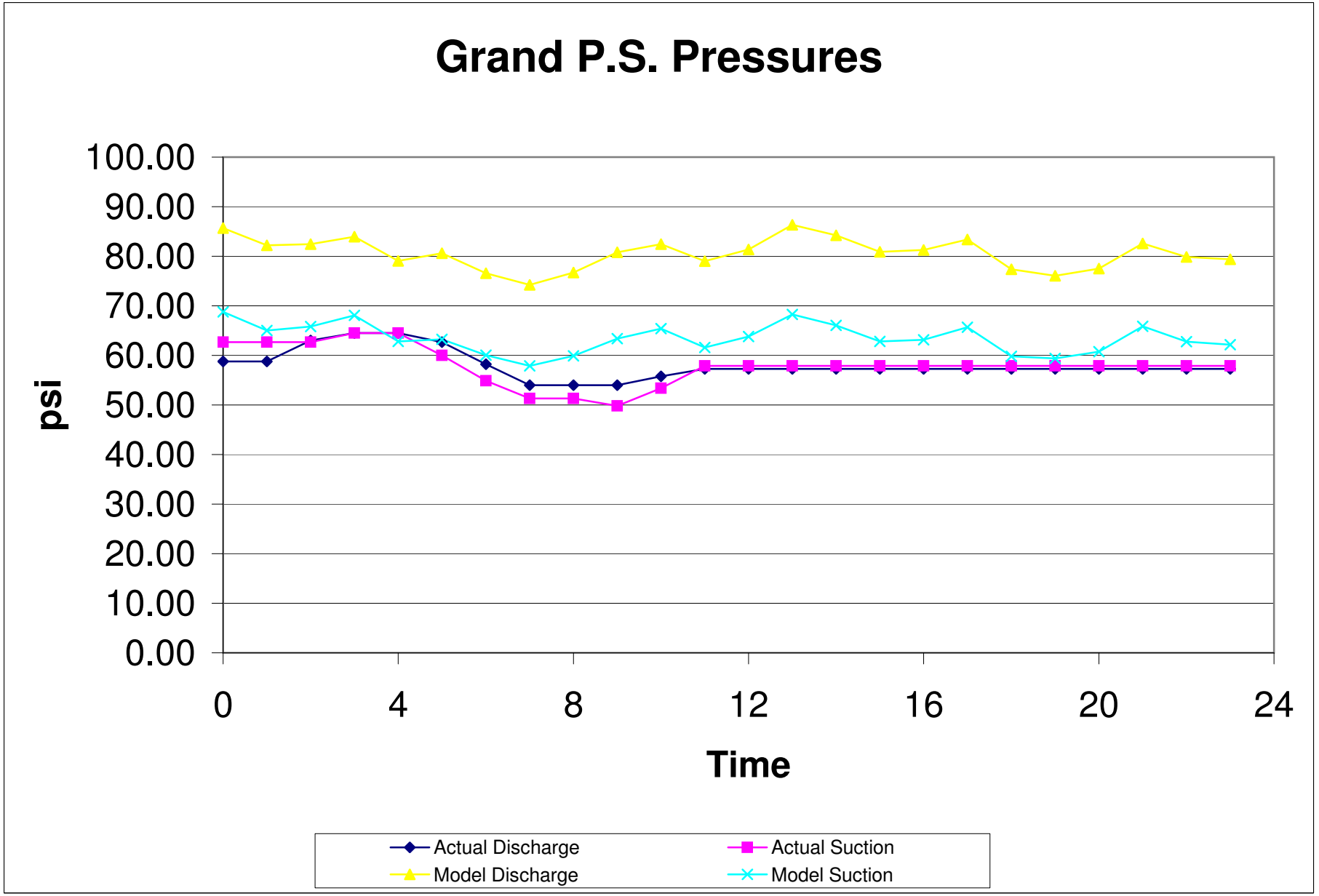

Cottrell P.S. Pressures
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction
Model Discharge
Model Suction

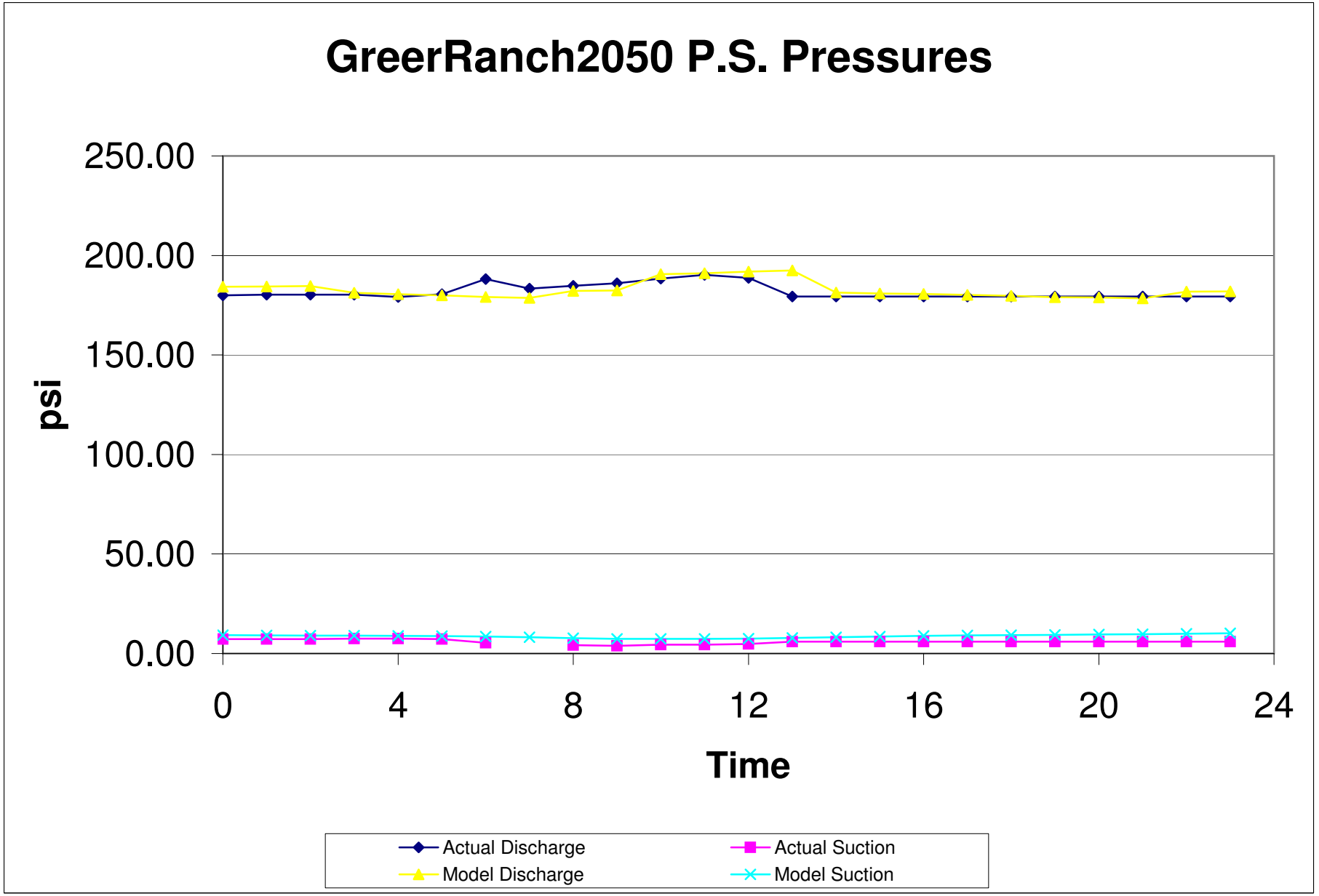

Daley_A P.S. Pressures
200.00
150.00
100.00
50.00
0.00
-50.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction
Model Discharge
Model Suction

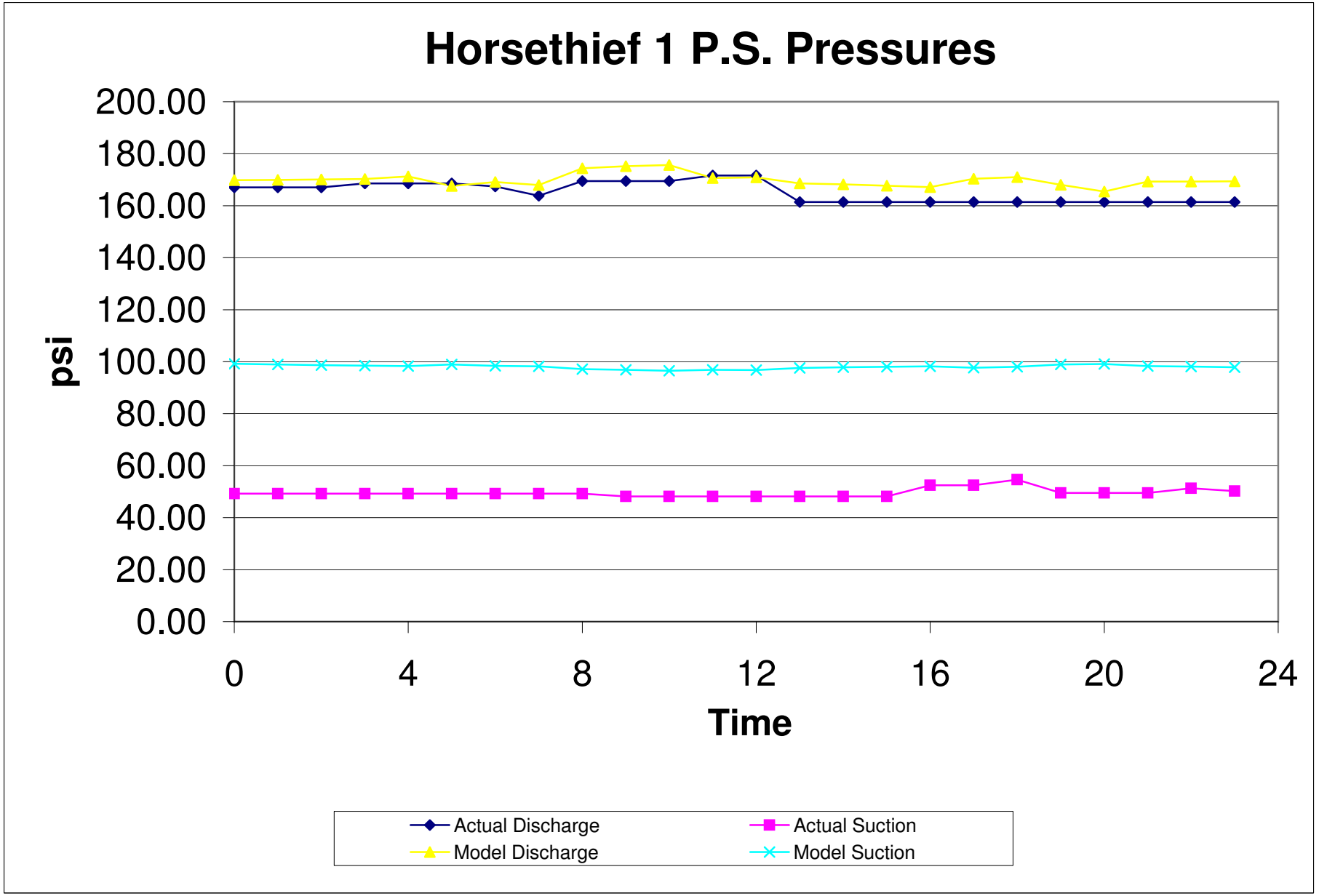

Daley_B P.S. Pressures
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
-20.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction
Model Discharge
Model Suction

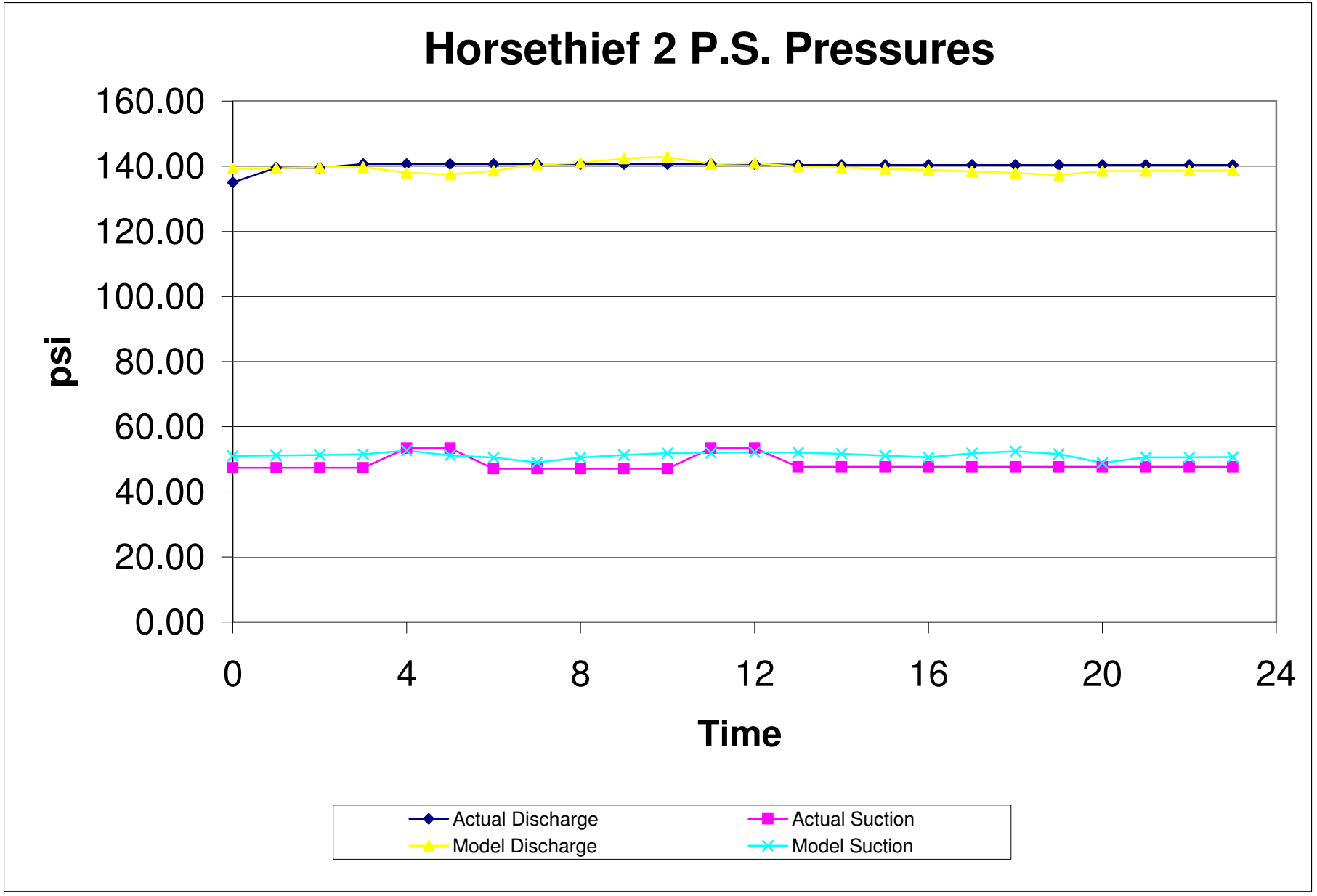

Encina P.S. Pressures
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction
Model Discharge
Model Suction

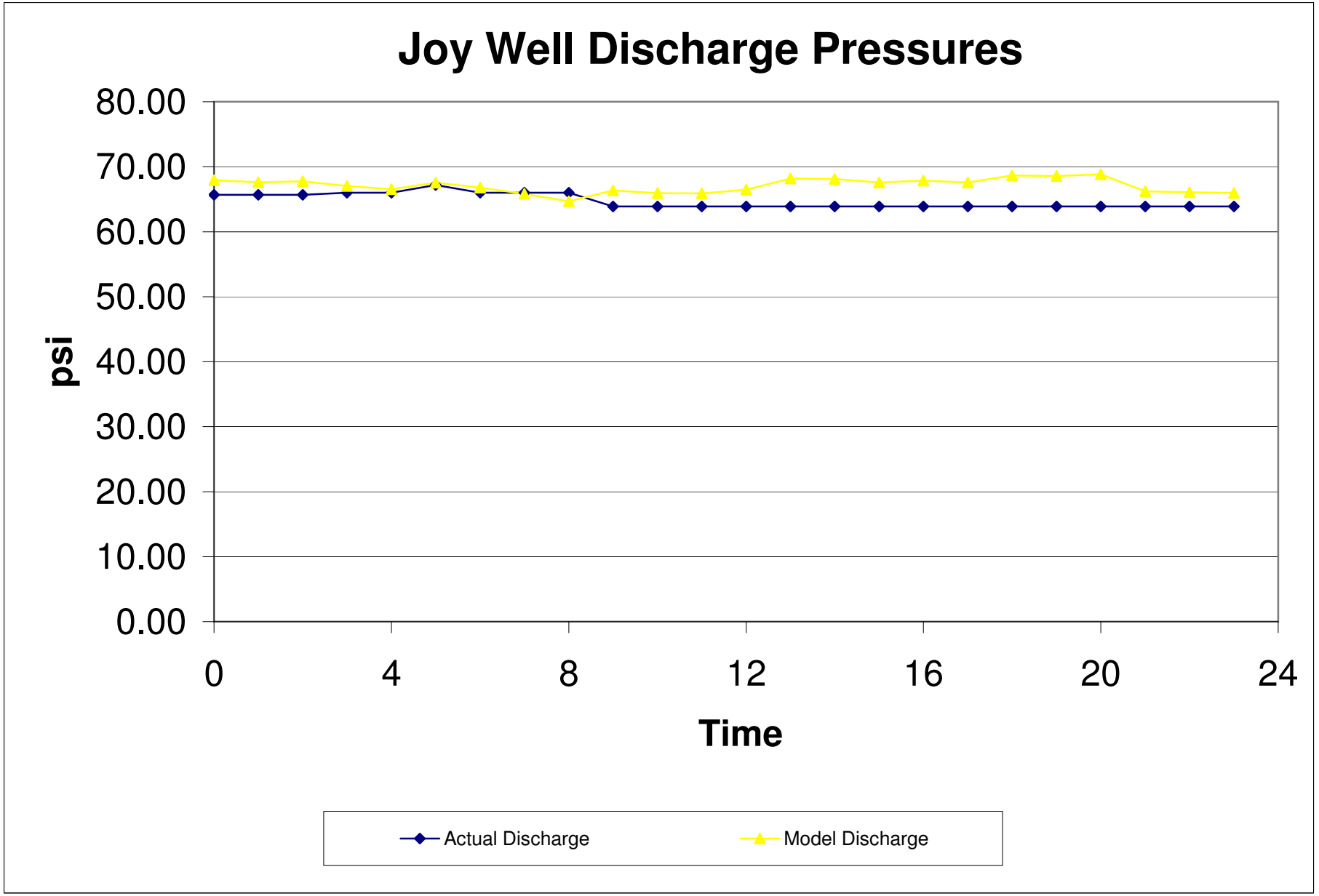

Farm P.S. Pressures
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction
Model Discharge
Model Suction

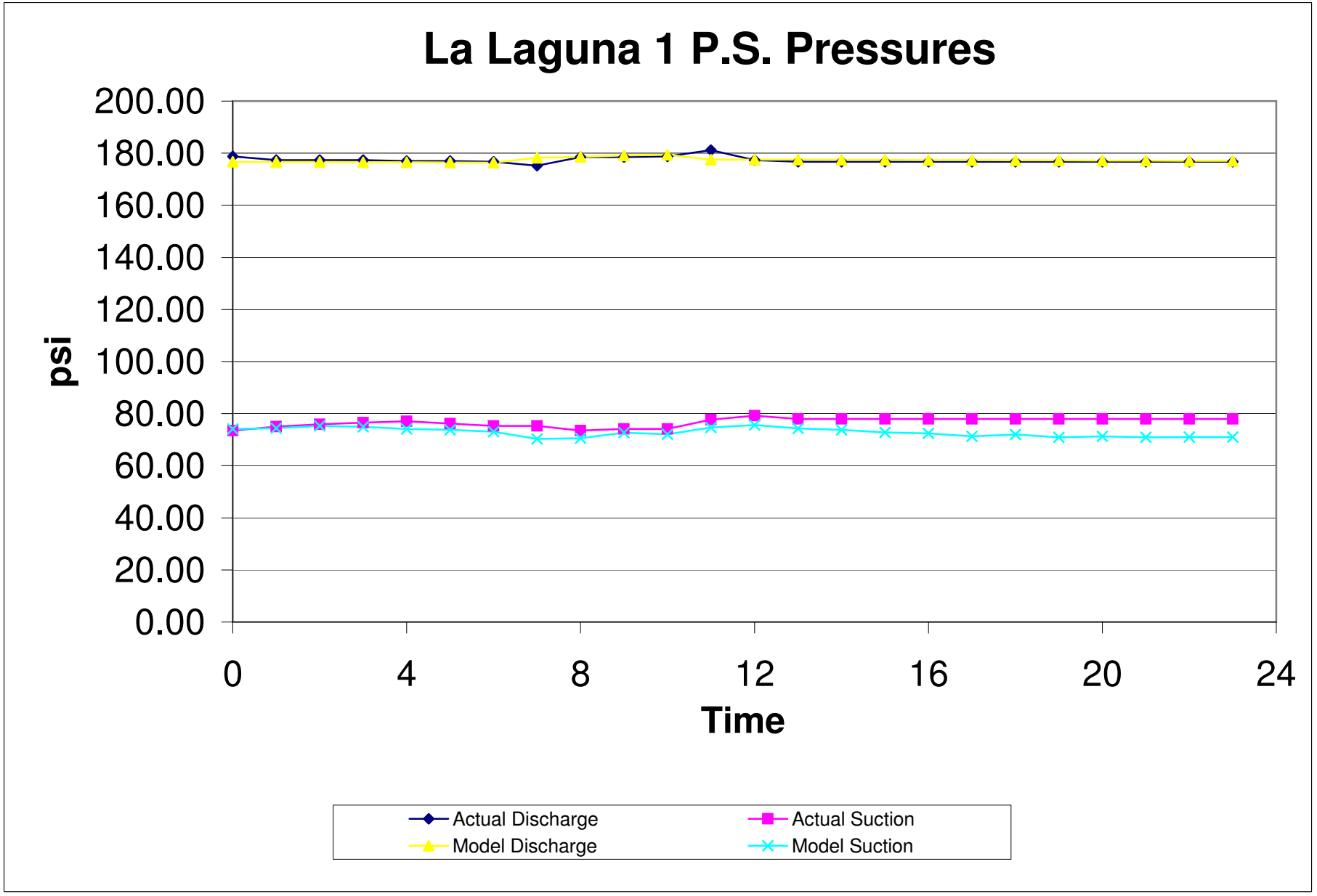

Grand P.S. Pressures
100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction
Model Discharge
Model Suction

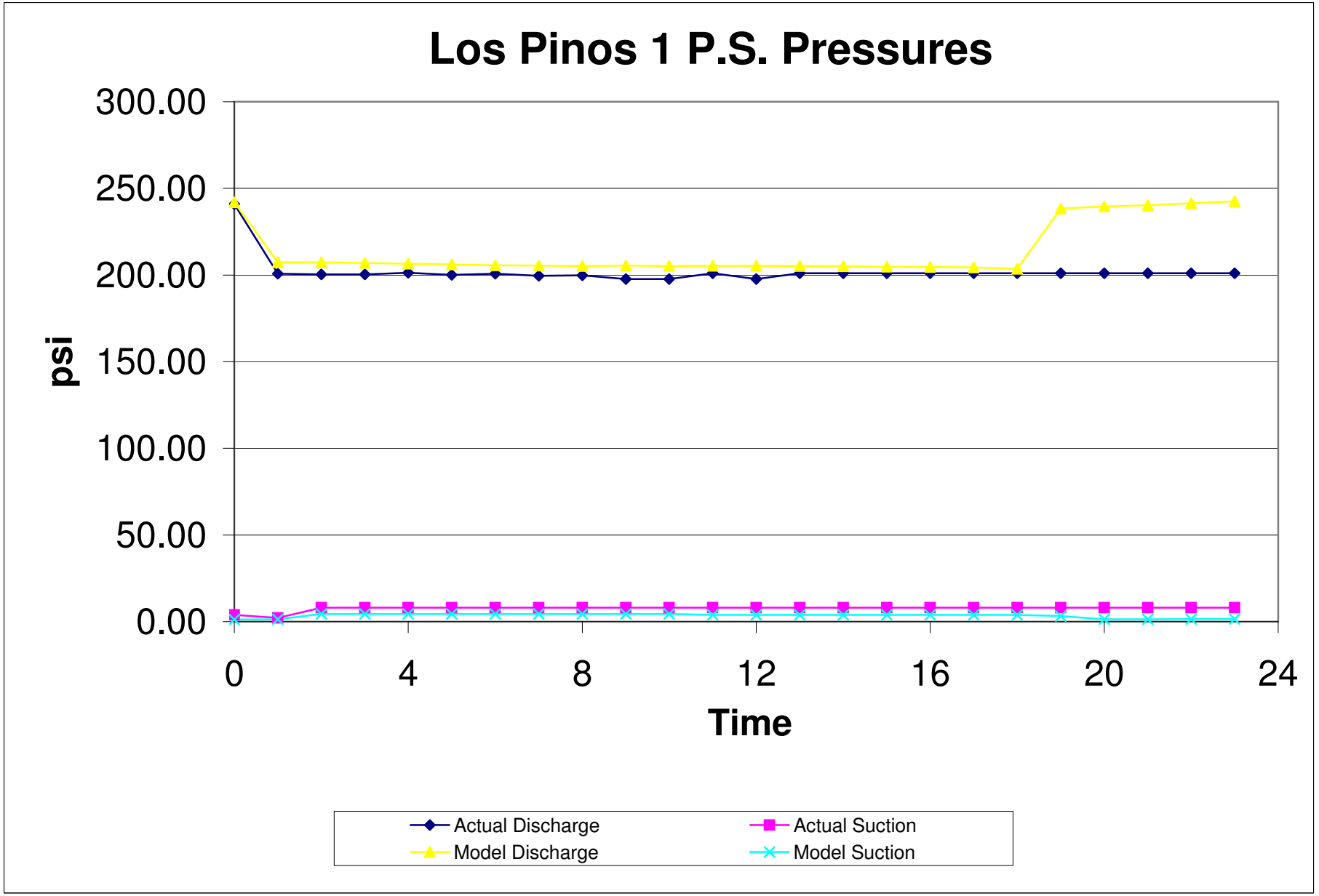

GreerRanch2050 P.S. Pressures
250.00
200.00
150.00
100.00
50.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction
Model Discharge
Model Suction

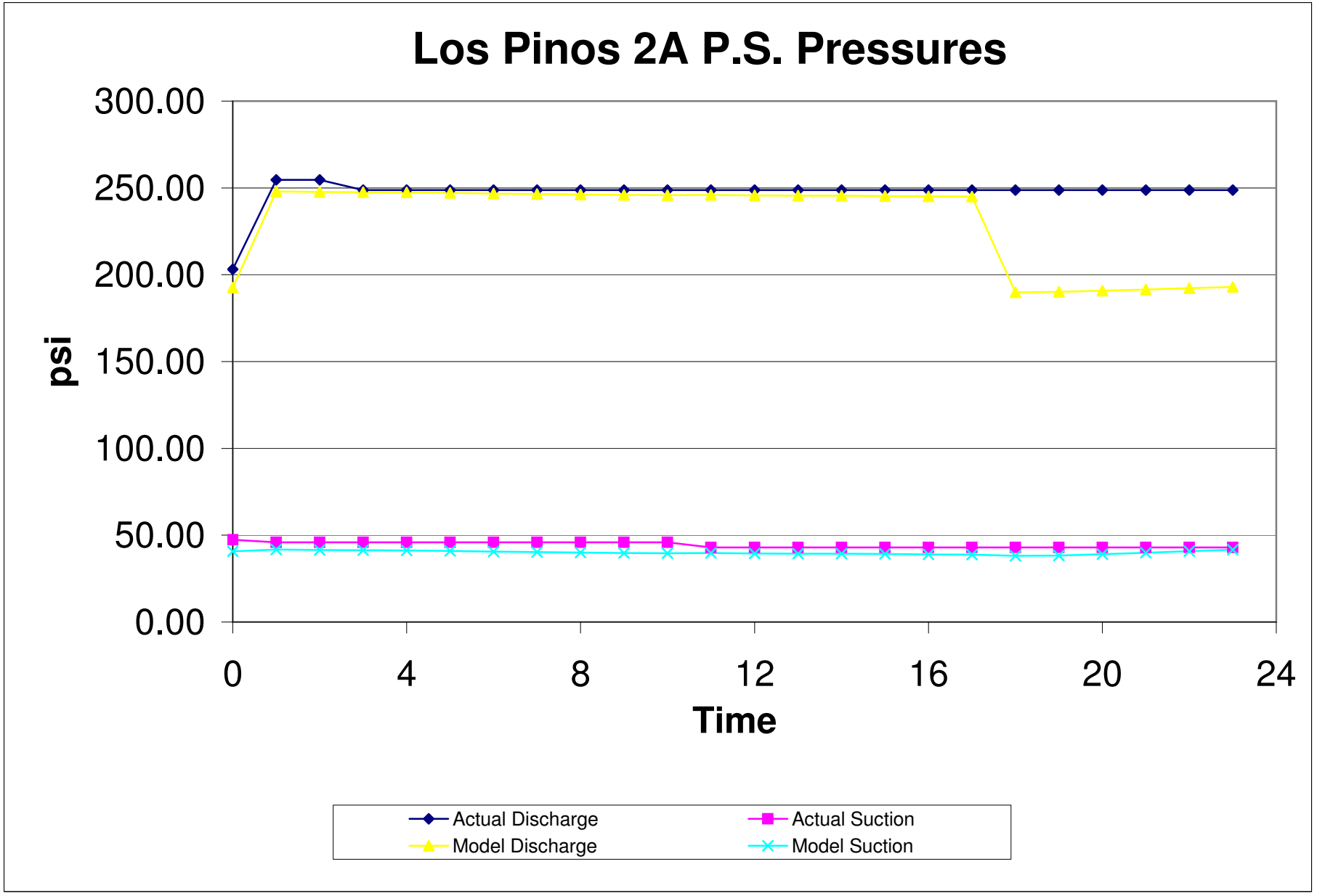

Horsethief 1 P.S. Pressures
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction
Model Discharge
Model Suction

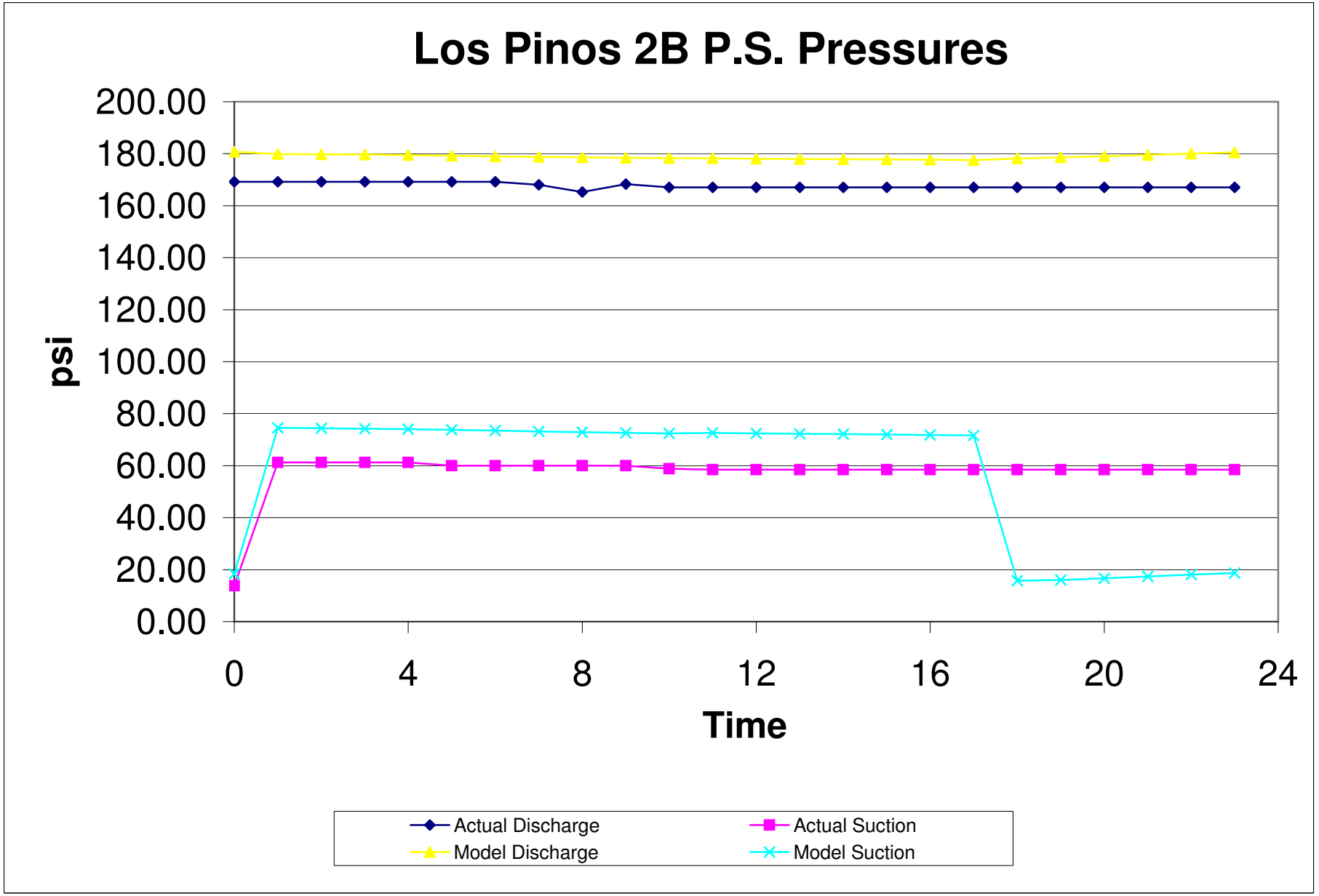

Horsethief 2 P.S. Pressures
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction
Model Discharge
Model Suction

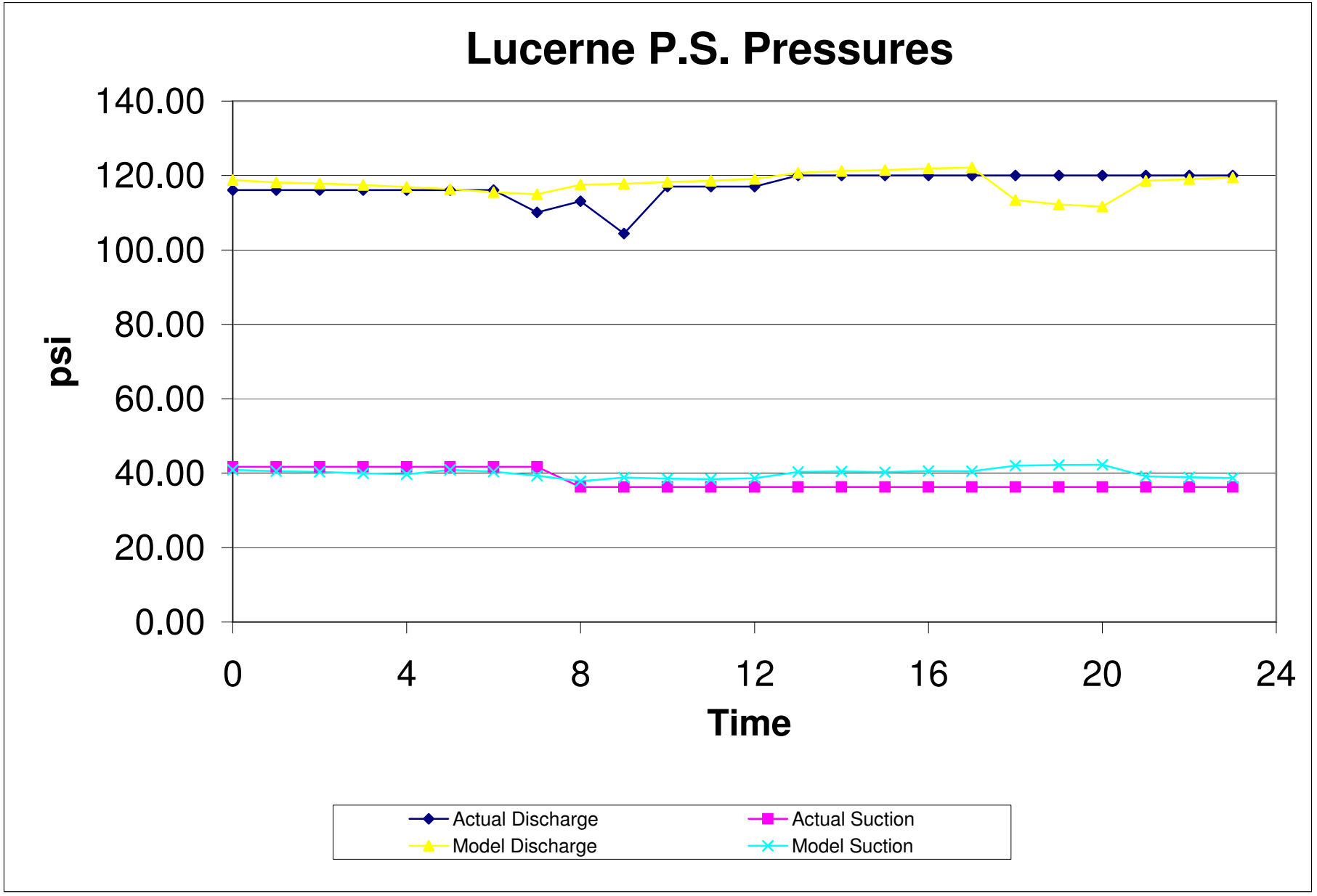

Joy Well Discharge Pressures
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Model Discharge

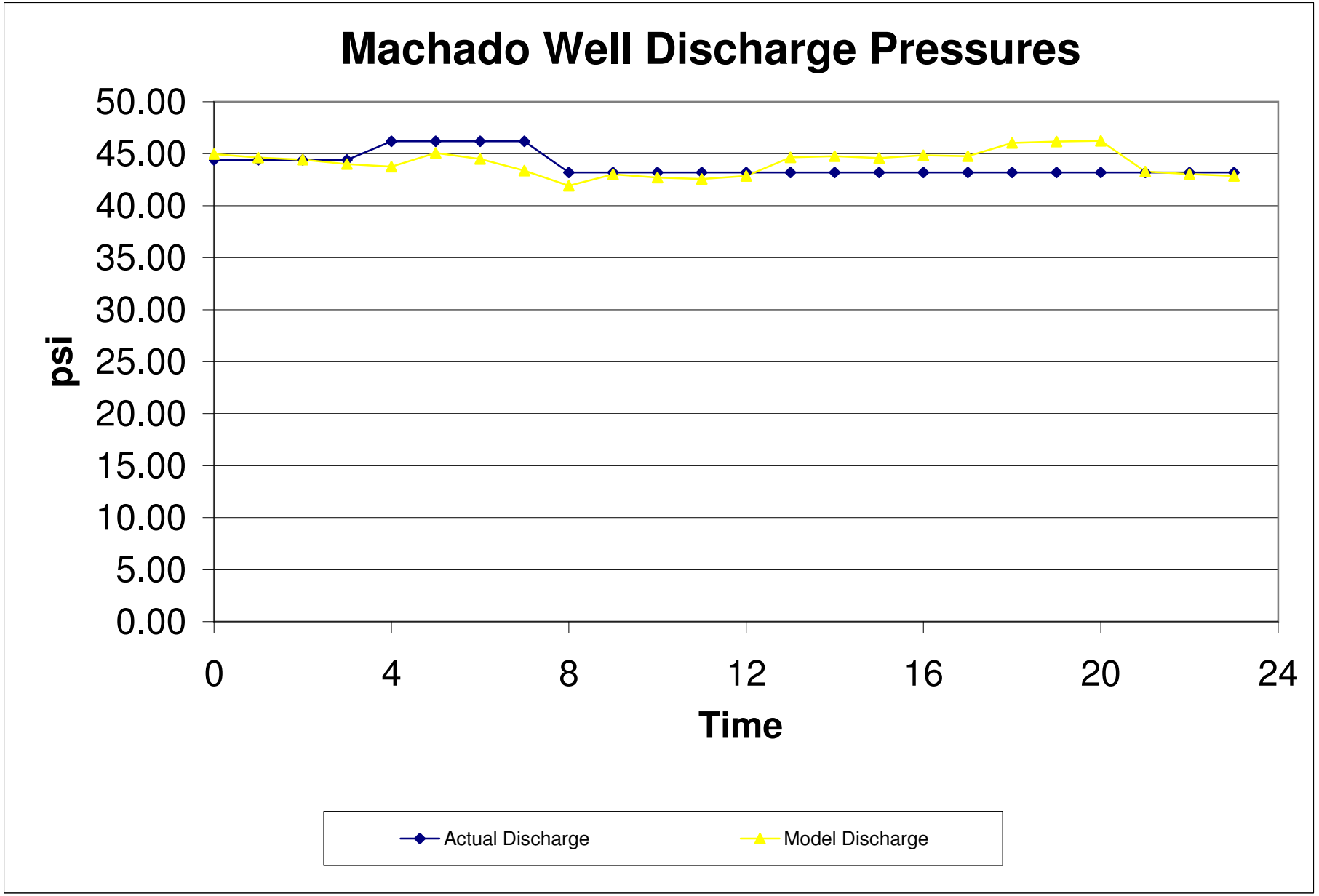

La Laguna 1 P.S. Pressures
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction
Model Discharge
Model Suction

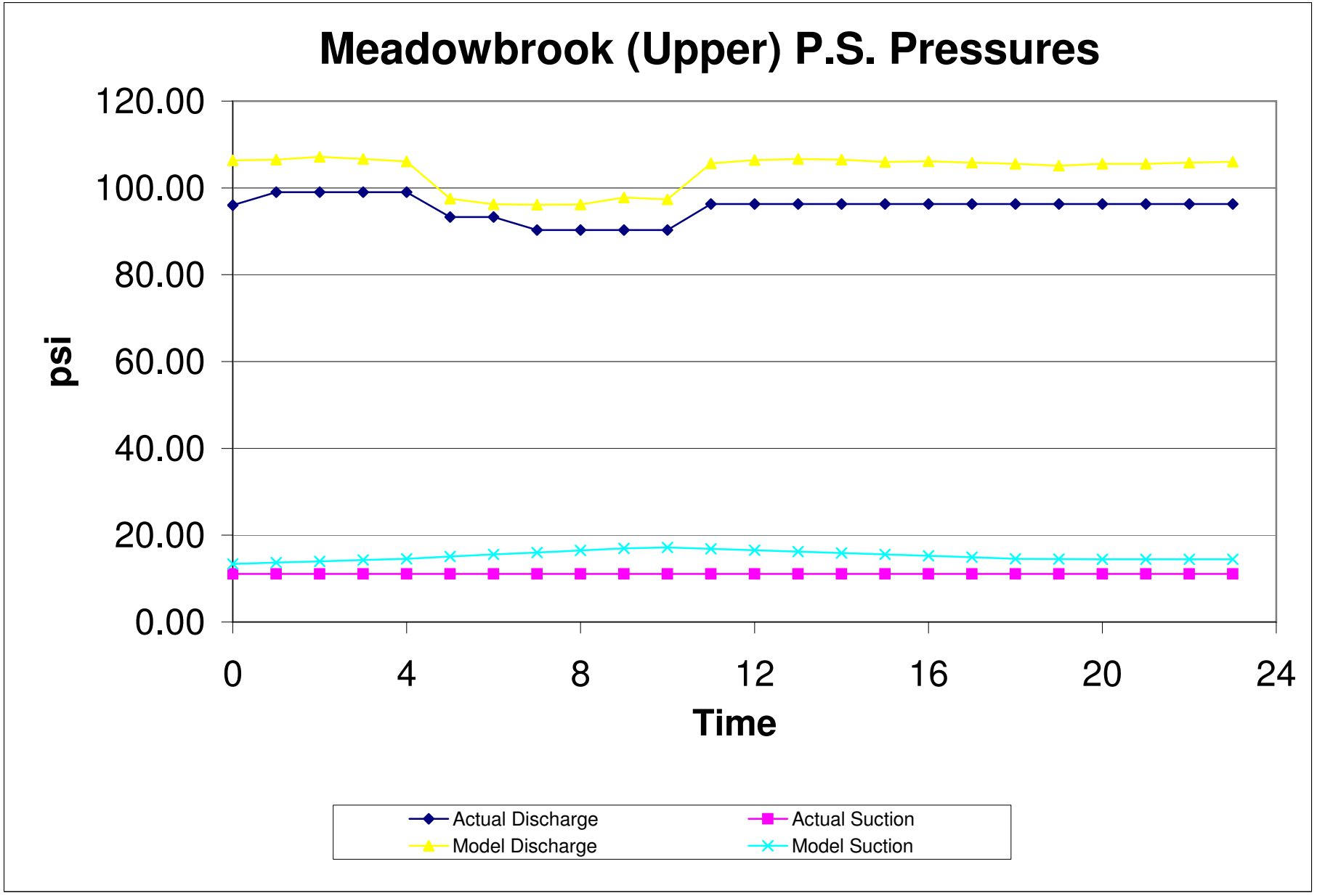

Los Pinos 1 P.S. Pressures
300.00
250.00
200.00
150.00
100.00
50.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction
Model Discharge
Model Suction

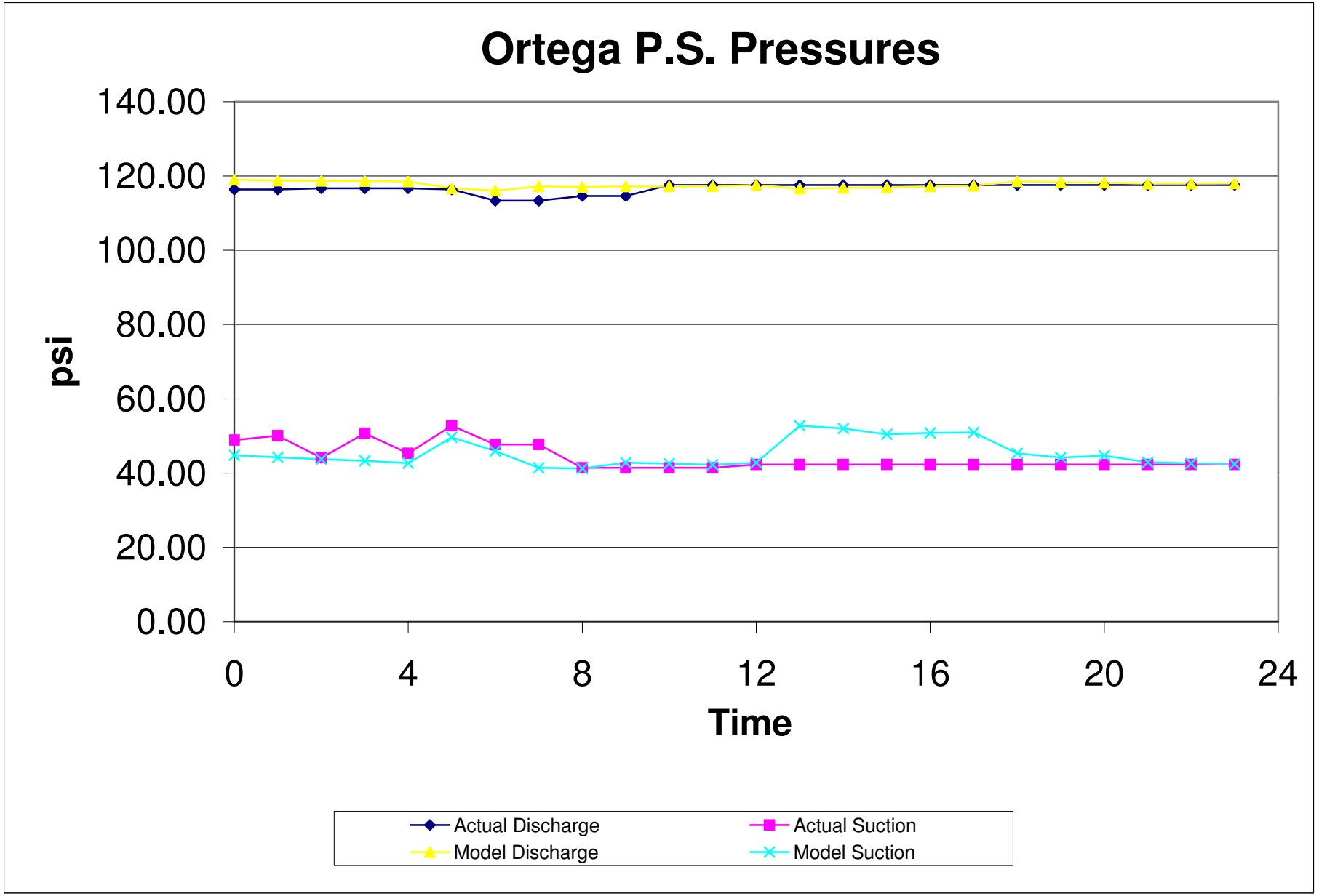

Los Pinos 2A P.S. Pressures
300.00
250.00
200.00
150.00
100.00
50.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction
Model Discharge
Model Suction

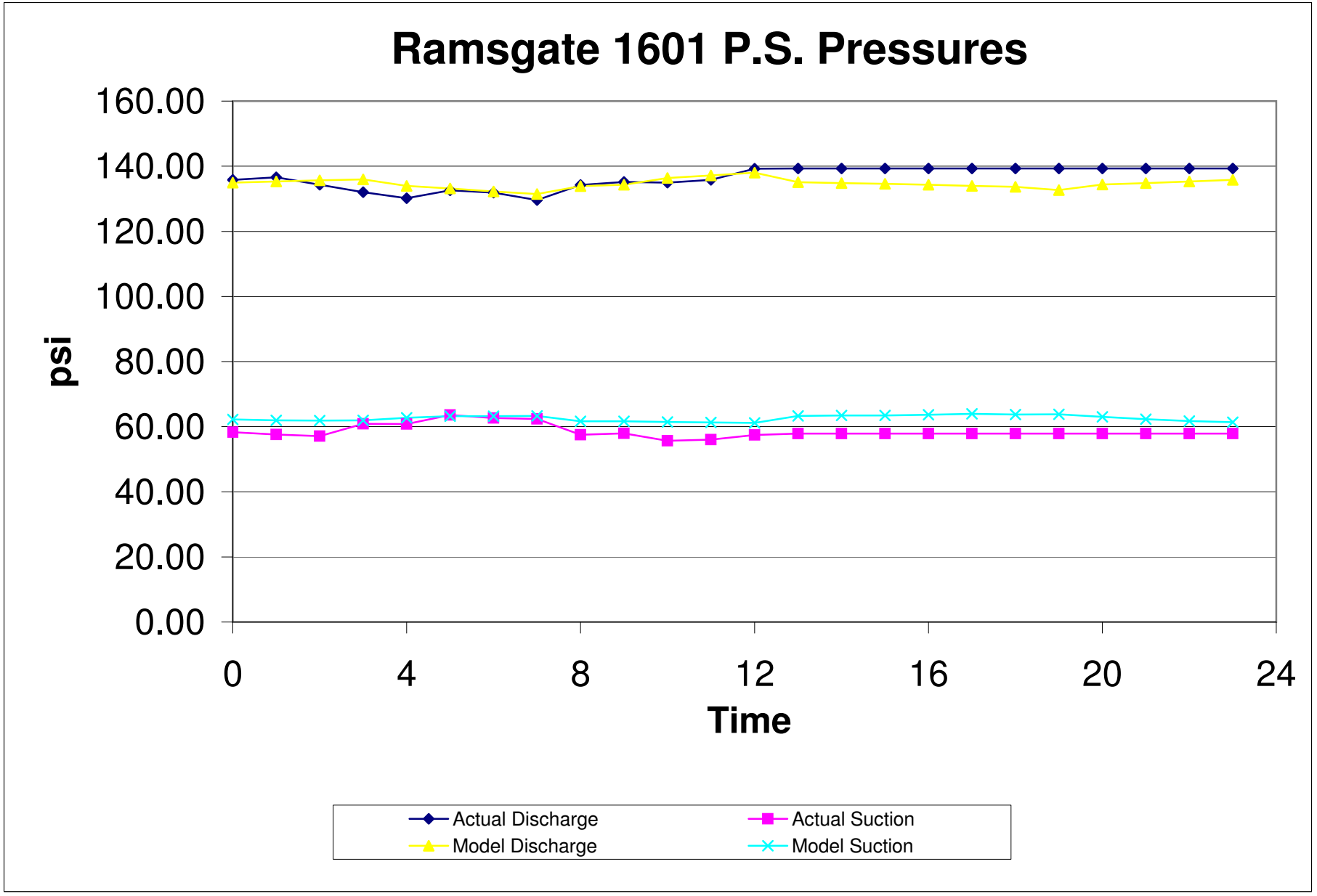

Los Pinos 2B P.S. Pressures
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction
Model Discharge
Model Suction

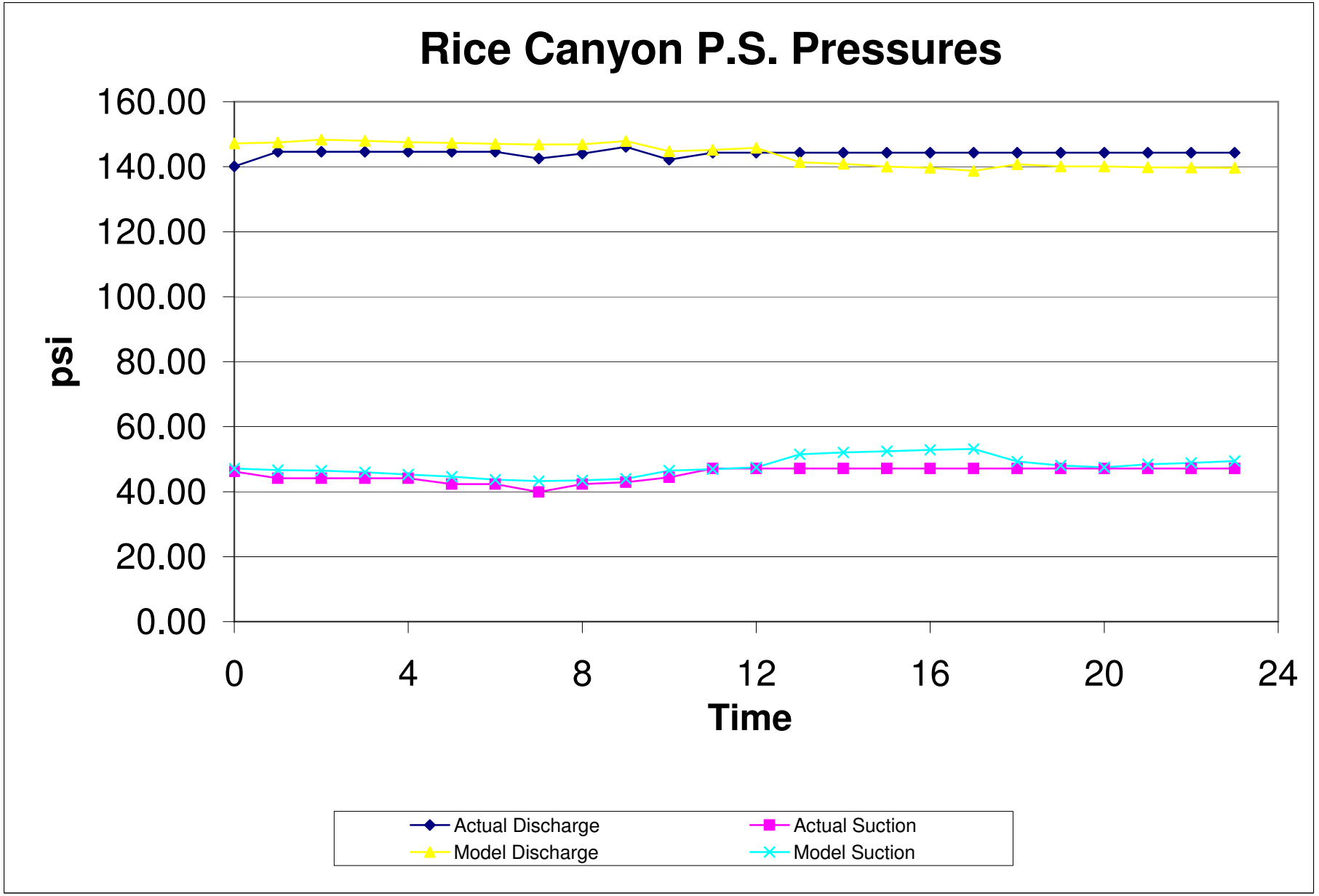

Lucerne P.S. Pressures
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction
Model Discharge
Model Suction

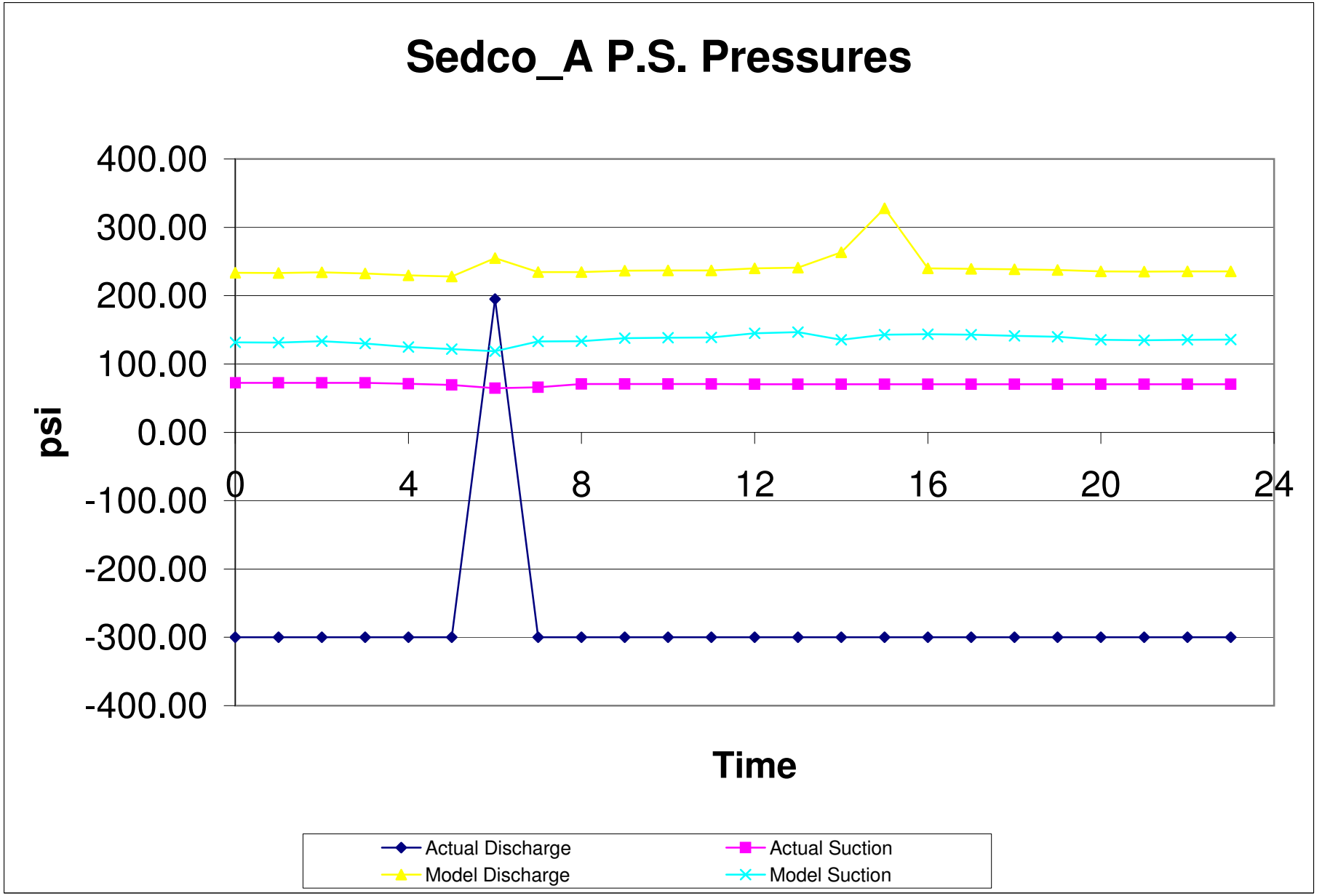

Machado Well Discharge Pressures
50.00
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Model Discharge

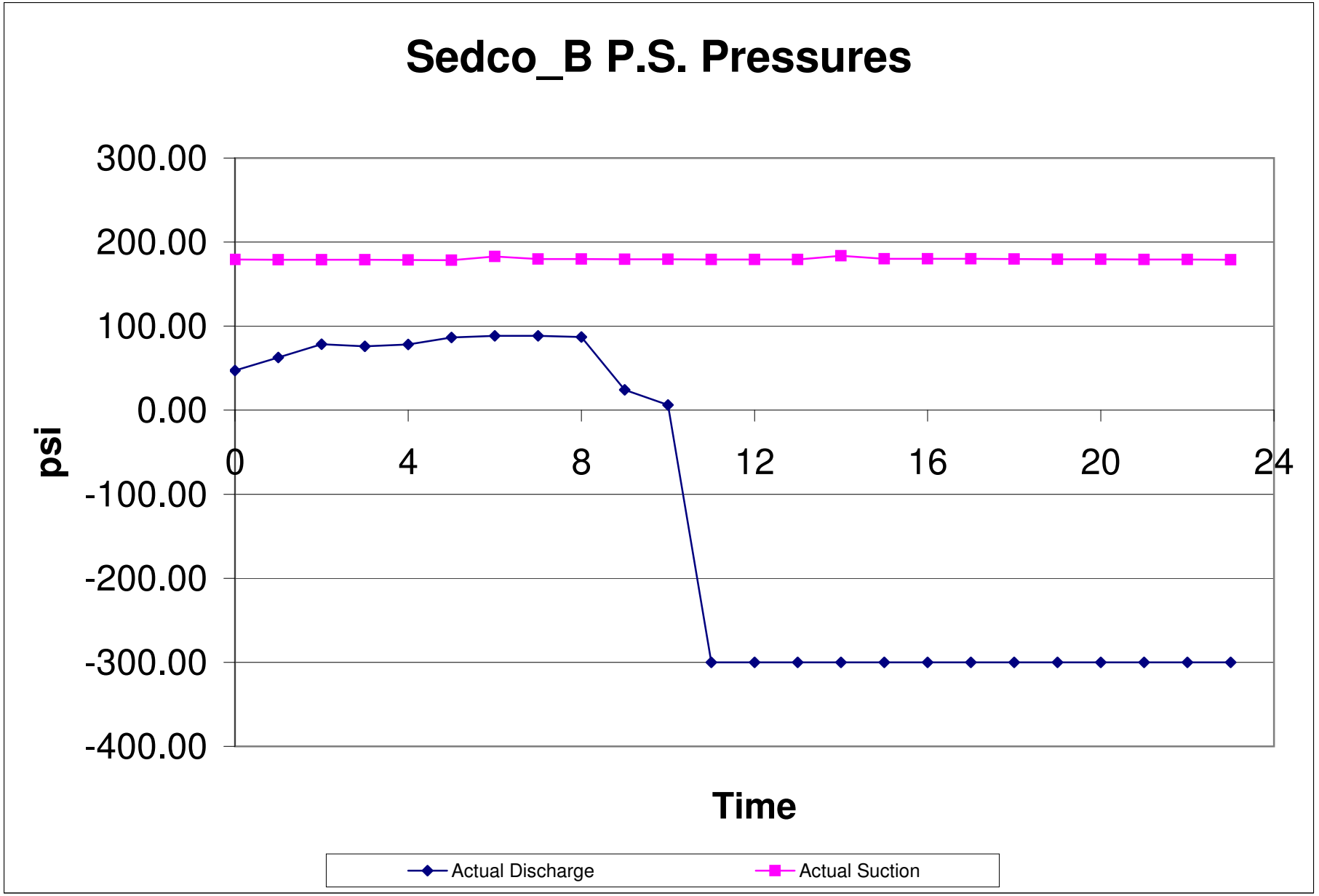

Meadowbrook (Upper) P.S. Pressures
120.00
100.00
80.00
60.00
40.00
20.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction
Model Discharge
Model Suction

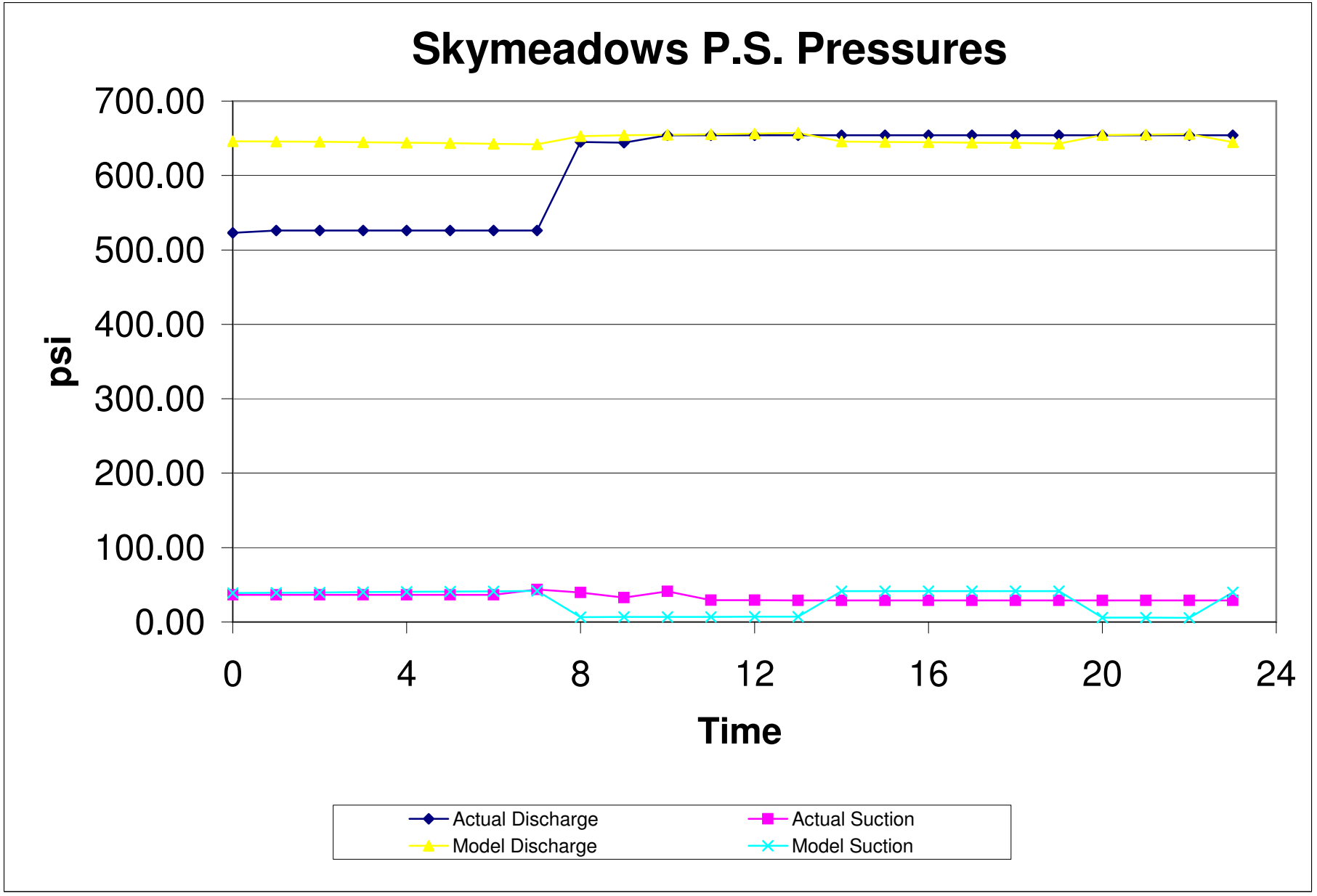

Ortega P.S. Pressures
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction
Model Discharge
Model Suction

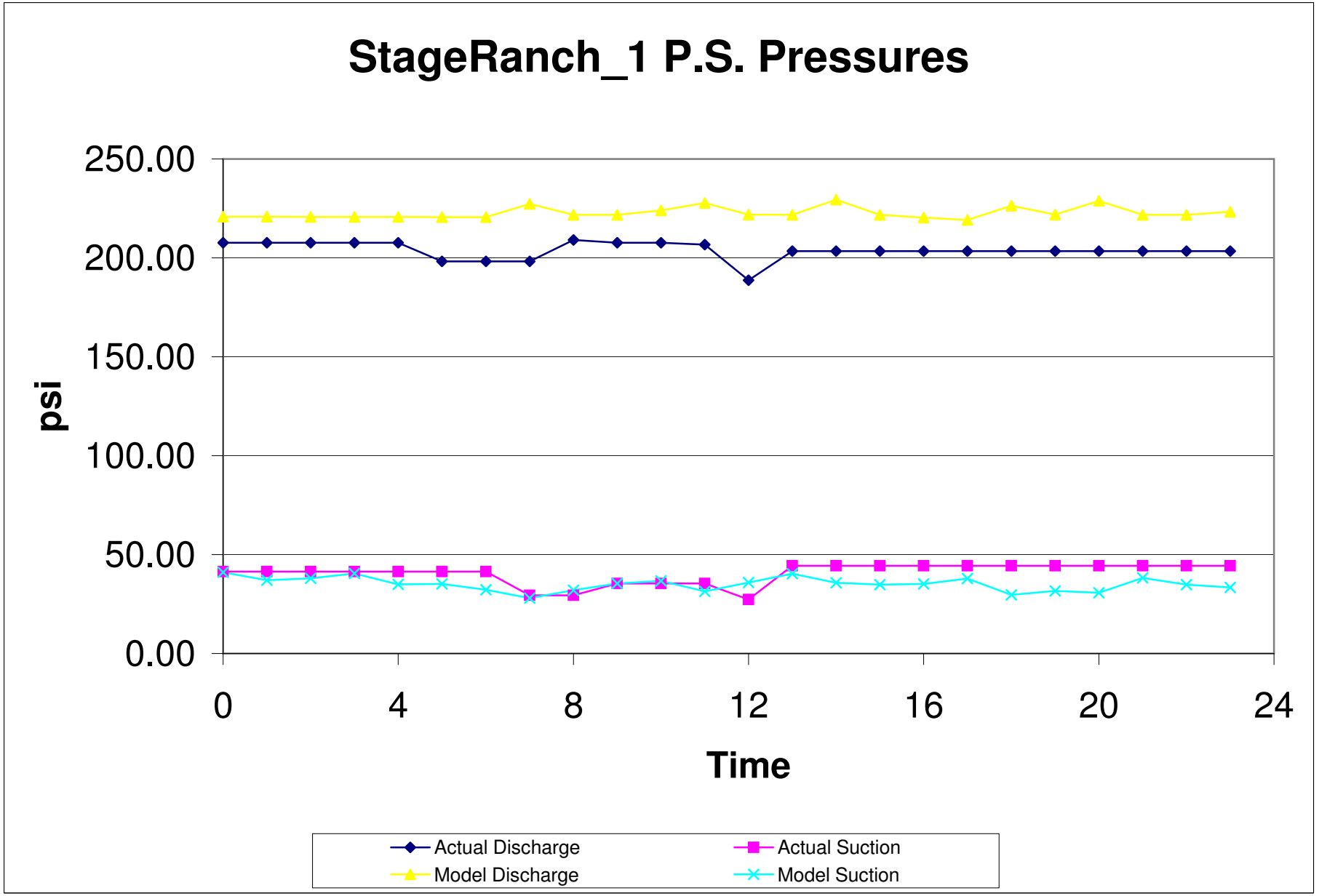

Ramsgate 1601 P.S. Pressures
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction
Model Discharge
Model Suction

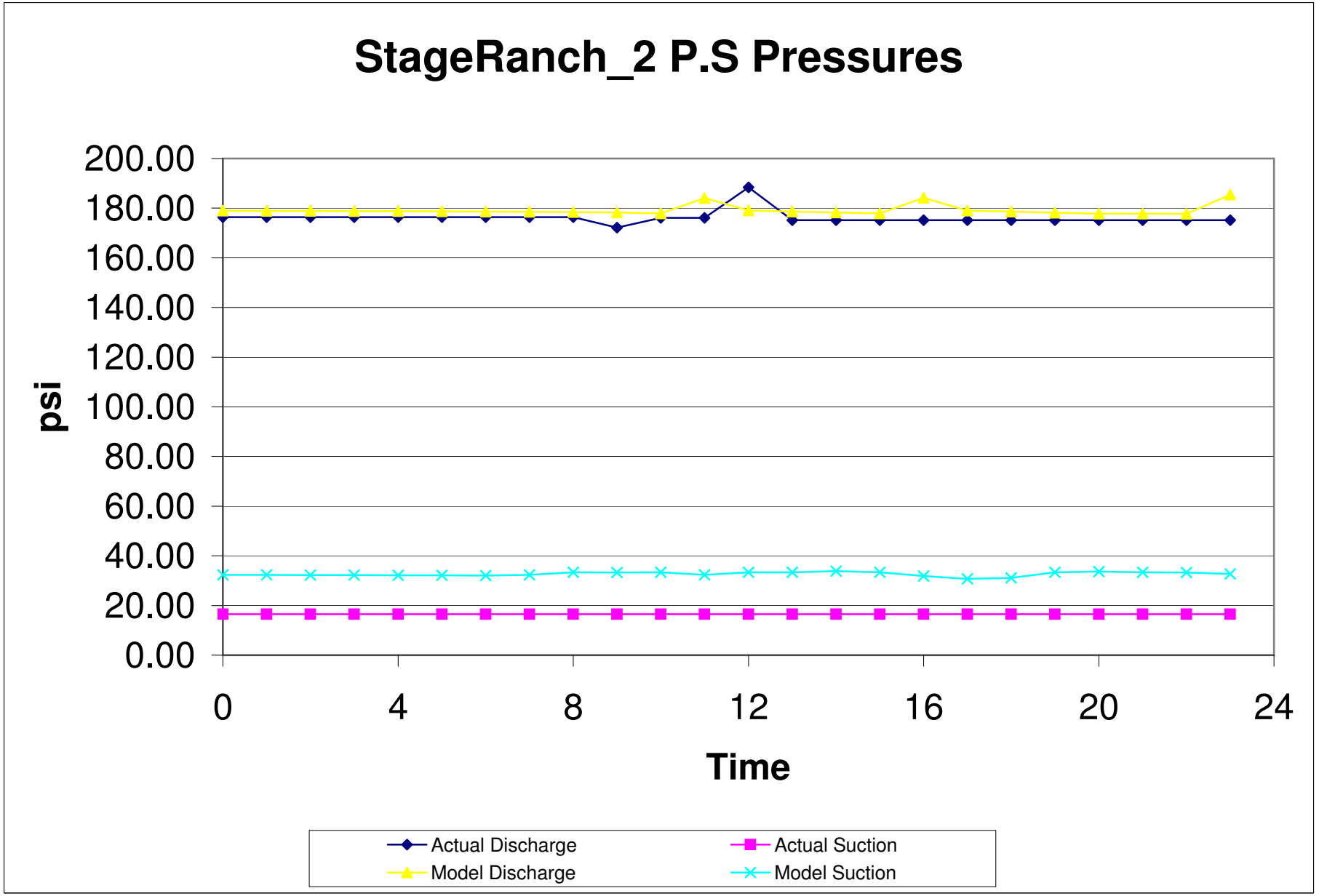

Rice Canyon P.S. Pressures
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction
Model Discharge
Model Suction

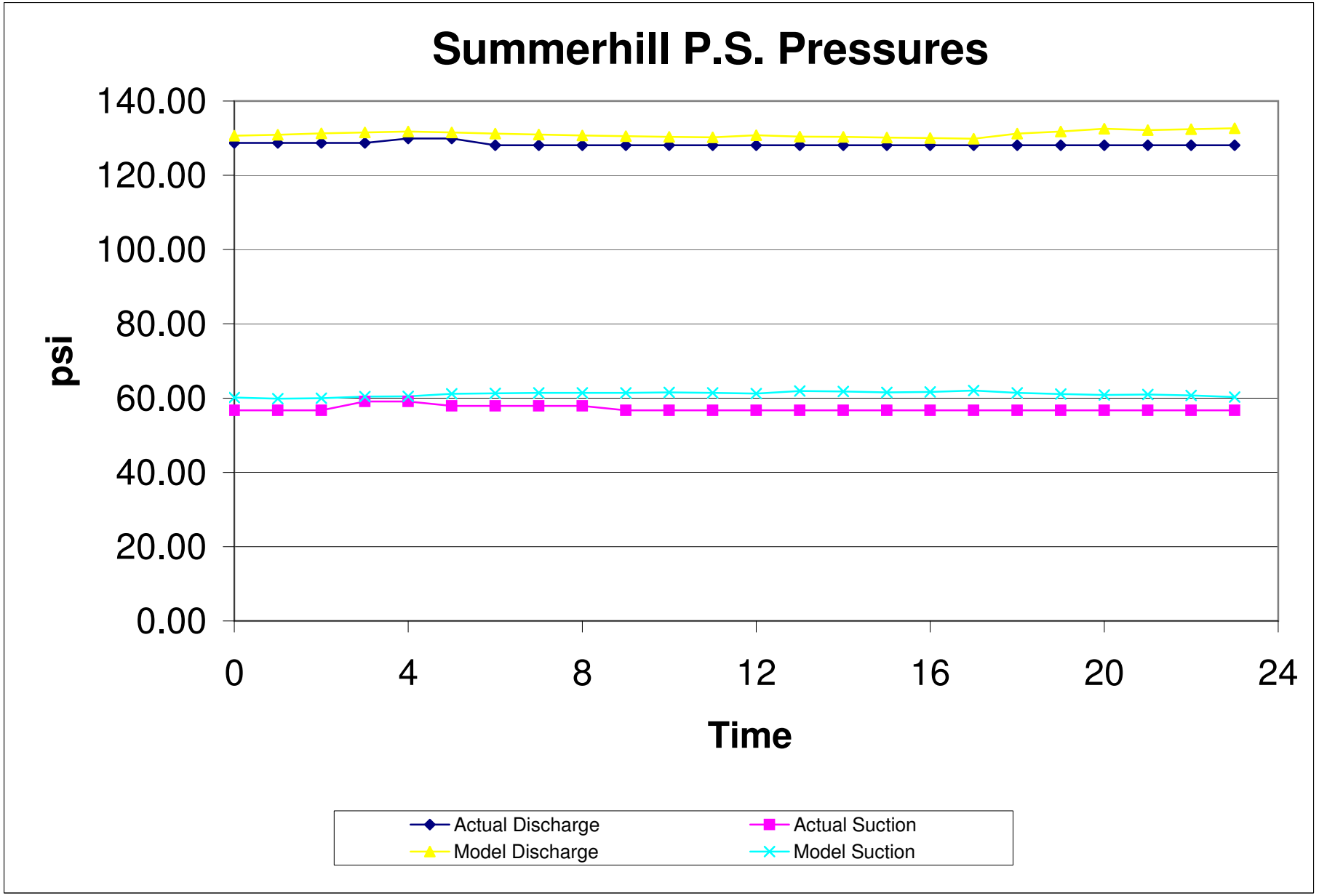

Sedco_A P.S. Pressures
400.00
300.00
200.00
100.00
0.00
-100.00
-200.00
-300.00
-400.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction
Model Discharge
Model Suction

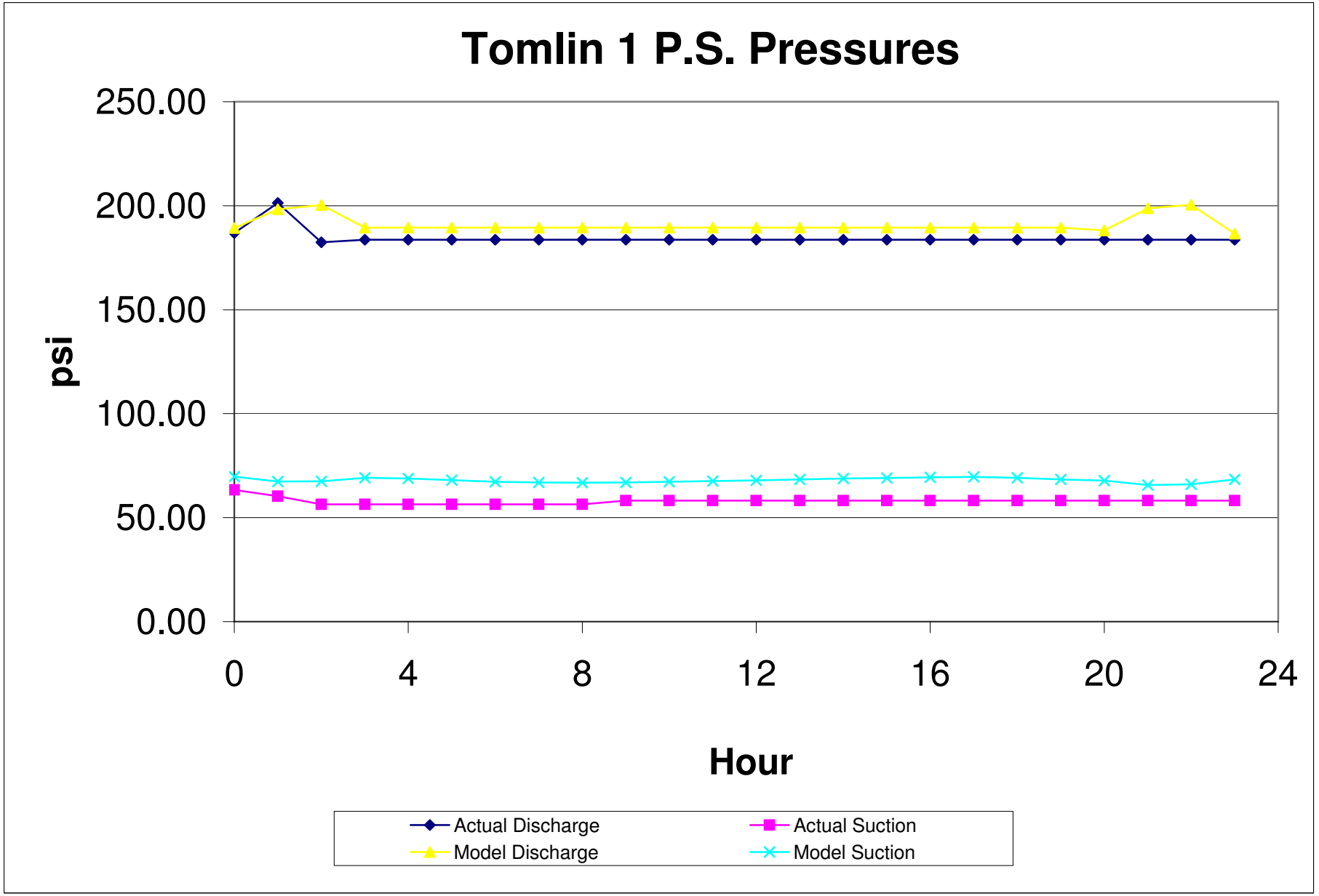

Sedco_B P.S. Pressures
300.00
200.00
100.00
0.00
-100.00
-200.00
-300.00
-400.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction

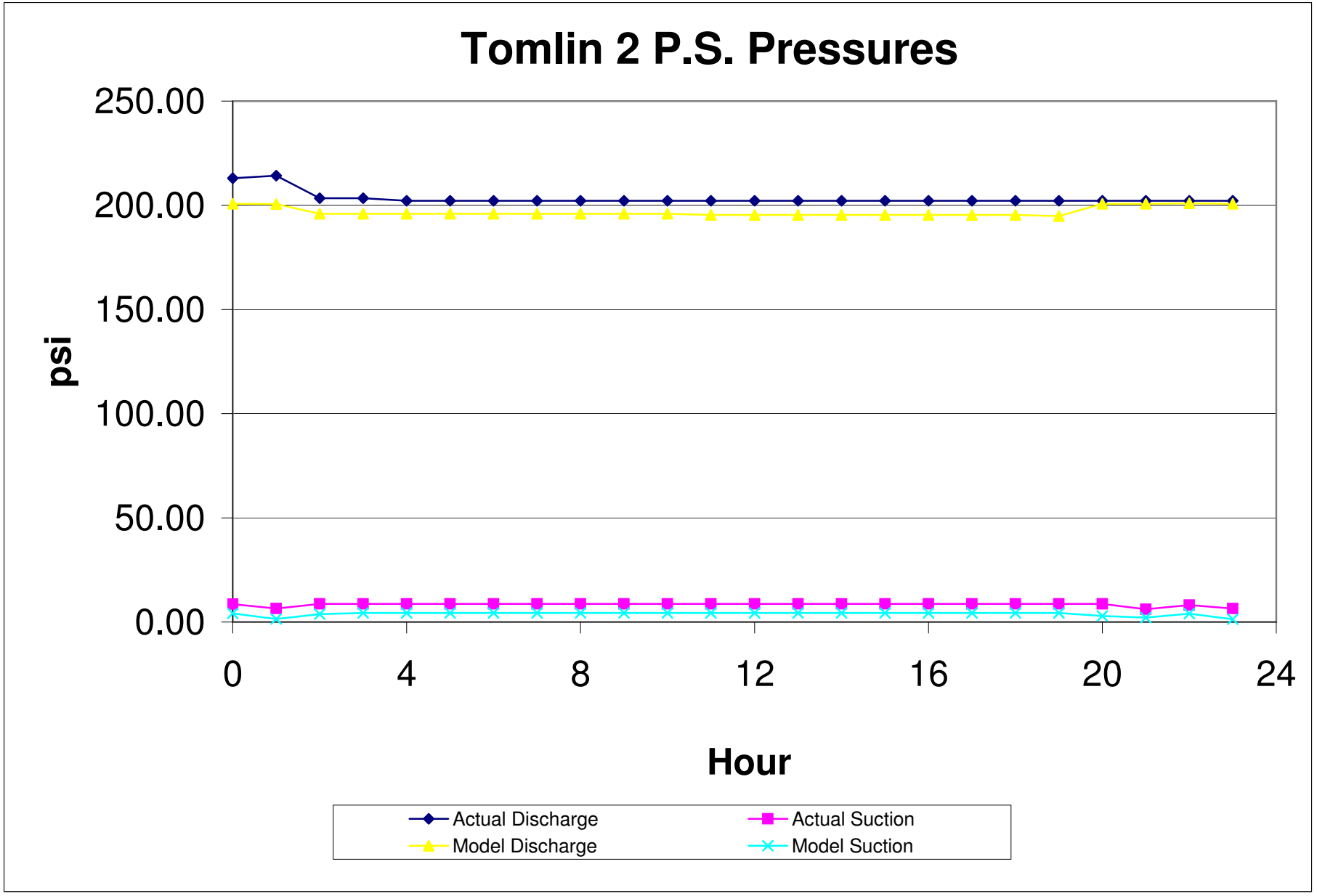

Skymeadows P.S. Pressures
700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction
Model Discharge
Model Suction

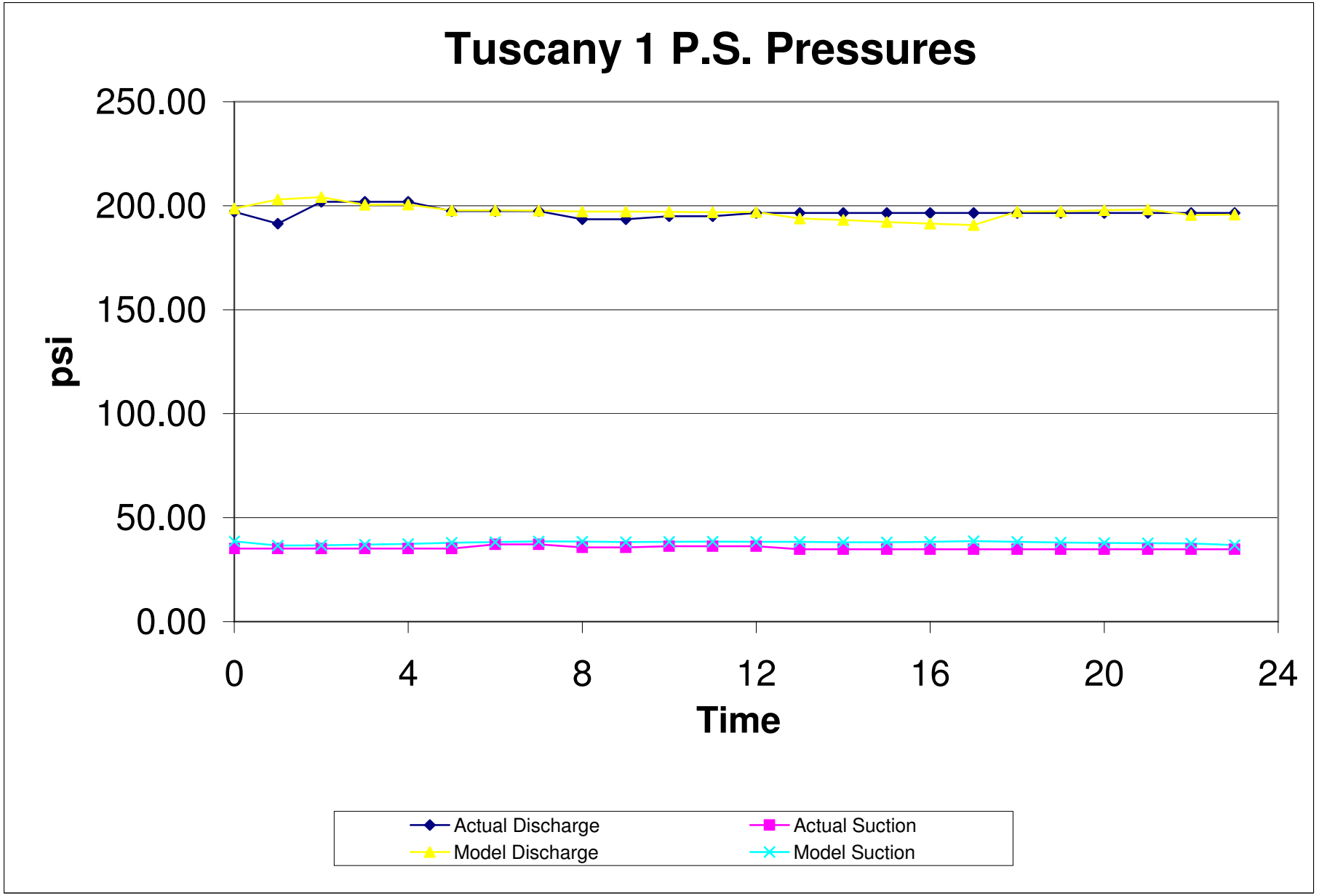

StageRanch_1 P.S. Pressures
250.00
200.00
150.00
100.00
50.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction
Model Discharge
Model Suction

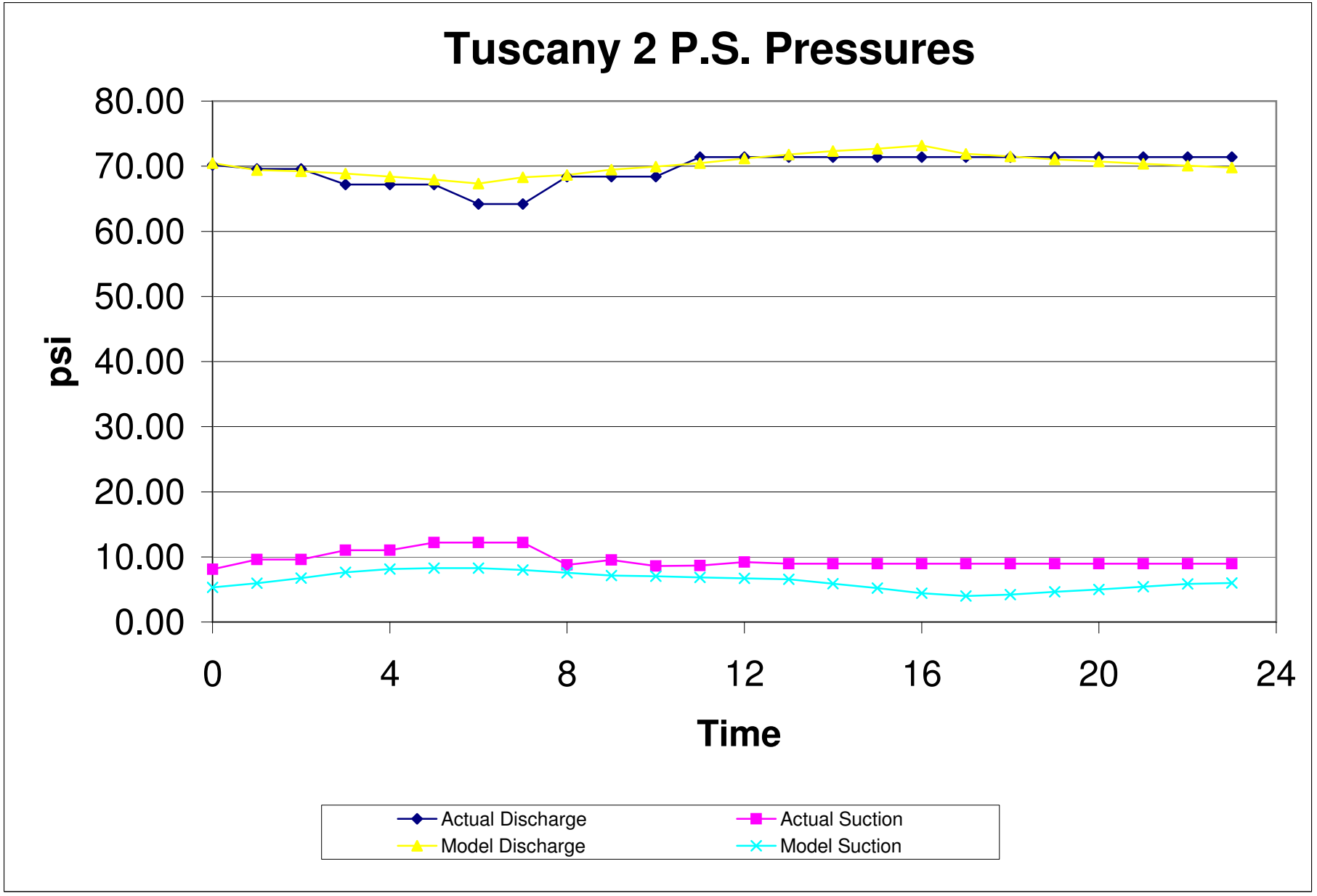

StageRanch_2 P.S Pressures
200.00
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction
Model Discharge
Model Suction

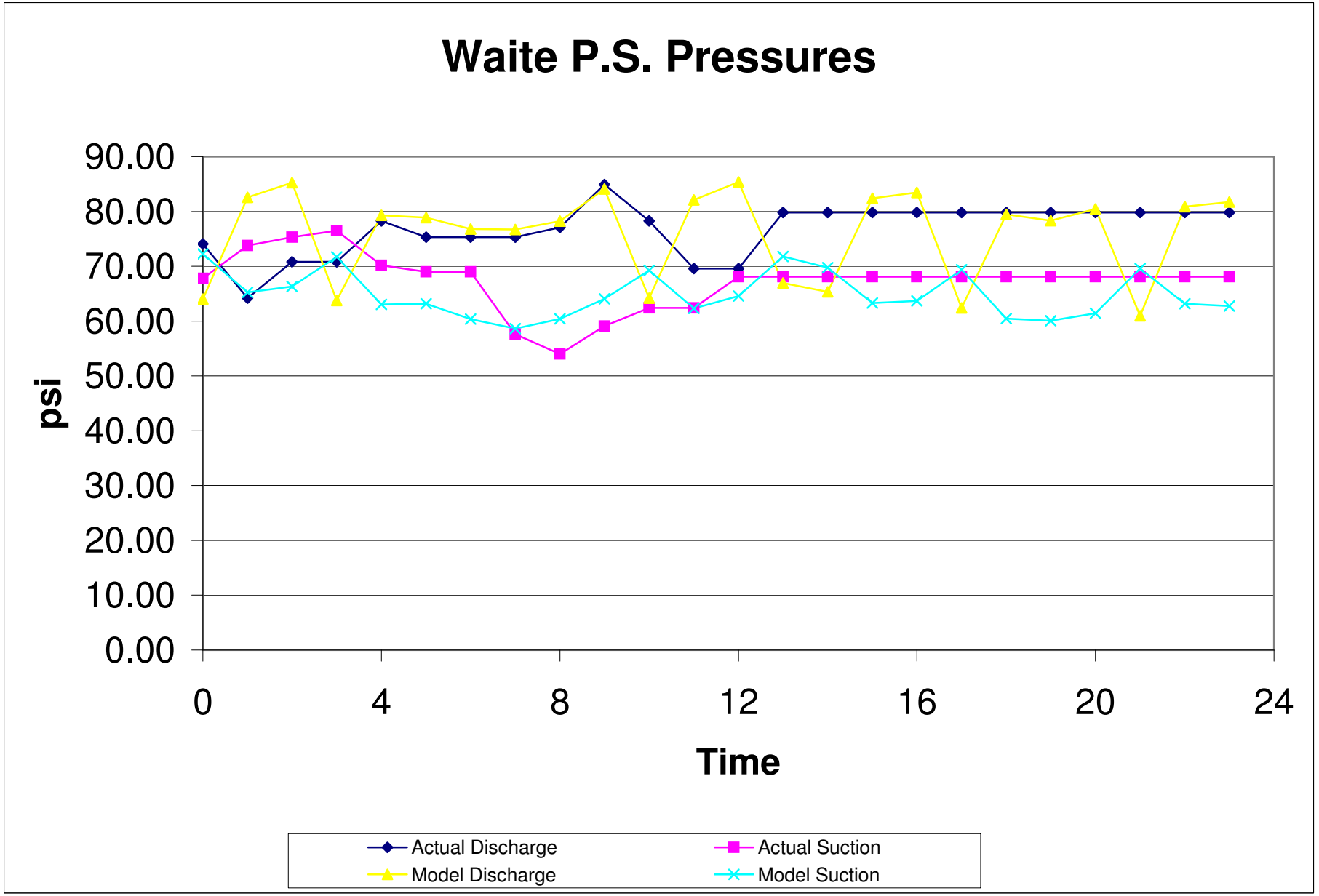

Summerhill P.S. Pressures
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction
Model Discharge
Model Suction

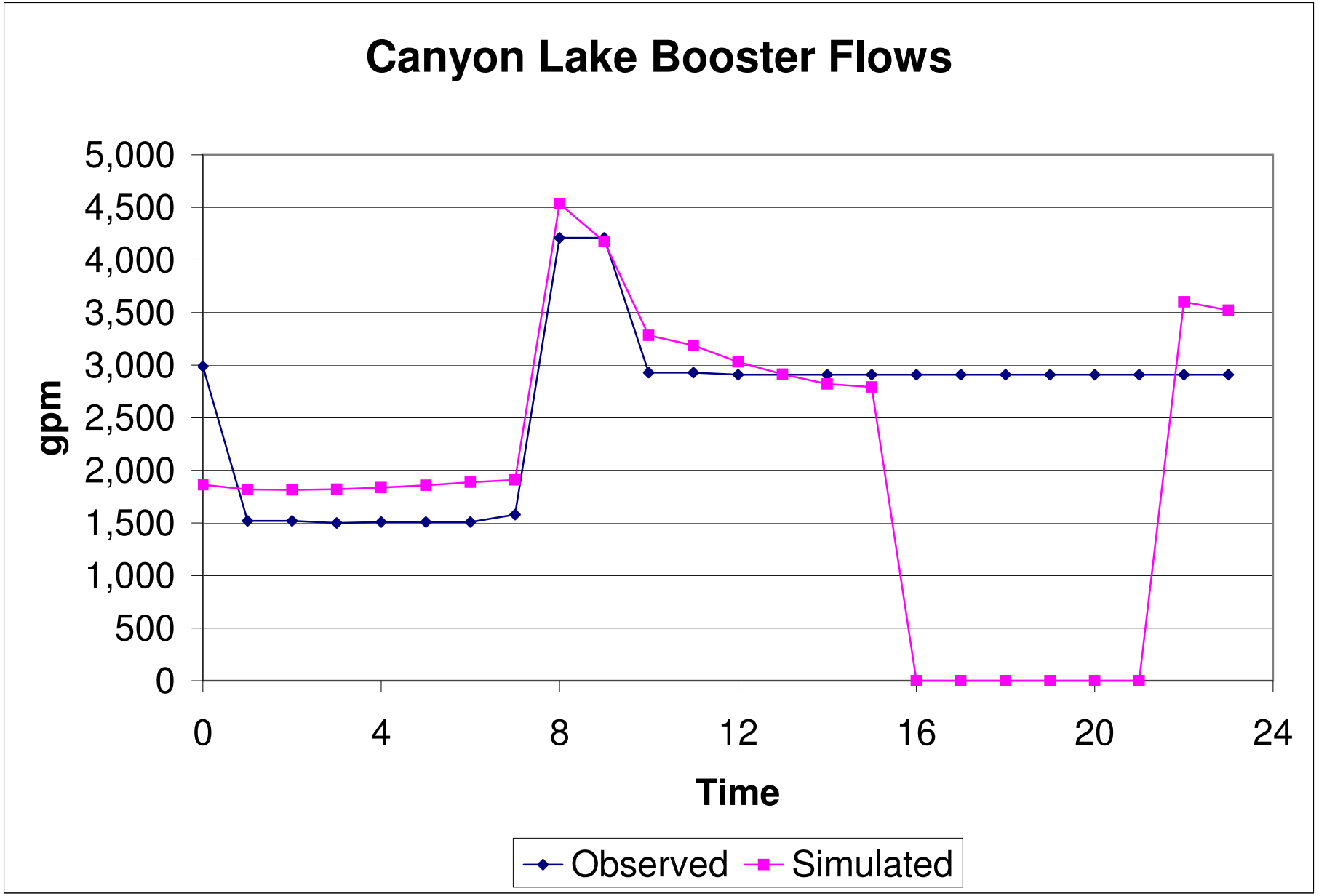

Tomlin 1 P.S. Pressures
250.00
200.00
150.00
100.00
50.00
0.00
psi
0
4
8
12
16
20
24
Hour
Actual Discharge
Actual Suction
Model Discharge
Model Suction


Tomlin 2 P.S. Pressures
250.00
200.00
150.00
100.00
50.00
0.00
psi
0
4
8
12
16
20
24
Hour
Actual Discharge
Actual Suction
Model Discharge
Model Suction


Tuscany 1 P.S. Pressures
250.00
200.00
150.00
100.00
50.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction
Model Discharge
Model Suction


Tuscany 2 P.S. Pressures
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction
Model Discharge
Model Suction


Waite P.S. Pressures
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
psi
0
4
8
12
16
20
24
Time
Actual Discharge
Actual Suction
Model Discharge
Model Suction


Canyon Lake Booster Flows
5,000
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
gpm
0
4
8
12
16
20
24
Time
Observed
Simulated

Appendix C
System Evaluation

Storage Evaluation – Year 2010 Conditions

Pressure Zone (Name)	Production for 2006 (MG)				Operational Storage (30% of MDD)	Fire Storage (MG)	Emergency Storage (1 MDD)	Total Volume Req'd[1] (MG)	Existing Storage Tanks (MG)	Surplus Storage (MG)
	ADD (mgd)	MDD (mgd)	Fire Flow Req'd (gpm)	Fire Duration (hrs)						
1258.4 (Clay Canyon 2)	0.20	0.41	500	4	0.12	0.12	0.41	0.65	0.08	**-0.57**
1358.7 (Mayhew)	0.33	0.65	500	4	0.20	0.12	0.65	0.97	0.18	**-0.79**
1434 (Loop Zone)	7.10	14.19	4,000	4	4.26	0.96	14.19	19.41	31.50	**12.09**
1601(El Toro/Ramsgate 1/Porto Romano 1)	0.94	1.89	4,000	4	0.57	0.96	1.89	3.41	3.14	**-0.27**
1601 (Horsethief 1/Pacific Clay/Ortega/Lucerne/Alberhill Ranch 1; includes City demand)	4.53	9.05	4,000	4	2.72	0.96	9.05	12.73	9.60	**-3.13**
1601 (Summerhill)	0.53	1.05	4,000	4	0.32	0.96	1.05	2.33	2.35	**0.02**
1601 (Waite)	1.29	2.58	4,000	4	0.77	0.96	2.58	4.31	0.50	**-3.81**
1620 (Adelpha)	0.07	0.15	1,000	4	0.04	0.24	0.15	0.43	0.02	**-0.41**
1622 (Canyon Lake)	1.91	3.83	2,500	4	1.15	0.60	3.83	5.58	2.00	**-3.58**
1650 (Cal Oaks)	2.76	5.51	4,000	4	1.65	0.96	5.51	8.12	9.40	**1.28**
1701 (Meadowbrook 1)	0.26	0.53	2,500	4	0.16	0.60	0.53	1.29	2.00	**0.71**
1746 (Bundy Canyon/Gafford)	1.38	2.76	4,000	4	0.83	0.96	2.76	4.55	3.04	**-1.51**
1750 (Cottonwood 1)	1.88	3.76	4,000	4	1.13	0.96	3.76	5.85	2.40	**-3.45**
1800/1801 (Leach Cyn/Rice Cyn/Horsethief 2/Alberhill Ranch 2)	2.39	4.78	2,500	4	1.43	0.60	4.78	6.81	5.01	**-1.80**
1800/1801 (Tuscany Hills 1/Ramsgate 2)	2.02	4.04	4,000	4	1.21	0.96	4.04	6.21	4.20	**-2.01**
1801 (Porto Romano 2)	0.03	0.06	4,000	4	0.02	0.96	0.06	1.04		**-1.04**
1850 (Greer Ranch 1)	0.36	0.71	4,000	4	0.21	0.96	0.71	1.89	0.84	**-1.05**
1850 (Alberhill CFD 1)	0.00	0.00	1,000	4	0.00	0.24	0.00	0.24		**-0.24**
1871 (Tomlin 1)	0.00	0.01	500	4	0.00	0.12	0.01	0.13	0.05	**-0.08**
1882 (Stage Ranch 1)	0.04	0.07	1,000	4	0.02	0.24	0.07	0.33	0.10	**-0.23**
1896 (Meadowbrook 2)	0.24	0.47	2,500	4	0.14	0.60	0.47	1.21	1.00	**-0.21**
1900 (Lemon Grove)	0.00	0.00	1,000	4	0.00	0.24	0.00	0.24		
1916.5 (Encina)	0.04	0.09	1,000	4	0.03	0.24	0.09	0.36	0.50	**0.14**
1934 (Cottonwood 2)	0.45	0.90	2,500	4	0.27	0.60	0.90	1.77	0.53	**-1.24**
1940 (Tuscany Hills 2)	0.77	1.53	1,500	4	0.46	0.36	1.53	2.36	1.00	**-1.36**
1968 (North Peak #1)	0.00	0.00	4,000	4	0.00	0.96	0.00	0.96		**-0.96**
2020 (Canyon Hills Estates)	0.04	0.07	1,000	4	0.02	0.24	0.07	0.34		**-0.34**
2040 (LaLaguna 1)	0.07	0.14	1,000	4	0.04	0.24	0.14	0.43	1.03	**0.60**
2050(Greer Ranch 2)	0.46	0.93	1,000	4	0.28	0.24	0.93	1.45	1.34	**-0.11**
2090 (Sunset Ridge 1)	0.00	0.00	1,000	4	0.00	0.24	0.00	0.24		**-0.24**
2137 (North Peak #2)	0.00	0.00	2,500	4	0.00	0.60	0.00	0.60		**-0.60**
2201 (Sedco)	0.02	0.05	1,000	4	0.01	0.24	0.05	0.30	0.09	**-0.21**
2216 (Daley)	0.02	0.04	1,000	4	0.01	0.24	0.04	0.29	0.09	**-0.20**
2217 (Stage Ranch 2)	0.05	0.10	500	4	0.03	0.12	0.10	0.26	0.10	**-0.16**
2240(LaLaguna 2)	0.04	0.08	1,000	4	0.02	0.24	0.08	0.34	0.73	**0.39**
2279 (North Peak #3)	0.00	0.00	2,500	4	0.00	0.60	0.00	0.60		**-0.60**
2313 (Tomlin 2)	0.01	0.03	500	4	0.01	0.12	0.03	0.16	0.05	**-0.11**
2460 (Alberhill CFD 3)	0.00	0.00	500	4	0.00	0.12	0.00	0.12		**-0.12**
2778 (Los Pinos 1)	0.03	0.07	500	4	0.02	0.12	0.07	0.21	0.10	**-0.11**
2954 (Nilson)	0.00	0.00	500	4	0.00	0.12	0.00	0.12		**-0.12**
3501 (Los Pinos 2)	0.02	0.05	500	4	0.01	0.12	0.05	0.18	0.10	**-0.08**
Entire System	**30.36**	**60.72**	**--**	**--**	**18.22**	**20.16**	**60.72**	**99.10**	**83.17**	**-15.69**

Note: Surplus is positive and deficit is negative

Storage Evaluation – Year 2015 Conditions

Pressure Zone (Name)	Production for 2006 (MG)				Operational Storage (30% of MDD)	Fire Storage (MG)	Emergency Storage (1 MDD)	Total Volume Req'd[1] (MG)	Existing Storage Tanks (MG)	Surplus Storage (MG)
	ADD (mgd)	MDD (mgd)	Fire Flow Req'd (gpm)	Fire Duration (hrs)						
1258.4 (Clay Canyon 2)	0.20	0.41	500	4	0.12	0.12	0.41	0.65	0.08	**-0.57**
1358.7 (Mayhew)	0.41	0.82	500	4	0.25	0.12	0.82	1.19	0.18	**-1.01**
1434 (Loop Zone)	8.66	17.31	4000	4	5.19	0.96	17.31	23.47	31.5	**8.03**
1601(El Toro/Ramsgate 1/Porto Romano 1)	1.68	3.36	4000	4	1.01	0.96	3.36	5.33	3.14	**-2.19**
1601 (Horsethief 1/Pacific Clay/Ortega/Lucerne/Alberhill Ranch 1; includes City demand)	5.12	10.23	4000	4	3.07	0.96	10.23	14.26	9.6	**-4.66**
1601 (Summerhill)	0.55	1.10	4000	4	0.33	0.96	1.10	2.39	2.35	**-0.04**
1601 (Waite)	1.29	2.58	4000	4	0.77	0.96	2.58	4.32	0.5	**-3.82**
1620 (Adelpha)	0.07	0.15	1000	4	0.04	0.24	0.15	0.43	0.02	**-0.41**
1622 (Canyon Lake)	1.98	3.95	2500	4	1.19	0.6	3.95	5.74	2	**-3.74**
1650 (Cal Oaks)	2.98	5.97	4000	4	1.79	0.96	5.97	8.71	9.4	**0.69**
1701 (Meadowbrook 1)	0.29	0.57	2500	4	0.17	0.6	0.57	1.34	2	**0.66**
1746 (Bundy Canyon/Gafford)	1.54	3.08	4000	4	0.93	0.96	3.08	4.97	3.04	**-1.93**
1750 (Cottonwood 1)	1.88	3.76	4000	4	1.13	0.96	3.76	5.85	2.4	**-3.45**
1800/1801 (Leach Cyn/Rice Cyn/Horsethief 2/Alberhill Ranch 2)	2.68	5.36	2500	4	1.61	0.6	5.36	7.56	5.01	**-2.55**
1800/1801 (Tuscany Hills 1/Ramsgate 2)	2.47	4.95	4000	4	1.48	0.96	4.95	7.39	4.2	**-3.19**
1801 (Porto Romano 2)	0.06	0.12	4000	4	0.04	0.96	0.12	1.11		**-1.11**
1850 (Greer Ranch 1)	0.36	0.71	4000	4	0.21	0.96	0.71	1.89	0.84	**-1.05**
1850 (Alberhill CFD 1)	0.00	0.00	1000	4	0.00	0.24	0.00	0.24		**-0.24**
1871 (Tomlin 1)	0.01	0.01	500	4	0.00	0.12	0.01	0.14	0.05	**-0.09**
1882 (Stage Ranch 1)	0.06	0.13	1000	4	0.04	0.24	0.13	0.41	0.1	**-0.31**
1896 (Meadowbrook 2)	0.24	0.47	2500	4	0.14	0.6	0.47	1.21	1	**-0.21**
1900 (Lemon Grove)	0.00	0.00	1000	4	0.00	0.24	0.00	0.24		
1916.5 (Encina)	0.08	0.15	1000	4	0.05	0.24	0.15	0.44	0.5	**0.06**
1934 (Cottonwood 2)	0.55	1.10	2500	4	0.33	0.6	1.10	2.03	0.53	**-1.50**
1940 (Tuscany Hills 2)	0.72	1.43	1500	4	0.43	0.36	1.43	2.22	1	**-1.22**
1968 (North Peak #1)	0.20	0.40	4000	4	0.12	0.96	0.40	1.47		**-1.47**
2020 (Canyon Hills Estates)	0.04	0.07	1000	4	0.02	0.24	0.07	0.34		**-0.34**
2040 (LaLaguna 1)	0.07	0.14	1000	4	0.04	0.24	0.14	0.43	1.03	**0.60**
2050(Greer Ranch 2)	0.46	0.93	1000	4	0.28	0.24	0.93	1.45	1.34	**-0.11**
2090 (Sunset Ridge 1)	0.33	0.67	1000	4	0.20	0.24	0.67	1.11		**-1.11**
2137 (North Peak #2)	0.13	0.27	2500	4	0.08	0.6	0.27	0.95		**-0.95**
2201 (Sedco)	0.03	0.06	1000	4	0.02	0.24	0.06	0.32	0.09	**-0.23**
2216 (Daley)	0.02	0.04	1000	4	0.01	0.24	0.04	0.29	0.09	**-0.20**
2217 (Stage Ranch 2)	0.02	0.04	500	4	0.01	0.12	0.04	0.17	0.1	**-0.07**
2240(LaLaguna 2)	0.04	0.09	1000	4	0.03	0.24	0.09	0.35	0.73	**0.38**
2279 (North Peak #3)	0.00	0.00	2500	4	0.00	0.6	0.00	0.60		**-0.60**
2313 (Tomlin 2)	0.03	0.05	500	4	0.02	0.12	0.05	0.19	0.05	**-0.14**
2460 (Alberhill CFD 3)	0.55	1.10	500	4	0.33	0.12	1.10	1.55		**-1.55**
2778 (Los Pinos 1)	0.19	0.38	500	4	0.11	0.12	0.38	0.61	0.1	**-0.51**
2954 (Nilson)	0.01	0.02	500	4	0.01	0.12	0.02	0.14		**-0.14**
3300 (Skymeadows)	0.08	0.16	500	4	0.05	0.12	0.16	0.32	0.1	**-0.22**
3501 (Los Pinos 2)	0.02	0.05	500	4	0.01	0.12	0.05	0.18	0.1	**-0.08**
Entire System	**48.43**	**96.85**	**--**	**--**	**29.05**	**20.16**	**96.85**	**146.06**	**83.17**	**-30.59**

Note: Surplus is positive and deficit is negative

Storage Evaluation – Year 2020 Conditions

Pressure Zone (Name)	Production for 2006 (MG)				Operational Storage (30% of MDD)	Fire Storage (MG)	Emergency Storage (1 MDD)	Total Volume Req'd[1] (MG)	Existing Storage Tanks (MG)	Surplus Storage (MG)
	ADD (mgd)	MDD (mgd)	Fire Flow Req'd (gpm)	Fire Duration (hrs)						
1258.4 (Clay Canyon 2)	0.20	0.41	500	4	0.12	0.12	0.41	0.65	0.08	
1358.7 (Mayhew)	0.49	0.99	500	4	0.30	0.12	0.99	1.40	0.18	**-1.22**
1434 (Loop Zone)	10.19	20.38	4,000	4	6.11	0.96	20.38	27.45	31.50	**4.05**
1601(El Toro/Ramsgate 1/Porto Romano 1)	1.99	3.97	4,000	4	1.19	0.96	3.97	6.13	3.14	**-2.99**
1601 (Horsethief 1/Pacific Clay/Ortega/Lucerne/Alberhill Ranch 1; includes City demand)	6.16	12.33	4,000	4	3.70	0.96	12.33	16.98	9.60	**-7.38**
1601 (Summerhill)	0.58	1.17	4,000	4	0.35	0.96	1.17	2.48	2.35	**-0.13**
1601 (Waite)	1.34	2.68	4,000	4	0.80	0.96	2.68	4.44	0.50	**-3.94**
1620 (Adelpha)	0.07	0.15	1,000	4	0.04	0.24	0.15	0.43	0.02	**-0.41**
1622 (Canyon Lake)	2.04	4.07	2,500	4	1.22	0.60	4.07	5.90	2.00	**-3.90**
1650 (Cal Oaks)	3.21	6.42	4,000	4	1.93	0.96	6.42	9.31	9.40	**0.09**
1701 (Meadowbrook 1)	0.31	0.61	2,500	4	0.18	0.60	0.61	1.40	2.00	**0.60**
1746 (Bundy Canyon/Gafford)	1.70	3.40	4,000	4	1.02	0.96	3.40	5.38	3.04	**-2.34**
1750 (Cottonwood 1)	1.88	3.76	4,000	4	1.13	0.96	3.76	5.85	2.40	**-3.45**
1800/1801 (Leach Cyn/Rice Cyn/Horsethief 2/Alberhill Ranch 2)	2.86	5.72	2,500	4	1.72	0.60	5.72	8.04	5.01	**-3.03**
1800/1801 (Tuscany Hills 1/Ramsgate 2)	2.97	5.94	4,000	4	1.78	0.96	5.94	8.68	4.20	**-4.48**
1801 (Porto Romano 2)	0.09	0.18	4,000	4	0.05	0.96	0.18	1.19		**-1.19**
1850 (Greer Ranch 1)	0.36	0.71	4,000	4	0.21	0.96	0.71	1.89	0.84	**-1.05**
1850 (Alberhill CFD 1)	0.00	0.00	1,000	4	0.00	0.24	0.00	0.24		**-0.24**
1871 (Tomlin 1)	0.01	0.02	500	4	0.00	0.12	0.02	0.14	0.05	**-0.09**
1882 (Stage Ranch 1)	0.09	0.18	1,000	4	0.05	0.24	0.18	0.48	0.10	**-0.38**
1896 (Meadowbrook 2)	0.24	0.47	2,500	4	0.14	0.60	0.47	1.21	1.00	**-0.21**
1900 (Lemon Grove)	0.00	0.00	1,000	4	0.00	0.24	0.00	0.24		
1916.5 (Encina)	0.11	0.21	1,000	4	0.06	0.24	0.21	0.52	0.50	**-0.02**
1934 (Cottonwood 2)	0.65	1.31	2,500	4	0.39	0.60	1.31	2.30	0.53	**-1.77**
1940 (Tuscany Hills 2)	0.72	1.43	1,500	4	0.43	0.36	1.43	2.22	1.00	**-1.22**
1968 (North Peak #1)	0.23	0.45	4,000	4	0.14	0.96	0.45	1.55		**-1.55**
2020 (Canyon Hills Estates)	0.04	0.07	1,000	4	0.02	0.24	0.07	0.34		**-0.34**
2040 (LaLaguna 1)	0.14	0.28	1,000	4	0.08	0.24	0.28	0.60	1.03	**0.43**
2050(Greer Ranch 2)	0.46	0.93	1,000	4	0.28	0.24	0.93	1.45	1.34	**-0.11**
2090 (Sunset Ridge 1)	0.67	1.34	1,000	4	0.40	0.24	1.34	1.98		**-1.98**
2137 (North Peak #2)	0.34	0.69	2,500	4	0.21	0.60	0.69	1.49		**-1.49**
2201 (Sedco)	0.04	0.07	1,000	4	0.02	0.24	0.07	0.33	0.09	**-0.24**
2216 (Daley)	0.02	0.04	1,000	4	0.01	0.24	0.04	0.29	0.09	**-0.20**
2217 (Stage Ranch 2)	0.03	0.07	500	4	0.02	0.12	0.07	0.21	0.10	**-0.11**
2240(LaLaguna 2)	0.05	0.09	1,000	4	0.03	0.24	0.09	0.36	0.73	**0.37**
2279 (North Peak #3)	0.06	0.12	2,500	4	0.04	0.60	0.12	0.75		**-0.75**
2313 (Tomlin 2)	0.04	0.08	500	4	0.02	0.12	0.08	0.23	0.05	**-0.18**
2460 (Alberhill CFD 3)	0.56	1.12	500	4	0.34	0.12	1.12	1.58		**-1.58**
2778 (Los Pinos 1)	0.35	0.69	500	4	0.21	0.12	0.69	1.02	0.10	**-0.92**
2954 (Nilson)	0.02	0.04	500	4	0.01	0.12	0.04	0.17		**-0.17**
3300 (Skymeadows)	0.08	0.17	500	4	0.05	0.12	0.17	0.34	0.10	**-0.24**
3501 (Los Pinos 2)	0.02	0.05	500	4	0.01	0.12	0.05	0.18	0.10	**-0.08**
Entire System	**41.40**	**82.80**	**--**	**--**	**24.84**	**20.16**	**82.80**	**127.80**	**83.17**	**-43.82**

Note: Surplus is positive and deficit is negative

Storage Evaluation – Year 2025 Conditions

Pressure Zone (Name)	Production for 2006 (MG)				Operational Storage (30% of MDD)	Fire Storage (MG)	Emergency Storage (1 MDD)	Total Volume Req'd[1] (MG)	Existing Storage Tanks (MG)	Surplus Storage (MG)
	ADD (mgd)	MDD (mgd)	Fire Flow Req'd (gpm)	Fire Duration (hrs)						
1258.4 (Clay Canyon 2)	0.20	0.41	500	4	0.12	0.12	0.41	0.65	0.08	
1358.7 (Mayhew)	0.49	0.99	500	4	0.30	0.12	0.99	1.40	0.18	**-1.22**
1434 (Loop Zone)	11.72	23.44	4,000	4	7.03	0.96	23.44	31.44	31.50	**0.06**
1601(El Toro/Ramsgate 1/Porto Romano 1)	2.25	4.49	4,000	4	1.35	0.96	4.49	6.80	3.14	**-3.66**
1601 (Horsethief 1/Pacific Clay/Ortega/Lucerne/Alberhill Ranch 1; includes City demand)	6.60	13.21	4,000	4	3.96	0.96	13.21	18.13	9.60	**-8.53**
1601 (Summerhill)	0.62	1.23	4,000	4	0.37	0.96	1.23	2.56	2.35	**-0.21**
1601 (Waite)	1.40	2.79	4,000	4	0.84	0.96	2.79	4.59	0.50	**-4.09**
1620 (Adelpha)	0.07	0.15	1,000	4	0.04	0.24	0.15	0.43	0.02	**-0.41**
1622 (Canyon Lake)	2.10	4.20	2,500	4	1.26	0.60	4.20	6.06	2.00	**-4.06**
1650 (Cal Oaks)	3.44	6.88	4,000	4	2.06	0.96	6.88	9.90	9.40	**-0.50**
1701 (Meadowbrook 1)	0.33	0.66	2,500	4	0.20	0.60	0.66	1.46	2.00	**0.54**
1746 (Bundy Canyon/Gafford)	1.86	3.72	4,000	4	1.12	0.96	3.72	5.80	3.04	**-2.76**
1750 (Cottonwood 1)	1.88	3.76	4,000	4	1.13	0.96	3.76	5.85	2.40	**-3.45**
1800/1801 (Leach Cyn/Rice Cyn/Horsethief 2/Alberhill Ranch 2)	3.05	6.09	2,500	4	1.83	0.60	6.09	8.52	5.01	**-3.51**
1800/1801 (Tuscany Hills 1/Ramsgate 2)	3.18	6.37	4,000	4	1.91	0.96	6.37	9.24	4.20	**-5.04**
1801 (Porto Romano 2)	0.12	0.24	4,000	4	0.07	0.96	0.24	1.27		**-1.27**
1850 (Greer Ranch 1)	0.36	0.71	4,000	4	0.21	0.96	0.71	1.89	0.84	**-1.05**
1850 (Alberhill CFD 1)	0.03	0.06	1,000	4	0.02	0.24	0.06	0.31		**-0.31**
1871 (Tomlin 1)	0.01	0.02	500	4	0.01	0.12	0.02	0.15	0.05	**-0.10**
1882 (Stage Ranch 1)	0.12	0.24	1,000	4	0.07	0.24	0.24	0.55	0.10	**-0.45**
1896 (Meadowbrook 2)	0.24	0.47	2,500	4	0.14	0.60	0.47	1.21	1.00	**-0.21**
1900 (Lemon Grove)	0.00	0.00	1,000	4	0.00	0.24	0.00	0.24		
1916.5 (Encina)	0.14	0.27	1,000	4	0.08	0.24	0.27	0.60	0.50	**-0.10**
1934 (Cottonwood 2)	0.76	1.51	2,500	4	0.45	0.60	1.51	2.56	0.53	**-2.03**
1940 (Tuscany Hills 2)	0.72	1.43	1,500	4	0.43	0.36	1.43	2.22	1.00	**-1.22**
1968 (North Peak #1)	0.25	0.51	4,000	4	0.15	0.96	0.51	1.62		**-1.62**
2020 (Canyon Hills Estates)	0.04	0.07	1,000	4	0.02	0.24	0.07	0.34		**-0.34**
2040 (LaLaguna 1)	0.21	0.41	1,000	4	0.12	0.24	0.41	0.78	1.03	**0.25**
2050(Greer Ranch 2)	0.46	0.93	1,000	4	0.28	0.24	0.93	1.45	1.34	**-0.11**
2090 (Sunset Ridge 1)	0.67	1.34	1,000	4	0.40	0.24	1.34	1.98		**-1.98**
2137 (North Peak #2)	0.35	0.70	2,500	4	0.21	0.60	0.70	1.51		**-1.51**
2201 (Sedco)	0.04	0.09	1,000	4	0.03	0.24	0.09	0.35	0.09	**-0.26**
2216 (Daley)	0.02	0.04	1,000	4	0.01	0.24	0.04	0.29	0.09	**-0.20**
2217 (Stage Ranch 2)	0.05	0.10	500	4	0.03	0.12	0.10	0.25	0.10	**-0.15**
2240(LaLaguna 2)	0.05	0.10	1,000	4	0.03	0.24	0.10	0.37	0.73	**0.36**
2279 (North Peak #3)	0.32	0.64	2,500	4	0.19	0.60	0.64	1.43		**-1.43**
2313 (Tomlin 2)	0.05	0.11	500	4	0.03	0.12	0.11	0.26	0.05	**-0.21**
2460 (Alberhill CFD 3)	0.57	1.14	500	4	0.34	0.12	1.14	1.61		**-1.61**
2778 (Los Pinos 1)	0.35	0.70	500	4	0.21	0.12	0.70	1.03	0.10	**-0.93**
2954 (Nilson)	0.02	0.04	500	4	0.01	0.12	0.04	0.17		**-0.17**
3300 (Skymeadows)	0.09	0.17	500	4	0.05	0.12	0.17	0.35	0.10	**-0.25**
3501 (Los Pinos 2)	0.02	0.05	500	4	0.01	0.12	0.05	0.18	0.10	**-0.08**
Entire System	**45.24**	90.48	--	--	27.14	20.16	90.48	137.79	83.17	**-53.80**

Note: Surplus is positive and deficit is negative

Pumping Capacity Evaluation – Year 2010 Conditions

Pressure Zone (Name)	In-Zone MDD	Higher Zone MDD	Total MDD	Firm Pumping capacity	Pumping Surplus
	(gpm)				
1258.4 (Clay Canyon 2)	285	--	--	--	--
1358.7 (Mayhew)	455	--	--	--	--
1434 (Loop Zone)	9,864	--	--	--	--
1550 (Cielo Vista)		0	0		0
1600 (Skylark)		0	0		0
1601 (Pacific Clay)	0	0	0		0
1601(El Toro/Ramsgate 1)	1,249	1,418	2,667	6,543	3,876
1601 (Horsethief 1)	1,368	1,386	2,754	3,682	928
1601 (Ortega)	788	102	890	2,694	1,804
1601 (Summerhill)	730	0	730	2,624	1,894
1601 (Lucerne/Alberhill Ranch 1)	2,885	2,088	4,973	7,463	2,490
1601 (City)	1,249	0	1,249	1,646	397
1601 (Waite)	1,790	0	1,790		-1,790
1601 (Porto Romano 1)	62	41	103		
1620 (Adelpha)	103	165	268	317	49
1622 (Canyon Lake)	2,661	0	2,661	4,173	1,512
1650 (Cal Oaks)	3,830	1,140	4,970	5,510	540
1701 (Meadowbrook 1)	367	328	696	1,233	537
1746 (Bundy Canyon/Gafford)	1,918	1,293	3,211	1,728	-1,483
1750 (Cottonwood 1)	2,614	677	3,291	1,382	-1,909
1800 (Leach Cyn/Rice Cyn)	1,877	154	2,031	2,730	699
1800 (Tuscany Hills 1)	2,087	1,067	3,153	3,025	-128
1801 (Porto Romano 2)	41	0	41		-41
1801 (Horsethief 2)	1,386	1,000	2,386	1,963	-423
1801 (Alberhill Ranch 2)	56	0	56	1,250	1,194
1801 (Ramsgate 2)	722	0	722	0	-722
1850 (Greer Ranch 1)	496	644	1,140	1,176	36
1850 (Alberhill CFD 1)	0	0	0		0
1871 (Tomlin 1)	5	97	102	450	348
1882 (Stage Ranch 1)	50	73	123	472	349
1896 (Meadowbrook 2)	328	0	328	943	615
1900 (Farm)	610	0	610	565	-45
1900 (Lemon Grove)	1,000	0	1,000		-1,000
1916.5 (Encina)	62	103	165	228	63
1934 (Cottonwood 2)	626	0	626	457	-169
1940 (Tuscany Hills 2)	1,067	0	1,067	1,273	206
1968 (North Peak #1)	0	0	0		0
2020 (Canyon Hills Estates)	52	0	52		-52
2040 (LaLaguna 1)	99	55	154	1,196	1,042
2050(Greer Ranch 2)	644	0	644	1,195	551
2090 (Sunset Ridge)	0	0	0		0
2137 (North Peak #2)	0	0	0		0
2201 (Sedco)	32	0	32	178	146
2216 (Daley)	26	0	26	134	108
2217 (Stage Ranch 2)	73	0	73	690	617
2240(LaLaguna 2)	55	0	55	554	499
2279 (North Peak #3)	0	0	0		0
2313 (Tomlin 2)	19	78	97	287	190
2460 (Alberhill CFD 3)	0	0	0		0
2778 (Los Pinos 1)	47	31	78	280	202
2954 (Nilson)	0	0	0		0
3300 (Skymeadows)	103	0	103	149	46
3501 (Los Pinos 2)	31	0	31	104	73
Entire System	**43,813**	**11,941**	**45,150**	**58,294**	**13,248**

Pumping Capacity Evaluation – Year 2015 Conditions

Pressure Zone (Name)	In-Zone MDD	Higher Zone MDD	Total MDD	Firm Pumping capacity	Pumping Surplus
	(gpm)				
1258.4 (Clay Canyon 2)	285	--	--	--	--
1358.7 (Mayhew)	571	--	--	--	--
1434 (Loop Zone)	12,033	--	--	--	--
1550 (Cielo Vista)		0	0		0
1600 (Skylark)		0	0		0
1601 (Pacific Clay)	0	0	0		0
1601(El Toro/Ramsgate 1)	2,210	2,389	4,599	6,543	1,994
1601 (Horsethief 1)	1,448	1,386	2,834	3,682	848
1601 (Ortega)	849	354	1,202	2,694	1,492
1601 (Summerhill)	767	0	767	2,624	1,857
1601 (Lucerne/Alberhill Ranch 1)	3,606	2,495	6,101	7,463	1,362
1601 (City)	1,209	0	1,209	1,646	437
1601 (Waite)	1,794	0	1,794		-1,794
1601 (Porto Romano 1)	124	83	207		
1620 (Adelpha)	103	214	317	317	0
1622 (Canyon Lake)	2,747	0	2,747	4,173	1,426
1650 (Cal Oaks)	4,146	1,140	5,286	5,510	224
1701 (Meadowbrook 1)	397	328	725	1,233	508
1746 (Bundy Canyon/Gafford)	2,144	2,018	4,161	1,728	-2,433
1750 (Cottonwood 1)	2,614	819	3,432	1,382	-2,050
1800 (Leach Cyn/Rice Cyn)	1,808	158	1,966	2,730	764
1800 (Tuscany Hills 1)	2,235	994	3,229	3,025	-204
1801 (Porto Romano 2)	83	0	83		-83
1801 (Horsethief 2)	1,386	1,000	2,386	1,963	-423
1801 (Alberhill Ranch 2)	528	0	528	1,250	722
1801 (Ramsgate 2)	1,203	0	1,203		-1,203
1850 (Greer Ranch 1)	496	644	1,140	1,176	36
1850 (Alberhill CFD 1)	0	764	764		-764
1871 (Tomlin 1)	9	345	354	450	96
1882 (Stage Ranch 1)	89	26	115	472	357
1896 (Meadowbrook 2)	328	0	328	943	615
1900 (Farm)	718	466	1,184	565	-619
1900 (Lemon Grove)	1,000	0	1,000		-1,000
1916.5 (Encina)	105	109	214	228	14
1934 (Cottonwood 2)	767	0	767	457	-310
1940 (Tuscany Hills 2)	994	0	994	1,273	279
1968 (North Peak #1)	275	185	460		-460
2020 (Canyon Hills Estates)	52	0	52		-52
2040 (LaLaguna 1)	99	59	158	1,196	1,038
2050(Greer Ranch 2)	644	0	644	1,195	551
2090 (Sunset Ridge)	466	0	466		-466
2137 (North Peak #2)	185	0	185		-185
2201 (Sedco)	41	0	41	178	137
2216 (Daley)	26	0	26	134	108
2217 (Stage Ranch 2)	26	0	26	690	664
2240(LaLaguna 2)	59	0	59	554	495
2279 (North Peak #3)	0	0	0		0
2313 (Tomlin 2)	38	307	345	287	-58
2460 (Alberhill CFD 3)	764	0	764		-764
2778 (Los Pinos 1)	264	44	307	280	-27
2954 (Nilson)	12	0	12		-12
3300 (Skymeadows)	109	0	109	149	40
3501 (Los Pinos 2)	31	0	31	104	73
Entire System	**51,885**	**16,327**	**55,323**	**58,294**	**3,177**

Pumping Capacity Evaluation – Year 2020 Conditions

Pressure Zone (Name)	In-Zone MDD	Higher Zone MDD	Total MDD	Firm Pumping capacity	Pumping Surplus
	(gpm)				
1258.4 (Clay Canyon 2)	285	--	--	--	--
1358.7 (Mayhew)	686	--	--	--	--
1434 (Loop Zone)	14,161	--	--	--	--
1550 (Cielo Vista)		0	0		0
1600 (Skylark)		0	0		0
1601 (Pacific Clay)	461	0	461		-461
1601(El Toro/Ramsgate 1)	2,576	3,698	6,273	6,543	270
1601 (Horsethief 1)	1,449	1,386	2,836	3,682	846
1601 (Ortega)	910	604	1,515	2,694	1,179
1601 (Summerhill)	812	0	812	2,624	1,812
1601 (Lucerne/Alberhill Ranch 1)	4,461	2,849	7,310	7,463	153
1601 (City)	1,285	0	1,285	1,646	361
1601 (Waite)	1,863	0	1,863		-1,863
1601 (Porto Romano 1)	186	124	310		
1620 (Adelpha)	103	263	366	317	-49
1622 (Canyon Lake)	2,832	0	2,832	4,173	1,341
1650 (Cal Oaks)	4,462	1,140	5,602	5,510	-92
1701 (Meadowbrook 1)	427	328	755	1,233	478
1746 (Bundy Canyon/Gafford)	2,364	2,742	5,106	1,728	-3,378
1750 (Cottonwood 1)	2,614	960	3,574	1,382	-2,192
1800 (Leach Cyn/Rice Cyn)	2,064	256	2,320	2,730	410
1800 (Tuscany Hills 1)	2,650	995	3,645	3,025	-620
1801 (Porto Romano 2)	124	0	124		-124
1801 (Horsethief 2)	1,386	1,000	2,386	1,963	-423
1801 (Alberhill Ranch 2)	528	0	528	1,250	722
1801 (Ramsgate 2)	1,475	0	1,475	0	-1,475
1850 (Greer Ranch 1)	496	644	1,140	1,176	36
1850 (Alberhill CFD 1)	0	779	779		-779
1871 (Tomlin 1)	12	593	604	450	-154
1882 (Stage Ranch 1)	127	47	174	472	298
1896 (Meadowbrook 2)	328	0	328	943	615
1900 (Farm)	827	931	1,758	565	-1,193
1900 (Lemon Grove)	1,000	0	1,000		-1,000
1916.5 (Encina)	148	115	263	228	-35
1934 (Cottonwood 2)	908	0	908	457	-451
1940 (Tuscany Hills 2)	995	0	995	1,273	278
1968 (North Peak #1)	314	559	872		-872
2020 (Canyon Hills Estates)	52	0	52		-52
2040 (LaLaguna 1)	193	64	256	1,196	940
2050(Greer Ranch 2)	644	0	644	1,195	551
2090 (Sunset Ridge)	931	0	931		-931
2137 (North Peak #2)	477	81	559		-559
2201 (Sedco)	50	0	50	178	128
2216 (Daley)	26	0	26	134	108
2217 (Stage Ranch 2)	47	0	47	690	643
2240(LaLaguna 2)	64	0	64	554	490
2279 (North Peak #3)	81	0	81		-81
2313 (Tomlin 2)	56	537	593	287	-306
2460 (Alberhill CFD 3)	779	0	779		-779
2778 (Los Pinos 1)	480	56	537	280	-257
2954 (Nilson)	25	0	25		-25
3300 (Skymeadows)	115	0	115	149	34
3501 (Los Pinos 2)	31	0	31	104	73
Entire System	**59,372**	**20,753**	**64,994**	**58,294**	**-6,390**

Pumping Capacity Evaluation – Year 2025 Conditions

Pressure Zone (Name)	In-Zone MDD	Higher Zone MDD	Total MDD	Firm Pumping capacity	Pumping Surplus
	(gpm)				
1258.4 (Clay Canyon 2)	285	--	--	--	--
1358.7 (Mayhew)	686	--	--	--	--
1434 (Loop Zone)	16,294	--	--	--	--
1550 (Cielo Vista)		0	0		0
1600 (Skylark)		0	0		0
1601 (Pacific Clay 1)	921	0	921		-921
1601(El Toro/Ramsgate 1)	2,875	3,730	6,605	6,543	-62
1601 (Horsethief 1)	1,451	1,386	2,837	3,682	845
1601 (Ortega)	971	633	1,604	2,694	1,090
1601 (Summerhill)	857	0	857	2,624	1,767
1601 (Lucerne/Alberhill Ranch 1)	4,484	3,203	7,686	7,463	-223
1601 (City)	1,352	0	1,352	1,646	294
1601 (Waite)	1,941	0	1,941		-1,941
1601 (Porto Romano 1)	248	165	413		
1620 (Adelpha)	103	312	415	317	-98
1622 (Canyon Lake)	2,918	0	2,918	4,173	1,255
1650 (Cal Oaks)	4,778	1,140	5,918	5,510	-408
1701 (Meadowbrook 1)	458	328	786	1,233	447
1746 (Bundy Canyon/Gafford)	2,588	3,001	5,589	1,728	-3,861
1750 (Cottonwood 1)	2,614	1,102	3,715	1,382	-2,333
1800 (Leach Cyn/Rice Cyn)	2,320	355	2,674	2,730	56
1800 (Tuscany Hills 1)	2,766	995	3,762	3,025	-737
1801 (Porto Romano 2)	165	0	165		-165
1801 (Horsethief 2)	1,386	1,000	2,386	1,963	-423
1801 (Alberhill Ranch 2)	528	0	528	1,250	722
1801 (Ramsgate 2)	1,659	0	1,659	0	-1,659
1850 (Greer Ranch 1)	496	644	1,140	1,176	36
1850 (Alberhill CFD 1)	39	795	834		-834
1871 (Tomlin 1)	15	618	633	450	-183
1882 (Stage Ranch 1)	166	69	234	472	238
1896 (Meadowbrook 2)	328	0	328	943	615
1900 (Farm)	935	931	1,866	565	-1,301
1900 (Lemon Grove)	1,000	0	1,000		-1,000
1916.5 (Encina)	190	122	312	228	-84
1934 (Cottonwood 2)	1,050	0	1,050	457	-593
1940 (Tuscany Hills 2)	995	0	995	1,273	278
1968 (North Peak #1)	352	933	1,285		-1,285
2020 (Canyon Hills Estates)	52	0	52		-52
2040 (LaLaguna 1)	287	68	355	1,196	841
2050(Greer Ranch 2)	644	0	644	1,195	551
2090 (Sunset Ridge)	931	0	931		-931
2137 (North Peak #2)	487	446	933		-933
2201 (Sedco)	60	0	60	178	118
2216 (Daley)	26	0	26	134	108
2217 (Stage Ranch 2)	69	0	69	690	621
2240(LaLaguna 2)	68	0	68	554	486
2279 (North Peak #3)	446	0	446		-446
2313 (Tomlin 2)	75	543	618	287	-331
2460 (Alberhill CFD 3)	795	0	795		-795
2778 (Los Pinos 1)	487	56	543	280	-263
2954 (Nilson)	25	0	25		-25
3300 (Skymeadows)	122	0	122	149	27
3501 (Los Pinos 2)	31	0	31	104	73
Entire System	**64,819**	**22,576**	**70,130**	**58,294**	**-11,423**

Appendix D
Fireflow Improvements

Appendix D - Fireflow Improvements

Map ID	Name	Diameter (in)	Length (ft)	Type	Phase	Unit	Cost/Unit	Construction Cost	Contingency (30%)	Engineering & Admin (15%)	Construction Mgmt (10%)	Total Cost
F1	From Linnet Drive along Canary Court (end of cul-de-sac)	6	200	Parallel		ft	$108	$21,000	$7,000	$4,000	$3,000	$40,000
F10	From Almond Street along Sheri Lane (end of cul-de-sac)	6	900	Replace		ft	$108	$95,000	$29,000	$15,000	$10,000	$150,000
F100	Along Riverside Drive between Eisenhower Drive and Lake Crest Drive	6	300	Replace		ft	$108	$28,000	$9,000	$5,000	$3,000	$50,000
F101	From Lincoln Street along Flannery Street (end of cul-de-sac)	6	1,100	Parallel		ft	$108	$113,000	$34,000	$17,000	$12,000	$180,000
F103	Along Riverside Drive between Lincoln Street and Joy Street	6	300	Replace		ft	$108	$24,000	$8,000	$4,000	$3,000	$40,000
F104	From Wise Street (end of cul-de-sac)	8	700	Replace		ft	$124	$75,000	$23,000	$12,000	$8,000	$120,000
F106	From Machado Street along Ulla Lane (end of cul-de-sac)	6	1,100	Parallel		ft	$108	$113,000	$34,000	$17,000	$12,000	$180,000
F107	Along Washington Street between Laguna Avenue and Grand Avenue	6	900	Replace		ft	$108	$91,000	$28,000	$14,000	$10,000	$150,000
F108	From Big Range Road along Pecos Place (end of cul-de-sac)	6	300	Replace		ft	$108	$23,000	$7,000	$4,000	$3,000	$40,000
F109	From Big Range Road along Crusader Place (end of cul-de-sac)	6	200	Replace		ft	$108	$20,000	$6,000	$3,000	$2,000	$40,000
F11	From Grand Avenue along Olive Street (end of cul-de-sac)	8	700	Replace		ft	$124	$86,000	$26,000	$13,000	$9,000	$140,000
F110	From Longhorn Drive along Saddle Court (end of cul-de-sac)	6	200	Replace		ft	$108	$21,000	$7,000	$4,000	$3,000	$40,000
F111	From Grand Avenue along California Street (end of cul-de-sac)	6	800	Replace		ft	$108	$79,000	$24,000	$12,000	$8,000	$130,000
F112	Install 8-inch pipeline parallel to existing 8-inch pipeline	8	1,300	Parallel		ft	$124	$157,000	$48,000	$24,000	$16,000	$250,000
F113	From Riverside Court along Laster Road (end of cul-de-sac)	6	900	Parallel		ft	$108	$94,000	$29,000	$15,000	$10,000	$150,000
F114	From Hammack Avenue along Oak Street (end of cul-de-sac)	6	500	Replace		ft	$108	$54,000	$17,000	$9,000	$6,000	$90,000
F115	From Lookout Circle along Walnut Street	6	800	Replace		ft	$108	$80,000	$24,000	$12,000	$8,000	$130,000
F116	Along Lookout Circle from Walnut Street and Elm Street (end of cul-de-sac)	8	700	Replace		ft	$124	$81,000	$25,000	$13,000	$9,000	$130,000
F118	Along Bryant Street from Toby Drive to Lorena Lane	6	600	Parallel		ft	$108	$62,000	$19,000	$10,000	$7,000	$100,000
F119	Install 12-inch pipeline at Orchard Avenue to connect existing 6-inch pipeline and 12-inch pipeline along Orchard Avenue south of Bundy Canyon Road and north of Canyon Drive	12	100	New		ft	$156	$2,000	$1,000	$1,000	$1,000	$10,000
F120	Along Pear Circle from Hammack Avenue (end of cul-de-sac)	6	400	Replace		ft	$108	$43,000	$13,000	$7,000	$5,000	$70,000
F121	Along Vista Avenue from Hammack Avenue	6	1,000	Replace		ft	$108	$103,000	$31,000	$16,000	$11,000	$170,000
F122	Along Milo Drive towards the cul-de-sac	6	200	Replace		ft	$108	$20,000	$6,000	$3,000	$2,000	$40,000
F123	Along Jarvis Street between Wallace Avenue and Garfield Road	6	1,100	Replace		ft	$108	$116,000	$35,000	$18,000	$12,000	$190,000
F124	Along Silver Sadle Court from Longhorn Drive (end of cul-de-sac)	6	200	Replace		ft	$108	$21,000	$7,000	$4,000	$3,000	$40,000
F125	Along Red Bard Place from Longhorn Drive (end of cul-de-sac)	6	400	Replace		ft	$108	$34,000	$11,000	$6,000	$4,000	$60,000
F126	Replace existing 4-inch pipeline	6	100	Replace		ft	$108	$8,000	$3,000	$2,000	$1,000	$20,000
F127	From River Road to Racicot Road parallel to existing 6-inch pipeline	6	1,900	Parallel		ft	$108	$202,000	$61,000	$31,000	$21,000	$320,000
F128	Along Baxter Road from Kilarney Lane to Porras Road	12	4,500	Parallel		ft	$156	$697,000	$210,000	$105,000	$70,000	$1,090,000
F129	Along Richard Street from Robert Street	6	2,500	Replace		ft	$108	$268,000	$81,000	$41,000	$27,000	$420,000
F13	Along Garner Road from Grand Avenue (end of cul-de-sac)	6	800	Replace		ft	$108	$82,000	$25,000	$13,000	$9,000	$130,000
F130	From Richard Street along Robert Street	8	1,300	Replace		ft	$124	$159,000	$48,000	$24,000	$16,000	$250,000
F132	Along Herbert Street between Robert Street and Theda Street	6	2,700	Replace		ft	$108	$288,000	$87,000	$44,000	$29,000	$450,000
F133	Along Richard Street from Highway 74 to Robert Street	8	500	Replace		ft	$124	$55,000	$17,000	$9,000	$6,000	$90,000
F135	Along Eugene Street from Robert Street (end of cul-de-sac)	6	1,700	Replace		ft	$108	$177,000	$54,000	$27,000	$18,000	$280,000
F136	Along 11th Street from Tereticornis Avenue	8	900	Replace		ft	$124	$110,000	$33,000	$17,000	$11,000	$180,000
F137	From Tereticornis Avenue to 11th Street along Manzanita Drive and Eucalyptus Avenue	6	1,000	Replace		ft	$108	$102,000	$31,000	$16,000	$11,000	$160,000
F138	Along Tereticornis Avenue from Rosarita Street to Haygood Way	6	800	Replace		ft	$108	$77,000	$24,000	$12,000	$8,000	$130,000
F139	From Rostrata Street to Leona Street along Mermack Avenue and from Mermack Avenue along Leona Street (end of cul-de-sac)	6	1,400	Replace		ft	$108	$147,000	$45,000	$23,000	$15,000	$230,000
F14	From Grand Avenue along Garner Road	6	300	Replace		ft	$108	$24,000	$8,000	$4,000	$3,000	$40,000
F140	From Highway 74 to El Toro Cutoff Road along Crater Drive and Nichols Road	12	1,600	Parallel		ft	$156	$247,000	$75,000	$38,000	$25,000	$390,000
F141	Along El Toro Cutoff Road from Nichols Road (end of cul-de-sac)	8	600	Parallel		ft	$124	$66,000	$20,000	$10,000	$7,000	$110,000
F143	Along Dexter Avenue between 2nd Street and 3rd Street	12	1,800	Parallel		ft	$156	$271,000	$82,000	$41,000	$28,000	$430,000
F147	Along 2nd Street between Dexter Avenue and Camino Del Norte	12	700	Parallel		ft	$156	$109,000	$33,000	$17,000	$11,000	$170,000
F15	Replace existing 4-inch pipeline at Mission Trail and Campbell Street with 6-inch pipeline	8	200	Replace		ft	$124	$20,000	$6,000	$3,000	$2,000	$40,000
F150	Along Heald Avenue between Langstaff Street and Riley Street	6	200	Replace		ft	$108	$14,000	$5,000	$3,000	$2,000	$30,000
F151	From Prospect Street along Olive Street (end of cul-de-sac)	6	600	Replace		ft	$108	$62,000	$19,000	$10,000	$7,000	$100,000
F152	From Flint Street to end of cul-de-sac, between East Hill Street and Adobe Street	6	200	Replace		ft	$108	$21,000	$7,000	$4,000	$3,000	$40,000
F153	From Flint Street to end of cul-de-sac, between Ellis Street and Lookout Street	6	400	Replace		ft	$108	$42,000	$13,000	$7,000	$5,000	$70,000
F154	Along Avenue 9 between Mill Street and Park Way	6	600	Parallel		ft	$108	$65,000	$20,000	$10,000	$7,000	$110,000
F155	Along Dawes Street (end of cul-de-sac)	8	400	Replace		ft	$124	$41,000	$13,000	$7,000	$5,000	$70,000
F156	Along Dawes Street at Dawes Street and Avenue 9	6	100	Replace		ft	$108	$3,000	$1,000	$1,000	$1,000	$10,000
F157	Along Pepper Drive from Park Way (end of cul-de-sac)	6	400	Replace		ft	$108	$35,000	$11,000	$6,000	$4,000	$60,000
F158	Install 8-inch pipeline between Lake Street and Temascal Canyon Road parallel to existing 6-inch pipeline	8	900	Parallel		ft	$124	$107,000	$33,000	$17,000	$11,000	$170,000
F159	Along Lakeview Avenue between Dreycott Way and Riverside Drive	6	1,000	Replace		ft	$108	$100,000	$30,000	$15,000	$10,000	$160,000
F16	Along Point Marina Drive from Swan Point Drive	6	900	Parallel		ft	$108	$92,000	$28,000	$14,000	$10,000	$150,000
F160	Along Palomar Street from Cert Street to Gruwell Street	8	800	Parallel		ft	$124	$89,000	$27,000	$14,000	$9,000	$140,000
F161	Replace existing 4-inch pipeline between the existing 14-inch and 4-inch pipelines along Grand Avenue	6	100	Replace		ft	$108	$5,000	$2,000	$1,000	$1,000	$10,000
F162	Along Canyon Ranch Road between Barrengo Road and Gafford Road	16	3,100	Parallel		ft	$192	$584,000	$176,000	$88,000	$59,000	$910,000
F163	Replace existing 4-inch pipeline at Rose Avenue and Grand Avenue	6	100	Replace		ft	$108	$5,000	$2,000	$1,000	$1,000	$10,000
F164	Along Albert Street between Morelock Way and McRae Lane	6	300	Replace		ft	$108	$23,000	$7,000	$4,000	$3,000	$40,000
F165	Along Coleman Avenue from Lookout Drive to Adelfa Street	12	900	Replace		ft	$156	$128,000	$39,000	$20,000	$13,000	$200,000
F166	Along Naranjo Street from Encina Drive and from Naranjo Street/Encina Drive to Granado Street along Encina Drive	6	2,100	Replace		ft	$108	$218,000	$66,000	$33,000	$22,000	$340,000
F167	Along Encina Drive from Encina Drive/Adelfa Street	6	300	Parallel		ft	$108	$28,000	$9,000	$5,000	$3,000	$50,000
F168	Along Canyon Drive from Hidden Glen Circle	6	300	New		ft	$108	$22,000	$7,000	$4,000	$3,000	$40,000
F169	Along Waite Street from Orange Street/Waite Street to Paradise Lane and along Paradise Lane from Waite Street (end of cul-de-sac)	6	700	Replace		ft	$108	$76,000	$23,000	$12,000	$8,000	$120,000
F17	From Emperor Drive along Big Butte Drive (end of cul-de-sac)	6	500	Parallel		ft	$108	$47,000	$15,000	$8,000	$5,000	$80,000
F170	From Canyon Drive along Orange Street	6	600	Replace		ft	$108	$61,000	$19,000	$10,000	$7,000	$100,000

Appendix D - Fireflow Improvements

Map ID	Name	Diameter (in)	Length (ft)	Type	Phase	Unit	Cost/Unit	Construction Cost	Contingency (30%)	Engineering & Admin (15%)	Construction Mgmt (10%)	Total Cost
F171	Replace existing 4-inch pipeline (end of cul-de-sac)	6	700	Replace		ft	$108	$67,000	$21,000	$11,000	$7,000	$110,000
F172	From Waite Street along Jo Ann Court (end of cul-de-sac)	6	600	Parallel		ft	$108	$55,000	$17,000	$9,000	$6,000	$90,000
F173	From Waite Street along Bonnie Lane (end of cul-de-sac)	6	700	Replace		ft	$108	$68,000	$21,000	$11,000	$7,000	$110,000
F174	From Orange Street along Raynor Lane (end of cul-de-sac)	6	1,400	Replace		ft	$108	$145,000	$44,000	$22,000	$15,000	$230,000
F175	From Waite Street along Maple Lane (end of cul-de-sac)	6	700	Replace		ft	$108	$65,000	$20,000	$10,000	$7,000	$110,000
F176	From Bundy Canyon Road along Christopher Lane (end of cul-de-sac)	6	400	Replace		ft	$108	$35,000	$11,000	$6,000	$4,000	$60,000
F177	From Waite Street along Linda Vista Lane (end of cul-de-sac)	6	300	Replace		ft	$108	$31,000	$10,000	$5,000	$4,000	$50,000
F178	From Lemon Street along Curtis Lane (end of cul-de-sac)	6	600	Replace		ft	$108	$61,000	$19,000	$10,000	$7,000	$100,000
F179	Replace existing 4-inch pipeline (end of cul-de-sac)	6	400	Replace		ft	$108	$38,000	$12,000	$6,000	$4,000	$60,000
F18	Along Avondale Way between Cedar Drive and Pepper Drive	8	300	Replace		ft	$124	$28,000	$9,000	$5,000	$3,000	$50,000
F180	Replace existing 4-inch pipeline (end of cul-de-sac)	6	300	Replace		ft	$108	$31,000	$10,000	$5,000	$4,000	$50,000
F181	From Orange Street along Valley Terrace (enf of cul-de-sac)	6	400	Replace		ft	$108	$41,000	$13,000	$7,000	$5,000	$70,000
F182	From Orange Street along Valley Terrace (enf of cul-de-sac)	6	300	Replace		ft	$108	$25,000	$8,000	$4,000	$3,000	$40,000
F183	Install 6-inch pipeline at Corydon Street	6	100	New		ft	$108	$5,000	$2,000	$1,000	$1,000	$10,000
F184	Along Malaga Road from Lake View Terrace to Lake View Drive and along Grape Street	12	2,700	Parallel		ft	$156	$421,000	$127,000	$64,000	$43,000	$660,000
F185	Install 12-inch pipeline along Sylvester Road to connect existing 8-inch pipelines along Lake View Terrace	12	100	New		ft	$156	$6,000	$2,000	$1,000	$1,000	$10,000
F186	Install 8-inch pipeline along Elberta Road/Lake View Terrace to connect existing 8-inch and 6-inch pipelines along Elberta Road	8	200	New		ft	$124	$20,000	$6,000	$3,000	$2,000	$40,000
F187	Install 6-inch pipeline along Tokay Road/Lake View Terrace to connect existing 6-inch pipelines along Tokay Road	6	100	New		ft	$108	$9,000	$3,000	$2,000	$1,000	$20,000
F188	From Tokay Road to Olive Street along Lake View Terrace, from Lake View Terrace to Orchard Street along Olive Street, and from Olive Street to Victorian Lane along Orchard Street	12	3,600	Parallel		ft	$156	$560,000	$168,000	$84,000	$56,000	$870,000
F189	Install 12-inch pipeline along Orchard Street to connect existing 12-inch and 6-inch pipelines along Orchard Street	12	100	New		ft	$156	$2,000	$1,000	$1,000	$1,000	$10,000
F19	Along Lime Street from Laguna Avenue	6	600	Replace		ft	$108	$63,000	$19,000	$10,000	$7,000	$100,000
F190	Along Harbor Circle from Cruise Circle Drive (end of cul-de-sac)	6	600	Replace		ft	$108	$62,000	$19,000	$10,000	$7,000	$100,000
F191	Along Comanche Circle from Continental Drive (end of cul-de-sac)	6	300	Replace		ft	$108	$25,000	$8,000	$4,000	$3,000	$40,000
F192	Along Big River Drive from Continental Drive (end of cul-de-sac)	6	200	Replace		ft	$108	$20,000	$6,000	$3,000	$2,000	$40,000
F193	Along White Cove Court from Continental Drive (end of cul-de-sac)	6	300	Replace		ft	$108	$23,000	$7,000	$4,000	$3,000	$40,000
F194	Along Emperor Drive from Continental Drive (end of cul-de-sac)	6	300	Replace		ft	$108	$25,000	$8,000	$4,000	$3,000	$40,000
F195	Along Cinnamon Teal Drive from Continental Drive (end of cul-de-sac)	6	300	Replace		ft	$108	$25,000	$8,000	$4,000	$3,000	$40,000
F196	Along Marblehead Circle from Emperor Drive (end of cul-de-sac)	6	200	Replace		ft	$108	$18,000	$6,000	$3,000	$2,000	$30,000
F197	Along Windward Drive from Canyon Lake Drive (end of cul-de-sac)	6	400	Replace		ft	$108	$37,000	$12,000	$6,000	$4,000	$60,000
F198	Along Landsend Place from Canyon Lake Drive (end of cul-de-sac)	6	300	Replace		ft	$108	$31,000	$10,000	$5,000	$4,000	$50,000
F2	Replace existing 4-inch pipeline	6	100	Replace		ft	$108	$11,000	$4,000	$2,000	$2,000	$20,000
F20	Along Calle de Los Pinos from Los Padres Road	6	600	Replace		ft	$108	$61,000	$19,000	$10,000	$7,000	$100,000
F200	Along Rim Rock Place from Canyon Lake Drive	6	300	Replace		ft	$108	$28,000	$9,000	$5,000	$3,000	$50,000
F201	From Rim Rock Place along Sage Place	6	300	Replace		ft	$108	$26,000	$8,000	$4,000	$3,000	$50,000
F202	Along Widgeon Place from Cross Hill Drive	6	300	Replace		ft	$108	$32,000	$10,000	$5,000	$4,000	$60,000
F203	Along Hiding Bass Place from Blue Teal Drive	6	400	Replace		ft	$108	$37,000	$12,000	$6,000	$4,000	$60,000
F204	Along Santana Court from Cove View Street	6	300	Replace		ft	$108	$31,000	$10,000	$5,000	$4,000	$50,000
F205	Along Sandpiper Court from Compass Drive	6	400	Replace		ft	$108	$35,000	$11,000	$6,000	$4,000	$60,000
F206	Along Aspen Place from Marine Drive (end of cul-de-sac)	6	200	Replace		ft	$108	$20,000	$6,000	$3,000	$2,000	$40,000
F207	Along Windsong Place from Vacation Drive (end of cul-de-sac)	6	400	Replace		ft	$108	$41,000	$13,000	$7,000	$5,000	$70,000
F208	Along Lake Court from Lighthouse Drive (end of cul-de-sac)	6	300	Replace		ft	$108	$26,000	$8,000	$4,000	$3,000	$50,000
F209	Along Beacon Court from Lighthouse Drive (end of cul-de-sac)	6	300	Replace		ft	$108	$31,000	$10,000	$5,000	$4,000	$50,000
F210	Along Lighthouse Drive from Canyon Club Drive (end of cul-de-sac)	6	200	Replace		ft	$108	$19,000	$6,000	$3,000	$2,000	$30,000
F211	Along Nautical Court from Boating Way (end of cul-de-sac)	6	200	Replace		ft	$108	$19,000	$6,000	$3,000	$2,000	$30,000
F212	Along Blue Heron Court from Compass Drive (end of cul-de-sac)	6	200	Replace		ft	$108	$22,000	$7,000	$4,000	$3,000	$40,000
F213	Along Fawn Lake Place from Yellow Gold Drive (end of cul-de-sac)	6	300	Replace		ft	$108	$32,000	$10,000	$5,000	$4,000	$60,000
F214	Along Klamath Court from Vacation Drive (end of cul-de-sac)	6	200	Replace		ft	$108	$16,000	$5,000	$3,000	$2,000	$30,000
F215	Along Sierra Trail from Vacation Drive (end of cul-de-sac)	6	400	Replace		ft	$108	$41,000	$13,000	$7,000	$5,000	$70,000
F216	From Vacation Drive to Mammoth Place along Green Pine Drive and from Green Pine Drive along Mammoth Place	6	1,100	Parallel		ft	$108	$116,000	$35,000	$18,000	$12,000	$190,000
F217	From San Joaquin Drive along Inspiration Point (end of cul-de-sac)	16	1,200	Parallel		ft	$192	$227,000	$69,000	$35,000	$23,000	$360,000
F218	From San Joaquin Drive along Granite Domain Place (end of cul-de-sac)	6	300	Replace		ft	$108	$31,000	$10,000	$5,000	$4,000	$50,000
F219	Along San Joaquin Drive from Inspiration Pint to Vacation Drive	8	700	Parallel		ft	$124	$80,000	$24,000	$12,000	$8,000	$130,000
F22	From South Main Divide Road along Hacienda Road (end of cul-de-sac)	6	300	Replace		ft	$108	$25,000	$8,000	$4,000	$3,000	$40,000
F220	Along Giant Fir Place from Yosemite Place (end of cul-de-sac)	6	1,400	Parallel		ft	$108	$141,000	$43,000	$22,000	$15,000	$230,000
F221	From Orange Street along Boggs Lane (end of cul-de-sac)	6	500	Replace		ft	$108	$48,000	$15,000	$8,000	$5,000	$80,000
F222	From Vacation Drive alone Yosemite Place (end of cul-de-sac)	12	1,800	Parallel		ft	$156	$274,000	$83,000	$42,000	$28,000	$430,000
F223	Along Brechtel Street from Grand Avenue (end of cul-de-sac)	6	1,100	Parallel		ft	$108	$113,000	$34,000	$17,000	$12,000	$180,000
F224	Along Vacation Drive from Yosemite Place to Sierra Trail	8	1,100	Parallel		ft	$124	$127,000	$39,000	$20,000	$13,000	$200,000
F225	From San Joaquin Drive along Lupin Place (end of cul-de-sac)	6	300	Replace		ft	$108	$23,000	$7,000	$4,000	$3,000	$40,000
F226	Along Hollister Drive from Alta Vista Avenue and Hollister Drive (end of cul-de-sac)	12	300	Replace		ft	$156	$41,000	$13,000	$7,000	$5,000	$70,000
F227	Along Hollister Drive from Alta Vista Avenue and Moorehead Terrace	6	500	Replace		ft	$108	$48,000	$15,000	$8,000	$5,000	$80,000
F228	Along Coleman Avenue from Lookout Drive and Hollister Drive	8	600	Replace		ft	$124	$67,000	$21,000	$11,000	$7,000	$110,000
F229	Along Zellar Street from Coleman Avenue to Akley Street	6	1,700	Replace		ft	$108	$184,000	$56,000	$28,000	$19,000	$290,000
F23	Along Los Alisos Road (end of cul-de-sac)	6	700	Replace		ft	$108	$73,000	$22,000	$11,000	$8,000	$120,000
F230	Along Arbolado Lane from Grand Avenue (end of cul-de-sac)	6	1,600	Parallel		ft	$108	$163,000	$49,000	$25,000	$17,000	$260,000
F231	Along Scales Way from Grand Avenue (end of cul-de-sac)	8	1,300	Replace		ft	$124	$160,000	$48,000	$24,000	$16,000	$250,000
F232	Along Alameda Del Monte from Hixon Street (end of cul-de-sac)	6	700	Replace		ft	$108	$74,000	$23,000	$12,000	$8,000	$120,000
F233	Along Hixon Street between Olivewood Drive and Alamdea Del Monte and along Olivewood Drive from Hixon Street (end of cul-de-sac)	6	1,000	Parallel		ft	$108	$102,000	$31,000	$16,000	$11,000	$160,000
F236	From Wallace Avenue along Greenwald Avenue	6	300	Replace		ft	$108	$27,000	$9,000	$5,000	$3,000	$50,000

Appendix D - Fireflow Improvements

Map ID	Name	Diameter (in)	Length (ft)	Type	Phase	Unit	Cost/Unit	Construction Cost	Contingency (30%)	Engineering & Admin (15%)	Construction Mgmt (10%)	Total Cost
F237	From Big Range Road along Buggywhip Court (end of cul-de-sac)	6	300	Replace		ft	$108	$27,000	$9,000	$5,000	$3,000	$50,000
F238	From Big Range Road along Tumbleweed Drive (end of cul-de-sac)	6	400	Replace		ft	$108	$41,000	$13,000	$7,000	$5,000	$70,000
F239	From Longhorn Drive along Old Paint Way (end of cul-de-sac)	6	400	Replace		ft	$108	$37,000	$12,000	$6,000	$4,000	$60,000
F24	From Rodeo Road along Los Pinos Road (end of cul-de-sac)	6	900	Replace		ft	$108	$87,000	$27,000	$14,000	$9,000	$140,000
F240	From Hoofbeat Way to Dogie Place along Stampede Way	6	600	Parallel		ft	$108	$65,000	$20,000	$10,000	$7,000	$110,000
F242	From Vacation Drive along Snow Water Place (end of cul-de-sac)	6	300	Parallel		ft	$108	$30,000	$9,000	$5,000	$3,000	$50,000
F243	From Vacation Drive along Scout Court (end of cul-de-sac)	6	300	Replace		ft	$108	$24,000	$8,000	$4,000	$3,000	$40,000
F244	Along Village Way Drive from Canyon Lake Drive (end of cul-de-sac)	6	300	Replace		ft	$108	$33,000	$10,000	$5,000	$4,000	$60,000
F245	Along Caliente Place from Village Way Drive (end of cul-de-sac)	6	400	Replace		ft	$108	$35,000	$11,000	$6,000	$4,000	$60,000
F246	Along Greenbriar Court from Canyon Lake Drive (end of cul-de-sac)	6	400	Replace		ft	$108	$36,000	$11,000	$6,000	$4,000	$60,000
F247	Along Greenbrook Place from Calcutta Drive (end of cul-de-sac)	6	200	Replace		ft	$108	$20,000	$6,000	$3,000	$2,000	$40,000
F248	Along Wallowbrook Place from Calcutta Drive (end of cul-de-sac)	6	200	Replace		ft	$108	$21,000	$7,000	$4,000	$3,000	$40,000
F249	Along Spyglass Way from Champion Drive (end of cul-de-sac)	6	300	Replace		ft	$108	$24,000	$8,000	$4,000	$3,000	$40,000
F25	Along Valencia Street from Lemon Street (end of cul-de-sac)	6	600	Replace		ft	$108	$61,000	$19,000	$10,000	$7,000	$100,000
F250	Along Earlyround Drive from Champion Drive (end of cul-de-sac)	6	500	Replace		ft	$108	$45,000	$14,000	$7,000	$5,000	$80,000
F251	Along Calcutta Drive from Champion Drive (end of cul-de-sac)	6	500	Parallel		ft	$108	$54,000	$17,000	$9,000	$6,000	$90,000
F252	Along Big Buck Court from Pretty Doe Drive (end of cul-de-sac)	6	200	Replace		ft	$108	$22,000	$7,000	$4,000	$3,000	$40,000
F253	Along Running Bear Circle from Golden Gate Drive (end of cul-de-sac)	6	200	Replace		ft	$108	$18,000	$6,000	$3,000	$2,000	$30,000
F254	Along Chip Way from Sky Link Drive (end of cul-de-sac)	6	300	Replace		ft	$108	$27,000	$9,000	$5,000	$3,000	$50,000
F256	From Early Round Drive towards Railroad Canyon Road parallel to existing 6-inch pipeline	6	900	Parallel		ft	$108	$91,000	$28,000	$14,000	$10,000	$150,000
F257	Along Railroad Canyon Road from Canyon Lake Drive	8	500	Parallel		ft	$124	$61,000	$19,000	$10,000	$7,000	$100,000
F258	From Railroad Canyon Road, parallel to existing 6-inch pipeline	6	300	Parallel		ft	$108	$28,000	$9,000	$5,000	$3,000	$50,000
F259	Along Burning Tree Drive from Pyramid Point Drive (end of cul-de-sac)	6	500	Parallel		ft	$108	$46,000	$14,000	$7,000	$5,000	$80,000
F26	Along Gaucho Road from El Dorado Road (end of cul-de-sac)	6	500	Replace		ft	$108	$52,000	$16,000	$8,000	$6,000	$90,000
F260	Along Burning Tree Drive from Pyramid Point Drive to Canyon Lake Drive	6	400	Parallel		ft	$108	$37,000	$12,000	$6,000	$4,000	$60,000
F261	Along Pheasant Drive from Gray Fox Drive (end of cul-de-sac)	6	1,300	Parallel		ft	$108	$135,000	$41,000	$21,000	$14,000	$220,000
F262	Along Pauma Place from Blue Bird Drive (end of cul-de-sac)	6	300	Parallel		ft	$108	$27,000	$9,000	$5,000	$3,000	$50,000
F264	Install 6-inch pipeline parallel to existing 6-inch pipeline	6	200	Parallel		ft	$108	$15,000	$5,000	$3,000	$2,000	$30,000
F265	Along Como Street from Central Street	6	300	Replace		ft	$108	$23,000	$7,000	$4,000	$3,000	$40,000
F266	Along Como Street from Central Street to Gruwell Street	8	1,400	Replace		ft	$124	$164,000	$50,000	$25,000	$17,000	$260,000
F267	Replace existing 4-inch pipeline from Baxter Road	6	500	Replace		ft	$108	$44,000	$14,000	$7,000	$5,000	$70,000
F268	Along Bilton Way from Bryant Street (end of cul-de-sac)	6	600	Parallel		ft	$108	$59,000	$18,000	$9,000	$6,000	$100,000
F269	Along Griffith Lane from Bryant Street (end of cul-de-sac)	6	500	Parallel		ft	$108	$45,000	$14,000	$7,000	$5,000	$80,000
F27	Along El Dorado Road from Monterrey Road to Charro Road	6	1,400	Replace		ft	$108	$142,000	$43,000	$22,000	$15,000	$230,000
F270	Along Hallie Street from Bryant Street (end of cul-de-sac)	6	600	Parallel		ft	$108	$59,000	$18,000	$9,000	$6,000	$100,000
F271	From Beecher Street - south of Beechcraft Way and north of Bryant Street (end of cul-de-sac)	6	500	Parallel		ft	$108	$53,000	$16,000	$8,000	$6,000	$90,000
F272	From Beecher Street along Beechcraft Way (end of cul-de-sac)	6	500	Parallel		ft	$108	$47,000	$15,000	$8,000	$5,000	$80,000
F273	Along Guffy Lane from Beecher Street to Mission Trail	6	1,300	Parallel		ft	$108	$135,000	$41,000	$21,000	$14,000	$220,000
F28	Along Lime Street from Orchard Street (end of cul-de-sac)	6	1,000	Replace		ft	$108	$106,000	$32,000	$16,000	$11,000	$170,000
F29	Along Los Coyotes Road from El Niguel Road (end of cul-de-sac)	6	800	Replace		ft	$108	$77,000	$24,000	$12,000	$8,000	$130,000
F3	Replace existing 4-inch pipeline	6	100	Replace		ft	$108	$8,000	$3,000	$2,000	$1,000	$20,000
F30	Along Loma Road from El Niguel Road (end of cul-de-sac)	6	700	Replace		ft	$108	$67,000	$21,000	$11,000	$7,000	$110,000
F31	Along Dusty Lane Court from Maitri Road (end of cul-de-sac)	6	400	Replace		ft	$108	$38,000	$12,000	$6,000	$4,000	$60,000
F32	Install 6-inch pipeline between existing 6-inch pipeline and existing 21-inch pipeline along Lake Street between Mountain Street and Running Deer Road	6	100	New		ft	$108	$2,000	$1,000	$1,000	$1,000	$10,000
F33	Along Monterey Street from Machado Street to Ponderosa Street	6	700	Parallel		ft	$108	$68,000	$21,000	$11,000	$7,000	$110,000
F34	Along Honeydew Lane from Vine Street (end of cul-de-sac)	6	700	Replace		ft	$108	$72,000	$22,000	$11,000	$8,000	$120,000
F35	Along Walnut Drive from Fraser Street to Baza Street	12	500	Parallel		ft	$156	$66,000	$20,000	$10,000	$7,000	$110,000
F36	Along Highway 74 from Joy Street to Walnut Drive	16	1,400	Parallel		ft	$192	$253,000	$76,000	$38,000	$26,000	$400,000
F37	Along Vail Street from Grand Avenue (end of cul-de-sac)	6	600	Parallel		ft	$108	$55,000	$17,000	$9,000	$6,000	$90,000

Appendix D - Fireflow Improvements

Map ID	Name	Diameter (in)	Length (ft)	Type	Phase	Unit	Cost/Unit	Construction Cost	Contingency (30%)	Engineering & Admin (15%)	Construction Mgmt (10%)	Total Cost
F38	Replace existing pipeline at Grand Avenue	6	400	Replace		ft	$108	$34,000	$11,000	$6,000	$4,000	$60,000
F39	Replace existing pipeline at Grand Avenue	6	300	Replace		ft	$108	$32,000	$10,000	$5,000	$4,000	$60,000
F4	From Joy Street along Quail Drive (end of cul-de-sac)	12	1,300	Parallel		ft	$156	$197,000	$60,000	$30,000	$20,000	$310,000
F40	From Grand Avenue along Gamel Way (end of cul-de-sac)	6	600	Replace		ft	$108	$62,000	$19,000	$10,000	$7,000	$100,000
F41	From Borchard Road along Willsie Drive (end of cul-de-sac)	6	400	Replace		ft	$108	$42,000	$13,000	$7,000	$5,000	$70,000
F42	From Grand Avenue along Marvella Lane (end of cul-de-sac)	6	600	Replace		ft	$108	$55,000	$17,000	$9,000	$6,000	$90,000
F43	From Grand Avenue along Kathryn Way (end of cul-de-sac)	6	700	Replace		ft	$108	$71,000	$22,000	$11,000	$8,000	$120,000
F44	Along Lawson Road between Gum Tree Drive and Temescal Canyon Road	6	2,400	Parallel		ft	$108	$257,000	$78,000	$39,000	$26,000	$400,000
F47	From Wildomar Road along Victorian Lane (end of cul-de-sac)	6	500	Replace		ft	$108	$44,000	$14,000	$7,000	$5,000	$70,000
F48	From Wildomar Road along Lewis Street (end of cul-de-sac)	6	500	Replace		ft	$108	$48,000	$15,000	$8,000	$5,000	$80,000
F49	From Hunt Road to Beazley Lane parallel to existing 6-inch piperline	12	1,200	Parallel		ft	$156	$178,000	$54,000	$27,000	$18,000	$280,000
F5	From Quail Drive along Nashland Avenue (end of cul-de-sac)	6	700	Parallel		ft	$108	$75,000	$23,000	$12,000	$8,000	$120,000
F50	From Gum Tree Drive to Beazley Lane, parallel to existing 6-inch pipeline	8	800	Parallel		ft	$124	$89,000	$27,000	$14,000	$9,000	$140,000
F51	From Hunt Road parallel to existing 6-inch piperline	8	300	Parallel		ft	$124	$35,000	$11,000	$6,000	$4,000	$60,000
F52	From Hunt Road along Lawson Road (end of cul-de-sac)	8	2,600	Replace		ft	$124	$317,000	$96,000	$48,000	$32,000	$500,000
F53	Along Wildomar Road from Olive Street to Lewis Street	8	1,800	Parallel		ft	$124	$216,000	$65,000	$33,000	$22,000	$340,000
F54	Along Lawson Road between Hunt Road and Beazley Lane	12	900	Parallel		ft	$156	$140,000	$42,000	$21,000	$14,000	$220,000
F55	Along Lawson Road from Beazley Lane to Gum Tree Drive	8	1,100	Parallel		ft	$124	$130,000	$39,000	$20,000	$13,000	$210,000
F56	From Olive Street along Mesa Drive (end of cul-de-sac)	6	200	Replace		ft	$108	$19,000	$6,000	$3,000	$2,000	$30,000
F57	From Lawson Road along Patspoint Drive (end of cul-de-sac)	6	1,600	Replace		ft	$108	$166,000	$50,000	$25,000	$17,000	$260,000
F58	From Mariposa Road along Mission Trail	10	800	Parallel		ft	$135	$106,000	$32,000	$16,000	$11,000	$170,000
F59	Along Malaga Road from Wildomar Road to Valley View Avenue	8	500	Parallel		ft	$124	$51,000	$16,000	$8,000	$6,000	$90,000
F6	From Linnet Drive along Oriole Court (end of cul-de-sac)	6	200	Parallel		ft	$108	$21,000	$7,000	$4,000	$3,000	$40,000
F60	Paralle; existing connection at Malaga Road and Valley View Street	6	400	Parallel		ft	$108	$39,000	$12,000	$6,000	$4,000	$70,000
F61	Serving commerical establishment at Campbell Street and Mission Trail	8	900	Replace		ft	$124	$101,000	$31,000	$16,000	$11,000	$160,000
F62	Along Hunt Road from Knabe Street to Lawson Road	6	300	Parallel		ft	$108	$33,000	$10,000	$5,000	$4,000	$60,000
F63	Along Warm Springs Drive from Gum Tree Drive to Glen Ivy Road	16	4,000	Parallel		ft	$192	$768,000	$231,000	$116,000	$77,000	$1,200,000
F64	From Warm Springs Drive along Gum Tree Drive to existing 6-inch pipeline	6	700	Parallel		ft	$108	$68,000	$21,000	$11,000	$7,000	$110,000
F65	From Fair Weather Drive along Skippers Way Drive (end of cul-de-sac)	6	1,100	Parallel		ft	$108	$118,000	$36,000	$18,000	$12,000	$190,000
F67	Replace 6-inch pipeline along Golden Pheasant Lane and Temecky Way	6	100	Replace		ft	$108	$2,000	$1,000	$1,000	$1,000	$10,000
F68	Replace 4-inch pipeline along Golden Pheasant Lane and Temecky Way	12	100	Replace		ft	$156	$11,000	$4,000	$2,000	$2,000	$20,000
F69	Install 12-inch pipeline at George Avenue and La Estrella Street	12	100	New		ft	$156	$8,000	$3,000	$2,000	$1,000	$20,000
F7	From Grand Avenue along Evergreen Street (end of cul-de-sac)	8	800	Replace		ft	$124	$100,000	$30,000	$15,000	$10,000	$160,000
F73	Along Elm Street from Grand Avenue to Austin Street	12	400	Replace		ft	$156	$57,000	$18,000	$9,000	$6,000	$90,000
F74	Along Dunn Street between Central Avenue and Elm Street	6	500	Replace		ft	$108	$53,000	$16,000	$8,000	$6,000	$90,000
F75	Along Penrose Street from Darby Street (end of cul-de-sac)	6	300	Replace		ft	$108	$26,000	$8,000	$4,000	$3,000	$50,000
F76	Along Illinois Street between Central Avenue and Elm Street	6	400	Parallel		ft	$108	$44,000	$14,000	$7,000	$5,000	$70,000
F77	From Palomar Street along Lone Lane, Durkee Lane, and Jensen Lane	6	1,500	Parallel		ft	$108	$160,000	$48,000	$24,000	$16,000	$250,000
F78	Along Union Street between Bryant Street and Webb Drive	6	700	Parallel		ft	$108	$71,000	$22,000	$11,000	$8,000	$120,000
F79	Along Robert Street from Grand Avenue (end of cul-de-sac)	6	600	Replace		ft	$108	$62,000	$19,000	$10,000	$7,000	$100,000
F8	Along Buena Vista street between Grand Avenue and Glenneta Way	8	500	Replace		ft	$124	$62,000	$19,000	$10,000	$7,000	$100,000
F80	From Grand Avenue along Danny Lane (end of cul-de-sac)	6	500	Replace		ft	$108	$54,000	$17,000	$9,000	$6,000	$90,000
F81	From Grand Avenue along Richard Street (end of cul-de-sac)	6	600	Replace		ft	$108	$58,000	$18,000	$9,000	$6,000	$100,000
F82	From Laguna Avenue along Jameson Street (end of cul-de-sac)	6	900	Replace		ft	$108	$95,000	$29,000	$15,000	$10,000	$150,000
F83	Along Highway 74 from Grand Avenue to Laguna Avenue	8	900	Parallel		ft	$124	$107,000	$33,000	$17,000	$11,000	$170,000
F84	Along Darnell Drive from Kenwood Court to Dreycott Way	6	800	Replace		ft	$108	$79,000	$24,000	$12,000	$8,000	$130,000
F85	Along Westlong Street from Laguna Avenue (end of cul-de-sac)	8	1,200	Replace		ft	$124	$148,000	$45,000	$23,000	$15,000	$240,000
F86	Along Sylvester Road from Mission Trail to Lakeview Terrace	6	1,100	Replace		ft	$108	$117,000	$36,000	$18,000	$12,000	$190,000
F87	Along Serenity Lane from Westlong Street to Washington Street and along Washington Street (end of cul-de-sac)	6	500	Replace		ft	$108	$53,000	$16,000	$8,000	$6,000	$90,000
F88	Along West Lynn Way from Dreycott Way to Darnell Drive	6	800	Replace		ft	$108	$82,000	$25,000	$13,000	$9,000	$130,000
F89	Along Kingsway Drive from Darnell Drive	6	300	Replace		ft	$108	$29,000	$9,000	$5,000	$3,000	$50,000
F9	From Buena Vista Street along Glenneta Way (end of cul-de-sac)	6	500	Replace		ft	$108	$44,000	$14,000	$7,000	$5,000	$70,000
F90	Along Mesa Drive from Muscatel Road to Olive Street	6	800	Replace		ft	$108	$80,000	$24,000	$12,000	$8,000	$130,000
F91	From Lancashire Drive to Sherwood Drive (end of cul-de-sac)	6	600	Parallel		ft	$108	$56,000	$17,000	$9,000	$6,000	$90,000
F92	Along Friartuck Way from Nottingham Street to Lancashire Drive	6	700	Replace		ft	$108	$71,000	$22,000	$11,000	$8,000	$120,000
F93	Along Lakeview Terrace from Mountain View Avenue to Muscatel Road	6	400	New		ft	$108	$34,000	$11,000	$6,000	$4,000	$60,000
F94	Along Mandaville Way from Nottingham Street to Lancashire Drive	6	900	Parallel		ft	$108	$88,000	$27,000	$14,000	$9,000	$140,000
F95	Along Crescent Avenue between Elberta Road and Sedco Boulevard	8	1,400	Parallel		ft	$124	$169,000	$51,000	$26,000	$17,000	$270,000
F96	Along Victoria Brook Lane between Grand Avenue and Lancashire Drive	6	400	Replace		ft	$108	$39,000	$12,000	$6,000	$4,000	$70,000
F97	From Amber Lane along Amberwood Court (end of cul-de-sac), From Amber Lane along Lake Crest Drive (end of cul-de-sac), and from Amber Lane from Lake Crest Drive to Amberwood Court	6	1,100	Parallel		ft	$108	$119,000	$36,000	$18,000	$12,000	$190,000
F99	From Garfield St along Cleveland Court (end of cul-de-sac)	6	500	Replace		ft	$108	$49,000	$15,000	$8,000	$5,000	$80,000
F282	Along Rodeo Road from Calle Grande to Los Pinos Road	6	700	Replace		ft	$108	$75,000	$23,000	$12,000	$8,000	$120,000
F283	Along Dogie Place from Stampede Way	6	300	Replace		ft	$108	$23,000	$7,000	$4,000	$3,000	$40,000
F284	Along Charro Road from El Dorado Road (end of cul-de-sac)	6	400	Replace		ft	$108	$38,000	$12,000	$6,000	$4,000	$60,000
F285	Along Elm Street from Walnut Street to Hammack Avenue	6	800	Replace		ft	$108	$86,000	$26,000	$13,000	$9,000	$140,000
F286	Along Garfield Road from Jarvis Street to Robert Street	6	700	Replace		ft	$108	$73,000	$22,000	$11,000	$8,000	$120,000
F287	Along Robert Street from Garfield Road (end of cul-de-sac)	6	200	Replace		ft	$108	$21,000	$7,000	$4,000	$3,000	$40,000
F288	Along Harley Davidson Alley from Garner Road (end of cul-de-sac)	6	200	Parallel		ft	$108	$20,000	$6,000	$3,000	$2,000	$40,000
Total								**$20,204,000**	**$6,186,000**	**$3,160,000**	**$2,143,000**	**$32,770,000**

Appendix M4:

Sewer System Management Plan_2008

Elsinore Valley Municipal Water District

Elsinore Valley Municipal Water District

Sewer System Management Plan

December 2008

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ELSINORE VALLEY MUNICIPAL WATER DISTRICT

SEWER SYSTEM MANAGEMENT PLAN

December 2008

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ELSINORE VALLEY MUNICIPAL WATER DISTRICT

SEWER SYSTEM MANAGEMENT PLAN

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LIST OF ABBREVIATIONS

Abbreviation	Definition
2007 WMP	2007 Water Distribution System Master Plan
BMP	Best Management Practices
C	Hazen-Williams Roughness Coefficient
Carollo	Carollo Engineers, P.C.
CCTV	Closed Circuit Television
CDL	California Driver's License
cfs	Cubic Feet per Second
CIP	Capital Improvement Plan
CIWQS	California Integrated Water Quality System
CMOM	Capacity, Management, Operation, and Maintenance
d/D	Flow Depth to Pipe Diameter Ratio
District	Elsinore Valley Municipal Water District
FOG	Fats, Oils, and Grease
fps	Feet per Second
ft/ft	Feet per Feet
GIS	Geographic Information Systems
I/I	Infiltration and Inflow
in	Inches
MRP	Monitoring Reporting Program
n	Manning's Friction Coefficient
NPDES	National Pollutant Discharge Elimination System
O&M	Operations and Maintenance
OES	Office of Emergency Services
Order No. 2006-0003	State Water Resources Control Board Order No. 2006-0003
PM	Preventative Maintenance
PVC	Polyvinyl Chloride
RWQCB	Regional Water Quality Control Board
SDR	Standard Dimension Ratio
SOI	Sphere of Influence
SSMP	Sewer System Management Plan
SSO	Sanitary Sewer Overflow
SSRP	Sewage Spill Response Plan

Abbreviation	Definition
TBD	To Be Determined
TV	Television
WDR	Waste Discharge Requirement
WRF	Water Reclamation Facility
WWMP	Wastewater Master Plan

Chapter 1

INTRODUCTION

This chapter presents an overview of the need for this Sewer System Management Plan (SSMP).

1.1 PURPOSE

This SSMP has been prepared by Carollo Engineers, P.C. (Carollo) for the Elsinore Valley Municipal Water District (District) as part of the District's 2008 Wastewater Master Plan (WWMP) project in order to comply with the State Water Resources Control Board (SWRCB) Order No. 2006-0003 (Order No. 2006-0003), adopted May 2, 2006. A copy of Order No. 2006 0003 is included in Appendix B. Order No. 2006-0003 was amended on February 20, 2008. The provisions of this amendment are incorporated in this report.

The purpose of this SSMP is to provide a plan and schedule to properly manage, operate, and maintain all parts of the District's sanitary sewer system. This will help reduce and prevent sanitary sewer overflows (SSOs) to the extent possible, as well as mitigate any SSOs that do occur.

1.2 SERVICE AREA

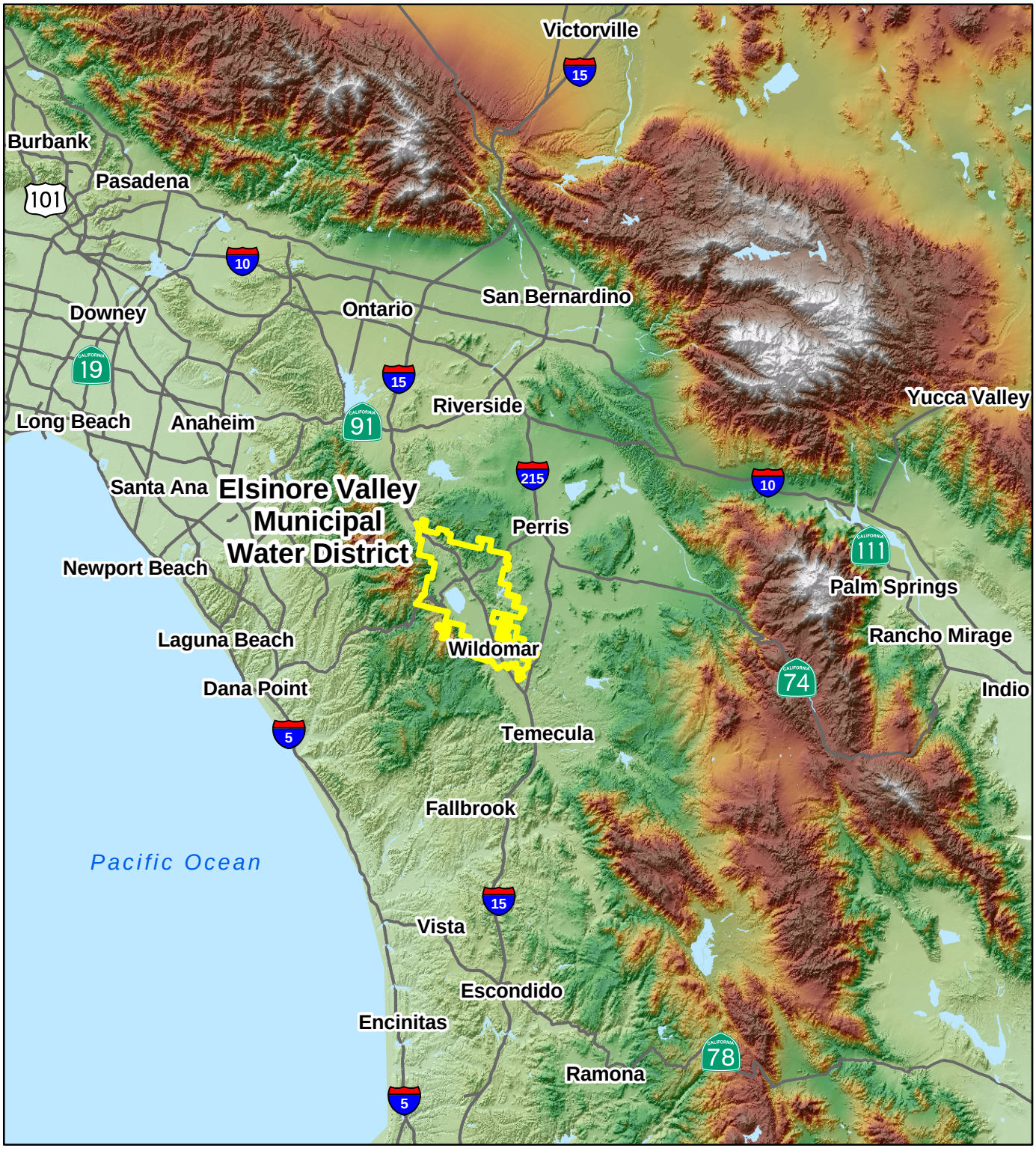
The District, which was formed in 1950, is located in the southwestern portion of Riverside County and provides potable water, sewer, and reclamation services to the City of Lake Elsinore, the City of Canyon Lake, portions of the City of Murrieta, Wildomar, and some unincorporated areas of Riverside County (Figure 1.1).

The District currently covers an area of approximately 96 square miles. The ultimate sphere of influence (SOI) of the District covers approximately 132 square miles. Figure 1.2 shows the current District boundary.

The District currently has four separate collection systems that are enrolled in the California Integrated Water Quality System (CIWQS) electronic reporting system. These systems are as follows:

- Regional Collection System;
- Canyon Lake Collection System;
- Horsethief Canyon Collection System;
- Southern Collection System.

This report serves as a comprehensive District SSMP and covers all four of the District's collection systems.



Elevation

High : 9,600 Feet

Low : Sea Level

Major Roads

Miles

0 5 10 20

FIGURE 1.1
REGIONAL LOCATION MAP

EVMWD

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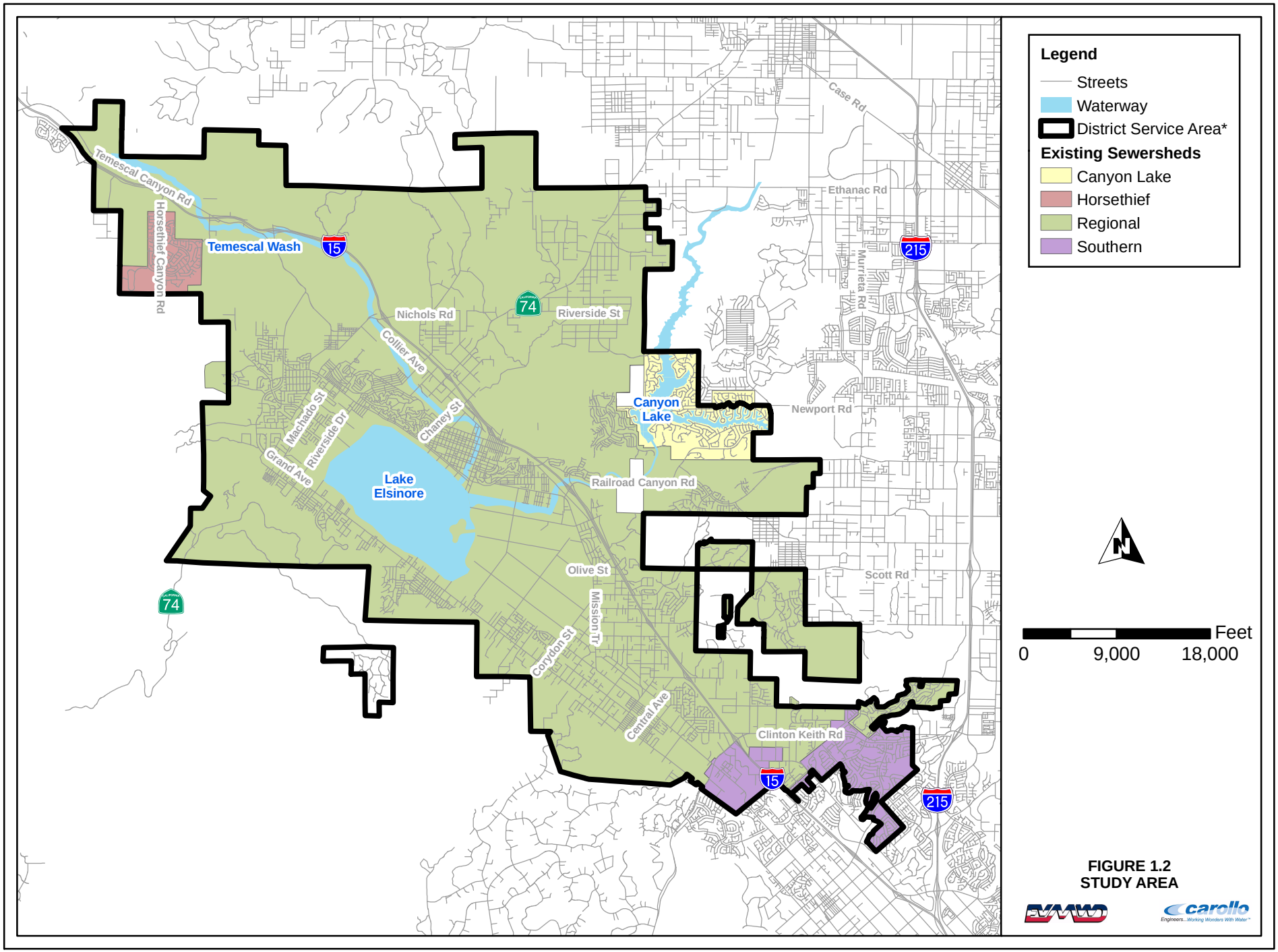

FIGURE 1.2
STUDY AREA

*Note: Master Plan Study Area does not include areas outside the District Service Area, but instead the District SOI.

1.3 BACKGROUND

Nationally, SSOs have been in the regulatory spotlight since 1995. The Environmental Protection Agency Report to Congress (August 2004) [1] identified the number and frequency of SSOs as a public health and water quality issue.

On May 2, 2006, the California SWRCB adopted Order No. 2006-0003, which focused on the reduction of SSOs. Order No. 2006-0003 requires that all collection systems with more than one mile of sewer pipe apply for coverage under the order by November 2, 2006.

Several Regional Water Quality Control Boards (RWQCBs) have existing requirements for collection systems and SSOs. Order No. 2006-0003 supplements the existing RWQCB requirements with the intent to gradually make requirements consistent statewide.

However, RWQCBs have the authority to adopt more stringent regional waste discharge requirements (WDRs).

The requirements for SSMPs are closely related to the Environmental Protection Agency's Capacity, Management, Operation, and Maintenance (CMOM) rule (published in the Federal Register in January 2001) and they constitute a best management practices (BMP) approach to the regulation of collection systems. The SSMP elements are:

- Goals
- Organization Structure
- Overflow Emergency Response Plan
- Fats, Oils, and Grease (FOG) Control Program
- Legal Authority
- Operation and Maintenance (O&M) Program
- Design and Performance Provisions
- System Evaluation and Capacity Assurance Plan
- Monitoring, Measurement, and Program Modifications
- SSMP Audits
- Communication Plan

1.4 SCHEDULE

Order No. 2006-0003 established an SSMP implementation schedule based on the size of the agency. According to the District's 2007 Draft Water Distribution System Master Plan (2007 WMP), the District's current population is over 100,000. The schedule for agencies with a population greater then 100,000 therefore governs the District's implementation schedule (Table 1.1).

Table 1.1 Sewer System Management Plan Implementation Schedule Sewer System Management Plan Elsinore Valley Municipal Water District	
Task	**Required Certification Date[(1)]**
SSMP Development Plan and Schedule	08/01/07
Goals and Organization Structure	11/01/07
Overflow Emergency Response Plan Legal Authority O&M Plan FOG Plan	11/01/08
Design and Performance Standards System Evaluation and Capacity Assurance Plan Final SSMP and Certification	05/01/09

Note:

1. Required Certification Date based on Order No. 2006-0003 for Population greater than 100,000 (See Appendix B).

1.5 ACKNOWLEDGEMENTS

Carollo wishes to acknowledge and thank: Mr. Phillip Miller, Director of Engineering; Mr. Sudhir Mohleji (Senior Civil Engineer); Mr. Robert Barnard (Wastewater Collection System Superintendent); and Mr. Theodore Eich (Wastewater Operations Manager). Their own and their staff's cooperation and courtesy in obtaining a variety of necessary information were valuable components in completing and producing this report.

1.6 REFERENCE FORMAT

References are cited periodically throughout this report, as appropriate. Reference sources are identified by the title of the referenced document followed by a reference number in brackets. The reference format is provided below:

- Title of Report or other Reference Source or Document [No.]

A complete list of references containing detailed information concerning each reference source is provided in Appendix A.

1.7 REPORT ORGANIZATION

This SSMP contains twelve chapters. Appendices are provided to support the information provided in the text. A brief description of the chapters is provided as follows:

Chapter 1 – Introduction. This chapter provides a brief description of the need for the SSMP and a description of the report organization.

Chapter 2 – Goals. This chapter discusses the goals of the District's SSMP. These goals pertain to the operation and management of the District's wastewater collection system with respect to SSOs.

Chapter 3 – Organization Structure. This chapter identifies the District's responsible representative for the implementation of this SSMP. It also includes an organizational chart and a chain of communication for reporting SSOs.

Chapter 4 – Legal Authority. This chapter serves to confirm that the District has the authority, through ordinances, services agreements, or other legally binding procedures, to conform to the requirements of Order No. 2006-0003.

Chapter 5 – Operation and Maintenance Program. This chapter contains a description of the District's O&M program, including mapping, routine and preventative maintenance, rehabilitation, and training.

Chapter 6 – Design and Performance Provisions. This chapter presents a summary of the District's design and construction standards, as well as its standards for the inspection and testing of new sewers, pumps, and other appurtenances and for rehabilitation projects.

Chapter 7 – Overflow Emergency Response Plan. This chapter contains a description of the District's overflow emergency response plan that serves to provide measures to protect the public health and the environment in the event of an overflow.

Chapter 8 – Fats, Oils, and Grease Control Program. This chapter discusses the need for a FOG control program. The purpose of such a program is to limit the amount of fats, oils, and greases that enter the collection system to the extent feasible.

Chapter 9 – System Evaluation and Capacity Assurance Plan. This chapter provides an evaluation of the District's sanitary sewer system facilities, identifies and proposes improvements for deficiencies, identifies design criteria, and provides a Capital Improvement Program (CIP) and schedule for improvements.

Chapter 10 – Monitoring, Measurement, and Program Modifications. This chapter presents a summary of the steps to be taken by the District to evaluate the effectiveness of this SSMP, and update it should improvements be necessary or desirable.

Chapter 11 – SSMP Program Audits. This chapter presents a summary of the procedures to be used by the District to perform internal audits.

Chapter 12 – Communication Program and Final Certification. This chapter presents a summary of the steps to be taken by the District to communicate with the public on the development, implementation, and performance of the SSMP. This chapter also contains the final certification of this SSMP.

1.8 ABBREVIATIONS

To improve readability, this report includes several abbreviations. The abbreviations are spelled out in the text the first time the phrase or title is used in each chapter and subsequently identified by abbreviation only. A summary of the abbreviations used in this report is located in the List of Abbreviations found immediately after the Table of Contents.

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GOALS

This chapter discusses the goals of the Elsinore Valley Municipal Water District's (District's) Sewer System Management Plan (SSMP). The SSMP goals pertain to the operation and management of the District's wastewater collection system with respect to sanitary sewer overflows (SSOs).

2.1 REGULATORY REQUIREMENT

Order No. 2006-0003 establishes the goal of the SSMP as follows:

> "The purpose of this SSMP is to provide a plan and schedule to properly manage, operate, and maintain all parts of the sanitary sewer system. This will help reduce and prevent SSOs, as well as mitigate any SSOs that do occur."

2.2 SSMP GOALS

This SSMP has been prepared in order to achieve the following goals:

- Properly manage, operate, and maintain all aspects and components of the District's wastewater collection system.
- Provide the wastewater collection system with adequate capacity to convey peak wastewater flows.
- Minimize the occurrence of SSOs to the extent possible.
- Mitigate the impacts that are associated with any SSO that may occur.
- Meet all regulatory requirements related to the SSMP and SSO reporting system.

2.3 DEFINITIONS

An SSO is defined as any overflow, release, discharge, or diversion of untreated or partially treated wastewater from a sanitary sewer system. There are three categories of SSOs as established by Order No. 2006-0003:

- **Category 1**: This category includes all discharges of sewage resulting from a failure in the District's sanitary sewer system that:
  a. Equal or exceed 1,000 gallons, or
  b. Result in a discharge to a drainage channel and/or surface water; or
  c. Discharge to a storm drainpipe that was not fully captured and returned to the sanitary sewer system.

- **Category 2**: This category includes all other discharges of sewage resulting from a failure in the District's sanitary sewer system.
- **Private Lateral Sewage Discharges**: Sewage discharges that are caused by blockages or other problems within a privately owned lateral.

As part of Order No. 2006-0003, all agencies that own or operate sanitary systems greater than one mile in length that collect and/or convey untreated or partially treated wastewater to a publicly owned treatment facility are required to report Category 1 and Category 2 SSOs. The reporting of Private Lateral Sewage Discharges is optional.

2.4 PROHIBITION

Order No. 2006-0003 prohibits any SSO that results in a discharge of untreated or partially treated wastewater to waters of the United States or that causes a "nuisance," as defined in California Water Code Section 13050(m). There is no "affirmative defense" for unforeseen or unavoidable SSOs. Instead, Section D.6 of Order No. 2006-0003 includes the concept of "enforcement discretion," and identifies seven specific factors that must be considered in an enforcement action, such as the extent to which the discharger has complied with the provisions of the WDRs. In the event of an SSO, all feasible steps should be taken to limit the released volume and prevent untreated water from entering storm drains, creeks, etc. All SSOs must be reported through a new statewide online reporting system, the California Integrated Water Quality System (CIWQS).

ORGANIZATION STRUCTURE

This chapter identifies the responsible representative from the Elsinore Valley Municipal Water District (District) for the implementation of this Sewer System Management Plan (SSMP). It also includes an organizational chart and a chain of communication for reporting sanitary sewer overflows (SSOs).

3.1 REGULATORY REQUIREMENT

Order No. 2006-0003 specifies that the SSMP must identify the following:

a. The name of the responsible or authorized representative for the implementation of the SSMP;

b. The names and telephone numbers for management, administrative, and maintenance positions responsible for implementing specific measures of the SSMP program. The SSMP must identify lines of authority through an organizational chart or similar document with a narrative explanation; and

c. The chain of communication for reporting SSOs, from receipt of a complaint and other information, including the person responsible for reporting SSOs to the State and Regional Water Board and other agencies if applicable (such as County Health Officer, County Environmental Health Agency, Regional Water Board, and/or State Office of Emergency Services (OES)).

3.2 AUTHORIZED REPRESENTATIVE

The District has authorized four staff members to serve as authorized representatives. These individuals are the Wastewater Operations Manager (Theodore P. Eich), the Chief Regional Plant Operator (Mitch Pierson), the Director of Operations (TDB), and the General Manager (Ronald Young).

The District has established five data entry designees who are responsible for entering spill data on CIWQS for the authorized representatives. These individuals are:

- Robert Barnard, Collection Systems Superintendent;
- Keith Ray, Senior Lift Station Technician;
- Scott Castillo, Senior Collection Systems Maintenance Worker;
- Dan VerPlank, Senior Collection Systems Maintenance Worker; and
- Shawn Moore, Senior Collection Systems Maintenance Worker.

3.3 ORGANIZATIONAL HIERARCHY

The organizational hierarchy and contact information for the implementation of the measures specified in this SSMP are provided in Appendix C and shown in Figure 3.1. A general description of those positions, as supplied by District Staff, is provided in this section. Appendix D contains the detailed job descriptions for these positions.

- **General Manager**. The General Manager is the chief executive officer of the District and serves as agent of the District Board of Directors in planning, directing, managing, and overseeing the services, activities, and operations of the District.
- **Assistant General Manager.** The Assistant General Manager, under general direction of the General Manager, shares the responsibility for the supervision of and assists the General Manager in directing all departments within the District.
- **Director of Operations**. The Director of Operations plans, directs, manages, and oversees the functions, programs, and operations of the Operations Department. This includes the District's domestic water system, including water treatment, groundwater production, water storage and delivery systems, the District's wastewater collection and treatment operations and source control program, the District's agricultural water pumping and delivery systems, the District's fleet maintenance and repair operations, District facilities and grounds maintenance and repair, and the District's Safety and Health Program.
- **Wastewater Operations Manager**. The Wastewater Operations Manager directs, manages, supervises, and coordinates the activities and operations of the Wastewater Division within the Operations Department, including collection system pipelines, lift stations, water reclamation facilities (WRFs) and the District's facilities source control program.
- **Wastewater Collection Systems Superintendent**. The Wastewater Collection Systems Superintendent oversees, supervises, and coordinates the work of a number of crews engaged in sanitary sewer maintenance and operation within the Wastewater Department.
- **Wastewater Chief Plant Operator**. The Chief Plant Operator oversees, supervises, and coordinates wastewater treatment activities and operations within the Wastewater Treatment Division of the Operations Department.
- **Senior Lift Station Maintenance Technician**. The Senior Lift Station Maintenance Technician leads, oversees, and participates in the more complex and difficult work of staff responsible for the maintenance, operation, diagnostic testing, installation and repair of instrumentation and control systems, auto-dialer maintenance/replacement/ programming, and other types of technical maintenance and repair involved with the District's sewage lift stations.

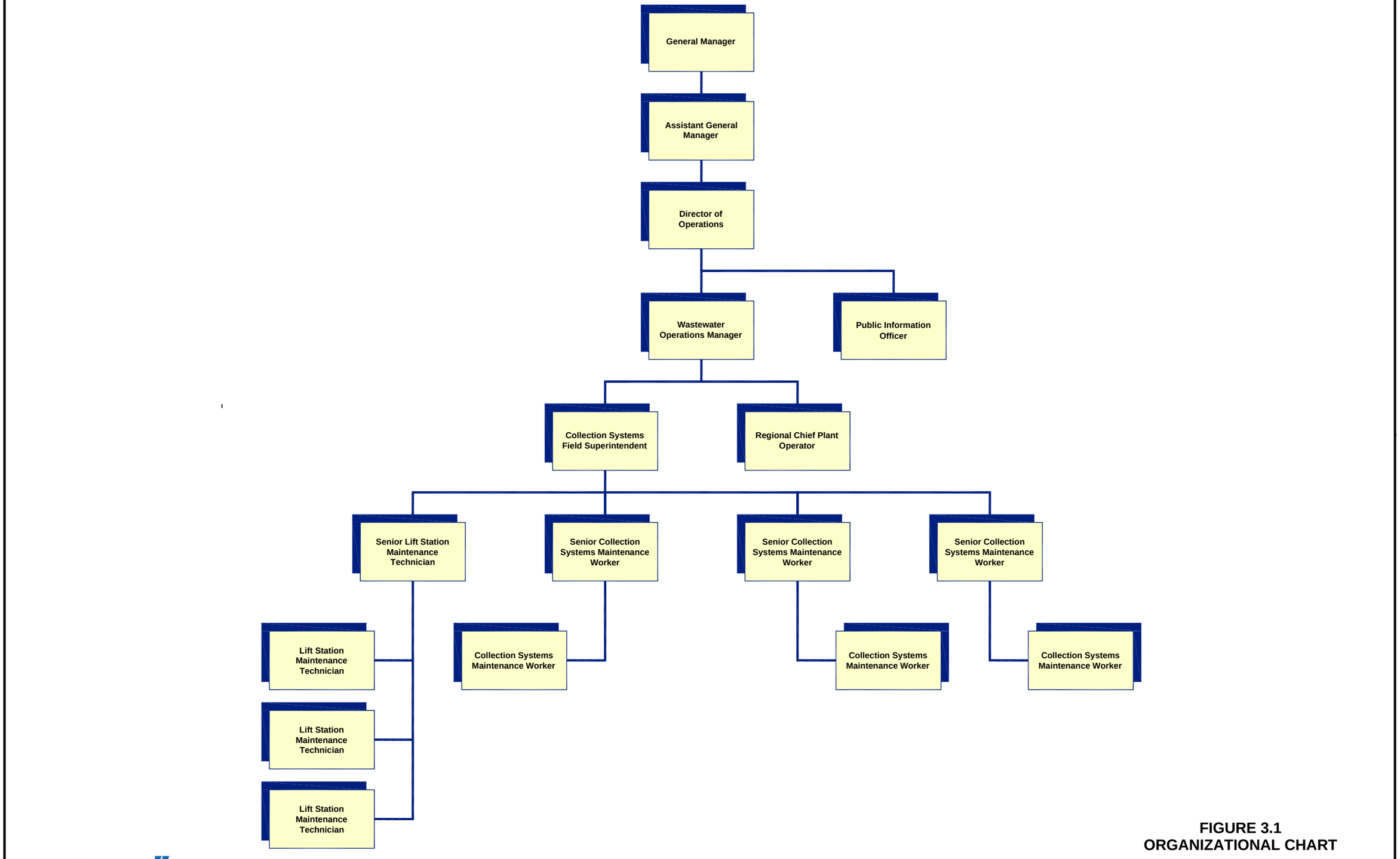

FIGURE 3.1
ORGANIZATIONAL CHART

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- **Senior Collection Systems Maintenance Worker**. The Senior Collection Systems Maintenance Worker leads, oversees, and participates in the work of a crew performing a variety of unskilled, semi-skilled and skilled operation, maintenance, and repair work involved in the District's sewage lift stations and sewage collection systems.
- **Lift Station Maintenance Technician**. The Lift Station Maintenance Technician performs skilled work in the maintenance, operation, diagnostic testing, installation and repair of instrumentation and control systems, auto-dialer maintenance/ replacement/programming and other types of technical maintenance and repair involved in the District's sewage lift stations, collection system, and related support equipment.
- **Collection System Maintenance Worker**. The Collection System Maintenance Worker performs a variety of unskilled, semi-skilled, and skilled maintenance, operational, and repair tasks involved in the District's sewage collection systems and sewage lift stations.

3.4 CHAIN OF COMMUNICATION FOR REPORTING SSOs

The District's Sewage Spill Response Plan (SSRP) contains the procedures utilized by the District to notify the primary SSO response crews (Appendix E). In addition to the SSRP, the City also conforms, as applicable, to the spill response procedures laid out in the Unified Sanitary Sewer Spill Response Procedure (Appendix F). This document is specific to the Santa Ana RWQCB and is meant to act as a bridge between different agencies within the region.

In general, a telephone operator at the District receives calls from the public regarding service calls and potential SSOs. Such calls are then directed to the Field Operations Dispatch Center. The Field Operations Dispatch Center obtains the necessary information from the reporting party to complete "Side A" of the District's standard Collection System Problem Report Form and dispatches a District service crew to the location of the reported problem. A copy of Collection System Problem Report Form can be found in the District's SSRP (Appendix E).

Upon arrival at the spill location, the service crew reports their findings to the Field Operations Dispatch Center. If an SSO has occurred, the Dispatch Center completes "Side B" of the Collection System Problem Report Form and immediately starts to notify the appropriate regulatory agencies and other impacted agencies in accordance with the District's Spill Notification Checklists, which are included in the District's SSRP (Appendix E).

During non-business hours, calls from the public regarding possible SSOs are received by the District's contract 24-hour answering service, who will assume identical notification responsibilities as that of the Field Operations Dispatch Center.

In the event of a confirmed SSO that results in a discharge to a drainage channel or surface water, the following regulatory agencies must be notified as soon as possible, but not later than two hours after becoming aware of the discharge:

- Appropriate Regional Water Quality Control Board (RWQCB), depending on location of spill;
- State OES; and
- Appropriate County Health Department.

Additionally, the statewide WDRs require that the District submit a certification to the appropriate RWQCB that the RWQCB, State OES, and County Health Department were notified of the SSO. This certification shall be completed as soon as possible, but no later than 24-hours after becoming aware of the discharge.

The District's SSRP currently does not contain provisions for the notification of the State Water Resources Control Board (SWRCB) through the California Integrated Water Quality System (CIWQS). The copy of the SSRP included in Appendix E contains suggested revisions to the SSRP to include such provisions and to update certain information based on District comments. The suggested revisions are underlined in red in the document itself.

Figure 3.2 is a flow chart that outlines the SWRCB reporting procedure that should be followed by the District should an SSO occur. A description of the Category 1 and Category 2 SSO reporting procedure is also provided in Sections 3.4.1 and 3.4.2, respectively. It is not anticipated that the District will report SSOs caused by blockages or problems within a privately owned lateral, although the District may choose to do so.

In addition to Figure 3.2, the San Diego RWQCB has also developed a flow chart for guidance on reporting SSOs that occur within their jurisdiction. This flow chart is included in Appendix G.

3.4.1 SWRCB Category 1 SSO Reporting Procedure

Order No. 2006-0003 specifies certain requirements for the reporting of SSOs. The District intends to comply with these requirements. Upon notification that an SSO has occurred, an initial report will be prepared and submitted through CIWQS. This initial report will be submitted as soon as is practicable, but no later than three business days after the District has been made aware of the SSO.

The initial report is then expanded and updated if new information on the overflow is made available. Upon review of the updated report by the District's authorized representative, it is finalized and certified on CIWQS. This final certification will be completed as soon as possible, but no later than 15 calendar days of the conclusion of SSO response and remediation.

Source: Adapted from Flow Chart created by the California Water Environment Association

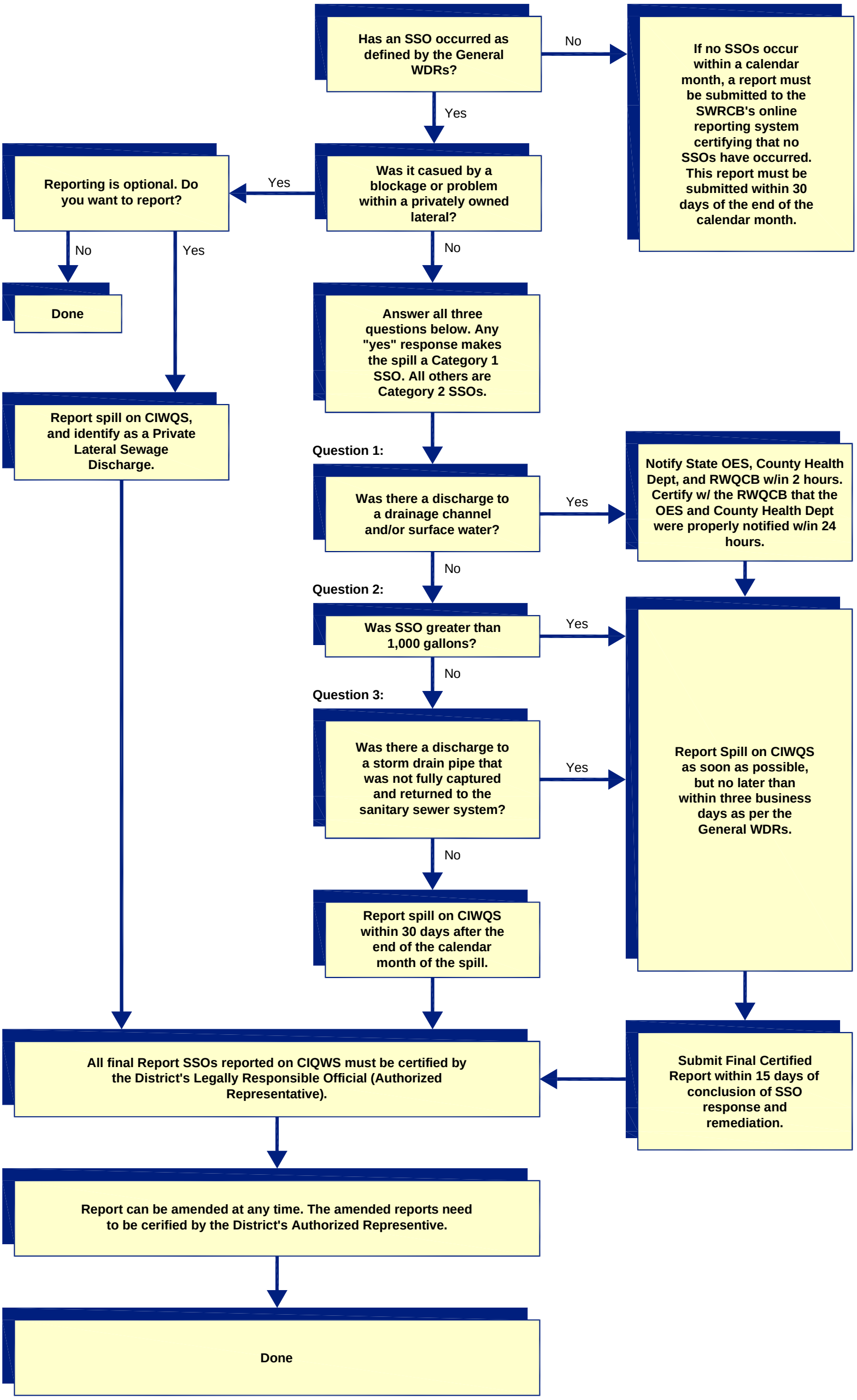

FIGURE 3.2
SWRCB SSO REPORTING REQUIREMENTS FLOW CHART

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3.4.2 SWRCB Category 2 SSO Reporting Procedure

The requirements for the reporting of Category 2 spills by the SWRCB are far less stringent than the Category 1 requirements. Upon notification that a Category 2 spill has occurred, all information relating to that spill is gathered. Once all the data on the spill is available, a spill report is completed through CIWQS. The report is then reviewed by the District's authorized representative and submitted on CIWQS. This report will be submitted as soon as possible, but no later than 30 days after the end of the calendar month in which the SSO occurs.

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Chapter 4

LEGAL AUTHORITY

This chapter serves to confirm that the Elsinore Valley Municipal Water District (District) has the authority, through ordinances, services agreements, or other legally binding procedures, to conform to the requirements of Order No. 2006-0003.

4.1 REGULATORY REQUIREMENT

Order No. 2006-0003 specifies the following with respect to Legal Authority:

Each Enrollee must demonstrate, through sanitary sewer system use ordinances, service agreements, or other legally binding procedures, that it possesses the necessary legal authority to:

a. Prevent illicit discharges into its sanitary sewer system (examples may include infiltration and inflow (I/I), stormwater, chemical pumping, unauthorized debris and cut roots, etc.);

b. Require that sewers and connections be properly designed and constructed;

c. Ensure access for maintenance, inspection, or repairs for portions of the lateral owned or maintained by the Public Agency;

d. Limit the discharge of fats, oils, and grease and other debris that may cause blockages; and

e. Enforce any violation of its sewer ordinances.

4.2 WASTE DISCHARGE AND SEWER USE ORDINANCES

The District Board of Directors has adopted Ordinance No. 160, which identifies District regulations for waste discharge and sewer use (Appendix H). The following subsections summarize Ordinance No. 160 as it pertains to the requirements established in Order No. 2006-0003.

Based on a review of Ordinance No. 160, it is not anticipated that any additions or modifications are necessary to comply with the requirements (a. through e.) outlined in Section 4.1 of this chapter.

4.2.1 Authority to Enforce Waste Discharge and Sewer Use Regulations

Section 1.900 of Ordinance No. 160 describes the District's authority to establish regulations on waste discharge and sewer use. This article states that the District is governed by various United States Government and State of California agencies. Through various Federal and State laws, the District has been granted authority to regulate and/or

prohibit direct or indirect discharges into the District's wastewater facilities. These laws include, but are not limited to, the following:

- The Clean Water Act (33 U.S.C. Section 1251 et seq);
- California Porter Cologne Water Quality Act (California Water Code Section 13000 et seq);
- California Health and Safety Codes sections 25100 to 25250;
- Resource and Recovery Act of 1976 (42 U.S.C. Section 6901 et seq); and
- California Government Code, Sections 54739 - 54740.

4.2.2 Illicit Discharges

Article 3.100 of Ordinance No. 160 provides prohibitions on certain types of wastewater discharges into the District's wastewater collection system. The following subsections summarize Article 3.100, while Appendix H contains the full text of Ordinance 160.

4.2.2.1 General Waste Discharge Prohibitions

Part A of Section 3.100 of Ordinance No. 160 provides generalized discharge prohibitions for the District's wastewater collection system. This section states, in part:

> "No user shall introduce or cause to be introduced into the District's collection system any pollutant which, alone or in conjunction with other substances, may cause pass through or interference, or any wastewater which has the potential to adversely or harmfully effect the District's sewers, maintenance personnel, wastewater treatment plant personnel or equipment, treatment plant process or the quality of treatment plant effluent or bio-solids, public or private property, or wastes which may otherwise endanger the public, the environment, or create a public nuisance."

4.2.2.2 Specific Waste Discharge Prohibitions

Part B of Section 3.100 of Ordinance No. 160 identifies 21 specific discharge prohibitions for the District's wastewater collection system. The 21 prohibited discharge types are included in pages 19 through 21 of Appendix H.

4.2.3 Design and Construction Requirements

Section 3.1000 of Ordinance No. 160 identifies the requirements for building sewers within the District. This section requires that all new building sewer construction and repair work be in accordance with District construction standards. Section 3.4000 of Ordinance No. 160 identifies the requirements for the inspection of newly constructed building sewer connections.

4.2.4 Maintenance, Inspection, and Repair Access

Section 1.700 of Ordinance No. 160 establishes the District's right for maintenance, inspection, and repair access. Section 1.700 states:

> "The District, Regional Water Quality Control Board, and the United States Environmental Protection Agency (when accompanied by District personnel) shall be permitted to enter all properties from which wastes or wastewaters are being or are capable of being discharged into a public sewer main for purposes of inspecting, copying of records, taking photographs observing, measuring, sampling, and testing pertinent to the discharge of wastes or wastewaters to ascertain whether the intent of this Ordinance is being met and the user is complying with all requirements. The District shall have access at reasonable times and without delay to all parts of the premises for the purposes of inspection and/or sampling. The District shall have the right to set up on the user's property such devices as are necessary to conduct sampling or metering operations. Where a user has security measures in force, the user shall make necessary arrangements so that personnel from the District will be permitted to enter without delay for the purpose of performing their specific responsibilities. Delays in allowing or refusal to allow the District access to the User's premises shall be a violation of (Ordinance No. 160)."

4.2.5 Limitations on Fats, Oils, and Grease and Other Debris

Part B, Item 3, of Section 3.100 of Ordinance No. 160 prohibits the discharge of:

> "Any solids or viscous substances of such size or in such quantity, condition, or nature that they may cause obstruction to flow in the sewer or be detrimental to proper wastewater treatment plant operations. These objectionable substances include…any materials which tend to solidify or collect in the sewer and obstruct wastewater flow."

Fats, oils, and grease (FOG) usually enter the wastewater collection system in a liquefied state. Reduced turbulence and low water temperatures within the collection system can then cause FOG to solidify and accumulate in sewer pipes and lift stations. This accumulation can lead to pipe blockages and sanitary sewer overflows (SSOs). For this reason, FOG can be interpreted to be covered under Part B, Item 3, of Section 3.100 of Ordinance No. 160.

4.2.6 Policies for Enforcing Violations

Article 5 of Ordinance No. 160 contains the procedures to be followed by the District in the event of a violation of Ordinance No. 160. This article also outlines the process of appeals to the General Manager or Board of Directors. The extent and severity of the enforcement action is generally dependent upon the magnitude and extent of the violation, the effect of the violation on District operations or discharge permits, the compliance history of the user, and the general good faith of the user. The full text of the District's enforcement policies is included in pages 46 through 62 of Appendix H.

Chapter 5

OPERATION AND MAINTENANCE PROGRAM

This chapter contains a description of the Elsinore Valley Municipal Water District (District) operations and maintenance program, including mapping, routine and preventative maintenance, rehabilitation, and training.

5.1 REGULATORY REQUIREMENT

Order No. 2006-0003 specifies that a District's Sewer System Management Plan (SSMP) must include the following elements as appropriate to the system:

a. Maintain an up-to-date map of the sanitary sewer system, showing all gravity line segments and manholes, pumping facilities, pressure pipes and valves, and applicable stormwater conveyance facilities;

b. Describe routine preventative operation and maintenance activities by staff and contractors, including a system for scheduling regular maintenance and cleaning of the sanitary sewer system with more frequent cleaning and maintenance targeted at known problem areas. The preventative maintenance (PM) program should have a system to document scheduled and conducted activities, such as work orders;

c. Develop a rehabilitation and replacement plan to identify and prioritize system deficiencies and implement short-term and long-term rehabilitation actions to address each deficiency. The program should include regular visual and TV inspections of manholes and sewer pipes, and a system for ranking the condition of sewer pipes and scheduling rehabilitation. Rehabilitation and replacement should focus on sewer pipes that are at a risk of collapse or prone to more frequent blockages due to pipe defects. Finally, the rehabilitation and replacement plan should have a capital improvement plan that addresses proper management and protection of the infrastructure assets. The plan shall include a time schedule for implementing the short- and long-term plans plus a schedule for developing the funds needed for the capital improvement plan;

d. Provide training on a regular basis for staff in sanitary sewer system operations and maintenance, and require contractors to be appropriately trained; and

e. Provide equipment and replacement part inventories, including identification of critical parts.

5.2 COLLECTION SYSTEM MAP

The District maintains a comprehensive map of its wastewater collection facilities in a Geographic Information System (GIS) format (Figure 5.1). An extensive amount of information is stored in the Districts collection system GIS data. This data includes the following:

- **Gravity Mains and Force Mains**
  - Diameter;
  - Status (Active or Inactive);
  - Installation Date;
  - Road Centerline Offset Distance;
  - Curb Offset Distance;
  - Pipe Material;
  - Pipe Length;
  - Upstream and Downstream Invert Elevations;
  - Pipe Slope;
  - Water Reclamation Facility (WRF) that the Pipeline is Tributary to;
  - Lift Station that the Pipeline is Tributary to.
- **Manholes**
  - Status (Active or Inactive);
  - Installation Date;
  - Manhole Diameter;
  - Manhole Depth;
  - Influent and Effluent Pipeline Invert Elevations;
  - Manhole Rim Elevation;
  - WRF that the Manhole is Tributary to;
  - Lift Station that the Manhole is Tributary to.
- **Lift Stations**
  - Status (Active or Inactive);
  - Installation Date;
  - Lift Station Name;
  - Number of Pumps;
  - Lift Station Capacity;
  - Address;
  - Location of Lift Station (Latitude and Longitude);
  - WRF that the Lift Station is Tributary to.

The District updates their GIS data periodically whenever changes to the collection system are made.

Horsethief LS
Horsethief Canyon WRF
Bolo LS
Alberhill LS
Nichols Rd
Collier Ave
Collier LS
A-1 LS
A-2 LS
A-3 LS
A-4 LS
Regional WRF
Lakeshore Dr
Machado St
Grand Ave
Riverside Dr
Chaney St
Serena LS
A-5 LS
Lake Elsinore
B-10 LS
B-9 LS
B-8 LS
B-7 LS
B-6 LS
B-5 LS
B-4 LS
B-3 LS
Corydon St
Mission Tr
Railroad Ave
Railroad Canyon Rd
Railroad Canyon WRF
Stadium Villa LS
B-1 LS
B-2 LS
Big Range LS
Vacation LS
Tuscany Hills LS
Longhorn LS
Longhorn II LS
Lighthouse LS
Canyon Lake
Village Way LS
Gray Fox LS
Continental LS
Newport Rd
Ethanac Rd
Case Rd
Murrieta Rd
Holland Rd
Garbani Rd
Scott Rd
Central Ave
Grand Ave
McVicar LS
Clinton Keith Rd
Greer Ranch LS
Robards Way LS
Los Alamos Rd
Washington Ave
74
15
215

Legend

- WRF
- Lift Stations
- Streets
- Waterway

Existing Collection System Diameter

- 8" and Smaller
- 10" - 16"
- 18" - 24"
- 27" and Larger
- Force Main

Sewersheds

- Canyon Lake
- Horsethief
- Regional
- Southern

N

Feet
0 8,000 16,000

FIGURE 5.1
EXISTING SEWER SYSTEM MAP

EVMWD

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5.3 WASTEWATER COLLECTION SYSTEM OVERVIEW

This section provides a brief overview of the District's wastewater collection system facilities. A detailed description of these facilities can be found in the 2008 Wastewater Master Plan (WWMP) report [4]. The District is divided into four major collection systems, which are distinguished by the WRF that services that collection system:

- Regional collection system;
- Canyon Lake collection system;
- Horsethief collection system; and
- Southern collection system.

5.3.1 Regional Collection System

This section summarizes the major aspects of the Regional collection system.

- **Regional WRF.**
  - Wastewater flow generated within the Regional collection system is treated at the District operated Regional WRF. This facility is located near the intersection of Chaney Street and Treleven Avenue and serves the District's customers in the City of Lake Elsinore and portions of the surrounding community.
  - The Regional WRF was constructed in 1985 with a capacity of 2.0 million gallons per day (mgd). The plant was expanded in 1989 to a capacity of 3.0 mgd. In 1994, an ultraviolet disinfection system was implemented and the plant was re-rated to a capacity of 4.0 mgd. In 2002, a new 4.0 mgd process train (Train B) was added to the existing 4.0 mgd Train A, expanding the Regional WRF to accommodate an average flow of 8.0 mgd.
- **Gravity Mains.**
  - This Regional collection system contains approximately 250 miles of sewer mains up to 54 inches in diameter, approximately 54 miles of which are 10 inches in diameter and larger.
- **Lift Stations and Force Mains.**
  - The Regional collection system contains 24 lift stations and associated force mains. Details of the District's lift stations and force mains are provided in the 2008 WWMP Report [4].

5.3.2 Canyon Lake Collection System

This section summarizes the major aspects of the Canyon Lake collection system.

- **Railroad Canyon WRF.**
  - Wastewater flow generated within the Canyon Lake collection system is treated at the Railroad Canyon WRF. This facility is located near Railroad Canyon Road east of Interstate 15 and treats wastewater flow from the communities surrounding Canyon Lake and was constructed in 1984. An expansion of the facility was completed in 2005 to meet the Nitrogen effluent criterion of less than 10 milligrams per liter (mg/L).

  It should be noted that the Railroad Canyon WRF is a scalping plant. Excess wastewater flows from the Canyon Lake area and all waste activated sludge from the plant are discharged to the Regional WRF via the Regional collection system.

- **Gravity Mains.**
  - The Canyon Lake collection system contains approximately 50 miles of sewer mains up to 21 inches in diameter, approximately 6.7 miles of which are 10 inches in diameter and larger.

- **Lift Stations and Force Mains.**
  - The Canyon Lake collection system contains seven lift stations and associated force mains.

5.3.3 Horsethief Collection System

This section summarizes the major aspects of the Horsethief collection system.

- **Horsethief Canyon WRF.**
  - Wastewater flow generated within the Horsethief planned community is treated at the Horsethief Canyon WRF. This facility is located on Shotgun Trail Road in the northeastern portion of the Horsethief Canyon planned community. The plant was constructed in 1990. When the planned Alberhill WRF is constructed in the future, the Horsethief WRF will be abandoned and this plant's influent will be discharged by gravity to the Alberhill facility.

- **Gravity Mains.**
  - The Horsethief collection system contains approximately 18 miles of sewer mains up to 18 inches in diameter, approximately 0.8 miles of which are 10 inches in diameter and larger.

- **Lift Stations and Force Mains.**
  - The Horsethief collection system contains two lift stations and associated force mains.

5.3.4 Southern Collection System

The Southern Sewershed conveys wastewater from a small area in the southeastern portion of the District to five metering manholes (MMHs) within the RCWD wastewater collection system. The RCWD records flow at these manholes using permanent flow meters. According to the District's GIS data, the Southern Sewershed currently covers an area of approximately 3.4 square miles (2,200 acres). Upon completion of the Washington Avenue Lift Station (LS) that will divert flow to the Regional WRF, the area tributary to RCWD will decrease by approximately 700 acres.

- **Santa Rosa WRF.**
  - The Santa Rosa WRF is located southeast of the District's service boundary on Washington Avenue in the City of Murrieta. Owned and operated by the RCWD, this facility is currently designed to accommodate an average design flow of 5.0 mgd and serves the cities of Temecula, Murrieta, and other unincorporated areas of Riverside County, including a portion of the District's service area.
- **Gravity Mains.**
  - This sewershed contains approximately 40 miles of sewer mains up to 15 inches in diameter, approximately 7.0 miles of which are 10 inches in diameter and larger. All wastewater generated within this sewershed presently flows by gravity to the RCWD collection system.
- **Lift Stations and Force Mains.**
  - The Southern collection system does not contain any lift stations or force mains.

5.4 DISTRICT PREVENTATIVE MAINTENANCE PROGRAM

The following subsections summarize the District's existing maintenance activities with respect to the requirements of Order No. 2006-0003.

5.4.1 Sanitary Sewer Main Line Cleaning

The District has developed a preventative maintenance program in order to more efficiently manage and operate its wastewater collection facilities. This program consists of regular maintenance of the District's known problem areas, as well as periodic maintenance of the remaining District facilities.

The District has identified several segments of pipes and certain manholes for more frequent maintenance. These "hot spots" are areas within the District's collection systems where problems are known to exist, which may cause blockages or other maintenance problems for the District. The general location of these "hot spots" is presented visually on Figure 5.2. Appendix I contains a table with more detailed information related to each hot spot, as well as street level maps showing the precise location of each hot spot.

Aside from the District "hot spots," sewer mains in Old Town Lake Elsinore are cleaned annually, sewer mains in the Canyon Lake sewershed are cleaned every two to three years, and the remaining sewer mains are cleaned every five to 5.5 years. Table 5.1 summarizes the District's sewer main cleaning schedule.

5.4.2 Lift Station Maintenance Program

The District inspects its sanitary sewer lift stations routinely five days out of the week (Monday through Friday). Any issues uncovered during these inspections are addressed as soon as possible to ensure that each lift station is operating correctly.

Table 5.1 Sanitary Sewer Main Cleaning Schedule
Sewer System Management Plan
Elsinore Valley Municipal Water District

Area	Sewer Main Cleaning Frequency
Old Town Lake Elsinore	Annually
Canyon Lake Sewershed	Once Every 2 - 3 Years
Designated "Hot Spots"	Varies (see Appendix I for Cleaning Schedule)
All Other Areas	Once Every 5 - 5.5 Years

5.5 REHABILITATION AND REPLACEMENT PLAN

Replacement and rehabilitation of deteriorated and capacity limited facilities is coordinated through the District's Capital Improvement Program (CIP). Details of the District CIP is available through the District's website [3]. Additionally, the 2008 WWMP [4] provides recommendations for the replacement of certain District facilities.

5.6 STAFF TRAINING

The District trains its maintenance workers through a combination of official certification programs and formal and informal training of staff on District standard operating procedures. Licensing and certification requirements vary depending on position. Table 5.2 lists these requirements for the District's positions. The District has a tiered Collection System and Lift Station Maintenance Worker Structure, which facilitates staff training. In this system, the higher level maintenance workers (Senior Collection Systems and Lift Station Maintenance Workers) are responsible for training the lower level maintenance workers on work practices and procedures. Lower level maintenance workers thereby gain valuable experience by working under and learning from the more experienced workers.

Horsethief Canyon WRF
Horsethief Canyon Rd
15
74
Nichols Rd
Collier Ave
Regional WRF
Lakeshore Dr
Grand Ave
Riverside Dr
Detail A
Detail B
Lake Elsinore
Railroad Ave
Railroad Canyon Rd
Railroad Canyon WRF
Canyon Lake
Detail C
Ethanac Rd
Case Rd
Newport Rd
Holland Rd
Garbani Rd
Scott Rd
Mission Trl
Condon St
Central Ave
Grand Ave
Clinton Keith Rd
15
215
Los Alamos Rd
Washington Ave

Legend

- WRF
- Lift Stations
- Manhole Hot Spot
- Pipe Hot Spot
- Streets
- Waterway
- District Boundary

Existing Collection System

- 8" and Smaller
- 10" and Larger
- Force Main

N

0 8,000 16,000 Feet

FIGURE 5.2
SANITARY SEWER "HOT SPOTS"

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Table 5.2 Licensing and Certification Requirements
Sewer System Management Plan
Elsinore Valley Municipal Water District

License or Certification	Time Frame
Collections Systems Maintenance Worker	
Valid Driver's License	Upon Appointment
Class A California Driver's License (CDL) w/ air breaks and tank endorsements	within 6 Months of Appointment
CWEA Collection System Maintenance Technologist Grade I	within 18 Months of Appointment
8-Hour First Responder Level Certification	Upon Appointment or Shortly Thereafter
District provided CPR/First Aid and Bloodborne Pathogen Training	Upon Appointment or Shortly Thereafter
Grade II Collection Systems Maintenance Certification	Desirable
Lift Station Maintenance Technician	
Valid Driver's License	Upon Appointment
Class A CDL	within 6 Months of Appointment
District provided CPR/First Aid and Bloodborne Pathogen Training	Upon Appointment or Shortly Thereafter
CWEA Grade I Plant Maintenance Technologist Certification	Upon Appointment
CWEA Collection System Maintenance Technologist Grade I	within 18 Months of Appointment
Grade II Plant Maintenance Technologist and Plant Maintenance Electrical/Instrumentation	Desirable
Senior Collection Systems Maintenance Worker	
Valid Driver's License	Upon Appointment
Class A CDL w/ air breaks and tank endorsements	within 6 Months of Appointment
CWEA Grade I Plant Maintenance Technologist and/or Grade III Collection System Maintenance Certification is desirable	Upon Appointment
8-Hour First Responder Level Certification	Upon Appointment or Shortly Thereafter
District provided CPR/First Aid and Bloodborne Pathogen Training	Upon Appointment or Shortly Thereafter
Qualified Applicator Certificate issued by State of California, Department of Food and Agriculture	Desirable
Senior Lift Station Maintenance Technician	
Valid Driver's License	Upon Appointment
Class A CDL w/ air breaks and tank endorsements	within 6 Months of Appointment
District provided CPR/First Aid and Bloodborne Pathogen Training	Upon Appointment or Shortly Thereafter
CWEA Grade I Plant Maintenance Technologist Certification	Upon Appointment
CWEA Collection System Maintenance Technologist Grade I	within 18 Months of Appointment
Grade II Plant Maintenance Technologist and Plant Maintenance Electrical/Instrumentation	Desirable

All new staff are trained on District standard operating procedures for equipment use and tasks upon hire. The standard operating procedures are then reviewed and updated every two years. Safety training and individual department tail gate training sessions are performed on a bi-weekly basis. Specialty training on specific safety programs is provided annually. In addition, staff are scheduled to attend one to two seminars annually.

5.7 EQUIPMENT AND REPLACEMENT PART INVENTORIES

The District has developed an equipment and replacement parts inventory for tracking purposes. The inventory is included in Appendix J of this report. The District uses this equipment in the performance of routine and emergency maintenance to the District's wastewater collection systems.

The District has a spare parts inventory to minimize downtime in the event of an emergency (such as a pump failure). It is recommended that the District periodically examine its spare parts inventory to determine which spare parts are needed in the event of a breakdown or malfunction.

Chapter 6

DESIGN AND PERFORMANCE PROVISIONS

This chapter presents a summary of the Elsinore Valley Municipal Water District's (District) design and construction standards, as well as its standards for the inspection and testing of new sewers, pumps, and other appurtenances and for rehabilitation projects.

6.1 REGULATORY REQUIREMENT

Order No. 2006-0003 specifies that a Sewer System Management Plan (SSMP) must include the following:

a. Design and construction standards and specifications for the installation of new sanitary sewer systems, pump stations, and other appurtenances; and for the rehabilitation and repair of existing sanitary sewer systems; and

b. Procedures and standards for inspecting and testing the installation of new sewers, pumps, and other appurtenances and for rehabilitation and repair projects.

6.2 DESIGN STANDARDS AND SPECIFICATIONS

Volume 1 of the District's Standard Specifications and Drawings [2] contains the District's requirements for the design and construction of sanitary sewer facilities. Excerpts of this document are included in Appendix K. An electronic copy of the entire document is available through the District's website (www.evmwd.com) [3], and a hard copy can be purchased from the District.

6.2.1 Design Requirements

This section summarizes the District's sewer design requirements. For a more detailed account of the District's design requirements, refer to Volume 1 of the District's Standard Specifications and Drawings.

6.2.1.1 Mainline Size

The minimum pipe diameter for public collection sewers in the District is 8 inches, unless a smaller pipeline size is authorized by the District. For pipeline sizing, it is necessary to determine the average wastewater flow that is meant to be served by the pipeline. This can be determined in several different ways, depending on the type of development. Section 2.04 of Volume 1 of the District's Standard Specifications and Drawings contains the procedures that should be followed to determine average wastewater flow.

The District's Standard Specifications and Drawings specify that the design peak flow for any given development should be calculated using the following equation:

$$Q_{peak} = 1.84 (Q_{avg})^{0.92}$$

Where: Q_{peak} = Design Peak Wastewater Flow (in cubic feet per second, cfs)

Q_{avg} = Average Wastewater Flow (cfs)

The District's design standards specify variable flow depth criteria for various pipe sizes. This criteria is expressed as a maximum depth of flow to pipe diameter ratio (d/D). Design d/D ratios typically range from 0.5 to 0.92, with the lower values typically used for smaller pipes, which may experience flow peaks greater than the design flow or blockages from debris, paper, or rags. Table 6.1 summarizes the d/D ratios used for the design of future trunk sewers.

Table 6.1 Maximum d/D Ratio for Design of New Sewers
Sewer System Management Plan
Elsinore Valley Municipal Water District

Pipe Diameter (in)	Maximum d/D Ratio (during peak flows)
12 and smaller (New Sewers)	1/2
Larger than 12 (New Sewers)	2/3

Source:
Elsinore Valley Municipal Water District Standard Specifications and Drawings, Volume 1.

6.2.1.2 Manning's Coefficient

The Manning coefficient 'n' is a friction coefficient and varies with respect to pipe material, size of pipe, depth of flow, smoothness of joints, root intrusion, and other factors. The District's design standards specify that a Manning's roughness coefficient (n) of 0.013 be used for the design of sewer facilities in the District.

6.2.1.3 Minimum Pipe Slope

According to the District's standard design requirements, sewers must be designed and constructed such that the mean velocity during design peak flow conditions is greater than 2 feet per second (fps). The maximum allowable velocity for gravity sewers is 10 fps. Table 6.2 lists the minimum slopes provided in the District's standard design requirements.

6.2.1.4 Minimum Cover

The minimum cover for sewer pipes is seven feet. District approval must be obtained if a shallower depth is needed. Additionally, the District may require greater cover depths, if necessary, to extend the sewer to other areas.

Table 6.2 Minimum Slopes for New Circular Pipes
Sewer System Management Plan
Elsinore Valley Municipal Water District

Sewer Size (in)	Minimum Pipe Slope (ft/ft)	Pipe Material
4	0.0200	SDR-35 PVC
6	0.0100	SDR-35 PVC
8	0.0040	SDR-35 PVC
10	0.0032	SDR-35 PVC
12	0.0024	SDR-35 PVC
15	0.0015	SDR-35 PVC
18	0.0012	SDR-35 PVC
21	0.0009	Vylon
24	0.0008	Vylon
27	0.0006	Vylon

Source:
Elsinore Valley Municipal Water District Standard Specifications and Drawings, Volume 1.

6.2.1.5 Manhole Requirements

The following summarizes the District's requirements for the installation of sanitary sewer manholes:

- Manholes must be installed at all changes in pipe slope, diameter, alignment, and all intersections of main sewers;
- The maximum manhole spacing is 400 feet. For curved sewers, the maximum spacing is 300 feet;
- The minimum drop across a manhole for pipes with less than a 7.5 percent slope is 0.10 feet. For pipe slopes greater than 7.5 percent, the following equation is used:

  Manhole Drop = $(S_1+S_2)(D_1+D_2)$

  Where: S_1 = Invert slope entering manhole, feet/feet

  S_2 = Invert slope leaving manhole, feet/feet

  D_1 = Diameter of inlet pipe

  D_2 = Diameter of outlet pipe
- When a smaller sewer joins a larger one, the crown elevations should be matched;
- The District must approve drop manholes for pipe sizes over 15 inches;
- The minimum inside diameter of a manhole is 48 inches (4 feet);

- Five-foot manholes are required when sewer depths are greater than 12 feet, when more than two sewer mains or laterals are connected to the manhole, and for pipe sizes greater than 18 inches;
- Steeply sloped pipes shall be polyvinyl chloride (PVC)-lined and provided with a sealed lid;
- Manholes in non-paved areas must have a 10-foot by 10-foot paved area surrounding them.

6.2.1.6 Other Miscellaneous Considerations

The District's design standards identify other requirements for the design of sanitary sewer facilities. These include requirements for the horizontal alignment of sewers, the requirements for curved sewers, service laterals, inverted siphons, easements, and closed circuit television (CCTV) inspection. Final inspection of all sewer lines is performed using CCTV. The contractor shall repair, at its own expense, any defects, should they be observed, to the satisfaction of the District.

Additionally, Section 2.01 of Volume 1 of the District's Standard Specifications and Drawings contains general requirements for the design of potable water, recycled water, and sanitary sewer facilities. These requirements must be followed in the design of sanitary sewer facilities.

6.2.2 Inspection Requirements

Section 15043 of the District's Standard Specifications contains leakage and infiltration testing requirements for sewers. The District requires the following tests be performed in the presence of the District:

- **Leakage Test:** Each section of sewer pipe between two successive manholes, or between a manhole and its corresponding cleanout or end plug, is tested for leakage, including sewer laterals to the property line;
- **Infiltration Test:** An infiltration test is performed in areas where groundwater is encountered, or where evidence exists that groundwater has encroached to the elevation of the sewer;
- **CCTV Inspection:** A CCTV inspection is required to be performed by the contractor upon the installation of the sewer;
- **Vacuum Testing:** Vacuum testing is performed on manholes in accordance with the requirements of Section 03461 of the District's Standard Specifications;
- **Mandrel Testing:** Sewer pipes are tested for deflections, joint offsets, and lateral pipe intrusions by pulling a mandrel through the pipe after backfill, but prior to the placement of permanent pavement; and

- **Pressure Tests for Sewer Force Mains:** All force mains should be pressure tested in accordance with the requirements of Section 15044 of the District Standard Specifications. The allowable leakage in a sewer force main, however, is zero gallons.

For more detailed descriptions of the test procedures for the aforementioned tests, refer to Volume 1 of the District's Standard Specifications and Drawings.

6.2.3 Standard Drawings

Section 4 of Volume 1 of the District's Standard Specifications and Drawings contains the District's standard drawings for water and sewer facilities. The District's sewer standard drawings have been included in Appendix K as a reference.

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OVERFLOW EMERGENCY RESPONSE PLAN

This chapter contains a description of the Elsinore Valley Municipal Water District's (District's) overflow emergency response plan that serves to provide measures to protect the public health and the environment in the event of an overflow.

7.1 REGULATORY REQUIREMENT

Order No. 2006-0003 specifies that a Sewer System Management Plan (SSMP) must include an Overflow Emergency Response Program that includes, at a minimum, the following:

a. Proper notification procedures so that the primary responders and regulatory agencies are informed of all sanitary sewer overflows (SSOs) in a timely manner;

b. A program to ensure an appropriate response to all overflows;

c. Procedures to ensure prompt notification to appropriate regulatory agencies and other potentially affected entities (e.g. health agencies, Regional Water Boards, water suppliers, etc.) of all SSOs that potentially affect public health or reach the waters of the State in accordance with the monitoring reporting program (MRP), the California Water Code, other State Law, and other applicable Regional Water Board waste discharge requirements (WDRs) or National Pollutant Discharge Elimination Program (NPDES) permit requirements. The SSMP should identify the officials who will receive immediate notification;

d. Procedures to ensure that appropriate staff and contractor personnel are aware of and follow the Emergency Response Plan and are appropriately trained;

e. Procedures to address emergency operations, such as traffic and crowd control and other necessary response activities; and

f. A program to ensure that all reasonable steps are taken to contain and prevent discharge of untreated or partially treated wastewater to waters of the United States and to minimize or correct any adverse impact of the environment resulting from the SSOs, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the discharge.

7.2 SEWAGE SPILL RESPONSE PLAN

The District has prepared a Sewage Spill Response Plan (SSRP), which provides information on procedures to be followed by District Staff in the event of an SSO (Appendix E). Suggested revisions to the SSRP are included in red and underlined in Appendix E. These revisions are provided to conform with the new statewide WDRs and to address specific comments provided by District Staff.

As previously mentioned, the City also conforms to the spill response procedures laid out in the Unified Sanitary Sewer Spill Response Procedure (Appendix F), as well as the reporting requirements of the San Diego RWQCB (Appendix G).

7.3 PRIMARY NOTIFICATION PROCEDURES

Section 3 of the District's SSRP contains the procedures that the District follows in the event of an SSO. This includes the procedures utilized during normal working hours, as well as weekends, holidays, and after hours. These procedures are included in Appendix E, and are summarized in Section 3.4 of this plan.

7.4 SSO RESPONSE PROGRAM

The District's SSRP contains procedures that are used to promote an appropriate response to SSOs that occur within the District's service boundary. Figure 7.1 is a flow chart for that response crews follow while responding to an SSO. This flow chart is provided in the SSRP, and provides a general response procedure for SSO response teams. In general, the field responder's duties are grouped into the following categories:

- First Responder Responsibilities;
- Identify and Relieve the Cause of the Spill;
- Spill Containment and Recovery;
- Cleanup and Disinfection;
- Spill Documentation.

A detailed description of individual tasks to be performed by the response crew is included in Part C of Section 4 of the District's SSRP.

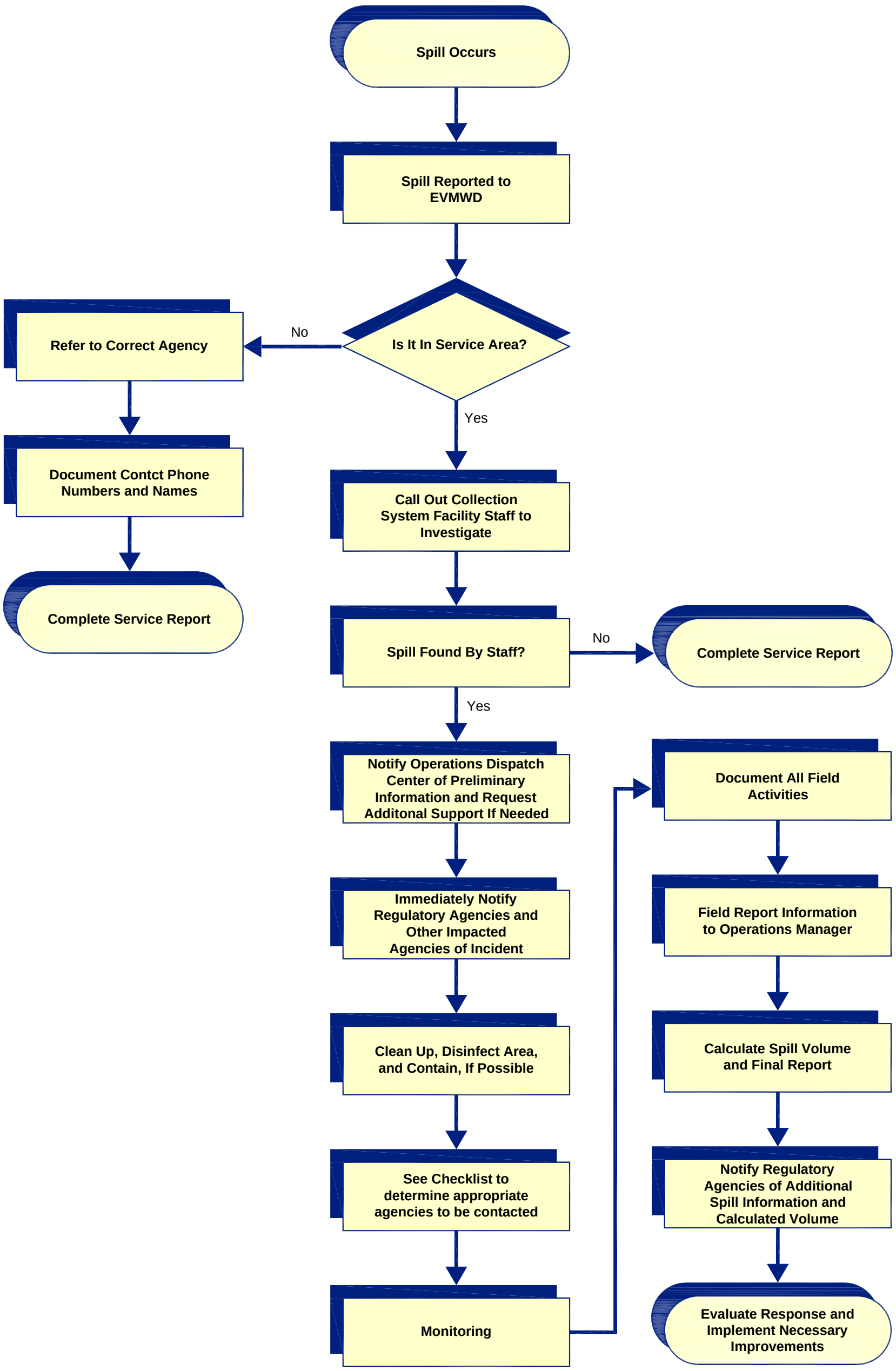

FIGURE 7.1
SPILL RESPONSE FLOW CHART

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7.5 NOTIFICATION OF REGULATORY AGENCIES

If an SSO has occurred, the Dispatch Center (or the 24-hour answering service) completes "Side B" of the Collection System Problem Report Form and immediately starts to notify the appropriate regulatory agencies and other impacted agencies in accordance with the District's Spill Notification Checklists, which are included in the District's SSRP (Appendix E).

Notification of the State Water Resources Control Board (SWRCB) is performed through the California Integrated Water Quality System (CIWQS). On CIWQS, the SSO reporting procedure is dependant upon the type and volume of spill that has occurred. The District is required to use this reporting system to submit SSO spill reports, should they occur, or no spill certification reports. A description of the Category 1 and Category 2 SSO reporting procedure is provided in Sections 3.4.1 and 3.4.2 of this report, respectively.

7.6 EMERGENCY RESPONSE PLAN AWARENESS AND TRAINING

Section 7 of the District's SSRP stipulates that appropriate District personnel, including management, collection systems, wastewater treatment, engineering, and public information personnel, receive a copy of the SSRP and be informed and trained on its provisions. The SSRP identifies three types of training exercises, which are summarized as follows:

- **Orientation Exercise**: This type of exercise is an introductory, lecture-type, session that includes visuals and dialog between the instructor and District staff. This exercise includes an overview of the SSRP components, provisions, and other appropriate topics. This exercise is given to new hires and provided annually thereafter.
- **Tabletop Exercise**: This type of exercise is a simulation of the SSO response activities, and includes no equipment use or deployment of staff. This exercise is performed annually.
- **Field Exercise**: In this type of exercise, an SSO is simulated. This exercise is used to evaluate the SSRP objectives, and to test equipment, response time, and manpower capabilities.

7.7 EMERGENCY OPERATIONS

Section 4 of the District's SSRP identifies steps to be taken by the District's SSO response crew. The first responder to an SSO should take steps to establish an appropriate perimeter around the spill site. This will prevent disruption of the response crew by vehicle traffic, pedestrians, and other factors that may interrupt the crew's ability to effectively respond to an SSO.

7.8 SSO SURFACE WATER IMPACT MITIGATION PROGRAM

Should an SSO result in a discharge to the waters of the United States, the District should take all feasible steps to avoid the degradation of this body of water. These steps will vary on a case by case basis.

Chapter 8

FATS, OILS, AND GREASE CONTROL PLAN

This chapter discusses the need for a Fats, Oils, and Grease (FOG) control program. The purpose of such a program is to limit the amount of fats, oils, and greases that enter the collection system to the extent feasible.

8.1 REGULATORY REQUIREMENT

Order No 2006-0003 specifies that each Sewer System Management Plan (SSMP) must include an evaluation of the service area of the Elsinore Valley Municipal Water District (District) to determine whether a FOG control program is needed. If no FOG program is needed, justification for why it is not needed must be provided. If FOG is considered to be a problem, a FOG source control program must be prepared and implemented, including the following as appropriate:

a. An implementation plan and schedule for a public education outreach program that promotes the proper disposal of FOG;

b. A plan and schedule for the disposal of FOG generated within the sanitary sewer system service area. This may include a list of acceptable disposal facilities and/or additional facilities needed to adequately dispose of FOG generated within a sanitary sewer system service area;

c. The legal authority to prohibit discharges into the system and identify measures to prevent sanitary sewer overflows (SSOs) and blockages caused by FOG;

d. Requirements to install grease removal devices (such as traps or interceptors), design standards for the removal devices, maintenance requirements, Best Management Practice (BMP) requirements, record keeping and reporting requirements;

e. Authority to inspect grease producing facilities, enforcement authorities, and whether the Enrollee has sufficient staff to inspect and enforce the FOG ordinance;

f. An identification of sanitary sewer system sections subject to FOG blockages and establishment of a cleaning maintenance schedule for each section; and

g. Development and implementation of source control measures for all sources of FOG discharged into the sanitary sewer system for each section identified in (f) above.

8.2 FOG CONTROL PLAN

Based on discussions with District staff familiar with the operation and management of the District's wastewater collection systems, it has been determined that FOG is not a major maintenance issue for the District. The District has not identified any specific areas in the system that are routinely affected by FOG, and in areas where FOG is encountered, it is usually due to another problem, such as root intrusion. For this reason, it is concluded that a formal FOG Control Plan is not necessary. The District, however, has implemented several FOG control measures already, as discussed in Section 8.3.

Should the District identify FOG as a major maintenance issue in the future, steps would be taken to study the effects of FOG in the District more thoroughly and prepare and develop a formal FOG Control Plan. Such a program would likely consist of source control measures, inspection of FOG producing facilities, requiring grease interceptor maintenance records be submitted to the District, FOG outreach programs, and BMP requirements.

8.3 EXISTING FOG CONTROL MEASURES

The District's existing FOG control provisions are presented mainly in Article 6 of District Ordinance No. 160 (Appendix H). This article establishes a Gravity Separation Interceptor Program for the District. This includes requirements for the installation of a gravity separation interception system for industrial users that, in the District's opinion, will contribute FOG, flammable substances, sands, suspended solids, or other harmful constituents to the District's collection systems.

The design and installation of an interception system is required to be performed in accordance with District standards. The minimum operational fluid capacity of the interceptor is 750 gallons. An interception system is not required for buildings used solely for residential purposes, except where common food preparation occurs.

Article 6 of Ordinance No. 160 also specifies certain requirements for the maintenance of an interceptor system, which is summarized as follows:

- The interceptor system must be maintained such that it is in proper working order at all times;
- Cleaning shall be performed as often as necessary, but not less than two times per calendar year;
- All cleaning shall be performed by a properly licensed and permitted waste hauler;
- The use of chemicals for the emulsification, suspension, or dissolution of FOG is prohibited; and
- Users who are required to have an interceptor system shall have a written plan of operation or program that ensures that the interceptor is properly working.

Additionally, Volume 1 of the District's Standard Specifications and Drawings [2] contains the standard drawings for sand/oil separators and grease interceptors. Excerpts of this document are included in Appendix K. An electronic copy of the entire document is available through the District's website (www.evmwd.com) [3], and a hard copy can be purchased from the District.

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SYSTEM EVALUATION AND CAPACITY ASSURANCE PLAN

This chapter provides an evaluation of the Elsinore Valley Municipal Water District's (District) sanitary sewer system facilities, identifies and proposes improvements for deficiencies, identifies design criteria, and provides a Capital Improvement Program (CIP) and schedule for improvements.

9.1 REGULATORY REQUIREMENT

Order No. 2006-0003 requires that the District prepare and implement a CIP that will provide hydraulic capacity for peak dry weather flows as well as the appropriate design storm or wet weather event. According to Order No. 2006-0003, the Sewer System Management Plan (SSMP) must address, at a minimum, the following:

a. **Evaluation**. Actions needed to evaluate those portions of sanitary sewer system that are experiencing or contributing to a sanitary sewer overflow (SSO) discharge caused by hydraulic deficiency. The evaluation must provide estimates of peak flows (including flows from SSOs that escape from the system) associated with conditions similar to those causing overflow events, estimates of the capacity of key system components, hydraulic deficiencies (including components of the system with limiting capacity) and the major sources that contribute to the peak flows associated with overflow events;

b. **Design Criteria**. Where design criteria do not exist or are deficient, undertake the evaluation identified in (a) above to establish appropriate design criteria;

c. **Capacity Enhancement Measures**. The steps needed to establish a short- and long-term CIP to address identified hydraulic deficiencies, including prioritization, alternatives analysis, and schedules. The CIP may include increases in pipe size, infiltration and inflow (I/I) reduction programs, increases and redundancy in pumping capacity, and storage facilities. The CIP shall include an implementation schedule and shall identify sources of funding; and

d. **Schedule**. The Enrollee shall develop a schedule of completion dates for all portions of the capital improvement program developed in (a) - (c) above. The schedule shall be reviewed and updated consistent with the SSMP review and update requirements as described in Section D.14 (of Order 2006-0003).

9.2 SYSTEM EVALUATION AND CAPACITY ASSURANCE PLAN

The District contracted Carollo Engineers, P.C. (Carollo) to complete a wastewater master planning project, which included this SSMP. The District's 2008 Wastewater Master Plan (2008 WWMP) [4] contains the following elements:

- Chapter 1 - Introduction
- Chapter 2 - Study Area Characteristics
- Chapter 3 - Wastewater Flow Projections
- Chapter 4 - Existing Wastewater Collection Systems
- Chapter 5 - Model Creation and Calibration
- Chapter 6 - Planning and Evaluation Criteria
- Chapter 7 - Existing System Evaluation
- Chapter 8 - Future System Evaluation
- Chapter 9 - Capital Improvement Program

This SSMP has been completed in conjunction with the WWMP [4]. The elements of the 2008 WWMP [4] that are required through Order No. 2006-0003 have been summarized in the following subsections. The executive summary of the 2008 WWMP [4] is included in Appendix L. A full copy of the 2008 WWMP [4] is available for review through the District.

9.2.1 Analysis Method

The District's wastewater collection systems were analyzed as part of the 2008 WWMP [4] with the aid of computer hydraulic modeling software. There is an abundance of sewer analysis software in the marketplace today, with a variety of features and capabilities. The selection of a particular model generally depends on user preferences, software costs, and the complexity of the sewer system. It was agreed that H_2OMAP SWMM, by MWH Soft, would be used to assemble the District's hydraulic model. H_2OMAP SWMM is a fully dynamic, stand alone, wastewater and stormwater modeling software application. This program includes seamless integration with the District's GIS data.

9.2.2 Planning and Design Criteria

The 2008 WWMP [4] established several criteria to model and evaluate the District's wastewater collection systems. This section summarizes the most important planning criteria that were used in the 2008 WWMP [4].

9.2.2.1 Gravity Sewers

The District's gravity sewers were analyzed in accordance with the criteria established in the following subsections.

9.2.2.1.1 Pipe Capacities

Pipe capacities for gravity sewers were determined through the use of the Continuity Equation and Manning's Equation for steady-state flow. The Continuity and Manning's Equation are presented as follows:

Continuity Equation:

$$Q = VA$$

where: Q = peak flow, cfs
V = velocity, fps
A = cross sectional area of pipe, sq. ft.

Manning's Equation:

$$V = \frac{1.486 R^{2/3} S^{1/2}}{n}$$

where: V = velocity, fps
n = Manning's coefficient of friction
R = hydraulic radius (area divided by wetted perimeter), ft
S = slope of pipe, feet per foot

9.2.2.1.2 Manning Coefficient (n)

The Manning coefficient 'n' is a friction coefficient and varies with respect to pipe material, size of pipe, depth of flow, smoothness of joints, root intrusion, and other factors. A value of 0.013 was used for gravity sewers in the master planning effort.

9.2.2.1.3 Flow Depth Criteria (d/D)

When designing sewer pipelines, it is common practice to adopt variable flow depth criteria for various pipe sizes. This criteria is expressed as a maximum depth of flow to pipe diameter ratio (d/D). Design d/D ratios typically range from 0.5 to 0.92, with the lower values typically used for smaller pipes, which may experience peak flows greater than the design flow or blockages from debris, paper, or rags. Table 9.1 summarizes the d/D ratios used for planning future trunk sizes.

According to Table 9.1, all new sewer trunks greater than 12 inches in diameter should be sized to carry the design flow at a maximum d/D ratio of 2/3. However, utilizing a d/D ratio of 2/3 for analyzing the existing wastewater collection system may lead to premature or unnecessary replacement of existing pipelines. Therefore, a d/D ratio of 0.92 (pipe flowing full) was utilized to evaluate the District's existing trunk system.

Table 9.1 Master Plan Maximum d/D Ratio Sewer System Management Plan Elsinore Valley Municipal Water District	
Pipe Diameter (in)	**Maximum d/D Ratio (during peak flows)**
12 and smaller (New Sewers)	1/2
Larger than 12 (New Sewers)	2/3
All Diameters (Existing Pipes)	0.92
Source: 2008 WWMP [4]	

9.2.2.1.4 Changes in Pipe Size

For the master planning effort, and in the absence of field data, sewer crowns were matched at the manholes when a smaller sewer joined a larger sewer.

9.2.2.1.5 Design Velocities and Minimum Slopes

According to the District's standard design requirements, sewers must be designed and constructed such that the mean velocity during design peak flow conditions is greater than 2 feet per second (fps). The maximum allowable velocity for gravity sewers is 10 fps.

Table 9.2 lists the minimum slopes that were used for planning future improvements. These values are based on the District's standard design requirements [2].

Table 9.2 Minimum Slopes for New Circular Pipes Sewer System Management Plan Elsinore Valley Municipal Water District		
Sewer Size (in)	**Minimum Pipe Slope (ft/ft)**	**Pipe Material**
4	0.0200	SDR-35 PVC
6	0.0100	SDR-35 PVC
8	0.0040	SDR-35 PVC
10	0.0032	SDR-35 PVC
12	0.0024	SDR-35 PVC
15	0.0015	SDR-35 PVC
18	0.0012	SDR-35 PVC
21	0.0009	Vylon
24	0.0008	Vylon
27	0.0006	Vylon

9.2.2.2 Lift Stations and Force Mains

As part of the master planning effort, the District's lift stations were evaluated and sized for peak flow with the largest pump serving as standby. For the sizing of force mains, the minimum and maximum recommended velocities are 2.0 and 6.5 fps, respectively. The Hazen-Williams formula is commonly used for the sizing of force mains. The Velocity Equation is:

$$V = 1.32\ C\ R^{0.63}\ S^{0.54}$$

where: V = mean velocity, fps
C = roughness coefficient
R = hydraulic radius, ft
S = slope of the energy grade line, ft/ft

The value of the Hazen-Williams 'C' varies with the type of pipe material. This value is influenced by the type of construction and age of the pipe. A 'C' value of 130 was used as part of the master planning effort.

9.2.3 Evaluation

To identify existing and future system deficiencies, the City's hydraulic model was developed using H_2OMAP SWMM. In order to accomplish this, the District's GIS data was converted to the H_2OMAP SWMM format and imported into H_2OMAP SWMM.

Wastewater flow projections were then developed based on the water demand data available from the 2007 Water Distribution System Master Plan (2007 WMP) [5] in five-year increments through the year 2030. Wastewater loads were then applied to the appropriate District manholes.

Based on the results of the temporary flow monitoring programs performed as part of the master planning effort, diurnal patterns were developed to be applied to the base wastewater flow at manholes in the District. The model was then calibrated to confirm that the modeled flow closely represents the actual flows recorded during the dry and wet weather flow monitoring programs.

Following calibration, the existing wastewater collection systems were evaluated according to the planning and design criteria summarized in this chapter. Deficient facilities were identified and improvement projects were recommended to address the identified deficiencies. Following the evaluation of the existing system, the District's wastewater collection systems were evaluated for future conditions. Future deficiencies were then identified and improvement projects were recommended such that the District's wastewater collection systems would be capable of conveying wastewater flows through the planning horizon.

9.2.4 Capacity Enhancement Measures

The 2008 WWMP [4] recommended improvements to mitigate existing and serve future customers. For a detailed description of the recommended improvements, see the District's 2008 WWMP [4]. The proposed improvements from the 2008 WWMP are shown in Figure 9.1.

9.2.5 Schedule

As part of the 2008 WWMP [4], a CIP and schedule was developed with a planning horizon of 2030. Table 9.3 lists the CIP and schedule for improvements that were included in the 2008 WWMP. As shown in Table 9.3, the total wastewater collection systems CIP is estimated to be approximately $207 million dollars. More details on the wastewater collection systems CIP can be found in the 2008 WWMP [4].

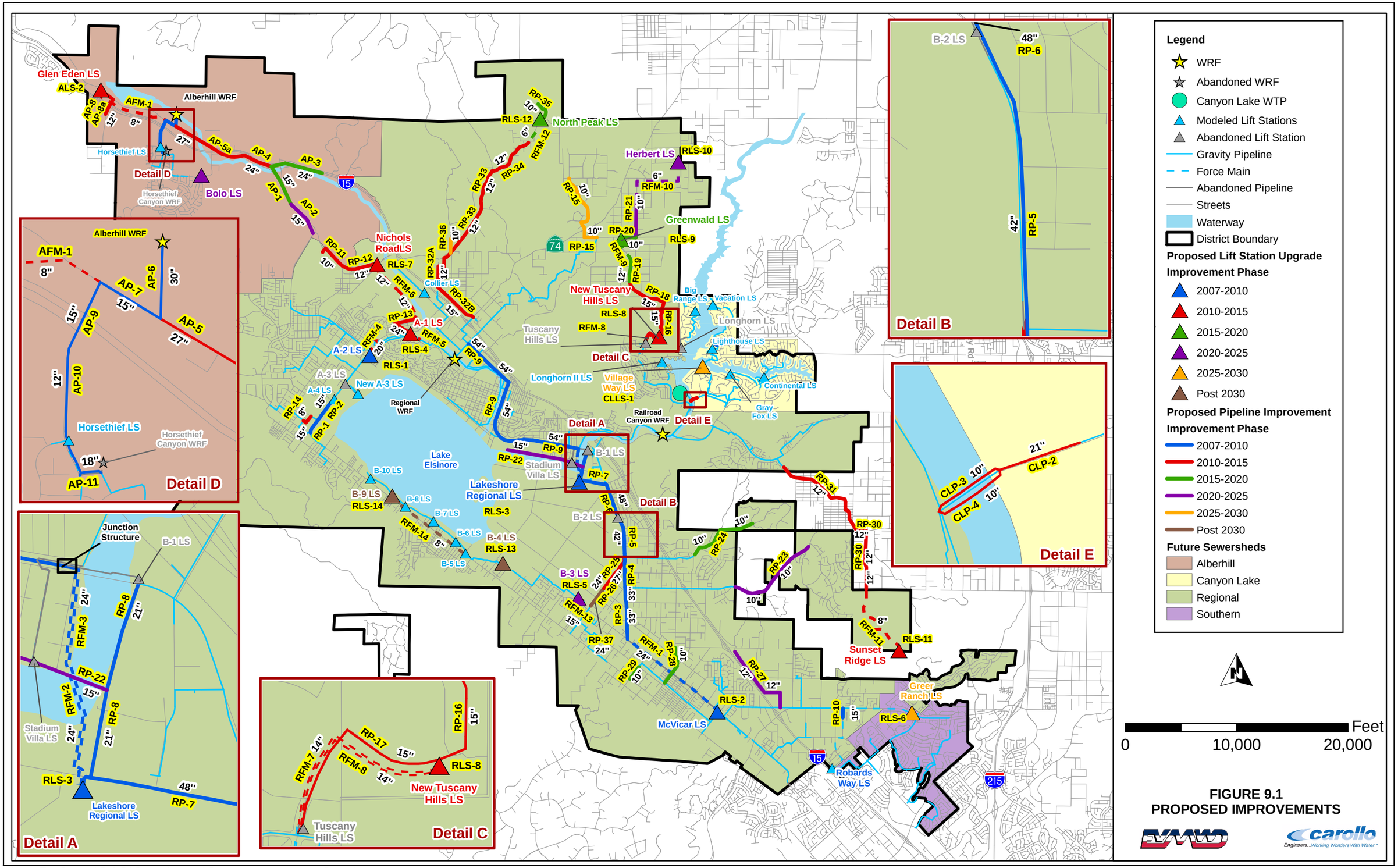

FIGURE 9.1
PROPOSED IMPROVEMENTS

*Note: The Serena LS, A-5 LS, and Alberhill LS were not included in the District's hydraulic model.

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Table 9.3 Capital Improvement Program
Sewer System Management Plan
Elsinore Valley Municipal Water District

Description of CIP Items								CIP Sizes				CIP Costs			CIP Costs by Phases						CIP Financing Split (Existing vs. Future Users)			
No.	Coded No.	Type of Improve-ment	Description/ Street	Description/ Limits	Sewer Trunk/ Planned Trunk Name	Detail Figure (See Master Plan Report)	Existing Deficiency	Ex. Size/ Diam. (in.)	New Size/ Diam. (in.)	Parallel/ Replace/ New	Length (ft)	Unit Cost ($/unit)	Baseline Construction Cost[7] ($)	Capital Improvement Cost (Rounded)[4] ($)	Phase 1 2008-2010 ($)	Phase 2 2011-2015 ($)	Phase 3 2016-2020 ($)	Phase 4 2021-2025 ($)	Phase 5 2026-2030 ($)	Phase 6 Post 2030 ($)	Future Users Benefit (%)	Existing Users Cost ($)	Future Users Cost ($)	Total Capital Cost ($)
Regional Sewershed																								
Gravity Main Improvements																								
1	RP-1	Pipe	Riverside Dr.	Grand Ave. to 1,300' ne/o Grand Ave.	A Trunk	Figure 1	X	10	15	Replace	1,300	339	$442,000	$687,000	$687,000						33%	$460,290	$226,710	$687,000
2	RP-2	Pipe	Riverside Dr.	1,300' ne/o Grand Ave. to 500' w/o A-4 LS	A Trunk	Figure 1	X	10	15	Replace	2,000	339	$679,000	$1,053,000	$1,053,000						37%	$663,390	$389,610	$1,053,000
3	RP-3	Pipe	Mission Trail	McVicar Force Main Discharge to Bundy Canyon Rd.	Lakeshore South	Figure 4A	X	12/15	33	Parallel	4,700	N/A[5]	$0	$0	$0						69%	$0	$0	$0
4	RP-4	Pipe	Mission Trail	Bundy Canyon Rd. to Corydon St.	Lakeshore South	Figure 4A	X	18	33	Parallel	2,300	N/A[5]	$0	$0	$0						70%	$0	$0	$0
5	RP-5	Pipe	Mission Trail	Corydon St. to 600' s/o Sedco Blvd.	Lakeshore South	Figure 5	X	21	42	Parallel	3,700	N/A[5]	$0	$0	$0						70%	$0	$0	$0
6	RP-6	Pipe	Mission Trail	600' sw/o Sedco Blvd. to Malaga Rd.	Lakeshore South	Figure 5	X	21	48	Parallel	3,500	N/A[5]	$0	$0	$0						71%	$0	$0	$0
7	RP-7	Pipe	Malaga Rd.	Mission Trail to planned Lakeshore Regional LS	Lakeshore Malaga	Figure 5	X	-	48	New	2,400	N/A[5]	$0	$0	$0						71%	$0	$0	$0
8	RP-8	Pipe	w/o Mission Trail	Lakeshore Dr. to Malaga Rd.	Regional/Lakeshore South	Figure 5	X	-	21	New	2,700	475	$1,284,000	$1,992,000	$1,992,000						0%	$1,992,000	$0	$1,992,000
9	RP-9	Pipe	Various Streets	B-1 Force Main Discharge to 3rd St.	Lakeshore North	Figure 6	X	24	54	Parallel	17,500	N/A[5]	$0	$0	$0						62%	$0	$0	$0
10	RP-10	Pipe	Jana Ln.	Robards Way LS Force Main Discharge End to Clinton Keith Rd.	Clinton Keith	Figure 3	X	10	15	Replace	900	339	$306,000	$475,000	$475,000						10%	$427,500	$47,500	$475,000
11	RP-11	Pipe	Coal Ave.	se/o Robb Rd. to Terra Cotta Rd.	Nichols Road	Figure 9		-	10	New	2,700	226	$611,000	$949,000		$949,000					100%	$0	$949,000	$949,000
12	RP-12	Pipe	Coal Ave.	Terra Cotta Rd. to Nichols Rd.	Nichols Road	Figure 9		-	12	New	3,200	272	$869,000	$1,348,000		$1,348,000					100%	$0	$1,348,000	$1,348,000
13	RP-13	Pipe	Turnbull Ave. and Gunnerson St.	Bunker St. to the A-1 LS	Nichols Road	Figure 9		-	24	New	3,300	582	$1,921,000	$2,980,000		$2,980,000					100%	$0	$2,980,000	$2,980,000
14	RP-14	Pipe	sw/o Ulla Ln.	w/o Ulla Ln. to w/o Riverside Dr.	A Trunk	Figure 1		-	8	New	1,000	181	$181,000	$283,000		$283,000					100%	$0	$283,000	$283,000
15	RP-15	Pipe	Hammack Ave.	Telford Ave. to Mauricio St.	3rd Street Trunk Extension	Figure 11		-	10	New	7,500	226	$1,698,000	$2,633,000					$2,633,000		100%	$0	$2,633,000	$2,633,000
16	RP-16	Pipe	No Existing Street	840' s/o Greenwald Ave. to New Tuscany Hills LS	North Tuscany Hills	Figure 8		-	15	New	2,800	315/945	$1,772,000	$2,748,000		$2,748,000					100%	$0	$2,748,000	$2,748,000
17	RP-17	Pipe	Summerhill Drive Extension	Existing Temporary Tuscany Hills LS n/e to Tuscany Hills LS	North Tuscany Hills	Figure 8		-	15	New	1,900	339	$645,000	$1,001,000		$1,001,000					100%	$0	$1,001,000	$1,001,000
18	RP-18	Pipe	Greenwald Ave.	Scenic Crest Dr. to 840' s/o Greenwald Ave.	North Tuscany Hills	Figure 8		-	15	New	4,700	339	$1,596,000	$2,475,000		$2,475,000					100%	$0	$2,475,000	$2,475,000
19	RP-19	Pipe	Greenwald Ave.	n/o Hyatt Rd. to Scenic Crest Dr.	North Tuscany Hills	Figure 8		-	12	New	2,300	272	$625,000	$970,000			$970,000				100%	$0	$970,000	$970,000
20	RP-20	Pipe	Mauricio St.	Penny Place to Greenwald Ave.	North Tuscany Hills	Figure 8		-	10	New	1,400	226	$317,000	$493,000			$493,000				100%	$0	$493,000	$493,000
21	RP-21	Pipe	Read St.	Senola Ave. to Mauricio St.	North Tuscany Hills	Figure 8		-	10	New	3,900	226	$883,000	$1,370,000				$1,370,000			100%	$0	$1,370,000	$1,370,000
22	RP-22	Pipe	s/o Lakeshore Dr.	e/o Lakepoint Park to e/o San Jacinto River	East Lake Subtrunk	Figure 10		-	15	New	7,000	339	$2,377,000	$3,686,000				$3,686,000			100%	$0	$3,686,000	$3,686,000
23	RP-23	Pipe	Bundy Canyon Rd.	e/o The Farm Rd. to w/o Tulip Ln.	Bundy Canyon Road Trunk Extension	Figure 13		-	10	New	8,600	226	$1,947,000	$3,020,000				$3,020,000			100%	$0	$3,020,000	$3,020,000
24	RP-24	Pipe	Lost Rd.	Crooked Arrow Dr. to Lemon St.	Lemon Street Trunk Extension	Figure 14		-	10	New	6,500	226	$1,471,000	$2,282,000			$2,282,000				100%	$0	$2,282,000	$2,282,000
25	RP-25	Pipe	Croydon St.	Cereal Street to Mission Trail	B Trunk	Figure 2A		18	27	Replace	1,900	655	$1,244,000	$1,930,000		$1,930,000					100%	$0	$1,930,000	$1,930,000
26	RP-26	Pipe	Croydon St.	e/o Melinda Ln. to Cereal St.	B Trunk	Figure 2A		18	24	Replace	1,500	582	$873,000	$1,354,000		$1,354,000					100%	$0	$1,354,000	$1,354,000
27	RP-27	Pipe	Parallel to Interstate 15	Frederick St. to Clinton Keith Rd.	Interstate 15 Subtrunk	Figure 15		-	12	New	7,400	252/756	$3,504,000	$5,433,000				$5,433,000			100%	$0	$5,433,000	$5,433,000

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Table 9.3 Capital Improvement Program
Sewer System Management Plan
Elsinore Valley Municipal Water District

Description of CIP Items								CIP Sizes				CIP Costs			CIP Costs by Phases						CIP Financing Split (Existing vs. Future Users)			
No.	Coded No.	Type of Improve-ment	Description/ Street	Description/ Limits	Sewer Trunk/ Planned Trunk Name	Detail Figure (See Master Plan Report)	Existing Deficiency	Ex. Size/ Diam. (in.)	New Size/ Diam. (in.)	Parallel/ Replace/ New	Length (ft)	Unit Cost ($/unit)	Baseline Construction Cost[7] ($)	Capital Improvement Cost (Rounded)[4] ($)	Phase 1 2008-2010 ($)	Phase 2 2011-2015 ($)	Phase 3 2016-2020 ($)	Phase 4 2021-2025 ($)	Phase 5 2026-2030 ($)	Phase 6 Post 2030 ($)	Future Users Benefit (%)	Existing Users Cost ($)	Future Users Cost ($)	Total Capital Cost ($)
28	RP-28	Pipe	Orange St. and Gruwell St.	Laguna Rd. to Front St.	Orange/Gruwell Street Subtrunk Extension	Figure 16		-	10	New	3,700	226	$838,000	$1,300,000			$1,300,000				100%	$0	$1,300,000	$1,300,000
29	RP-29	Pipe	Wesley St.	Grand Ave. to Union St.	Front Street Subtrunk Extension	Figure 16		-	10	New	1,400	226	$317,000	$493,000			$493,000				100%	$0	$493,000	$493,000
30	RP-30	Pipe	Arcadia Ln. and Lynx Rd.	Sunset Ridge LS force main to Bundy Canyon Rd.	Sunset Ridge	Figure 12		-	12	New	6,200	272	$1,684,000	$2,612,000		$2,612,000					100%	$0	$2,612,000	$2,612,000
31	RP-31	Pipe	Cottonwood Canyon Rd.	Bundy Canyon Rd. to n/o Hemlock St.	Sunset Ridge	Figure 12		-	12	New	10,000	272	$2,716,000	$4,211,000		$4,211,000					100%	$0	$4,211,000	$4,211,000
32	RP-32A	Pipe	El Toro Rd.	Lindell Rd. to Dexter Ave.	North Peak	Figure 7		-	12	New	4,100	272	$1,114,000	$1,729,000		$1,729,000					100%	$0	$1,729,000	$1,729,000
33	RP-32B	Pipe	Dexter Ave.	El Toro Rd. to Highway 74	North Peak	Figure 7		-	15	New	4,200	315/945	$2,857,000	$4,430,000		$4,430,000					100%	$0	$4,430,000	$4,430,000
34	RP-33	Pipe	El Toro Rd.	North Peak Development to Lindell Rd.	North Peak	Figure 7		-	12	New	7,800	272	$2,119,000	$3,285,000		$3,285,000					100%	$0	$3,285,000	$3,285,000
35	RP-34	Pipe	El Toro Rd.	North Peak LS force main 5,300' sw/o force main	North Peak	Figure 7		-	12	New	5,300	272	$1,440,000	$2,232,000		$2,232,000					100%	$0	$2,232,000	$2,232,000
36	RP-35	Pipe	El Toro Rd.	n/o North Peak LS to North Peak LS	North Peak	Figure 7		-	10	New	2,000	226	$453,000	$703,000			$703,000				100%	$0	$703,000	$703,000
37	RP-36	Pipe	Lindell Road	1,300' n/o El Toro Road to El Toro Rd.	North Peak	Figure 7		-	10	New	1,300	226	$295,000	$459,000					$459,000		100%	$0	$459,000	$459,000
38	RP-37	Pipe	Corydon St.	B-3 LS Force Main outlet to e/o Melinda Ln.	B Trunk	Figure 2A		18	24	Replace	2,000	582	$1,164,000	$1,806,000						$1,806,000	100%	$0	$1,806,000	$1,806,000
Subtotal Gravity Main Improvements													$40,242,000	$62,422,000	$4,207,000	$33,567,000	$6,241,000	$13,509,000	$3,092,000	$1,806,000		$3,543,180	$58,878,820	$62,422,000
Lift Station Improvements																								
39	RLS-1	Lift Station	se/o Riverside Dr.	A-2 LS Upgrade	A Trunk	Figure 1	X	2,400 gpm	7.5 mgd	Replace	-	-	$15,000,000	$23,250,000	$23,250,000						28%	$16,740,000	$6,510,000	$23,250,000
40	RLS-2	Lift Station	McVicar St.	McVicar LS Upgrade	Mission Trail	Figure 4B	X	1,350 gpm	8.5 mgd	Replace	-	-	$17,000,000	$26,350,000	$26,350,000						69%	$8,168,500	$18,181,500	$26,350,000
41	RLS-3	Lift Station	Malaga Rd.	New Lakeshore Regional Lift Station	Lakeshore Malaga	Figure 5	X	-	22.50 mgd	New	-	-	$0	$0							72%	$0	$0	$0
42	RLS-4	Lift Station	Strickland Ave.	A-1 LS Upgrade	A Trunk	Figure 9		255 gpm	1.5 mgd	Replace	-	-	$3,000,000	$4,650,000		$4,650,000					100%	$0	$4,650,000	$4,650,000
43	RLS-5	Lift Station	Grand Ave.	B-3 LS Upgrade	B Trunk	Figure 2A		1,050 gpm	3.0 mgd	Replace	-	-	$6,000,000	$9,300,000				$9,300,000			100%	$0	$9,300,000	$9,300,000
44	RLS-6	Lift Station	Clinton Keith Rd.	Greer Ranch LS Upgrade	Clinton Keith	Figure 3		350 gpm	0.75 mgd	Replace	-	-	$1,500,000	$2,325,000					$2,325,000		100%	$0	$2,325,000	$2,325,000
45	RLS-7	Lift Station	Nichols Rd.	New Nichols Rd. LS	Nichols Road	Figure 9		-	1.0 mgd	New	-	-	$2,000,000	$3,100,000		$3,100,000					100%	$0	$3,100,000	$3,100,000
46	RLS-8	Lift Station	ne/o Existing Tuscany Hills LS	New Tuscany Hills LS	North Tuscany Hills	Figure 8		-	2.5 mgd	New	-	-	$5,000,000	$7,750,000		$7,750,000					100%	$0	$7,750,000	$7,750,000
47	RLS-9	Lift Station	Greenwald Ave.	New Greenwald LS	North Tuscany Hills	Figure 8		-	0.5 mgd	New	-	-	$1,000,000	$1,550,000			$1,550,000				100%	$0	$1,550,000	$1,550,000
48	RLS-10	Lift Station	Herbert St.	New Herbert LS	North Tuscany Hills	Figure 8		-	0.25 mgd	New	-	-	$500,000	$775,000				$775,000			100%	$0	$775,000	$775,000
49	RLS-11	Lift Station	Sunset Ridge Development	New Sunset Ridge LS	Sunset Ridge	Figure 12		-	0.5 mgd	New	-	-	$1,000,000	$1,550,000		$1,550,000					100%	$0	$1,550,000	$1,550,000
50	RLS-12	Lift Station	North Peak Development	New North Peak LS	North Peak	Figure 7		-	0.5 mgd	New	-	-	$1,000,000	$1,550,000			$1,550,000				100%	$0	$1,550,000	$1,550,000
51	RLS-13	Lift Station	e/o Grand Ave.	B-4 LS Upgrade	B Trunk	Figure 2B		1,010 gpm	2.5 mgd	Replace	-	-	$5,000,000	$7,750,000						$7,750,000	100%	$0	$7,750,000	$7,750,000
52	RLS-14	Lift Station	Grand Ave.	B-9 LS Upgrade	B Trunk	Figure 2B		260 gpm	0.75 mgd	Replace	-	-	$1,500,000	$2,325,000						$2,325,000	100%	$0	$2,325,000	$2,325,000
Subtotal Lift Station Improvements													$59,500,000	$92,225,000	$49,600,000	$17,050,000	$3,100,000	$10,075,000	$2,325,000	$10,075,000		$24,908,500	$67,316,500	$92,225,000

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Table 9.3 Capital Improvement Program
Sewer System Management Plan
Elsinore Valley Municipal Water District

Description of CIP Items												CIP Costs			CIP Costs by Phases							CIP Financing Split (Existing vs. Future Users)			
								CIP Sizes																	
No.	Coded No.	Type of Improve-ment	Description/ Street	Description/ Limits	Sewer Trunk/ Planned Trunk Name	Detail Figure (See Master Plan Report)	Existing Deficiency	Ex. Size/ Diam. (in.)	New Size/ Diam. (in.)	Parallel/ Replace/ New	Length (ft)	Unit Cost ($/unit)	Baseline Construction Cost[7] ($)	Capital Improvement Cost (Rounded)[4] ($)	Phase 1 2008-2010 ($)	Phase 2 2011-2015 ($)	Phase 3 2016-2020 ($)	Phase 4 2021-2025 ($)	Phase 5 2026-2030 ($)	Phase 6 Post 2030 ($)	Future Users Benefit (%)	Existing Users Cost ($)	Future Users Cost ($)	Total Capital Cost ($)
Force Main Improvements																									
53	RFM-1	Force Main	Palomar St.	McVicar St. to Mission Trail	Mission Trail	Figure 4B	X	12	24	Replace	11,100	420	$4,662,000	$7,228,000	$7,228,000						69%	$2,240,680	$4,987,320	$7,228,000
54	RFM-2	Force Main	w/o Mission Trail	Lakeshore Regional Lift Station FM-1	Lakeshore Malaga	Figure 5	X	-	24	New	3,600	420	$0	$0	$0						72%	$0	$0	$0
55	RFM-3	Force Main	w/o Mission Trail	Lakeshore Regional Lift Station FM-2	Lakeshore Malaga	Figure 5	X	-	24	New	3,600	420	$0	$0	$0						72%	$0	$0	$0
56	RFM-4	Force Main	Riverside Dr.	A-2 LS Force Main Upgrade	A Trunk	Figure 1		14	20	Replace	1,700	350	$595,000	$924,000		$924,000					100%	$0	$924,000	$924,000
57	RFM-5	Force Main	Strickland Ave.	A-1 LS Force Main Upgrade	A Trunk	Figure 9		6	8	Replace	1,100	140	$154,000	$241,000		$241,000					100%	$0	$241,000	$241,000
58	RFM-6	Force Main	Nichols Rd.	New Nichols Rd. LS Force Main	Nichols Road	Figure 9		-	12	New	6,700	210	$1,407,000	$2,183,000		$2,183,000					100%	$0	$2,183,000	$2,183,000
59	RFM-7	Force Main	ne/o Existing Tuscany Hills LS	New Tuscany Hills LS Force Main	North Tuscany Hills	Figure 8		-	14	New	1,900	245	$466,000	$723,000		$723,000					100%	$0	$723,000	$723,000
60	RFM-8	Force Main	ne/o Existing Tuscany Hills LS	New Tuscany Hills LS Force Main	North Tuscany Hills	Figure 8		-	14	New	1,900	245	$466,000	$723,000		$723,000					100%	$0	$723,000	$723,000
61	RFM-9	Force Main	Greenwald Ave.	New Greenwald LS Force Main	North Tuscany Hills	Figure 8		-	8	New	1,600	140	$224,000	$349,000			$349,000				100%	$0	$349,000	$349,000
62	RFM-10	Force Main	Herbert St.	New Herbert LS Force Main	North Tuscany Hills	Figure 8		-	6	New	6,300	106	$668,000	$1,037,000				$1,037,000			100%	$0	$1,037,000	$1,037,000
63	RFM-11	Force Main	Sunset Ridge Development	New Sunset Ridge LS Force Main	Sunset Ridge	Figure 12		-	8	New	7,100	140	$994,000	$1,543,000		$1,543,000					100%	$0	$1,543,000	$1,543,000
64	RFM-12	Force Main	North Peak Development	New North Peak LS Force Main	North Peak	Figure 7		-	6	New	2,500	106	$265,000	$412,000			$412,000				100%	$0	$412,000	$412,000
65	RFM-13	Force Main	Grand Ave.	B-3 LS Force Main	B Trunk	Figure 2A		10	15	Replace	1,400	245	$343,000	$533,000						$533,000	100%	$0	$533,000	$533,000
66	RFM-14	Force Main	Grand Ave.	B-9 LS Force Main	B Trunk	Figure 2B		6	8	Replace	8,700	140	$1,218,000	$1,889,000						$1,889,000	100%	$0	$1,889,000	$1,889,000
Subtotal Force Main Improvements													$11,462,000	$17,785,000	$7,228,000	$6,337,000	$761,000	$1,037,000	$0	$2,422,000		$2,240,680	$15,544,320	$17,785,000
Subtotal Regional Sewershed Improvements													$111,204,000	$172,432,000	$110,635,000	$74,004,000	$13,202,000	$34,696,000	$7,742,000	$24,378,000		$30,692,360	$129,399,640	$160,092,000
Canyon Lake Sewershed																								
Gravity Main Improvements																								
67	CLP-1	Pipe	Redwood Dr.	Boating Way to 470' se/o Boating Way	Canyon Lake	Figure 17	X	8	12	Replace	500	272	$136,000	$212,000	$212,000						28%	$152,640	$59,360	$212,000
68	CLP-2	Pipe	Cottonwood Canyon Rd.	e/o San Jacinto River	Canyon Lake Railroad Canyon Road	Figure 18		15	21	Replace	300	475	$143,000	$223,000		$223,000					100%	$0	$223,000	$223,000
69	CLP-3	Pipe	Siphon Under San Jacinto River	Parallel Siphon with 2 10-inch pipes	Canyon Lake Railroad Canyon Road	Figure 18		-	10	Parallel	300	226	$68,000	$107,000		$107,000					100%	$0	$107,000	$107,000
70	CLP-4	Pipe	Siphon Under San Jacinto River	Parallel Siphon with 2 10-inch pipes	Canyon Lake Railroad Canyon Road	Figure 18		-	10	Parallel	300	226	$68,000	$107,000		$107,000					100%	$0	$107,000	$107,000
Subtotal Gravity Main Improvements													$415,000	$649,000	$212,000	$437,000	$0	$0	$0	$0		$152,640	$496,360	$649,000
Lift Station Improvements																								
71	CLLS-1	Lift Station	Village Way	Village Way LS Upgrade	Canyon Lake	Figure 17		1,075 gpm	1.8 mgd	Replace	-	-	3,500,000	5,425,000					5,425,000		100%	$0	$5,425,000	$5,425,000
Subtotal Lift Station Improvements													$3,500,000	$5,425,000	$0	$0	$0	$0	$5,425,000	$0		$0	$5,425,000	$5,425,000
Subtotal Canyon Lake Sewershed Improvements													$3,915,000	$6,074,000	$212,000	$874,000	$0	$0	$0	$0		$152,640	$933,360	$1,086,000

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Table 9.3 Capital Improvement Program
Sewer System Management Plan
Elsinore Valley Municipal Water District

Description of CIP Items												CIP Costs			CIP Costs by Phases							CIP Financing Split (Existing vs. Future Users)			
								CIP Sizes																	
No.	Coded No.	Type of Improve-ment	Description/ Street	Description/ Limits	Sewer Trunk/ Planned Trunk Name	Detail Figure (See Master Plan Report)	Existing Deficiency	Ex. Size/ Diam. (in.)	New Size/ Diam. (in.)	Parallel/ Replace/ New	Length (ft)	Unit Cost ($/unit)	Baseline Construction Cost[7] ($)	Capital Improvement Cost (Rounded)[4] ($)	Phase 1 2008-2010 ($)	Phase 2 2011-2015 ($)	Phase 3 2016-2020 ($)	Phase 4 2021-2025 ($)	Phase 5 2026-2030 ($)	Phase 6 Post 2030 ($)	Future Users Benefit (%)	Existing Users Cost ($)	Future Users Cost ($)	Total Capital Cost ($)
Alberhill Sewershed																									
Gravity Main Improvements																									
72	AP-1	Pipe	Lake St.	3,560' se/oTemescal Canyon Rd. to Temescal Canyon Rd.	Pacific Clay	Figure 21		-	15	New	3,600	339	$1,223,000	$1,897,000			$1,897,000				100%	$0	$1,897,000	$1,897,000
73	AP-2	Pipe	Lake St.	nw/o Coal Rd. to 3,560' se/o Temescal Canyon Rd.	Pacific Clay	Figure 21		-	15	New	3,900	339	$1,324,000	$2,054,000				$2,054,000			100%	$0	$2,054,000	$2,054,000
74	AP-3	Pipe	Parallel to Interstate 15	4,700' e/o Lake St. to Lake St.	East Alberhill CFD	Figure 20		-	18	New	4,700	407	$1,915,000	$2,970,000			$2,970,000				100%	$0	$2,970,000	$2,970,000
75	AP-4	Pipe	Parallel to Interstate 15	Lake Street to 2,660' w/o Lake St.	East Alberhill CFD	Figure 20		-	24	New	2,700	582	$1,572,000	$2,438,000		$2,438,000					100%	$0	$2,438,000	$2,438,000
76	AP-5	Pipe	Parallel to Interstate 15	s/o Interstate 15 to e/o Horsethief Canyon Rd.	East Alberhill CFD	Figure 20		-	27	New	6,800	655	$4,452,000	$6,902,000		$6,902,000					100%	$0	$6,902,000	$6,902,000
77	AP-5a	Casing[1]	Interstate 15	Crossing Under Interstate 15	East Alberhill CFD	Figure 20		-	27/48	New	350	1,768	$619,000	$960,000		$960,000					100%	$0	$960,000	$960,000
78	AP-6	Pipe	e/o Horsethief Canyon Rd.	Interstate 15 to the Alberhill WRF	Glen Eden	Figure 19		-	30	New	1,200	727	$873,000	$1,354,000	$1,354,000						100%	$0	$1,354,000	$1,354,000
79	AP-7	Pipe	Parallel to Interstate 15	Horsethief Canyon Rd. to e/o Horsethief Canyon Rd.	Glen Eden	Figure 19		-	15	New	1,100	339	$374,000	$582,000	$582,000						100%	$0	$582,000	$582,000
80	AP-8	Pipe	Near Interstate 15	Glen Eden to the Glen Eden LS	Glen Eden	Figure 19		-	12	New	1,250	272	$340,000	$527,000		$527,000					100%	$0	$527,000	$527,000
81	AP-8a	Casing[1]	Interstate 15	Crossing Under Interstate 15	Glen Eden	Figure 19		-	12/30	New	550	2,025	$1,114,000	$1,729,000		$1,729,000					100%	$0	$1,729,000	$1,729,000
82	AP-9	Pipe	Horsethief Canyon Rd.	s/o Interstate 15 to Temescal Canyon Rd.	Horsethief Canyon Road Connector Trunk	Figure 22		-	15	New	1,200	339	$408,000	$634,000	$634,000						60%	$253,600	$380,400	$634,000
83	AP-9a	Casing[1]	Interstate 15	Crossing Under Interstate 15	Horsethief Canyon Road Connector Trunk	Figure 22		-	15/35	New	300	917	$275,000	$428,000	$428,000						60%	$171,200	$256,800	$428,000
84	AP-10	Pipe	Horsethief Canyon Rd.	n/o Kicking Horse Dr. to s/o Interstate 15	Horsethief Canyon Road Connector Trunk	Figure 22		-	12	New	1,700	272	$462,000	$718,000	$718,000						60%	$287,200	$430,800	$718,000
85	AP-11	Pipe	n/o Kicking Horse Dr.	near Horsethief WRF to Horsethief Canyon Rd.	Horsethief Canyon Road Connector Trunk	Figure 22		-	18	New	300	407	$123,000	$192,000	$192,000						60%	$76,800	$115,200	$192,000
Subtotal Gravity Main Improvements													$15,074,000	$23,385,000	$3,908,000	$12,556,000	$4,867,000	$2,054,000	$0	$0		$788,800	$22,596,200	$23,385,000
Lift Station Improvements																									
86	ALS-1	Lift Station	Bolo St.	Bolo LS upgrade	Bolo Trunk	Figure 23		200 gpm	0.4 mgd	Replace	-	-	$800,000	$1,240,000				$1,240,000			100%	$0	$1,240,000	$1,240,000
87	ALS-2	Lift Station	Temescal Canyon Rd.	New Glen Eden LS	Glen Eden	Figure 19		-	0.8 mgd	New	-	-	$1,500,000	$2,325,000		$2,325,000					100%	$0	$2,325,000	$2,325,000
Subtotal Lift Station Improvements													$2,300,000	$3,565,000	$0	$2,325,000	$0	$1,240,000	$0	$0		$0	$3,565,000	$3,565,000
Force Main Improvements																									
88	AFM-1	Force Main	Parallel to Interstate 15	From the Glen Eden LS to Horsethief Canyon Rd.	Glen Eden	Figure 19		-	8	New	6,800	140	$952,000	$1,477,000		$1,477,000					100%	$0	$1,477,000	$1,477,000
Subtotal Force Main Improvements													$23,348,000	$36,220,000	$5,880,000	$20,939,000	$4,867,000	$4,534,000	$0	$0		$1,577,600	$34,642,400	$36,220,000
													$192,945,000	$206,933,000	$65,155,000	$73,749,000	$14,969,000	$27,915,000	$10,842,000	$14,303,000	Total	$31,633,800	$175,299,200	$206,933,000

Notes:
(1) Contingency Cost = 30% of the Baseline Construction Cost
(2) Engineering and Administrative Costs = 15% of the Baseline Construction Cost
(3) Construction Management Cost = 10% of the Baseline Construction Cost
(4) Capital Improvement Cost = Baseline Construction Cost + Contingency Cost + Engineering and Administrative Cost + Construction Management Cost. This value is rounded.
(5) Capital Improvement Costs were not developed for the Lakeshore North, Lakeshore South, and Lakeshore Malaga Trunk Sewer Reaches, Lakeshore Regional LS, and Lakeshore Regional LS Force Mains because these projects have already been budgeted for in the District's CIP.
(6) Proposed Casing size and carrier pipe size.
(7) All cost rounded up to the nearest $1,000 and represent ENR CCI 9,895 (Los Angeles, October 2008)

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Chapter 10

MONITORING, MEASUREMENT, AND PROGRAM MODIFICATIONS

This chapter presents a summary of the steps to be taken by the Elsinore Valley Municipal Water District (District) to evaluate the effectiveness of this Sewer System Management Plan (SSMP) and update it should improvements be necessary or desirable.

10.1 REGULATORY REQUIREMENT

Order No. 2006-0003 specifies that the District shall:

a. Maintain relevant information that can be used to establish and prioritize appropriate SSMP activities;

b. Monitor the implementation and, where appropriate, measure the effectiveness of each element of the SSMP;

c. Assess the success of the preventative maintenance program;

d. Update program elements, as appropriate, based on monitoring or performance evaluations; and

e. Identify and illustrate SSO trends, including frequency, location, and volume.

10.2 SSMP INFORMATION MAINTENANCE PROGRAM

The District should maintain information that is appropriate to the SSMP in a way that is convenient and easily accessible to those individuals involved with the SSMP. This information should be recorded or stored in the appropriate format so that conclusions and trends related to sanitary sewer overflows (SSOs) and the performance of the SSMP can be easily tracked.

It is recommended that the District develop a database to store and analyze information related to the SSMP, which can be accomplished through simple Microsoft Excel based spreadsheets, GIS techniques, or other means.

The District's SSMP database tracks a few key performance indicators that will be used to measure the progress of the SSMP implementation and the performance of the District's sanitary sewer collection system. Some key performance indicators that should be considered for tracking by the District are:

- Number of Service Calls, blockages, and SSOs over a one year period;
- SSO events by cause;

- SSO events by Category (i.e. Category 1, Category 2, or Private Lateral Sewage Discharge);
- Volume of SSOs and volume contained;
- Volume of sewage that reached surface waters; and
- SSO events by location within the District.

10.3 SSMP IMPLEMENTATION MONITORING

To accurately gauge the progress of the SSMP and its successes or failures in preventing SSOs, this plan recommends that the District monitor the implementation and effectiveness of the SSMP elements. The District should maintain all records related to SSMP programs in a common location that is known to all District staff members that are involved in these programs. This should include all records related to the maintenance of the system, SSO field reports, California Integrated Water Quality System (CIWQS) reports, and other relevant information.

This plan recommends that the District assign a key staff member, or a group of staff members to perform interim evaluations of the effectiveness of the SSMP based on the key performance indicators established in Section 10.2 of this report. This evaluation should occur at some predetermined interval, such as bi-annually or annually, and more often as necessary. The purpose of these interim evaluations is to establish the overall trend of the key performance indicators. The conclusions of these evaluations should be kept on record and used for program updates and audits.

10.4 PREVENTATIVE MAINTENANCE PROGRAM EVALUATION

This plan recommends that the District assess the success of the preventative maintenance (PM) program periodically similar to the procedure outlined in Section 10.3 of this report. Appropriate staff members should be designated to perform an evaluation of the District's PM program at some predetermined interval. The District's designees should evaluate where the District's PM program can be improved in order to maximize the efficiency of the system. The conclusions of these evaluations should be kept on record and used for program updates and audits.

10.5 SSMP PROGRAM UPDATES

Updates to the District's SSMP programs should be performed based on the results of the interim evaluations on these programs, as well as the two-year program audits discussed in Chapter 11 of this report. All program updates and modifications should be approved by the District's Authorized Representatives and incorporated into the SSMP report, when necessary. If there are major changes to the SSMP, it needs to be re-certified by District's Authorized Representative on CIWQS. At a minimum, the District shall update and re-certify the SSMP once every five years.

10.6 SSO TRENDS

To optimize the performance of the District's wastewater collection systems, it is necessary to identify any SSO trends that may exist. Through the identification of such trends, the District may find capacity deficiencies, areas of the system in need of increased maintenance, or SSO or fats, oils, and grease (FOG) "Hot Spots." The District currently has mapped historical SSOs. This map should be expanded upon whenever a new spill occurs and used to identify SSO trends.

In addition, this plan recommends that the District keep copies of the CIWQS SSO reports on file for use by the District in the identification of SSO trends, as these reports contain very detailed information on specific spills that is not practical to maintain on other databases.

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SSMP PROGRAM AUDITS

This chapter presents a summary of the procedures to be used by the Elsinore Valley Municipal Water District (District) to perform internal audits of the District's Sewer System Management Plan (SSMP).

11.1 REGULATORY REQUIREMENT

Order No. 2006-0003 specifies the following in relation to audits of the SSMP:

> As part of the SSMP, the Enrollee shall conduct periodic internal audits, appropriate to the size of the system and the number of sanitary sewer overflows (SSOs). At a minimum, these audits must occur every two years and a report must be kept on file. This audit shall focus on the effectiveness of the SSMP and the Enrollee's compliance with the SSMP requirements identified in this subsection (D.13), including identification of any deficiencies in the SSMP and steps to correct them.

11.2 EVMWD'S SSMP PROGRAM AUDITS

In accordance with the requirements of Order No. 2006-0003, the District plans to perform periodic performance audits on its SSMP. The following subsections outline the major components of the District's future performance audits. The costs associated with these audits should be budgeted for by the District.

11.2.1 Responsible Party for Program Audit

The District's Authorized Representatives will oversee the performance of the SSMP program audit. They will designate certain key District staff that are knowledgeable in the District's wastewater collection facilities to perform the audits based on the findings of the interim SSMP program evaluations. The District may also choose to contract with a consultant to perform such audits.

11.2.2 Scope of SSMP Program Audits

The District's program audits will consist of a comprehensive analysis of all elements of the SSMP, including the following:

- Goals
- Organization
- Legal Authority (the District's sewer use ordinances)

- Design and Performance Provisions (the District's design and construction standards)
- Overflow Emergency Response Plan
- FOG Control Plan
- System Evaluation and Capacity Assurance Plan (the District's Wastewater Master Plan)
- Monitoring, Measurement, and Program Modifications
- SSMP Program Audits
- Communication Program

11.2.3 SSMP Program Audit Report

An SSMP Program Audit report will be prepared and kept on file, which highlights the results of the SSMP Program Audit. This report should include supporting material, such as tables, figures and maps that support the conclusions of the report. It should also include the following elements, as well as other information that may be useful in the evaluation of the SSMP:

- An evaluation of each element of the SSMP report, including the District's sewer ordinances, design standards, O&M program, overflow emergency response plan, FOG control plan, system evaluation and capacity assurance plan, and communication program;
- Progress made on the development of SSMP elements. Justification should be provided if progress has not been made on the development of certain elements of this SSMP;
- A description of the new SSMP program elements since the last program audit;
- The effectiveness of implementing SSMP elements;
- A description of the additions and improvements to the sanitary sewer collection system facilities since the previous program audit; and
- A description of the additions and improvements to the sanitary sewer collection system facilities planned for the next two years.

11.2.4 Schedule for Program Audits

At a minimum, the District's program audits must occur every two years. Therefore, it is recommended that the District's initial program audit take place within two years of the adoption of this SSMP report, and every two years subsequently. Should District staff determine, based on the results of the interim program evaluations described in Chapter 10, that more frequent audits are desirable, a shorter time interval, such as annually, may be chosen.

COMMUNICATION PROGRAM AND FINAL CERTIFICATION

This chapter presents a summary of the steps to be taken by the Elsinore Valley Municipal Water District (District) to communicate with the public on the development, implementation, and performance of the Sewer System Management Plan (SSMP). In addition, steps taken for the final certification of the SSMP are summarized in this chapter.

12.1 REGULATORY REQUIREMENT

Order No. 2006-0003 specifies the following for the District's communication program:

> The Enrollee shall communicate on a regular basis with the public on the development, implementation, and performance of the SSMP. The communication system shall provide the public the opportunity to provide input to the Enrollee as the program is developed and implemented.
>
> The Enrollee shall also create a plan of communication with systems that are tributary and/or satellite to the Enrollee's sanitary sewer system.

In order to certify the SSMP, Order No. 2006-0003 specifies that the District must complete the following:

> Both the SSMP and the Enrollee's program to implement the SSMP must be certified by the Enrollee to be in compliance with the requirements set forth (in the previous sections) and must be presented to the Enrollee's governing board for approval at a public meeting. The Enrollee shall certify that the SSMP, and subparts thereof, are in compliance with the general Water Discharge Requirements (WDRs) within the time frames identified in the time schedule provided (in Chapter 1).
>
> In order to complete the certification, the Enrollee's authorized representative must complete the certification portion in the Online Sanitary Sewer Overflow (SSO) Database Questionnaire by checking the appropriate milestone box, printing and signing the automated form, and sending the form to:
>
> State Water Resources Control Board
> Division of Water Quality
> Attn: SSO Program Manager
> P.O. Box 100
> Sacramento, CA 95812

The SSMP must be updated every five years, and must include any significant program changes. Re-certification by the governing board of the Enrollee is required (as specified above) when significant updates to the SSMP are made. To complete this re-certification process, the Enrollee shall enter the data in the online SSO Database and mail the form to the Sate Water Board, as described above.

12.2 COMMUNICATION PROGRAM AND SSMP ADOPTION

In accordance with Order No. 2006-0003, the District's Board of Directors held a public hearing and adopted the SSMP on _____. A copy of the adopting resolution is included in Appendix M. A notice of the public hearing was published two successive weeks prior to adoption in the local newspaper, which notified interested parties that the draft SSMP was available for review (Appendix N).

In order to provide the District's residents with the chance to review and comment on the SSMP, it is recommended that a copy of this document be posted on the District's website. In addition, it is recommended that the District keeps its residents up to date on the implementation and performance of the SSMP. This could be accomplished through bill inserts, public workshops, brochures, or other means.

12.3 FINAL CERTICATION

The District has certified that all sections of this report are in compliance with the applicable general WDRs and the requirements set forth in Order No. 2006-0003. The District's authorized representatives have completed the certification portion in the Online SSO Database Questionnaire and sent the appropriate signed form to the State Water Resources Control Board (SWRCB). A copy of the SWRCB certification form, sent out on _____, is included in Appendix O of this report.

The District plans to update and re-certify the SSMP when significant changes are made. At a minimum, the District plans to update and re-certify this report every five years.

APPENDIX A – REFERENCES

[1] United States Environmental Protection Agency, *Report to Congress, Impacts and Control of CSOs and SSOs*, August 2004.

[2] Elsinore Valley Municipal Water District, *Standard Specifications and Drawings, Volume 1*, September 2006.

[3] Elsinore Valley Municipal Water District website, www.evmwd.com.

[4] Carollo, *Final Wastewater Master Plan prepared for the Elsinore Valley Municipal Water District,* November 2008.

[5] MWH, *Draft Water Distribution System Master Plan prepared for the Elsinore Valley Municipal Water District*, May 2007.

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APPENDIX B – SWRCB ORDER NO. 2006-0003

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STATE WATER RESOURCES CONTROL BOARD
ORDER NO. 2006-0003

STATEWIDE GENERAL WASTE DISCHARGE REQUIREMENTS FOR SANITARY SEWER SYSTEMS

The State Water Resources Control Board, hereinafter referred to as "State Water Board", finds that:

1. All federal and state agencies, municipalities, counties, districts, and other public entities that own or operate sanitary sewer systems greater than one mile in length that collect and/or convey untreated or partially treated wastewater to a publicly owned treatment facility in the State of California are required to comply with the terms of this Order. Such entities are hereinafter referred to as "Enrollees".

2. Sanitary sewer overflows (SSOs) are overflows from sanitary sewer systems of domestic wastewater, as well as industrial and commercial wastewater, depending on the pattern of land uses in the area served by the sanitary sewer system. SSOs often contain high levels of suspended solids, pathogenic organisms, toxic pollutants, nutrients, oxygen-demanding organic compounds, oil and grease and other pollutants. SSOs may cause a public nuisance, particularly when raw untreated wastewater is discharged to areas with high public exposure, such as streets or surface waters used for drinking, fishing, or body contact recreation. SSOs may pollute surface or ground waters, threaten public health, adversely affect aquatic life, and impair the recreational use and aesthetic enjoyment of surface waters.

3. Sanitary sewer systems experience periodic failures resulting in discharges that may affect waters of the state. There are many factors (including factors related to geology, design, construction methods and materials, age of the system, population growth, and system operation and maintenance), which affect the likelihood of an SSO. A proactive approach that requires Enrollees to ensure a system-wide operation, maintenance, and management plan is in place will reduce the number and frequency of SSOs within the state. This approach will in turn decrease the risk to human health and the environment caused by SSOs.

4. Major causes of SSOs include: grease blockages, root blockages, sewer line flood damage, manhole structure failures, vandalism, pump station mechanical failures, power outages, excessive storm or ground water inflow/infiltration, debris blockages, sanitary sewer system age and construction material failures, lack of proper operation and maintenance, insufficient capacity and contractor-caused damages. Many SSOs are preventable with adequate and appropriate facilities, source control measures and operation and maintenance of the sanitary sewer system.

SEWER SYSTEM MANAGEMENT PLANS

5. To facilitate proper funding and management of sanitary sewer systems, each Enrollee must develop and implement a system-specific Sewer System Management Plan (SSMP). To be effective, SSMPs must include provisions to provide proper and efficient management, operation, and maintenance of sanitary sewer systems, while taking into consideration risk management and cost benefit analysis. Additionally, an SSMP must contain a spill response plan that establishes standard procedures for immediate response to an SSO in a manner designed to minimize water quality impacts and potential nuisance conditions.

6. Many local public agencies in California have already developed SSMPs and implemented measures to reduce SSOs. These entities can build upon their existing efforts to establish a comprehensive SSMP consistent with this Order. Others, however, still require technical assistance and, in some cases, funding to improve sanitary sewer system operation and maintenance in order to reduce SSOs.

7. SSMP certification by technically qualified and experienced persons can provide a useful and cost-effective means for ensuring that SSMPs are developed and implemented appropriately.

8. It is the State Water Board's intent to gather additional information on the causes and sources of SSOs to augment existing information and to determine the full extent of SSOs and consequent public health and/or environmental impacts occurring in the State.

9. Both uniform SSO reporting and a centralized statewide electronic database are needed to collect information to allow the State Water Board and Regional Water Quality Control Boards (Regional Water Boards) to effectively analyze the extent of SSOs statewide and their potential impacts on beneficial uses and public health. The monitoring and reporting program required by this Order and the attached **Monitoring and Reporting Program No. 2006-0003**, are necessary to assure compliance with these waste discharge requirements (WDRs).

10. Information regarding SSOs must be provided to Regional Water Boards and other regulatory agencies in a timely manner and be made available to the public in a complete, concise, and timely fashion.

11. Some Regional Water Boards have issued WDRs or WDRs that serve as National Pollution Discharge Elimination System (NPDES) permits to sanitary sewer system owners/operators within their jurisdictions. This Order establishes minimum requirements to prevent SSOs. Although it is the State Water Board's intent that this Order be the primary regulatory mechanism for sanitary sewer systems statewide, Regional Water Boards may issue more stringent or more

prescriptive WDRs for sanitary sewer systems. Upon issuance or reissuance of a Regional Water Board's WDRs for a system subject to this Order, the Regional Water Board shall coordinate its requirements with stated requirements within this Order, to identify requirements that are more stringent, to remove requirements that are less stringent than this Order, and to provide consistency in reporting.

REGULATORY CONSIDERATIONS

12. California Water Code section 13263 provides that the State Water Board may prescribe general WDRs for a category of discharges if the State Water Board finds or determines that:

    - The discharges are produced by the same or similar operations;
    - The discharges involve the same or similar types of waste;
    - The discharges require the same or similar treatment standards; and
    - The discharges are more appropriately regulated under general discharge requirements than individual discharge requirements.

    This Order establishes requirements for a class of operations, facilities, and discharges that are similar throughout the state.

13. The issuance of general WDRs to the Enrollees will:
    a) Reduce the administrative burden of issuing individual WDRs to each Enrollee;
    b) Provide for a unified statewide approach for the reporting and database tracking of SSOs;
    c) Establish consistent and uniform requirements for SSMP development and implementation;
    d) Provide statewide consistency in reporting; and
    e) Facilitate consistent enforcement for violations.

14. The beneficial uses of surface waters that can be impaired by SSOs include, but are not limited to, aquatic life, drinking water supply, body contact and non-contact recreation, and aesthetics. The beneficial uses of ground water that can be impaired include, but are not limited to, drinking water and agricultural supply. Surface and ground waters throughout the state support these uses to varying degrees.

15. The implementation of requirements set forth in this Order will ensure the reasonable protection of past, present, and probable future beneficial uses of water and the prevention of nuisance. The requirements implement the water quality control plans (Basin Plans) for each region and take into account the environmental characteristics of hydrographic units within the state. Additionally, the State Water Board has considered water quality conditions that could reasonably be achieved through the coordinated control of all factors that affect

water quality in the area, costs associated with compliance with these requirements, the need for developing housing within California, and the need to develop and use recycled water.

16. The Federal Clean Water Act largely prohibits any discharge of pollutants from a point source to waters of the United States except as authorized under an NPDES permit. In general, any point source discharge of sewage effluent to waters of the United States must comply with technology-based, secondary treatment standards, at a minimum, and any more stringent requirements necessary to meet applicable water quality standards and other requirements. Hence, the unpermitted discharge of wastewater from a sanitary sewer system to waters of the United States is illegal under the Clean Water Act. In addition, many Basin Plans adopted by the Regional Water Boards contain discharge prohibitions that apply to the discharge of untreated or partially treated wastewater. Finally, the California Water Code generally prohibits the discharge of waste to land prior to the filing of any required report of waste discharge and the subsequent issuance of either WDRs or a waiver of WDRs.

17. California Water Code section 13263 requires a water board to, after any necessary hearing, prescribe requirements as to the nature of any proposed discharge, existing discharge, or material change in an existing discharge. The requirements shall, among other things, take into consideration the need to prevent nuisance.

18. California Water Code section 13050, subdivision (m), defines nuisance as anything which meets all of the following requirements:
    a. Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property.
    b. Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.
    c. Occurs during, or as a result of, the treatment or disposal of wastes.

19. This Order is consistent with State Water Board Resolution No. 68-16 (Statement of Policy with Respect to Maintaining High Quality of Waters in California) in that the Order imposes conditions to prevent impacts to water quality, does not allow the degradation of water quality, will not unreasonably affect beneficial uses of water, and will not result in water quality less than prescribed in State Water Board or Regional Water Board plans and policies.

20. The action to adopt this General Order is exempt from the California Environmental Quality Act (Public Resources Code §21000 et seq.) because it is an action taken by a regulatory agency to assure the protection of the environment and the regulatory process involves procedures for protection of the environment. (Cal. Code Regs., tit. 14, §15308). In addition, the action to adopt

this Order is exempt from CEQA pursuant to Cal.Code Regs., title 14, §15301 to the extent that it applies to existing sanitary sewer collection systems that constitute "existing facilities" as that term is used in Section 15301, and §15302, to the extent that it results in the repair or replacement of existing systems involving negligible or no expansion of capacity.

21. The Fact Sheet, which is incorporated by reference in the Order, contains supplemental information that was also considered in establishing these requirements.

22. The State Water Board has notified all affected public agencies and all known interested persons of the intent to prescribe general WDRs that require Enrollees to develop SSMPs and to report all SSOs.

23. The State Water Board conducted a public hearing on February 8, 2006, to receive oral and written comments on the draft order. The State Water Board received and considered, at its May 2, 2006, meeting, additional public comments on substantial changes made to the proposed general WDRs following the February 8, 2006, public hearing. The State Water Board has considered all comments pertaining to the proposed general WDRs.

IT IS HEREBY ORDERED, that pursuant to California Water Code section 13263, the Enrollees, their agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted hereunder, shall comply with the following:

A. DEFINITIONS

1. **Sanitary sewer overflow (SSO)** - Any overflow, spill, release, discharge or diversion of untreated or partially treated wastewater from a sanitary sewer system. SSOs include:
   (i) Overflows or releases of untreated or partially treated wastewater that reach waters of the United States;
   (ii) Overflows or releases of untreated or partially treated wastewater that do not reach waters of the United States; and
   (iii) Wastewater backups into buildings and on private property that are caused by blockages or flow conditions within the publicly owned portion of a sanitary sewer system.

2. **Sanitary sewer system** – Any system of pipes, pump stations, sewer lines, or other conveyances, upstream of a wastewater treatment plant headworks used to collect and convey wastewater to the publicly owned treatment facility. Temporary storage and conveyance facilities (such as vaults, temporary piping, construction trenches, wet wells, impoundments, tanks, etc.) are considered to be part of the sanitary sewer system, and discharges into these temporary storage facilities are not considered to be SSOs.

For purposes of this Order, sanitary sewer systems include only those systems owned by public agencies that are comprised of more than one mile of pipes or sewer lines.

3. **Enrollee** - A federal or state agency, municipality, county, district, and other public entity that owns or operates a sanitary sewer system, as defined in the general WDRs, and that has submitted a complete and approved application for coverage under this Order.

4. **SSO Reporting System** – Online spill reporting system that is hosted, controlled, and maintained by the State Water Board. The web address for this site is http://ciwqs.waterboards.ca.gov. This online database is maintained on a secure site and is controlled by unique usernames and passwords.

5. **Untreated or partially treated wastewater** – Any volume of waste discharged from the sanitary sewer system upstream of a wastewater treatment plant headworks.

6. **Satellite collection system** – The portion, if any, of a sanitary sewer system owned or operated by a different public agency than the agency that owns and operates the wastewater treatment facility to which the sanitary sewer system is tributary.

7. **Nuisance** - California Water Code section 13050, subdivision (m), defines nuisance as anything which meets all of the following requirements:
    a. Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property.
    b. Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.
    c. Occurs during, or as a result of, the treatment or disposal of wastes.

B. APPLICATION REQUIREMENTS

1. Deadlines for Application – All public agencies that currently own or operate sanitary sewer systems within the State of California must apply for coverage under the general WDRs within six (6) months of the date of adoption of the general WDRs. Additionally, public agencies that acquire or assume responsibility for operating sanitary sewer systems after the date of adoption of this Order must apply for coverage under the general WDRs at least three (3) months prior to operation of those facilities.

2. Applications under the general WDRs – In order to apply for coverage pursuant to the general WDRs, a legally authorized representative for each agency must submit a complete application package. Within sixty (60) days of adoption of the general WDRs, State Water Board staff will send specific instructions on how to

apply for coverage under the general WDRs to all known public agencies that own sanitary sewer systems. Agencies that do not receive notice may obtain applications and instructions online on the Water Board's website.

3. Coverage under the general WDRs – Permit coverage will be in effect once a complete application package has been submitted and approved by the State Water Board's Division of Water Quality.

C. PROHIBITIONS

1. Any SSO that results in a discharge of untreated or partially treated wastewater to waters of the United States is prohibited.

2. Any SSO that results in a discharge of untreated or partially treated wastewater that creates a nuisance as defined in California Water Code Section 13050(m) is prohibited.

D. PROVISIONS

1. The Enrollee must comply with all conditions of this Order. Any noncompliance with this Order constitutes a violation of the California Water Code and is grounds for enforcement action.

2. It is the intent of the State Water Board that sanitary sewer systems be regulated in a manner consistent with the general WDRs. Nothing in the general WDRs shall be:

    (i) Interpreted or applied in a manner inconsistent with the Federal Clean Water Act, or supersede a more specific or more stringent state or federal requirement in an existing permit, regulation, or administrative/judicial order or Consent Decree;
    (ii) Interpreted or applied to authorize an SSO that is illegal under either the Clean Water Act, an applicable Basin Plan prohibition or water quality standard, or the California Water Code;
    (iii) Interpreted or applied to prohibit a Regional Water Board from issuing an individual NPDES permit or WDR, superseding this general WDR, for a sanitary sewer system, authorized under the Clean Water Act or California Water Code; or
    (iv) Interpreted or applied to supersede any more specific or more stringent WDRs or enforcement order issued by a Regional Water Board.

3. The Enrollee shall take all feasible steps to eliminate SSOs. In the event that an SSO does occur, the Enrollee shall take all feasible steps to contain and mitigate the impacts of an SSO.

4. In the event of an SSO, the Enrollee shall take all feasible steps to prevent untreated or partially treated wastewater from discharging from storm drains into

flood control channels or waters of the United States by blocking the storm drainage system and by removing the wastewater from the storm drains.

5. All SSOs must be reported in accordance with Section G of the general WDRs.

6. In any enforcement action, the State and/or Regional Water Boards will consider the appropriate factors under the duly adopted State Water Board Enforcement Policy. And, consistent with the Enforcement Policy, the State and/or Regional Water Boards must consider the Enrollee's efforts to contain, control, and mitigate SSOs when considering the California Water Code Section 13327 factors. In assessing these factors, the State and/or Regional Water Boards will also consider whether:

   (i) The Enrollee has complied with the requirements of this Order, including requirements for reporting and developing and implementing a SSMP;

   (ii) The Enrollee can identify the cause or likely cause of the discharge event;

   (iii) There were no feasible alternatives to the discharge, such as temporary storage or retention of untreated wastewater, reduction of inflow and infiltration, use of adequate backup equipment, collecting and hauling of untreated wastewater to a treatment facility, or an increase in the capacity of the system as necessary to contain the design storm event identified in the SSMP. It is inappropriate to consider the lack of feasible alternatives, if the Enrollee does not implement a periodic or continuing process to identify and correct problems.

   (iv) The discharge was exceptional, unintentional, temporary, and caused by factors beyond the reasonable control of the Enrollee;

   (v) The discharge could have been prevented by the exercise of reasonable control described in a certified SSMP for:
      - Proper management, operation and maintenance;
      - Adequate treatment facilities, sanitary sewer system facilities, and/or components with an appropriate design capacity, to reasonably prevent SSOs (e.g., adequately enlarging treatment or collection facilities to accommodate growth, infiltration and inflow (I/I), etc.);
      - Preventive maintenance (including cleaning and fats, oils, and grease (FOG) control);
      - Installation of adequate backup equipment; and
      - Inflow and infiltration prevention and control to the extent practicable.

   (vi) The sanitary sewer system design capacity is appropriate to reasonably prevent SSOs.

(vii) The Enrollee took all reasonable steps to stop and mitigate the impact of the discharge as soon as possible.

7. When a sanitary sewer overflow occurs, the Enrollee shall take all feasible steps and necessary remedial actions to 1) control or limit the volume of untreated or partially treated wastewater discharged, 2) terminate the discharge, and 3) recover as much of the wastewater discharged as possible for proper disposal, including any wash down water.

   The Enrollee shall implement all remedial actions to the extent they may be applicable to the discharge and not inconsistent with an emergency response plan, including the following:

   (i) Interception and rerouting of untreated or partially treated wastewater flows around the wastewater line failure;
   (ii) Vacuum truck recovery of sanitary sewer overflows and wash down water;
   (iii) Cleanup of debris at the overflow site;
   (iv) System modifications to prevent another SSO at the same location;
   (v) Adequate sampling to determine the nature and impact of the release; and
   (vi) Adequate public notification to protect the public from exposure to the SSO.

8. The Enrollee shall properly, manage, operate, and maintain all parts of the sanitary sewer system owned or operated by the Enrollee, and shall ensure that the system operators (including employees, contractors, or other agents) are adequately trained and possess adequate knowledge, skills, and abilities.

9. The Enrollee shall allocate adequate resources for the operation, maintenance, and repair of its sanitary sewer system, by establishing a proper rate structure, accounting mechanisms, and auditing procedures to ensure an adequate measure of revenues and expenditures. These procedures must be in compliance with applicable laws and regulations and comply with generally acceptable accounting practices.

10. The Enrollee shall provide adequate capacity to convey base flows and peak flows, including flows related to wet weather events. Capacity shall meet or exceed the design criteria as defined in the Enrollee's System Evaluation and Capacity Assurance Plan for all parts of the sanitary sewer system owned or operated by the Enrollee.

11. The Enrollee shall develop and implement a written Sewer System Management Plan (SSMP) and make it available to the State and/or Regional Water Board upon request. A copy of this document must be publicly available at the Enrollee's office and/or available on the Internet. This SSMP must be approved by the Enrollee's governing board at a public meeting.

12. In accordance with the California Business and Professions Code sections 6735, 7835, and 7835.1, all engineering and geologic evaluations and judgments shall be performed by or under the direction of registered professionals competent and proficient in the fields pertinent to the required activities. Specific elements of the SSMP that require professional evaluation and judgments shall be prepared by or under the direction of appropriately qualified professionals, and shall bear the professional(s)' signature and stamp.

13. The mandatory elements of the SSMP are specified below. However, if the Enrollee believes that any element of this section is not appropriate or applicable to the Enrollee's sanitary sewer system, the SSMP program does not need to address that element. The Enrollee must justify why that element is not applicable. The SSMP must be approved by the deadlines listed in the SSMP Time Schedule below.

Sewer System Management Plan (SSMP)

(i) **Goal**: The goal of the SSMP is to provide a plan and schedule to properly manage, operate, and maintain all parts of the sanitary sewer system. This will help reduce and prevent SSOs, as well as mitigate any SSOs that do occur.

(ii) **Organization**: The SSMP must identify:

(a) The name of the responsible or authorized representative as described in Section J of this Order.

(b) The names and telephone numbers for management, administrative, and maintenance positions responsible for implementing specific measures in the SSMP program. The SSMP must identify lines of authority through an organization chart or similar document with a narrative explanation; and

(c) The chain of communication for reporting SSOs, from receipt of a complaint or other information, including the person responsible for reporting SSOs to the State and Regional Water Board and other agencies if applicable (such as County Health Officer, County Environmental Health Agency, Regional Water Board, and/or State Office of Emergency Services (OES)).

(iii) **Legal Authority:** Each Enrollee must demonstrate, through sanitary sewer system use ordinances, service agreements, or other legally binding procedures, that it possesses the necessary legal authority to:

(a) Prevent illicit discharges into its sanitary sewer system (examples may include I/I, stormwater, chemical dumping, unauthorized debris and cut roots, etc.);

(b) Require that sewers and connections be properly designed and constructed;

(c) Ensure access for maintenance, inspection, or repairs for portions of the lateral owned or maintained by the Public Agency;

(d) Limit the discharge of fats, oils, and grease and other debris that may cause blockages, and

(e) Enforce any violation of its sewer ordinances.

(iv) **Operation and Maintenance Program**. The SSMP must include those elements listed below that are appropriate and applicable to the Enrollee's system:

(a) Maintain an up-to-date map of the sanitary sewer system, showing all gravity line segments and manholes, pumping facilities, pressure pipes and valves, and applicable stormwater conveyance facilities;

(b) Describe routine preventive operation and maintenance activities by staff and contractors, including a system for scheduling regular maintenance and cleaning of the sanitary sewer system with more frequent cleaning and maintenance targeted at known problem areas. The Preventative Maintenance (PM) program should have a system to document scheduled and conducted activities, such as work orders;

(c) Develop a rehabilitation and replacement plan to identify and prioritize system deficiencies and implement short-term and long-term rehabilitation actions to address each deficiency. The program should include regular visual and TV inspections of manholes and sewer pipes, and a system for ranking the condition of sewer pipes and scheduling rehabilitation. Rehabilitation and replacement should focus on sewer pipes that are at risk of collapse or prone to more frequent blockages due to pipe defects. Finally, the rehabilitation and replacement plan should include a capital improvement plan that addresses proper management and protection of the infrastructure assets. The plan shall include a time schedule for implementing the short- and long-term plans plus a schedule for developing the funds needed for the capital improvement plan;

(d) Provide training on a regular basis for staff in sanitary sewer system operations and maintenance, and require contractors to be appropriately trained; and

(e) Provide equipment and replacement part inventories, including identification of critical replacement parts.

(v) **Design and Performance Provisions**:

(a) Design and construction standards and specifications for the installation of new sanitary sewer systems, pump stations and other appurtenances; and for the rehabilitation and repair of existing sanitary sewer systems; and

(b) Procedures and standards for inspecting and testing the installation of new sewers, pumps, and other appurtenances and for rehabilitation and repair projects.

(vi) **Overflow Emergency Response Plan -** Each Enrollee shall develop and implement an overflow emergency response plan that identifies measures to protect public health and the environment. At a minimum, this plan must include the following:

(a) Proper notification procedures so that the primary responders and regulatory agencies are informed of all SSOs in a timely manner;

(b) A program to ensure an appropriate response to all overflows;

(c) Procedures to ensure prompt notification to appropriate regulatory agencies and other potentially affected entities (e.g. health agencies, Regional Water Boards, water suppliers, etc.) of all SSOs that potentially affect public health or reach the waters of the State in accordance with the MRP. All SSOs shall be reported in accordance with this MRP, the California Water Code, other State Law, and other applicable Regional Water Board WDRs or NPDES permit requirements. The SSMP should identify the officials who will receive immediate notification;

(d) Procedures to ensure that appropriate staff and contractor personnel are aware of and follow the Emergency Response Plan and are appropriately trained;

(e) Procedures to address emergency operations, such as traffic and crowd control and other necessary response activities; and

(f) A program to ensure that all reasonable steps are taken to contain and prevent the discharge of untreated and partially treated wastewater to waters of the United States and to minimize or correct any adverse impact on the environment resulting from the SSOs, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the discharge.

(vii) **FOG Control Program:** Each Enrollee shall evaluate its service area to determine whether a FOG control program is needed. If an Enrollee determines that a FOG program is not needed, the Enrollee must provide justification for why it is not needed. If FOG is found to be a problem, the Enrollee must prepare and implement a FOG source control program to reduce the amount of these substances discharged to the sanitary sewer system. This plan shall include the following as appropriate:

(a) An implementation plan and schedule for a public education outreach program that promotes proper disposal of FOG;

(b) A plan and schedule for the disposal of FOG generated within the sanitary sewer system service area. This may include a list of acceptable disposal facilities and/or additional facilities needed to adequately dispose of FOG generated within a sanitary sewer system service area;

(c) The legal authority to prohibit discharges to the system and identify measures to prevent SSOs and blockages caused by FOG;

(d) Requirements to install grease removal devices (such as traps or interceptors), design standards for the removal devices, maintenance requirements, BMP requirements, record keeping and reporting requirements;

(e) Authority to inspect grease producing facilities, enforcement authorities, and whether the Enrollee has sufficient staff to inspect and enforce the FOG ordinance;

(f) An identification of sanitary sewer system sections subject to FOG blockages and establishment of a cleaning maintenance schedule for each section; and

(g) Development and implementation of source control measures for all sources of FOG discharged to the sanitary sewer system for each section identified in (f) above.

(viii) **System Evaluation and Capacity Assurance Plan**: The Enrollee shall prepare and implement a capital improvement plan (CIP) that will provide hydraulic capacity of key sanitary sewer system elements for dry weather peak flow conditions, as well as the appropriate design storm or wet weather event. At a minimum, the plan must include:

(a) **Evaluation**: Actions needed to evaluate those portions of the sanitary sewer system that are experiencing or contributing to an SSO discharge caused by hydraulic deficiency. The evaluation must provide estimates of peak flows (including flows from SSOs

that escape from the system) associated with conditions similar to those causing overflow events, estimates of the capacity of key system components, hydraulic deficiencies (including components of the system with limiting capacity) and the major sources that contribute to the peak flows associated with overflow events;

(b) **Design Criteria:** Where design criteria do not exist or are deficient, undertake the evaluation identified in (a) above to establish appropriate design criteria; and

(c) **Capacity Enhancement Measures:** The steps needed to establish a short- and long-term CIP to address identified hydraulic deficiencies, including prioritization, alternatives analysis, and schedules. The CIP may include increases in pipe size, I/I reduction programs, increases and redundancy in pumping capacity, and storage facilities. The CIP shall include an implementation schedule and shall identify sources of funding.

(d) **Schedule:** The Enrollee shall develop a schedule of completion dates for all portions of the capital improvement program developed in (a)-(c) above. This schedule shall be reviewed and updated consistent with the SSMP review and update requirements as described in Section D. 14.

(ix) **Monitoring, Measurement, and Program Modifications:** The Enrollee shall:

(a) Maintain relevant information that can be used to establish and prioritize appropriate SSMP activities;

(b) Monitor the implementation and, where appropriate, measure the effectiveness of each element of the SSMP;

(c) Assess the success of the preventative maintenance program;

(d) Update program elements, as appropriate, based on monitoring or performance evaluations; and

(e) Identify and illustrate SSO trends, including: frequency, location, and volume.

(x) **SSMP Program Audits** - As part of the SSMP, the Enrollee shall conduct periodic internal audits, appropriate to the size of the system and the number of SSOs. At a minimum, these audits must occur every two years and a report must be prepared and kept on file. This audit shall focus on evaluating the effectiveness of the SSMP and the

Enrollee's compliance with the SSMP requirements identified in this subsection (D.13), including identification of any deficiencies in the SSMP and steps to correct them.

(xi) **Communication Program** – The Enrollee shall communicate on a regular basis with the public on the development, implementation, and performance of its SSMP. The communication system shall provide the public the opportunity to provide input to the Enrollee as the program is developed and implemented.

The Enrollee shall also create a plan of communication with systems that are tributary and/or satellite to the Enrollee's sanitary sewer system.

14. Both the SSMP and the Enrollee's program to implement the SSMP must be certified by the Enrollee to be in compliance with the requirements set forth above and must be presented to the Enrollee's governing board for approval at a public meeting. The Enrollee shall certify that the SSMP, and subparts thereof, are in compliance with the general WDRs within the time frames identified in the time schedule provided in subsection D.15, below.

    In order to complete this certification, the Enrollee's authorized representative must complete the certification portion in the Online SSO Database Questionnaire by checking the appropriate milestone box, printing and signing the automated form, and sending the form to:

    State Water Resources Control Board
    Division of Water Quality
    Attn: SSO Program Manager
    P.O. Box 100
    Sacramento, CA 95812

    The SSMP must be updated every five (5) years, and must include any significant program changes. Re-certification by the governing board of the Enrollee is required in accordance with D.14 when significant updates to the SSMP are made. To complete the re-certification process, the Enrollee shall enter the data in the Online SSO Database and mail the form to the State Water Board, as described above.

15. The Enrollee shall comply with these requirements according to the following schedule. This time schedule does not supersede existing requirements or time schedules associated with other permits or regulatory requirements.

Sewer System Management Plan Time Schedule

Task and Associated Section	**Completion Date**			
	Population > 100,000	Population between 100,000 and 10,000	Population between 10,000 and 2,500	Population < 2,500
Application for Permit Coverage ***Section C***	6 months after WDRs Adoption			
Reporting Program ***Section G***	6 months after WDRs Adoption[1]			
SSMP Development Plan and Schedule ***No specific Section***	9 months after WDRs Adoption[2]	12 months after WDRs Adoption[2]	15 months after WDRs Adoption[2]	18 months after WDRs Adoption[2]
Goals and Organization Structure ***Section D 13 (i) & (ii)***	12 months after WDRs Adoption[2]		18 months after WDRs Adoption[2]	
Overflow Emergency Response Program ***Section D 13 (vi)***	24 months after WDRs Adoption[2]	30 months after WDRs Adoption[2]	36 months after WDRs Adoption[2]	39 months after WDRs Adoption[2]
Legal Authority ***Section D 13 (iii)***				
Operation and Maintenance Program ***Section D 13 (iv)***				
Grease Control Program ***Section D 13 (vii)***				
Design and Performance ***Section D 13 (v)***	36 months after WDRs Adoption	39 months after WDRs Adoption	48 months after WDRs Adoption	51 months after WDRs Adoption
System Evaluation and Capacity Assurance Plan ***Section D 13 (viii)***				
Final SSMP, incorporating all of the SSMP requirements ***Section D 13***				

1. In the event that by July 1, 2006 the Executive Director is able to execute a memorandum of agreement (MOA) with the California Water Environment Association (CWEA) or discharger representatives outlining a strategy and time schedule for CWEA or another entity to provide statewide training on the adopted monitoring program, SSO database electronic reporting, and SSMP development, consistent with this Order, then the schedule of Reporting Program Section G shall be replaced with the following schedule:

Reporting Program ***Section G***	
Regional Boards 4, 8, and 9	8 months after WDRs Adoption
Regional Boards 1, 2, and 3	12 months after WDRs Adoption
Regional Boards 5, 6, and 7	16 months after WDRs Adoption

If this MOU is not executed by July 1, 2006, the reporting program time schedule will remain six (6) months for all regions and agency size categories.

2. In the event that the Executive Director executes the MOA identified in note 1 by July 1, 2006, then the deadline for this task shall be extended by six (6) months. The time schedule identified in the MOA must be consistent with the extended time schedule provided by this note. If the MOA is not executed by July 1, 2006, the six (6) month time extension will not be granted.

E. WDRs and SSMP AVAILABILITY

1. A copy of the general WDRs and the certified SSMP shall be maintained at appropriate locations (such as the Enrollee's offices, facilities, and/or Internet homepage) and shall be available to sanitary sewer system operating and maintenance personnel at all times.

F. ENTRY AND INSPECTION

1. The Enrollee shall allow the State or Regional Water Boards or their authorized representative, upon presentation of credentials and other documents as may be required by law, to:

    a. Enter upon the Enrollee's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this Order;

    b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order;

c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order; and

d. Sample or monitor at reasonable times, for the purposes of assuring compliance with this Order or as otherwise authorized by the California Water Code, any substances or parameters at any location.

G. GENERAL MONITORING AND REPORTING REQUIREMENTS

1. The Enrollee shall furnish to the State or Regional Water Board, within a reasonable time, any information that the State or Regional Water Board may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order. The Enrollee shall also furnish to the Executive Director of the State Water Board or Executive Officer of the applicable Regional Water Board, upon request, copies of records required to be kept by this Order.

2. The Enrollee shall comply with the attached Monitoring and Reporting Program No. 2006-0003 and future revisions thereto, as specified by the Executive Director. Monitoring results shall be reported at the intervals specified in Monitoring and Reporting Program No. 2006-0003. Unless superseded by a specific enforcement Order for a specific Enrollee, these reporting requirements are intended to replace other mandatory routine written reports associated with SSOs.

3. All Enrollees must obtain SSO Database accounts and receive a “Username” and “Password” by registering through the California Integrated Water Quality System (CIWQS). These accounts will allow controlled and secure entry into the SSO Database. Additionally, within 30days of receiving an account and prior to recording spills into the SSO Database, all Enrollees must complete the “Collection System Questionnaire”, which collects pertinent information regarding a Enrollee’s collection system. The “Collection System Questionnaire” must be updated at least every 12 months.

4. Pursuant to Health and Safety Code section 5411.5, any person who, without regard to intent or negligence, causes or permits any untreated wastewater or other waste to be discharged in or on any waters of the State, or discharged in or deposited where it is, or probably will be, discharged in or on any surface waters of the State, as soon as that person has knowledge of the discharge, shall immediately notify the local health officer of the discharge. Discharges of untreated or partially treated wastewater to storm drains and drainage channels, whether man-made or natural or concrete-lined, shall be reported as required above.

   Any SSO greater than 1,000 gallons discharged in or on any waters of the State, or discharged in or deposited where it is, or probably will be, discharged in or on any surface waters of the State shall also be reported to the Office of Emergency Services pursuant to California Water Code section 13271.

H. CHANGE IN OWNERSHIP

1. This Order is not transferable to any person or party, except after notice to the Executive Director. The Enrollee shall submit this notice in writing at least 30 days in advance of any proposed transfer. The notice must include a written agreement between the existing and new Enrollee containing a specific date for the transfer of this Order's responsibility and coverage between the existing Enrollee and the new Enrollee. This agreement shall include an acknowledgement that the existing Enrollee is liable for violations up to the transfer date and that the new Enrollee is liable from the transfer date forward.

I. INCOMPLETE REPORTS

1. If an Enrollee becomes aware that it failed to submit any relevant facts in any report required under this Order, the Enrollee shall promptly submit such facts or information by formally amending the report in the Online SSO Database.

J. REPORT DECLARATION

1. All applications, reports, or information shall be signed and certified as follows:

    (i) All reports required by this Order and other information required by the State or Regional Water Board shall be signed and certified by a person designated, for a municipality, state, federal or other public agency, as either a principal executive officer or ranking elected official, or by a duly authorized representative of that person, as described in paragraph (ii) of this provision. (For purposes of electronic reporting, an electronic signature and accompanying certification, which is in compliance with the Online SSO database procedures, meet this certification requirement.)

    (ii) An individual is a duly authorized representative only if:

        (a) The authorization is made in writing by a person described in paragraph (i) of this provision; and

        (b) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity.

K. CIVIL MONETARY REMEDIES FOR DISCHARGE VIOLATIONS

1. The California Water Code provides various enforcement options, including civil monetary remedies, for violations of this Order.

2. The California Water Code also provides that any person failing or refusing to furnish technical or monitoring program reports, as required under this Order, or

falsifying any information provided in the technical or monitoring reports is subject to civil monetary penalties.

L. SEVERABILITY

1. The provisions of this Order are severable, and if any provision of this Order, or the application of any provision of this Order to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this Order, shall not be affected thereby.

2. This order does not convey any property rights of any sort or any exclusive privileges. The requirements prescribed herein do not authorize the commission of any act causing injury to persons or property, nor protect the Enrollee from liability under federal, state or local laws, nor create a vested right for the Enrollee to continue the waste discharge.

CERTIFICATION

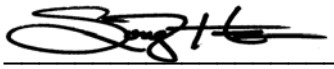
The undersigned Clerk to the State Water Board does hereby certify that the foregoing is a full, true, and correct copy of general WDRs duly and regularly adopted at a meeting of the State Water Resources Control Board held on May 2, 2006.

AYE: Tam M. Doduc
Gerald D. Secundy

NO: Arthur G. Baggett

ABSENT: None

ABSTAIN: None



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Clerk to the Board

APPENDIX C – ORGANIZATIONAL CHART AND CONTACT INFORMATION

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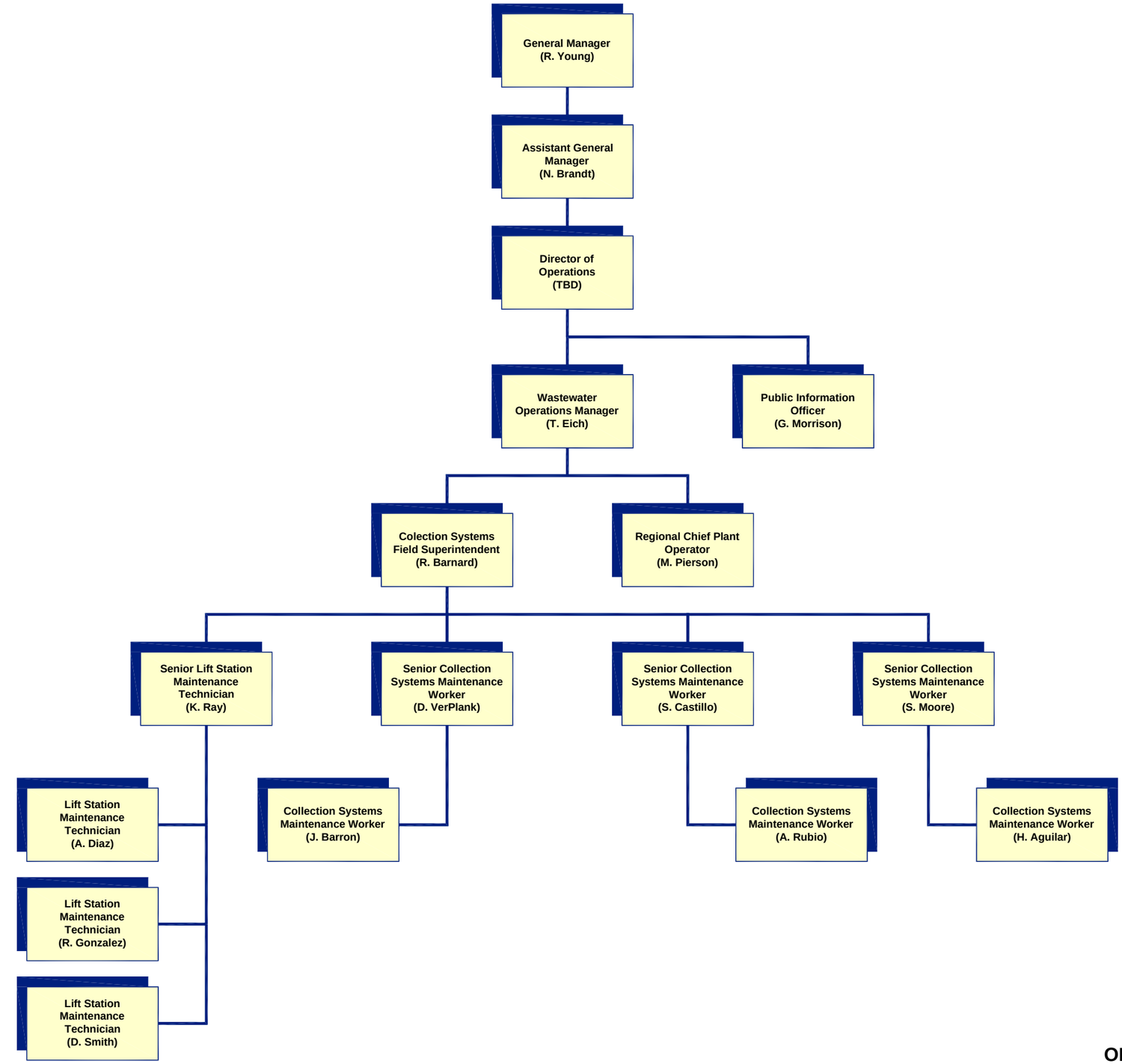

ORGANIZATIONAL CHART

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Engineers...Working Wonders With Water™

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Organization Chart Contact Information

Elsinore Valley Municipal Water District

Position	Name	Phone Number	Fax Number	E-Mail Address
General Manager	Ronald Young	(951) 674-3146 ext. 8251	(951) 674-9872	ryoung@evmwd.net
Assistant General Manager	Norris Brandt	(951) 674-3146 ext. 8359	(951) 674-9872	nbrandt@evmwd.net
Director of Operations	TBD	N/A N/A	N/A	N/A
Wastewater Operations Manager	Theodore P. Eich	(951) 674-3146 ext. 8203	(951) 245-5946	teich@evmwd.net
Collection Systems Superintendent	Robert Barnard	(951) 674-3146 ext. 8283	(951) 245-5946	robertb@evmwd.net
Chief Plant Operator	Mitch Pierson	(951) 674-3135 ext. 8350	(951) 245-6293	mpierson@evmwd.net
Senior Collection Systems Maintenance Worker	Scott Castillo	(951) 674-3146 ext. 8323	(951) 245-5946	scastillo@evmwd.net
Senior Collection Systems Maintenance Worker	Dan VerPlank	(951) 674-3146 --	--	dverplank@evmwd.net
Senior Collection Systems Maintenance Worker	Shawn Moore	(951) 674-3146 --	--	smoore@evmwd.net
Senior Lift Station Technician	Keith Ray	(951) 674-3146 ext. 8298	(951) 245-5946	kray@evmwd.net
Collection Systems Maintenance Worker	Jesus Barron	(951) 674-3146 --	--	jbarron@evmed.net
Collection Systems Maintenance Worker	Angel Rubio	(951) 674-3146 --	--	arubio@evmwd.net
Collection Systems Maintenance Worker	Humberto Aguilar	(951) 674-3146 --	--	haguilar@evmed.net

Note:

1. Source: Data Provided by District Staff

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APPENDIX D – JOB DESCRIPTIONS

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ELSINORE VALLEY MUNICIPAL WATER DISTRICT

General Manager

Job descriptions are intended to present a descriptive list of the range of duties performed by employees in this job. Specifications are NOT intended to reflect all duties performed with the job.

SUMMARY DESCRIPTION

Under policy direction, serves as agent of the Board of Directors in planning, directing, managing, and overseeing the services, activities, and operations of the District including Engineering, Finance, Human Resources, Operations, and Public Affairs; serves as chief executive officer of the District ensuring that services and operations are delivered in an efficient and effective manner; implements policy decisions made by the Board of Directors; facilitates the development and implementation of District goals and objectives; and provides highly complex administrative support to the Board of Directors.

REPRESENTATIVE DUTIES

The following duties are typical for this classification. Incumbents may not perform all duties and/or may be required to perform additional or different duties from those set forth below to address business needs and changing business practices.

- Serves as Chief Executive Officer of the Elsinore Valley Municipal Water District; assumes full management responsibility for all District operations, services, and activities; plans, directs, manages, and oversees the activities and operations of the District including Engineering, Finance, Human Resources, Operations, and Public Affairs.
- Provides general direction to the design, construction, operation, and maintenance of District facilities; directs water production, treatment, storage, and distribution services and activities, wastewater collection, treatment, and disposal services and activities, reclaimed water storage distribution services and activities, administrative activities including personnel, purchasing, and administrative complex maintenance, and customer service activities.
- Facilitates the development, implementation, and administration of District goals and objectives; interprets and implements, through subordinates, goals, policies, rules and regulations set by the Board of Directors in an efficient and cost-effective manner.
- Directs and participates, with department head cooperation, in the development and administration of the District's budget; prepares long-term plans of capital improvements including financing plans; approves the forecast of funds needed for staffing, equipment, materials, and supplies; approves expenditures and implement budgetary adjustments as appropriate and necessary.
- Establishes organizational standards and objectives; establishes, within District policy, appropriate service and staffing levels; monitors and evaluates the efficiency and effectiveness of service delivery methods and procedures; allocate resources accordingly.
- Plans, directs, and coordinates, through department heads, the work plan for the District; assigns projects and programmatic areas of responsibility; reviews and evaluates work methods and procedures; ensures that the District is being operated in compliance with applicable regulations and laws, that the District's needs are being assessed, and that improvements are being developed and implemented as necessary; meets with management staff to identify and resolve issues.
- Assesses and monitors workload, administrative support systems, and internal reporting relationships; identifies opportunities for improvement and implement as appropriate.
- Provides staff assistance to the Board of Directors; prepares, submits, and presents staff reports and other necessary correspondence and recommendations to the Board of Directors on issues for its consideration and action; oversees the preparation and administration of Board agendas; keeps Board of Directors advised of financial conditions, program progress, and present and future needs of the District; prepares recommendations and advises the Board of Directors on matters requiring legislative action; carries out direction of the Board by assigning tasks and evaluating results.
- Assumes responsibility for establishing and maintaining favorable contacts with state and national government leaders to develop sound water related legislation and programs.
- Confers with and represents the District to all departments, regulatory agencies, customers, businesses, and other individuals, groups, and outside agencies having an interest or potential interest in affairs of the District's concern; coordinates District activities with those of other districts, cities, counties, outside agencies, and organizations in accordance with the Board of Directors' policies.

General Manager (continued)

- Negotiates a variety of contracts and agreements on the District's behalf in areas including, but not limited to, labor relations, development reimbursements, interagency relationships, and professional service provisions.
- Prepares reports and correspondence and makes presentations to legislative bodies, other agencies, the Board of Directors, the general public, and District personnel on issues regarding District administrative activities and functions.
- Responds to and resolves difficult, complex, and sensitive inquiries and complaints; contacts departments involved; provides direction and delegates authority as necessary to correct issues; interprets, analyzes, defends, and explains District policies, procedures, programs, and activities; negotiates and resolves sensitive and controversial issues; handles public relations dealing with the news media.
- Attends and participates in professional group meetings; stays abreast of new trends and innovations in the fields of business and public administration and issues related to the ongoing operation of a public utility.
- Prepares for and acts as necessary to carry out the mission of the District in emergency circumstances.
- Establishes and complies with the District's Safety Manual; attends safety meetings as necessary; reports all accidents, violations, or infractions.
- Performs related duties as required.

QUALIFICATIONS

The following generally decribes the knowledge and ability required to enter the job and/or be learned within a short period of time in order to successfully perform the assigned duties.

Ability to:

- Provide effective leadership to and coordinate the activities of the Elsinore Valley Municipal Water District.
- Analyze a variety of administrative and organizational problems and make sound policy and procedural recommendations.
- Analyze and define problems, identify alternative solutions, project consequences of proposed actions and implement recommendations in support of goals.
- Identify and respond to community and Board of Directors' issues, concerns, and needs.
- Serve effectively as the administrative agent of the Board of Directors.
- Develop and administer District-wide goals, objectives, and procedures.
- Research, analyze, and evaluate new service delivery methods and techniques.
- Prepare clear and concise administrative and financial reports.
- Prepare and administer large and complex budgets.
- Interpret and apply federal, state, and local policies, laws, and regulations.
- Plan, organize, and direct the work of staff.Plan, organize, and direct the work of staff.
- Select, supervise, train and evaluate staff.
- Delegate authority and responsibility.
- Negotiate and resolve complex issues.
- Operate a variety of office equipment including a computer and standard office applications.
- Make effective oral and written presentations to groups within and outside the District including legislative bodies.
- Exercise tact and diplomacy in dealing with sensitive, complex and confidential issues and situations.
- Effectively represent the District to outside individuals and agencies to accomplish the goals and objectives of the unit.
- Interact with elected officials at every level of government.
- Work cooperatively with other departments, District officials, and outside agencies.
- Communicate clearly and concisely, both orally and in writing.
- Establish and maintain effective working relationships with those contacted in the course of work.

General Manager (continued)

Education and Experience Guidelines

Any combination of educationa and experience that would likely provide the required knowledge and abilities is qualifying. A typical way to obtain the knowledge and abilities would be:

Education

- Equivalent to a Bachelor's degree from an accredited college or university with major course work in public administration, business administration, engineering, or a related field. A Master's degree is desirable.

Experience

- Ten years of progressively responsible administrative or staff experience in a private or public organization with at least five years of experience in a high level administrative or executive capacity involving responsibility for planning, organizing, directing, and financing a varied work program and preferably involved in water and wastewater systems and technologies.

Knowledge

- Advanced principles and practices of public administration including the organization, functions, and problems of a public utility.
- Operations, services, and activities of a public utility.
- Government, governing body, and legislative processes.
- Principles and practices of budget preparation and administration.
- Current social, political, and economic trends and operating problems of public utilities.
- Advanced principles and practices of organization, management and supervision.
- Principles and practices of strategic planning.
- Methods of analyzing, evaluating, and modifying administrative procedures.
- Decision making techniques.
- Negotiating principles and practices.
- Pertinent federal, state, and local laws, codes and regulations.
- Principles of effective public relations and interrelationships with community groups and agencies, private businesses and firms, and other levels of government.
- Advanced interpersonal relations skills.
- Principles and practices of program development and administration.
- Methods and techniques of research, statistical analysis, and report preparation and presentation.
- Principles of business letter writing.
- Office procedures, methods, and equipment including computers and applicable software applications such as word processing, spreadsheets, and databases.

License/Certification

- Possession of, or ability to obtain, an appropriate, valid driver's license.

PHYSICAL DEMANDS AND WORKING ENVIRONMENT

The conditions herein are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accomodations may be made to enable individuals with disabilities to perform the essential job functions.

ENVIRONMENT

Standard office setting; frequent interaction with District staff, the general public, elected officials, and the media.

PHYSICAL • Level One

Incumbents require sufficient mobility to work in an office setting; stand or sit for prolonged periods of time; operate office equipment including use of a computer keyboard; light lifting and carrying; ability to verbally communicate to exchange information.

General Manager (continued)

VISION

See in the normal visual range with or without correction; vision sufficient to read computer screens and printed documents; and to operate assigned equipment.

HEARING

Hear in the normal audio range with or without correction.

JOB STATUS Exempt Contract - Individual

SALARY RANGE: 50

(10GM)

ELSINORE VALLEY MUNICIPAL WATER DISTRICT

Assistant General Manager

Job descriptions are intended to present a descriptive list of the range of duties performed by employees in this job. Specifications are NOT intended to reflect all duties performed with the job.

SUMMARY DESCRIPTION

Under general direction of the General Manager, directly responsible for the supervision of the administration, human resources, public information, purchasing, warehousing, building and grounds maintenance, and vehicle maintenance divisions. Assists the General Manager in directing all other divisions within the District. Acts as General Manager in the absence of the General Manager.

REPRESENTATIVE DUTIES

The following duties are typical for this classification. Incumbents may not perform all duties and/or may be required to perform additional or different duties from those set forth below to address business needs and changing business practices.

- Assists General Manager in carrying out directives of the Board of Directors; ensures compliance with District policy; ensures timely completion of a variety of projects; develops and implements District's business plan.
- Works with the Board of Directors and other high level officials to develop policy. Assists General Manager with special projects, studies, research, and reports.
- Selects, trains, supervises and evaluates personnel within administration, human resources, public information, purchasing, warehousing, building and grounds maintenance, and vehicle maintenance divisions; prepares and administers divisional budgets.
- Maintains minutes, resolutions, ordinances and other official District records; prepares, publishes, posts and mails all legal notices; performs official CEQA filings with County Clerk's office; coordinates preparation and distribution of Board agendas and back up material; administers timely filing of Conflict of Interest Statements and Annual Campaign Disclosure Statements.
- Provides assistance and works with District's right-of-way consultants on real property acquisitions and dispositions.
- Processes District annexations which include meetings with developers, engineers, consultants, and Local Agency Formation Commission.
- Establishes procedures, schedules, and methods for administrative services including word processing, records management, and maintenance of the District's library.
- Directly supervises public information activities including preparation of District newsletter, press releases, public workshops, open houses, and water education and tours; provides supervision of purchasing and warehouse activities, personnel functions, building and grounds maintenance, vehicle maintenance, and Injury Prevention Program activities; evaluates and prepares performance evaluations and disciplinary recommendations for employees in each of these areas.
- Reads, understands and complies with the District's Safety Manual; attends safety meetings, as required; reports all accidents, violations or infractions to supervisor.
- Interrelates effectively and diplomatically with management and coworkers.
- Performs other related duties as assigned.

QUALIFICATIONS

The following generally decribes the knowledge and ability required to enter the job and/or be learned within a short period of time in order to successfully perform the assigned duties.

Ability to:

- Appear to work on time.
- Interact effectively with co-workers.
- Understand & follow work rules and procedures.
- Accept constructive criticism.
- Ability to lead and manage others.

Assistant General Manager (continued)

Education and Experience Guidelines

Any combination of educationa and experience that would likely provide the required knowledge and abilities is qualifying. A typical way to obtain the knowledge and abilities would be:

Education

- Graduation from high school or equivalent required.
- Bachelors Degree in Business or Public Administration.

Experience

- At least 10 years experience in management level public administration work.

License/Certification

- California Drivers License Must possess and maintain a valid California Driver License, provide proof thereof and maintain a driving record acceptable to the District's automobile insurance carrier.

PHYSICAL DEMANDS AND WORKING ENVIRONMENT

The conditions herein are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accomodations may be made to enable individuals with disabilities to perform the essential job functions.

ENVIRONMENT

PHYSICAL • Level One

VISION

HEARING

JOB STATUS Exempt Unrepresented

SALARY RANGE: 48

(10AGM)

ELSINORE VALLEY MUNICIPAL WATER DISTRICT

Director of Operations

Job descriptions are intended to present a descriptive list of the range of duties performed by employees in this job. Specifications are NOT intended to reflect all duties performed with the job.

SUMMARY DESCRIPTION

Under general administrative direction, plans, directs, manages, and oversees the functions, programs, and operations of the Operations Department; oversees and directs the District's domestic water system, including water treatment, ground water production, water storage and delivery systems, the District's wastewater collection and treatment operations and source control program, the District's agricultural water pumping and delivery systems, the District's fleet maintenance and repair operations, District facilities and grounds maintenance and repair, and the District's Safety and Health Program as efficiently and economically as possible; formulates and implements operating policies and procedures within general administrative guidelines; coordinates assigned activities with other departments and outside agencies; and provides highly responsible and complex administrative support to the General Manager.

REPRESENTATIVE DUTIES

The following duties are typical for this classification. Incumbents may not perform all duties and/or may be required to perform additional or different duties from those set forth below to address business needs and changing business practices.

- • Assumes full management responsibility for all Operations Department functions, programs, and operations including water treatment, ground water production, water storage and delivery systems, wastewater collection and treatment operations and source control program, agricultural water pumping and delivery systems, fleet maintenance and repair operations, facilities and grounds maintenance and repair, and the District's Safety and Health Program.
- • Manages the development and implementation of Departmental goals, objectives, and priorities for each assigned service area; recommends and administers policies and procedures.
- • Establishes within District policy, appropriate service and staffing levels; monitors and evaluates the efficiency and effectiveness of service delivery methods and procedures; allocates resources accordingly.
- • Assesses and monitors work load, administrative support systems, and internal reporting relationships; identifies opportunities for improvement; directs and implements changes.
- • Plans, directs, and coordinates, through subordinate level staff, the Operations Department's work plan; assigns projects and programmatic areas of responsibility; reviews and evaluates work methods and procedures; meets with key staff to identify and resolve problems; encourages professional growth of subordinate managers.
- • Selects, trains, motivates, and evaluates assigned personnel; provides or coordinates staff training; works with employees to correct deficiencies; implements discipline and termination procedures.
- • Oversees and participates in the development and administration of the Department budget; approves the forecast of funds needed for staffing, equipment, materials, and supplies; approves expenditures and implements budgetary adjustments as appropriate and necessary.
- • Develops and recommends cost saving mechanisms and programs; coordinates budget requests of the managed divisions to eliminate waste and maximize efficiency; monitors and controls departmental expenditures of approved budget allocations to assure the efficient and effective use of available resources; directs cost projections and estimates for departmental objectives; recommends Operations capital improvement needs to District Engineer.
- • Maintains contact with various governmental and regulatory agencies regarding special projects through the use of subordinates; ensures compliance with reporting and other requirements of regulatory agencies; supervises the preparation of various reports to regulatory and other agencies.
- • Develops, implements, and directs the maintenance of accurate records.
- • Administers and directs through subordinate management staff, the work of predictive, preventive and reactive maintenance, repair and upkeep of District Administrative Office complex and grounds, the Operations, Warehouse and Fleet Maintenance Buildings, parking lots, parking lot structures and driveways, and support systems including heating, ventilation and air conditioning (HVAC) and emergency/backup power generation.
- • Provides oversight of Mutual Water Company operational activities; represents the District in meetings with governmental agencies, private firms, contractors, vendors and others as necessary; assists District Finance Department with related financial and budgetary requirements.

Director of Operations (continued)

- • Oversees and directs through subordinate safety staff the District's comprehensive Safety and Health Program; plans, implements, and directs formulation of operational safety procedures and manuals including District's major disaster program; interfaces with the various regulatory and governmental agencies, as required.
- • Interrelates effectively and diplomatically in all areas of employee relations, always projecting a professional image in keeping with the District's goals and objectives while exercising the highest degree of confidentiality.
- • Provides staff assistance to the General Manager; prepares and presents staff reports and other necessary correspondence.
- • Represents the Operations Department to other departments, elected officials, and outside agencies; coordinates assigned activities with those of other departments and outside agencies and organizations.
- • Explains, justifies, and defends department programs, policies, and activities; negotiates and resolves sensitive and controversial issues.
- • Participates on a variety of boards, commissions, and committees.
- • Attends and participates in professional group meetings; stays abreast of new trends and innovations in the field of operation maintenance; directs the incorporation of new developments into program areas, as appropriate.
- • Responds to and resolves difficult and sensitive citizen inquiries and complaints.
- • Reads, understands and complies with the District's Safety Manual; attends safety meetings as required; reports all accidents, violations or infractions occurring within the Operations Department; ensures that departmental functions are carried out in a safe and efficient manner.
- • Performs related duties as required.

QUALIFICATIONS

The following generally decribes the knowledge and ability required to enter the job and/or be learned within a short period of time in order to successfully perform the assigned duties.

Ability to:

- Manage and direct a comprehensive domestic water system program.
- Develop and administer departmental goals, objectives, and procedures.
- Prepare and administer large and complex budgets.
- Analyze and assess programs, policies, and operational needs and make appropriate adjustments.
- Research, analyze, and evaluate new service delivery methods and techniques.
- Select, train, and evaluate staff.
- Plan, organize, direct, and coordinate the work of lower level staff.
- Delegate authority and responsibility.
- Analyze problems, identify alternative solutions, project consequences of proposed actions, and implement recommendations in support of goals.
- Prepare clear and concise administrative and financial reports.
- Understand the organization and operation of the District and of outside agencies as necessary to assume assigned responsibilities.
- Interpret and apply applicable federal, state, and local policies, laws, and regulations.
- Identify and respond to sensitive community and organizational issues, concerns, and needs.
- Effectively represent the District to outside individuals and agencies to accomplish the goals and objectives of the unit.
- Work cooperatively with other departments, District officials, and outside agencies.
- Communicate clearly and concisely, both orally and in writing.
- Establish and maintain effective working relationships with those contacted in the course of work.

Education and Experience Guidelines

Any combination of educationa and experience that would likely provide the required knowledge and abilities is qualifying. A typical way to obtain the knowledge and abilities would be:

Education

- Equivalent to a Bachelor's Degree from an accredited college or university with major course work in business administration, public administration, or related field.

Director of Operations (continued)

Experience

- Ten (10) years of increasingly responsible experience in municipal utility administration including five years of management and administrative responsibility,. principles, operations and techniques, including planning, budgeting, safety and staff organization and development.

Knowledge

- Operational characteristics, services, and activities of a comprehensive domestic water system program.
- Advanced principles and practices of water distribution systems including wells, booster stations and water storage facilities.
- Advanced principles and practices of water treatment, wastewater collection/treatment and agricultural water delivery system.
- Advanced principles and practices of fleet maintenance management.
- Advanced principles and practices of building and grounds maintenance management.
- Principles and practices of Injury and Illness Prevention Program Administration.
- Principles and practices of program development and administration.
- Principles and practices of budget preparation and administration.
- Principles of supervision, training, and performance evaluation.
- Pertinent federal, state, and local laws, codes, and regulations.
- Office procedures, methods, and equipment including computers and applicable software applications such as word processing, spreadsheets, and databases.

License/Certification

- Possession of an appropriate, valid driver's license.
- Certification required in District provided CPR/First Aid training.
- Possession of a Valid Grade IV California Water Environment Certification in the disciplines of Mechanical Technology and/or Wastewater Collection Systems is highly desirable.
- Possession of a State of California certification in Water or Wastewater Treatment Plant Operations is desirable.
- Possession of a State of California, Department of Health Services, Water Distribution Operator Certification is desirable.
- Possession of a United States Department of Labor (OSHA) Safety Trainer Certification is desirable.
- Possession of a California Department of Food and Agriculture Qualified Applicator certification is desirable.

PHYSICAL DEMANDS AND WORKING ENVIRONMENT

The conditions herein are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accomodations may be made to enable individuals with disabilities to perform the essential job functions.

ENVIRONMENT

Standard office setting.

PHYSICAL • Level One

Incumbents require sufficient mobility to work in an office setting; stand or sit for prolonged periods of time; operate office equipment including use of a computer keyboard; light lifting and carrying; ability to verbally communicate to exchange information.

VISION

See in the normal visual range with or without correction; vision sufficient to read computer screens and printed documents; and to operate assigned equipment.

HEARING

Hear in the normal audio range with or without correction.

Director of Operations (continued)

JOB STATUS Exempt Unrepresented

SALARY RANGE: 44

(80DOO)

ELSINORE VALLEY MUNICIPAL WATER DISTRICT

Wastewater Operations Manager

Job descriptions are intended to present a descriptive list of the range of duties performed by employees in this job. Specifications are NOT intended to reflect all duties performed with the job.

SUMMARY DESCRIPTION

Under administrative direction, directs, manages, supervises, and coordinates the activities and operations of the Wastewater Division within the Operations Department including collection system pipelines, lift stations, wastewater reclamation treatment facilities and the District's facilities source control program; coordinates assigned activities with other divisions, departments, and outside agencies; and provides highly responsible and complex administrative support to the Director of Operations.

REPRESENTATIVE DUTIES

The following duties are typical for this classification. Incumbents may not perform all duties and/or may be required to perform additional or different duties from those set forth below to address business needs and changing business practices.

- Assumes management responsibility for assigned services and activities of the Wastewater Division including organizing, scheduling, assigning and supervising directly, and through subordinates, the daily and long-term management and operation of the District's wastewater reclamation plants, wastewater collection systems including liftstations, forcemains and gravity lines and the District's source control program.
- Manages and participates in the development and implementation of goals, objectives, and priorities for assigned programs; recommends and administers policies and procedures.
- Monitors and evaluates the efficiency and effectiveness of service delivery methods and procedures; recommends, within departmental policy, appropriate service and staffing levels.
- Plans, directs, coordinates, and reviews the work plan for assigned staff; assigns work activities, projects, and programs; reviews and evaluates work products, methods, and procedures; meets with staff to identify and resolve problems.
- Selects, trains, motivates, and evaluates assigned personnel; provides or coordinates staff training; works with employees to correct deficiencies; implements discipline and termination procedures.
- Oversees and participates in the development and administration of the Wastewater Division's annual budget including capital outlay and capital improvement projects; participates in the forecast of funds needed for staffing, equipment, materials, and supplies; monitors and approves expenditures; implements adjustments.
- Reports significant operational problems and recommendations for resolution to the Director of Operations; in emergencies, has the authority to take corrective actions where such actions are deemed essential to public safety and continued service to the District's customers.
- Prepares and submits periodic reports in accordance with District and other regulatory agency requirements.
- Provides professional operational advice related to the construction of various District waste water facilities and field projects in progress, as necessary.
- Administers and reviews reclaimed water facilities and users for compliance with District standards and other applicable federal, state, and local regulations.
- Maintains up-to-date knowledge of wastewater regulations and makes recommendations to ensure current and future District compliance with all local, state, and federal regulations.
- Administers the District's Industrial Waste Source Control Program; works with Industrial Waste Inspector to schedule routine source control investigations and inspections.
- Monitors requisition of supplies, materials and equipment for the District's wastewater facilities and collection systems.
- Interrelates effectively and diplomatically in all areas of employee relations, always projecting a professional image in keeping with the District's goals and objectives while exercising the highest degree of confidentiality.
- Serves as the Incident Commander during hazmat and confined space rescue operations.
- Provides responsible staff assistance to the Director of Operations; conducts a variety of organizational studies, investigations, and operational studies; recommends modifications to wastewater programs, policies, and procedures as appropriate.

Wastewater Operations Manager (continued)

- Serves as the liaison for the Wastewater Division to other divisions, departments, and outside agencies; negotiates and resolves sensitive and controversial issues; interprets policies and procedures established by regulatory agencies.
- Serves as staff on a variety of boards, commissions, and committees; prepares and presents staff reports and other necessary correspondence.
- Attends and participates in professional group meetings; stays abreast of new trends and innovations in the field of wastewater operations and administration; directs the incorporation of new developments into program areas, as appropriate.
- Responds to and resolves difficult and sensitive citizen inquiries and complaints.
- Reads, understands, and ensures compliance with the District Safety Manual; attends safety meetings, as required; reports all accidents, violations, or infractions to supervisor.
- Performs related duties as required.

QUALIFICATIONS

The following generally decribes the knowledge and ability required to enter the job and/or be learned within a short period of time in order to successfully perform the assigned duties.

Ability to:

- Oversee and participate in the management of a comprehensive wastewater operations program.
- Oversee, direct, and coordinate the work of lower level staff.
- Select, train, and evaluate staff.
- Oversee and participate in the development and administration of division goals, objectives, and procedures.
- Research, analyze, and evaluate new service delivery methods and techniques.
- Prepare and administer large program budgets.
- Prepare clear and concise reports including administrative and financial reports.
- Read and interpret blueprints, schematics, plans, and drawings.
- Manage multiple tasks and projects.
- Prioritize work loads and goals.
- Operate office equipment including computers and supporting word processing, spreadsheet, and database applications.
- Ensure adherence to established safety rules, regulations and guidelines.
- Analyze problems, identify alternative solutions, project consequences of proposed actions and implement recommendations in support of goals.
- Understand the organization and operation of the District and of outside agencies as necessary to assume assigned responsibilities.
- Understand, interpret, and apply general and specific administrative and departmental policies and procedures as well as applicable federal, state, and local policies, laws, and regulations.
- Effectively represent the District to outside individuals and agencies to accomplish the goals and objectives of the unit.
- Work cooperatively with other departments, District officials, and outside agencies.
- Communicate clearly and concisely, both orally and in writing.
- Establish and maintain effective working relationships with those contacted in the course of work.

Education and Experience Guidelines

Any combination of educationa and experience that would likely provide the required knowledge and abilities is qualifying. A typical way to obtain the knowledge and abilities would be:

Education

- Equivalent to the completion of the twelfth grade supplemented by college level coursework in wastewater operations and water distribution or a related field.

Wastewater Operations Manager (continued)

Experience

- Seven years of increasingly responsible experience in the operation, inspection, maintenance, and repair of wastewater collection, pumping systems, wastewater treatment and wastewater reclamation including four years of administrative and supervisory responsibility.

Knowledge

- Operational characteristics, services, and activities of a wastewater operations program.
- Advanced wastewater treatment principles, methods, tools and equipment, safety procedures, wastewater sampling and control test procedures, chemicals and regulatory requirements.
- Modern and complex principles and practices of operating a wastewater treatment plant.
- Principles and techniques of various processes and sub processes that effectively result in the efficient treatment of wastewater.
- Principles and practices of operating equipment such as pneumatic and hydraulic tools.
- Use, application, and safe handling of chemicals, chemical agents, and biological processes in the effective treatment of wastewater.
- Principles and practices of program development and administration.
- Principles and practices of budget preparation and administration.
- Principles of supervision, training, and performance evaluation.
- Pertinent federal, state, and local laws, codes, and regulations.
- Principles and procedures of record keeping.
- Principles of business letter writing and report preparation.
- Office procedures, methods, and equipment including computers and applicable software applications such as word processing, spreadsheets, and databases.

License/Certification

- Possession of an appropriate, valid driver's license.
- Possession of a valid Grade V Wastewater Treatment Operator Certificate issued by the California State Water Resources Control Board.
- Possession of a valid Grade IV Wastewater Collection Systems Certification issued by the California Water Environment Association.
- Possession of a valid Grade I Environmental Compliance Inspector Certification issued by the California Waster Environment Association.

PHYSICAL DEMANDS AND WORKING ENVIRONMENT

The conditions herein are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accomodations may be made to enable individuals with disabilities to perform the essential job functions.

ENVIRONMENT

Standard office setting with some travel to various locations to attend meetings or to inspect job sites.

PHYSICAL • Level One

Incumbents require sufficient mobility to work in an office setting; stand, walk or sit for prolonged periods of time; operate office equipment including use of a computer keyboard; light lifting and carrying; ability to verbally communicate to exchange information.

VISION

See in the normal visual range with or without correction; vision sufficient to read computer screens and printed documents; and to operate assigned equipment.

HEARING

Hear in the normal audio range with or without correction.

Wastewater Operations Manager (continued)

JOB STATUS Exempt Unrepresented

SALARY RANGE: 40

(90WOP)

ELSINORE VALLEY MUNICIPAL WATER DISTRICT

Wastewater Collections System Superintendent

Job descriptions are intended to present a descriptive list of the range of duties performed by employees in this job. Specifications are NOT intended to reflect all duties performed with the job.

SUMMARY DESCRIPTION

Under general direction, oversees, supervises, and coordinates the work of a number of crews engaged in sanitary sewer maintenance and operation within the Wastewater Department; assists in inspection of sewer lines and mains and performs skilled and supervisory work in the construction, maintenance and repair of sanitary sewers and sewage lift stations; participates in the District's Hazwhopper Program; coordinates assigned activities with other divisions, outside agencies, and the general public; may be required to perform weekend duty, standby duty and call back for sewer and/or water problems; and provides highly responsible and complex staff assistance to the Wastewater Operations Manager.

REPRESENTATIVE DUTIES

The following duties are typical for this classification. Incumbents may not perform all duties and/or may be required to perform additional or different duties from those set forth below to address business needs and changing business practices.

- Assumes responsibility for collection systems activities and operations within the Wastewater Department including the work of a number of crews engaged in sanitary sewer maintenance and operation.
- Coordinates the organization, staffing, and operational activities for the wastewater collections program.
- Directs, coordinates, and reviews the work plan for assigned wastewater collections services and activities; assigns work activities and projects; monitors work flow; reviews and evaluates work products, methods, and procedures; meets with staff to identify and resolve problems.
- Participates in the development and implementation of goals, objectives, and priorities; recommends and participates in the implementation of resulting policies and procedures; monitors work activities to ensure compliance with established policies and procedures.
- Identifies opportunities for improving service delivery methods and procedures; identifies resource needs; reviews with appropriate management staff; implements improvements.
- Selects, trains, motivates, and evaluates assigned personnel; provides or coordinates staff training; works with employees to correct deficiencies; implements discipline and termination procedures.
- Participates in the development and administration of assigned program budget; forecasts funds needed for staffing, equipment, materials, and supplies; monitors and approves expenditures; recommends adjustments as necessary.
- Supervises, schedules, assigns and participates in the work of skilled and unskilled workers engaged in the maintenance and repair of sewer lines including cleaning, rodding and replacement of sewer lines and manholes; supervises, schedules, assigns and participates in the operation and maintenance of sewage lift stations.
- Inspects the work of crews engaged in sewer maintenance and repair; assists in the inspection of existing and newly constructed sanitary sewer collection systems including conveyance lines and lift stations.
- Ensures compliance with the State Water Quality Control Board's discharge permits concerning sanitary sewer overflows, sewer overflow prevention plans, and sewer overflow remediation plans.
- Applies, trains and directs others in the application of Pesticides and Herbicides.
- Operates a variety of heavy equipment including, but not limited to, tractor trailer unit, crane, skip loader, tandem drive axle rigs, service trucks and backhoe/loaders as necessary.
- Must be able to respond to emergency call-out situations and perform standby duty for emergency response after hours, on weekends and holidays according to predetermined schedule; while performing stand-by duty and during emergency situations, or as otherwise directed, diagnoses and performs corrective actions involving collection system and sewage liftstation malfunctions using a variety of specialized mechanical and electrical tools.
- Performs confined space and permit confined space entries as defined by the California Code of Regulations-Title8. General Industry Safety Orders, Section 5157 and Federal OSHA Standards 29 CFR1910.146. Has designated authority to complete pre-entry checklists, performs atmospheric testing and evaluation of various entry conditions and situations as outlined in Appendix C to the above referenced regulations.
- Provides staff assistance to the Wastewater Operations Manager; conducts a variety of studies and investigations; develops and recommends modifications to wastewater collections programs, policies, and procedures as appropriate.

- Maintains records concerning operations and programs; prepares reports on operations and activities; may keep operational records, such as operations logs, test results, and unusual operating conditions; may prepare regulatory reports for review by Utility Operations Manager; may be required to update sewer overflow remediation and prevention plans.
- Coordinates collection system maintenance activities with those of other divisions and outside agencies and organizations; resolves sensitive and controversial issues.
- Serves as staff on a variety of boards, commissions, and committees; prepares and presents staff reports and other necessary correspondence.
- Attends and participates in professional group meetings; stays abreast of new trends and innovations in the field of collection system maintenance; directs and participates in the incorporation of new developments into program areas, as appropriate.
- Responds to and resolves citizen inquires and complaints related to sewer maintenance, repairs, lift stations, and sewer odors.
- Review collection system and liftstation plans.
- Reads, understands, and ensures compliance with the District Safety Manual; attends and may be responsible for initiating safety meetings, as required; reports all accidents, violations, or infractions to supervisor.
- Performs related duties as required.

QUALIFICATIONS

The following generally decribes the knowledge and ability required to enter the job and/or be learned within a short period of time in order to successfully perform the assigned duties.

Ability to:

- Oversee and participate in the management of collection systems maintenance activities and operations within the Wastewater Department.
- Supervise, direct, and coordinate the work of assigned staff.
- Plan and organize work to meet changing priorities and deadlines.
- Select, train, and evaluate staff.
- Participate in the development and administration of division goals, objectives, and procedures.
- Research, analyze, and evaluate new service delivery methods and techniques.
- Understand the organization and operation of the District and of outside agencies as necessary to assume assigned responsibilities.
- Understand, interpret, and apply general and specific administrative and departmental policies and procedures as well as applicable federal, state, and local policies, laws, and regulations.
- Participate in the preparation and administration of assigned budgets.
- Prepare clear and concise reports including administrative and financial reports.
- Analyze problems, identify alternative solutions, project consequences of proposed actions and implement recommendations in support of goals.
- Effectively represent the District to outside individuals and agencies to accomplish the goals and objectives of the unit.
- Work cooperatively with other departments, District officials, and outside agencies.
- Respond tactfully, clearly, concisely, and appropriately to inquiries from the public, District staff, or other agencies on sensitive issues in area of responsibility.
- Operate a variety of vehicles and equipment in a safe and effective manner.
- Use Self Contained Breathing Apparatus (SCBA).
- Communicate clearly and concisely, both orally and in writing.
- Establish and maintain effective working relationships with those contacted in the course of work.

Wastewater Collections System Superintendent

Education and Experience Guidelines

Any combination of education and experience that would likely provide the required knowledge and abilities is qualifying. A typical way to obtain the knowledge and abilities would be:

Education/Training

- Equivalent to the completion of the twelfth grade supplemented by college level course work in wastewater operations or a related field.

Experience

- Six years of responsible experience in lift station operation and line cleaning including three years of administrative and supervisory responsibility.

Knowledge

- Operations, services, and activities of a collection systems maintenance program.
- Modern wastewater system methods, materials, practices, tools, machinery, and technical equipment.
- Operation of power equipment, including trucks, loaders and related equipment.
- Operational characteristics of maintenance and construction equipment and tools.
- Advanced Methods, techniques and safety practices in maintaining wastewater systems.
- Confined space entry.
- The use of power operated and hand tools and safety gear.
- Mathematical principles.
- Principles and practices of record keeping.
- Occupational hazards and standard safety practices including those used for entrance into confined spaces.
- Principles of supervision, training, and performance evaluation.
- Principles and practices of budget preparation and administration.
- Basic principles and practices of program development and administration.
- Pertinent federal, state, and local laws, codes, and regulations.
- Principles and procedures of record keeping.
- Principles of business letter writing and report preparation.
- Office procedures, methods, and equipment including computers and applicable software applications such as word processing, spreadsheets, and databases.

License/Certification

- Possession of an appropriate, valid driver's license.
- Possession of a Class A California Drivers License with air brake and tank endorsements within 6 months of hire.
- Possession of a valid Grade III Collection Systems Maintenance Technologist Certification issued by the California Water Environment Association (CWEA).
- Possession of a valid Grade II Plant Maintenance Electrical/Instrumentation or Mechanical Technology Certification issued by the California Water Environment Association (CWEA).
- Possession of a confined space entry supervisor certificate.
- Must hold or be willing to be trained to 8 hour First Responder level for disaster preparedness and emergency response purposes.
- Certification required in District provided CPR/First Aid and Bloodborne Pathogen training.
- Possession of a Grade IV Collection System Maintenance Certification issued by CWEA is desirable.
- Possession of a Qualified Applicators Certificate issued by the State of California, Department of Food and Agriculture is desirable.

PHYSICAL DEMANDS AND WORKING ENVIRONMENT

The conditions herein are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accomodations may be made to enable individuals with disabilities to perform the essential job functions.

ENVIRONMENT

Standard office setting and outdoor field environment; travel from site to site; exposure to noise, dust, grease, smoke, fumes, noxious odors, gases, vibrations, and all types of weather and temperature conditions; exposure to hazardous traffic conditions; work in or around water; work and/and or walk on various types of surfaces including slippery or uneven surfaces and rough terrain; incumbents may be required to work extended hours including evenings and weekends.

PHYSICAL

- Level Three
- NIDA
- Pulmonary

Incumbents require sufficient mobility to work in an office setting and field environment; walk, stand, and sit for prolonged periods of time; frequently stoop, bend, kneel, crouch, crawl, climb, reach, and twist; push, pull, lift, and/or carry light to moderate amounts of weights; operate office equipment including use of a computer keyboard; operate assigned equipment and vehicles; ability to verbally communicate to exchange information.

VISION

See in the normal visual range with or without correction; vision sufficient to read computer screens and printed documents; and to operate assigned equipment.

HEARING

Hear in the normal audio range with or without correction.

JOB STATUS Non-Exempt: Management Team Association

SALARY RANGE: 33

(91WWCSS)

ELSINORE VALLEY MUNICIPAL WATER DISTRICT

Wastewater Chief Plant Operator

Job descriptions are intended to present a descriptive list of the range of duties performed by employees in this job. Specifications are NOT intended to reflect all duties performed with the job.

SUMMARY DESCRIPTION

Under general direction, oversees, supervises, and coordinates wastewater treatment activities and operations within the Wastewater Treatment Division within the Operations Department; plans, organizes, trains, directs, and supervises a staff of wastewater treatment plant operators in the operation of the District's state-of-art biological nutrient removal wastewater facility; ensures and demonstrates that the facility or facilities supervised are in compliance with all regulatory agencies through the documentation of plant performance and reporting these performances and compliance levels through monthly, quarterly, semi-annual and annual reports; coordinates assigned activities with other divisions, outside agencies, and the general public; and provides highly responsible and complex staff assistance to the Wastewater Operations Manager.

REPRESENTATIVE DUTIES

The following duties are typical for this classification. Incumbents may not perform all duties and/or may be required to perform additional or different duties from those set forth below to address business needs and changing business practices.

- Assumes responsibility for wastewater treatment activities and operations within the Wastewater Treatment Division within the Operations Department including the operation of the District's state-of-art biological nutrient removal wastewater facility.
- Coordinates the organization, staffing, and operational activities for the wastewater treatment plant program.
- Directs, coordinates, and reviews the work plan for assigned wastewater treatment services and activities; assigns work activities and projects; monitors work flow; reviews and evaluates work products, methods, and procedures; meets with staff to identify and resolve problems.
- Participates in the development and implementation of goals, objectives, and priorities; recommends and participates in the implementation of resulting policies and procedures; monitors work activities to ensure compliance with established policies and procedures.
- Identifies opportunities for improving service delivery methods and procedures; identifies resource needs; reviews with appropriate management staff; implements improvements.
- Selects, trains, motivates, and evaluates assigned personnel; provides or coordinates staff training; establishes performance requirements and personnel development targets for assigned staff; works with employees to correct deficiencies; implements discipline and termination procedures.
- Participates in the development and administration of assigned program budget; forecasts funds needed for staffing, equipment, materials, and supplies; monitors and approves expenditures; recommends adjustments as necessary.
- Provides day-to-day leadership and works with staff to ensure a high performance, safe, efficient and customer service-oriented work environment that supports achieving the facility's and District's mission, strategic plan, objectives and values.
- Reads and interprets plant piping and distribution plans; assists in locating and troubleshooting plant malfunctions as necessary.
- Maintains operational records, such as plant operational logs, test results, unusual operating conditions, and maintenance of work performed; generates monthly and annual regulatory reports as required for operations.
- Monitors, researches, develops, and recommends improvements, modifications, enhancements, and changes to the Facility's DCS System.
- Reviews and coordinates with appropriate personnel the implementation of local, state and federal laws and regulations regarding wastewater treatment, effluent disposal, biosolids and grit disposal.
- Ensures operational status of facility's treatment systems and processes; ensures treatment standards, and goals are achieved through proper operation and maintenance of facilities and equipment.
- Ensures the District's safety program and goals are implemented and carried out within the facility.
- Inspects plant facilities and evaluates laboratory and operational performance data to analyze trends; directs staff in making process changes to ensure plant compliance with Federal and State regulations pertaining to wastewater treatment and disposal.

Wastewater Chief Plant Operator (continued)

- Schedules delivery of chemicals and supplies with vendors; places orders and requisitions for materials and supplies.
- Interrelates effectively and diplomatically in all areas of employee relations, always projecting a professional image in keeping with the District's goals and objectives while exercising the highest degree of confidentiality.
- Provides staff assistance to the Wastewater Operations Manager; conducts a variety of studies and investigations; develops and recommends modifications to wastewater treatment programs, policies, and procedures as appropriate.
- Maintains records concerning operations and programs; prepares reports on operations and activities.
- Coordinates assigned activities with those of other divisions and outside agencies and organizations; resolves sensitive and controversial issues.
- Serves as staff on a variety of boards, commissions, and committees; prepares and presents staff reports and other necessary correspondence.
- Attends and participates in professional group meetings; stays abreast of new trends and innovations in the field of wastewater treatment; directs and participates in the incorporation of new developments into program areas, as appropriate.
- Responds to and resolves citizen inquiries and complaints.
- Reads, understands, and ensures compliance with the District Safety Manual; attends safety meetings, as required; reports all accidents, violations, or infractions to supervisor.
- Performs related duties as required.

QUALIFICATIONS

The following generally decribes the knowledge and ability required to enter the job and/or be learned within a short period of time in order to successfully perform the assigned duties.

Ability to:

- Oversee and participate in the management of wastewater treatment activities and operations within the Wastewater Treatment Division within the Operations Department.
- Supervise, direct, and coordinate the work of assigned staff.
- Plan and organize work to meet changing priorities and deadlines.
- Select, train, and evaluate staff.
- Participate in the development and administration of division goals, objectives, and procedures.
- Research, analyze, and evaluate new service delivery methods and techniques.
- Understand the organization and operation of the District and of outside agencies as necessary to assume assigned responsibilities.
- Understand, interpret, and apply general and specific administrative and departmental policies and procedures as well as applicable federal, state, and local policies, laws, and regulations.
- Participate in the preparation and administration of assigned budgets.
- Prepare clear and concise reports including administrative and financial reports.
- Analyze problems, identify alternative solutions, project consequences of proposed actions and implement recommendations in support of goals.
- Effectively represent the District to outside individuals and agencies to accomplish the goals and objectives of the unit.
- Work cooperatively with other departments, District officials, and outside agencies.
- Respond tactfully, clearly, concisely, and appropriately to inquiries from the public, District staff, or other agencies on sensitive issues in area of responsibility.
- Respond within thirty (30) minute time period to the District's Corporate Yard while on standby duty; must be able to communicate by telephone while on standby duty.
- Communicate clearly and concisely, both orally and in writing.
- Establish and maintain effective working relationships with those contacted in the course of work.

Wastewater Chief Plant Operator (continued)

Education and Experience Guidelines

Any combination of educationa and experience that would likely provide the required knowledge and abilities is qualifying. A typical way to obtain the knowledge and abilities would be:

Education

- Equivalent to the completion of the twelfth grade supplemented by college level coursework in wastewater treatment or a related field.

Experience

- Six years of responsible experience in the operation, construction, maintenance, inspection and repair of a wastewater treatment facility with biological nutrient removal processes including three years of administrative and supervisory responsibility.

Knowledge

- Operations, services, and activities of a wastewater treatment program.
- Advanced wastewater treatment principles, methods, tools and equipment, safety procedures, wastewater sampling and control test procedures, chemicals and regulatory requirements.
- Modern and complex principles and practices of operating a wastewater treatment plant.
- Principles and techniques of various processes and sub processes that effectively result in the efficient treatment of wastewater.
- Principles and practices of operating equipment such as pneumatic and hydraulic tools.
- Use, application, and safe handling of chemicals, chemical agents, and biological processes in the effective treatment of wastewater.
- Principles of supervision, training, and performance evaluation.
- Principles and practices of budget preparation and administration.
- Basic principles and practices of program development and administration.
- Pertinent federal, state, and local laws, codes, and regulations.
- Principles and procedures of record keeping.
- Principles of business letter writing and report preparation.
- Office procedures, methods, and equipment including computers and applicable software applications such as word processing, spreadsheets, and databases.

License/Certification

- Possession of an appropriate, valid driver's license.
- Certification required in the District-provided CPR/First Aid training.
- Possession of a valid Grade IV Wastewater Treatment Plant Operator Certificate issued by the California State Water Resources Control Board.
- Must hold or be willing to be trained in 24 hour Hazardous Technician Hazwhoper level for disaster preparedness and emergency response purposes.

PHYSICAL DEMANDS AND WORKING ENVIRONMENT

The conditions herein are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accomodations may be made to enable individuals with disabilities to perform the essential job functions.

ENVIRONMENT

Wastewater treatment plant and field environment; exposure to noise, dust, grease, fumes, gases, potentially hazardous chemicals, electrical energy, and inclement weather conditions including wet and/or humid conditions; work around water or wastewater; work on slippery surfaces; regularly work near moving mechanical parts; and work around moderately loud noise levels; incumbents may be required to work evenings, nights, and weekends.

PHYSICAL

- Level Three
- NIDA
- Pulmonary

Wastewater Chief Plant Operator (continued)

Incumbents require sufficient mobility to work in a wastewater treatment plant and field environment; walk, stand, and sit for prolonged periods of time; frequently stoop, bend, kneel, crouch, crawl, climb, reach, and twist; push, pull, lift, and/or carry moderate to heavy amounts of weights; operate assigned equipment and vehicles; ability to verbally communicate to exchange information.

VISION

See in the normal visual range with or without correction; vision sufficient to read computer screens and printed documents; and to operate assigned equipment.

HEARING

Hear in the normal audio range with or without correction.

JOB STATUS Exempt Management Team Association

SALARY RANGE: 36

(90WWCPO)

ELSINORE VALLEY MUNICIPAL WATER DISTRICT

Senior Lift Station Maintenance Technician

Job descriptions are intended to present a descriptive list of the range of duties performed by employees in this job. Specifications are NOT intended to reflect all duties performed with the job.

SUMMARY DESCRIPTION

Under direction, leads, oversees, and participates in the more complex and difficult work of staff responsible for the maintenance, operation, diagnostic testing, installation and repair of instrumentation and control systems, auto-dialer maintenance/replacement/programming and other types of technical maintenance and repair involved in the District's sewage lift stations, wastewater collection systems and related support equipment; ensures that the general waste discharge orders issued by the State Water Quality Board are complied with; operates a variety of maintenance and construction tools and equipment; may be required to participate in the research, formulation and implementation of job specific safety programs; and performs a variety of tasks relative to assigned areas of responsibility.

REPRESENTATIVE DUTIES

The following duties are typical for this classification. Incumbents may not perform all duties and/or may be required to perform additional or different duties from those set forth below to address business needs and changing business practices.

- Plans, leads, and reviews the work of staff responsible for the maintenance, operation, diagnostic testing, installation and repair of instrumentation and control systems, auto-dialer maintenance/replacement/programming and other types of technical maintenance and repair involved in the District's sewage lift stations, wastewater collection systems and related support equipment.
- Trains assigned employees in their areas of work including liftstation maintenance methods, procedures, and techniques.
- Supervises the use, care, and operation of liftstation maintenance equipment including crane truck, multi-meters, megometers, ampmeters, and loop calibrator.
- Verifies the work of assigned employees for accuracy, proper work methods, techniques, and compliance with applicable standards and specifications; ensures adherence to safe work practices and procedures; works with staff to correct deficiencies; communicates any possible inefficiencies to immediate supervisor; conducts tailgate safety meetings.
- Oversees and participates in installing, troubleshooting and maintaining various types of lift station control systems including, floats ultrasonic level controllers, pressurized air (bubbler) controllers and pressure differential controllers; field tests, troubleshoots, programs and maintains multi-zone auto dialers and alarm systems.
- Oversees, performs, repairs, inspects and troubleshoots work associated with electrical circuits, alarm circuits, motors, pumps, valves, piping and pneumatic/electrical controls; installs and modifies equipment as needed.
- Oversees and participates in using hand, bench and machine tools in the repair of pumps, valves, and other lift station machinery and equipment; operates drill presses, grinders and other related equipment; repairs/replaces bearings, shaft sleeves, pressure and drain piping and other parts.
- Leads and performs the installation of electrical and mechanical equipment including pumps, motors, valves, solenoids, timers; installs and maintains time delay relays, magnetic controllers, contact points, mechanical seals, seal fluid filters, lighting fixtures, receptacles, switches, fuses, bearings and gaskets.
- Oversees and participates in diagnosing and performing corrective action involving sewage lift station malfunctions using a variety of specialized tools and testing/diagnostic instrumentation.
- Reads, interprets, performs, supervises and inspects work from electrical schematics blueprints, plans and maps as related to sewage liftstations, control systems, wastewater collection system maintenance and manufacturer maintenance and operation manuals; performs plan checking, as directed, related to lift station and collection system construction/improvements.
- Maintains, schedules and performs repairs at all District sewage lift stations, coordinates and performs repair operations, equipment replacement and related special projects with, and as directed by, supervisor; maintains records and prepares a variety of reports including time, supplies/materials relevant to collections system and pumping system operations.
- Oversees and participates in troubleshooting and maintaining stand-by power generation systems, transfer switches and related components; bends and installs electrical conduit and pull wire for power above and below ground.

- Performs confined space and permit required confined space entry as defined by the California Code of Regulations - Title 8, General Industry Safety Orders, Section 5157 and Federal OSHA Standard 29 CFR 1910.146. Has designated authority to complete re-entry checklists, perform atmospheric testing and evaluation of various entry conditions and situations as outlined in Appendix C to the above referenced regulations. Supervises the calibration and maintains confined space atmospheric testing instrumentation and self contained breathing apparatus units.
- Applies pesticides and herbicides under the direction of a licensed applicator.
- Performs standby duty as assigned and must be able to respond to emergency call-out situations; while performing stand-by duty, during emergency situations and as otherwise directed, diagnoses and performs corrective actions involving collection system and sewage liftstation malfunctions using a variety of specialized and electrical tools.
- Responds to public inquiries in a courteous manner; provides information within the area of assignment; resolves complaints in an efficient and timely manner.
- Estimates time, materials, and equipment required for jobs assigned; requisitions materials as required; keeps inventory of replacement parts; prepares and maintains records and written reports, as required.
- Assists superintendent in department budget preparation.
- Reads, understands, and ensures compliance with the District Safety Manual; attends safety meetings, as required; reports all accidents, violations, or infractions to superintendent.
- Performs related duties as required.

QUALIFICATIONS

The following generally decribes the knowledge and ability required to enter the job and/or be learned within a short period of time in order to successfully perform the assigned duties.

Ability to:

- Lead, organize, and review the work of assigned staff.
- Independently perform the most difficult maintenance, operation, diagnostic testing, installation and repair of instrumentation and control systems, auto-dialer maintenance/replacement/programming and other types of technical maintenance and repair involved in the District's sewage lift stations, wastewater collection systems and related support equipment.
- Interpret, explain, and enforce department policies and procedures.
- Inspect, troubleshoot, diagnose, and repair electrical and electronic malfunctions.
- Operate a variety of maintenance and repair equipment in a safe and effective manner.
- Read, interpret, and work from blueprints, electrical diagrams and schematics, manufacturer instructions and directions.
- Accurate diagnose repair needs.
- Perform heavy manual labor.
- Perform preventative and corrective maintenance on assigned equipment.
- Perform assigned work in accordance with appropriate safety practices and regulations.
- Operate office equipment including computers.
- Work independently and with minimum direct supervision.
- Understand and carry out oral and written instructions.
- Maintain a variety of records.
- Respond within a thirty (30) minute time period to the District's corporate yard during an emergency situation.
- Per Cal-OSHA, must be clean shaven (except for close trimmed mustache/sideburns) in order to comply with respirator face mask fit test requirements.
- Communicate clearly and concisely, both orally and in writing.
- Establish and maintain effective working relationships with those contacted in the course of work.

Education and Experience Guidelines

Any combination of educationa and experience that would likely provide the required knowledge and abilities is qualifying. A typical way to obtain the knowledge and abilities would be:

Education

- Equivalent to the completion of the twelfth grade supplemented by specialized training in the areas of mechanical equipment maintenance and repair.

Experience

- Three years of experience in the maintenance and repair of sewage lift stations (or similar pumping applications) or experience in a mechanical trade such as electrical work, plumbing or pipe fitting, preferably at a journey level, and two years full time experience in the maintenance and repair of sewage lift stations.

Knowledge

- Operations, services, and activities of wastewater systems and facilities.
- Principles of lead supervision and training.
- Advanced methods and techniques for performing preventive and corrective maintenance on assigned equipment.
- Advanced principles, methods, materials, and tools employed in the repair and maintenance of assigned equipment, vehicles, and/or machinery.
- Advanced methods and techniques of performing diagnostic troubleshooting services.
- Advanced preventive and corrective maintenance techniques.
- Basic electrical and mechanical practices.
- Office procedures, methods, and equipment including computers.
- Principles and practices of record keeping.
- Occupational hazards and standard safety practices.
- Pertinent federal, state, and local laws, codes, and regulations.

License/Certification

- Possession of an appropriate, valid driver's license.
- Possession of a Class A California Drivers License, with air brakes and tank endorsement, within 6 months of hire.
- Certification required in District provided CPR/First Aid and Bloodborne Pathogen training.
- Possession of a valid Grade I Plant Maintenance Technologist Certification issued by the California Water Environment Association.
- Possession of a valid Grade II Collection System Maintenance Technologist Certification issued by the California Water Environment Association.
- Possession of a valid Grade II or higher Electrical/Instrumentation Technologist Certification issued by the California Water Environment Association is required within 18 months of appointment.
- Be willing to be trained for and maintain 8 hour First Responder level certification disaster preparedness and emergency response purposes.
- Possession of a valid Grade III Plant Maintenance Technologist, and Grade III Plant Maintenance Electrical/Instrumentation Technologist Certification is desirable.

PHYSICAL DEMANDS AND WORKING ENVIRONMENT

The conditions herein are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accomodations may be made to enable individuals with disabilities to perform the essential job functions.

ENVIRONMENT

Outdoor field environment; travel from site to site; exposure to noise, dust, grease, smoke, fumes, noxious odors, gases, vibrations, and all types of weather and temperature conditions; exposure to hazardous traffic conditions; work in or around water; work and/and or walk on various types of surfaces including slippery or uneven surfaces and rough terrain; incumbents may be required to work extended hours including

evenings and weekends.

PHYSICAL • Level One

Incumbents require sufficient mobility to work in a field environment; walk, stand, and sit for prolonged periods of time; frequently stoop, bend, kneel, crouch, crawl, climb, reach, and twist; push, pull, lift, and/or carry moderate to heavy amounts of weights; operate assigned equipment and vehicles; ability to verbally communicate to exchange information.

VISION
See in the normal visual range with or without correction; vision sufficient to read printed documents and to operate assigned equipment.

HEARING
Hear in the normal audio range with or without correction

JOB STATUS Non-Exempt: Employees Association

SALARY RANGE: 29

(90SLSMT)

ELSINORE VALLEY MUNICIPAL WATER DISTRICT

Senior Collection Systems Maintenance Worker

Job descriptions are intended to present a descriptive list of the range of duties performed by employees in this job. Specifications are NOT intended to reflect all duties performed with the job.

SUMMARY DESCRIPTION

Under direction, leads, oversees, and participates in the work of a crew performing a variety of unskilled, semi-skilled and skilled operation, maintenance, and repair work involved in the District's sewage lift stations and sewage collection systems; ensures compliance with waste discharge orders issued by the California State Water Quality Control Board; operates and maintains a variety of maintenance and construction tools and equipment; and performs a variety of technical tasks relative to assigned areas of responsibility.

REPRESENTATIVE DUTIES

The following duties are typical for this classification. Incumbents may not perform all duties and/or may be required to perform additional or different duties from those set forth below to address business needs and changing business practices.

- Plans, leads, and reviews the work of staff responsible for performing a variety of unskilled, semi-skilled and skilled operation, maintenance, and repair work involved in the District's sewage lift stations and sewage collection systems; participates in performing the most complex work of the unit including backfilling and compacting excavations to District standards.
- Trains assigned employees in their areas of work including collection systems maintenance methods, procedures, and techniques including confined space entry; assists in assigned employee evaluations.
- Supervises the use, care, and operation of collection systems equipment including Hydrojet, vacuum and mechanical line cleaning equipment.
- Verifies the work of assigned employees for accuracy, proper work methods, techniques, and compliance with applicable standards and specifications; ensures adherence to safe work practices and procedures; communicates any possible inefficiencies to immediate supervisor.
- Oversees and participates in flushing, rodding, cleaning, and repairing sewer collection lines and manholes; performs repair work resulting from mainline damage; raises manholes and cleanouts to grade; replaces system components.
- Oversees and participates in responding to system blockages and provides temporary repair of trench failures; performs system disconnects.
- Oversees and participates in excavating for various purposes; loads and unloads asphalt, rock, dirt, and construction and repair related materials and equipment.
- Oversees and participates in spreading and placing asphalt for patching and repairing street excavations as necessary including placement of hot and cold asphalt and the operation of equipment necessary to provide a finished street surface.
- Oversees and participates in operating a variety of sewer cleaners, jet rodders, pressure washers, and TV inspection equipment in the inspection, maintenance, and construction of sewer lines and laterals.
- Oversees the maintenance of all sewer equipment including emergency power generator, sewer rodder, power sprayer, and pneumatic tools; performs safety checks and checks fluid levels of vehicles and equipment; lubricates pumps, motors, and equipment; replaces sectional rods on sewer rodder; replaces and repairs high pressure hoses on Hydro-jet units and suction tubing on vacuum units; cleans assigned vehicles and equipment.
- Works at wastewater treatment plants under direct supervision of licensed operators.
- Assists Liftstation Maintenance Technicians in the troubleshooting, maintenance and repair of the District's sewage lift stations including pumps, motors control panels and standby power generators.
- Assists the Liftstation Maintenance Technicians by monitoring and servicing lift station odor control systems and reading and interpreting mechanical and electrical plans as related to lift station operations.
- Oversees and participates in performing line locating and marking.
- Performs confined space and permit required confined space entries as defined by the California Code of Regulations - Title 8 GISO Section 5157 and Federal OSHA Standards 29 CFR1910.146; completes pre-entry checklists, performs atmospheric testing and evaluation of various entry conditions and situations as outlined in Appendix C of the above referenced regulations.
- Applies and may train and direct others in the application of pesticides and herbicides.
- Oversees and participates in the establishment of appropriate traffic control including safety devices, signs, and barricades; ensures safety of public and work crew; may flag traffic when necessary.

- Responds to emergency call out situations and perform standby duty for emergency response on weekends and holidays according to predetermined schedule; while performing stand-by duty, during emergency situations, or as otherwise directed, diagnoses and performs corrective actions involving collection system and assist Liftstation Maintenance Technician diagnoses and repairs of sewage liftstation malfunctions using a variety of specialized mechanical and electrical tools.
- Responds to public inquiries in a courteous manner; provides information within the area of assignment; resolves complaints in an efficient and timely manner.
- Estimates time, materials, and equipment required for jobs assigned; requisitions materials as required; keeps inventory of replacement parts; prepares and maintains records and written reports, as required.
- Assists supervisor in department budget preparation.
- Reads, understands, and ensures compliance with the District Safety Manual; attends safety meetings, as required; reports all accidents, violations, or infractions to supervisor.
- Performs related duties as required.

QUALIFICATIONS

The following generally decribes the knowledge and ability required to enter the job and/or be learned within a short period of time in order to successfully perform the assigned duties.

Ability to:

- Lead, organize, and review the work of assigned staff.
- Independently perform the most difficult semi-skilled and skilled tasks involved in the operation, maintenance, and repair work involved in the District's sewage lift stations and sewage collection systems.
- Interpret, explain, and enforce department policies and procedures.
- Perform a variety of un-skilled, semi-skilled, and skilled maintenance, operational, and repair tasks involved in the District's sewage lift stations and sewage collection systems
- Operate a variety of vehicles and equipment in a safe and effective manner.
- Use and operate vehicles and equipment, hand tools, and power tools and equipment required for the work in a safe and efficient manner.
- Ensure safety around work areas in high traffic.
- Perform heavy manual labor.
- Ensure adherence to safe work practices and procedures.
- Understand and carry out oral and written directions.
- Respond within a thirty (30) minute time period to the District's Corporate Yard while on standby duty; must be able to communicate by telephone while on standby duty.
- Basic computer skills.
- Communicate clearly and concisely, both orally and in writing.
- Establish and maintain effective working relationships with those contacted in the course of work.

Education and Experience Guidelines

Any combination of education and experience that would likely provide the required knowledge and abilities is qualifying. A typical way to obtain the knowledge and abilities would be:

Education/Training

- Equivalent to the completion of the twelfth grade.

Experience

- Three years of experience in sewer operation, maintenance, and repair.

Knowledge

- Operations, services, and activities of wastewater systems and facilities.

Knowledge

- Principles of lead supervision and training.
- Methods, tools, and equipment used in the maintenance, operational, and repair of wastewater systems.
- Operation of power equipment, including trucks, loaders and related equipment.
- Operational characteristics of maintenance and construction equipment and tools.
- Methods, techniques and safety practices in maintaining wastewater systems.
- Procedures and techniques used in concrete and asphalt work.
- Practices and procedures of traffic control.
- Confined space entry.
- The use of power operated and hand tools and safety gear.
- Basic mathematical principles.
- Basic principles and practices of record keeping.
- Occupational hazards and standard safety practices including those used for entrance into confined spaces.
- Pertinent federal, state and local codes, laws and regulations.

License/Certification

- Possession of an appropriate, valid driver's license.
- Possession of a Class A California Drivers License with air brakes and tank endorsements within 6 months of hire.
- Possession of a Grade I Plant Maintenance Technologist and/or Grade III Collection System Maintenance Certification is desirable.
- Certification required in District provided CPR/ First Aid and Bloodborne Pathogen training.
- Must hold or be willing to be trained to and maintain 8 hour First Responder level certification for disaster preparedness and emergency response purposes.
- Possession of a Grade I Plant Maintenance Technologist and/or Grade III Collection System Maintenance Certification is desirable.
- Possession of a Qualified Applicator Certificate issued by the State of California, Department of Food and Agriculture is desirable.

PHYSICAL DEMANDS AND WORKING ENVIRONMENT

The conditions herein are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accomodations may be made to enable individuals with disabilities to perform the essential job functions.

ENVIRONMENT

Outdoor field environment; travel from site to site; exposure to noise, dust, grease, smoke, fumes, noxious odors, gases, vibrations, and all types of weather and temperature conditions; exposure to hazardous traffic conditions; work in or around water; work and/and or walk on various types of surfaces including slippery or uneven surfaces and rough terrain; incumbents may be required to work extended hours including evenings and weekends.

PHYSICAL

- Level Three
- Pulmonary

Incumbents require sufficient mobility to work in a field environment; walk, stand, and sit for prolonged periods of time; frequently stoop, bend, kneel, crouch, crawl, climb, reach, and twist; push, pull, lift, and/or carry moderate to heavy amounts of weights; operate assigned equipment and vehicles; ability to verbally communicate to exchange

information.

VISION
See in the normal visual range with or without correction; vision sufficient to read printed documents and to operate assigned equipment.

HEARING
Hear in the normal audio range with or without correction.

JOB STATUS Non-Exempt: Employees Association

SALARY RANGE: 27

(90SCSMW)

ELSINORE VALLEY MUNICIPAL WATER DISTRICT

Lift Station Maintenance Technician

Job descriptions are intended to present a descriptive list of the range of duties performed by employees in this job. Specifications are NOT intended to reflect all duties performed with the job.

SUMMARY DESCRIPTION

Under general supervision, performs skilled work in the maintenance, operation, diagnostic testing, installation and repair of instrumentation and control systems, auto-dialer maintenance/ replacement/ programming and other types of technical maintenance and repair involved in the District's sewage lift stations, collection system and related support equipment; ensures compliance with the general waste discharge orders issued by the California Water Quality Board; operates a variety of maintenance and construction tools and equipment; and may be required to participate in formulation of District safety programs.

REPRESENTATIVE DUTIES

The following duties are typical for this classification. Incumbents may not perform all duties and/or may be required to perform additional or different duties from those set forth below to address business needs and changing business practices.

-
- Installs, troubleshoots and maintains various types of lift station control systems including floats, ultrasonic level controllers, pressurized air (bubbler) controllers and pressure differential controllers; field tests, troubleshoots, programs and maintains multi-zone auto dialers and alarm systems.
- Makes repairs and troubleshoots electrical circuits, alarm circuits, motors, pumps, valves, piping and pneumatic/electrical controls; installs and modifies equipment as needed.
- Uses hand, bench and machine tools in the repair of pumps, valves, and other liftstation machinery and equipment; operates drill presses, grinders and other related equipment; repairs/replaces bearings, shaft sleeves, pressure and drain piping and other parts.
- Installs electrical and mechanical equipment including pumps, motors, valves, and solenoids, timers; installs and maintains time delay relays, magnetic controllers, contact points, mechanical seals, seal fluid filters, lighting fixtures, receptacles, switches, fuses, bearings and gaskets.
- Diagnoses and performs corrective action involving sewage lift station malfunctions using a variety of specialized tools and testing/diagnostic instrumentation.
- Reads, interprets and works from electrical schematic blueprints, plans and maps as related to sewage lift stations, control systems, manufacturer maintenance, operation manuals and wastewater collection system maintenance.
- Assists in training departmental staff in proper lift station maintenance methods, procedures, and techniques as assigned; works with staff to correct deficiencies.
- Assists in maintaining, scheduling and performing repairs at all District sewage lift stations; coordinates repair operations, equipment replacement and related special projects with, and as directed by the superintendent.
- Maintains records and prepares a variety of reports including time and supplies/materials relevant to collection system and pumping system operations.
- Troubleshoots and maintains stand-by power generation systems, transfer switches and related components; bends and installs electrical conduit and pull wire for power above and below ground.
- Performs confined space and permit required confined space entry as defined by the California Code Of Regulations - Title 8, General Industry Safety Orders, Section 5157 and Federal OSHA Standard 29 CFR 1910.146; completes pre entry check lists, performs atmospheric testing and evaluation of various entry conditions and situations as outlined in Appendix C to the above referenced regulations; assists in the calibration and maintenance of confined space atmospheric testing instrumentation and self contained breathing apparatus units.
- Performs standby duty assigned and must be able to respond to emergency call-out situations; while performing stand-by duty, during emergency situations or as otherwise directed, diagnoses and performs corrective actions involving sewage liftstation and collection system malfunctions using a variety of specialized mechanical and electrical tools.
- Reads, understands, and ensures compliance with the District Safety Manual; attends safety meetings, as required; reports all accidents, violations, or infractions to supervisor.
- Performs related duties as required.

QUALIFICATIONS

The following generally decribes the knowledge and ability required to enter the job and/or be learned within a short period of time in order to successfully perform the assigned duties.

Ability to:

- Perform a variety of maintenance, operation, diagnostic testing, installation and repair of instrumentation and control systems, auto-dialer maintenance/ replacement/ programming and other types of technical maintenance and repair involved in the District's sewage lift stations, collection system and related support equipment.
- Inspect, troubleshoot, diagnose, and repair electrical and electronic malfunctions.
- Operate a variety of maintenance and repair equipment in a safe and effective manner.
- Read, interpret, and work from blueprints, electrical diagrams and schematics, manufacturer instructions and directions.
- Accurate diagnose repair needs.
- Perform heavy manual labor.
- Perform preventative and corrective maintenance on assigned equipment.
- Perform assigned work in accordance with appropriate safety practices and regulations.
- Operate office equipment including computers.
- Work independently and with minimum direct supervision.
- Understand and carry out oral and written instructions.
- Maintain a variety of records.
- Must be able to respond within a thirty (30) minute time period to the District's corporate yard during an emergency situation while on stand-by.
- Comply with Cal-OSHA respirator face mask fit test requirements.
- Use Self Contained Breathing Apparatus (SCBA).
- Communicate clearly and concisely, both orally and in writing.
- Establish and maintain effective working relationships with those contacted in the course of work.

Education and Experience Guidelines

Any combination of educationa and experience that would likely provide the required knowledge and abilities is qualifying. A typical way to obtain the knowledge and abilities would be:

Education

- Equivalent to the completion of the twelfth grade supplemented by specialized training in the areas of mechanical equipment maintenance and repair.

Experience

- Two (2) years of full time experience in the maintenance and repair of sewage lift stations (or similar pumping applications) or experience in a mechanical trade such as electrical work, plumbing or pipe fitting, preferable at a journey level and 1 year full time experience in the maintenance and repair of sewage lift stations (or similar pumping applications).

Knowledge

- Operations, services, and activities of wastewater systems and facilities.
- Methods and techniques for performing preventive and corrective maintenance on assigned equipment.
- Operational characteristics of wastewater treatment plant systems and equipment.
- Principles, methods, materials, and tools employed in the repair and maintenance of assigned equipment, vehicles, and/or machinery.
- Methods and techniques of performing diagnostic troubleshooting services.
- Preventive and corrective maintenance techniques.
- Basic electrical and mechanical practices.
- Office procedures, methods, and equipment including computers.
- Principles and practices of record keeping.
- Occupational hazards and standard safety practices.
- Pertinent federal, state, and local laws, codes, and regulations.

License/Certification

- Possession of an appropriate, valid driver's license.
- Possession of a Class A California Drivers License within 6 months of hire.
- Certification required in District provided CPR/ First Aid and Bloodborne Pathogen training.
- Possession of a valid Grade I Plant Maintenance Certification issued by the California Water Environment Association.
- Possession of a valid Grade I Collection System Maintenance certification issued by the California Water Environment Association within 18 months of hire.
- Be willing to be trained to (and maintain) 8 hour First Responder level certification for disaster preparedness and emergency response purposes.
- Possession of a Grade II Plant Maintenance Technologist and Plant Maintenance Electrical/Instrumentation Certification is desirable.

PHYSICAL DEMANDS AND WORKING ENVIRONMENT

The conditions herein are representative of those that must be met by an employee to successfully perform the essential functions of this job. Reasonable accomodations may be made to enable individuals with disabilities to perform the essential job functions.

ENVIRONMENT

Outdoor field environment; travel from site to site; exposure to noise, dust, grease, smoke, fumes, noxious odors, gases, vibrations, and all types of weather and temperature conditions; exposure to hazardous traffic conditions; work in or around water; work and/and or walk on various types of surfaces including slippery or uneven surfaces and rough terrain; incumbents may be required to work extended hours including evenings and weekends.

PHYSICAL • Level One

Incumbents require sufficient mobility to work in a field environment; walk, stand, and sit for prolonged periods of time; frequently stoop, bend, kneel, crouch, crawl, climb, reach, and twist; push, pull, lift, and/or carry moderate to heavy amounts of weights; operate assigned equipment and vehicles; ability to verbally communicate to exchange information.

VISION

See in the normal visual range with or without correction; vision sufficient to read printed documents and to operate assigned equipment.

HEARING

Hear in the normal audio range with or without correction.

JOB STATUS Non-Exempt: Employees Association

SALARY RANGE: 27

(90LSMT)

ELSINORE VALLEY MUNICIPAL WATER DISTRICT

Collection Systems Maintenance Worker

Job descriptions are intended to present a descriptive list of the range of duties performed by employees in this job. Specifications are NOT intended to reflect all duties performed with the job.

SUMMARY DESCRIPTION

Under general supervision, performs a variety of un-skilled, semi-skilled and skilled maintenance, operational, and repair tasks involved in the District's sewage collection systems and sewage lift stations; and operates a variety of maintenance and construction tools and equipment.

REPRESENTATIVE DUTIES

The following duties are typical for this classification. Incumbents may not perform all duties and/or may be required to perform additional or different duties from those set forth below to address business needs and changing business practices.

- Performs a variety of un-skilled, semi-skilled and skilled maintenance, operational, and repair tasks involved in the District's sewage collection systems and sewage lift stations.
- Flushes, rods, cleans and repairs sewer collection lines and manholes; performs repair work resulting from mainline damage; raises manholes and cleanouts to grade; replaces system components.
- Responds to system blockages and provides temporary repair of trench failures; performs system disconnects.
- Excavates for various purposes; loads and unloads asphalt, rock, dirt and construction and repair related materials and equipment.
- Spreads and places asphalt for patching and repairing street excavations as necessary.
- Operates a variety of sewer cleaners, jet rodders, pressure washers, and TV inspection equipment in the inspection, maintenance, and construction of sewer lines and laterals.
- Maintains and performs minor maintenance of all sewer equipment including emergency power generator, sewer rodder, power sprayer, and pneumatic tools; performs safety checks and checks fluid levels of vehicles and equipment; lubricates pumps, motors, and equipment; replaces sectional rods on sewer rodder; replaces and repairs high pressure hoses on Hydro-jet units and suction tubing on vacuum units; cleans assigned vehicles and equipment.
- Assists Lift Station Maintenance Technicians with facility monitoring of lift stations; performs minor lift station maintenance and repair work; assists Lift Station Maintenance Technicians with major repairs.
- Performs line locating and marking.
- Performs confined space and permit confined space entries as defined by the California Code of Regulations - Title 8, General Industry Safety Orders, Section 5157 and Federal OSHA Standards 29 CFR 1910.146; completes pre-entry checklists, performs atmospheric testing and evaluation of various entry conditions and situations as outlined in Appendix C to the above referenced regulations.
- Applies pesticides and herbicides under the direction of a licensed applicator as assigned.
- Sets traffic control including safety devices, signs, and barricades; ensures safety of public and work crew; may flag traffic when necessary.
- Assists other departments in the performance of work as required.
- Responds to emergency call out situations and performs standby duty for emergency response after hours, on weekends and holidays according to predetermined schedule; while performing stand-by duty and during emergency situations, or as otherwise directed, diagnoses and performs corrective actions involving collection system and sewage liftstation malfunctions using a variety of specialized mechanical and electrical tools.
- Maintains records of work performed.
- Reads, understands, and ensures compliance with the District Safety Manual; attends safety meetings, as required; reports all accidents, violations, or infractions to supervisor.
- Performs related duties as required.

QUALIFICATIONS

The following generally decribes the knowledge and ability required to enter the job and/or be learned within a short period of time in order to successfully perform the assigned duties.

Ability to:

- Perform a variety of un-skilled, semi-skilled, and skilled maintenance, operational, and repair tasks involved in the District's sewage lift stations and sewage collection systems
- Operate a variety of vehicles and equipment in a safe and effective manner.
- Use and operate vehicles and equipment, hand tools, and power tools and equipment required for the work in a safe and efficient manner.
- Use Self Contained Breathing Apparatus (SCBA).
- Ensure safety around work areas in high traffic.
- Perform heavy manual labor.
- Read, understand, and comply with the District Safety Manual.
- Must be able to respond within a thirty (30) minute time period to the District's Corporate Yard while on standby duty; must be able to communicate by telephone while on standby duty.
- Communicate clearly and concisely, both orally and in writing.
- Establish and maintain effective working relationships with those contacted in the course of work.

Education and Experience Guidelines

Any combination of educationa and experience that would likely provide the required knowledge and abilities is qualifying. A typical way to obtain the knowledge and abilities would be:

Education

- Equivalent to the completion of the twelfth grade.

Experience

- Some general maintenance and repair experience is desirable.

Knowledge

- Operations, services, and activities of wastewater systems and facilities.
- Methods, tools, and equipment used in the maintenance, operational, and repair of wastewater systems.
- Operation of power equipment, including trucks, loaders and related equipment.
- Operational characteristics of maintenance and construction equipment and tools.
- Methods, techniques and safety practices in maintaining wastewater systems.
- Procedures and techniques used in concrete and asphalt work.
- Practices and procedures of traffic control.
- Confined space entry.
- The use of power operated and hand tools and safety gear.
- Computer hardware and applicable software at an intermediate level.
- Basic mathematical principles.
- Basic principles and practices of record keeping.
- Occupational hazards and standard safety practices including those used for entrance into confined spaces.

License/Certification

- Possession of an appropriate, valid driver's license.
- Possession of a Class A California Drivers License with air brakes and tank endorsements within 6 months of hire.
- Possession of a CWEA Collection System Maintenance Technologist Grade I certificate within 18 months of hire.
- Must hold or be willing to be trained to and maintain 8 hour First Responder level certification for disaster preparedness and emergency response purposes.
- Certification required in District provided CPR/ First Aid and Bloodborne Pathogen training.
- Certification required in District provided CPR/ First Aid and Bloodborne Pathogen training.
- Possession of a Grade II Collection Systems Maintenance certification is desirable.

PHYSICAL DEMANDS AND WORKING ENVIRONMENT

The conditions herein are representative of those that must be met by an employee to successfully perform the essential

functions of this job. Reasonable accomodations may be made to enable individuals with disabilities to perform the essential job functions.

ENVIRONMENT

Outdoor field environment; travel from site to site; exposure to noise, dust, grease, smoke, fumes, noxious odors, toxic gases, vibrations, and all types of weather and temperature conditions; exposure to hazardous traffic conditions; work in or around water; work and/and or walk on various types of surfaces including slippery or uneven surfaces and rough terrain; incumbents may be required to work extended hours including evenings and weekends.

PHYSICAL

- Level Three
- NIDA
- Pulmonary
- Endurance

Incumbents require sufficient mobility to work in a field environment; walk, stand, and sit for prolonged periods of time; frequently stoop, bend, kneel, crouch, crawl, climb, reach, and twist; push, pull, lift, and/or carry moderate to heavy amounts of weights; operate assigned equipment and vehicles; ability to verbally communicate to exchange information.

VISION

See in the normal visual range with or without correction; vision sufficient to read printed documents and to operate assigned equipment.

HEARING

Hear in the normal audio range with or without correction.

JOB STATUS Non-Exempt: Employees Association

SALARY RANGE: 22

(91CSMW)

APPENDIX E – SEWAGE SPILL RESPONSE PLAN (WITH REDLINED MODIFICATION RECOMMENDATIONS)

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Elsinore Valley Municipal Water District

Sewage Spill Response Plan

31315 Chaney Street, P.O. Box 3000, Lake Elsinore, CA 92530
(951)674-3146 FAX (951) 245-5946

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Section 1

Introduction

Introduction

The Elsinore Valley Municipal Water District was incorporated on December 23, 1950, under the provisions of the Municipal Water District Act of 1911. The District's 125 square mile service area lies in western Riverside County between the cities of Corona and Temecula. The District currently provides water to approximately 25,691 accounts and sewer service to approximately 20,475 accounts.

Elsinore Valley Municipal Water District owns and operates three wastewater treatment facilities within its service area. The treatment plants include:

- Regional Wastewater Treatment Plant (8.0 MDG, tertiary treatment)
- Railroad Canyon Wastewater Treatment Plant (1.2 MGD, tertiary treatment)
- Horsethief Canyon Wastewater Reclamation Plant (0.50 MGD, tertiary treatment)

The District's sanitary wastewater collection system consists of four separate collection system areas:

- The Canyon Lake Collection System which serves the City of Canyon Lake
- The Southern (California Oaks) Collection System which serves a portion of the City of Murrieta
- The Horsethief Canyon Collection System designed to serve a 2,000 home community in the Temescal Canyon area of Riverside County
- The Regional (Elsinore Valley) Collection ~~system~~System, which serves portions of the City of Lake Elsinore and the unincorporated areas of Lakeland Village, Sedco Hills, and Wildomar.

These four areas contain more than 287 miles of sanitary sewer pipeline ranging from 6 to 52 inches in diameter and a total of 30 sewage lift stations.

Section 2

Authority and Responding Staff Responsibilities

Authority and Responding Staff Responsibilities

Authority

The General Manager is provided with the authority to direct emergency response activities of the collection system facility.

In the event the General Manager is not available, or at his delegation, the Assistant General Manager or the Director of Operations will assume the role of overall authority.

In the event the Assistant General Manager or the Director of Operations is not available, the Wastewater Operations Manager shall assume the role of overall authority.

Responding Staff Responsibilities

The responding supervisor has the immediate responsibility to protect people, property, and the environment from the effects of sewage release. To meet these objectives in a rapid, efficient and organized manner, District personnel will respond and fulfill the duties of the following categories as directed by the On-Scene Supervisor:

A. On-Scene Supervisor:

1 Assume primary management and coordination of all emergency actions.

2 Request assistance from other departments.

3 Designate spill assessment personnel.

4 Assess spill information (including on and off site spill migration).

5 Establish spill abatement priorities.

6 Direct immediate spill control and containment measures.

7 Communicate with the Public Information Officer.

8 Act as primary liaison with responding agencies.

9 Perform or delegate the following responsibilities as necessary:

a) Identification of potential impacts to the public and environment.

b) Notification of all necessary agencies providing them immediate spill information.

c) Coordination with responding agencies: spill information, incident site and affected off-site areas.

d) Notification of outside contractor and overseeing of cleanup activities.

e) Assignment and coordination of on and off-site sample collection with in-house staff, regulatory and other affected agencies.

f) Mobilization and direction of in-house field crews and equipment for spill abatement activities to include containment, disinfection and cleanup.

g) Lockout/tag electrical as necessary (lift stations).

h) Verification of emergency power status as required.

i) Establishment of ingress and egress routes, as necessary.

j) Establishment of site security, as necessary.

k) Personnel evacuation, as necessary.

B. Engineering Director

1 Provide as-built drawings of all facilities

2 Assist in assessing damage to facilities.

3 Provide input for appropriate technical specifications for emergency repair and materials.

C. Public Information Officer

1 Report to the On-Scene Supervisor for status reports of spill abatement activities.

2 Release information to the press and public (as necessary).

3 Provide the General Manager with timely status reports, i.e. documents, photos, spill and abatement activities.

Section 3

Mandatory Notification Procedures

Mandatory Notification Procedures

During Normal Working Hours:

During normal working hours, Collection System service calls are directed to the Field Operations Dispatch Center. It is the responsibility of the Field Operations Dispatch Center to obtain the necessary information from the reporting party to complete "Side A" of the Collection System Problem Report Form (see page 3-~~3~~ 4 of this Section) and dispatch a District service crew to the location of the reported problem.

If the reporting party advises that a sewage overflow or spill is involved, dispatch shall obtain additional information from the reporting party and initiate the actions as outlined on the Spill Response Plan Flow Chart (see page 3-~~9~~ 13 of this Section).

Upon arrival, the responding service crew will report their findings to Dispatch. If a spill is involved, Dispatch will begin completion of "Side B" of the Collection System Problem Report Form (see page 3-~~4~~ 5 of this Section) and immediately begin notification of regulatory agencies and other impacted agencies per the Spill Notification Check Lists (see pages 3-2 and 3-~~5~~ 6 of this Section).

In the event of a confirmed spill that results in a sewage discharge to a drainage channel or surface water, the following regulatory agencies must be notified as soon as possible, but not later than two hours after becoming aware of the discharge: appropriate Regional Water Quality Control Board (depending on location of spill), State Office of Emergency Services, and the appropriate County Health Department.

Additionally, a certification must be submitted to the appropriate Regional Water Quality Control Board that the Regional Water Quality Control Board, State Office of Emergency Services, and County Health Department were notified of the spill. This certification shall be completed as soon as possible, but no later than 24-hours after becoming aware of the discharge.

On Weekends, Holiday and After Hours:

On weekends, holidays and after hours, all calls are received by the District's contract 24-hour answering service who will assume identical notification responsibilities as that of the Field Operations Dispatch Center.

State Water Resources Control Board Notification Requirements:

The notification requirements for the State Water Resources Control Board vary depending on the type of spill. There are two general types of spills that require notification of the State Water Resources Control Board. See the District SSMP for a description of each spill category, and page 3-2 for notification procedures.

Elsinore Valley Municipal Water District

SPILL NOTIFICATION CRITERIA

Regulatory/Outside Agencies

Mandatory Notification-First Priority

AGENCY	PHONE	CRITERIA
California Regional Water Quality Control Boards	Santa Ana ---------- 909/782-4130 FAX---------- 909/781-6288 Najah N. Amin ------ 909/320-6362 Gary Stewart--------- 909/732-4379 San Diego ---------- 858/467-2952	Whenever a sewage spill enters or threatens to impact any waters of the State. Contact within 2 hours for spills that reach a drainage channel or surface water. Within 24 hours of spill that reaches drainage channel or surface water, certify to appropriate RWQCB that the RWQCB, State OES, and appropriate County Health Department were notified.
Office of Emergency Services	Sacramento---------- 800/852-7550	Whenever a sewage spill enters or threatens any water of the State. Contact within 2 hours for spills that reach a drainage channel or surface water.
State Department of Health Services Office of Drinking Water	San Diego ---------- 619/525-4159	Whenever a sewage spill enters the Canyon Lake Reservoir (Canyon Lake). Contact within 2 hours.
Riverside County Health Services Agency, Department of Environmental Health	Riverside ---------- 951/500-3730 FAX ---------- 951/781-9653	Whenever a sewage spill occurs. Contact within 2 hours for spills that reach a drainage channel or surface water.
Department of Health Services	Jim Gillis ---------- 951/955-8928 FAX ---------- 951/781-9653	Whenever a sewage spill occurs.
State Water Resources Control Board	No Phone Number. All correspondence performed online via California Integrated Water Quality System (CIWQS).	Category 1 SSO: Initial Report - Submit on CIWQS within 3 business days. Final Report - Certify on CIWQS within 15 calendar days. Category 2 SSO: Final Report - Submit and Certify on CIWQS within 30 days after the end of the calendar month.

Next Priority-if applicable call:

AGENCY	PHONE	CRITERIA
California Department of Fish and Game	310/590-5113	Whenever a sewage spill enters or threatens State water.
California Highway Patrol	Normally contacted by OES.	Whenever a sewage spill occurs within their jurisdictional boundaries.
Department of Transportation (CALTRANS)	Riverside----------951/383-6470	Whenever a sewage spill threatens to contaminate or otherwise disrupt the operation of the State Water Project.
Riverside County Flood Control & Conservation District	Riverside----------951/275-1250 FAX----------951/788-9965 Emergency----951/275-1230	Whenever a sewage spill impacts the storm drain system in Riverside County.
City of Canyon Lake Canyon Lake POA	951/244-2955 519/244-6841	Whenever a sewage spill occurs in Canyon Lake Reservoir (Canyon Lake).
City of Lake Elsinore City Yard	951/674-3124 951/674-5170 951/674-7730	Whenever a sewage spill threatens or flows into Lake Elsinore.
City of Murrieta	951/698-1040	Whenever a sewage spill over 1,000 gallons occurs in California Oaks
County of Riverside Transportation Department	Riverside----------951/275-6790 FAX----------951/275-6797	Whenever a sewage spill affects a Riverside County highway/street.

COLLECTION SYSTEM PROBLEM REPORT

Fill Out Completely
(Reverse Side for Spill Information)

Date of Occurrence: _____ Time of Occurrence: _____ AM/PM
Date of Notification: _____ Time of Notification: _____ AM/PM

PERSON REPORTING PROBLEM:
Name: _____ Phone: _____
Agency: _____
Address:_____
LOCATION OF PROBLEM: _____
City: _____ Nearest Cross Street: _____
Thomas Guide Page and Coordinates: _____
PROBLEM: ☐ Odor ☐ Lift Station ☐ Sewage Spill* ☐ Other

_____

_____

*Fill Out Reverse Side Spill Section

IS PROBLEM IN DISTRICT SERVICE AREA? ☐ Yes ☐ No

Note: If spill is involved, tell reporting individual that EVMWD staff will clean it up or notify responsible agency.

LIFT STATION AUTO ALARM CALL:
Station Name/Number _____
Type of Alarm (i.e. high level, power outage, intruder, etc.): _____

_____

ACTION TAKEN: (Detailed description including responding personnel and equipment):

_____

_____

_____

Report Received By: _____ Date: _____ Time: _____
Dispatched To: _____ Date: _____ Time: _____
Name Emp.#

SPILL REPORT

Type of Spill: Sewage ☐ Chemical (I.W.) ☐ Other ☐

Estimated Spill Volume (Gallons)*:
☐ Small <1,000
☐ Medium 1,000 - 10,000
☐ Large >10,000

Identify Receiving Water**: _____

Is there a potential health hazard from the spill? ☐ Yes ☐ No

If yes, explain. _____

Source of information: _____ Phone No: _____

Quantity of disinfectant: _____

*Must be a verifiable estimation

**If applicable: Creek, River, Flood Control Channel, Lake, etc.

NOTIFICATION LIST (NON-SPILL):		Time	Date	Initial
Responding Unit No. _____	☐	_____ AM/PM	_____	_____
NOTIFICATION LIST (SPILL) (In this order):				
Responding Unit No: _____	☐	_____ AM/PM	_____	_____
Collection Systems Field Superintendent	☐	_____ AM/PM	_____	_____
Operations Manager	☐	_____ AM/PM	_____	_____
Director of Operations	☐	_____ AM/PM	_____	_____
Health Department _____ (Contact)	☐	_____ AM/PM	_____	_____
Regional Board _____ (Contact)	☐	_____ AM/PM	_____	_____
General Manager	☐	_____ AM/PM	_____	_____
Public Information Officer	☐	_____ AM/PM	_____	_____

Supervisor Completing Report: _____ Date: _____
(Full Name)

Follow Up: _____

_____

_____

Follow Up By: _____ Date: _____
(Name) (Dept.)

Elsinore Valley Municipal Water District
Spill Notification Checklist
INTERNAL

Name	Title	Daytime Telephone		After Hours
Ron Young	General Manager	951/674-3146 951/757-0002	Ext. 224 Cell	951/757-0002
Norris Brandt	Assistant General Manager	951/674-3146 951/579-8240	Ext. 8359 Cell	951/579-8240
~~Wally Borchard~~TBD	Director of Operations	~~951/674-3146~~N/A ~~951/376-0531~~ ~~951/372-5717~~	~~Cell~~ ~~Pager~~	~~951/678-1333~~N/A
Theodore P. Eich	Operations Manager	951/674-3146 951/236-6466 951/308-7716	 Cell Pager	951/674-2225
Robert Barnard	Collection Systems Field Superintendent	951/674-3146 951/453-3850 951/301-0724	 Cell Pager	951/678-2923
Greg Morrison	Public Information Officer	951/674-3146 951/376-1318	 Cell	951/693-9570

Directory of Key Personnel and Outside Agencies

Key Personnel		**Adjacent Water Districts**	
Ron Young	951/757-0002	Eastern MWD	951/925-7676
Cell Phone	951/757-0002	Rancho CA WD	951/676-4101
~~Wally Borchard~~Norris Brandt	~~951/678-7771~~951/674-3146	Western MWD	951/780-4170
Cell Phone	~~951/376-0531~~951/579-8240		
		EVMWD Wholesale Customers	
		Elsinore WD	951/674-2168
		The Farm	951/244-4198
Ted Eich	951/674-2225		
Cell Phone	951/376-0527	**Utilities**	
Pager No.	951/535-1351	Southern California Edison	1-800/442-4950
Julius Ma	949/733-9938	Southern California Gas	1-800/662-9777
Cell Phone	951/453-3903	Underground Service Alert	1-800/422-4133
Pager No.	951/672-5559		
~~Russell Adams~~	~~951/244-3884~~	**Local Agencies, POA's, Hospital**	
~~*Cell Phone*~~	~~951/376-0524~~	City of Canyon Lake	951/244-2955
~~*Pager No.*~~	~~951/672-8824~~	City of Lake Elsinore	951/674-3124
~~George Cambero~~	~~951/678-4757~~	City of Murrieta	951/698-1040
~~*Cell Phone*~~	~~951/453-3127~~	Canyon Lake POA	951/244-6841
~~*Pager No.*~~	~~951/672-8825~~	Lake Elsinore USD	951/674-7731
~~Daniel Hebert~~	~~951/696-0337~~	Inland Valley Regional Medical Ctr.	951/677-1111
~~*Cell Phone*~~	~~951/453-3866~~		
~~*Pager No.*~~	~~951/672-5783~~	**Answering Service**	
Steve House	951/699-6166	A & K Communications	951/699-7122
Cell Phone	951/676-0525		
Pager No.	951/672-8829	**Police, Fire and Sheriff**	**911**
Bob Hughes	909/825-6148		
Cell Phone	951/453-3851		
Pager No.	951/672-5170		
~~Jake Hernandez~~Angel Marquez	951/674-3327		
Cell Phone	951/~~453-3872~~294-1308		
Pager No.	~~951/672-8826~~		
Administration			
Gail Hanson	951/674-3146		
Engineering (Base 6)			
Phil Miller	951/688-4167		
~~Loren Sorber~~Sudhir Mohleji	951/~~245-1382~~757-3105		
~~Steve Simmons~~	~~951/678-1154~~		

LOCAL MEDIA

(TV, RADIO, NEWSPAPERS)

Channel 3	(951) 674-0661
KRTM 88.9 FM	(951) 694-0866
K-HI 105.7 FM	(951) 925-9000
KNSJ 1320 AM	(951) 925-9000
Press Enterprise	(951) 245-2923
Lake Elsinore Valley Sun-Tribune	(951) 674-1535
The Californian	(951) 676-4315
Friday Flyer	(951) 244-1966

INSTITUTIONS & FOOD SERVICE DIRECTORY

(951 AREA CODE)

PUBLIC SCHOOLS (11.26.08-revised)	TELEPHONE (951)	EMERGENCY HEALTH CARE PROVIDERS	TELEPHONE (951)
Lake Elsinore Unified SD	253-7000	Inland Valley Med Center	677-9712
Head Start Program	253-7091	Rancho Springs Med Center	696-6000
Butterfield Elementary	253-7470	A Plus Walk-In Urgent Care	461-6963
Cottonwood Cyn. Elementary	244-2585	Total Care Urgent Care	674-4114
Donald Graham Elementary	678-8450	Inland Urgent Care	600-0110
Earl Warren Elementary	253-7810	Industrial Medical Care	600-9070
Elsinore Elementary	253-7615	**RESTAURANTS**	**TELEPHONE**
Luiseno Elementary	674-0750	**CANYON LAKE AREA**	
Machado Elementary	253-7500	Amato's	244-1919
Railroad Cyn. Elementary	674-8671	A's Pizza	244-3886
Rice Cyn. Elementary	471-2184	Pepe's	244-7373
Ronald Reagan Elementary	253-7650	Dominos	244-5111
Tuscany Hills Elementary	245-6850	Surfer Bean	244-2978
William Collier Elementary	678-8488	Canyon Lake Market	244-0133
Wildomar Elementary	253-7555	Sports Stop Pub	244-3369
Withrow Elementary	678-0132	Canyon Lake Country Club	244-6841
Canyon Lake Middle School	244-2123	Canyon Lake Lodge	244-6841
David A. Brown Middle School	253-7430	Rockin Tacos	246-8226
Elsinore Middle School	674-2118	**CAL OAKS AREA**	
Lakeland Village Middle School	253-7400	Cal Oaks Bowl	698-2202
Terra Cotta Middle School	253-7380	Dominos	696-0117
Elsinore High School	253-7200	**WILDOMAR AREA**	
Lakeside High School	253-7300	Yanaka Sushi	677-9004
Temescal Cyn. High School	253-7250	Arby's	696-7179
Ortega Continuation High School	253-7065	Ultimate Sports Pizza	304-9292
Murrieta Valley Unified SD	696-1600	Golden Spoon Yogurt	677-3528
Shivela Middle School (MUSD)	696-1406	Subway Sandwiches	461-8930
Tovashal Elementary (MUSD)	696-1411	Los Jilberto's Taco Shop	677-3770
PRE/PRIVATE SCHOOLS	**TELEPHONE**	McDonalds (Clinton Keith)	461-7345
Kids In Action	674-5437	Denny's	245-5058
Lakeland Children's Center	678-0130	Panda Express	696-1387
Rosetta Cyn. Kids Childcare	245-5389	La Cresta	677-9377
Shepherd's Flock Preschool	674-7241	Starbucks (Hidden Springs)	678-0583
St. Francis of Rome Preschool	471-5144	Olivera's	678-1701
Murrieta Kindercare	696-0825	Jack In The Box (Hidden Springs)	678-8833
Anne Sullivan School	678-3557	Figaro's Pizza	678-5500
Small World Child Develop Center	674-5520	Del Taco #516 (Hidden Springs)	609-3581
Bundy Cyn. Christian School	674-1254	Charo Chicken	678-1240
Clingman Family Childcare	471-1063	China Panda	678-6881
Hilltop Christian School	678-4434	Starbucks (Albertsons Plaza)	696-2737
Kids in Action Preschool	674-5437	Raised Donuts	609-3703
Mountain View Christian School	600-9897	Submarina	678-1500
Wildomar Ranch Pre-School	245-1345	D Canters	678-2828
California Lutheran High School	678-7000	Stadium Pizza	678-7826
Cornerstone Christian School	674-9381	Bear Valley Ranch Market	678-1670

RESTAURANTS (Continued)	TELEPHONE	RESTAURANTS	TELEPHONE
Crivello's	609-1266	Subway (Diamond Dr.)	674-0689
Massimo Pizza	678-7155	Peony's Chinese	471-0138
Jack In The Box (Bundy Cyn.)	245-7970	El Pollo Loco (Grape St.)	245-1542
LAKE ELSINORE AREA		Sushi Zen	245-7105
Tacos Elsinore	609-0282	In-N-Out	674-1232
Fly High Chinese	471-1019	KFC (Summerhill Dr.)	245-4060
Raised Donuts	471-1019	Quizno's	471-5053
Big Jim's Grill	678-1872	Carl's Jr. (Rail Road Cyn)	246-9941
Lake Elsinore Casino	674-3101	Papa John's	246-2772
Subs-N-Cones	674-7200	Los Amigos	244-4144
El Ranchito Taco Shop	245-1438	Los Jilberto's	244-4571
Annie's Café	245-6106	Subway (Cyn. Hills)	244-1185
Kokoros Sushi	674-5055	Starbucks	244-1175
Don Rubens	674-8544	Baskin Robbins	244-3434
Carniceria Lucio	471-8124	Panda Express	246-2663
Del Taco (Mission Trail)	674-5771	La Unica (Main St. Park)	674-2233
Nena's Pizza (Mission Trail)	245-9396	El Unico	674-8503
Domino's Pizza (Mission Trail)	674-7766	Los Compadres Market	245-8468
Diamond Stadium Restaurant	245-4487	Guadalajara's	674-8294
Trevi Lanes	674-6080	Nena's Pizza (Riverside Dr.)	245-2820
Jack In The Box (Railroad Cyn.)	244-2649	Hana Sushi	244-1200
Valley Market Deli	678-2015	Family Basket	674-8577
Café China	674-2888	Raviolis Italian Bistro	245-7242
Pizza Hut (Casino Dr.)	674-6825	Las Cuatro Milpas	674-2586
Don Jose's	245-6131	El Comal	674-4323
Coco's	245-5040	La Conchita	245-2420
Vincenzo's Olive Tree	674-8941	Douglas Burger	245-5441
Sizzler	674-8989	Tom's Burger	471-5565
Kamakura	471-3100	Sansui Sushi	245-1864
Taco Bell	674-7991	Burger King (Dexter Ave.)	674-5729
Carl's Jr. (Diamond Dr.)	674-0580	Archibald's	245-4440
Vista Donuts (Diamond Dr.)	674-8811	Del Taco (Central Ave.)	245-2710
Diamond Pizza	674-3483	Cold Stone Creamery	471-5400
McDonald's (Mission Trail)	245-9413	Maui Hawaii B-B-Q	471-8282
My Buddies Pizza	674-6946	Juice It Up (Central Ave.)	245-5211
Burger King	674-5233	Chili's	245-5101
Denny's (Grape St.)	245-5058	Tacos Del Mar	245-7188
Starbucks (Grape St.)	245-0755	Submarina	471-0300
Panda Express (Central Ave.)	674-4689	Wendy's	471-3620
Coffee Bean Tea & Leaf	245-4374	Costco	253-6030
IHOP	674-4522	McDonalds (Collier Ave.)	245-5076
McDonald's (Wal-Mart)	245-4132	Starbucks (Collier Ave.)	245-4701
Wienerschnitzel	245-5817	Ibarra's Market	471-1650
El Pollo Loco (Collier Ave.)	674-1581	Juice It Up (Cyn. Hills)	245-5000
Farmer Boy's	245-8885	Papa John's (Collier Ave.)	245-3999
Maui Wowi Juice/Coffee	245-9455	Target	674-2620
Forever Cool Ice Cream	674-3690	Subway (Collier Ave.)	245-9798
Wetzel's Pretzels	245-9536	Golden Chop Stix	245-5435
Pizza Hut (Riverside Dr.)	471-0500	Dairy Queen	245-1248
Tacone Flavor Grill	674-9838	Rolling Stop Pizza/Burger	678-8600
Cheese Cake House	245-7558	Los Chilangos	471-2052

RESTAURANTS (Continued)	TELEPHONE
SS Burger	245-5000
Del Taco (Lakeshore Dr.)	674-3646
Las Palmas	245-2606
Fat Cat Tavern	245-1480
Donut Star	674-0907
Domino's Pizza (Lakeshore Dr.)	245-2882
Papa G's Bistro	674-4842
Pizza Factory	674-1466
O'Hara's Bar	678-3512
Chill & Grill	471-3471
KFC/Taco Bell	674-3300
Grandma's Café & Bakery	245-8012
Pollo Pepe	674-8156
Roadhouse Tavern (Grand Ave.)	678-0390
Mariscos Nayarit	245-0341
Taqueria Nayarit	245-7989
Los Primos Market (Grand Ave.)	678-6460
Arrivederci Roma	245-7490
China Hut	674-7778
Vista Donuts (Riverside Dr.)	674-1766
Pizza Bowl	674-6993
Louisa's Mexican	245-5138
Hunny's	245-4548
Jack In The Box (Riverside Dr.)	674-7656
Juan Pollo	245-3688
Nena's Pizza (Riverside Dr.)	245-2820
Las Brasas	245-0682
Mi Restaurant Vallarta	674-0775
Rudy's Tacos	471-1717
Little Caesar's	674-7717

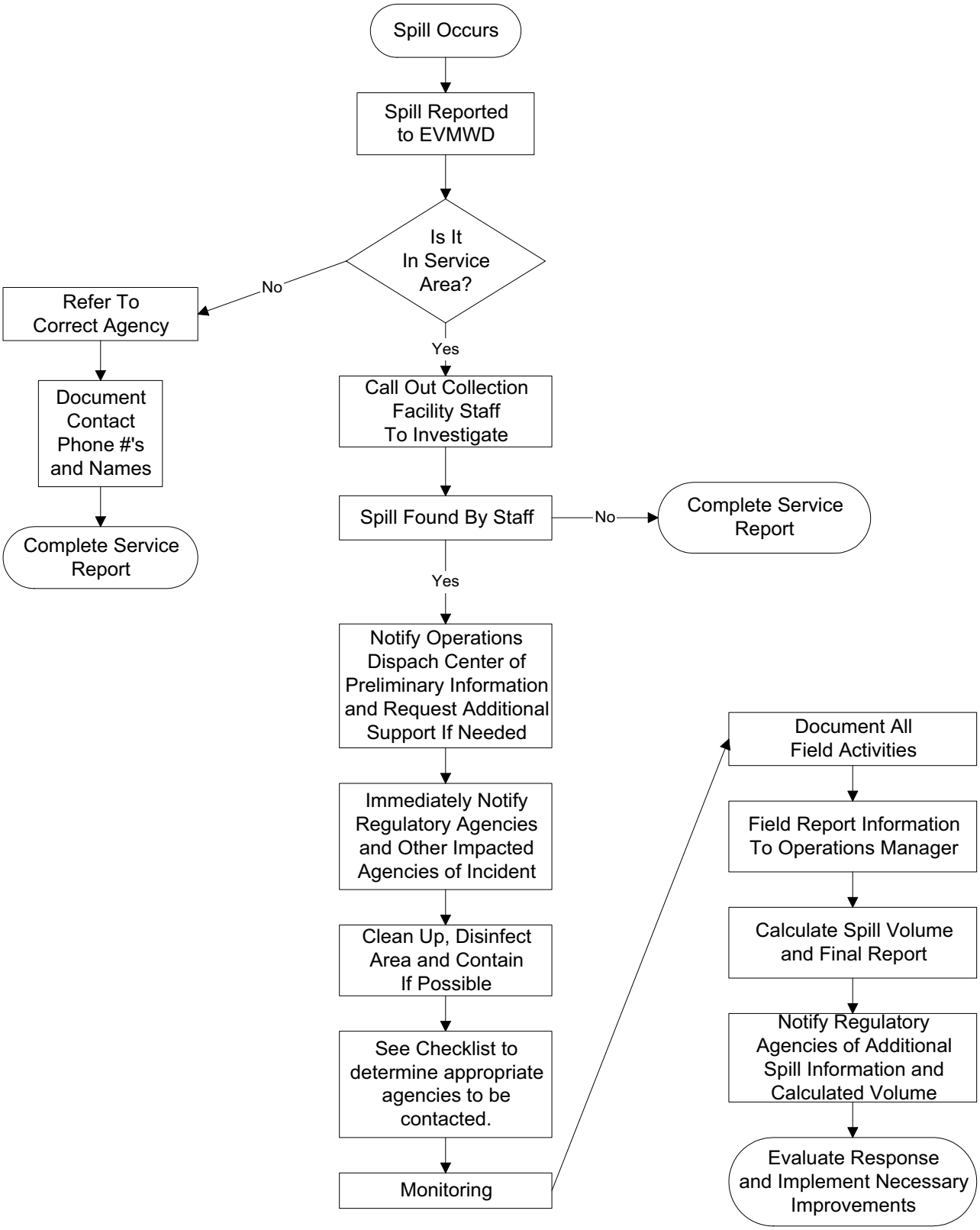
~~INSTITUTIONS & FOOD SERVICE DIRECTORY~~

~~(951 AREA CODE)~~

~~Public Schools~~		~~Area Emergency Health Care Providers~~	
~~Lake Elsinore USD~~	~~674-7731~~	~~Rancho Canyon Med. Corp.~~	~~674-3155~~
~~Head Start Program~~	~~245-6790~~	~~Family Health Care~~	~~674-7811~~
~~Butterfield Elementary~~	~~678-8470~~	~~Menifee Valley Med. Center~~	~~679-8888~~
~~Jean Hayman Elementary~~	~~674-4711~~	~~Rancho Cyn Ind. Medicine~~	~~694-8700~~
~~Elsinore Elementary~~	~~674-2164~~	~~Rancho Urgent Care~~	~~676-6668~~
~~Luiseno Elementary~~	~~674-0750~~	~~Inland Valley Med. Center~~	~~677-1111~~
~~Machado Elementary~~	~~674-2137~~	~~Sharp Health Care~~	~~696-6000~~
~~Terra Cotta Jr. High~~	~~674-0641~~		
~~Elsinore High~~	~~674-3194~~	~~Restaurants~~	
~~Elsinore Jr. High~~	~~674-2118~~	~~Amato's~~	~~244-1919~~
~~Wildomar Elementary~~	~~678-2114~~	~~Burger King~~	~~674-5233~~
~~Ortega High~~	~~678-3613~~	~~Carl's Jr.~~	~~674-0580~~

~~Withrow Elementary~~	~~678-0132~~	~~Del Taco~~	~~674-5771~~	
~~Temescal Canyon High School~~	~~245-4484~~	~~Don Jose's~~	~~245-6131~~	
~~RR Canyon Elementary~~	~~674-8671~~	~~El Unico~~	~~674-8583~~	
~~David A Brown Middle School~~	~~678-8400~~	~~Family Basket~~	~~674-8577~~	
~~Tuscany Hills Elementary~~	~~245-6850~~	~~Gaudalajara~~	~~674-8294~~	
		~~In and Out Burger~~	~~800/786-1000~~	
~~**Private Schools**~~		~~Manney's~~	~~245-5040~~	
~~Rancho Valley Christian~~	~~245-1020~~	~~McDonald's~~	~~674-2547~~	
~~A Small World~~	~~674-5520~~	~~New China~~	~~245-0666~~	
~~Anne Sullivan Nursery~~	~~678-3557~~	~~Off Ramp Cafe~~	~~674-8194~~	
~~Beginning Concepts~~	~~674-2010~~	~~Pearly Mae's Restaurant~~	~~245-1724~~	
~~Bundy Canyon Christian~~	~~674-1254~~	~~El Ranchito~~	~~245-1738~~	
~~Lakeland Child Care Center~~	~~678-0130~~	~~Pepe's Mexican Restaurant~~	~~244-7373~~	
~~Ortega Trail Rec. & Park Dist. Children Center~~	~~674-6941~~	~~Cyn Lake Golf Club Rest.~~	~~244-6310~~	
~~Wildomar Christian School~~	~~678-4434~~	~~Pizza Hut~~	~~674-6825~~	
~~Elsinore Naval & Military~~	~~678-1433~~	~~Sea Farmers Seafood~~	~~674-4846~~	
~~L.E. 7th Day Adventist~~	~~674-7323~~			
~~Kid's In Action~~	~~674-5437~~			
~~Countryside Academy~~	~~674-9376~~			
~~Canyon Lake Christian Sch.~~	~~244-1790~~			
~~L.E. Senior Center~~	~~674-2526~~			
~~Faith Baptist Academy~~	~~245-8748~~			

Spill Response Plan Flowchart



Section 4

Field Activities

FIELD ACTIVITIES

Spill categories are defined as follows:

Small:	Less than 1,000 gallons
Medium:	1,000 gallons to 10,000 gallons
Large:	More than 10,000 gallons

A. Small Spill

For small, non-threatening spills such as have been contained and/or have not reached receiving waters (creek, river, lake, flood control channel, etc.) the following procedure shall be followed by the responding service crew:

1. Contain as appropriate/applicable.
2. Determine cause of spill and correct as required (i.e. by use of vactor, rodding machine, etc.).
3. Disinfect and abate spill as follows:
   a) Apply Lysol disinfectant concentrate or liquid chlorine solution using appropriate protective equipment (gloves, masks, etc.)
   b) Vacuum up residual, as necessary.
   c) Wash down area with high-pressure hand held gun on vactor.
   d) Vacuum up residual, as necessary.
   e) Remove containment, if applicable.
   f) Notify field supervisor (or if unavailable, the Collections System Manager) of spill.
   g) Complete Field Sewage Soil Report form (see at end of this section) and submit to Field Supervisor for follow-up.

B. Medium and Large Spills

Spills of 1,000 gallons or more shall immediately be reported to the Collection Systems Field Supervisor or in his absence, the Wastewater Operations Manager, who will immediately report to the site and assume On-Scene Supervisor responsibilities per Section 2 of this plan.

C. In the Event of Any Spill, the Following Shall Be Implemented

1. Upon arrival of first responder:

   a) Protect public health, environment and property from the sewage spill event and restore the area back to normal as soon as possible.

   b) Safely and competently respond with appropriate resources and capabilities.

   c) Establish perimeters and control zones with cones, barricades, vehicles, or terrain.

   d) Promptly notify agency's communication center of preliminary spill information and potential impacts.

   e) Contain the sewage discharge to the maximum extent possible. Every effort must be made to prevent the discharge of sewage into surface waters.

2. Identify and Relieve the Cause of the Spill

   a) Collection System

      (1) Determine section of line containing the blockage.

      (2) Go to the downstream manhole (where possible) and set up traffic control, as needed.

      (3) Position vactor and begin hydrojetting operation.

      (4) Relieve blockage.

   b) Sewage Lift Stations

      (1) Refer to lift station trouble shooting guide for determination of source of problem (i.e. power outage, tripped breaker, pump blockage, etc.).

3. Spill Containment and Recovery

   The following shall be used for methods of spill containment, as applicable.

   a) Plug, block, divert around (sand bag) storm drains whenever appropriate to contain the spill.

   b) Divert spill by building a small berm to change direction of flow back to sewer.

   c) Divert spill by pumping around overflow and return to sewer.

   d) Retain spill by letting it collect in a natural low area and recover sewage when time permits.

   e) Dike/dam spill by building berm to collect spill.

4. Cleanup and Disinfection

Cleanup all sewage liquid/solids as follows:

a) Apply Lysol disinfectant concentrate or liquid chlorine solution where practicable, using necessary personal protective equipment. Do not over broadcast or over apply.

b) Wash down and vacuum up residual as necessary, using vactor or contract vacuum dump trucks (see Contractor Listing in Emergency Contacts Lists, Section 9). Return residual to sewer system.

c) Utilize the District water tank trailer or District street washer (ramrodder) for cleanup of large pavement/hard surface areas. Contain and vacuum residual returning it to sewer.

5. Spill Documentation

a) Provide accurate flow measurements and duration of spill using flow calculation method or alternative visual method (see examples at end of this section).

b) **Provide map of problem location showing manhole(s) involved and where the spill discharged (i.e. storm drain, field, stream, etc.).

c) Take photos of event.

d) **Describe cause of spill (i.e. blockage due to roots, grease or breakage of the line due to contractor, etc.).

e) **Report when crew was on site, when spill was stopped and when the cleanup was completed.

f) **Report type and quantity of disinfectant used.

g) **Report size of line where stoppage occurred, if applicable.

**Note: These items will be accomplished with completion of the "Field Sewage Spill Report" form.

Responding Unit #(s)	Emp. Name(s) & #(s)
Location:	Date call received: Time: AM PM
Private System Yes☐ No☐ EVMWD System Yes☐ No☐	Date of arrival: Time: AM PM
Sewage spill: Yes☐ No☐ Estimated gallons:_____ Recovered gallons:_____ Volume discharged* (check box below) ☐ Small ---------- 1,000 gal. or less ☐ Medium --------- 1,000-10,000 gal. ☐ Large ---------- 10,000 gal. or over *Must be a verifiable estimation	Cause: ☐Roots ☐Grease ☐Other (specify below) _____ _____ _____

Line size where stoppage occurred (if applicable): ☐ 6" ☐8" ☐10" ☐12" ☐Other_____	
Type of disinfectant :_____	Quantity used: _____

Receiving Water ☐Creek ☐River ☐Flood Control Channel ☐Lake ☐Other
Identify Receiving Water: _____

NOTE: Notify Operations Dispatch (Base 2) immediately of any spills!

Time Operations dispatch (Base 2) notified of a confirmed spill: _____AM☐ PM☐	
Date spill stopped: _____ Time: _____ AM☐ PM☐	Date cleanup completed: _____ Time: _____ AM☐ PM☐
Corrective Action Taken: _____ _____ _____ _____	

Supervisory Follow Up: _____	
Supervisor:	Date & Time

Note: Map showing location of spill drainage must be drawn up ASAP and submitted to Collection System Field Supervisor (use back of form for map).

CALCULATING SPILLS

The purpose of this report is to take the mystery out of calculating spills. Ninety-eight percent of all spills can be calculated using the two examples discussed in this section.

The orifice equation is used to calculate the volume of a spill. Understanding the orifice equation is not as complex as it may sound. If you know the diameter of the hole (i.e., pick hole or annular space between the ring and cover) and the height at which the fluid is coming out of the hole, then you can calculate the flow out of that hole.

The equation is $Q=Ca\sqrt{2gh}$ ~~2gh~~

Where Q = flow of fluid from the hole,
C = coefficient of discharge,
a = area of the hole (measured in ft.),
g = gravity (32.2 ft/sec) and
h = height of the fluid above the cover (measured in ft.)

The coefficient of discharge (C) is the product of the coefficient of velocity (Cv) multiplied by the coefficient of contraction (Cc). The values for Cv have been found to vary from 0.954 for ¾ inch orifices to 0.991 for 2.5-inch orifices. The values for Cc have been found to vary from 0.67 for ¾ inch orifices to 0.614 for 2.5-inch orifices.

Example 1

A report of a spill occurring at 12 noon is reported. Crews respond to the spill and relieve the spill at 2:30 p.m. In addition, you are informed that the flow was coming from two ¾ inch pick holes in the manhole cover, and when crews arrived on the scene, the flow appeared to be coming out of the holes approximately four inches above the lid. What is the total flow that you are to report to the Regional Board?

Assumptions for Example 1 spill:

1. Flow started at noon and was stopped at 2:30 p.m.
   Total time of spill was 2.5 hours (150 minutes).
2. Flow was coming from two - ¾ inch pick holes.
   The area of each ¾ inch hole is 0.44179 in. (see Table 1-2)
   To convert in^2 to ft^2 multiply by 0.006944.

   Therefore, a = 0.44179 in^2 x 0.006944 = 0.0031 ft^2 for each hole

3. Flow was coming out of each hole at a height of four inches.

   To convert inches to feet, multiply by $\frac{1 foot}{12 inches}$

   Therefore, H=4 inches x $\frac{1 foot}{12 inches}$ = 0.33 ft.

4. The coefficient of discharge, C = Cv x Cc. For a ¾ inch hole
   Cv = 0.954, Cc = 0.67.

   Therefore, C = 0.954 x 0.67 = 0.639

5. Using the orifice equation Qh = Ca $\sqrt{2gh}$ ~~$2gh$~~ the flow from each hole is:

   ~~Qh = 0.639 { (0.0031 ft^2) 2(32.2 $^{ft}/_{sec^2}$)(0.33 ft)~~Qh = (0.639)(0.0031 ft^2) $\sqrt{2(32.2\ ft/sec^2)(0.33\ ft)}$

   = 0.009ft^3/sec x 448.831 gpm/ft^3/sec = 4.099 gpm/hole

~~12.~~6. Total flow, Qt = Qh x number of holes x length of spill (minutes)

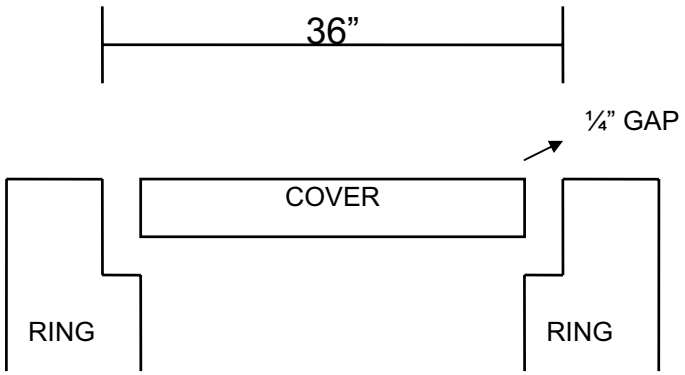
   Qt= 4.099 gpm/hole x 2 holes x 150 minutes = 1230 gallons.

Example 2

In this next Example, the facts are similar to Example 1; except, in addition to the flow coming out of the two pick holes, it is also coming out of the ¼ inch gap between the ring and cover at a height of 4 inches.

~~13.~~7. In addition to steps 1-6 in Example 1, calculate the total area where the flow is coming out between the ring and cover.

We know that the relationship between the ring and cover probably looks like this:



This problem is made simple if you take the ID of the ring (shown here to be 36 inches), figure out it's area and subtract it from the area of the cover (shown here to be 36” - ½” = 35.5 inches). Since both of these areas are circles, we know that the formula is A = $\pi (D/2)^2$. Therefore;

A = A ring - A cover

= $[\pi (36/2)^2] - [\pi (35.5/2)^2]$ π = 3.1416

= [3.1416 (324)] - [3.1416 (315.1)]

=1017.9 - 989.8

= 28.1 in^2 x 0.006944 = 0.195 ft^2

8. From example 1; H = 0.33 ft, g = 32.2 ft/sec, C= 0.639

9. Using orifice equation Q = Ca $\sqrt{2gh}$ ~~2gh~~

Q = (0.639~~(~~)(0.195ft^2) $\sqrt{2(32.2\ ft/sec^2)(0.33ft)}$ ~~2(32.2 ft/sec^2)(0.33ft)~~
= 0.574 ft/sec = 257.82 gpm
= 257.82 gpm x 150 min = 38,673 gallons

10. In this example, flow was coming from two pick holes and the space between the ring and cover. Therefore, in this example we must add the flow calculated in step 6 above to the flow calculated in step 9 above—making the total flow of the spill in this example:

    QT = 1230 gallons + 38,673 gallons

    =39,903 gallons

Alternative Method: Visual

Calculating spills is not for everybody, so, thanks to the City of San Diego, a series of pictures that show the relationship of various flows between 5 gpm to 275 gpm follow this page.

Overflow Vloumes

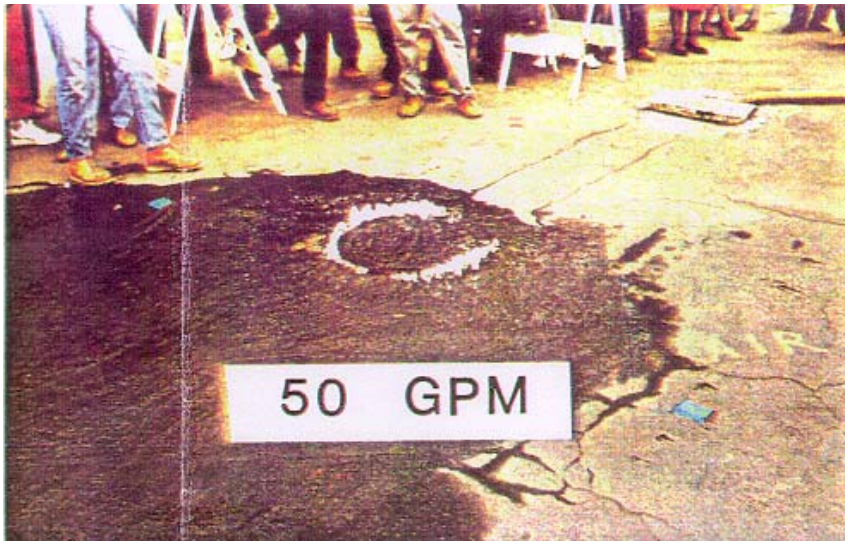
Flow Ht in Inches	1/2" PH GPM	5/8" PH GPM	3/4" PH GPM
0.25	0.47	0.67	1.03
0.5	0.66	0.95	1.46
0.75	0.81	1.17	1.78
1	0.94	1.35	2.06
1.25	1.05	1.51	2.3
1.5	1.15	1.65	2.52
1.75	1.24	1.77	2.72
2	1.32	1.91	2.91
2.25	1.4	2.03	3.09
2.5	1.48	2.13	3.26
2.75	1.55	2.24	3.42
3	1.62	2.34	3.57
3.25	1.69	2.43	3.71
3.5	1.75	2.53	3.85
3.75	1.81	2.61	3.99
4	1.87	2.7	4.12
4.25	1.93	2.78	4.25
4.5	1.98	2.86	4.37
4.75	2.04	2.94	4.49
5	2.09	3.02	4.6
5.25	2.14	3.09	4.72
5.5	2.19	3.17	4.83
5.75	2.24	3.24	4.94
6	2.29	3.31	5.04
6.25	2.34	3.38	5.15
6.5	2.39	3.44	5.25
6.75	2.43	3.51	5.35
7	2.48	3.57	5.45

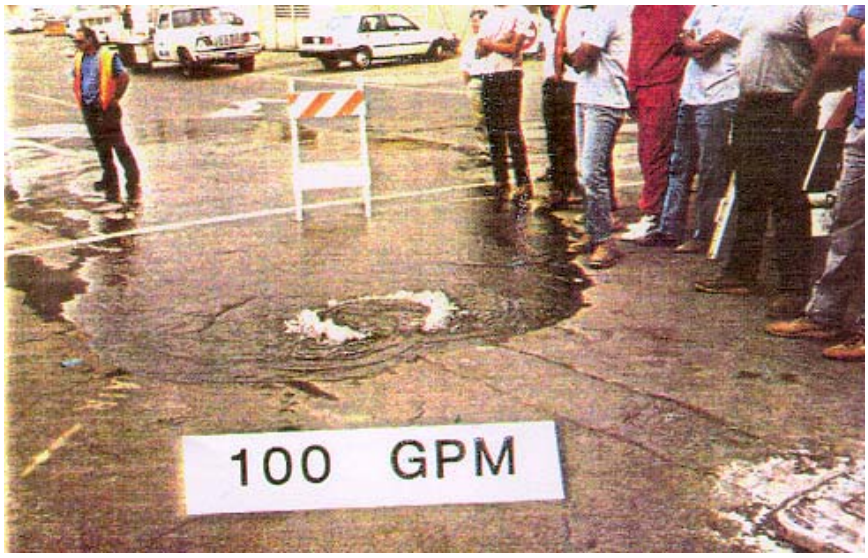
Sewer Overflow Volumes

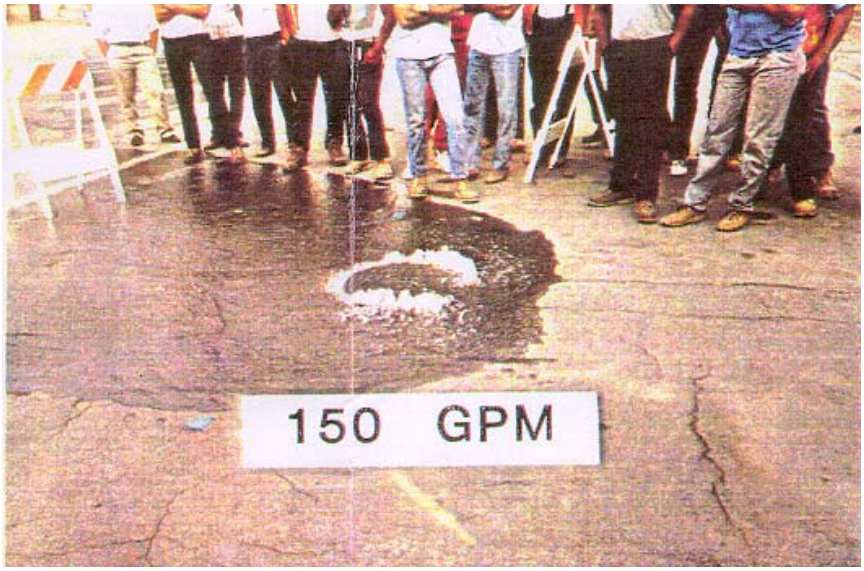
Flow Ht in Inches	1/2" PH GPM	5/8" PH GPM	3/4" PH GPM
7.25	2.44	3.81	5.49
7.5	2.48	3.87	5.58
7.75	2.52	3.93	5.67
8	2.56	4	5.76
8.25	2.6	4.06	5.85
8.5	2.64	4.12	5.94
8.75	2.68	4.18	6.03
9	2.72	4.24	6.11
9.25	2.75	4.3	6.2
9.5	2.79	4.36	6.28
9.75	2.82	4.41	6.36
10	2.86	4.47	6.45
10.25	2.9	4.53	6.53
10.5	2.93	4.58	6.61
10.75	2.97	4.63	6.68
11	3	4.69	6.76
11.25	3.04	4.74	6.83
11.5	3.07	4.79	6.91
11.75	3.1	4.84	9.98
12	3.13	4.89	7.06
12.25	3.17	4.95	7.14
12.5	3.2	5	7.2
12.75	3.23	5.05	7.27
13	3.26	5.09	7.34
13.25	3.29	5.14	7.42
13.5	3.33	5.19	7.49
13.75	3.36	5.24	7.56
14	3.39	5.29	7.63

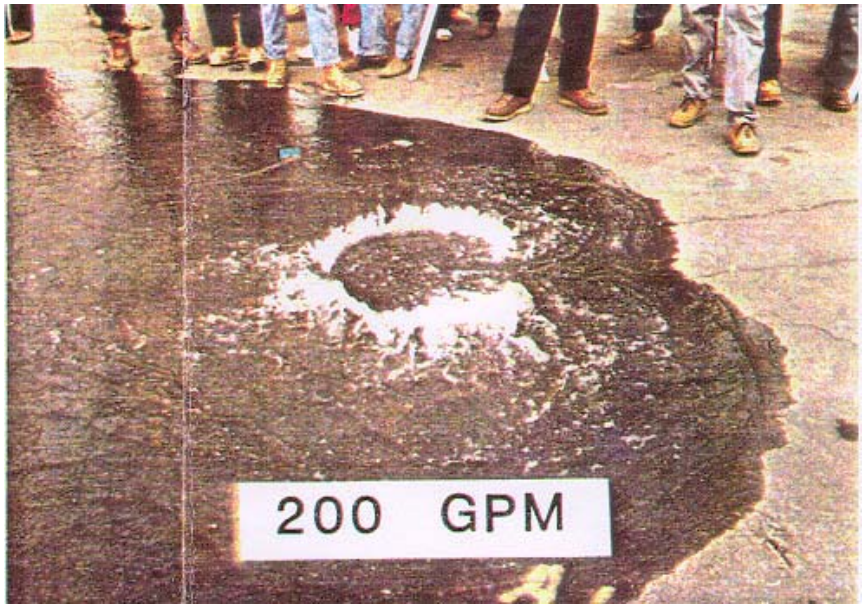
5to10 GPM

25 GPM


50 GPM

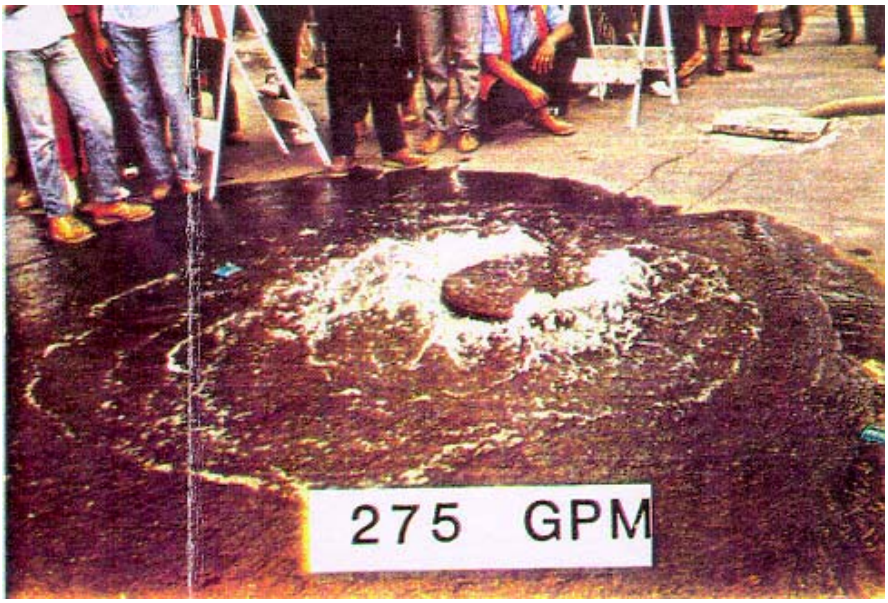

100 GPM


150 GPM


200 GPM

225 GPM

250 GPM


275 GPM

Section 5

Monitoring

MONITORING

Sample collection, preservation, and analyses shall be done in a timely manner. Sampling responsibility shall of that of the On-Scene Supervisor as outlined in Section 2A, 9e.

District and/or contract laboratories (i.e. Babcock Laboratory, McDonald Stevens Laboratory, etc., see Contractors Listing in Appendix of this plan) shall be used as necessary for sample analyses.

Sample coordination with State and County Health Departments and the Regional Water Quality Control Board will be practiced.

Section 6

Record Keeping And Reporting

RECORD KEEPING AND REPORTING

Record Keeping
The Operations Manager will maintain a system file on all sewage spills.

Reporting
Within ten (10) working days from the date of the spill abatement, the General Manager or his delegate shall submit a written report to the Regional Water Quality Control Board, local public health agency, and other appropriate agencies. The report shall include:

A. Estimate of the total volume of the sewage discharged.
B. Estimate of the total volume of sewage that was contained and returned to sewer.
C. Discussion of the events or circumstances that resulted in the sewage spill.
D. Discussion of the impact of the spill on public health and environment.
E. Summary of cleanup activities and any mitigation measures taken to protect public health and the environment.
F. Corrective actions to prevent the recurrence of such incidents.
G. Size of the line where spill occurred, if applicable.
H. When crew was on site.
I. When spill was relieved.
J. When cleanup was complete.

Section 7

Training

TRAINING

Appropriate District personnel (i.e. Management, Collection Systems, Wastewater Treatment, Engineering And Public Information) at all levels of responsibility shall receive a copy of this plan and shall be informed and trained in regard to its components, objectives and use.

Three types of training exercises will be used. These exercises, while providing training and promoting preparedness, will also test the plans effectiveness.

1. Orientation Exercise

   This exercise will be conducted as an introductory session utilizing lecture, visuals, and dialog between instructor and employees. Instruction will be provided regarding the purpose of the plan, its individual components, documentation/record keeping, spill reporting, and procedure. Orientation will be provided to all appropriate employees initially, and to new hires as required. Re-orientation shall be provided annually to be followed by a tabletop exercise.

2. Tabletop Exercise

   In this exercise, there is no use of equipment or deployment of resources. All activities are simulated. Participants play through discussion and the use of a facilitator. Exercise effectiveness is determined by the feedback from participants, impact on, and revisions to plans, procedures, and systems. This exercise will be performed annually, followed by a field exercise.

3. Field Exercise

   A spill event is simulated during this exercise. Controllers monitor the play, and observers record the players' actions. This type of exercise will be used to evaluate plan objectives. It will also test equipment, response time, training resource, and manpower capabilities.

All exercises will have a follow-up meeting to critique strengths/weaknesses and recommend improvements.

Section 8

Emergency Contact Lists

ELSINORE VALLEY MUNICIPAL WATER DISTRICT

EMERGENCY NOTIFICATION PLAN ADMINISTRATORS
(951) Area Code

	NAME	TITLE	TELEPHONE DAY	TELEPHONE EVENING
1.	Ron Young	General Manager	674-3146, Ext. ~~2248~~8451 Cell Phone: 909-757-0002	757-0002
2.	~~Wally Borchard~~TBD	Director of Operations	674-3146 Cell Phone: ~~909-376-0531~~ Pager No: ~~909-672-5717~~	~~678-1333~~
3.	Julius Ma	Water Quality & Treatment Manager	674-3146, Ext. 8208 Cell Phone: 453-3903 Pager No: 672-5559	949-733-9938
4.	Theodore P. Eich	Wastewater Operations Manager	674-3146, Ext. 8203 Cell Phone: 376-0527 Pager No: 535-1351	674-2225
5.	Angel Marquez	District Maintenance Manager	674-3146, Ext. 8201 Cell Phone: Pager No:	294-1308
6.	Robert Barnard	Collection System Superintendent	674-3146, Ext. 8283 Cell Phone: 453-3850	453-3850
~~6.~~	~~Russell Adams~~	~~Water Treatment Supervisor~~	~~674-3146~~ ~~Cell Phone: 376-0524~~ ~~Pager No: 672-8824~~	~~244-3884~~
~~7.~~	~~Daniel Hebert~~	~~Water Treatment Supervisor~~	~~674-3146~~ ~~Cell Phone: 453-3866~~ ~~Pager No: 672-5783~~	~~696-0337~~
~~8~~7.	Steve House	Field Superintendent	674-3146 Cell Phone: 376-0525 Pager No: 672-8829	699-6166
~~9~~8.	Bob Hughes	Field Superintendent	674-3146 Cell Phone: 453-3851 Pager No: 672-5170	909-825-6148
~~10.~~	~~Jake Hernandez~~	~~Field Superintendent~~	~~674-3146~~ ~~Cell Phone: 453-3872~~ ~~Pager No: 672-8826~~	~~674-3327~~
~~11.~~	~~George Cambero~~	~~Agricultural Systems Supervisor~~	~~674-3146~~ ~~Cell Phone: 453-3727~~ ~~Pager No: 672-8825~~	~~678-4757~~

State of California
Department of Health Services
Drinking Water Field Operations Branch
Emergency Contact Numbers

Office General Number: (619) 525-4159
FAX: (619) 525-4383
Cell Phone (619) 379-3632

	Name/Title	Day	Evening
1.	Steve Williams, P.E., District Engineer Riverside District e-mail---swillia7@dhs.ca.gov	(619) 525-4580 Cell (619) 865-3278	(619) 561-2661
2..	Edward Hitti, Sanitary Engineer e-mail---ehitti@dhs.ca.gov	(619) 525-4013	(858) 487-3375
3.	Jing Chao, P.E., Sanitary Engineer e-mail---jchao@dhs.ca.gov	(619) 525-4834	(858) 622-1246

Riverside County

Emergency Contact Numbers
(760) 863-7000

	Day	Evening
Greg Dellenbach Public Health Engineer	(909) 955-8932	(909) 358-5055
Don Park Public Health Engineer	(760) 863-7008	(760) 863-7008

If the above personnel cannot be reached, contact: Office of Emergency Services, Warning Center (24 hours). The State number is Sacramento is: (916) 262-1621.

CITY OF LAKE ELSINORE

Public Service Emergency Call Out List

Please make every attempt to contact the Department Manager before calling the Foremen.

PUBLIC WORKS **(951) 674-5170**
EMERGENCY STANDBY: **(951) 232-4884**

DEPARTMENT MANAGER - WILLIAM PAYNE

Home: (951) 674-1246
Mobile: (951) 721-9231

PARKS/TREE/STREETS FOREMEN - JON FAZZIO

Home: (951) 354-5665

LAKE MAINTENANCE - PAT KILROY

Office: (951) 674-7730
Home: (909) 678-5962

CODE ENFORCEMENT – BOB BRADY

Office: (951) 322-6663

CITY OF MURRIETA

EMERGENCY AFTER HOURS PHONE NUMBERS

PUBLIC WORKS MATTERS

Mike Brooks, Maintenance Superintendent	(951) 679-1829
Ben Minamide, Director of Public Works	(714) 779-1296
(some week nights)	(951) 698-7766
Russ Napier, Principal Public Works Inspector	(951) 443-4808
Ken Burris, Senior Public Works Inspector	(951) 672-9813
Dan Clark, Assistant City Engineer	(951) 677-0246
Bob Brock, Civil Engineer Associate	(951) 698-3315
Wayne Watson, Maintenance Leadman	(951) 698-5338
Jason Morrel, Equipment Operator	(951) 678-5543
Chris Vega-McCain, Maintenance Worker	(951) 698-6523

BUILDING & SAFETY MATTERS

Dennis Blundell, Building Official	(951) 698-2208

RIVERSIDE COUNTY ROAD DEPARTMENT

County Yard (7 am - 4 pm)	(951) 677-5889
Jim Posey, Road Maint. Supervisor	(951) 686-0131
Martin Harris, Leadman	(951) 674-3266

RIVERSIDE COUNTY FLOOD CONTROL (951) 275-1250
(951) 955-1248

MS4 PERMITTEE (Storm Drains)

City of Murrieta	(951) 461-6075
City of Lake Elsinore	(951) 6714-3124 ext.244
City of Canyon Lake	(951) 244-2955
City of Corona	(951) 736-2443

MURRIETA POLICE (951) 696-3615

Dispatch (24 hours Police & Fire Dept.)

RIVERSIDE SHERIFF DEPT. (800) 950-2444
After-hours can contact County by Radio

CANYON LAKE PROPERTY OWNERS ASSOCIATION
OPERATIONS DEPARTMENT

Monday thru Friday 6:00AM - 3:30PM — Call Operations Dept. 951/244-6841 Ext. 510

Direct Line 951/246-1751

Weekends and Holidays 24 Hours call: — Pager (951) 508-1546

Monday thru Friday 3:30PM - 6:00AM call: — Pager (951) 508-1546 OR CALL DIRECT ACCORDING TO CATEGORY:

1. General Manager	Clint Warrell	951/672-7734
2. Director of Operations	Paul Johnson	951/679-2101
3. Coordinator of Operations	Merrie Shaw	951/244-2236
4. Operations Clerk	Carolyne Rogers	951/244-5834
5. Mechanic	Dave Norton	951/244-2042
6. Plumbing	Gene Hill	951/674-5572
7. Marine/Lake	Jose Gomez	951/943-2561
8. Carpenter	Chuck Grantham	951/674-5101
9. Electrical (Refrigeration/Gas)	Jan Pianka	951/652-4452
10. Grounds Superintendent	Evaristo Garcia	951/657-0429
11. Building Superintendent	Mark De Husson	951/674-7011
12. Grounds Leadman	Jesus Falcon	951/678-4523

Golf Course Emergency

Greg Swanson Pager 416-6649 (760) 721-9781

CITY OF CANYON LAKE
(951) 244-2955
31532 Railroad Canyon Road
Canyon Lake, CA 92587

APPENDIX F – UNIFIED SANITARY SEWER SPILL RESPONSE PROCEDURE

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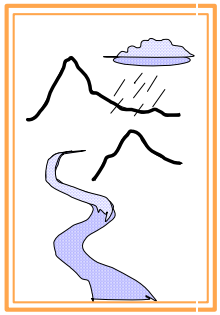

Unified Sanitary Sewer Spill Response Procedure

Submitted to the
SANTA ANA REGIONAL WATER QUALITY CONTROL BOARD

(SARWQCB ORDER No. R8-2002-0011)

July 10, 2008

BY THE RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISRICT, COUNTY OF RIVERSIDE, AND CITIES OF RIVERSIDE COUNTY (SANTA ANA REGION)

N P D E S

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Unified Sanitary Sewer Spill Response Procedure

1.0 Background

The Santa Ana Regional Water Quality Control Board (SARWQCB) adopted Order No. R8-2002-11 (NPDES No. CAS 618033), Waste Discharge Requirements for Riverside County Flood Control and Water Conservation District (RCFC), the County of Riverside, and the incorporated cities of Riverside County within the Santa Ana Region (Permittees). This Order, also known as the Municipal Separate Storm Sewer System permit (MS4 permit), requires the Permittees to control the discharge of pollutants from the MS4s to Waters of the United States. The local sewering agencies are under separate permits for operation of portions of the sanitary sewer facilities under the jurisdiction of the SARWCQB.

The SARWQCB has found that effluent from sanitary sewer overflows (SSOs) that may enter the MS4 can ultimately have a negative impact on Beneficial Uses of downstream Waters of the U.S. Therefore, Section VII.A of the MS4 permit requires the sewering agencies and the Permittees to jointly develop a Unified Sanitary Sewer Spill Response Procedure for containing and cleaning up effluent from SSOs that have or could infiltrate to the MS4. The SARWQCB has used their regulatory authority over the sewering agencies and the Permittees within it's jurisdiction to coordinate the joint development of this procedure. This procedure may also be used to address SSO response in other Regions of Riverside County.

2.0 Purpose

Both sewering agencies and the Permittees are required to provide notification, documentation, spill response and reporting pursuant to established federal and state regulations, and individual National Pollutant Discharge Elimination System (NPDES) permits. The purpose of this procedure is to act as a bridge between these response programs to ensure effective coordination between sewering agencies and the Permittees in the event that a SSO threatens to impact, or impacts, the MS4. This procedure will:

- Enhance communication between the Permittees, sewering agencies and the SARWQCB
- Clarify and streamline interagency SSO response procedures
- Provide additional protection of Waters of the U.S. necessary to meet the requirements of Section VII.A of the MS4 permit

This procedure incorporates elements of spill release notification guidance published by the California Office of Emergency Services Hazardous Materials Unit. As that guidance is updated, this procedure will be revised to conform. This procedure is intended to address any occurring or impending SSO that may enter the MS4.

3.0 Procedure

Sewering Agency SSO Response Procedure

Upon determination by a sewering agency or Permittee, persons in charge, contractor or field crew that a SSO has occurred that may impact the MS4, the following procedure will be implemented.

Notification

The following notification requirements are applicable to sewering agencies:

All significant or threatened SSOs require immediate notification of government agencies by owners, operators, persons in charge and employers per established reporting guidelines.

- Less than 1,000 gallons and not impacting the MS4 – Established reporting procedures only.
- Less than 1,000 gallons and potential impact to the MS4 – Established reporting procedures, as well as report to Riverside County Environmental Health, RCFC and the appropriate City.
- More than 1,000 gallons – Established reporting procedures, OES, Riverside County Environmental Health, RCFC and appropriate City.

The following notification requirements are applicable to Permittees:

Should a Permittee discover a SSO or determine that sewage is leaching into the MS4, the Permittee shall immediately contact the appropriate sewering agency. The Permittee must also make other contacts as required by established notification guidelines in the Riverside County Santa Ana/Santa Margarita Drainage Area Management Plan.

A list of the current contact phone numbers for various agencies is provided below:

Sewering agency with jurisdiction in spill area		**See Attachment A**
County of Riverside, DEH, Environmental Resources Management		951.955.8980
Governor's Office of Emergency Services: 1.800.852.7550 (1,000 gallons or greater only).		
Regional Water Quality Control Board:	Santa Ana:	951.782.4130
	San Diego:	858.467.2952
	Colorado River Basin:	760.346.7491
Riverside County Flood Control and Water Conservation District NPDES Section: 951.955.1200		
Permittee Staff (whose MS4 may be affected by spill):		**See Attachment C**

Minimum Information for Notification

Persons providing notice should make reasonable attempts to reach staff contacts during and after normal working hours. In cases where staff contacts are not available, messages should be left. Noticing requirements are generally specified through established state, federal or NPDES permit reporting guidelines, however in communications between Permittees and sewering agencies the following minimum information should be conveyed as appropriate:

- Identity of caller
- Location, date and time of incident, status of the release (actual or threatened release)
- Substance and quantity of sewage released (estimate flow or volume)
- Need for public safety or traffic control measures (For Permittees informing sewering agency of spill).
- Identify cause of the release
- Description of immediate measures taken to contain/mitigate SSO
- Estimate of additional containment and/or clean-up options
- Determination if sewage was discharged to MS4 or areas otherwise impacting the MS4 **(Refer to Attachments B and D)**

A copy of a sample SSO Reporting form is included in **Attachment E**.

Reporting Requirements

Each agency responsible for the SSO shall file reports as required under federal and state law, including any applicable NPDES or other permits. Sewering agencies are required to report any discharges to the Department of Environmental Health immediately, per the requirements of Health and Safety Codes section 5411.5. Permittees shall additionally follow specific reporting requirements as described in Section 4 of the Riverside County Drainage Area Management Plan for the Santa Ana and Santa Margarita Regions.

The Person in Charge at the responsible sewering agency must CC the final SSO Report provided to the Regional Board to the affected Permittees via hard copy or electronic means.

Response Requirements

Responsible sewering agencies will lead response to SSOs and will assume Person in Charge responsibilities in most cases. Person in Charge of spill response:

- Will take all immediate measures necessary to contain release or potential release of sewage and prevent/minimize impacts to water quality and the MS4.

- May cut locks, open manholes, or otherwise enter MS4 as necessary to contain and clean SSOs.

- Will contact the maintenance/public works department of the appropriate Permittee as necessary and as soon as possible to notify them of actions within their MS4. Contact numbers are included

in **Attachment C**. If necessary, Permittee staff will support spill response by providing MS4 maps or other support if available.

- Will coordinate with Permittee staff as necessary to ensure that the clean up adequately remedies impacts of the sewage released to the MS4. It should be noted that the Regional Board prefers that MS4 facilities are not sanitized with disinfectant, where not immediately impacting public health (i.e. no chlorine shall be used when discharge is within 1,500 ft of a waterway).

- Will coordinate with local fire, police, and traffic departments, as necessary to ensure the safety of the response effort, and to manage traffic and local residents.

Private Property SSOs

Sewering agencies and their contractors will respond to all SSOs within their service area. If a private property is the source of an SSO, agencies and their contractors shall assist in the control and containment to ensure that the sewage does not enter the MS4. If the SSO was a result of a private lateral, the private property owner will be informed of the blockage, and will be responsible to remove the blockage. If the SSO was a result of the sewer trunk line blockage, the response crew will correct the problem.

Sampling/Monitoring

Monitoring may be required by the Regional Board for spills that reach surface waters. Testing of soils may also be required.

Training Requirements

Sewering Agencies and Permittee staff will ensure that training for this procedure is incorporated into appropriate training programs related to SSO response.

Unified Detection Involving Infiltration into MS4

In the event that Permittees encounter evidence of potential sewage infiltration into the MS4 due to water quality monitoring or field observation, the Permittees will notify the relevant sewering agency (**see Attachment A**) to coordinate a response.

Glossary

MS4 (Municipal Separate Storm Sewer System) - A MS4 is a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, natural drainage features or channels, modified natural channels, man-made channels, or storm drains):

(i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to Waters of the U.S.;
(ii) (Designated or used for collecting of conveying storm water;
(iii) Which is not a combined sewer;
(iv) Which is not part of the POTW as defined at 40 CFR 122.2.

Region – Either the Santa Ana, Santa Margarita, or Whitewater River watershed regions of Riverside County. These regions are regulated by the Santa Ana, San Diego and Colorado River Region Regional Water Quality Control Boards, respectively.

Sanitary Sewer Overflow (SSO) - A sanitary sewer overflow is any overflow, spill, release, discharge or diversion of wastewater from a sanitary sewer system. SSOs include:

(i) Overflows or releases of wastewater that reach waters of the United States;
(ii) Overflows or releases of wastewater that do not reach waters of the United States; and
(iii) Wastewater backups into buildings and on private property that are caused by blockages or flow conditions in a sanitary sewer, other than a building lateral. Wastewater backups into buildings caused by a blockage or other malfunction of a building lateral that is privately owned is a SSO when sewage is discharged off of private property into streets, stormdrains, or waters of the State.

Sanitary Sewer System - Any system of pipes, pump stations, sewer lines, etc., used to collect and convey sewage to a treatment plant. Temporary storage and conveyance facilities (such as vaults, temporary piping, construction trenches, wet wells, impoundments, tanks, highlines, etc.) are considered to be part of the sanitary sewer system, and discharges of sewage to these facilities are not sanitary sewer overflows.

Sewage - The waste and wastewater produced by residential and commercial establishments and discharged into sewers.

Waters of the United States – Waters of the United States can be broadly defined as the navigable surface waters and all tributary waters to navigable surface waters. Groundwater is not considered to be a Waters of the United States. See 40 CFR 122.2 for a more expansive definition.

Attachment A

Unified Sanitary Sewer Spill Response Procedure

Attachment A (Sewering Agency Contact Roster)

City of Beaumont
Mr. Roger Vesely
550 E. 6th Street
Beaumont, CA 92223
951.769.8534, After Hours: 951.505.9234
Fax: 951.769.0914
rvesely@4conops.com

City of Corona
Rudy Fandel, Dept. of Water and Power
400 S. Vicentia Avenue
Corona, CA 92882
951.736.2476, After Hours: 951.736-2223
Fax 951.739.4909
Rudy.fandel@ci.corona.ca.us

City of Hemet Water/Wastewater Dept.
Mr. Randy Hundley
3777 Industrial Avenue
Hemet, CA 92545
951.765.3710, Cell: 951.634.3101,Police Dispatch: 951.765.2400
Fax 951.765.2493
Rhundley@cityofhemet.org

City of Riverside
Mr. Reagan S. Bailey
5950 Acorn Street
Riverside, CA 92504
951.351.6095, After Hours: 951.351.6140
Fax 951.687.6978
RSbailey@riversideca.gov

Eastern Municipal Water District
Integrated Operations Center or
Mr. Mark Chamberlin
P.O. Box 8300
Perris, CA 92572
951.928.3777 ext. 6265 (During & After Work Hours)
Fax 951.928.6177
chamberm@emwd.org

Edgemont Community Services District
Mr. Joe Teague 951.233.8860
Ms. Virginia Lou Rahn 951.683.0685 or After Hours 951.656.1234
P.O. Box 2024
Riverside, CA 92516-2024
Sam.Gershon@webbassociates.com

Elsinore Valley Municipal Water District
Mr. Ted Eich
P.O. Box 3000
Lake Elsinore, CA 92531-3000
951.674.3146 ext. 8203, After Hours: 951.258.9299
Fax: 951.245.5946
teich@evmwd.net

Jurupa Community Services District
Mr. Steve Jaynes
11201 Harrel Street
Mira Loma, CA 91752
951.681.1482 ext.107, Cell: 951.830.1517
Fax: 951-685-1153
info@jcsd.org OR sjaynes@jcsd.us

Lake Hemet Municipal Water District
Mitch Freeman (Sr W. Operator), Jeff Wall (Chief Engineer)
P.O. Box 5039
Hemet, CA 92544
951.658.3241 ext. 247; 951.658.3241 ext. 238
After Work Hours: 951.956.4836; 951.970.8970
Fax 951.766.7031
mfreeman@lhmwd.org

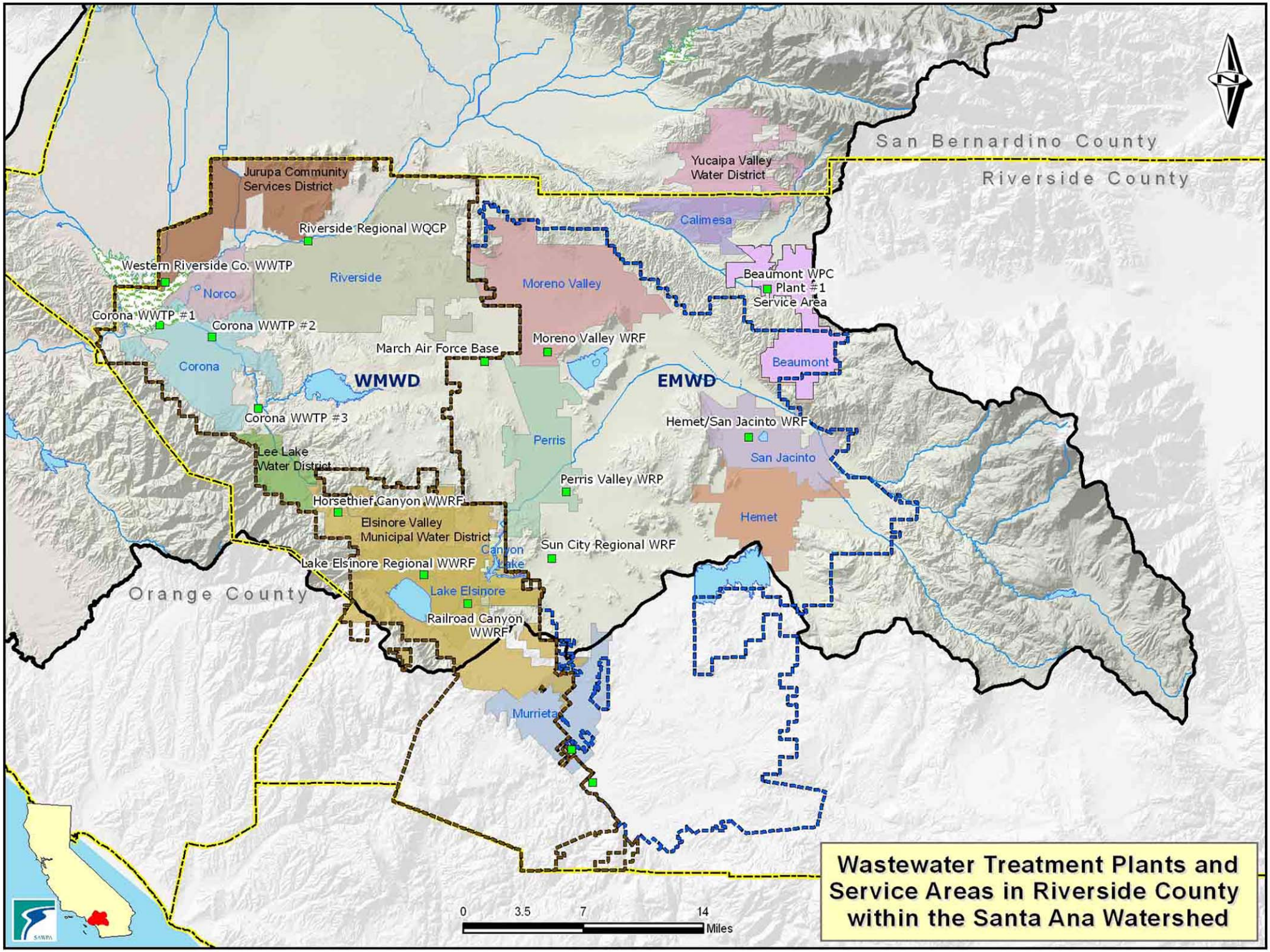
Lee Lake Water District
Ken Codwell (Plant Super.) Mr. Harry Riebe (Eng.) Jeff Pape (GM)
22646 Temescal Canyon Rd.
Corona, CA 91719
During Work: 760.277.1414; 760.479.4120; 951.277.1414
After Work: 951.830.3651; 760.473.4120; 760.250.9658
Fax 951.277.1419
hriebe@dudek.com

Rubidoux Community Services District
Mr. Dan Ballow
P.O. Box 3098
Riverside, CA 92519
951.684.7580, After Work Hours: 951.684.7580
Fax: 951.369.4061
dballow@rcsd.org

Western Municipal Water District
Mr. John Gallegos or Ed Acosta
450 East Alessandro Boulevard
Riverside, CA 92508
951.789.5110, After Work Hours: 951.789.5109
Fax: 951.780.0272
westernops@wmwd.com

Yucaipa Valley Water District
Mr. John Wrobel
P.O. Box 730
909.797.5117, After Work Hours: 951.789.5109
Fax 909.797.5937
jwrobel@yvwd.dst.ca.us

Attachment B



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Attachment C

Unified Sanitary Sewer Spill Response Procedure

Attachment C (MS4 Permittee Contact Roster)

City of Beaumont
Mr. John Wilder
550 E. 6th Street
Beaumont, CA 92223
951.769.8520 Fax 951.769.8526
ulcjohn1@aol.com

City of Canyon Lake
Robert Bohan, Senior Special Enforcement Officer
31516 Railroad Cyn. Rd., Ste 101
Canyon Lake, CA 92587
951.244.2955 Fax 951.246.2022
Cell 951.265.1796 Home 951.244.3935(Deputy)
Kathy@cityofcanyonlake.com

City of Hemet
Ms. Linda Nixon
510 E. Florida Avenue
Hemet, CA 92543
951.765.3880 Fax 951.765.3878
lnixon@cityofhemet.org

City of Moreno Valley
Mr. Kent Wegelin or Ms. Phuong Hunter
14177 Frederick Street
Moreno Valley, CA 92552-0805
951.413.3480 Fax 951.413.3498
After hours: Emergency Stand-by group
Cell 951.442.5208 Pager 909.783.7149
kentw@moval.org or phuongh@moval.org

City of Norco
Mr. Terry Piorkowski
1281 Fifth Street
Norco, CA 92860
951.270.5607 Fax 951.735.0186
Emergency 951.273.6069 Pager 909.448.5550
tpiorkowski@ci.norco.ca.us

City of Riverside
Mr. Reagan S. Bailey or Mr. Ernie Meloy
5950 Acorn Street
Riverside, CA 92504
951.351.6095 Fax 951.687.6978
rbailey@riversideca.gov or emeloy@riversideca.gov

City of Temecula
Mr. Aldo Licitra
43200 Business Park Drive
Temecula, CA 92589-9033
951.394.6411 Fax 951.694.6475
After Hours: Brad Burton 951.551.4669
licitra@cityoftemecula.org or
Brad.Buron@CityofTemecula.org

Riverside County Exec. Office
Mr. Alex Gann
4080 Lemon Street, 5th Floor
Riverside, CA 92501
951.955.1180 Fax 951.955.1105
agann@rceo.org

City of Calimesa
Mr. Bob French
908 Park Avenue
Calimesa, CA 92320
909.795.9801 Fax 951.795.4399
bfrench@cityofcalimesa.net

City of Corona
Mr. Ed Lockhart
730 Corporation Yard Way, 1st Floor
Corona, CA 92880
951.736.2443 Fax 951.279.3613
951.232.2510
edl.@ci.corona.ca.us

City of Lake Elsinore
Mr. Ken Seumalo
130 South Main Street
Lake Elsinore, CA 92530
951.674.3124 Ext. 244 Fax 951.674.2392
kseumalo@lake-elsinore.org

City of Murrieta
Ms. Farida Naceem
26442 Beckman Court
Murrieta, CA 92562
951.461.6075 Fax 951.698.4509
fnaceem@murrieta.org

City of Perris
Mr. Michael Morales
101 N. "D" Street
Perris, CA 92570
951.943.5003 Fax 951.943.3293
mmorales@perris-ca.org

City of San Jacinto
Mike Emberton (Public Works Director), Aaron Anderson (Utilities Super.)
201 E. Main Street
San Jacinto, CA 92583
951.654.4041, Cell: 951.538.9499, Pager: 951.765.8197
Fax 951.487.7382
Memberton@sanjacintoca.us; Aanderson@sanjacintoca.us;

Riverside Co. Env. Health
Mr. John Watkins
4080 Lemon Street, 9th Floor
Riverside, CA 92501
951.955.3915 Fax 951.781.9653
Jwatkins@co.riverside.ca.us

Riverside County Flood Control & Water Conservation District
Ms. Arlene Chun abchun@rcflood.org
1995 Market Street, Riverside, CA 92501
951.955.1330 Fax 951.788.9965

Mark Biloki, Maintenance Superintendent mbiloki@rcflood.org
Office 951.955.1310, Cell 951.288.5254, Home 909.877.2716

Steve Stump, Maintenance Division Manager sstump@rcflood.org
Office 951.955.1280, Cell 909.214.6159

Attachment D

Attachment E

Unified Sanitary Sewer Spill Response Procedure

Attachment E

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SANITARY SEWER OVERFLOW REPORT FORM

THIS REPORT IS (CIRCLE ONE): PRELIMINARY FINAL REVISED FINAL

SANITARY SEWER OVERFLOW SEQUENTIAL TRACKING NUMBER: _____

REPORTED TO: _____
(ENTER FAX, VOICE MAIL, OR NAME OF REGIONAL BOARD STAFF)
DATE REPORTED: _____ (MM/DD/YY)
TIME REPORTED:_____ (24 HOUR CLOCK)
REPORTED BY: _____
PHONE: _____
REPORTING SEWER AGENCY: _____
RESPONSIBLE SEWER AGENCY: _____
OVERFLOW START: DATE: ___/___/___(MM/DD/YY)
TIME:_____ (24 HOUR CLOCK)
OVERFLOW END: DATE: ___/___/___(MM/DD/YY)
TIME: _____ (24 HOUR CLOCK)
ESTIMATED OVERFLOW FLOW RATE: _____(GALLONS PER MINUTE)
TOTAL OVERFLOW VOLUME:_____ (GALLONS)
OVERFLOW VOLUME RECOVERED: _____ (GALLONS)
OVERFLOW VOLUME RELEASED TO ENVIRONMENT:_____ (GALLONS)

SANITARY SEWER OVERFLOW LOCATION AND DESCRIPTION:

STREET: _____

CITY:_____ ZIP CODE:_____

COUNTY:_____ (SD, RI, OR)

SANITARY SEWER OVERFLOW STRUCTURE I.D.:

_____

NUMBER OF OVERFLOWS WITHIN 1000 FT. OF THIS LOCATION IN PAST 12 MONTHS _____

Unified Sanitary Sewer Spill Response Procedure

Attachment E

DATES OF OVERFLOWS WITHIN 1000 FT OF THIS LOCATION IN PAST 12 MONTHS

_____

OVERFLOW CAUSE -- SHORT DESCRIPTION -- CIRCLE ONE

ROOTS	GREASE	LINE BREAK	INFILTRATION
ROCKS	BLOCKAGE	POWER FAILURE	PUMP STATION FAILURE
DEBRIS	VANDALISM	FLOOD DAMAGE	MANHOLE FAILURE
OTHER	UNKNOWN	CONSTRUCTION	PRIVATE PROPERTY

OVERFLOW CAUSE -- DETAILED DESCRIPTION OF CAUSE

_____

_____

_____

_____

_____

SANITARY SEWER OVERFLOW CORRECTION -- DESCRIPTION OF ALL PREVENTATIVE AND CORRECTIVE MEASURES TAKEN OR PLANNED

_____

_____

_____

_____

_____

WAS THERE MEASURABLE PRECIPITATION DURING 72-HOUR PERIOD PRIOR TO THE OVERFLOW? (Y OR N)

INITIAL AND SECONDARY RECEIVING WATERS:

DID THE SANITARY SEWER OVERFLOW ENTER A STORM DRAIN? ___(Y OR N)

Unified Sanitary Sewer Spill Response Procedure

Attachment E

DID THE SANITARY SEWER OVERFLOW REACH SURFACE WATERS OTHER THAN A STORM DRAIN? ___(Y OR N)

NAME OR DESCRIPTION OF INITIAL RECEIVING WATERS. (IF NONE, TYPE NONE)

_____

NAME OR DESCRIPTION OF SECONDARY RECEIVING WATERS. (IF NONE, TYPE NONE)

_____

IF THE SANITARY SEWER OVERFLOW DID NOT REACH SURFACE WATERS, DESCRIBE THE FINAL DESTINATION OF SEWAGE.

_____

NOTIFICATION:

WAS THE LOCAL HEALTH SERVICES AGENCY NOTIFIED? __ (Y OR N)

IF THE OVERFLOW WAS OVER 1,000 GALLONS, WAS THE OFFICE OF EMERGENCY SERVICES (OES) NOTIFIED? __ (Y or N) (NOT APPLICABLE, ENTER NA)

AFFECTED AREA POSTING:

WERE SIGNS POSTED TO WARN OF CONTAMINATION? __ (Y OR N)

LOCATION OF POSTING (IF POSTED): _____

HOW MANY DAYS WERE THE WARNING SIGNS POSTED? ___

REMARKS:

_____

_____

_____

_____

APPENDIX G – SAN DIEGO REGIONAL BOARD SSO GUIDELINES FLOW CHART

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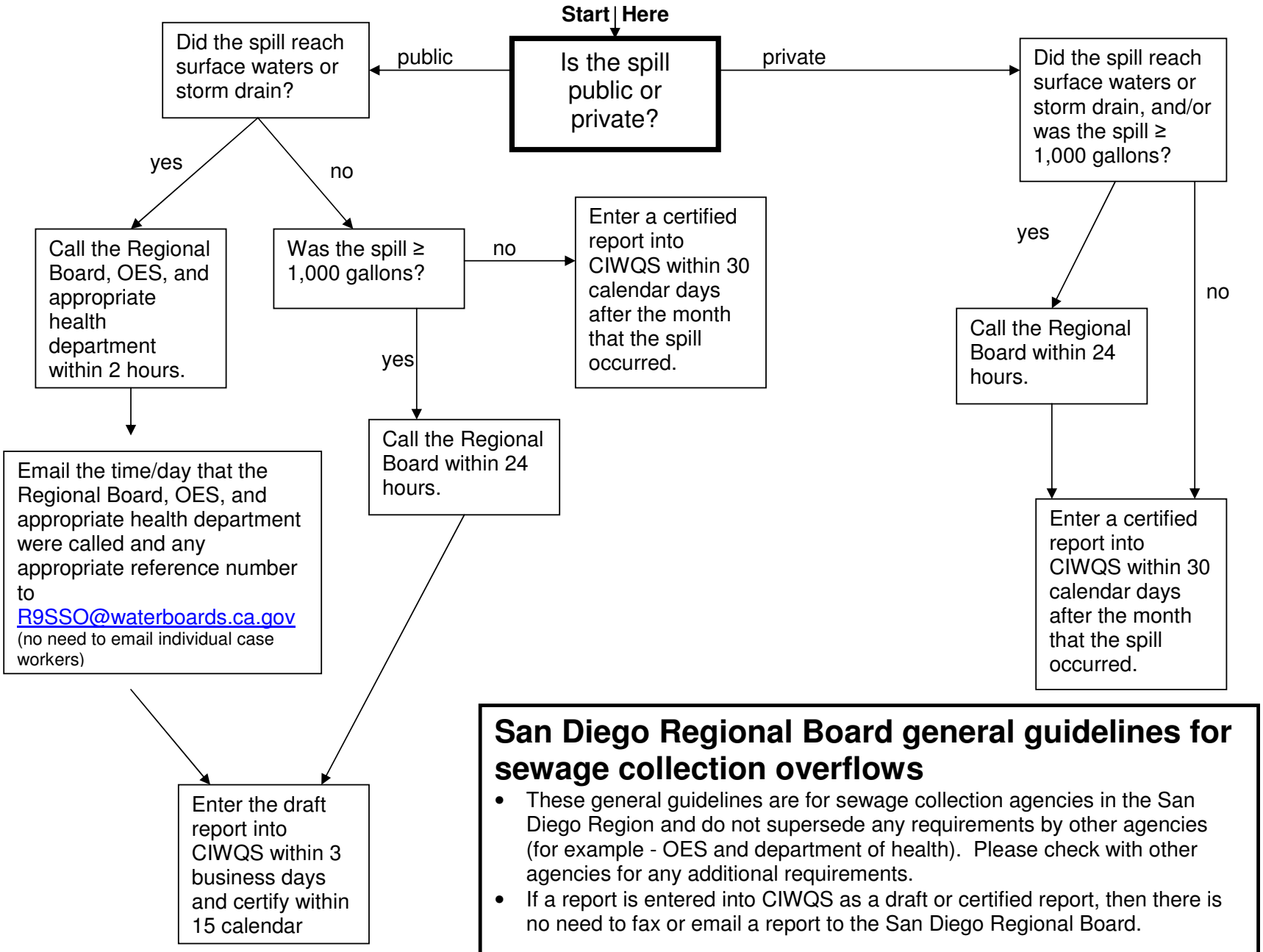

San Diego Regional Board general guidelines for sewage collection overflows

- These general guidelines are for sewage collection agencies in the San Diego Region and do not supersede any requirements by other agencies (for example - OES and department of health). Please check with other agencies for any additional requirements.
- If a report is entered into CIWQS as a draft or certified report, then there is no need to fax or email a report to the San Diego Regional Board.

During business hours, the San Diego RWQCB contact is Joann Cofrancesco at 858-637-5589. After hours, the San Diego RWQCB number is 858-822-8344.

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APPENDIX H – SEWER USE ORDINANCE

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Elsinore Valley Municipal Water District

Regulations For Waste Discharge And Sewer Use

ORDINANCE NO. 160

ADOPTED BY THE BOARD OF DIRECTORS OF ELSINORE VALLEY MUNICIPAL WATER DISTRICT

December 20, 2004

ADOPTED, SIGNED, AND APPROVED this 20th day of December, 2004

W. Ben Wicke, President of the Board of Directors of the Elsinore Valley Municipal Water District

ATTEST:

Terese Quintanar, Secretary of the Board of Directors of the Elsinore Valley Municipal Water District

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ARTICLE 1

General Provisions

1.100 INTENT

A. It is the intent of this Ordinance to protect public health, District personnel, the District's wastewater collection, treatment systems and the environment from waste discharges by users with the potential to detrimentally impact the beneficial use of reclaimed (recycled) water and municipal sludge (bio-solids).

1.200 PURPOSE

A. The purpose of this Ordinance is to set forth:

1. Conditions and limitations on the use of the District's sewer system;

2. Specific enforcement provisions to resolve noncompliance with the District's Ordinance, thereby allowing the District to:

a. Comply with the laws, regulations, and rules imposed upon it by Regulatory Agencies;

b. Ensure that the District's sewerage facilities and treatment processes are protected and are able to operate with the highest degree of efficiency;

c. Protect the beneficial use of reclaimed (recycled) water and municipal sludge (bio-solids); and

d. Protect the public health and environment.

1.300 POLICY

A. This Ordinance shall be interpreted in accordance with the definitions set forth in Article 2. The provisions of this Ordinance shall apply to the direct and indirect discharge of all wastes to facilities of the District.

B. The District shall seek the cooperation of the users of the collection system to ensure compliance with this Ordinance. Reasonable approaches shall be utilized when applying applicable regulations without compromising the intent, purpose and policies of this Ordinance.

C. The District shall adopt more stringent quality requirements on wastewater discharges regulated by 40 CFR, Chapter I, Subchapter N, Parts 405-471, in the event that more stringent quality requirements are necessary to protect beneficial use of reclaimed (recycled) water and municipal sludge (bio-solids).

D. The District shall encourage conservation and pollution prevention through source control strategies, which reduce the amount of pollutants entering the environment, prior to recycling, pretreatment, or disposal.

E. The District shall use the revenues derived from the application of this Ordinance to defray the cost of regulating sewer usage to include, but not be limited to, administration, monitoring, inspecting, permitting, reporting, and enforcement.

F. All costs and expenses incurred by the administration, monitoring, inspecting, permitting, reporting, and enforcement procedures of the District's Source Control Division shall be paid by the applicant/discharger. All applicable fees shall be pursuant to the most current edition of the ***Districts Pretreatment Program Fee Schedule*** and as amended thereto.

G. The District shall ensure that all parties are afforded due process of law. An applicant or user shall be given written notice of rejection of an application, or violation of a control mechanism, or of any enforcement action. Such notice shall include a statement of reasons in support thereof and proposed actions to be taken, if any. Affected applicants or users shall have the right to a hearing. Decisions/determinations may be appealed as set forth in Article 5.

H. The District, in its sole and reasonable discretion, may utilize any one, combination, or all enforcement remedies provided in Article 1.600(A) (10) in response to any violation.

1.400 SCOPE

A. The provisions of these Regulations shall apply to sewer construction, use, maintenance, discharge, deposit, or disposal of wastewater, both directly and indirectly, into and through all District collection systems and to the issuance of control mechanisms and assessment/imposition of fees, fines and penalties thereof.

1.500 APPLICABILITY

A. This "Regulations for Waste Discharge and Sewer Use" Ordinance applies to all users of the District's sewer system and specifies herein that all

users of the District's sewer system are subject to regulation and enforcement.

1.600 POWERS

A. The General Manager is authorized to:

1. Issue Waste Discharge Authorizations;

2. Issue Waste Discharge Permits;

3. Require the installation and maintenance of pretreatment and/or monitoring facilities and equipment;

4. Conduct inspections of facilities, including, but not limited to, inspecting and copying records;

5. Require monitoring and reporting of discharges to the public sewer system;

6. Monitor the quality of wastewater entering the sewer system;

7. Require the development of Spill Containment Plans and reporting of accidental discharges;

8. Require the development of a Slug Control Plan (per Title 40 of the Code of Federal Regulations (40 CFR) 403.8(f)(2)(v));

9. Deny, approve or approve with conditions, new or increased discharges or change in the quantity or characteristics of discharges, when such discharges do not meet applicable pretreatment requirements as specified in 40 CFR 403.8(f)(1)(i).

10. Take enforcement actions against those who violate or cause violation of this Ordinance or Waste Discharge Permit conditions. These actions may include, but are not limited to the following:

a. Issuing letters;
b. Issuing Notices of Violation;
c. Issuing Administrative Orders;
d. Issuing Cease and Desist Orders;
e. Initiating and conducting non-compliance meetings;
f. Initiating and conducting non-compliance inspections;
g. Initiating and conducting administrative hearings;
h. Petitioning the courts for injunctions or civil penalties;

i. Signing criminal complaints;
j. Terminating water and or wastewater services;
k. Requiring payment of violation charges;
l. Revoking and/or suspending the discharge permit.

11. Delegate authority to the Division Head, Department Head or Inspector of any power granted to or the carrying out of any duty imposed upon the General Manager pursuant to this Ordinance.

1.700 ACCESS

A. The District, Regional Board, and USEPA (when accompanied by District personnel) shall be permitted to enter all properties from which wastes or wastewaters are being or are capable of being discharged into a public sewer main for purposes of inspecting, copying of records, taking photographs observing, measuring, sampling, and testing pertinent to the discharge of wastes or wastewaters to ascertain whether the intent of this Ordinance is being met and the user is complying with all requirements. The District shall have access at reasonable times and without delay to all parts of the premises for the purposes of inspection and/or sampling. The District shall have the right to set up on the user's property such devices as are necessary to conduct sampling or metering operations. Where a user has security measures in force, the user shall make necessary arrangements so that personnel from the District will be permitted to enter without delay for the purpose of performing their specific responsibilities. Delays in allowing or refusal to allow the District access to the User’s premises shall be a violation of this Ordinance.

1.800 INFORMATION REQUIRED

A. To provide for fair and equitable use of sewerage facilities, the District shall have the unqualified right to require a discharger to provide information necessary to insure compliance with all rules, regulations and provisions of this Ordinance.

B. All information and data on a user shall be available to the public and governmental agencies in accordance with Public Records unless the user specifically requests and is able to demonstrate to the satisfaction of the District that the release of such information would divulge information, processes or methods which would be detrimental to the user's competitive position. The demonstration of the need for confidentiality made by the permittee must meet the burden necessary for holding such information from the general public under applicable State and Federal law.

In any event, the District shall not limit EPA's access to any information provided by the discharger.

In any event, information concerning wastewater quality and quantity will not be deemed confidential. Such information may include, but is not limited to:

1. Wastewater discharge peak flow rates and volume over a specified time period;

2. Physical, chemical, bacteriological, or radiological analysis of wastewaters;

3. Information on raw materials, processes, and products;

4. Quantity and disposition of specific liquid, sludge, oil, solvent, or other materials;

5. Details of wastewater pretreatment facilities, their operation and maintenance;

6. Details of systems to prevent and control the losses of materials through spills to the public sewer main;

7. Detailed plumbing plans indicating all sources discharging to the on or off-site pretreatment or sewerage facilities;

8. A slug control program, per 40 CFR 403.8(f)(2)(v);

9. Notification of discharges of a listed hazardous waste (Section 3001 of the Resource Conservation and Recovery Act (RCRA) to the sewer system per 40 CFR 403.12(p));

10. Baseline monitoring reports per 40 CFR 403.12(b);

11. Compliance progress reports in accordance with all provisions listed in 40 CFR 403.12(c), (d), and (e).

12. Notification of potential problems, including slug loading in accordance with all provisions listed in 40 CFR 403.12(f).

13. Notification of substantial changes in volume or character of pollutants discharged in accordance with all provisions listed in 40 CFR 403.12(j).

14. Monitoring and analysis reports demonstrating continued compliance in accordance with all provisions listed in 40 CFR 403.12(g).

1.900 AUTHORITY

The District is regulated by several agencies of the United States Government and the State of California, pursuant to the provisions of Federal and State Law. Federal and State Laws (including, but not limited to: 1) Federal Water Pollution Control Act, commonly known as the Clean Water Act (33 U.S.C. Section 1251 et seq); 2) California Porter Cologne Water Quality Act (California Water Code section 13000 et seq.); 3) California Health & Safety Code sections 25100 to 25250; 4) Resource Conservation and Recovery Act of 1976 (42 U.S.C. Section 6901 et seq.); and 5) California Government Code, Sections 54739-54740) grant to the District the authority to regulate and/or prohibit, by the adoption of an ordinance, and by issuance of control mechanisms, the discharge of any waste, directly or indirectly, to the District sewerage facilities. Said authority includes the right to establish limits, conditions, and prohibitions; to establish flow rates or prohibit flows discharged to the District sewerage facilities; to require the development of compliance schedules for the installation of equipment systems and materials by all users; and to take all actions necessary to enforce its authority, whether within or outside the District boundaries, including those users that are tributary to the District or within areas for which the District has contracted to provide sewerage services.

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ARTICLE 2

Definitions

2.100 DEFINITIONS

A. Unless otherwise defined herein, terms related to water quality shall be as adopted in the latest edition of Standard Methods for the Examination of Water and Wastewater, published by the American Public Health Association, the American Water Works Association and the Water Environment Federation. The testing procedures for waste constituents and characteristics shall be as provided in 40 CFR 136 (Code of Federal Regulations; Title 40; Protection of Environment; Chapter I, Environmental Protection Agency; Part 136, Test Procedures for the Analyses of Pollutants), or as specified. Other terms not herein defined are defined as being the same as set forth in the International Conference of Building Officials, Uniform Building Code, Current Edition, or the International Association of Plumbing and Mechanical Officials, Uniform Plumbing Code, Current Edition.

B. Unless a provision explicitly states otherwise, the following terms and phrases, as used in this Ordinance, shall have the meanings hereinafter designated.

1. Applicant shall mean any person or persons who have applied for permission to use the District's collection system for commercial or industrial purposes.

2. Board shall mean the Board of Directors of Elsinore Valley Municipal Water District.

3. Building Sewer shall mean the entire length of a private sewage service lateral extending from the facility or structure to be served to the point of connection with the public sewer main.

4. Categorical Pretreatment Standards shall mean those final regulations promulgated and adopted by EPA (as outlined in 40 CFR 403, and 40 CFR, Chapter I, Subchapter N, 405-471) for each standard industrial classification (S.I.C.) or subcategory containing pollutant discharge limits.

5. Categorical User shall mean any industrial user whose process (es) are subject to Categorical Pretreatment Standards.

6. Cesspool shall mean a lined excavation in the ground which receives the discharge of a sewage drainage system, or part thereof, so designed as to retain the solids and organic matter, but permitting liquids to seep through the bottom and sides. This shall also mean Seepage Pit.

7. Class I User shall mean a discharger that is a Categorical or Significant Industrial User.

8. Class II User shall mean a discharger that discharges non-domestic wastewater and has the potential to discharge incompatible pollutants and/or pollutants that are limited by the adoption of local limits established by the District.

9. Class III User shall mean food service facilities (refer to Article 2, item 23).

10. Class IV User shall mean a discharger that is required to install and maintain or has an existing oil/sand gravity separation interceptor or clarifier system.

11. Class V User shall mean waste hauler.

12. Class VI User shall mean any discharger that discharges only domestic wastewater but has the potential to discharge hazardous materials and/or incompatible pollutants and/or pollutants that are limited by the adoption of local limits established by the District.

13. Code of Federal Regulations (CFR) shall mean the codification of the general and permanent rules published in the United States Federal Register by the Executive departments and agencies of the Federal Government to include but not be limited to the Environmental Protection Agency.

14. Collection System shall mean the combined pipes, conduits, manholes, liftstations and other structures, above and below ground, whose purpose is to convey wastewater to a District RWRF.

15. Compatible or Conventional Pollutant shall mean a combination of BOD, Total Suspended Solids, pH, fecal coliform bacteria, plus other pollutants that the District's treatment facilities are designed to accept, treat and/or remove. Some compatible pollutants may be considered incompatible when discharged in quantities that have an adverse effect on the District’s collection, treatment, disposal

systems and/or discharge permit regulating the treatment facilities cause interference or pass through.

16. Control Mechanism shall mean Waste Discharge Permit, Waste Discharge Authorization or Special Agreement.

17. Department Head shall mean that person duly designated by the General Manager to direct the Source Control Division and perform the duties as specified in this Ordinance.

18. Discharger shall mean any person, entity or collection agency that discharges or causes a discharge of domestic or non-domestic wastewater directly or indirectly to the District's POTW. Discharger shall mean the same as User.

19. Discharge Requirements shall mean the requirements of Federal (as listed in 40 CFR 403), state or local public agencies having jurisdiction over the effluent discharges from District Regional Water Reclamation Facilities.

20. District shall mean the Elsinore Valley Municipal Water District.

21. Division Head shall mean that person duly designated by the General Manager to implement the District's Source Control Program and perform the duties as specified in this Ordinance.

22. Domestic Wastewater shall mean the liquid and solid waterborne wastes derived from the ordinary living processes of humans of such character as to permit satisfactory disposal, without special treatment, into the public sewer or by means of a private disposal system.

23. Food Service Facilities shall include, but not limited to, retail establishments selling prepackaged foods, prepared foods and or drinks for consumption either on or off the premises. Institutional kitchens are included, but not limited to, schools, hospitals, convalescent/health care homes, community centers, fire stations etc., also, lunch counters and refreshment stands selling prepackaged and prepared foods/drinks for immediate consumption. Restaurants, lunch counters, and drinking places operating as a subordinate service facility by other establishments shall also be included.

24. General Manager shall mean the General Manager of the Elsinore Valley Municipal Water District or his designee, agent, representative or inspector.

25. Incompatible or Non-Conventional Pollutant shall mean any pollutant which is not a compatible pollutant as defined herein.

26. Indirect Discharger shall mean any person, entity or collection agency which discharges or causes a discharge of wastewater to a septic tank, cesspool, chemical toilet, or private sewer system which, from time to time, is serviced by a Liquid Waste Hauler permitted by the District to discharge to District sewerage facilities.

27. Industrial User shall mean any discharger of non-domestic wastewater to a collection agency's sewer main either directly or indirectly. Also any discharger who has the potential to discharge non-domestic wastewater.

28. Industrial Wastewater shall mean, unless otherwise exempted, all liquid carried wastes including, but not limited to, all wastewater from any producing, manufacturing, processing, institutional, commercial, restaurant, agriculture, or other operation where the wastewater discharged contains quantities of wastes of non-human origin and excluding domestic wastewater, rainwater, uncontaminated groundwater, storm water, and drainage of uncontaminated water.

29. Inspector shall mean a person authorized by the General Manager to inspect any establishment directly or indirectly discharging or anticipating discharge to a public sewer main or a RWRF.

30. Interference shall mean a discharge by a User which, alone or in conjunction with discharges by other sources, inhibits or disrupts the District's RWRF, its treatment processes or operations, or its sludge processes (bio-solids), use or disposal; and which is a cause of a violation of any requirement of the RWRF's discharge order (including an increase in the magnitude or duration of a violation), or of the prevention of sewage sludge (bio-solid) use or disposal in compliance with applicable Federal, State, and local regulations (per 40 CFR 403.3 (i)).

31. Liquid Waste Hauler shall mean the same as Waste Hauler.

32. Local Limits shall mean a set of technically based discharge limits that are developed by the District to protect the public sewer

system and to prevent sludge (bio-solid) contamination or violation of discharge requirements.

33. Mass Emission Rate shall mean the weight of material discharged to the sewer system during a given time interval. Unless otherwise specified, the mass emission rate shall mean pounds per day of a particular constituent or combination of constituents.

34. New Source shall mean any building, structure, facility, or installation from which there is or may be a discharge of pollutants, the construction of which commenced after the publication of proposed pretreatment standards under section 307c of the Act. (See also 40 CFR 403.3(k) Definitions)

35. Non-domestic Wastewater shall mean all wastewater except domestic wastewater and pollutant-free wastewater. This shall also mean Industrial Wastewater.

36 Non-Significant Industrial User (NSIU) shall mean any industrial user that is not classified as a Categorical or Significant Industrial User.

37. Normal Working Day shall mean the period of time during which production and/or operation is taking place.

38. Pass Through shall mean the discharge of pollutants through the RWRF in quantities or concentrations, which discharge is a cause in whole or in part of a violation of any requirement of the RWRF's discharge order (per 40 CFR 403.3(n)).

39. Permittee shall mean a person who has applied for and received permission to discharge into the District's collection system subject to the requirements and conditions established by the District.

40. Person shall mean any individual, partnership, company, firm, association, corporation or public agency, including the State of California and the United States of America.

41. Photographic Processing Facility a facility, which processes images from silver-sensitized films and papers. These includes, but is not limited to, commercial photographic and film processing facilities, micro labs, printers, x-ray and other medical/dental/chiropractic/industrial institutional diagnostic facilities which use silver-based imaging materials, the processing of which produces a silver rich solution.

42. Pollutant shall mean any constituent or characteristic of wastewater on which a discharge limitation or prohibition may be imposed either by the District or the regulatory agencies empowered to regulate the District.

43. Pretreatment shall mean the reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater to a less harmful state prior to discharge of the wastewater into a collection agency's system. The reduction or alteration may be accomplished by physical, chemical or biological process or process changes, or by other means.

44. Pretreatment Facility shall mean any works or devices for the treatment or flow control of wastewater prior to discharge.

45. Pretreatment Requirements shall mean any substantive or procedural requirement related to pretreatment imposed on a user, other than a pretreatment standard.

46. Pretreatment Standard or Standards shall mean prohibited discharge standards, categorical pretreatment standards, and local limits.

47. Priority Pollutants shall mean the listing of the toxic pollutants causing the greatest environmental concern and requiring pretreatment prior to discharge (in 40 CFR 403).

48. Public Agency shall mean the State of California or any city, county, district, other local authority or public body within this state.

49. Publicly Owned Treatment Works (POTW) shall mean treatment works as defined by Section 212 of the Clean Water Act, (33 USC 1292). This definition includes any devices or systems owned and operated by the District, which are used in the conveyance, storage, treatment, recycling and reclamation of municipal sewage. It also includes the District's interceptors and tributary sewer systems.

50. Public Nuisance shall mean anything which: (1) is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property, and (2) affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted

upon individuals may be unequal, and (3) occurs during or as a result of the treatment or disposal of wastes.

51. Public Sewer Main shall mean any closed conduit, excluding building sewers, which is financed, installed, owned, operated, or maintained by a Public Agency for the purpose of transporting wastewater from building sewers.

52. RCRA shall mean Resource Conservation and Recovery Act of 1976 Public Law (Pl) 94-580 and amendments thereto.

53. Regional Water Reclamation Facility (RWRF) shall mean the District sewage treatment plant designed to serve a specific area of the District.

54. Regulatory Agencies shall mean those agencies having oversight of the operation of the District, including but not limited to the following:

    A. United States Environmental Protection Agency (EPA);

    B. California Environmental Protection Agency (Cal-EPA);

    C. California State Water Resources Control Board (SWRCB);

    D. California Regional Water Quality Control Board, Santa Ana Region (CRWQCB, SAR);

    E. California Regional Water Quality Control Board, San Diego Region (CRWQCB, SDR)

55. Residential User shall mean a household which discharges only domestic wastewater from a dwelling unit.

56. Responsible Party shall mean:

    A. if the User is a corporation, a responsible corporate officer, that is:

        1. A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions for the corporation, or

2. the manager of one or more manufacturing, production, or operation facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25 million (in second-quarter 2001 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

B. if the User is a partnership or sole proprietorship. a general partner or proprietor, respectively.

C. if the User is a Federal, State, or local governmental entity, or their agents, the principal executive officer or director having responsibility for the overall operation of the discharging facility.

D. By a duly authorized representative of the individual designated in paragraph (A), (B) or (C) of this definition if:

1. The authorization is made in writing by the individual described in paragraph (A), (B) or (C);

2. The authorization specifies either an individual or a position having responsibility for the overall operation of the facility from which the discharge originates, such as the position of plant manager, operator of a well, or well field superintendent, or a position of equivalent responsibility, or having overall responsibility for environmental matters for the company; and

3. The written authorization is submitted to the District.

E. If an authorization under paragraph (D) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility or overall responsibility for environmental matters for the company, a new authorization satisfying the requirements of paragraph (D) of this section must be submitted to the District.

57. Sanitary Wastewater shall mean domestic quality wastewater from other than a dwelling unit.

58. Septic Tank shall mean a watertight receptacle, which receives the discharge from a sewer system and is designed and constructed to

retain solids, digest organic matter through a period of detention, and allow the liquids to discharge for disposal.

59. Sewerage Facilities shall mean any and all facilities used for collecting, conveying, pumping, treating and disposing of wastewater.

60. Significant Industrial User shall mean:

A. A user subject to categorical pretreatment standards; or

B. A user that:

1. Discharges an average of twenty-five thousand (25,000) gallons per day (gpd) or more of process wastewater to the District's collection system (excluding sanitary, non-contact cooling, and boiler blowdown wastewater);

2. Contributes a process wastestream which makes up five (5) percent or more of the average dry weather hydraulic or organic capacity of the RWRF; or

3. Is designated as such by the District on the basis that it has a potential for adversely affecting the RWRF's operation or for violating any pretreatment standard or requirement.

C. Upon a finding that a user meeting the criteria in Subsection (B) has no reasonable potential for adversely affecting the RWRF's operation or for violating any pretreatment standard or requirement, the District may at any time, on its own initiative or in response to a petition received from a user, and in accordance with procedures in 40 CFR 403.8 (f) (6), determine that such user should not be considered a significant industrial user.

61. Significant Non-Compliance (SNC) shall mean any user with compliance violations, which meet one or more of the following criteria:

A. Chronic violations of wastewater discharge limits, defined as those in which sixty-six (66%) percent or more of all of the measurements taken during a six-month (6) period exceed

(by any magnitude) the daily maximum limit or the average limit for the same pollutant parameter;

B. Technical review criteria (TRC) violations, defined as those in which thirty-three percent (33%) or more of all of the measurements taken during a six-month (6) period equal or exceed the product of the daily maximum limit or the average limit times the applicable TRC (TRC=1.4 for BOD, TSS, fats, oil and grease, and 1.2 for all other pollutants except pH);

C. Any other violation of a pretreatment effluent limit (daily maximum or longer term average) that the District determines has caused, alone or in combination with other discharges, interference or pass through (including endangering the health of District personnel or the general public);

D. Any discharge of a pollutant that has caused imminent endangerment to human health, welfare or to the environment or has resulted in the District's exercise of its emergency authority to halt or prevent such a discharge;

E. Failure to meet, by ninety-days (90) or more after the schedule date, a compliance schedule milestone contained in a local control mechanism or enforcement order, for starting construction, completing construction, or attaining final compliance;

F. Failure to provide required reports such as baseline monitoring reports, ninety-days (90) day compliance reports, periodic self-monitoring reports, and reports on compliance with compliance schedules within thirty days of the due date;

G. Failure to accurately report non-compliance;

H. Any other violation or group of violations, which the District considers to be significant.

62. Single Pass Cooling shall mean unpolluted water used for the absorption and immediate discharge of excess thermal energy to the environs prior to heat exchange and reuse.

63. Silver CMP shall mean the Code of Management Practice for Silver Discharges, issued by The Silver Council and the Association of

Metropolitan Sewerage Agencies (AMSA), September 1995, and all subsequent revisions thereto. The Silver CMP provides recommendations on technology, equipment and management practices for controlling silver discharges from facilities that process photographic materials.

64. Silver Recovery shall mean the process of removing silver from silver-rich solutions such as fixers, bleach fixes, washless stabilizers and low- flow washes.

65. Silver-Rich Solution shall mean a solution containing sufficient silver such that cost-effective recover can be done either on-site or off-site. Within photographic processing facilities, such solutions include, but are not limited to fix and bleach-fix solutions, stabilizers (e.g., plumbless stabilizers and chemical washes), low replenished (low-flow) washes and all functionally similar solutions. It does not include such low silver solutions as used developers, bleaches, stop baths, pre-bleaches, stabilizers following washes and wash waters.

66. Slug shall mean any discharge of water or wastewater which, in concentration of any given constituent or in quantity of flow, exceeds five (5) times the average 24-hour concentration of flows during normal operation for a period of fifteen (15) minutes or more and/or has a significant adverse impact, either singly or in combination with other discharges, on the collection agency's sewer system or the quality of the effluent from the involved District treatment plant.

67. Spill Containment shall mean a protection system installed by the user to prohibit the accidental discharge to the sewer of incompatible pollutants.

68. Standard Industrial Classification (S.I.C.) shall mean the system of classifying industries identified in the S.I.C. Manual, issued by the Office of Management and Budget.

69. Toxic Pollutants shall mean those substances which, individually or when combined with other substances normally found in domestic sewage, result in wastes in a collection agency sewer system in concentrations or quantities which could have an adverse or harmful effect on such sewer system facilities, sewer treatment plant operations and maintenance personnel or equipment, treated sewage effluent quality, water reclamation procedures, public or

private property, or which may endanger the public, local environment, or create a public nuisance.

70. User shall mean any person who discharges or causes a discharge of domestic or non-domestic wastewater directly or indirectly to the District's POTW. User shall mean the same as Discharger.

71. Violation shall mean an event or condition at a user's facility or dwelling that is prohibited by Ordinance, control mechanism, or Order.

72. Violation Charge shall mean that charge levied against a discharger for costs incurred by the District as a result of a waste discharge violation.

73. Waste Discharge Authorization shall mean the revocable permission to discharge wastewater to the public sewer main possibly subjected to technically based limits on wastewater constituents and characteristics.

74. Waste Discharge Permit (WDP) shall mean the periodically renewable, revocable permission to discharge industrial wastewater to the public sewer main subject to technically based limits on wastewater constituents and characteristics.

75. Waste Discharge Violation shall mean the failure by a user to comply with this Ordinance, or any conditions or reporting requirements as contained in their control mechanism.

76. Waste Hauler shall mean any commercial pumper that is permitted by Riverside County Department of Health as a Non-Hazardous Liquid Waste Hauler, discharging portable/chemical toilet, domestic and sanitary wastewater only. This definition shall also mean septic tank pumper and liquid waste hauler.

2.101 OTHER MEANINGS

Words used in this Ordinance in the singular may include the plural and the plural the singular. Use of masculine shall mean feminine and use of feminine shall mean masculine. Shall is mandatory; may is permissive or discretionary.

ARTICLE 3

GENERAL SEWER USE REQUIREMENTS

3.100 PROHIBITED DISCHARGE STANDARDS

A. General Prohibitions. No user shall introduce or cause to be introduced into the District's collection system any pollutant or wastewater which, alone or in conjunction with other substances, may cause pass through and/or interference, or any wastewater which has the potential to adversely or harmfully effect the District's sewers, maintenance personnel, wastewater treatment plant personnel or equipment, treatment plant processes or the quality of treatment plant effluent or bio-solids, public or private property, or wastes which may otherwise endanger the public, the environment, or create a public nuisance. These general prohibitions apply to all users whether or not they are subject to categorical pretreatment standards or any other National, State, or local pretreatment standards or requirements.

B. Specific Prohibitions. No user shall introduce or cause to be introduced into the District's collection system the following pollutants, substances, or wastewater:

1. Pollutants which can create a fire or explosive hazard in the District's RWRF or collection system, including, but not limited to, wastestreams with a closed-cup flashpoint of less than $140^{O}F$ ($60^{O}C$) using the test methods specified in 40 CFR 261.21;

2. Wastewater having a pH less than 6.0 or more than 11.0, or wastewater having any other corrosive property capable of causing damage or hazard to structures, equipment and/or personnel of the POTW;

3. Any solids or viscous substances of such size or in such quantity, condition, or nature that they may cause obstruction to flow in the sewer or be detrimental to proper wastewater treatment plant operations. These objectionable substances include, but are not limited to, asphalt, dead animals, concrete, ashes, sand, mud, straw, industrial process shavings, metal, glass, diatomaceous earth, rags, feathers, tar, plastics, wood, paunch manure, bones, hair and/or fleshings, entrails, disposable dishes, disposable cups, or other similar paper products whole or ground or any materials which tend to solidify or collect in the sewer and obstruct wastewater flow.

4. Pollutants, including oxygen-demanding pollutants (BOD, etc.), released in a discharge at a flow rate and/or pollutant concentration

which, either singly or by interaction with other pollutants, could cause interference with the District's RWRF's or collection system;

5. Wastewater having a temperature greater than 140°F (60°C), or which will inhibit biological activity in the RWRF resulting in interference, but in no case wastewater which causes the temperature at the introduction into the RWRF to exceed 104°F (40°C);

6. Any petroleum oil, refined petroleum products, or products of mineral origin in amounts, which has the potential to cause interference or pass- through;

7. Any non-biodegradable or biodegradable cutting oils, commonly called soluble oils, which form persistent water emulsions; including engine/machine coolants and ethylene glycol.

8. Pollutants which result in the presence of toxic gases, vapors, or fumes within the District's RWRF or collection system in a quantity that may cause acute worker health and safety problems;

9. Trucked or hauled pollutants, except at discharge points designated by the General Manager;

10. Noxious or malodorous liquids, gases, solids, or other wastewater which, either singly or by interaction with other wastes, may create a public nuisance or a hazard to life, or to prevent entry into the sewers for maintenance or repair;

11. Wastewater, which imparts color, which cannot be removed by the treatment process, such as, but not limited to, dye wastes and vegetable tanning solutions, which consequently imparts color to the RWRF's effluent;

12. Any wastewater containing any radioactive wastes or isotopes of such half-life or concentration as may cause Interference, Pass-Through, or violation of applicable State or Federal regulations;

13. Storm water, surface/yard water, ground water, sulfur water, artesian well water, roof runoff, subsurface drainage, hot springs water, swimming/wading pool drainage, spa/whirlpool drainage, condensate, deionized water, non-contact cooling water, recreation vehicle (RV) holding tank waste and unpolluted wastewater. The General Manager in his sole and reasonable discretion may approve on a temporary basis, the discharge of certain types of waters to the POTW when no reasonable alternative method of

disposal is available, subject to current District policy and the payment of all applicable User charges and fees by the discharger;

14. Sludges, screenings, or other residues from the pretreatment of industrial wastes;

15. Detergents, surface-active agents, or other substances, which may cause excessive foaming in the District's RWRF or collection system;

16. Wastewater required to be manifested under RCRA, unless specifically authorized by the General Manager;

17. Solid wastes from hospitals, clinics, offices of medical doctors, convalescent homes, mortuaries, medical laboratories or other medical facilities including, but not limited to, hypodermic needles, syringes, instruments, IV bags, utensils or other paper and plastic items of a disposable nature, also including, but not limited to, pharmaceutical wastes such as antibiotics, painkillers, antineoplastics, and controlled substances;

    Infectious wastes may not be discharged to the District's sewer system without prior written authorization from the District. All dischargers who wish to discharge infectious waste must make the request in writing and include the source and volume of the infectious waste. The District shall have the authority to require that any discharge of an infectious waste to the sewer system be rendered non-infectious prior to discharge;

18. Dissolved sulfides above a concentration of 0.1 mg/l or wastes which contribute to excessive sulfide production;

19. Any quantities of herbicides, germicides, biocides, algaecides, pesticides, fertilizers or any types of bacteriological retardation type compounds. This shall include any of the following substances: DDT (both isomers), DDD, DDE, Aldrin, Chlordane, Dieldrin, Endosufan (alpha, beta and sulfate), Endrin, Aldehyde, Heptachlor, Perchloroethylene, Heptachlor Epoxide, Lindane, Disulfoton, Formaldehyde, Phorate, Glutaraldehyde, Dichlorobenzene and/or Toxaphene;

20. Any quantity of Dissolved Organic Halides (DOX), also known as Purgeable Halocarbons;

21. Any quantity of any of the following compounds: Arochlors 1221, 1228, 1232, 1242, 1254, 1260 and 1262. Any quantity of TCDD equivalents.

C. Pollutants, substances, or wastewater prohibited by this section shall not be processed or stored in such a manner that they could be discharged to the District's collection system.

3.200 NATIONAL CATEGORICAL PRETREATMENT STANDARDS

A. The categorical pretreatment standards found at 40 CFR Chapter I, Subchapter N, Parts 405-471 are hereby incorporated.

B. Where a categorical pretreatment standard is expressed only in terms of either the mass or the concentration of a pollutant in wastewater, the General Manager may impose equivalent concentration or mass limits in accordance with 40 CFR 403.6(c).

C. When wastewater subject to a categorical pretreatment standard is mixed with wastewater not regulated by the same standard, the General Manager shall impose an alternate limit using the combined wastestream formula in 40 CFR 403.6(e).

D. A user may obtain a variance from a categorical pretreatment standard if the user can prove, pursuant to the procedural and substantive provisions in 40 CFR 403.13, that factors relating to its discharge are fundamentally different from the factors considered by EPA when developing the categorical pretreatment standard.

E. A user may obtain a net gross adjustment to a categorical standard in accordance with 40 CFR 403.15.

3.300 LOCAL LIMITS

A. No user shall discharge or cause to be introduced directly or indirectly into the District's collection system, a quantity or quality of wastewater, which exceeds the Local Limits on discharges to public sewer mains, established by the District. (Refer to Table A)

B. These limits apply at the point where the wastewater is discharged to the District's collection system. The General Manager may impose limitations based on concentrations of pollutants in milligrams per liter or as an amount of pollutants in pounds per day.

3.400 LIMITATIONS ON WATER SOFTENERS

Residential water softeners will be regulated in accordance with State law. Industrial and commercial users may not discharge wastewater from the regenerative process of onsite water softening units into the Districts collection system. Any person installing or operating a water softener apparatus of any kind

shall make such apparatus accessible to the District for inspection at all times and shall submit pertinent information as requested by the General Manager.

3.500 RIGHT OF REVISION

The District reserves the right to establish, by ordinance or in wastewater discharge permits, more stringent standards, conditions or requirements on discharges to the District's RWRF's or collection system.

3.600 DILUTION

No user shall ever increase the use of process water or in any way attempt to dilute a discharge as a partial or complete substitute for adequate treatment to achieve compliance with a discharge limitation unless expressly authorized by an applicable pretreatment standard or requirement. The General Manager may impose such limitations on the amount, in pounds per day, of pollutants discharged by users who are using dilution to meet applicable pretreatment standards or requirements, or in other cases when the imposition of such limitations is appropriate.

3.700 LIQUID WASTE HAULER PERMIT APPLICATIONS

A. All liquid waste haulers shall comply with all permitting and disposal procedures as established by this Section and pay all applicable fees established by the District. In addition, all liquid waste haulers shall abide by the following requirements and conditions:

1. The District's RWRF located at 14980 Strickland Avenue, Lake Elsinore, CA shall be the only designated disposal site for hauled liquid wastes.

2. Liquid waste haulers seeking a Waste Discharge Permit to use the District's designated disposal site shall complete and file with the District an application provided by the District. This application shall require the following information:

a.) Name, address and telephone number of the liquid waste hauler.

b.) Number of vehicles, gallon capacity of each vehicle, license plate of each vehicle, ownership, make and model of all vehicles that are operated by the hauler for purposes of hauling liquid wastes.

c.) Person to contact regarding the information contained in the application.

d.) The name and policy number of the insurance carrier and bonding company.

e.) The number of the current permit required by the Riverside County Department of Environmental Health for transportation and disposal of liquid wastes.

f.) Other information as may be required by the District.

3.701 LIQUID WASTE HAULER DISCHARGE PERMIT CONDITIONS AND LIMITS

A. All liquid waste haulers shall obtain a Waste Discharge Permit for discharge to the District's RWRF. This permit shall be issued for no longer than one (1) year. All terms and conditions of the permit may be subject to modification and change by the District at any time during the duration of the permit. Conditions contained within the permit may include, but are not limited to, the following:

1. Business name, address, and telephone number.

2. Authorized representative and signature.

3. Certification of permit condition acceptance.

4. Restrictions on operating hours for designated dumpsite.

5. Conditions upon which permit revocation, suspension, or termination can occur.

6. Permit number.

7. Record keeping and reporting requirements.

8. Compliance with applicable rules and regulations of this Article and the Riverside County Health Department regarding cleanliness and sanitary conditions.

9. Requirements to notify the District immediately of any unusual circumstances observed during liquid waste pumping operations.

10. Other conditions, policies, procedures, limitations or prohibitions deemed appropriate by the District.

B. Permits to use the designated disposal site of the District are subject to all the provisions of this section and any other discharge limits, policies and procedures enacted by the District.

C. Liquid wastes disposed of at the District's designated disposal site may be subject to sampling and analysis to determine compliance with all applicable provisions of this section and any other applicable provisions of this Ordinance. The sampling shall be performed by authorized personnel of the District and may be taken at any time. If the wastes are found to be unacceptable, the liquid waste hauler shall be liable for all costs associated with the inspection, sampling, and analysis.

D. If the liquid waste hauler is in the business of hauling both industrial wastes and domestic wastes, the liquid waste hauler shall remove all industrial waste contamination from the interior of the vacuum tank prior to removing any domestic wastes from a site.

E. Falsification by a liquid waste hauler of any information in any permit application, hauler's report, manifest, or correspondence shall be a violation of this Ordinance and may result in termination, revocation or suspension of the Waste Discharge Permit and all discharge privileges.

F. All reports and records required to be retained by this Section, shall be retained for a minimum of three (3) years and shall be made available to the District immediately upon request.

G. All liquid waste haulers shall pay all applicable fees and charges. Failure to pay any applicable fee or charge shall be a violation of this Ordinance and shall be cause for the District to suspend all waste discharge privileges until all applicable fees and charges have been paid.

H. All liquid waste haulers shall provide detailed documentation as to the origin of the wastes hauled prior to discharging into the District's RWRF.

I. If the wastes hauled by a liquid waste hauler are found unacceptable for discharge into the District's POTW, the liquid waste hauler shall dispose of the wastes at a legal disposal site. The liquid waste hauler shall provide the District with a copy of the waste hauler's manifest documenting the legal disposal of the rejected wastes within fourteen (14) days from the date the wastes were rejected. Failure to provide verifiable documentation shall constitute a violation of this section.

J. Liquid waste haulers are prohibited from discharging industrial waste into the District's POTW. No liquid waste hauler shall mix industrial waste and domestic septic wastes in an attempt to discharge the mixture to the District's designated dumpsite.

K. No liquid waste hauler shall discharge or cause to be discharged any material defined as hazardous by RCRA.

L. The District shall accept only domestic septic tank and portable/chemical toilet wastes. At no time shall the permittee discharge grease interceptor waste, sand/oil separator waste, industrial waste, hazardous waste or any other non-domestic waste to the RWRF dump station. In the case of portable/chemical toilet waste, only wastes containing bacteria based deodorizers will be accepted at the Districts RWRF dump station. The District in its sole and reasonable discretion must first approve the type of bacteria based chemical toilet products that an applicant or permittee wishes to discharge.

M. The General Manager may deny the issuance or re-issuance of a Waste Discharge Permit for any of the following conditions:

1. The applicant knowingly falsified information on the application;

2. The applicant's previous liquid waste hauler permit is under suspension or probation or has been otherwise revoked and the condition upon which such action was taken still exists; or

3. The applicant is not current on all disposal and permit related reports and charges.

N. In the event that a liquid waste haulers permit is denied, the District may notify the applicant in writing of such denial and the appeal procedures. Such notification shall state the grounds for such denial and necessary actions which must be taken by the applicant prior to the issuance of a permit.

O. All liquid waste hauler permits issued to any person or company may be revoked, suspended or entered into a probationary period upon a finding by the District that any of the following conditions exist:

1. Such person or representative thereof failed to display the authorization document upon request by a District employee.

2. Such person or representative thereof has changed, altered or otherwise modified the face of a permit or authorization document without the permission of the District;

3. Such person or representative thereof has violated any condition of the permit;

4. Such person or representative thereof has falsified any application record, report or monitoring results required to be maintained or has failed to make them immediately available to the District upon request;

5. Such person or representative thereof failed to halt immediately the discharge from his or her truck into designated disposal facilities of the District upon the order of any authorized District employee;

6. Such person or representative thereof discharged or attempted to discharge a hazardous waste or material into the designated discharge point;

7. Such person or representative thereof discharged or attempted to discharge industrial waste into the designated discharge point;

8. Such person or representative thereof discharged has repeatedly filed documents with falsified or incorrect information;

9. Such person or representative thereof has done physical violence or harm to any District employee;

10. Such person or representative thereof has made threatening remarks or threatening acts toward any District employee.

P. Any Waste Discharge Permit, which has been revoked, suspended or entered into probation pursuant to this Ordinance, may request to be reinstated after submitting a formal written request to the District for review.

Q. Upon determination of a violation of this Ordinance or a Waste Discharge Permit violation, the permittee shall be subject to the enforcement actions set forth in the Enforcement Article of this Ordinance, or as is otherwise contained in the Waste Discharge Permit as necessary to protect the District's RWRF, the public, the environment or District employees.

R. Suspension and periods of probation may be imposed by the District for any length of time, up to a two (2) year period.

S. Any authorized District employee shall have the authority to order the immediate cessation of the discharge from any liquid waste hauler truck in the designated disposal site of the District. Such order shall be based on the employee's best professional judgment that said discharge may be in violation of any applicable condition of this Ordinance or may otherwise be harmful to the operation of the District's POTW or its employees.

3.800 USE OF AND DAMAGE TO DISTRICT EQUIPEMENT OR FACILITIES

A. No person shall enter, break, damage, destroy, uncover, deface or tamper with any temporary or permanent structure, equipment or appurtenance which is part of the Districts collection system or POTW.

B. Any person who discharges or causes the discharge of wastewater or materials, which cause detrimental effects on the Districts collection system, POTW, the environment or any other damages, including the imposition of fines by Federal, State or other regulatory agencies against the District, shall be liable to the District for all damages and fines incurred including all legal and administrative expenses. An administrative fee of fifty (50%) percent of the Districts repairs and personnel costs shall be added to these charges. All charges shall be due and payable to the District within thirty (30) days of invoicing by the District.

3.900 DISCHARGERS OF SILVER RICH SOLUTIONS

3.901 PROHIBITION

It shall be unlawful for silver-rich solution from a photographic processing facility to be discharged or otherwise introduced into the District's POTW, unless such silver-rich solution is managed by the photographic processing facility in accordance with the Silver CMP (or its District-approved equivalent) prior to its introduction into the POTW.

3.902 ENFORCIBILITY

The Silver CMP (or its District-approved equivalent) is a fully enforceable element of the District's pretreatment program and constitutes a local limitation for silver discharged from photographic processing facilities.

3.903 INSPECTIONS

The District shall have the right to enter the property or premises of the photographic processing facility, at reasonable times and upon presentation of suitable identification, to verify the facility's implementation of and compliance with the Silver CMP (or its District-approved equivalent). The District shall have the right to inspect any silver recovery equipment, relevant operation and maintenance records, any monitoring equipment or method, and to sample any discharge of wastewater to the POTW. The photographic processing facility shall make available for inspection and copying by the District all record and sampling results required under the Silver CMP (or its District-approved equivalent).

3.904 REGISTRATION

In addition to applying for a control mechanism in accordance with Section 4.106 of this Ordinance all photographic processing facilities shall within sixty (60) days of the effective date of this article (for existing photographic processing facilities), or within forty five (45) days before the date upon which a new photographic processing facility commences the discharge of silver-rich solutions to the Districts POTW, the photographic processing facility shall submit the following notification to the District: [Photographic processing facility] hereby notifies the

District that it is or will soon be discharge silver-rich solutions to the District's POTW and that such discharges will hereafter be managed in accordance with the Silver CMP.

3.905 COMPLIANCE CERTIFICATION

Each photographic processing facility which has implemented the Silver CMP (or its District approved equivalent) for the control of silver discharges to the Districts POTW shall submit an annual compliance certification to the District by February 1 of each calendar year. This compliance certification, to be completed by an authorized representative of the photographic processing facility shall consist of the following statement:

On behalf of [photographic processing facility], I certify that, except as specifically noted below, this facility has implemented since the date of its last certification the CMP (or its District approved equivalent) for the control of silver discharges to the Districts POTW and as of the date of this certification, is in compliance with the requirements of the CMP (or its District approved equivalent).

3.906 ANNUAL REPORT

In addition to the submittal of a compliance certification, each photographic processing facility which is required to implement the CMP (or its District approved equivalent) shall submit an annual report and certification to the District by February 1 of each calendar year. The annual report shall contain the following information for the preceding calendar year: (i) type and description of silver recovery processes employed at the facility, (ii) quantity of silver-rich solution generated, (iii) description of any major changes in silver recovery equipment or operation since the submittal of the last annual report, (iv) all wastewater sampling results, (v) the average, minimum and maximum silver recovery achieved since the last annual report, and (v) explanation of all deviations from the CMP.

3.1000 BUILDING SEWERS

All building sewers connected to the District's wastewater collection systems shall be regularly and adequately maintained by the property owners, so as to prevent sewer blockages and/or spills caused by damage to the building sewer. All construction, reconstruction, or maintenance of a building sewer shall be accomplished by the property owner at their sole expense. All new construction and repair work shall be in accordance with District construction standards.

3.2000 CHARGE FOR EXCESSIVE SEWER MAINTENANCE

No person shall discharge or cause to be discharged to a District's sewer system, either directly or indirectly, any waste that obstructs, interferes with, or otherwise requires excessive maintenance of any District's sewer or sewerage

facility; including any waste that creates a stoppage or breakage; any toxic, hazardous or odorous condition; or any damage or deterioration of any District's sewer or sewerage facility. Any excessive sewer or sewerage maintenance expenses or reconstruction costs including administrative costs attributable thereto shall be charged to the discharger causing or contributing to such conditions. Any refusal to pay such charges shall constitute a violation of this Ordinance.

3.3000 IMPROPER USE OF CONNECTED SEWERS

The District may inspect any building sewer or collecting sewers that discharge wastewater directly or indirectly to the District's public sewer system. If the General Manager determines that the improper use, maintenance, or construction of a building sewer or collecting sewer causes or contributes to the discharge of septic wastewater, excessive groundwater, debris or any other objectionable substance to the District's public sewer main, the General Manager may give notice of the unsatisfactory condition to any discharger contributing to such condition and shall direct that condition be corrected. In the event of a failure to comply with the General Manager's directive, the District may disconnect such building sewer or collecting sewer from the District's sewerage system.

3.4000 INSPECTION OF CONSTRUCTION

A. All building sewers to be connected directly to a District collection system will be inspected by personnel of the District during construction. The District shall be notified at least forty-eight (48) hours prior (excluding weekends and holidays) to excavating to expose a public sewer main or commencing construction of a manhole that is connected to a public sewer main. In making a connection to a District collection system, no physical alteration of the District facilities shall commence until a District inspector is present.

B. Upon completion of construction and prior to removal of the downstream bulkhead and upon receiving forty-eight (48) hours notice (excluding weekends and holidays), the District will inspect the work to determine if it has been constructed in a satisfactory manner and to determine if all facilities are cleaned of construction debris that could be flushed into the District collection system. Sewerage facilities which will not be directly connected to a District collection system will not be inspected routinely by the District during construction.

C. No wastewater shall be discharged into any sewerage facility tributary to a District facility prior to obtaining inspection and approval of sewerage construction by the District.

D. Following satisfactory completion of construction, the District will, if requested, issue a construction inspection completion statement.

3.5000 AVAILABILITY OF DISTRICT SEWERAGE FACILITIES

If sewerage capacity is not available, the District may require any industrial wastewater discharger to restrict a discharge until sufficient capacity can be made available. When requested, the District will advise persons desiring to locate new facilities of those areas where industrial wastewater of their proposed quantity and quality can be accommodated by available sewerage facilities. The District may, in its sole and reasonable discretion, refuse service to persons locating facilities in areas where their proposed quantity or quality of industrial wastewater would adversely affect the available sewerage facility.

3.6000 FLOW MEASUREMENT

All industrial users who discharge twenty - five thousand gallons per day (gpd) or more of industrial wastewater, or as otherwise required by the District, shall install a continuous monitoring flow meter capable of measuring the industrial user's discharge to the Districts collection system. The flow measurement device shall conform to standards issued by the District. In regards to industrial users who were discharging to the District's collection system prior to the adoption of this Ordinance, the District may evaluate each discharger on a case-by case basis.

3.7000 ANTI-FLOODING DEVICE

Whenever, in the opinion of the District, there exists the possibility of domestic or non-domestic wastewater from a District collection system flooding private property as a result of a restriction or stoppage from a District collection system, a anti-flooding device (backwater valve), approved by the District, shall be installed and connected to a building sewer. This device shall be purchased, installed, and maintained at the discharger's expense.

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Article 4

Control Mechanisms

4.100 General Requirements

4.101 WASTEWATER ANALYSIS

When requested by the District, a user must submit information on the nature and characteristics of its wastewater within sixty (60) days of the request. The District may prepare a form for this purpose and may periodically require users to update this information.

4.102 CONTROL MECHANISM REQUIREMENTS

A. All industrial users shall notify the District of the volume and characteristics of their wastewater at least sixty (60) days prior to commencing their discharge on a form provided by the District. This notification shall include but not be limited to any new introduction of wastewater constituents or any substantial change in the volume or character of the wastewater being introduced into the RWRF.

B. It shall be unlawful for any industrial user to discharge wastewater either directly or indirectly into the District's sanitary sewer system without first obtaining a control mechanism or other authorization from the District's Source Control Division. Any violation of the terms and conditions of a control mechanism shall be deemed a violation of this Ordinance and subject the user to the sanctions set out in Article 5 of this Ordinance. Obtaining a control mechanism does not relieve the user of its obligation to comply with all Federal and State pretreatment standards or requirements or with any other requirements of Federal, State, and local law.

4.103 EXISTING CONNECTIONS

Any user who was discharging wastewater into the District's collection system prior to the effective date of this Ordinance and who wishes to continue such discharges in the future, shall, within ninety (90) days after said date, apply to the District for a control mechanism in accordance with Section 4.107 of this Ordinance, and shall not cause or allow discharges to the District's collection system to continue after one hundred twenty (120) days of the effective date of this Ordinance except in accordance with a control mechanism issued by the District.

4.104 NEW CONNECTIONS

Any categorical or significant industrial user required to obtain a control mechanism who proposes to begin or recommence discharging into the District's collection system must apply for such control mechanism prior to the beginning or recommencing of such discharge. An application for this control mechanism, in accordance with Section 4.107 of this Ordinance, must be filed at least sixty (60) days prior to the date upon which any discharge will begin or commence.

4.105 RESPONSIBILITY OF USERS

It shall be the responsibility of the user and/or discharger to comply with all of the provisions of this Ordinance. The omission to act by the District and/or the failure of the District to take cognizance of the nature of the operation of the user and/or the properties of the user's wastewater shall not relieve the user of responsibility to comply with the conditions of this Ordinance, including, but not limited to, such requirements regarding permitting, pretreatment of wastewaters, monitoring, sampling and reporting. It shall be the responsibility of the user to make determinations as to the nature of its operation and wastewater flow and to take such actions as may be required under this Ordinance prior to any discharge of wastewater, whether or not the user has been informed by the District of the requirements, which may apply to the user regarding its discharge.

4.106 CLASS OF USERS

A. The District will classify all users in accordance with the activities conducted on the premises where the discharge occurs. The purpose of the classification is to facilitate regulation of discharges to the District's POTW's on the basis of each user's waste discharge quality and quantity. The classification shall further provide a means of imposing an appropriate level of oversight, control and enforcement according to the source of the discharge. The classification system will also allow equitable recovery of capital and operating costs for the Districts pretreatment program.

    1. Users are categorized as Class I, II, III, IV, V or VI as defined in Article 2 of this Ordinance.

B. All classes of users shall apply for and must receive a Waste Discharge Permit or authorization prior to discharging wastewater to the Districts POTW.

C. Residential users, under normal circumstances, will not be required to apply for or receive a control mechanism as defined in this Ordinance, providing that said residential user discharges only that wastewater which is consistent with the definition of domestic wastewater set forth in this Ordinance.

4.107 WASTE DISCHARGE APPLICATION CONTENTS

All users required, or who may be required, to obtain a control mechanism must submit a Waste Discharge Application. The District may require all users to submit as part of an application the following information:

A. All information required in Section 4.301 (B) of this Ordinance;

B. Description of activities, facilities, and plant processes on the premises, including a list of all raw materials and chemicals used or stored at the facility, which are or could accidentally or intentionally be discharged to the District's collection system;

C. Number and type of employees, hours of operation, and proposed or actual hours of operation;

D. Each product produced by type, amount, process or processes, and rate of production;

E. Type and amount of raw materials processed (average and maximum per day);

F. Site plans, floor plans, mechanical and plumbing plans, and details to show all sewers, floor drains, and appurtenances by size, location, and elevation, and all points of discharge;

G. Time and duration of discharges; and

H. Any other information as may be deemed necessary by the General Manager to evaluate the Waste Discharge Application.

Incomplete or inaccurate applications will not be processed and will be returned to the user for revision.

4.108 APPLICATION SIGNATORIES AND CERTIFICATION

All Waste Discharge Applications and user reports must be signed by an authorized representative of the user and contain the following certification statement:

> "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting

false information, including the possibility of fine and imprisonment for knowing violations."

4.109 CONTROL MECHANISM DECISIONS

The District will evaluate the data furnished by the user and may require additional information. Within forty five (45) days of receipt of a complete Waste Discharge Application, the District will determine whether or not to issue or modify a control mechanism. The District may deny any application for a control mechanism.

4.200 CONTROL MECHANISM ISSUANCE PROCESS

4.201 CONTROL MECHANISM DURATION

A. A Waste Discharge Permit shall be issued for a specified time period, not to exceed three (3) years from the effective date of the permit. A Waste Discharge Permit may be issued for a period less than three (3) years, at the discretion of the District's Pretreatment Program Division. Each Waste Discharge Permit will indicate a specific date upon which it will expire.

B. A Waste Discharge Authorization shall be issued for an indefinite time period, subject to review and reconsideration at the discretion of the District.

C. A Special Agreement shall be issued for a specified time period, set forth in the terms of the Special Agreement.

4.202 WASTE DISCHARGE PERMIT CONTENTS

A. Waste Discharge Permit shall include such conditions as are deemed reasonably necessary by the District to prevent pass through or interference, protect the quality of the water body receiving the RWRF's effluent, protect worker health and safety, facilitate sludge management and disposal, and protect against damage to the RWRF and the District's collection system.

Waste Discharge Permits may contain:

1. A statement that indicates Waste Discharge Permit duration, which in no event shall exceed three (3) years;

2. A statement that the Waste Discharge Permit is nontransferable without prior notification to the District in accordance with Section 4.205 of this Ordinance, and provisions for furnishing the new owner or operator with a copy of the existing Waste Discharge Permit;

3. Effluent limitations based on applicable pretreatment standards;

4. Self-monitoring, sampling, reporting, notification, and record-keeping requirements. These requirements shall include an identification of pollutants to be monitored, sampling location, frequency, and sample type based on Federal, State, and local law;

5. A statement of applicable civil and criminal penalties for violations of pretreatment standards and requirements, and any applicable compliance schedule. Such schedule may not extend the time for compliance beyond that required by applicable Federal, State, or local law.

B. Waste Discharge Permits may contain, but need not be limited to, the following conditions:

1. Limits on the average and/or maximum rate of discharge, time of discharge, and/or requirements for flow regulation and equalization;

2. Requirements for the installation and maintenance of pretreatment technology, pollution control, or construction of appropriate containment devices, designed to reduce, eliminate, or prevent the introduction of pollutants into the District's collection system;

3. Requirements for the development and implementation of spill control plans or other special conditions including management practices necessary to adequately prevent accidental, unanticipated, or routine discharges;

4. Development and implementation of waste minimization plan to reduce the amount of pollutants discharged to the District's collection system;

5. The unit charge or schedule of user charges and fees for the management of the wastewater discharged to the District's collection system;

6. Requirements for installation and maintenance of inspection and sampling facilities and pretreatment equipment;

7. A statement that compliance with the Waste Discharge Permit does not relieve the permittee of responsibility for compliance with all applicable Federal and State pretreatment standards, including those which become effective during the term of the Waste Discharge Permit; and

8. Other conditions as deemed appropriate so as to ensure compliance with this ordinance, and State and Federal laws, rules, and regulations.

4.203 WASTE DISCHARGE PERMIT APPEALS

Any person, including the user, may petition in writing the District to reconsider the terms of a Waste Discharge Permit within thirty (30) days of notice of its issuance.

A. Failure to submit timely petition for review shall be deemed to be a waiver of the administrative appeal.

B. In its petition, the appealing party must indicate the Waste Discharge Permit provisions objected to, the reasons for this objection, and the alternative condition, if any, it seeks to be placed in the Waste Discharge Permit.

C. The effectiveness of the Waste Discharge Permit shall not be stayed pending the appeal.

D. If the District fails to act within thirty (30) days of the filing of an appeal, a request for reconsideration shall be deemed to be a decision to deny such request. Decisions not to reconsider a Waste Discharge Permit, not to issue a Waste Discharge Permit, or not to modify a Waste Discharge Permit shall be considered final administrative actions for the purposes of judicial review.

E. Aggrieved parties seeking judicial review of the final administrative Waste Discharge Permit decision shall do so by filing a petition for writ of mandate with the Superior Court for Riverside County within ninety (90) days.

4.204 WASTE DISCHARGE PERMIT MODIFICATION

The District may modify a Waste Discharge Permit for good cause including, but not limited to, the following reasons:

A. To incorporate any new or revised Federal, State, or local pretreatment standards or requirements;

B. To address significant alterations or additions to the discharger's operation processes, or wastewater volume or character since the time of Waste Discharge Permit issuance;

C. A change in the RWRF that requires either a temporary or permanent reduction or elimination of the authorized discharge;

D. Information indicating that the permitted discharge poses a threat to the District's collection system, District personnel or the receiving waters;

E. Violation of any terms or conditions of the Waste Discharge Permit;

F. Misrepresentation or failure to fully disclose all relevant facts in the Waste Discharge Application or in any required reporting;

G. Revision of or a grant of variance from such categorical standards pursuant to 40 CFR 403.13;

H. Correction of typographical or other errors in the Waste Discharge permit; or

I. To reflect a transfer of the facility ownership or operation to a new owner or operator.

J. Other terms and conditions determined to be necessary to protect the District's POTW.

4.205 WASTE DISCHARGE PERMIT TRANSFER

Waste Discharge Permits may be transferred to a new owner or operator only if the permittee gives at least thirty (30) days advance notice to the District and the District approves the Waste Discharge Permit transfer. The notice to the District must include a written certification by the new owner or operator which:

A. States that the new owner and/or operator has no immediate intent to change the facility's operations and processes;

B. Identifies the specific date on which the transfer is to occur; and

C. Acknowledges full responsibility for complying with the existing Waste Discharge Permit.

Failure to provide advance notice (in accordance with this article) of a transfer renders the Waste Discharge Permit void as of the date of facility transfer.

4.206 WASTE DISCHARGE PERMIT REVOCATION

A. A Waste Discharge Permit may be revoked for good cause including, but not limited to the following reasons:

1. Failure to notify the District of significant changes to the wastewater prior to the changed discharge;

2. Failure to provide prior notification to the District of changed conditions pursuant to Section 4.305 of this Ordinance;

3. Misrepresentation or failure to fully disclose all relevant facts in the Waste Discharge Application;

4. Falsifying self-monitoring reports;

5. Tampering with monitoring equipment;

6. Refusing to allow the District timely access to the facility premises and records;

7. Failure to meet effluent limitations;

8. Failure to pay fines;

9. Failure to pay sewer charges;

10. Failure to meet compliance schedules;

11. Failure to complete a wastewater survey or the Waste Discharge Application;

12. Failure to provide advance notice of the transfer of business ownership of a permitted facility; or

13. Violation of any pretreatment standard, requirement, or condition or any terms of the Waste Discharge Permit or this Ordinance.

B. Waste Discharge Permits shall be void upon cessation of operations or transfer of business ownership. All Waste Discharge Permits issued to a particular user are void upon the issuance of a new Waste Discharge Permit to that user.

C. Waste Discharge permit revocation is subject to appeal as set fort in article 5.1000

4.207 WASTE DISCHARGE PERMIT REISSUANCE

A user with an expiring Waste Discharge Permit shall apply for Waste Discharge Permit reissuance by submitting a complete Waste Discharge Application (or a statement signed by the responsible party that there are no changes to the application previously submitted), in accordance with Section 4.107 of this Ordinance, a minimum of sixty (60) days prior to the expiration of the user's existing Waste Discharge Permit.

4.300 REPORTING REQUIREMENTS

4.301 BASELINE MONITORING REPORTS

A. Within either one hundred eighty (180) days after the effective date of a categorical pretreatment standard, or the final administrative decision on a category determination under 40 CFR 403.6 (a)(4), whichever is later, existing categorical users currently discharging to or scheduled to discharge to the District's collection system shall submit to the General Manager a report which contains the information listed in paragraph B, below. At least ninety (90) days prior to commencement of their discharge, new sources, and sources that become categorical users subsequent to the promulgation of an applicable categorical standard, shall submit to the General Manager a report which contains the information listed in paragraph B, below. A new source shall report the method of pretreatment it intends to use to meet applicable categorical standards. A new source shall also give estimates of its anticipated flow and quantity of pollutants to be discharged.

B. Users described above shall submit the information set forth below.

1. Identifying Information. The name and address of the facility, including the name of the operator and owner.

2. Environmental Permits. A list of any environmental control permits held by or for the facility.

3. Description of Operations. A brief description of the nature, average rate of production, and standard industrial classifications of the operation(s) carried out by such user. This description should include a schematic process diagram, which indicates points of discharge to the District's collection system from the regulated processes.

4. Flow Measurement. Information showing the measured average daily and maximum daily flow, in gallons per day, to the District's collection system from regulated process streams and other streams, as necessary, to allow use of the combined waste stream formula set out in 40 CFR 403.6(e).

5. Measurement of Pollutants.

   a. The categorical pretreatment standards applicable to each regulated process.

   b. The results of sampling and analysis identifying the nature and concentration, and/or mass, where required by the

standard or by the General Manager, of the regulated pollutants in the discharge from each regulated process. Instantaneous, daily maximum, and long-term average concentrations, or mass, where required, shall be reported. The sample shall be representative of daily operations and shall be analyzed in accordance with procedures set out in section 4.309 of this Ordinance.

c. Sampling must be performed in accordance with procedures set out in Section 4.310 of this Ordinance.

6. Certification. A statement, reviewed by the user's authorized representative and certified by a qualified professional, indicating whether pretreatment standards are being met on a consistent basis, and, if not, whether additional operation and maintenance (O&M) and/or additional pretreatment is required to meet the pretreatment standards and requirements.

7. Compliance Schedule. If additional pretreatment and/or O&M will be required to meet the pretreatment standards, the shortest schedule by which the user will provide such additional pretreatment and/or O&M shall be implemented. The completion date in this schedule shall not be later than the compliance date established for the applicable pretreatment standard. A compliance schedule pursuant to this section must meet the requirements set out in Section 4.302 of this Ordinance.

8. Signature and Certification. All baseline-monitoring reports must be signed and certified in accordance with Section 4.106 of this Ordinance.

4.302 COMPLIANCE SCHEDULE PROGRESS REPORTS

The following conditions shall apply to the compliance schedule required by section 4.301(B)(7) of this Ordinance:

A. The schedule shall contain progress increments in the form of dates for the commencement and completion of major events leading to the construction and operation of additional pretreatment required for the user to meet the applicable pretreatment standards (such events include, but are not limited to, hiring an engineer, completing preliminary and final plans, executing contracts for major components, commencing and completing construction, and beginning and conducting routine operation);

B. No increment referred to above shall exceed nine (9) months;

C. The user shall submit a progress report to the General Manager no later than fourteen (14) days following each date in the schedule and the final date of compliance including, as a minimum, whether or not it complied with the increment of progress, the reason for any delay, and, if appropriate, the steps being taken by the user to return to the established schedule; and

D. In no event shall more than nine (9) months elapse between such progress reports to the General Manager.

4.303 REPORTS ON COMPLIANCE WITH CATEGORICAL PRETREATMENT STANDARD DEADLINE

Within ninety (90) days following the date for final compliance with applicable categorical pretreatment standards, or in the case of a new source following commencement of the introduction of wastewater into the District's collection system, any user subject to such pretreatment standards and requirements shall submit to the General Manager a report containing the information described in Section 4.301(B)(4-6) of this Ordinance. For users subject to equivalent mass or concentration limits established in accordance with the procedures in 40 CFR 403.6(c), this report shall contain a reasonable measure of the user's long-term production rate. For all other users subject to categorical pretreatment standards expressed in terms of allowable pollutant discharge per unit of production (or other measure of operation), this report shall include the user's actual production during the appropriate sampling period. All compliance reports must be signed and certified in accordance with Section 4.108 of this Ordinance.

4.304 PERIODIC COMPLIANCE REPORTS

A. If a permitted user monitors any pollutant using the procedures prescribed in Section 4.310 of this Ordinance, the results of this monitoring shall, at a frequency determined by the General Manager but in no case less than twice per year be reported. The report shall indicate the nature and concentration of pollutants in the discharge, which are limited by pretreatment standards, and the measured or estimated average and maximum daily flows for the reporting period. All such reports must be signed and certified in accordance with Section 4.108 of this Ordinance.

B. All wastewater samples must be representative of the user's discharge. Wastewater monitoring and flow measurement facilities shall be properly operated, kept clean, and maintained in good working order at all times. The failure of a user to keep its monitoring facility in good working order shall not be grounds for the user to claim that sample results are unrepresentative of its discharge.

4.305 REPORTS OF CHANGED CONDITIONS

Each user must notify the General Manager of any planned significant changes to the user's operations or system, which might alter the nature, quality, or volume of its wastewater at least forty-five (45) days before the change is made.

A. The General Manager may require the user to submit such information as may be deemed necessary to evaluate the changed condition, including the submission of a Waste Discharge Application under Section 4.106 of this Ordinance.

B. The General Manager may issue a Waste Discharge Permit under Section 4.106 of this Ordinance or modify an existing Waste Discharge Permit under Section 4.204 of this Ordinance in response to changed conditions or anticipated changed conditions.

C. For purposes of this requirement, significant changes include, but are not limited to, flow increases of twenty percent (20%) or greater, and the discharge of any previously unreported pollutants.

4.306 REPORTS OF A DISCHARGE OF HAZARDOUS WASTE

Any industrial user shall give notice of the discharge of hazardous waste, as defined in 40 CFR Part 261, and in accordance with the pretreatment requirements in 40 CFR Part 403.12 (p).

4.307 REPORTS OF POTENTIAL PROBLEMS

A. In the case of any discharge, including, but not limited to, accidental discharges, discharges of a non-routine, episodic nature, a non-customary batch discharge, or a slug load, that may cause potential problems for the RWRF or the District's collection system, the user shall immediately telephone and notify the District of the incident. This notification shall include the location of the discharge, type of waste, concentration and volume, if known, and corrective actions taken by the user.

B. Within five (5) days following such discharge, the user shall, unless waived by the General Manager, submit a detailed written report describing the cause(s) of the discharge and the measures to be taken by the user to prevent similar future occurrences. Such notification shall not relieve the user of any expense, loss, damage, or other liability which may be incurred as a result of damage to the District's collection system or RWRF, natural resources, or any other damage to person or property; nor shall such notification relieve the user of any fines, penalties, or other liability which may be imposed pursuant to this Ordinance.

4.308 REPORTS FROM UNPERMITTED USERS

All users not required to obtain a Waste Discharge Permit shall provide appropriate reports to the General Manager as the General Manager may require.

4.309 REPORTS OF SAMPLING VIOLATIONS/REPEAT SAMPLING

If sampling performed by a user indicates a violation, the user must notify the General Manager within twenty-four (24) hours of becoming aware of the violation. The user shall also repeat the sampling and analysis and submit the results of the repeat analysis to the General Manager within thirty (30) days after becoming aware of the violation. The user is not required to resample if the District monitors at the user's facility at least once a month, or if the District samples between the user's initial sampling and when the user receives the results of this sampling.

4.310 ANALYTICAL REQUIREMENTS

All pollutant analyses, including sampling techniques, to be submitted as part of a waste discharge application or report shall be performed in accordance with the techniques prescribed in 40 CFR Part 136, unless otherwise specified in an applicable categorical pretreatment standard. If 40 CFR Part 136 does not contain sampling or analytical techniques for the pollutant in question, sampling and analysis must be performed in accordance with procedures approved by US EPA.

4.311 SAMPLE COLLECTION

A. Except as indicated in Section B, below, the user must collect wastewater samples using flow proportional composite collection techniques. In the event flow proportional sampling is infeasible, the General Manager may authorize the use of time proportional sampling or a minimum of four (4) grab samples where the user demonstrates that this will provide a representative sample of the effluent being discharged. In addition, grab samples may be required to show compliance with instantaneous discharge limits.

B. Samples for oil and grease, temperature, pH, cyanide, phenols, sulfides, and volatile organic compounds must be obtained using grab collection techniques.

4.312 TIMING

Written reports will be deemed to have been submitted on the date postmarked. For reports which are not mailed, postage prepaid, into a mail facility serviced by

the United States Postal Service, the date of the District's receipt of the report shall govern.

4.313 RECORD KEEPING

Users subject to the reporting requirements of this Ordinance shall retain, and make available for inspection and copying, all records of information obtained pursuant to monitoring activities undertaken by the user independent of such requirements. Records shall include the date, exact place, method, and time of sampling, and the name of the person(s) taking the samples; the dates analyses were performed; who performed the analyses; the analytical techniques or methods used; and the results of such analyses. These records shall remain available for a period of at least three (3) years. This period shall be automatically extended for the duration of any litigation concerning the user or the District, or where the General Manager has specifically notified the user of a longer retention period.

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ARTICLE 5

Enforcement

5.100 NON-COMPLIANCE MONITORING PROCEDURES AND APPLICABLE FEES

A. Self-Monitoring Requirements as a Result of Non-Compliance

1. If analysis of any sample obtained by the District or by a user shows non-compliance with the applicable wastewater discharge limits set forth in the Ordinance or in the permittee's discharge permit, the District may impose self-monitoring requirements on the permittee or user.

2. A user shall perform required self-monitoring of constituents in a frequency, at the specific location, and in a manner directed by the District.

3. All analyses of self-monitoring samples shall be performed by an independent laboratory acceptable to the District and submitted to the District in a form and at a frequency determined by the District.

4. All self-monitoring costs shall be borne by the user.

5. Nothing in this section shall be deemed to limit the authority of the District to impose self-monitoring as a permit condition.

B. Noncompliance Sampling Fees

1. If analysis of any sample of a user's discharge obtained by the District shows a violation by the user of the mass emission rates or concentration limits specified in the user's discharge permit or in this Ordinance, then the user shall be subject to noncompliance sampling fees pursuant to the most current edition of the Districts Pretreatment Program Fee Schedule and as amended thereto.

2. The fees specified in subsection 5.100(B)(1) herein shall be imposed for each date on which the District conducts sampling as a result of a violation by a user.

C. Noncompliance Inspection Fees

1. Each user is subject to routine inspections and fees. When non-compliance with any of the provisions of this Ordinance or in the permittee's discharge permit is determined, a follow-up inspection may be required. Each user shall receive one follow-up inspection

to verify compliance for each routine inspection without being subject to noncompliance inspection fees.

2. When it becomes necessary to perform additional inspections in order to determine compliance with the provisions of this Ordinance, then the user shall pay noncompliance inspection fees to the District pursuant to the most current edition of the Districts Pretreatment Program Fee Schedules and as amended thereto.

3. The fees specified in subsection 5.100(C)(2) herein shall be imposed for each date (excluding one follow-up inspection) on which the District conducts an inspection as a result of a violation by a user.

5.200 ELECTION OF ENFORCEMENT REMEDIES

The General Manager, upon finding a violation, may employ any of the remedies set forth in this article, subject to due consideration of the following:

A. The magnitude of the violation;

B. The duration of the violation;

C. The effect of the violation on RWRF compliance with Discharge Order;

D. The effect of the violation on the operation of the RWRF;

E. The compliance history of the user; and

F. The good faith of the user.

5.300 NOTICE OF VIOLATION

A. Upon finding a violation, the District may issue a notice of violation. Within ten (10) working days of the delivery of this notice, the user shall respond to the Pretreatment Program Division with either an objection contesting the finding, or an explanation of the violation and a plan for the satisfactory correction and prevention thereof, to include specific required action. Said response in no way relieves the user of liability for any violations occurring before or after the receipt of the notice of violation.

B. Upon receipt of an objection contesting a finding of violation, the Division Head will schedule a hearing within ten (10) working days at which the user may present information supporting the objection. Within five (5) working days of the hearing, the Division Head shall determine the validity of the objection, either rescinding the notice of violation or denying the objection, thereby requiring submission of the plan. The user may appeal

the Division Head's determination as set forth in Article 5.1000.

5.400 ADMINISTRATIVE ORDERS

Administrative Orders include, but are not limited to, Consent Orders, Show Cause Orders, Cease and Desist Orders, and Compliance Orders.

5.401 CONSENT ORDERS

The General Manager may enter into Consent Orders, assurances of voluntary compliance, or other similar documents establishing an agreement with any user responsible for noncompliance. Such documents will include specific action to be taken by the user to correct the noncompliance within a time period specified by the document. Such documents shall have the same force and effect as the administrative orders issued pursuant to Sections 5.403 of this Ordinance and shall be judicially enforceable.

5.402 SHOW CAUSE ORDERS

A. The General Manager may order a user which has been given a notice of violation and which has failed to submit an acceptable plan of corrective action or which, having submitted such a plan, fails to follow through with execution of the plan, to appear at a hearing scheduled by the General Manager to show cause why the enforcement action proposed in the Show Cause Order should not be taken.

B. The Show Cause Order shall specify the time and place for the hearing, the proposed enforcement action, the reasons for such action, and a request that the user show why the proposed enforcement action should not be taken. The Show Cause Order shall be served personally or by registered or certified mail (return receipt requested) at least fifteen (15) days prior to the hearing. The Order may be served on any authorized representative of the user. A Show Cause Order shall not be a bar against, or prerequisite for, taking any other action against the user.

C. At the conclusion of the show cause hearing, the General Manager may: rescind previous enforcement action; issue an appropriate Administrative Order (Consent Order, Compliance Order, or Cease and Desist Order), including assessment of fines; initiate control mechanism revocation proceedings or termination of sewer services; or direct the remission of the file to Counsel for legal action.

5.403 COMPLIANCE ORDERS

A. When the General Manager finds a violation, he may issue an order to the user responsible for the discharge directing that the user come into

compliance within a specified time. If the user does not come into compliance within the time provided, sewer service may be discontinued unless adequate treatment facilities, devices, or other related appurtenances are installed and properly operated.

B. Compliance orders also may contain other requirements to address the noncompliance, including additional self-monitoring and management practices designed to minimize the amount of pollutants discharged to the sewer. A compliance order may not extend the deadline for compliance established for a pretreatment standards or requirement, nor does a compliance order relieve the user of liability for any violation, including any continuing violation.

C. Issuance of a compliance order shall not be a bar against, or a prerequisite for, taking any other action against the user.

5.500 ADMINISTRATIVE FINES

A. When, subsequent to a Show Cause hearing, the General Manager finds a violation, he may fine the user in an amount not to exceed $5,000.00 per violation per day of discharge in violation of any control mechanism or order issued hereunder, or any other pretreatment standards or requirement.

B. The user may be responsible for the District's costs of preparing administrative enforcement actions, such as notices and orders.

C. Unpaid charges, fines, and penalties shall, after thirty (30) calendar days, be assessed an additional penalty of five percent (5%) of the unpaid balance, and interest shall accrue thereafter at a rate of one and one half percent (1.5%) per month. A lien against the user's property will be sought for unpaid charges, fines, and penalties.

D. Users desiring to dispute an administrative fine must file a written request for the General Manager to reconsider the fine along with full payment of the fine amount within thirty (30) days of the user's receipt of notice of the fine. Assessment of fines may be appealed pursuant to Article 5.1000. In the event the user's appeal is successful, the payment, together with any interest accruing thereto, shall be returned to the user.

E. Issuance of an administrative fine shall not be a bar against, or a prerequisite for, taking any other action against the user.

5.600 EMERGENCY SUSPENSIONS

A. The District may immediately suspend a user's discharge or water supply, after informal notice to the user, whenever such suspension is necessary

to stop an actual or threatened discharge which reasonably appears to present or cause an imminent or substantial endangerment to the health or welfare of persons or the environment.

B. The District may also immediately suspend a user's discharge or water supply, after notice and opportunity to respond, that threatens to interfere with the operation of a Regional Water Reclamation Facility, or which presents, or may present, an endangerment to the environment.

C. Any user notified of a suspension of its discharge or water supply shall immediately stop or eliminate its contribution. In the event of a user's failure to immediately comply voluntarily with the suspension order, the District may take such steps as deemed necessary, including immediate severance of the sewer connection, to prevent or minimize damage to the District's collection system, the District's RWRF, the receiving stream, or endangerment to any individuals. The District may allow the user to recommence its discharge when the user has demonstrated to the satisfaction of the District that the period of endangerment has passed, unless the termination proceedings in Section 5.700 of this Ordinance are initiated against the user.

D. A user that is responsible, in whole or in part, for any discharge presenting imminent endangerment shall submit a detailed written statement, describing the causes of the harmful contribution and the measures taken to prevent any future occurrence, to the District prior to the date of any show cause or termination hearing under Sections 5.402 or 5.700 of this Ordinance.

E. Nothing in this section shall be interpreted as requiring a hearing prior to any emergency suspension.

5.700 TERMINATION OF DISCHARGE

In addition to the provisions in Section 4.206 of this Ordinance, any user who violates the following conditions is subject to discharge termination:

A. Violation of Waste Discharge Permit conditions;

B. Failure to accurately report the wastewater constituents and characteristics of its discharge;

C. Failure to report significant changes in operations or wastewater volume, constituents, and characteristics prior to discharge;

D. Refusal of reasonable access to the user's premises for the purpose of inspection, monitoring, or sampling; or

E. Violation of the pretreatment standards in Article 3 of this Ordinance.

Such user will be notified of the proposed termination of its discharge and be offered an opportunity to show cause under Section 5.402 of this Ordinance why the proposed action should not be taken. Exercise of this option by the District shall not be a bar to, or a prerequisite for, taking any other action against the user.

5.800 PUBLISHED NOTICES FOR SIGNIFICANT NONCOMPLIANCE

In accordance with Federal Regulations, the District shall annually cause to be published the names of all Categorical or Significant Industrial users in significant non-compliance. Said publication shall be made in the newspaper of the largest daily circulation published in the District's service area.

5.900 JUDICIAL ENFORCEMENT REMEDIES

In certain circumstances, judicial enforcement may be appropriate. Such remedies may include, but are not limited to, injunctive relief, civil penalties, and criminal prosecution.

5.901 INJUNCTIVE RELIEF

When the General Manager finds a violation, the District may petition the Superior Court for the issuance of a temporary or permanent injunction, as appropriate, which restrains or compels the specific performance of the control mechanism, order, or other requirement imposed by this Ordinance on activities of the user. The District may also seek such other action as is appropriate for legal and/or equitable relief, including a requirement for the user to conduct environmental remediation.

A petition for injunctive relief shall not be a bar against, or a prerequisite for, taking any other action against the user.

5.902 CIVIL PENALTIES

A. Authority

All users of the District's system and facilities are subject to administrative or judicial enforcement actions by the District, U.S. EPA, State of California Regional Water Quality Control Board, or the County of Riverside District Attorney. Said actions may be taken pursuant to the authority and provisions of several laws, including but not limited to: (I) Federal Water Pollution Control Act, commonly known as the Clean Water Act (33 U.S.C.A. Section 1251 et seq.); (2) California Porter-Cologne Water Quality Act (California Water Code Section 13000 et seq.); (3) California Hazardous Waste Control Law (California Health & Safety Code Sections 25100 to 25250); (4) Resource Conservation and Recovery Act

of 1976 (42 U.S.C.A. Section 6901 et seq.); and (5) California Government Code, Sections 54739-54740.

B. Recovery of Fines or Penalties

When the District must pay fines or penalties imposed by other regulatory or enforcement agencies based, and the District can establish said violation was the result of the discharge of any user, which discharge was in violation, as defined in this Ordinance, the District shall be entitled to recover from the user all costs and expenses, including, but not limited to, the full amount of said fines or penalties.

C. Ordinance

Pursuant to the authority of California Government Code Sections 54739-54740, any person who violates any provision of this Ordinance, any permit condition, prohibition or effluent limit, or any suspension or revocation order, shall be liable civilly for a sum not to exceed $25,000.00 per violation for each day in which such violation occurs. Pursuant to the authority of the Clean Water Act, 33 U.S.C. Section 1251 et seq., any person who violates any provision of this Ordinance, or any permit condition, prohibition, or effluent limit shall be liable civilly for a sum not to exceed $25,000.00 per violation for each day in which such violation occurs. The District shall petition the Superior Court to impose, assess, and recover such penalties, or such penalties as the District may impose, assess, and recover pursuant to Federal and/or State law.

D. Administrative Civil Penalties

1. Pursuant to the authority of California Government Code Sections 54740.5 and 54740.6, the District may issue an administrative complaint against any person who violates:

   a. any provision of this Ordinance;

   b. any permit condition, prohibition, or effluent limit; or

   c. any suspension or revocation order.

2. The administrative complaint shall be served by personal delivery or certified mail, and shall specify a date and time for a hearing, which will be held within sixty (60) days following service. The administrative complaint will allege the act or failure to act that constitutes the violation of the District's requirements, the provisions of law authorizing civil liability to be imposed, and the proposed civil penalty. A hearing officer designated by the Board of Directors shall hear the matter. The person against whom an

administrative complaint has been issued may waive the right to a hearing.

3. At the hearing, the person shall have an opportunity to respond to the allegations set forth in the administrative complaint by presenting written or oral evidence.

4. After the hearing, the hearing officer shall deliver a written report to the General Manager, setting forth findings of fact, conclusions and a recommendation. Upon receipt of the written report, the General Manager shall issue his decision and order in writing within thirty (30) calendar days after the hearing. The decision and order shall be served by personal delivery or certified mail.

5. In determining the amount of civil penalties, the General Manager may take into consideration all relevant circumstances, including but not limited to the extent of harm caused by the violation, the economic benefit derived through any noncompliance, the nature and persistence of the violation, the length of time over which the violation occurs, and corrective action, if any, attempted or taken by the person involved.

6. Civil penalties may be assessed as follows:

    a. In an amount which shall not exceed $2,000.00 for each day for failing or refusing to furnish technical or monitoring reports;

    b. In an amount, which shall not exceed $3,000.00 for each, day for failing or refusing to timely comply with any compliance schedules established by the District;

    c. In an amount, which shall not exceed $5,000.00 per violation for each day of discharge in violation of any waste discharge limit, permit condition, or requirement issued, reissued, or adopted by the District;

    d. In any amount, which does not exceed $10.00 per gallon for discharges in violation of any suspension, revocation, cease and desist order or other orders, or prohibition issued, reissued, or adopted by the District;

7. The General Manager's order assessing administrative civil penalties shall be final on the thirty-first (31st) day after it is served on the person unless an appeal and request for hearing is filed with the Board of Directors before the thirty-first (31st) day. Copies of the administrative order shall be served on the party served with

the administrative complaint, either by personal service or by registered mail, and a copy forwarded to other persons who appeared at the hearing and requested a copy.

8. The General Manager's decision and order is subject to appeal to the Board of Directors pursuant to Section 5.1100. Any person aggrieved by a final order issued by the Board of Directors may obtain review of the order of the Board of Directors in the superior court, pursuant to Government Code Section 54740.6, by filing a petition for writ of mandate within thirty (30) days following service of the Board's decision or order.

9. Payment of any order setting administrative civil penalties shall be made within thirty (30) days of the date the order becomes final. The amount of any administrative civil penalties imposed, which have remained delinquent for a period of sixty (60) days, shall constitute a lien against the real property of the discharger from which the discharge resulting in the imposition of the civil penalty originated. The lien shall have no effect until recorded with the county recorder. The District may record the lien for any unpaid administrative civil penalties on the ninety-first (91st) day following the date the order becomes final.

10. No administrative civil penalties shall be recoverable under Section 5.902(D) for any violation for which the District has recovered civil penalties through a judicial proceeding filed pursuant to Government Code Section 54740.

E. Filing a suit for civil penalties shall not be a bar to, or a prerequisite for, taking any other action against a user.

5.903 CRIMINAL PROSECUTION

A user who willfully or negligently violates any provision of this Ordinance, a control mechanism, or order issued hereunder, or any other pretreatment standard or requirement shall, upon conviction, be guilty of a misdemeanor, punishable by a fine not to exceed $25,000.00, or imprisonment for not more than six (6) months, or both. Each violation and each day in which a violation occurs may constitute a new and separate violation of this Ordinance and shall be subject to the penalties contained herein.

5.1000 APPEALS TO GENERAL MANAGER

A. General

Any user or applicant affected by any decision, action or determination may file with the General Manager a written request for an appeal hearing.

The District must receive the request within thirty (30) days of mailing of notice of the decision, action, or determination to the user or applicant. The request for hearing shall set forth in detail all facts supporting the request.

B. Notice

The General Manager shall, within fifteen (15) days of receiving the request for appeal, designate a Hearing Officer who will hear the appeal and provide written notice to the user or applicant of the hearing date, time and place. The hearing date shall not be more than thirty (30) days from the mailing of such notice by certified mail, unless the user or applicant agrees to a later date. If the hearing is not held at the agreed time due to actions or inactions of the user or applicant, then the decision shall be deemed final.

C. Hearing

At the hearing, the user or applicant shall have the opportunity to present information supporting its position concerning the decision, action or determination.

D. Written Determination

After the hearing, the Hearing Officer shall deliver a written report to the General Manager setting forth findings of fact, conclusions, and a recommendation whether to uphold, modify or reverse the original decision, action or determination. Upon receipt of the written report, the General Manager shall issue his decision and order within thirty (30) calendar days of the hearing. The written decision and order of the General Manager shall be sent by certified mail. The order of the General Manager shall be final on the sixteenth (16th) day after it is mailed, unless a request for hearing is filed with the Board of Directors pursuant to Section 5.1100, no later than 5:00 p.m. on the fifteenth (15th) day following such mailing.

5.1100 APPEALS TO THE BOARD OF DIRECTORS

A. General

1. Any user or applicant may appeal a decision, action, or determination made by the General Manager prior to the date that the General Manager's order becomes final, by filing a written request for hearing with the Board of Directors accompanied by an appeal fee of $250.00. The request for hearing shall set forth in detail all the issues in dispute and all facts supporting the request.

2. No later than sixty (60) days after receipt of the request for hearing, the Board of Directors shall either set the matter for a hearing, or deny the request for a hearing.

3. A hearing shall be held by the Board of Directors within sixty-five (65) days of the date the request for a hearing was granted, unless the user or applicant and the Board of Directors agree to a later date. If the matter is not heard within the required time, due to actions or inactions of the user or applicant, the General Manager's order shall be final.

B. Granting Request for Hearing

The Board of Directors shall grant all requests for an appeals hearing concerning permit suspension, revocation, or denial. Whether to grant or deny the request for a hearing on appeals of other decisions of the General Manager shall be within the sole discretion of the Board of Directors.

C. Appeal Fee Refund

The appeal fee shall be refunded if the Board of Directors denies a hearing.

D. Written Determination

1. After the hearing, the Board of Directors shall make a determination whether to uphold, modify, or reverse the decision, action, or determination made by the General Manager.

2. The Board's decision shall be set forth in writing and shall contain findings of fact and conclusions. The written decision and order of the Board of Directors shall be sent by certified mail within sixty-five (65) days after the close of the hearing

3. The order of the Board of Directors shall be final upon its adoption.

5.1200 APPEAL OF CHARGES AND FEES

A. Any user or applicant may request reconsideration of the imposition and collection of fees or charges, such as connection charges, sewer use charges, and waste hauler fees. Following review of such a request, the District shall notify the user or applicant by certified mail of the District's decision on the reconsideration request within thirty (30) days of the District's receipt of the request. Any user or applicant may file an appeal, which shall be heard by the Board of Directors. The District must receive

the notice of appeal within thirty (30) days of the mailing of the District's decision on the reconsideration request.

B. Notwithstanding the foregoing, appeals of non-compliance sampling fees shall be made pursuant to the appeal procedure set forth in Sections 5.1000 and 5.1100.

5.1300 PAYMENT OF CHARGES

A. Except as otherwise provided, all fees, charges and penalties established by this Ordinance or by the most current edition of the ***District's Pretreatment Program Fee Schedule*** and as amended thereto are due and payable upon notice thereof. All such amounts are delinquent if unpaid thirty (30) days after date of invoice.

B. Any charge that becomes delinquent shall have added to it a penalty in accordance with the following:

1. Thirty-one (31) days after date of invoice, a basic penalty of 5% of the base invoice amount, not to exceed a maximum of $1,000.00; and

2. Interest at a rate of 1.5% per month of the sum of base invoice amount and basic penalty shall accrue from and after the thirty-first (31st) day after date of invoice.

C. Any invoice outstanding and unpaid after sixty (60) days shall be cause for immediate initiation of permit revocation proceedings or immediate suspension of the permit.

D. Penalties charged under this section shall not accrue to those invoices successfully appealed.

5.1400 REMEDIES NONEXCLUSIVE

The remedies provided for in this Ordinance are not exclusive. The General Manager may take any, all, or any combination of these actions against a noncompliant user. Enforcement of pretreatment violations will be in accordance with this ordinance. However, the General Manager may take other action against any user when the circumstances warrant. Further, the General Manager is empowered to take more than one enforcement action against any noncompliant user.

5.1500 COLLECTION OF DELINQUENT ACCOUNTS

Collection of delinquent accounts shall be in accordance with the District's policy resolution establishing procedures for collection of delinquent obligations owed to

the District, as amended from time to time by the Board of Directors. Any such action for collection may include an application for an injunction to prevent repeated and recurring violations of this Ordinance.

5.1600 RECOVERY OF COSTS INCURRED BY DISTRICT

In the event a user fails to comply with any of the terms and conditions of the District's Ordinance, an administrative order, a permit suspension or revocation, a Consent Order, or a permit issued hereunder, the District shall be entitled to reasonable attorney's fees and costs which may be incurred in order to enforce any of said terms and conditions with or without filing proceedings in court.

5.1700 FINANCIAL SECURITY/AMENDMENTS TO PERMIT

A. Compliance Deposit

Users that have been subject to enforcement and/or collection proceedings may be required to deposit with the District an amount necessary to guarantee payment of all charges, fees, penalties, costs and expenses that may be incurred in the future, before permission is granted for further discharge to the collection system.

B. Delinquent Accounts

The District shall review and examine user's account to determine whether previously incurred fees and charges have been paid in accordance with time requirements prescribed by this Ordinance. The District may thereafter issue an amendment to the user's control mechanism in accordance with the provisions of Article 4 and Section 5.1700 E. of this Ordinance.

C. Bankruptcy

Every user filing any legal action in any court of competent jurisdiction, including the United States Bankruptcy Court, for purposes of discharging its financial debts or obligations or seeking court-ordered, protection from its creditors, shall, within ten (10) days of filing such action, apply for and obtain the issuance of an amendment to its control mechanism.

D. Permit Amendments

The District shall review and examine user's account to determine whether previously incurred fees and charges have been paid in accordance with time requirements prescribed by this Ordinance. The District may thereafter issue an amendment to the user's permit in accordance with the provisions of Article 4 and Section 5.1700 E. of this Ordinance.

E. Security

An amendment to a control mechanism issued pursuant to Sections 5.401, 5.402, and 5.403, may be conditioned upon the user depositing financial security in an amount equal to the average total fees and charges for three (3) calendar months during the preceding year. Said deposit shall be used to guarantee payment of all fees and charges incurred for future services and facilities furnished by District and shall not be used by the District to recover outstanding fees and charges incurred prior to the user filing and receiving protection from creditors in the United States Bankruptcy Court.

F. Return of Security

In the event the user makes payment in full within the time prescribed by this Ordinance of all fees and charges incurred over a period of two (2) years following the issuance of an amendment to the control mechanism pursuant to Sections 5.1700 (B), (C), (D), the District shall either return the security deposit posted by the user or credit their account.

G. Water Supply Severance

Water service to the user may be severed for any violation. Service will only recommence, at the user's expense, after it has satisfactorily demonstrated its ability to comply.

5.1800 JUDICIAL REVIEW

A. Purpose and Effect

Pursuant to Section 1094.6 of the California Code of Civil Procedure, the District hereby enacts this part to limit to ninety (90) days following final decisions in ad judicatory administrative hearings the time within which an action can be brought to review such decisions by means of administrative mandamus.

B. Definitions

As used in this section, the following terms and words shall have the following meanings:

1. Decision shall mean and include ad judicatory administrative decisions that are made after hearing, or after revoking, suspending, or denying an application for a permit or a license.

2. Complete Record shall mean and include the transcript, if any, of the proceedings, all pleadings, all notices and orders, any proposed

decision by the General Manager, the final decision, all admitted exhibits, all rejected exhibits in the possession of the District or its offices or agents, all written evidence, and any other papers in the case.

3. Party shall mean a person whose permit or service has been denied, suspended, or revoked.

C. Time Limit for Judicial Review

Judicial review of any decision of the District or its officer or agent may be made pursuant to Section 1094.5 of the Code of Civil Procedure only if the petition for writ of mandate is filed not later than the 90th day following the date on which the decision becomes final. If there is no provision for reconsideration in the procedures governing the proceedings or if the date is not otherwise specified, the decision is final on the date it is made. If there is provision for reconsideration, the decision is final upon the expiration of the period during which reconsideration can be sought; provided that if reconsideration is sought pursuant to such provision the decision is final for the purpose of this section on the date that reconsideration is rejected.

D. Preparation of the Record

The petitioner may request, in writing, the complete record of the proceedings. The record shall be prepared by the District officer or agent who made the decision and shall be delivered to the petitioner within ninety (90) days after filing the written request. The District may recover from the petitioner its actual costs for transcribing or preparing the record.

E. Extension

If the petitioner files a request for the record within ten (10) days after the date the decision becomes final, the time within which a petition, pursuant to Section 1094.5 of the Code of Civil Procedure, may be filed shall be extended to not later than the 30th day following the date on which the record is either personally delivered or mailed to the petitioner or the petitioner's attorney of record, if appropriate.

F. Notice

In making a final decision, the District shall provide notice to the party that the time within which judicial review must be sought is governed by Section 1094.6 of the Code of Civil Procedure.

G. Administrative Civil Penalties

Notwithstanding the foregoing in Section 5.1700, and pursuant to Government Code Section 54740.6, judicial review of an order of the Board of Directors imposing administrative civil penalties pursuant to Section 5.902(D) may be made only if the petition for writ of mandate is filed not later than the 30th day following the day on which the order of the Board of Directors becomes final.

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ARTICLE 6

GRAVITY SEPARATION INTERCEPTOR PROGRAM

6.100 PURPOSE AND SCOPE

A. All industrial users shall be required to install and maintain a gravity separation interceptor system when the District finds that it is necessary for the proper handling of (a) liquid waste containing fats, oils and grease (of animal, vegetable or petroleum origin), (b) flammable wastes, (c) sand and or suspended solids that will settle, or (d) other harmful constituents which may be properly eliminated from the collection system by use of a gravity separation interceptor. The interceptor shall have a minimum operational fluid capacity of not less than 750 gallons. The interceptor system shall be watertight, structurally sound, and durable and shall have a minimum of two chambers and a sample box.

B. An interceptor system is not required for a building used solely for residential purposes except where common food preparation occurs.

C. An interceptor system shall be required when the wastewater flow from the building is anticipated to contain fats, oils, grease (of animal, vegetable or petroleum origin), flammable substances, sand and or suspended solids or other harmful ingredients in amounts or concentrations which, in the discretion of the District, present the possibility of causing or contributing to the fouling of, the blockage of, or other damage to the District's POTW.

D. All industrial users for which a gravity separation interceptor system is required shall have an interceptor system, which shall serve only that singular establishment or business.

6.101 ADMINISTRATION OF INTERCEPTOR PROGRAM

A. The District may administer a Gravity Separation Interceptor Program which is intended to prevent fats, oils, and grease (of animal, vegetable, and petroleum origin), sand, flammable liquids, and other substances which are likely to block, restrict or create a hazard within the collection system from entering the system through use of gravity separation interceptors.

B. The District may require any industrial user to install or increase the size of an interceptor system according to the guidelines set forth in the District's Standard Specifications and or the most current edition of the Uniform Plumbing Code or any other District

requirement, program or procedure prior to connection to the District or at any time after connection to the District if the District discovers or determines subsequent to the connection that the building, facility, or operation of the user produces a waste with characteristics that would require installation of an interceptor system pursuant to this Ordinance.

C. The installation of a properly sized interceptor system shall be the responsibility of the parcel owner and the entity, which applies for the connection or waste discharge permit, and the owner/proprietor of the business or entity whose operations cause or contribute to the necessity for an interceptor system.

D. The District shall determine whether a gravity interceptor or some other type of interceptor system is required on a case-by-case basis based on an evaluation of objective criteria including but not limited to factors such as those listed hereunder:

1. The type of facility (e.g. restaurant, bakery, coffee house, sandwich shop, car wash, gas station, lube/oil facility, body shop, vehicle repair shop etc.);

2. The volume of the user's business or operation (such as number of meals served, number of seats, hours of operation);

3. The peak flow of process wastewater discharged to the collection system;

4. Size and nature of facilities (including kitchen facilities) based on size, type, number of fixtures, and type of processing or cooking equipment used;

5. The type of service provided or operation undertaken (such as dine-in meal service versus carry-out meal service);

6. The type of foods or other materials used in the cooking, processing or manufacturing operations carried on within the user's facility;

7. The overall potential for fats, grease and oil-laden (of animal, vegetable or petroleum origin), flammable or sand-laden discharges;

8. The existence of devices, procedures or processes which are designed to minimize the amount of fats, grease, sand,

oil or other flammable liquids from entering the collection system.

E. The District shall approve the design, location and procedures for operation and maintenance of a required interceptor system. Such approval shall be obtained prior to the user's connection of the facility to the District's collection system, in the event of new construction or remodeling.

F. In circumstances where a user has already connected (e.g. prior to adoption of this Ordinance or failure by a user to contact the District regarding interceptor requirements and approval) and the District determines that an interceptor system must be installed, the user shall promptly provide for the installation of the interceptor system within a reasonable time frame (as may be set by the District), including providing design plans and operational plans for District approval prior to interceptor system installation.

G. The installation of an interceptor system as required by this Ordinance on an existing users facility shall occur within reasonable time not to exceed ninety (90) days after the user has been provided notice of the requirement that an interceptor system be installed. Upon written request and approval this ninety-day (90) limit may be extended to a maximum of one hundred and eighty days (180) from the time of the first notice.

6.102 INTERCEPTOR MAINTENANCE PROGRAM REQUIREMENTS

A. Any user who is required by the District and/or this Ordinance to install and/or operate a gravity separation interceptor system shall be required to adequately maintain the system so that such a device is in proper working order at all times. Cleaning and completely pumping out of all interceptor contents including the sample box shall be completed as needed, but in no case shall the frequency of cleaning and pumping out be less than (2) two times per calendar year.

B. All types of gravity separation interceptor systems shall be cleaned a minimum of two (2) times per calendar year by a properly licensed and permitted waste hauler or as often as necessary so as to assure that the interceptor will operate as designed at all times.

C. The use of chemicals or other materials for the emulsification, suspension or dissolution of oil or grease is prohibited.

D. The use of microbiological agents to metabolize oil and grease shall be reviewed on a case-by-case basis. The user shall submit a written request to the District for the use of any microbiological agent prior to

the use of that agent. The use of microbiological agents shall not be a substitute for adequate interceptor maintenance.

E. The user may be required to perform a study to document the effectiveness of any proposed microbiological agent's ability to metabolize oil and grease under the conditions of the intended use. These studies shall be performed at each unique site where the microbiological agent is proposed for use. The study shall include effluent wastewater sampling by both the user and the District. The user shall be responsible for all costs associated with the study, including all District sampling and analysis costs. The elements of the study shall be submitted to the District for review and approval prior to any element of the proposed study being implemented.

F. Any users who are required to install or have in operation an interceptor system pursuant to this Ordinance, shall be required to have a written plan of operation or program for their facility which is intended to insure that the interceptor operates as designed to prevent grease, fats, oil (of animal, vegetable or petroleum origin), sand or other harmful constituents from entering the collection system. These procedures may include: adoption of kitchen practices to minimize the fat, oil and grease-laden garbage which ultimately enters the facility's drains and floor traps; maintaining records of inspections by the user of the interceptor; maintaining, on-site, manifests from the licensed and permitted waste hauler servicing the interceptor system; and/or other such procedures as may be required for the proper operation of the interceptor system.

G. All gravity separation interceptor systems shall be located and maintained so as to provide immediate and easy access for maintenance and inspection at all times.

6.103 Prohibited Restaurant Surface Discharges

No person who owns, operates, or maintains a restaurant shall at any time discharge any wastewater to a service dock area, parking lot, storm drain or the ground. Wastewater generated by restaurants must be disposed of through an approved gravity separation interceptor system that is connected to the Districts collection system or hauled offsite to a legal disposal site.

6.104 Conditional Waivers For Gravity Separation Interceptors

The District on a case-by-case basis may, in its sole and reasonable discretion grant conditional waivers for gravity separation interceptors to those users, which are determined by the District not to have any potential adverse effects on the Districts POTW. The user shall submit a written

request to the District and must be granted approval prior to commencing construction or remodeling. In lieu of installing a gravity separator interceptor system and a condition of granting an approved conditional waiver the District may require the user to install a sampling/monitoring manhole or box to the discharger's process wastestream.

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ARTICLE 7

Severability

7.100 SEVERABILITY

If any provision of this Ordinance or the application to any person or circumstances is held invalid, the remainder of the Ordinance or the application of such provision to other persons or other circumstances shall not be affected.

ARTICLE 8

Repeal

8.100 REPEAL

The Ordinance No. 71 is hereby repealed on the effective date hereof and all Ordinances or parts of Ordinances inconsistent with this Ordinance are hereby repealed to the extent that they are inconsistent with the provisions of this Ordinance.

ARTICLE 9

Effective Date

9.100 EFFECTIVE DATE

The effective date of this Ordinance shall be December 20, 2004.

TABLE A

Local Limits for Discharge to the EVMWD Sewer System

Pollutant Category	Constituent	Units	Local Limit	Time Frequency Associated with Local Limit
Physical Chemical	Grease and oil of petroleum or mineral origin	mg/l	100[1]	Daily Average[1]
	pH	pH units	6.0 – 12.0[2]	Inst. Maximum[2]
Mineral	TDS	mg/l	< 250 mg/l above existing potable water supply[3,4]	Monthly Average[4]
	Boron	mg/l	1.5[4]	Monthly Average[4]
	Fluoride	mg/l	2.3[4]	Monthly Average[4]
Toxic Inorganic	Arsenic	µg/l	No increase above existing potable water supply[3,4]	Monthly Average[4]
	Copper	µg/l	130[1]	Daily Average[1]
	Lead	µg/l	15[4]	Monthly Average[4]
	Mercury	µg/l	0.1[4]	Monthly Average[4]
	Selenium	µg/l	No increase above existing potable water supply[3,4]	Monthly Average[4]
	Zinc	µg/l	480[1]	Daily Average[1]
	Cadmium	µg/l	15[4]	Monthly Average[4]
	Chromium	µg/l	85[4]	Monthly Average[4]
	Silver	µg/l	60[4]	Monthly Average[4]
	Thallium	µg/l	15[4]	Monthly Average[4]
	Cyanide	µg/l	15[4]	Monthly Average[4]
Toxic Organic	Chloromethane	µg/l	23[5]	Inst. Maximum[5]
	1,1-dichloroethylene	µg/l	21[4]	Monthly Average[4]
	bis (2-ethylhexyl) phthalate	µg/l	< 5[4,6]	Monthly Average[4,6]
	Hexachlorocyclobutadiene	µg/l	< 1[5,6]	Inst. Maximum[5,6]

1. Daily average concentration limit.
2. pH range not to be exceeded at any time.
3. Limit expressed in terms of incremental difference between potable water supply concentration and concentration in the discharge to the EVMWD sewer system.
4. Maximum mean monthly concentration.
5. Instantaneous maximum concentration limit.
6. Not to be discharged to the EVMWD sewer system in any detectable concentrations. The listed concentration limits are minimum detection limits set forth by the State Water Resources Control Board in *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (2000).

TABLE B

ELSINORE VALLEY MUNICIPAL WATER DISTRICT

PRETREATMENT PROGRAM

FEE SCHEDULE

	DISCHARGER CLASS					
DESCRPITION	**1**	**2**	**3**	**4**	**5**	**6**
PERMT FEE/YR.	$4,590	$920	$180	$370	$280	$180
PERMIT REVISION FEE	$920	$280	$90	$90	$280	$90
ROUTINE/FOLLOW-UP INSPECTIONS	$1,380	$460	$180	$180	N/A	$180
NON - COMPLIANCE INSPECTION	$1,100	$730	$460	$460	N/A	$280
NON – COMPLIANCE SAMPLING	$180	$180	$180	$180	$180	$180
NON – COMPLIANCE MEETING	$180	$180	$180	$180	$180	$180
FAILURE TO ALLOW ENTRY FOR INSPECTION	$180	$180	$180	$180	N/A	$180

	ALL DISCHARGER CLASSES
ENVIRONMENTAL COMPLIANCE REVIEW FEE	$210
CONSTRUCTION INSPECTION FEE	$290
ADDITIONAL MANPOWER/HR.	$88
REPLACE DUMP STATION ACCESS CARD	$92
LIQUID WASTE PROCESS FEE/PER GALLON	$0.03
LIQUID WASTE PROCESS FEE/PER GALLON (OFFSITE)	*TBD
CHEMICAL ANALYSIS	ACTUAL COSTS AS BILLED BY LAB PLUS G&A O/H

* = TO BE DETERMINED (TBD)

APPENDIX I – SANITARY SEWER HOT SPOTS

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Hot Spot Calendar

Date and initial each box indicating cleaned. Turn into Supervisor when complete.

Month/Year_____Revised 9-10-07

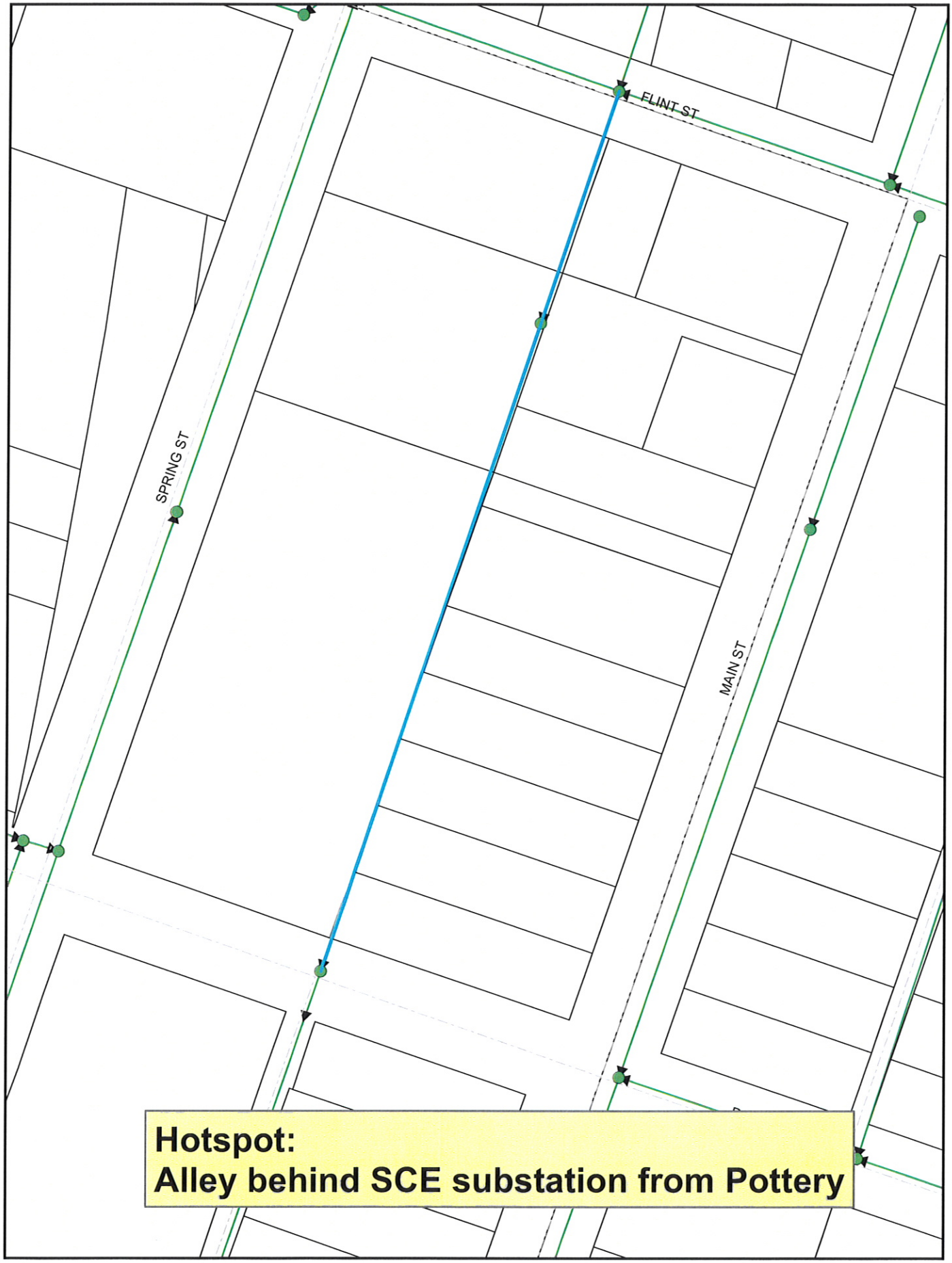
Wastewater Hot Spots Description SEE MAPS	Footage to be cleaned	Location	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
Skylink Dr. to Railroad Canyon Rd to golf course	757’	CL												
Burning Tree Dr to shopping center	1024’	CL												
Village Way Dr boat ramp	925’	CL												
Easement from Cove View to CLDN	317’	CL												
Lighthouse Dr into condos	677’	CL												
Old Wrangler to Big Range	608’	CL												
Longhorn from Strawberry Ln. to Happy Camp	900’	CL												
Point Marina, check manholes at end of culdesac	MH-1738 MH-1740	CL												
Manholes in alley between Sumner/Pottery off Main	MH-2403 MH-2413	Downtown Els												
Heald & Mohr, west	191’	Downtown Els.												
Sumner btwn Davis and Townsend, **low pressure**	282’	Downtown Els												
Main St from Sumner to Peck	1023’	Downtown Els												
Riley from Pottery south to alley, alley between Riley and Langstaff.	204’	Downtown Els												
Alley behind SCE substation from Pottery	618’	Downtown Els												
Ellis and Pottery- Pottery and alley, **low pressure**	522’	Downtown Els												
Heald and Matich, west, **low pressure**	279’	Downtown Els												
Main St and Sumner, east, **6” to 4” outside MH, low pressure**	215’	Downtown Els												
Nashland to parking lot	823’	Els												
Harbor Grand Apts to Riverside Dr	1480’	Els												
Machado School to Quail	2638’	Els												
Riverside Drive from Lake Crest to Corner of Sears Plaza, one segment up Eisenhower and Lake Crest.	1972’	Els.												
Lincoln from A-3 to Robin	1880’	Els												
Outrigger from Edgewater to Spyglass	326’	Els												
Laurlwood Ct. to Terra Cotta,Terra Cotta - St Clair Ave to Braodway Ave	528’	Els												
Lake Crest Dr to Mari & dolly St.	172’	Els												
Navut from Pashal to Gatu	496’	Windsong V												
Wanki & Woshka	803’	Windsong V												
Twinflower from Larkspur to Aster	270’	Windsong V												
Cashew from Wesley to Mission Trail	3468’	Wildomar												
Monroe Ave. & Sunflower St.	443’	Cal Oaks												
Cal Oaks fm Saradella to the Colony	383’	Cal Oaks												
B-8 Liftstation Wet Well (clean & degrease)		Lakeland Village												

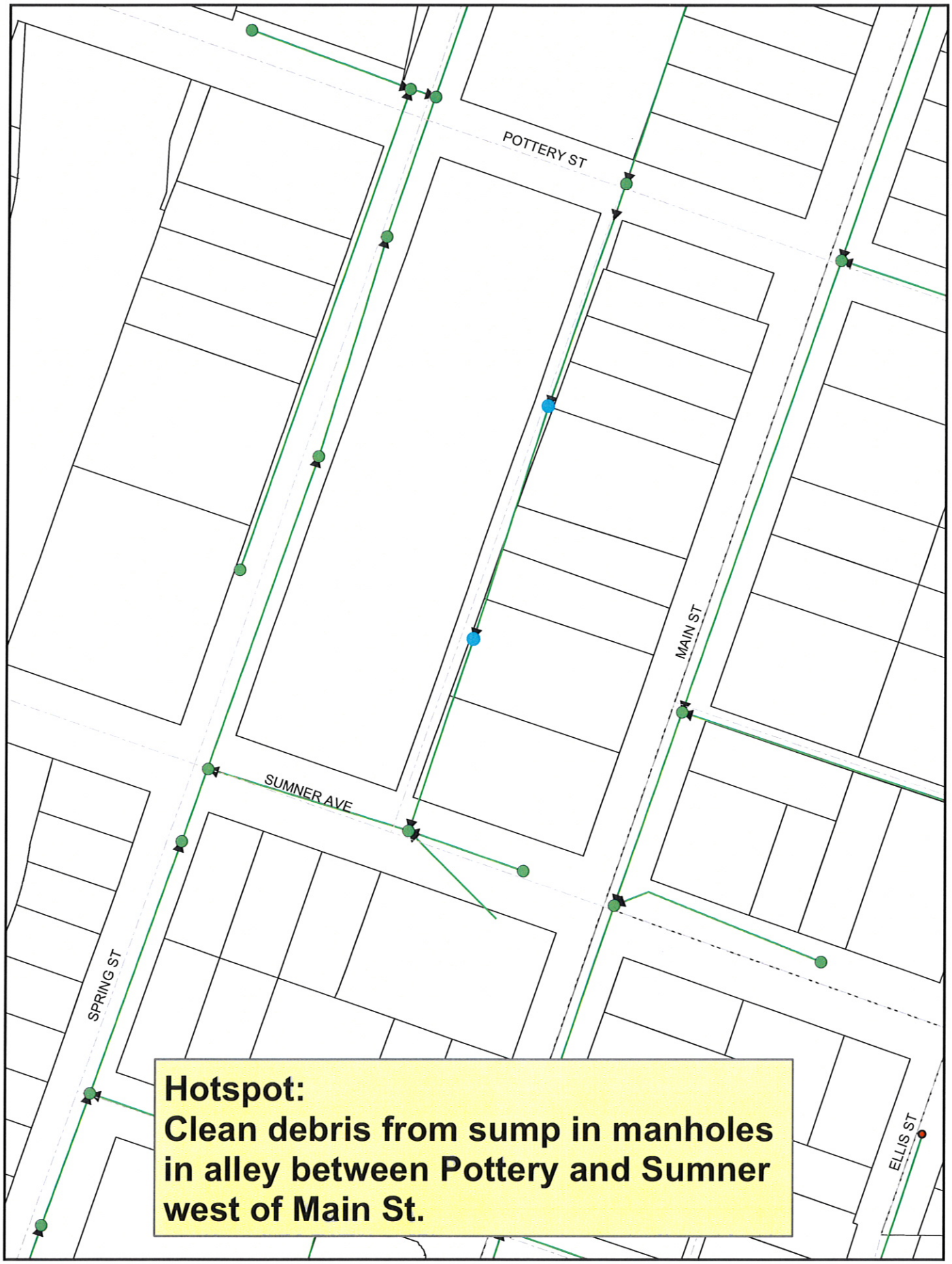
Hot Spot Calendar

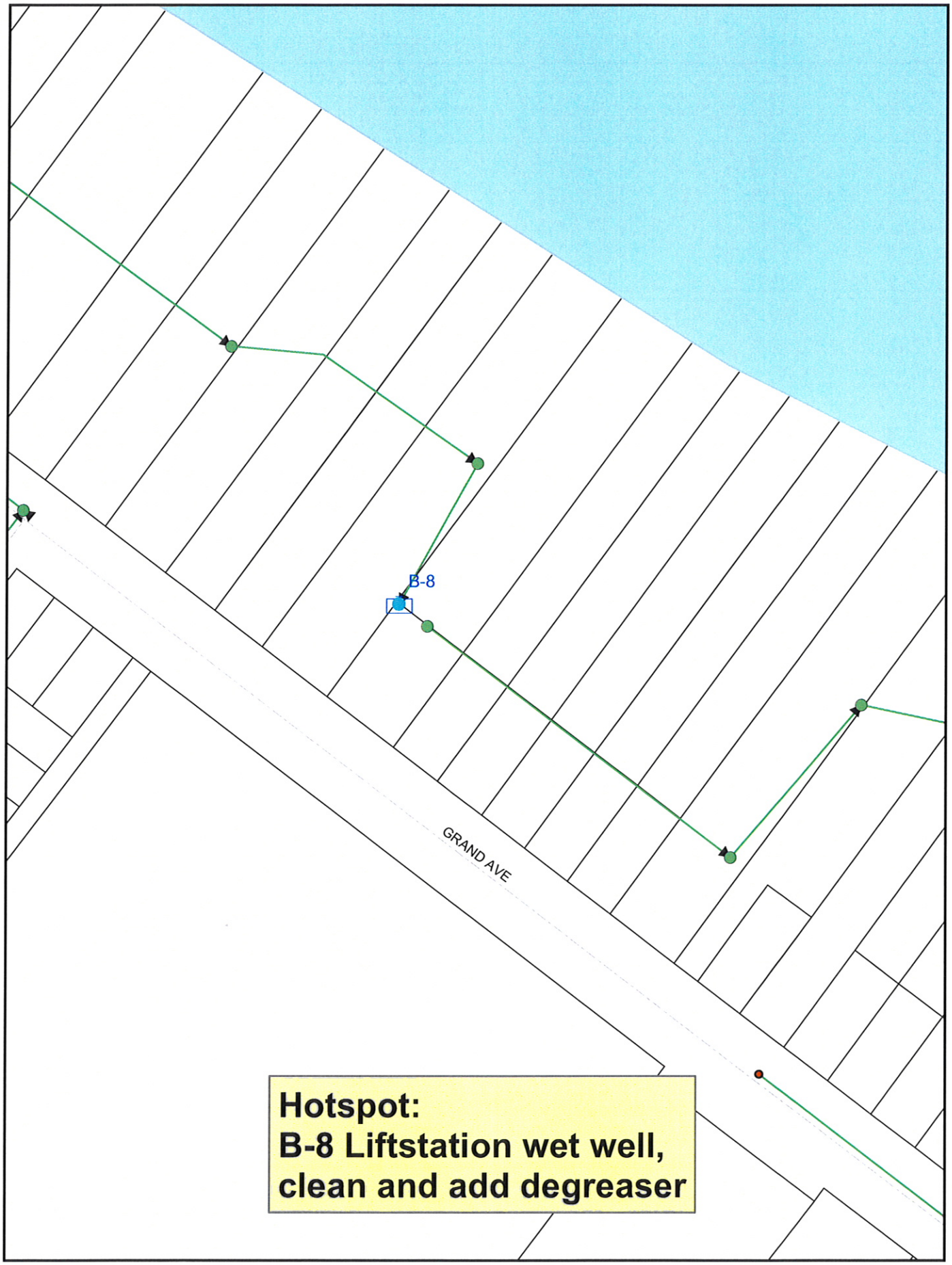
Date and initial each box indicating cleaned. Turn into Supervisor when complete.

Month/Year_____Revised 9-10-07

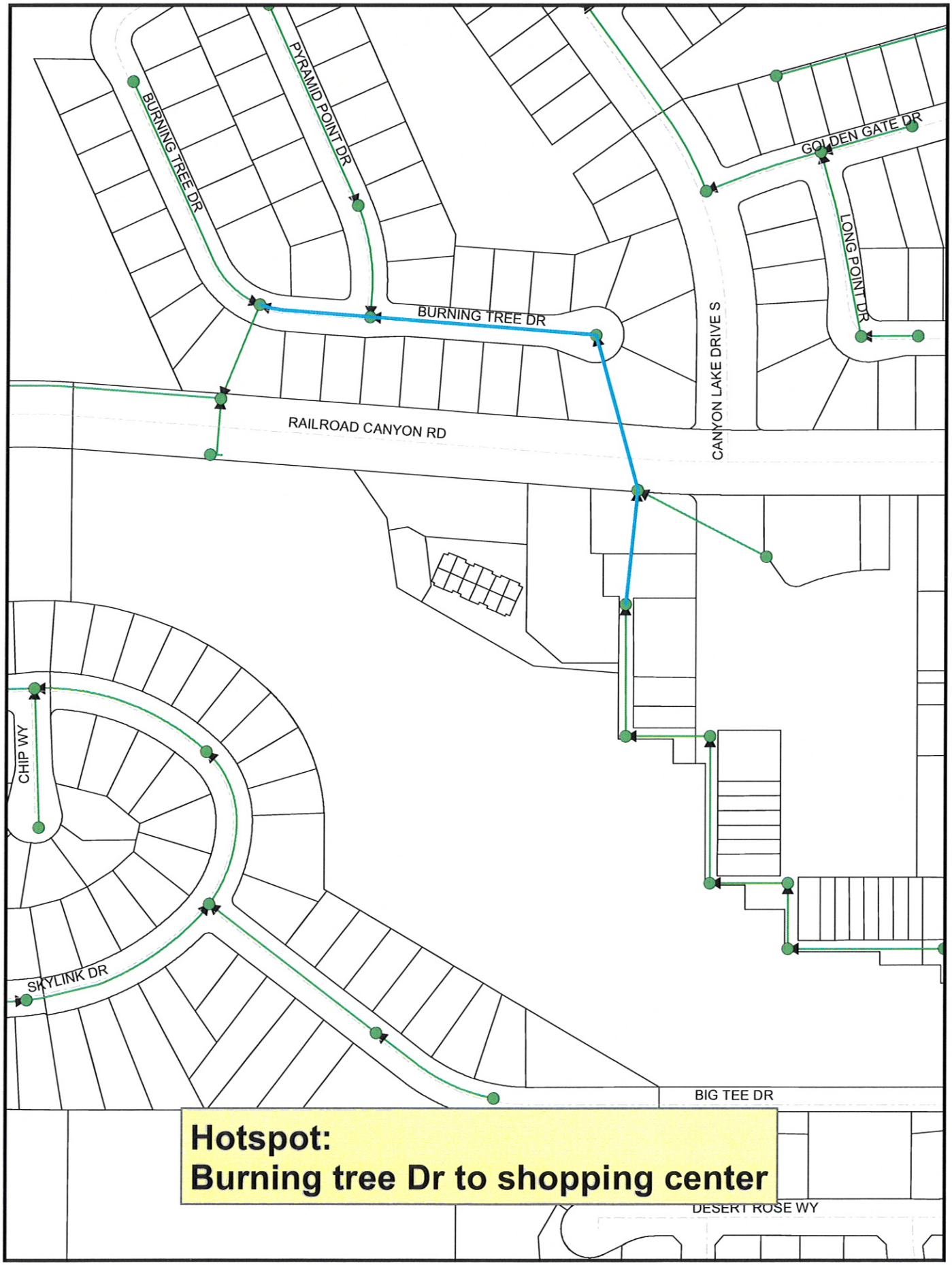
Knollwood to Horsethief Canyon to Bay Meadows	707’	Horsethief												
Mountain View	MH-176	Horsethief												

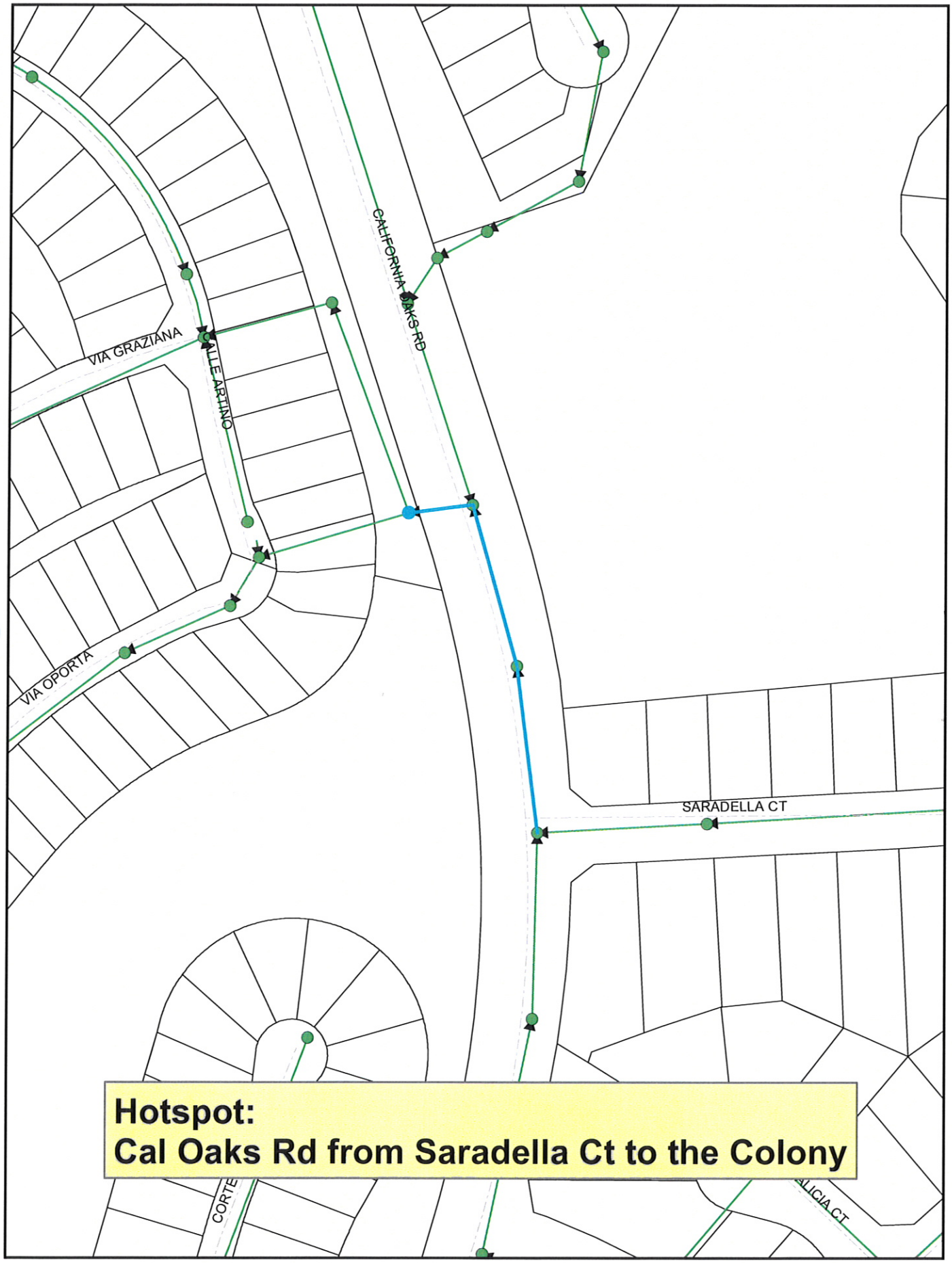

FLINT ST
SPRING ST
MAIN ST
Hotspot:
Alley behind SCE substation from Pottery


POTTERY ST
MAIN ST
SUMNER AVE
SPRING ST
ELLIS ST
Hotspot:
Clean debris from sump in manholes in alley between Pottery and Sumner west of Main St.

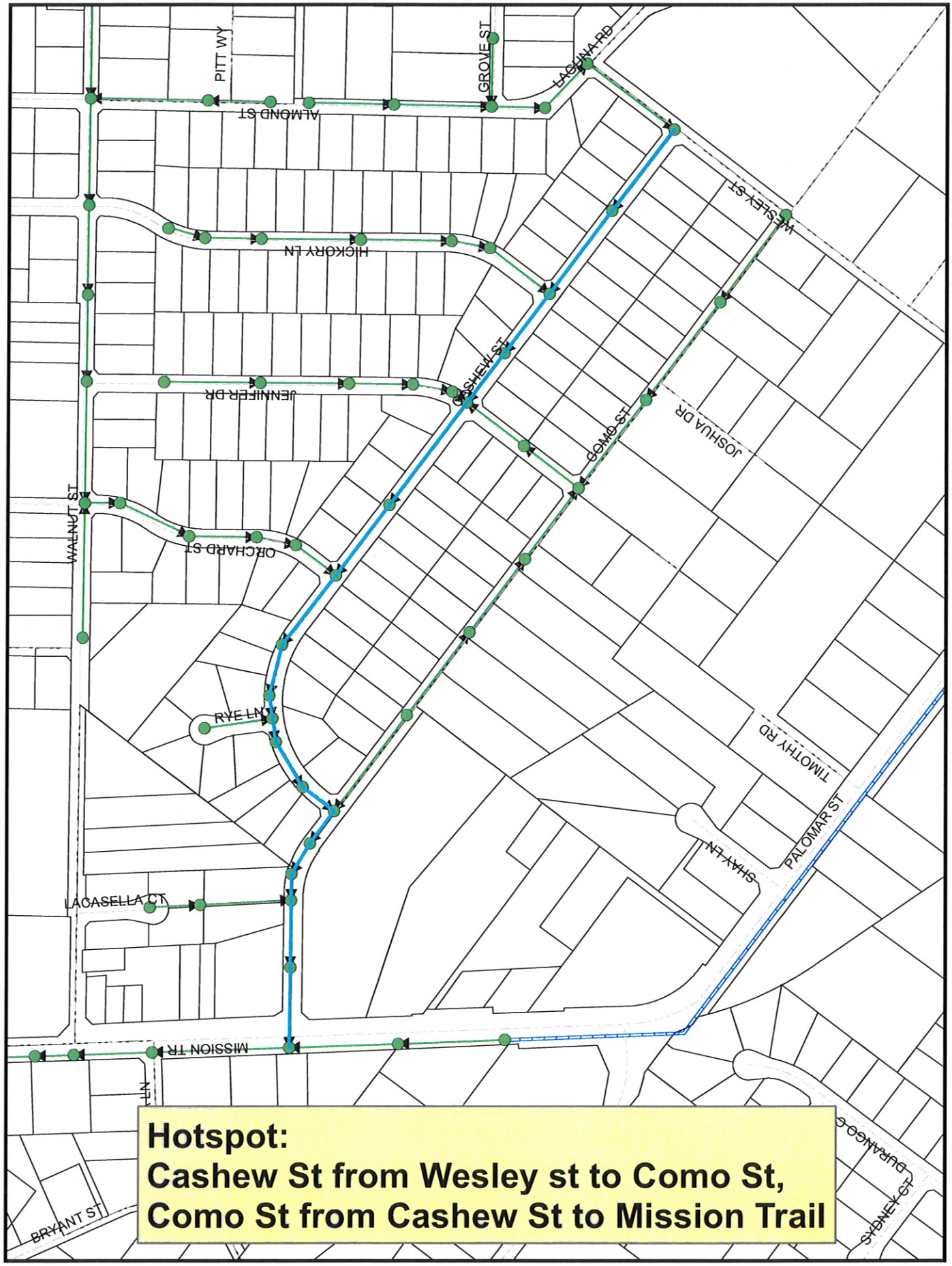

B-8
GRAND AVE
Hotspot:
B-8 Liftstation wet well,
clean and add degreaser

#4


BURNING TREE DR
PYRAMID POINT DR
BURNING TREE DR
GOLDEN GATE DR
LONG POINT DR
CANYON LAKE DRIVE S
RAILROAD CANYON RD
CHIP WY
SKYLINK DR
BIG TEE DR
DESERT ROSE WY
Hotspot:
Burning tree Dr to shopping center



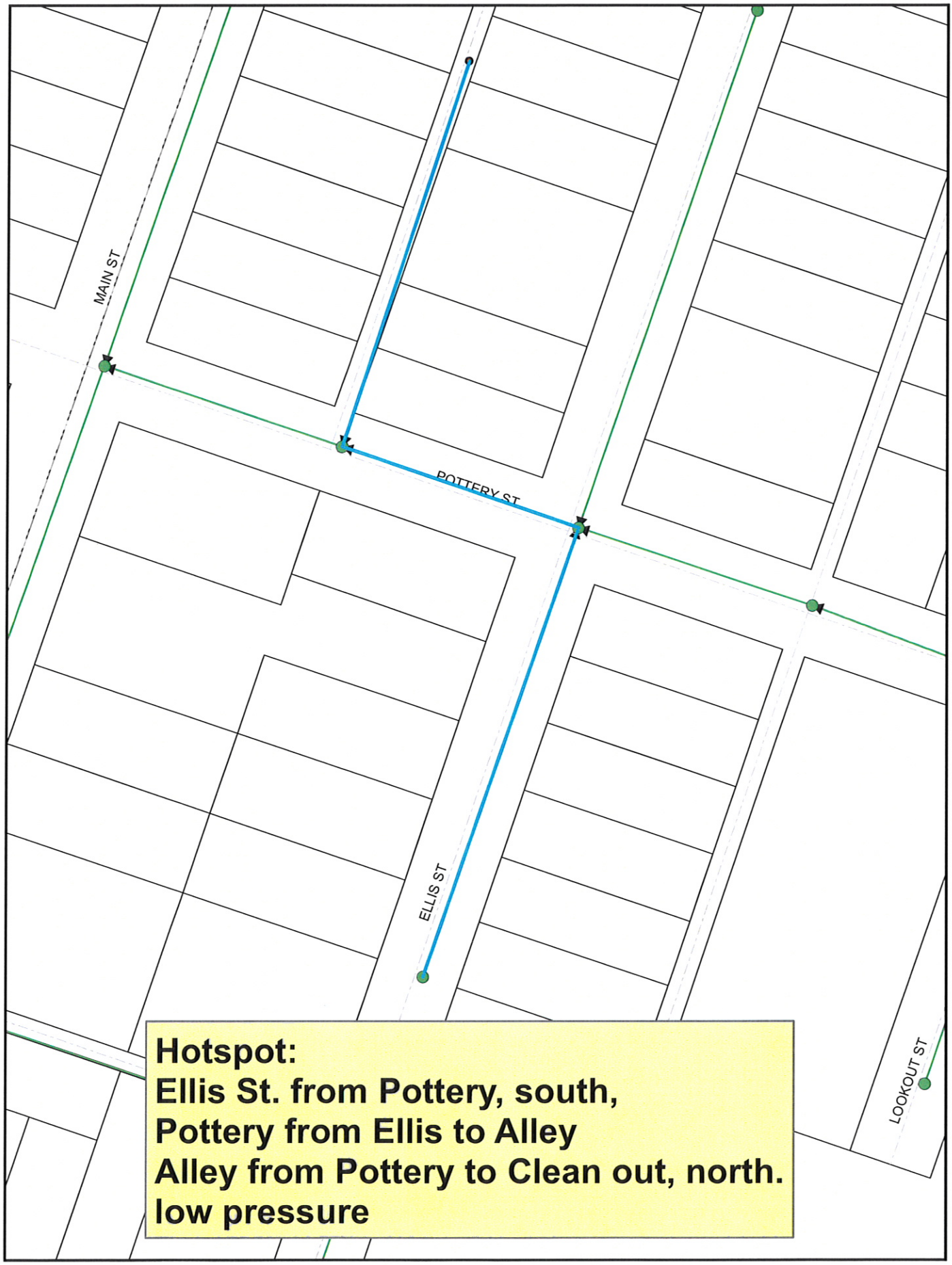
Hotspot:
Cal Oaks Rd from Saradella Ct to the Colony

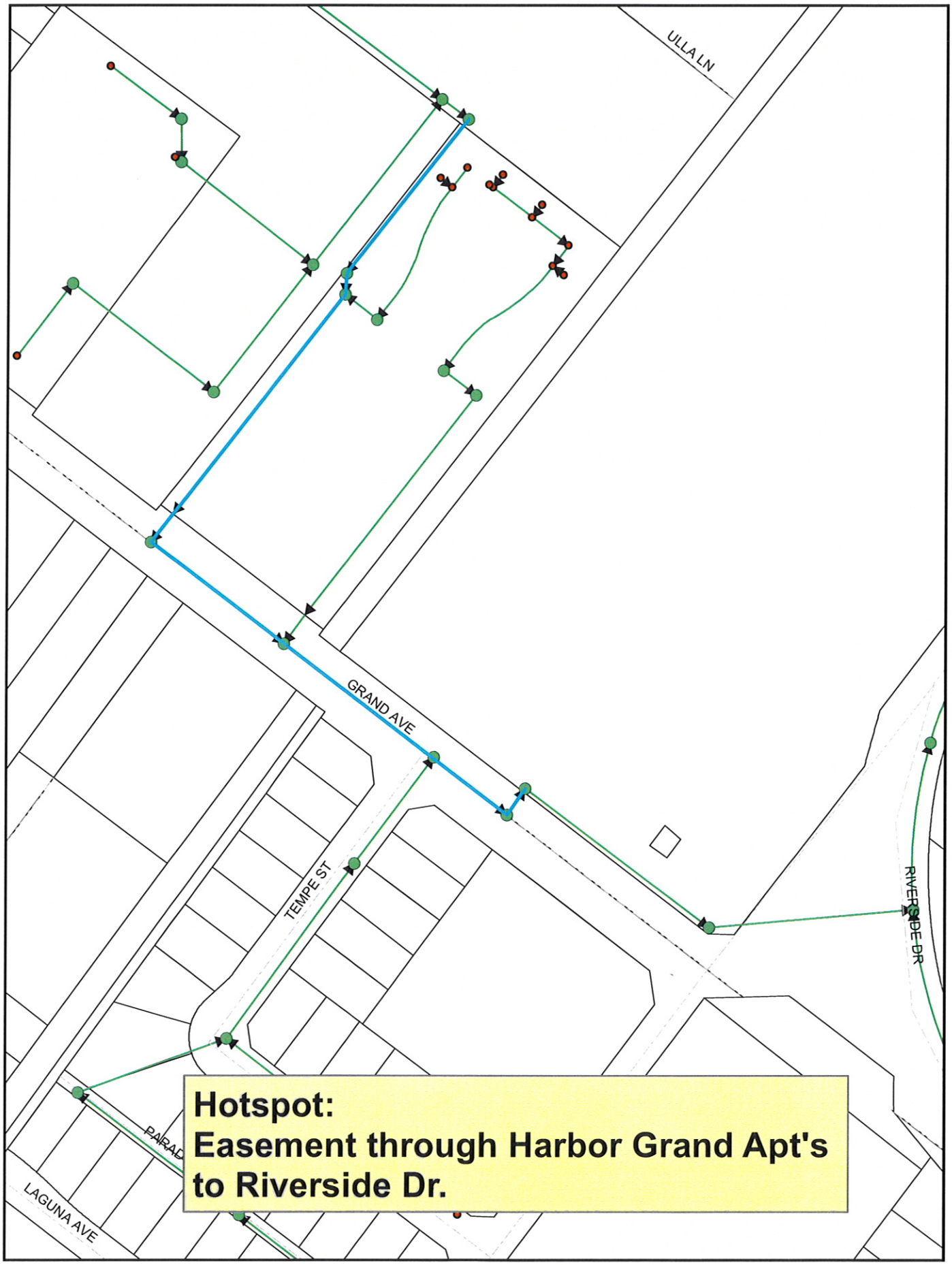


Hotspot:
Cashew St from Wesley st to Como St,
Como St from Cashew St to Mission Trail

#7

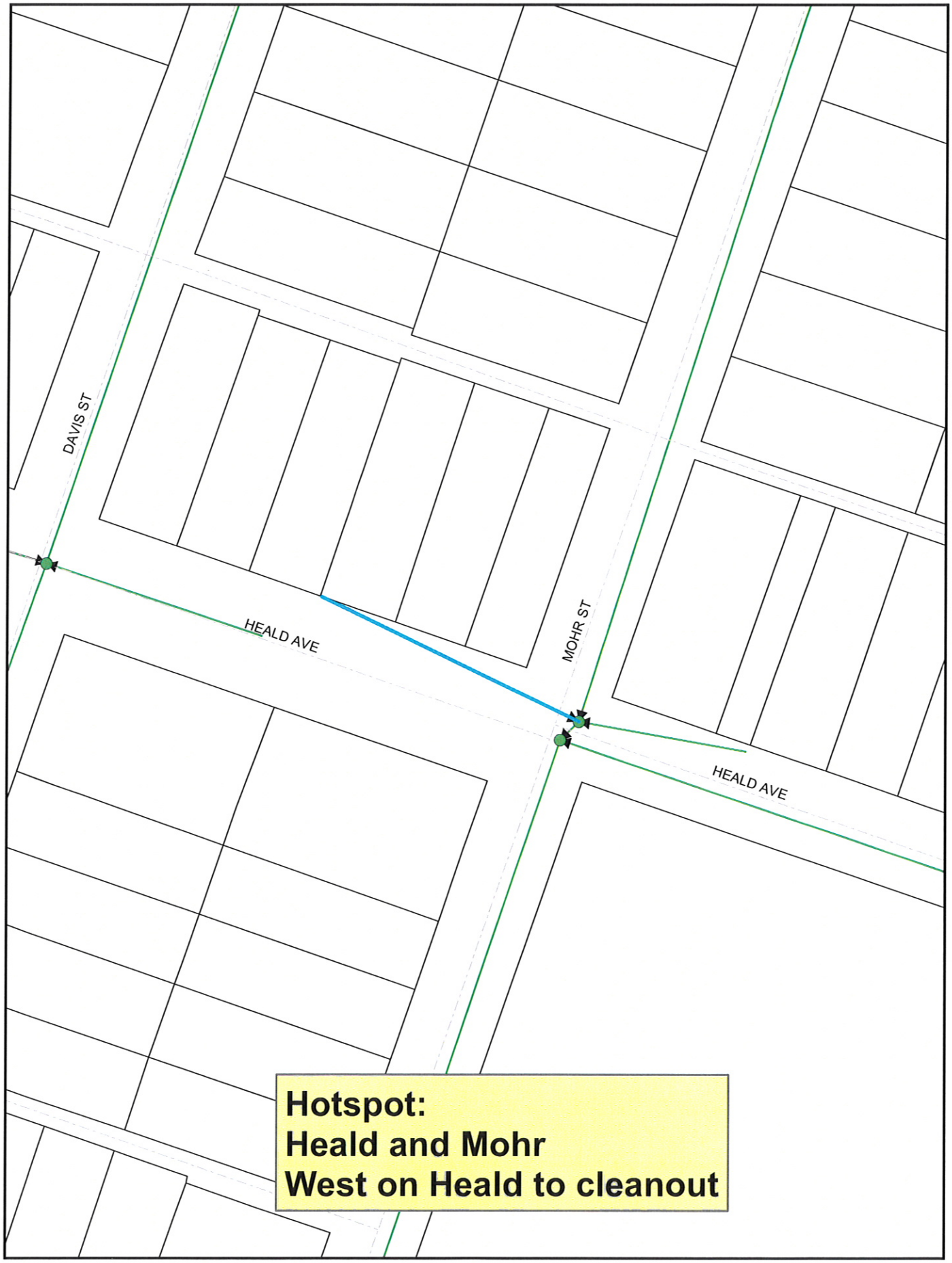
WIND SONG PL
LIGHTHOUSE DR
BEACON CT
SANTANA CT
WHITE SAIL PL
COMPASS DR
COVE VIEW ST
VACATION DR
CANYON CLUB DR
CANYON LAKE DRIVE N
BLUE TEAL DR
RED LURE PL
HIDING BASS PL
Hotspot:
Easement from Cove View St to
Canyon Lake Drive North


MAIN ST
POTTERY ST
ELLIS ST
LOOKOUT ST
Hotspot:
Ellis St. from Pottery, south,
Pottery from Ellis to Alley
Alley from Pottery to Clean out, north.
low pressure

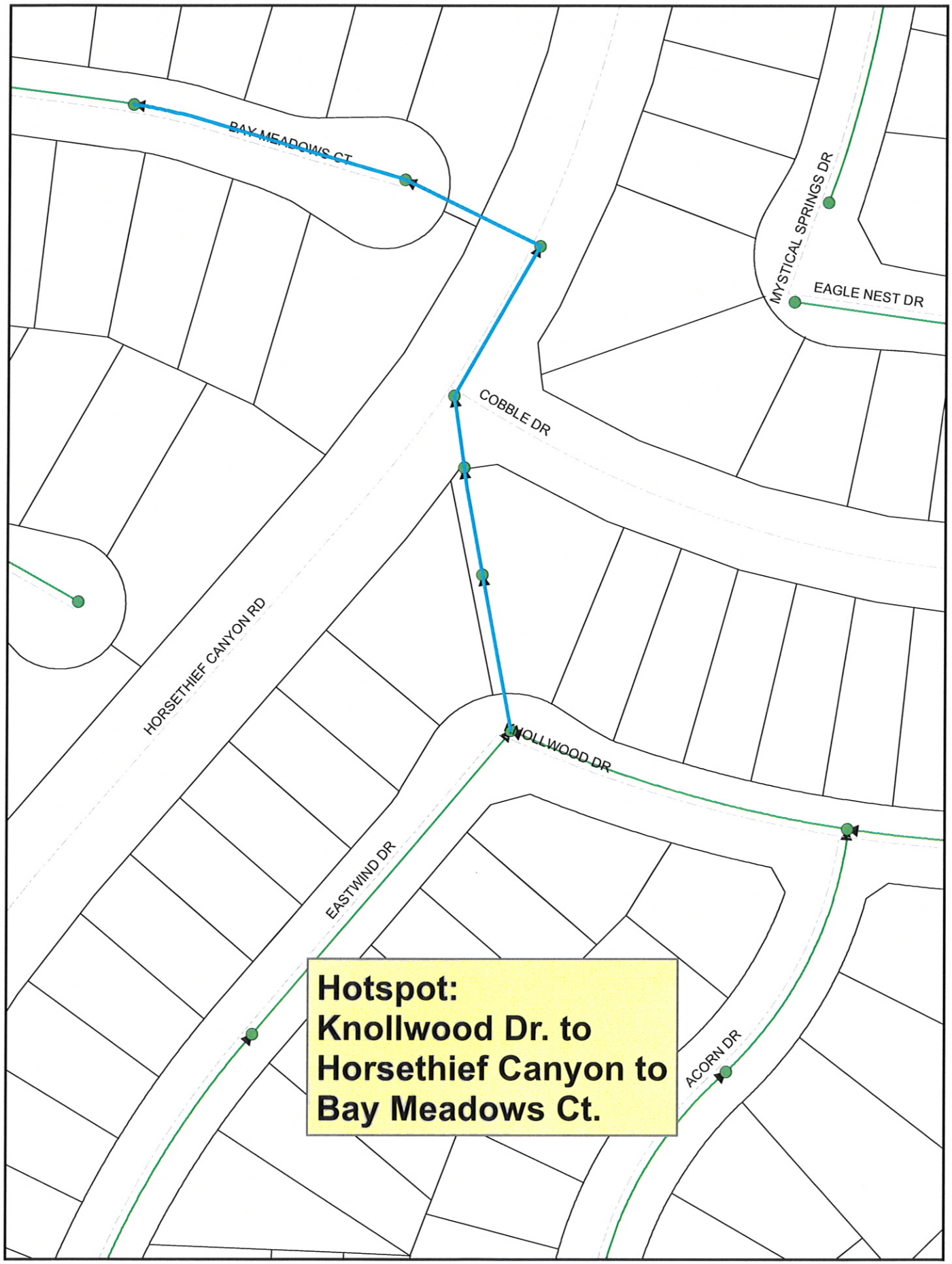

ULLA LN
GRAND AVE
TEMPE ST
RIVERSIDE DR
LAGUNA AVE
Hotspot:
Easement through Harbor Grand Apt's
to Riverside Dr.

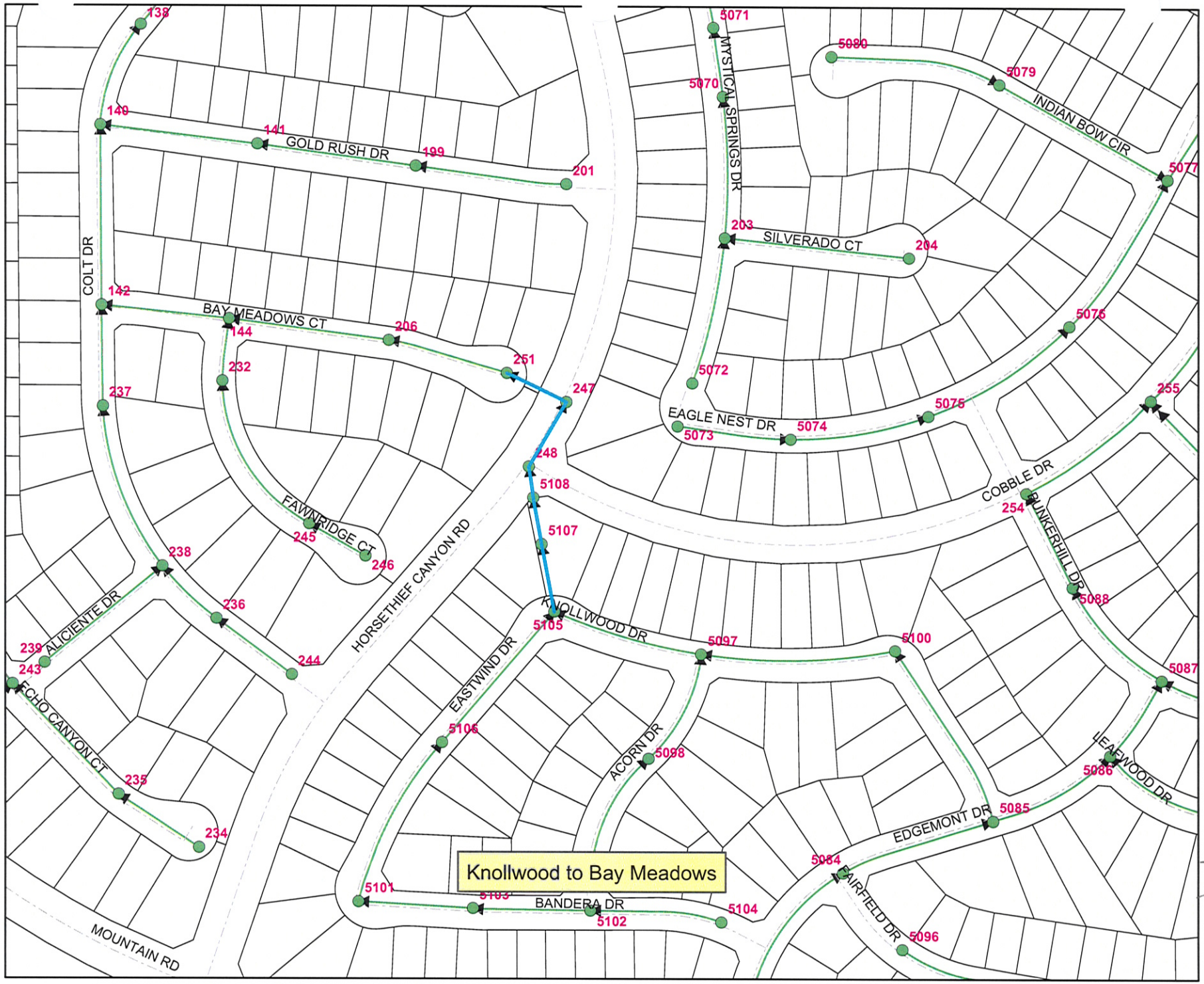
CHANEY ST
MATICH ST
HEALD AVE
LAKESHORE DR
Hotspot:
Heald and Matich, west
low pressure.

#11


DAVIS ST
HEALD AVE
MOHR ST
HEALD AVE
Hotspot:
Heald and Mohr
West on Heald to cleanout

#12


BAY MEADOWS CT
MYSTICAL SPRINGS DR
EAGLE NEST DR
COBBLE DR
HORSETHIEF CANYON RD
KNOLLWOOD DR
EASTWIND DR
ACORN DR
Hotspot:
Knollwood Dr. to
Horsethief Canyon to
Bay Meadows Ct.



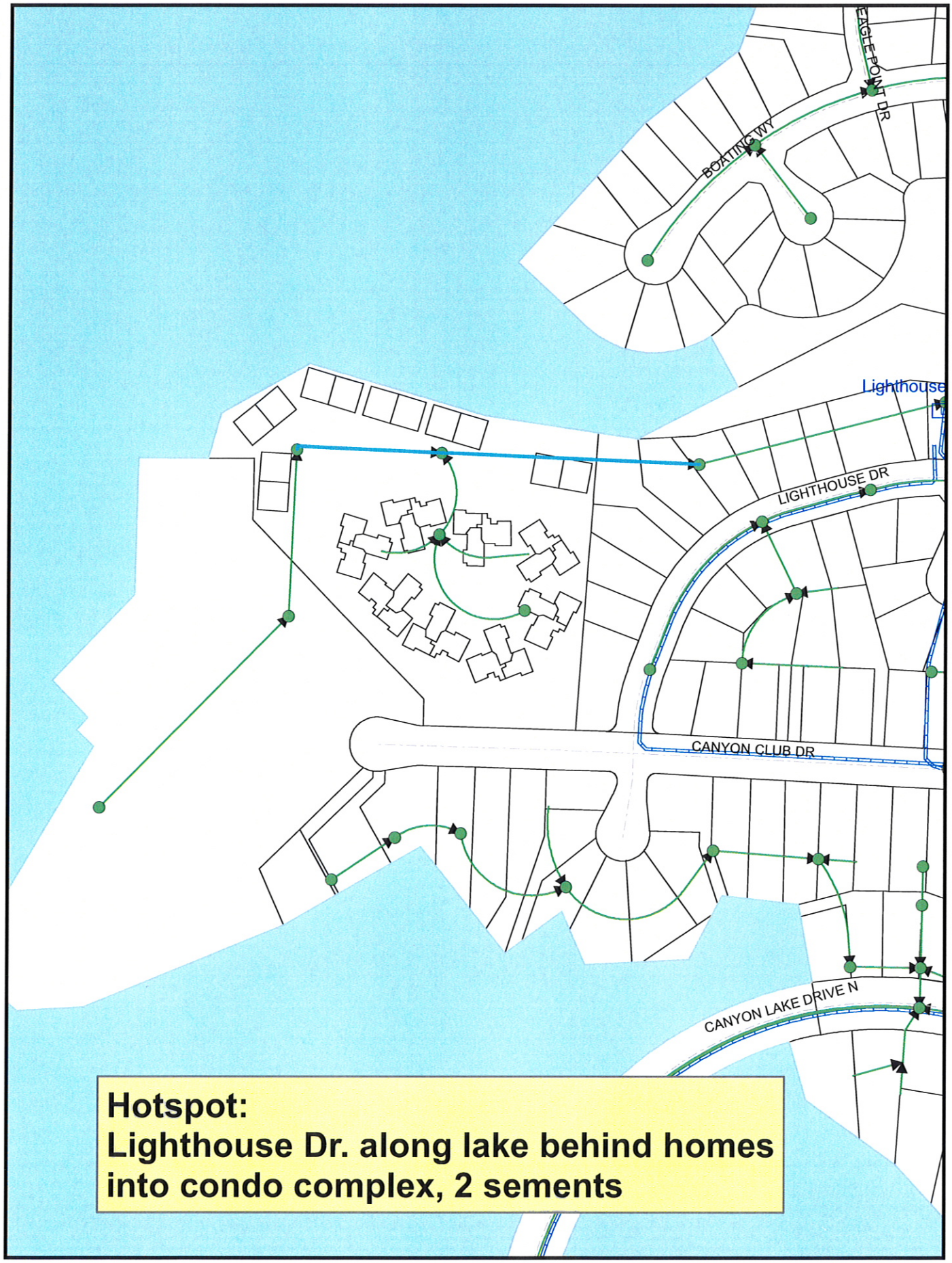
Same as previous page

21 #12

#13

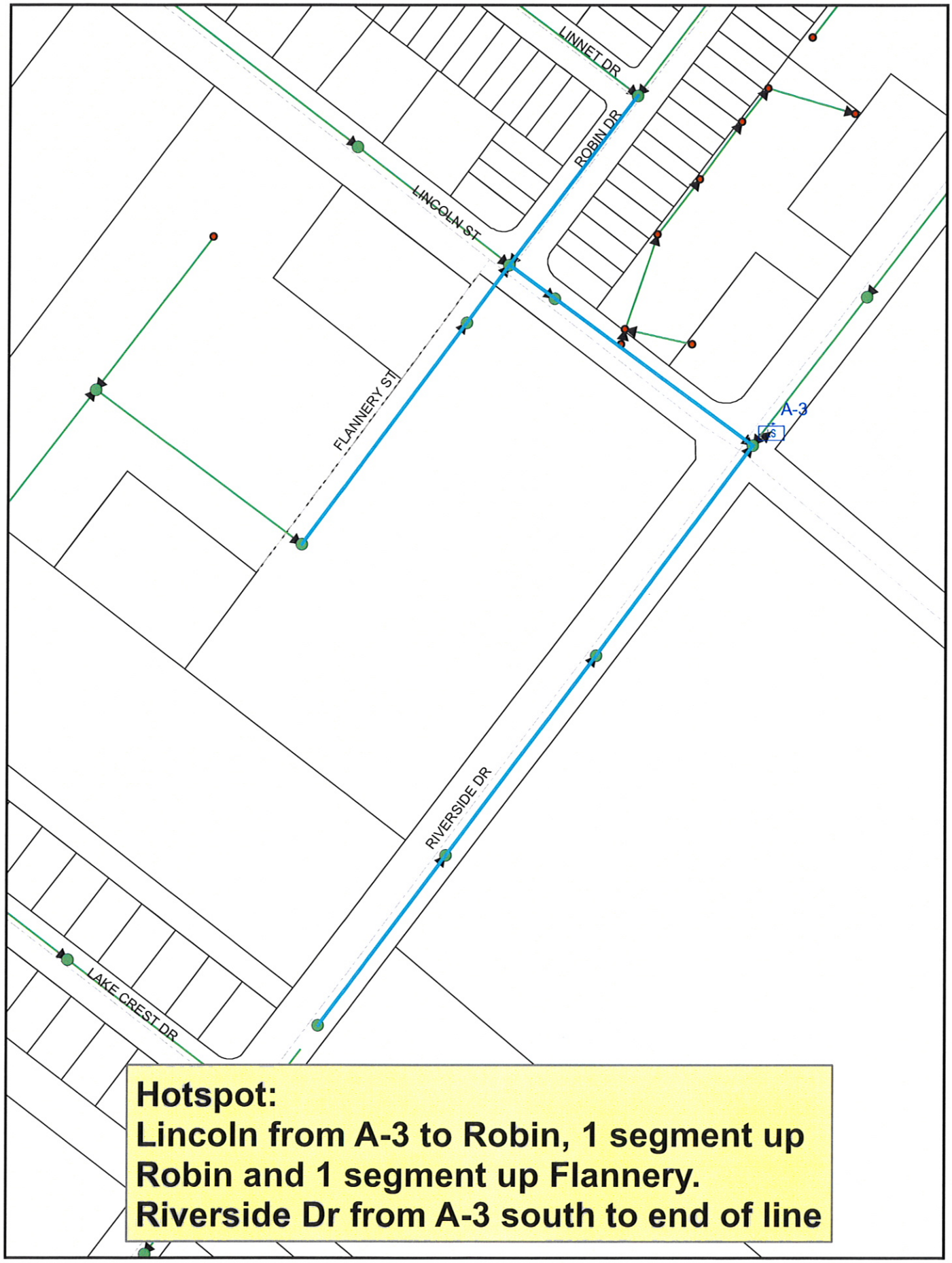
CHRISTINA CT
MACHADO ST
LORI WY
MARCIA CT
MARIE DR
DOLLY DR
AMBERWOOD CT
JEFFERSON ST
LAKE CREST DR
AMBER LN
TAYLOR ST
MADISON ST
ADAMS ST
Hotspot:
Lake Crest to Marie-Dolly,
Check manhole at Marie-Dolly.

Hotspot:
Laurelwood Ct.to Terra Cotta
Terra Cotta Rd.-St. Clair Ave to Broadway

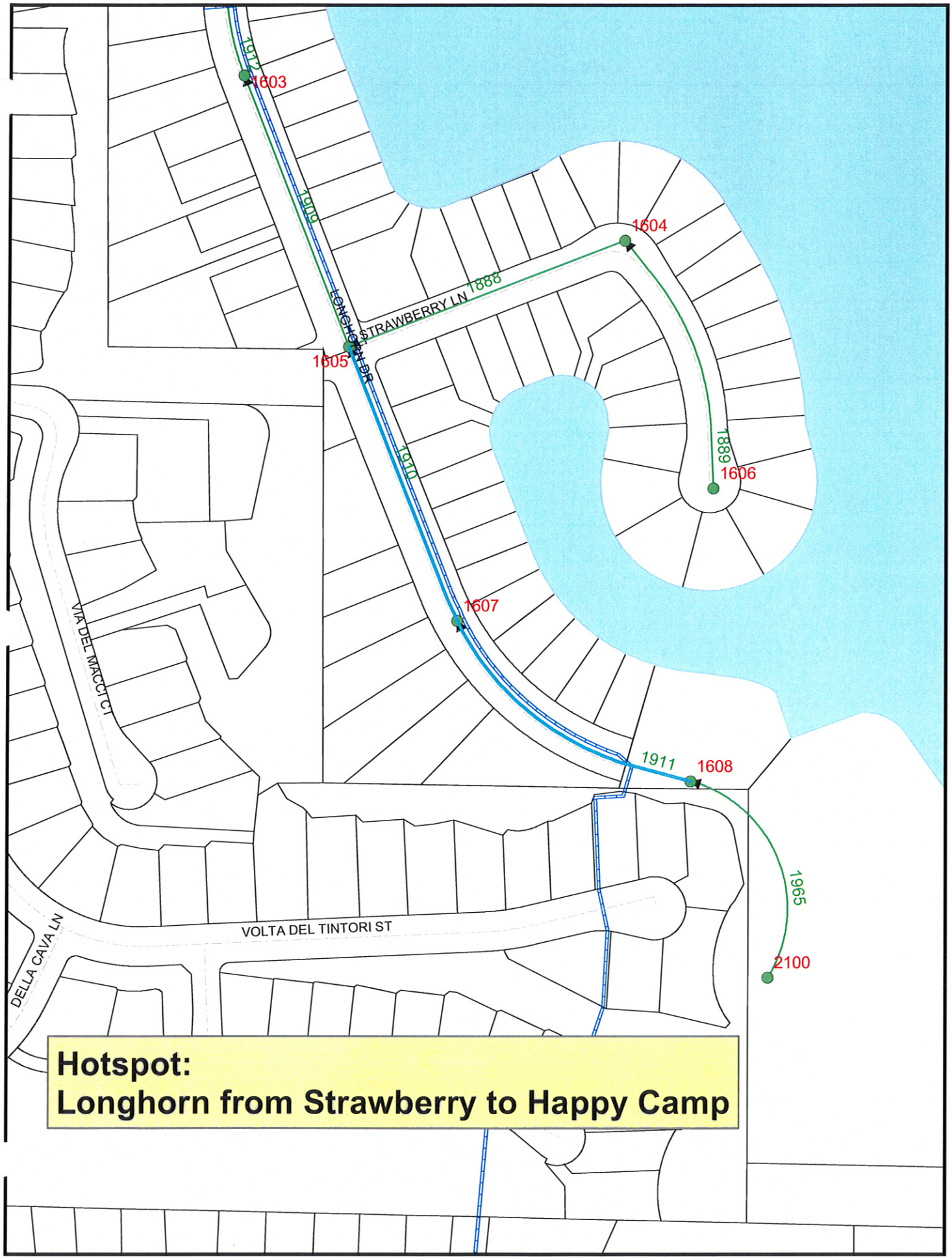


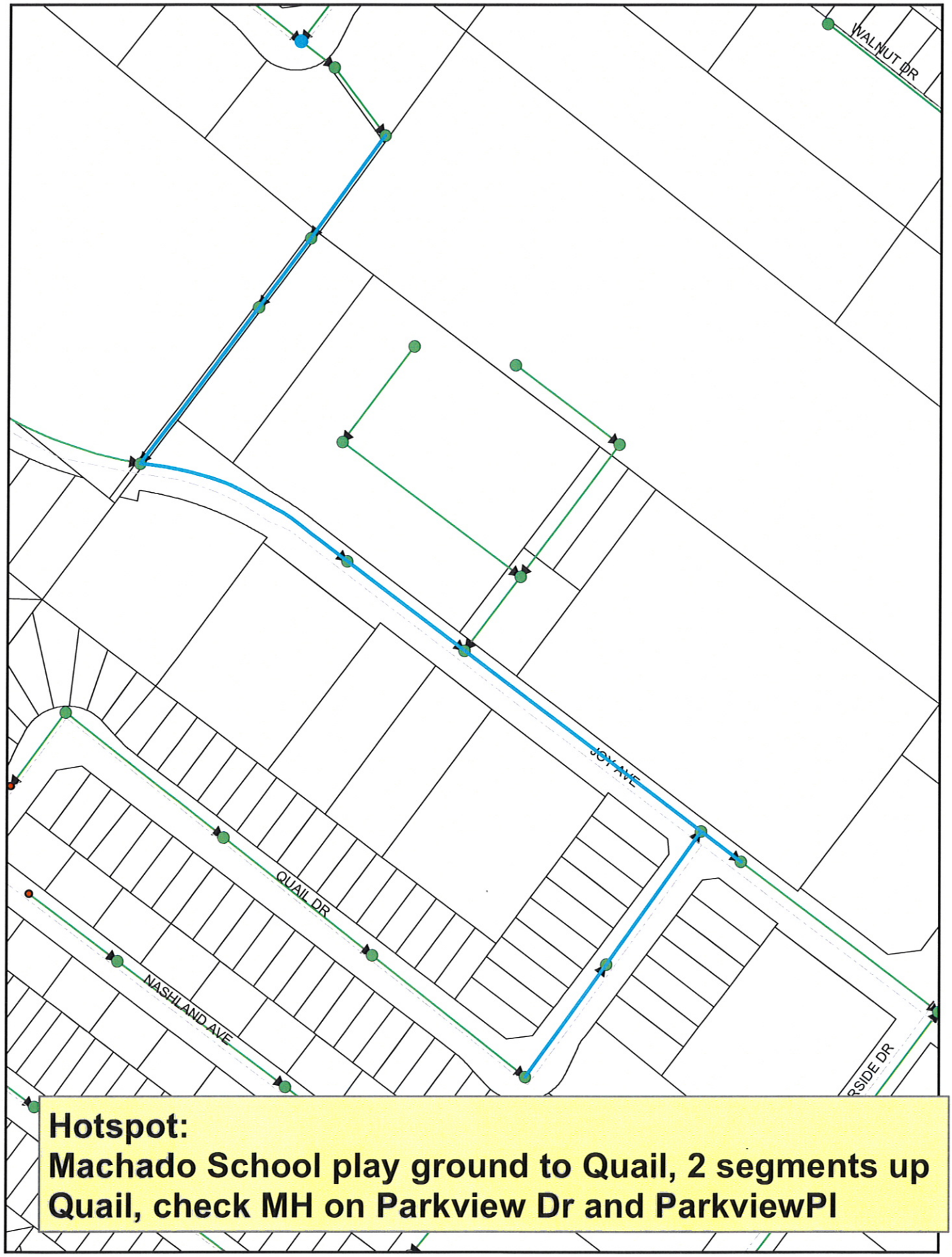
Hotspot:
Lighthouse Dr. along lake behind homes into condo complex, 2 sements

#16



Hotspot:
Lincoln from A-3 to Robin, 1 segment up Robin and 1 segment up Flannery.
Riverside Dr from A-3 south to end of line


1912
1603
1909
LONGHORN DR
STRAWBERRY LN
1888
1604
1605
1889
1606
1910
1607
VIA DEL MACCI CT
1911
1608
1965
VOLTA DEL TINTORI ST
DELLA CAVA LN
2100
Hotspot:
Longhorn from Strawberry to Happy Camp

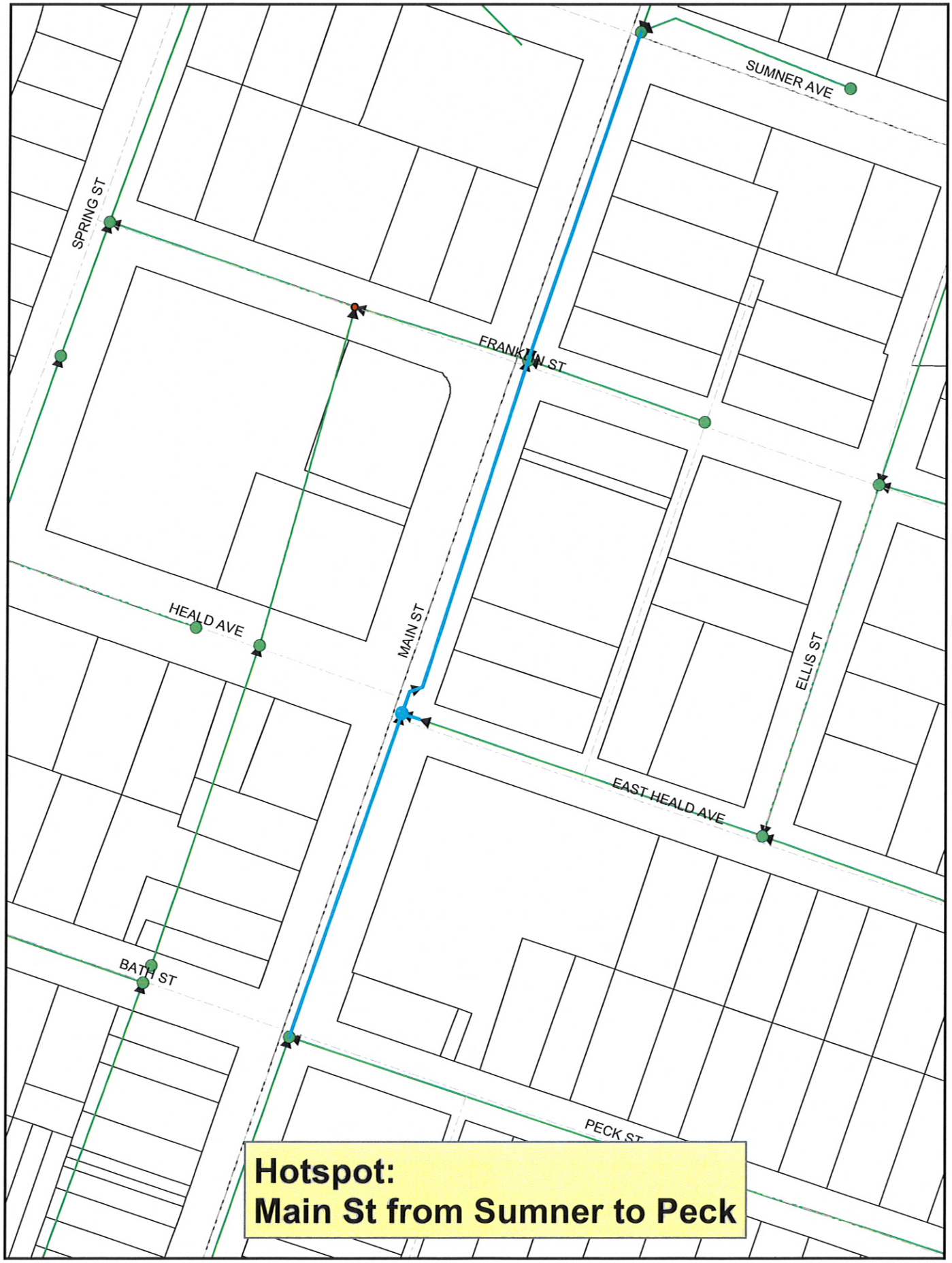


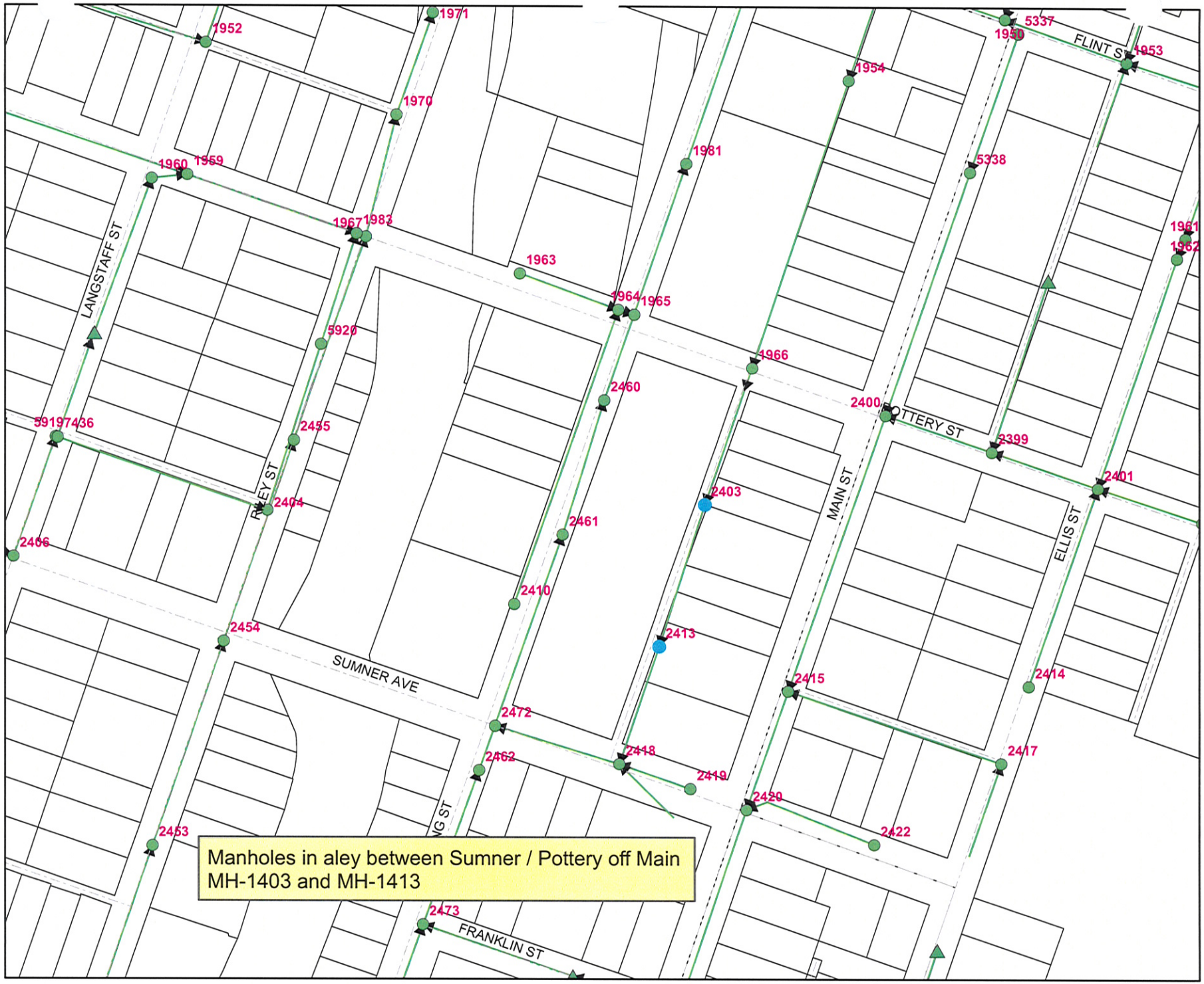
Hotspot:
Machado School play ground to Quail, 2 segments up Quail, check MH on Parkview Dr and ParkviewPl

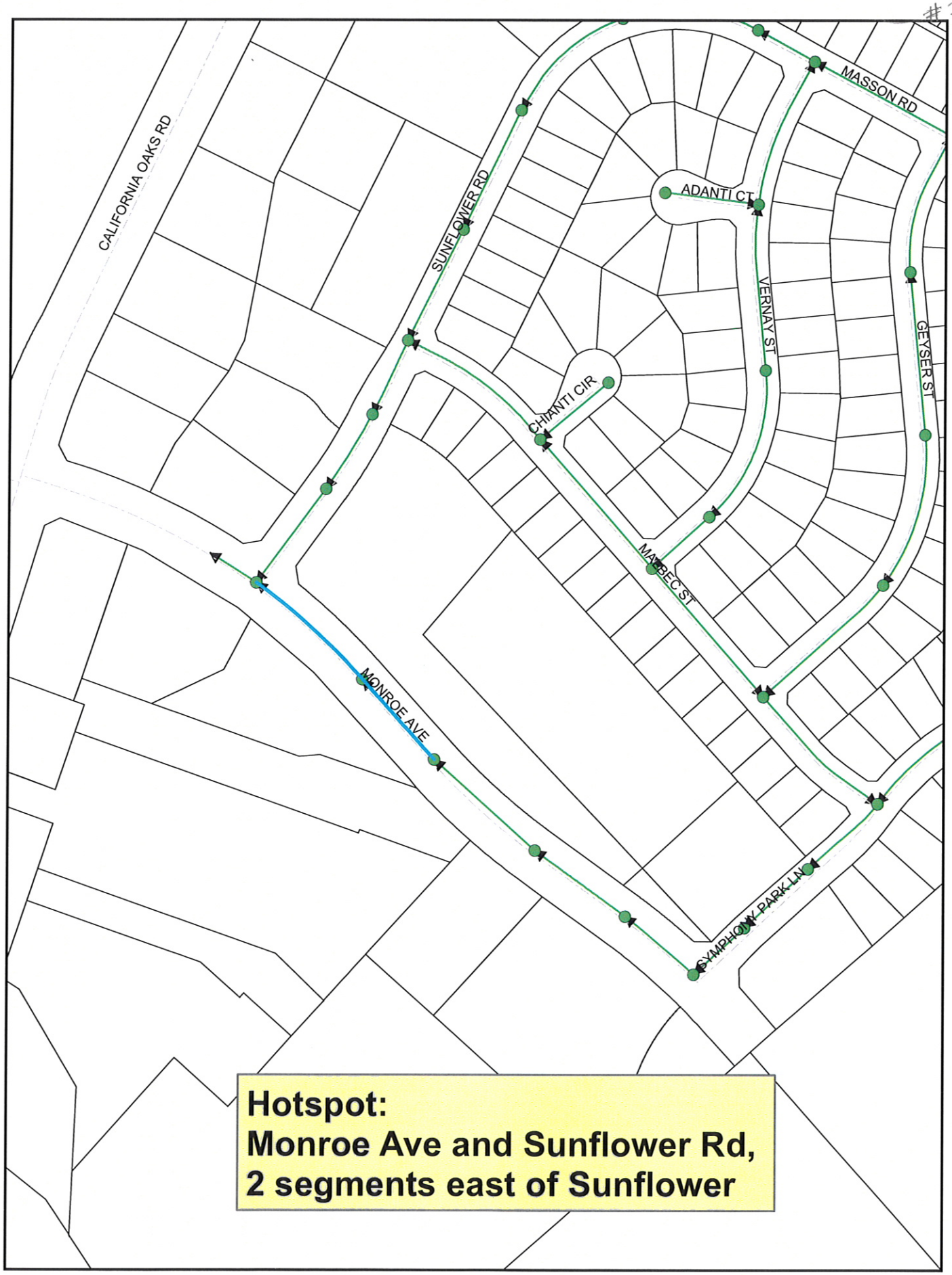
#19

SUMNER AVE
MAIN ST
ELLIS ST
FRANKLIN ST
Hotspot:
Main St. and Sumner, east.
6" to 4" outside manhole, low pressure.

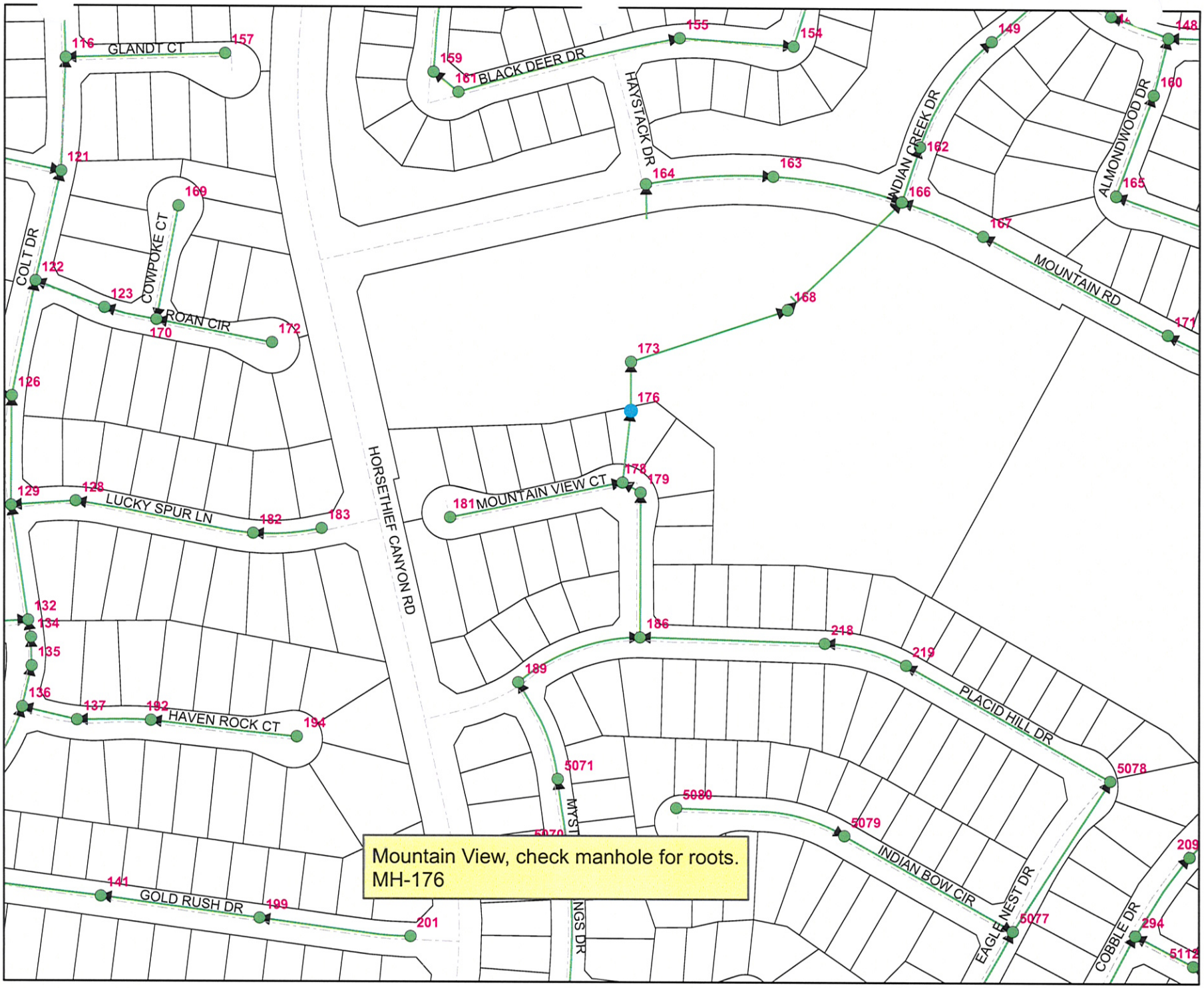
#20


SUMNER AVE
SPRING ST
FRANKLIN ST
HEALD AVE
MAIN ST
ELLIS ST
EAST HEALD AVE
BATH ST
PECK ST
Hotspot:
Main St from Sumner to Peck


1971
1952
1970
1960
1959
1967
1983
1963
1964
1965
5920
1966
2460
59197436
2455
2404
2406
2461
2410
2454
2413
SUMNER AVE
2472
2462
2418
2419
2420
2453
2473
FRANKLIN ST
1954
1981
5337
1950
FLINT ST
1953
5338
1961
1962
2400
OTTERY ST
2399
2401
2403
MAIN ST
ELLIS ST
2414
2415
2417
2422
LANGSTAFF ST
RILEY ST
Manholes in aley between Sumner / Pottery off Main
MH-1403 and MH-1413

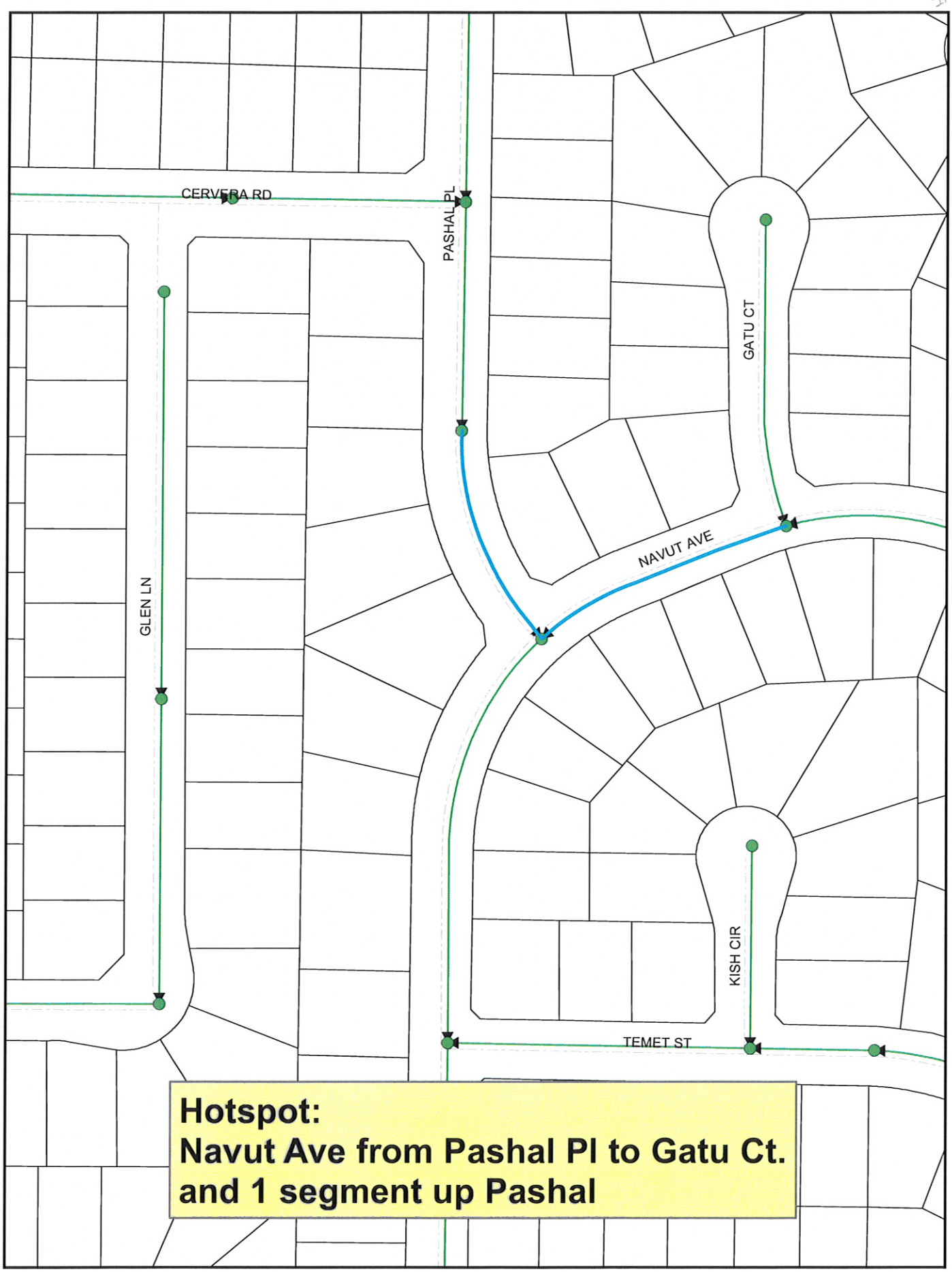


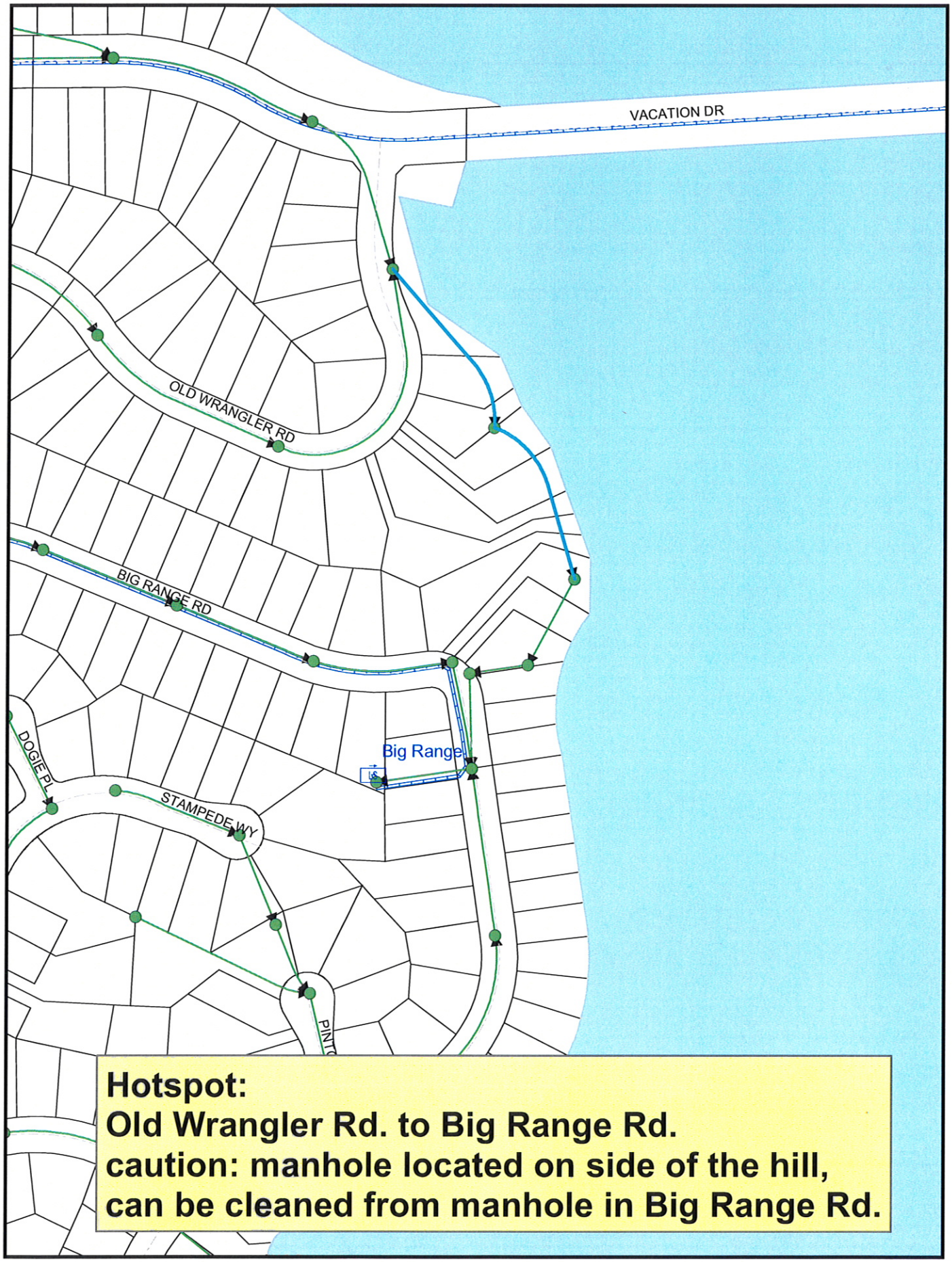
Hotspot:
Monroe Ave and Sunflower Rd,
2 segments east of Sunflower


GLANDT CT
BLACK DEER DR
HAYSTACK DR
INDIAN CREEK DR
ALMONDWOOD DR
COLT DR
COWPOKE CT
ROAN CIR
MOUNTAIN RD
HORSETHIEF CANYON RD
MOUNTAIN VIEW CT
LUCKY SPUR LN
HAVEN ROCK CT
PLACID HILL DR
INDIAN BOW CIR
EAGLE NEST DR
COBBLE DR
GOLD RUSH DR
Mountain View, check manhole for roots.
MH-176

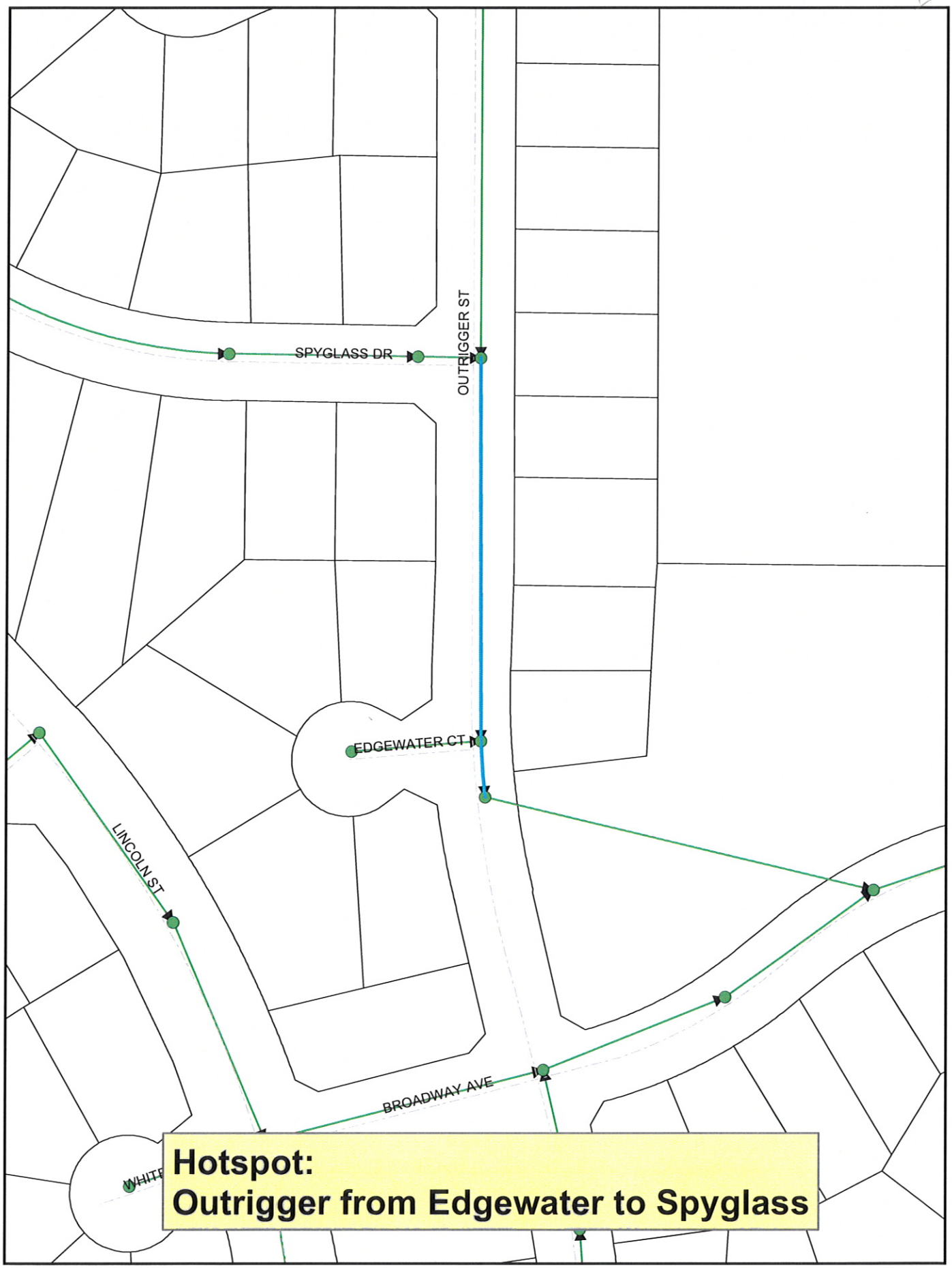
#23

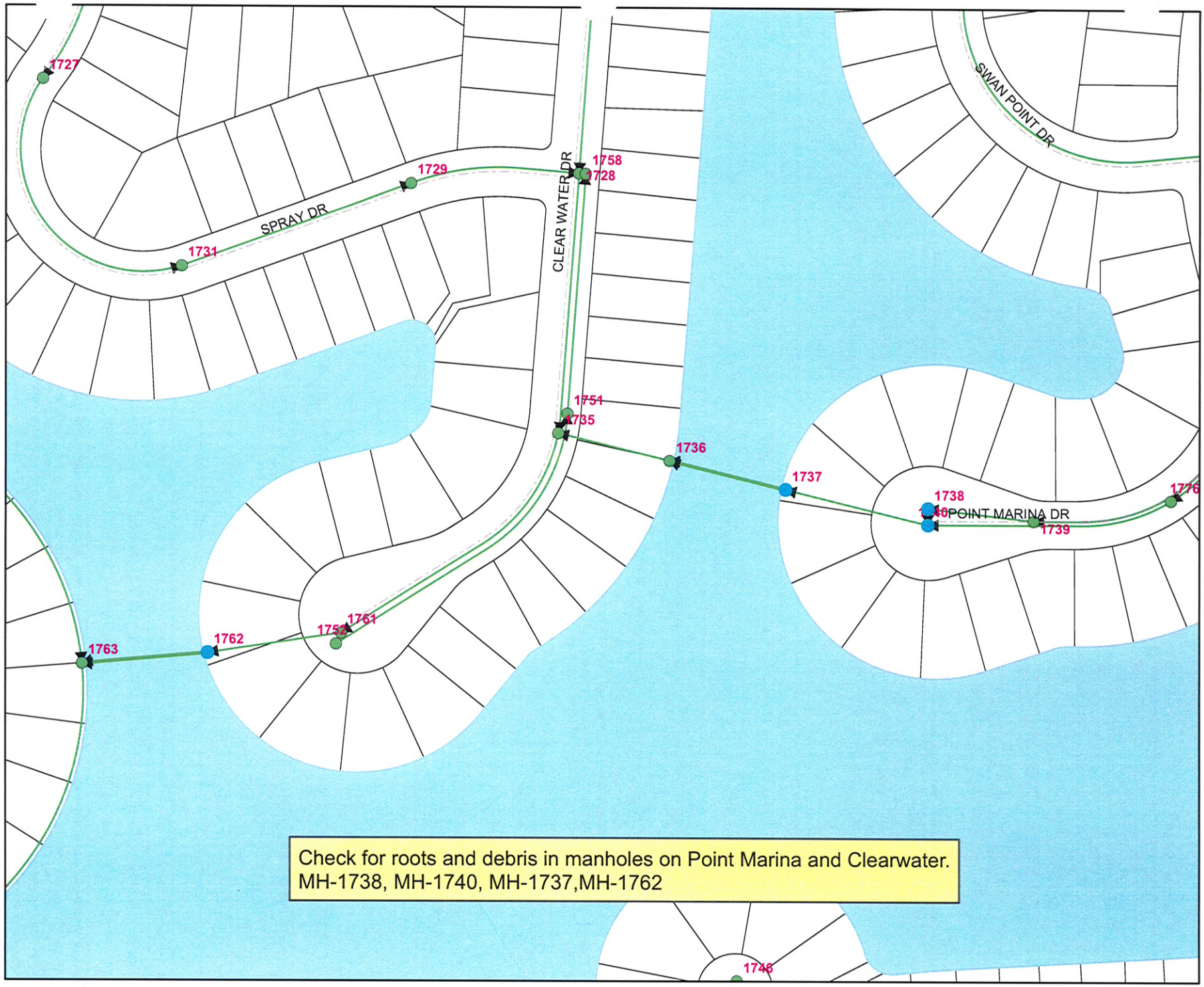
JOY AVE
QUAIL DR
NASHLAND AVE
RAVEN DR
ORIOLE CT
CANARY CT
LINNET DR
ROBIN DR
RIVERSIDE DR
LINCOLN ST
FLANNERY ST
A-3
Hotspot:
Nashland to parking lot


CERVERA RD
PASHAL PL
GATU CT
GLEN LN
NAVUT AVE
KISH CIR
TEMET ST
Hotspot:
Navut Ave from Pashal Pl to Gatu Ct.
and 1 segment up Pashal

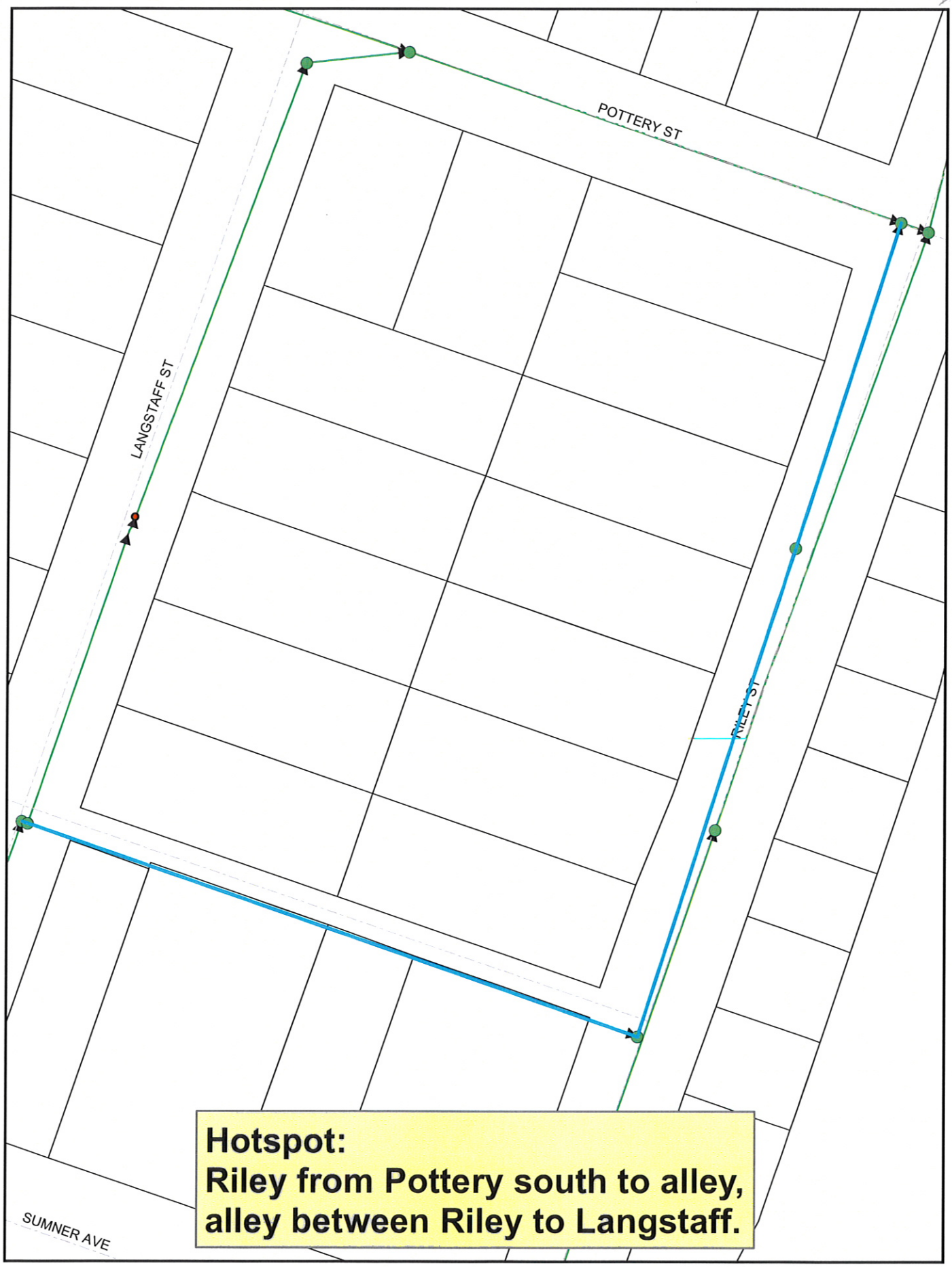


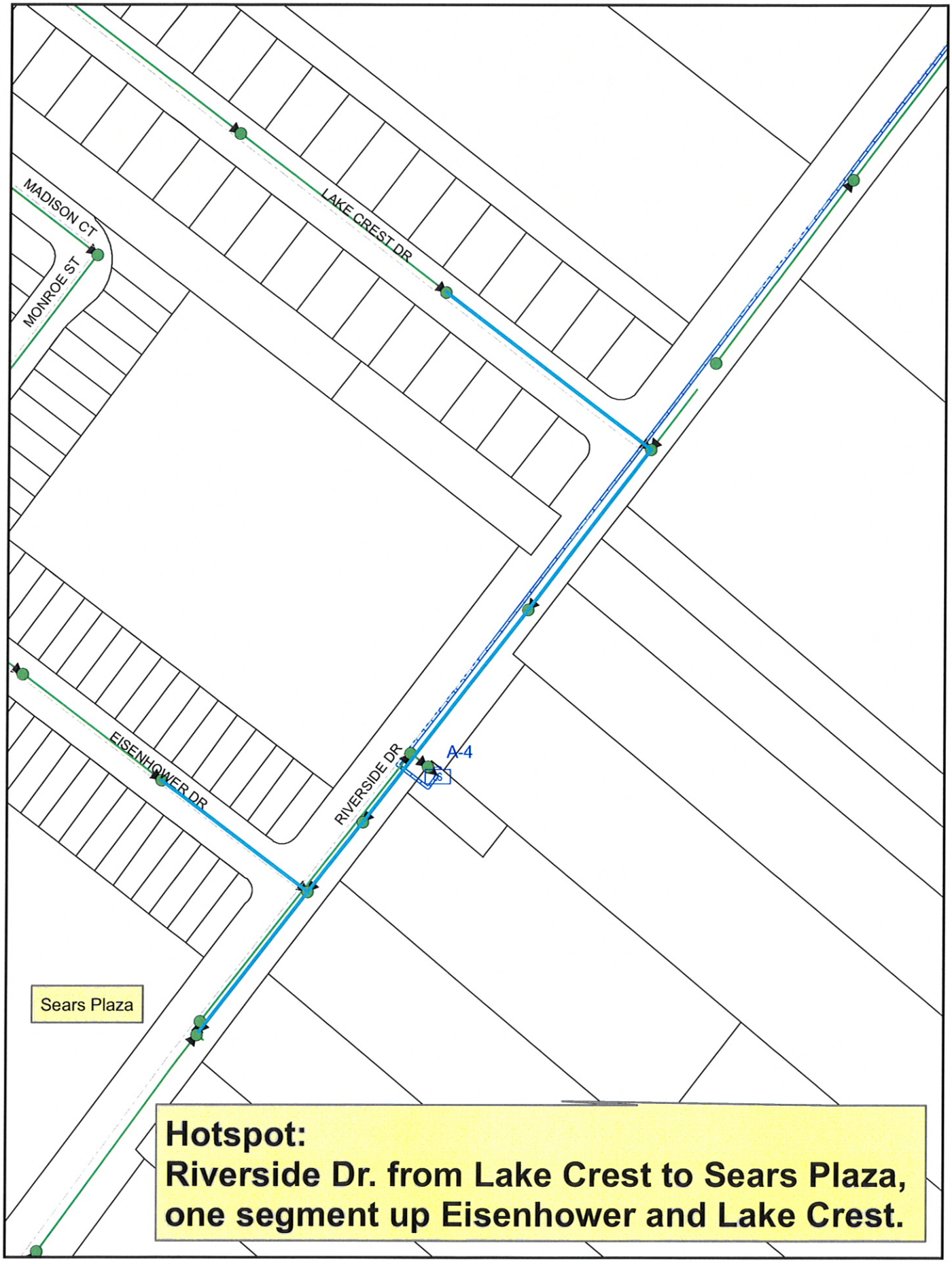
Hotspot:
Old Wrangler Rd. to Big Range Rd.
caution: manhole located on side of the hill, can be cleaned from manhole in Big Range Rd.


SPYGLASS DR
OUTRIGGER ST
EDGEWATER CT
LINCOLN ST
BROADWAY AVE
Hotspot:
Outrigger from Edgewater to Spyglass

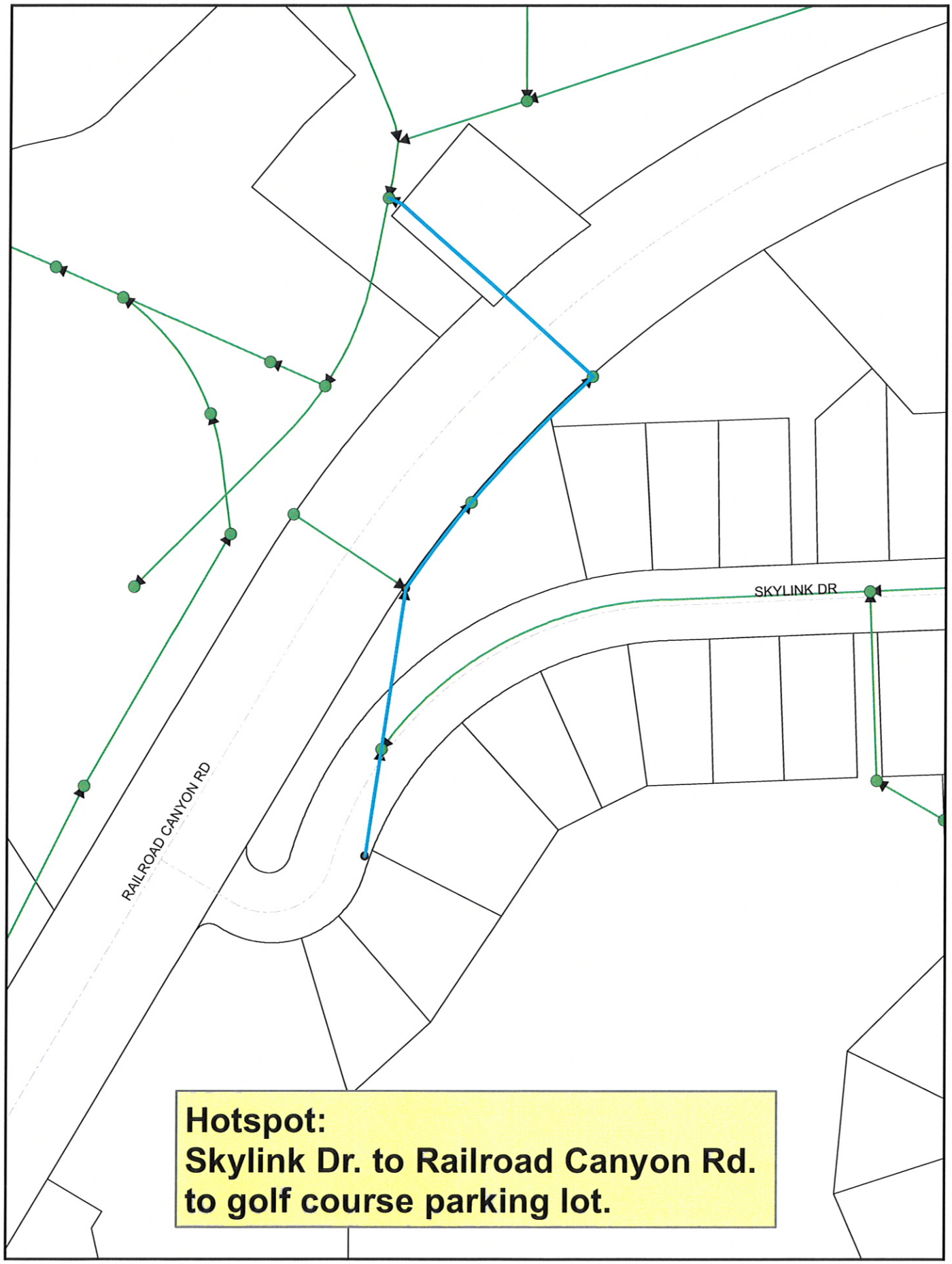

1727
SPRAY DR
1729
1731
CLEAR WATER DR
1758
1728
SWAN POINT DR
1751
1735
1736
1737
1738
POINT MARINA DR
1739
1776
1763
1762
1761
1752
1746
Check for roots and debris in manholes on Point Marina and Clearwater.
MH-1738, MH-1740, MH-1737,MH-1762

#'28


POTTERY ST
LANGSTAFF ST
RILEY ST
SUMNER AVE
Hotspot:
Riley from Pottery south to alley,
alley between Riley to Langstaff.



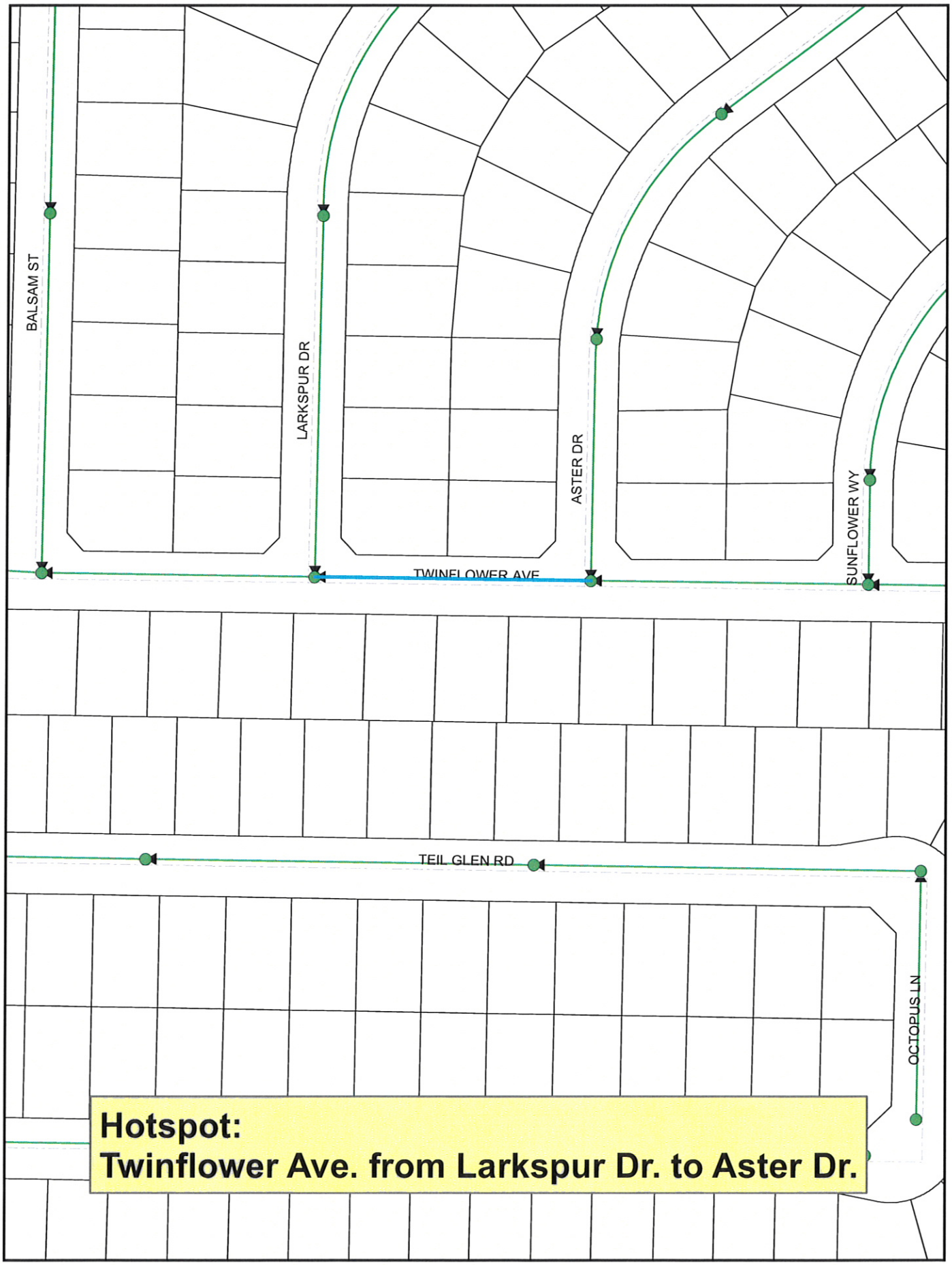
Hotspot:
Riverside Dr. from Lake Crest to Sears Plaza, one segment up Eisenhower and Lake Crest.

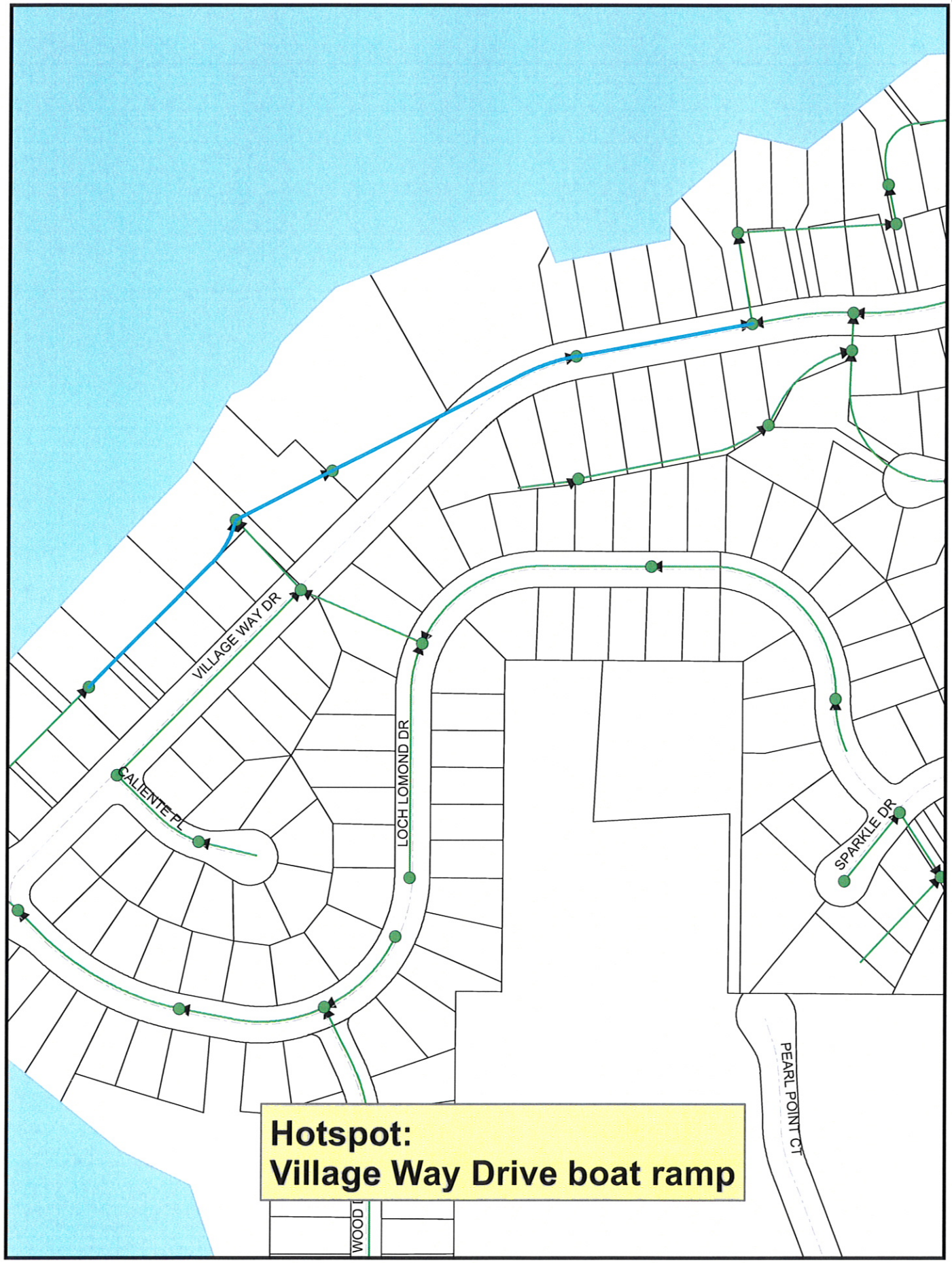

SKYLINK DR
RAILROAD CANYON RD
Hotspot:
Skylink Dr. to Railroad Canyon Rd.
to golf course parking lot.

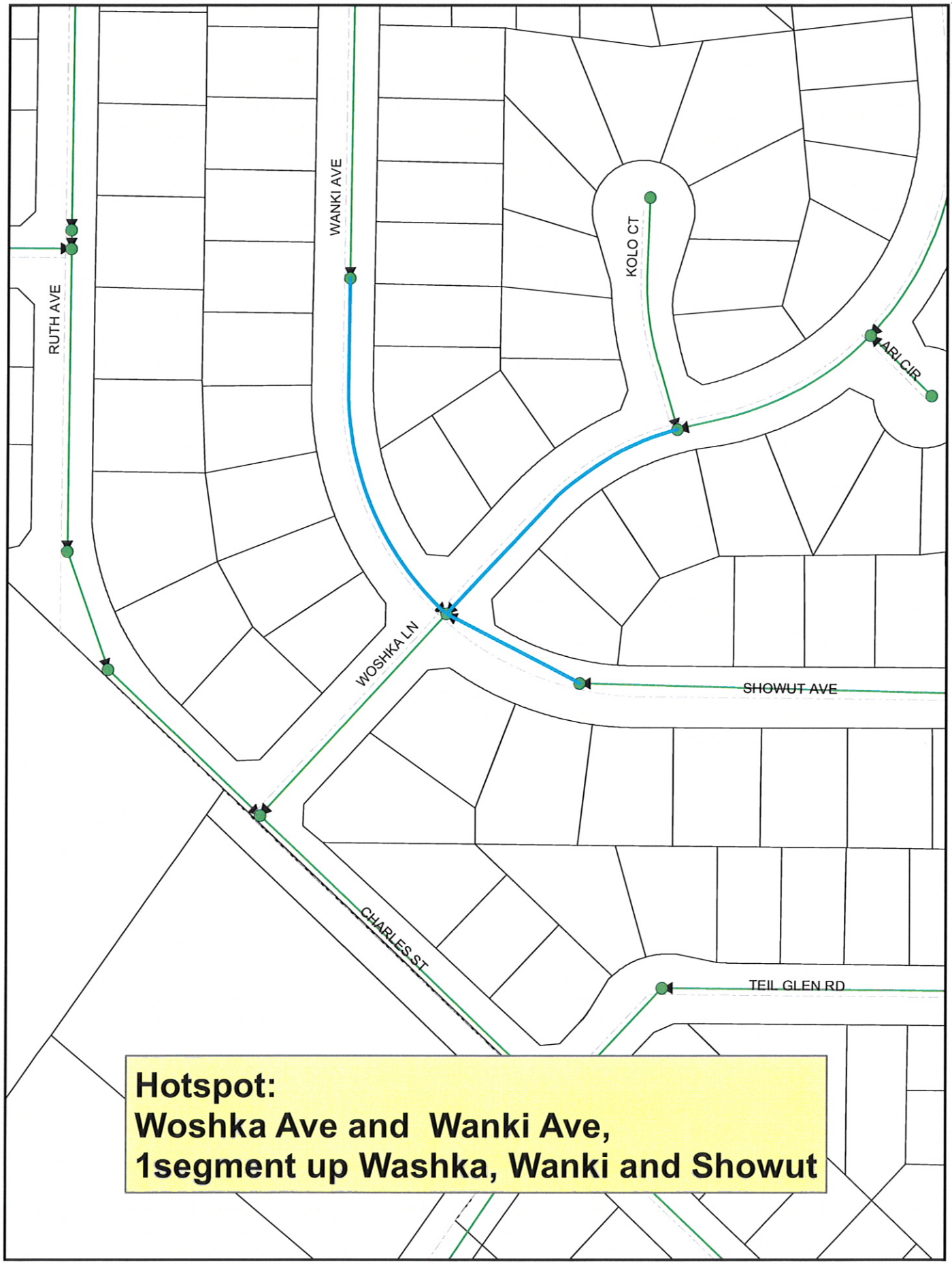
#31

Hotspot:
Sumner between Davis and Townsend, low pressure

#32


BALSAM ST
LARKSPUR DR
ASTER DR
SUNFLOWER WY
TWINFLOWER AVE
TEIL GLEN RD
OCTOPUS LN
Hotspot:
Twinflower Ave. from Larkspur Dr. to Aster Dr.


VILLAGE WAY DR
LOCH LOMOND DR
CALIENTE PL
SPARKLE DR
PEARL POINT CT
Hotspot:
Village Way Drive boat ramp


WANKI AVE
KOLO CT
RUTH AVE
ARI CIR
WOSHKA LN
SHOWUT AVE
CHARLES ST
TEIL GLEN RD
Hotspot:
Woshka Ave and Wanki Ave,
1segment up Washka, Wanki and Showut

APPENDIX J – EQUIPMENT AND REPLACEMENT PARTS INVENTORY

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Appendix J Inventory Parts and Equipment List

Submersible Pumps and Motors

FRAME	MAKE	HP	RPM	ID
X320TY	RELIANCE	25	875	1YLE62247A1
X320TY	RELIANCE	25	875	1YLE62247A2
X250TY	RELIANCE	15	1160	P25027070
	KSB	19		

Motors

FRAME	MAKE	HP	RPM	ID
286TPZ	ALLIS CHALMERS	15	1750	51-321-852
256VPZ DP	US MOTORS	10	1155	
213TPZ	ALLIS CHALMERS	5	1755	51-321-862
215HPZ	SMITH & LOVELESS	10	1745	ZN2I5TT1R8672ANL

Spare Pump Parts

PART DESCRIPTION	QUANTITY
TY210 POTHEAD AND CABLE USED	1
TY250 POTHEAD AND CABLE USED	1
TY320 POTHEAD AND CABLE USED	1
TY320 POTHEAD AND CABLE NEW FOR NEW LONGHORN	2
TY320 POTHEAD AND CABLE NEW FOR MCVICAR	2
IMPELLAR FOR NEW LONGHORN	1
PUMP FRAMES AND VOLUTES WITH 90 DEGREE SUCTION FLANGE FOR A-3	2
1 3/8" OD SHAFT BY 10" OD LENGTH	2
4" WEAR PLATE TO FLANGE ADAPTOR	2
TY250 CLAW ASSEMBLEY	3
TY320 LIFTING BAIL	3
TY250 LIFTING BAIL	1
12" OD x 2.5" ID IMPELLAR	2
13.5" OD x 1.75" ID IMPELLAR	1

Electrical Parts

PART DESCRIPTION	QUANTITY
ASCO 940 TRANSFER SWITCH	1
DIALOG ELITE DIALER FROM OLD LIGHTHOUSE	1
9070E01D1 CONTROL TRANSFORMER PRIMARY VOLTS 220/440 230/460 240/480 SECONDARY VOLTS 110 115 120 0.05 KVA 60 HZ	2
9070T250D1 CONTROL TRANS PRIMARY VOLTS 220/440 230/460 240/480 SECONDARY VOLTS 110 115 120 0.16KVA 60 HZ	3
MOTOR SAVER PANEL DISPLAY MOD.520-RDF	10
MOTOR SAVER CONTROL MOD. 520CS-115	10

Appendix J Inventory Parts and Equipment List

Electrical Parts

PART DESCRIPTION	QUANTITY
MOTOR SAVER CONTROL MOD. 101	2
CT'S INSTRUMENT TRANSFORMER INC. CURRENT TRANSFORMER MOD. 2RL-500	9
LIQUID LEVEL SWITCH MOD. 2A551	1
GE INDICATOR LIGHT MOD. CR104PLG32	16
OVERLOAD RESET KIT MOD. 49MARSR	11
GE SINGLE CIRCUIT CONTACT BLOCK MOD. CR104PXC1	15
HD OIL LIGHT PUSH BUTTON CR 104 PBG00UI	5
BURNDY VERSI-POLE TERMINAL BLOCK MOD. BDC-11-2/0-1	2.5
REDDINGTON HOUR METER 120 VAC CAT. 48905	9
12" LONG 12 GA TERMINAL BLOCK STRIP	1
MOTOR STARTER OVERLOAD MOD. CR123C180B	3
A-3 VFD FANS NMB-MAT MOD. 2410ML-04W-B60 12 VDC 0.40A	2
D152 LEVEL CONTROLLERS	2
MAGNETIC MOTOR STARTER CR306C002 SIZE 1 115-120 COIL 3 POLE 3 OVERLOADS	3
MAGNETIC MOTOR STARTER CR306D002 SIZE 2 115-120 COIL 3 POLE 3 OVERLOADS	3
CRAMER COMPANY HOUR METER MOD. 6X137	1
BUBBLER COMPRESSOR MOTOR "2 NEW" MOD. HH2OP	7
CONERY HIGH/LOW LEVEL FLOAT MOD. 2902-B4S2-50 FT	2
SPECTRA RMS ACCESSORY CAT. SRPE150A125	1
SIEMENS HOA BLACK KNOB MOD. 3SB02-3MKBP	1
SIEMENS MILLTRONICS ISOLATOR LIS1 SER. 580152 ITEM 51014421	1

Appendix J Inventory Parts and Equipment List

Electrical Parts

PART DESCRIPTION	QUANTITY
TERMINAL BLOCK 175A-600V BUSS 3LINE MOD. BUSS 16321-3	1
GE PORTABLE SUPPLEMANTARY POWER SUPPLY MOD. TVPBP	1
WEATHER PROOF OUTLET BOX MOD. 1B503	3
WARRICK CONTROL MOD. 1D1E0	12
IDEC HOA SWITCH MOD. HWIS-3JTF21NI	1
IDEC POWER SUPPLY 24V DC 1.3A TYPE PS5R-C24 CAT. 71007	1
24 HR TIME SWITCH 120 VOLT MOD. 2A517	2
OMRON POWER SUPPLY TRANSFORMER 120V INPUT 6V DC OUTPUT MOD. 97ADPT	1
SIEMENS 40 AMP BREAKER MOD. ED43B040L	1
ASCO ATS PC BOARD 295462 120 VOLT	1

Other Related Parts

PART DESCRIPTION	QUANTITY
KENNEDY 3" CHECK VALVE NEW	1
APCD 8" CHECK VALVE USED	2
500FT SPOOL 1/4" STAINLESS CABLE	1
6" CHECK VALVE FOR PORTABLE LIFTSTATION	1
CHEMICAL MIXER MOTORS WITH SHAFT MODEL G-13	4

Equipment

EQUIPMENT DESCRIPTION	QUANTITY
ON SITE STANDBY GENERATORS	32/33
PORTABLE GENERATORS	5
DUMP TRUCKS	4
BACK HOES	3
SERVOCE TRUCKS	9
SUPPORT VEHICLES	
COMBINATION SEWER LINE CLEANING UNITS	2
SECTIONAL RODDER WITH 300 FEET OF ROD	1
CCTV VAN	1
MOBILE CRANES	3
PORTABLE LIFT STATION/PUMP	1
TRAILER MOUNTED HOSE REEL WITH 1,950 FEET OF LAY FLAT HOSE	1

Source: Data Provided by District Staff

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APPENDIX K – EXCERPTS OF DISTRICT STANDARD SPECIFICATIONS AND DRAWINGS

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SET NO: 06-_____

Elsinore Valley Municipal Water District

Standard Specifications And Drawings

FOR THE CONSTRUCTION OF POTABLE WATER, RECYCLED WATER AND SEWER FACILITIES

SEPTEMBER 2006

Sewer

2.04 SEWER REQUIREMENTS

A. Mainline Size

No public collection sewer shall be smaller than 8 inches in diameter, except as authorized by the District.

The following criteria shall be used in determining the size of pipes:

1. Residential Areas - 100 gal/capita/day average

2. People/Dwelling Unit - 2.5 Single family residence

3. Check with District for criteria to be used for other types of development.

4. The design peak flow in c.f.s. can be calculated from the average flow by: Peak flow = 1.84 (average flow in cfs) $^{0.92}$

5. Sewers over 12 inches in diameter shall be designed to flow 2/3 full. Sewers 12 inches in diameter or less shall be designed to flow ½ full.

6. For other sewer demand factors use the water requirement table (Section 2.02 A for average daily demand factors divided by two.

B. Design Criteria

1. The value of 0.013 shall be used as a coefficient of roughness equivalent to Manning's "n".

2. All sewers shall be designed and constructed with hydraulic slopes sufficient to give mean velocities at design peak flow of not less than 2.0 feet per second. Maximum allowable velocity in the sewer shall not be greater than 10.0 feet per second.

3. Following are minimum slopes and pipe material that should be provided under normal depth conditions:

Sewer Size, inches	Minimum Percent Grade	Pipe Material
4	2.0	SDR-35 PVC
6	1.0	SDR-35 PVC
8	0.4	SDR-35 PVC
10	0.32	SDR-35 PVC
12	0.24	SDR-35 PVC
15	0.15	SDR-35 PVC
18	0.12	SDR-35 PVC
21	0.09	Vylon
24	0.08	Vylon
27	0.06	Vylon

4. For depths of cover in excess of 15 over the top of the sewer, for pipes 4 inches through 12 inches in diameter, the pipe material shall be C900 PVC Class 100 (DR 25). For depths of cover greater than 15 feet, and for pipes 15 inches and 18 inches in diameter, the pipe material shall be C905 PVC Class 165 (DR 25) and a diameter of 16 inch shall be used for the 15-inch diameter sewer..

5. Manholes shall be installed on sewer mains at all changes in slope, size of pipe, alignment and at all intersections of main line sewers.

   a. The maximum allowable spacing between manholes is 400 feet. See Section paragraph D, Section 2.03 of the Standard Design Requirements for curved sewer exceptions.

   b. A minimum drop 0.10 foot shall be used for sewer with slopes less than 7.5 percent. For sewer greater than 7.5 percent, the following formula shall be used to determine the drop, up to a maximum drop across the manhole of 0.60 feet:

      Drop in feet = $2(S_1 + S_2) \times (D_1 + D_2)/2$, for sizes up to and including 15 inches where,

      S_2 = Invert slope leaving manhole in feet/foot
      S_1 = Invert slope entering manhole in feet/foot
      D_2 = diameter in feet of outlet pipe
      D_1 = diameter in feet of inlet pipe

   c. Where the inlet pipe size is of a smaller diameter that the outlet pipe, the inlet pipe shall be designed to be at the same soffitt elevation as the outlet pipe.

   d. For a 90 degree bend through the structure, a minimum of 0.20 foot and a maximum of 1.00 foot shall be used.

   e. For sizes over 15 inches, obtain authorization of drop across manhole from District.

   f. Minimum inside dimension of manholes shall be 48 inches.

   g. Where diameter of the downstream pipe is larger than the diameter of the upstream pipe, the soffit of the downstream outlet shall not be higher than the soffit of the upstream inlet.

   h. Five foot diameter manholes shall be used when sewer depths exceed 12 feet or when more than two mains or buildings laterals enter into the manhole. Five foot diameter manholes shall also be used to connect pipe sizes 18 inches in diameter and larger.

   i. Manholes located within an intersection inlet channels and a stub-out shall be provided in all directions for each intersecting roadway or easement, in addition to the main inlet and outline pipe. This requirement will apply to locations

where the roadway could be extended, at a future time, but is currently undeveloped.

j. Manhole shall be located at the end of sewers where it is anticipated that the roadway or the sewer may be extended in the future. A minimum stub of 5 feet shall be provided in the direction of the future extension.

k. Manholes at the downstream end of a steeply sloped sewer shall be PVC-lined and provided with a sealed lid. Manholes upstream of a steeply sloped short-length sewer shall be PVC-lined with a sealed lid. The implementation of the requirement related to PVC lining for steeply sloped sewer shall be solely at the District's discretion.

l. Manholes located in non-paved areas shall have a 10-foot by 10-foot paved area surrounding it in accordance with Standard Drawings S-10.

6. Where a proposed sewer connects to an existing manhole, the elevation of the inlets and outlets shall be shown in profile as determined by actual survey. If an existing sewer is straddled by a new manhole, the elevations of the proposed manhole shall be determined by actual survey. The applicant's private engineer shall submit the field notes.

7. The minimum vertical distance between sewers and other utilities shall be one (1) foot, outside of pipe to outside of pipe.

8. When an existing "live" sewer exists in an easement or unpaved roadway, and construction is proposed adjacent to the sewer (and the street will be paved), the existing manholes shall be covered and protected as follows:

   a. Prior to construction, cover existing manhole with 2 layers of 20 mil visqueen.

   b. Cover visqueen with ¾-inch plywood cut to a diameter 2 inches larger than manhole diameter.

   c. Place sandbags (6 minimum) over plywood to weight down.

   d. Remove sandbags, plywood and visqueen after road is paved. For easements, remove after grading and construction has been completed.

C. **Horizontal Alignment**

Sewer shall be located as follows:

1. In public streets parallel to and 6 feet north or east of the street centerline. When located in narrow streets where potable water and recycled water are present, the sewer alignment may differ from the 6-foot requirement (alignment to be reviewed by the District under these conditions).

2. In local residential and industrial streets, pipe is to be located six (6) feet off the street centerline in the middle of the driving lane. In major, primary, and secondary highways, pipe will be located in the center of the driving lane nearest to the center of the street. Pipe will not be located in median strips or parking lanes.

3. On curvilinear streets, the pipe shall be concentric or parallel to the street centerline.

4. The standard minimum distance between the sewer and other utilities is five (5) feet outside of pipe to outside of pipe, except for potable water and recycled water lines, which shall be ten (10) feet outside of pipe to outside of pipe.

D. **Curved Sewer**

Curved sewers shall be designed using the following requirements:

1. No curved sewers with radius less than 200 feet or the manufacturer's minimum recommended radius, whichever is greater, will be permitted.

2. Longitudinal bending deflections shall not exceed 1-1/2 degrees or 80-percent of the manufacturer's recommended maximum allowed deflection, whichever is less.

3. Manholes are required at the beginning of curve (B.C.), or end of curve (E.C.).

4. Manhole spacing in curved runs shall not exceed 300 feet.

5. Minimum slopes shall be 50 percent greater than those given in paragraph B.3, Section 2.03 of the Standard Design Requirements, if the radius for the curve requires the use of high deflection couplings to construct the horizontal curve.

E. **Sewer Depth**

The minimum cover to the top of sewers is seven (7) feet. However, in some instances, if the existing outlet sewers are too shallow to obtain such a depth, a shallower depth may be approved. Shallow sewers are subject to specific review and authorization by the District and may require additional protection. The District may require greater depths where it is necessary to extend sewers to serve other areas.

F. Service Laterals

The following criteria apply to the design of sewer laterals:

1. A 4-inch sewer service lateral shall be installed for each property occupied by a single-family dwelling provided a minimum 2 percent grade from the main line sewer to the property line can be maintained with a minimum 5-1/2 feet of depth below the surface at the property line.

2. A 6-inch service lateral may be laid on a grade of one percent.

3. Sewer lateral connections to the main cannot be made within 3 feet of each other nor closer than 3 feet from the outside of a manhole.

4. Any sewer laterals installed within driveways will be required to be removed and relocated away from the driveway.

5. All service laterals shall be constructed perpendicular to the sewer main. If impractical or impossible to do so, the service lateral may enter the main sewer at any angle up to 45 degrees measured from the upstream side of the lateral, subject to District review.

6. A service lateral shall be installed for each property along a main line extension.

7. A cleanout one foot inside of the property must be installed as shown on Drawing S-12.

8. For multiple-family dwellings, commercial lots, schools, etc., calculation should be submitted to determine the proper size of the lateral, but shall be no less than 6 inches in diameter.

9. If sewer laterals appear to have less than 2 feet of vertical clearance while crossing under the water main, profiles of sewer laterals may be required to be plotted at the District's discretion. Minimum clearances shall be in accordance with State of California Department of Health Services requirements and the Standard Drawings.

10. Deep cut risers or chimneys shall be used only upon written District authorization.

11. All sewer laterals shall be constructed of polyvinyl chloride pipe.

12. Alternate types of materials proposed by the private engineer, such as ductile iron, may be used for special applications or conditions, with prior written approval by the District.

13. All sewer laterals must be shown in a laterals table and include the stations, length, and depth at property line, slope and remarks.

14. Provide a backwater valve in accordance with the Standard Drawings for sewer laterals to properties where the house slab elevation is below the nearest upstream manhole rim elevation.

G. Inverted Siphons

Inverted siphons should be avoided wherever possible. Where required, at least two barrels should be designed with a minimum pipe diameter of six inches and a minimum velocity of 3 fps in each barrel.

H. Easements

Sewer easements shall comply with the requirements set forth in paragraph Y, Section 2.02 of the Standard Design Requirements, except that the final width for a sewer easement will depend upon the depth of the sewer, the soil conditions encountered and easement location.

I. TV Inspection

Final inspection of all sewer lines shall be by color TV camera. A color video in DVD (TV) format shall be recorded in the presence of the District's Inspector and presented to the District along with a written report of the location of laterals, manholes and any defects encountered. The video shall be in color and show stationing and locations of all manholes and laterals. The DVD shall have a program embedded that will allow indexing of information to be performed. The developer and/or contractor shall bear all costs for the video inspection process.

Any areas showing evidence of reverse slope as indicated by ponding water or dips in vertical pipe alignment, as well as any other defects shall be repaired to the satisfaction of the District at the Contractor's expense.

END OF SECTION

Standard Specifications

SECTION 03461
PRECAST CONCRETE MANHOLES

PART 1 – GENERAL

1.01 DESCRIPTION

This section includes materials, testing, and installation of precast concrete manholes for sewers or for access to below grade water mains and appurtenances.

1.02 REFERENCE STANDARDS

The publications listed below form part of this specification to the extent referenced and are referred to in the text by the basic designation only. Reference shall be made to the latest edition of said standards unless otherwise called for.

ASTM A 48	-	Gray Iron Castings
ASTM C 478	-	Precast Reinforced Concrete Manhole Sections
ASTM C 478M	-	Precast Reinforced Concrete Manhole Sections [Metric]
ASTM C 923	-	Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals

1.03 RELATED WORK SPECIFIED ELSEWHERE

A. EVMWD Standard Drawings
B. Trenching, Backfilling and Compacting: Section 02223
C. Cast-in-Place Concrete: Section 03300
D. Field Painting and Coating: Section 09902

1.04 SUBMITTALS

A. Submit shop drawings in accordance with Standard Specification Section 01300.

B. Submit manufacturer's catalog data on precast items. Show dimensions of vault and location of openings including thicknesses of shaft and cone sections and grade rings.

C. Submit manufacturer's design calculations and certification signed and sealed by a professional civil or structural engineer registered in the State of California the precast section design and construction comply with the specified design load conditions and the referenced ASTM specification.

D. Submit manufacturer's catalog data, descriptive literature and installation instructions for the recommended waterproofing material.

1.05 SEWER MANHOLES

Sewer manholes shall have inside diameters consistent with the sizes stated in EVMWD Standard Drawing Nos. S-4 and S-5.

1.06 DROP MANHOLES

Use 60-inch diameter drop manholes for sewer applications and constructed only at locations shown on the approved plans in accordance with EVMWD Standard Drawing No. S-8.

1.07 CORROSION PROTECTION

A corrosion protection lining and/or coating as described in these specification's shall be applied to the interior of manholes for sewer mains 18-inch or larger, and to all drop manholes and manholes with excessive difference in inlet and outlet slopes, as determined by the District, regardless of sewer pipe size.

1.08 DAMP-PROOFING

A damp-proofing material shall be applied to the exterior portions of manholes in accordance with Section 03300 and as directed by the District when located at or below the water table or when moisture or seepage is indicated.

1.09 JOINT SEALING

Joint sealant shall be used to form a continuous watertight seal on the concrete base and between successive precast concrete manhole or vault sections.

1.10 SAFETY GRATING

A safety grating shall be provided above the drain channels in manholes and drop manholes for sewer mains 18-inch and larger. Safety grating shall be installed only in locations shown on the plans or as called for by the District.

1.11 VACUUM TESTING OF MANHOLES

Vacuum testing of manholes is intended for testing precast concrete manhole sections to demonstrate the integrity of the installed materials and construction procedures.

PART 2 - MATERIALS

2.01 PRECAST CONCRETE MANHOLES

A. Precast components and other appurtenant materials shall be selected from the Approved Materials List.

B. Precast concrete manhole components shall be in accordance with ASTM C 478 and the Standard Drawings.

C. Manhole components shall be designed for H-20 highway wheel loading and specific site conditions.

D. Manhole bases may be either precast or cast-in-place, as appropriate for the application, with a formed recess shaped to match the first precast shaft section. The manhole base shall extend 1 foot below the bottom of the lowest pipe and 6-inch above the top of the largest pipe. Manhole bases for mains 18-inch or larger shall incorporate a 4-inch wide grating-support ledge, cast integrally with the drain channels, at the top of the base.

E. Manhole shafts shall be fabricated only from precast shaft sections, eccentric cone sections and grade rings.

F. Pipe penetrations for sewer applications shall incorporate a watertight flexible pipe connector or ring-type seal according to the method of manhole construction as shown in the Standard Drawings. Precast manholes shall utilize either an integrally cast embedded pipe connector, or a boot-type connector installed in a circular block out opening in accordance with ASTM C 923. Connections to existing manholes shall utilize a boot type connector per ASTM C 923 installed in a cored opening. Cast-in-place bases shall incorporate a ring-type seal on the pipe to be embedded in the concrete.

G. All drop manholes regardless of the size of the sewer main, shall be PVC lined and polyurethane coated. Precast shaft sections, cone sections and grade rings on PVC-lined manholes shall have an integrally-cast PVC T-shaped liner of 0.065-inch minimum thickness. A 100% solids elastomeric polyurethane coating shall be applied to exposed concrete at the interior of precast and cast-in-place bases. Other manholes may require PVC lining as determined by the District

2.02 CRUSHED ROCK BASE AND BACKFILL MATERIALS

Crushed rock base and backfill materials shall be in accordance with Section 02223.

2.03 MANHOLE FRAMES AND COVERS

A. Manhole frames shall be 30-inch diameter single piece cover, made of cast-iron in accordance with ASTM A 48, Class 30, the Standard Drawings and the Approved Materials List. Locking frames and covers, in accordance with the Standard Drawings, may be required as determined by the District.

B. A 36-inch diameter manhole with two concentric covers shall be used where indicated on the drawings.

C. Frames and covers shall be designed for H-20 highway wheel loading.

D. Covers shall have the words "'EVMWD' and 'WATER', 'RECYCLED WATER', or, 'SEWER"' cast into the cover as appropriate to the application. No other lettering will be permitted on the top portion of the cover.

Castings shall be smooth, clean, and free from blisters, blowholes, and shrinkage. Mating surfaces of the frame and cover shall be machined to prevent movement of the lid. Frames and covers shall be match marked in sets before shipping to the site.

E. All castings shall be dipped twice in a preparation of asphalt or coal tar and oil applied at a temperature of not less than 290° F nor more than 310° F and in such a manner as to form a firm and tenacious coating.

2.04 CONCRETE

Concrete used for manholes and appurtenances shall be in accordance with Section 03300.

2.05 REPAIR MORTAR AND EPOXY BONDING AGENT

Repair mortar and an epoxy bonding agent shall be used to repair minor surface damage to precast sections or cast-in-place manhole bases at the discretion of the District. Repair products shall be in accordance with Section 03300.

2.06 CORROSION PROTECTION

PVC lining for manholes shall be accordance with Section 03475.

2.07 DAMP-PROOFING

Damp-proofing material shall be in accordance with Section 03300.

2.08 JOINT SEALING COMPOUND

Joint sealing compound shall be a mastic-type material in a flexible rope or rolled form with removable wrapper sized to fit into the key of manhole or vault sections. Joint sealing compound shall be selected from the Approved Materials List.

2.09 MORTAR

Mortar for use on joints between grade rings and for setting manhole cover frames shall be in accordance with Section 03300.

PART 3 – EXECUTION

3.01 WORK WITHIN EXISTING MANHOLES

Contractor shall comply with all Federal and State regulations for confined space entry. Work inside confined spaces, as defined by the applicable regulations, shall not be undertaken until all the tests and safety provisions of the Code of Federal Regulations 1910.146, and the General Industry Safety Orders of the California Code of Regulations, Title 8, Section 5159, for confined space entry have been performed and the area is verified as safe to enter. District policy prohibits entry into any confined space with Immediately Dangerous to Life and Health (IDLH) conditions except by trained emergency rescue personnel.

3.02 EARTHWORK

Manhole excavation, foundation stabilization (if necessary), placement of base material, backfill and compaction shall be performed in accordance with Section 02223.

3.03 MANHOLE BASE

A. The invert of precast and cast-in-place bases shall be hand-worked to provide channels conforming in size to the inside diameter of the piping as indicated on the Approved Plans. The channels shall vary uniformly in size and shape from inlet to outlet. The concrete base shall be shaped with a wood float and shall receive a hard steel trowel finish before the concrete sets. A template shall be used to accurately form the level surface that will receive the first precast section.

B. During construction of cast-in-place bases, all sewer mains and stub piping shall be in place, including ring-type seals, before concrete placement. Pipe grade and alignment shall be verified immediately upon placement of concrete to assure that the pipelines are in proper position prior to the concrete taking an initial set. The invert elevation and flow line of piping shall be as shown on the Approved Plans and Standard Drawings. The manhole base shall extend 1-foot below the bottom of the lowest pipe and 6-inch above the top of the largest pipe.

C. Cast-in-place bases shall set a minimum of 24 hours before the manhole construction is continued. In certain critical situations, the setting time may be reduced upon approval of the District.

3.04 INSTALLING MANHOLE SECTIONS

A. The concrete manhole base and successive precast sections will receive a mastic joint sealing compound prior to setting the precast sections in place as shown on the Standard Drawings. Following the vacuum testing as described in this section, the joints will be mortared and tooled to a smooth finish, free of voids. Note that sewer manholes are to be vacuum tested following assembly of the concrete sections, but prior to mortaring the joints, or backfilling.

B. Manhole components incorporating a PVC liner and polyurethane coating shall be installed and tested in accordance with these specifications, the manufacturer's recommendations, and the Standard Drawings. Upon assembly of the precast sections and vacuum testing as described in this section, the mortaring and finishing of joints shall be performed. The PVC liner seams at the joints shall then be welded. The PVC liner shall be secured by insertion between the uppermost grade ring and the manhole cover frame. Note that PVC lined sewer manholes are to be vacuum tested following assembly of the concrete sections, but prior to mortaring the joints, welding the seams of the PVC liner, or backfilling. The polyurethane coating of all exposed concrete on the manhole base shall follow completion of the entire installation and all construction activity within the manhole.

C. Assemble the precast sections to the elevation required by the location of the manhole as follows:

1. Paved Areas: Top of cover shall be flush with the finished paving surface.

2. Traveled Way: Top of cover shall be flush with the existing surface where it is in a traveled way.

3. Shoulder Areas: Top of cover shall be 1-inch above the existing surface where outside the limits of a traveled way. Vaults shall not be placed in roadside ditches without the prior approval of the District.

4. Unpaved easements: Top of cover shall be 6-inch above the ground surface. Guard Posts around the vault may be required in this area as directed by the District.

D. Secure the manhole frame to the grade ring with mortar.

E. After the frame is securely set the cover shall be installed. All necessary cleaning of foreign materials from the frames and covers shall be accomplished to ensure a satisfactory fit.

F. Where manholes are to be given a protective coating, they shall be free of seepage and surface moisture.

G. Piping installation adjacent to the manhole and connection to the base or shaft sections shall be performed as shown on the Standard Drawings and Approved Plans. Piping installation into flexible pipe connectors shall be in accordance with the manufacturer's recommendations for assembly, lubricants and limits of deflection.

H. In order to prevent accidental use of the new sewer before completion and acceptance, the new inlet to existing tie-in manhole(s) and the outlet of the first new upstream manhole(s) shall be sealed with expandable plugs. The District shall approve the specific location of these plugs. Plugs shall be removed at the time of final inspection or as directed by the District. Removal of all construction debris and water shall be completed prior to removal of plugs.

I. Brick or mortar bulkheads shall be installed by the Contractor at the manhole end of all unused stub channels over 36-inch beyond manhole base. The bulkheads are intended to prevent ponding of sewage and debris in the unused channels until such time as the manhole stub is connected and normal sewage flow can occur.

J. New connections to existing manholes, where stubs have not been provided, shall be made by core drilling through the walls or base as directed by the District. Flexible seals selected from the Approved Materials List and installed in accordance with the Standard Drawings shall be used for the pipe penetration. Apply a protective epoxy coating to the cored concrete and the ends of any reinforcing steel exposed in accordance with Section 03300.

K. A concrete collar shall be cast around manhole frames in accordance with the Standard Drawings.

L. Replacement of asphalt or concrete pavement shall be in accordance with the requirements of the agency having jurisdiction.

3.05 CORROSION PROTECTION

PVC lining shall be installed in accordance with Section 03475.

3.06 DAMP-PROOFING

At the discretion of the District, damp-proofing material shall be applied to the exterior surfaces of manholes in accordance with the manufacturer's recommendations and Section 03300. The material shall be applied to all exterior surfaces below a point 12-inch above the water table or indications of seepage or moisture as directed by the District.

3.07 VACUUM TESTING OF MANHOLES

A. Vacuum testing of manholes is required and shall be performed as directed in the presence of the District.

B. Vacuum testing equipment shall be as manufactured by P.A. Glazier, Inc. or equal.

C. Manholes shall be tested after assembly and prior to mortaring the joints or backfilling. In the case of manholes incorporating a PVC liner and polyurethane coating, the testing is to take place prior to mortaring the joints, welding the liner seams between sections, applying the coating, or backfilling.

D. All lift holes shall be plugged with an approved grout prior to testing.

E. All pipes entering the manhole shall be plugged, and bracing installed, to prevent the plug from being drawn into the manhole.

F. The test head shall be placed inside the top of the cone section and the seal inflated in accordance with the manufacturer's recommendations.

G. A vacuum of 10-inch of mercury shall be drawn. The time shall be measured for the vacuum to drop to 9-inch. The manhole shall pass the test if the time taken for the drop is greater than 60 seconds.

H. If the manhole fails the test, necessary repairs shall be made and the test repeated until acceptable results are obtained. The leak(s) shall be located and repaired according to their nature with material-in-kind.

3.08 PULL TESTING OF PVC-LINED MANHOLES

PVC-lined manholes shall have field-welded joints pull tested. Field welds shall withstand a pull test of at least 100 lbs per liner inch, applied perpendicularly to the concrete surface for a period of one minute, without evidence of cracks or separations. This test shall be conducted at a temperature of 70° F to 80° F inclusive.

3.09 HOLIDAY TESTING OF PVC-LINED MANHOLES

PVC-Lined and Polyurethane-coated surfaces shall be holiday tested with an electrical holiday detector as manufactured by Tinker and Rasor (Model #AP-W with power pack) with the instrument set at 20,000 volts and used as directed by the District. All imperfections identified on the PVC lining and polyurethane coating shall be repaired with materials-in-kind and the test shall be repeated until no holidays are evident.

END OF SECTION

SECTION 15043
SEWER LEAKAGE AND INFILTRATION TESTING

PART 1 – GENERAL

1.01 DESCRIPTION

This section designates the requirements and procedures for leakage and infiltration testing of gravity sewer pipelines. The Contractor shall furnish all labor, materials, tools, and equipment necessary to provide and complete leakage and infiltration testing as specified. It is the intent of the Plans and Specifications that the completed gravity sewer pipes of all types, along with manholes and other appurtenances, shall be watertight.

1.02 REFERENCED STANDARDS

The publications listed below form part of this specification to the extent referenced and are referred to in the text by the basic designation only. Reference shall be made to the latest edition of said standards unless otherwise called for.

UNI-B-6 - Recommended Practice for Low-Pressure Air Testing of Installed Sewer Pipe (Uni-Bell PVC Pipe Association)
SSPWC - Standard Specifications for Public Works Construction ("Greenbook")

1.03 RELATED WORK SPECIFIED ELSEWHERE

A. Trenching, Backfilling and Compacting: Section 02223
B. Precast Concrete Manholes: Section 03461
C. Hydrostatic Testing of Pressure Pipe: Section 15044

1.04 SUBMITTALS

Contractor shall furnish submittals in accordance with the requirements of Section 01300, Shop Drawing Submittals. The following submittals are required:

A. The Contractor shall furnish a detailed plan showing how the Contractor intends to test and flush the pipeline.

1.05 REQUIREMENTS PRIOR TO TESTING

Trenching for all dry utilities such as electrical, telephone and cable television shall be completed prior to performing any tests on the sewer pipe.

1.06 TESTING

A. The official tests for the District will not be made until after all other utilities have been installed and trench compaction verified.

B. All tests shall be made in the presence of the District .

C. All tests must be completed before the street or trench is paved, unless otherwise allowed by the District .

D. Leakage Test: Each section of sewer pipe between two successive manholes, or between a manhole and its corresponding cleanout or end plug, shall be tested for leakage. The sewer laterals to the property line shall be included in the test.

E. Infiltration Test: In addition to the leakage test, an infiltration test shall be made where groundwater is encountered, or evidence exists that ground water has encroached to the elevation of the sewer, and as directed by the District .

F. Closed Circuit Television: A closed circuit television inspection shall be required to be performed, by the Contractor, on the sewer installation.

G. Vacuum testing of manholes shall be performed in accordance with Section 03461.

H. Mandrel Test: Following the completion of the required testing, the placement and densification of backfill, and the installation of all utilities, and prior to the placing of the permanent paving, all PVC sewer pipe shall be cleaned and then mandrelled, to measure for obstructions (deflections, joint offsets, and lateral pipe intrusions).

I. Testing may be repeated, as directed by the District, if the subsequent construction operations of the Contractor or others may have damaged or affected the structural integrity of the sewer pipe and/or laterals.

PART 2 – MATERIALS

The Contractor shall furnish all labor, materials and equipment necessary for completing the testing process as specified herein. The equipment utilized by the Contractor shall arrive on the site in good and proper working order and ready for use.

PART 3 - EXECUTION

3.01 AIR TEST FOR PVC GRAVITY SEWERS

PVC pipe shall be air pressure tested in accordance with UNI-B-6.

3.02 INFILTRATION TEST

A. Prior to testing for infiltration, the ends of the sewer pipe section to be tested shall be cleaned using a Wayne Ball, capped or plugged to prevent the entrance of water, and pumping of groundwater shall be discontinued for at least three days.

B. Any infiltration discovered before completion and acceptance of the sewer shall be corrected. The sewer shall be examined and the source of infiltration eliminated. Following repairs or replacement as necessary, including backfill and compaction, the subject line shall be retested to assure no infiltration.

3.03 MANDREL TEST

Mandrel tests shall be in accordance with the requirements of the Standard Specifications for Public Works Construction (latest edition) Section 306-1.2.12. A rigid mandrel, with a circular cross section having a diameter of at least 95 percent of the specified inside diameter, shall be pulled through the pipe by hand. The minimum length of the circular portion of the mandrel shall be equal to the nominal diameter of the pipe.

Obstructions encountered by the mandrel shall be corrected by the Contractor. All material, equipment, and labor to perform the test shall be provided by the Contractor at no cost to the Owner.

3.04 PRESSURE TESTS FOR SEWER FORCE MAINS

Pressure tests for sewer force mains shall be in accordance with Section 15044 except that the allowable leakage shall be zero (0) gallons. All leak points shall be located and stopped. All defective pipe, fittings, valves and other appurtenances discovered shall be removed and replaced with sound material and tests repeated until the leakage is zero (0) gallons.

3.05 CLOSED-CIRCUIT TELEVISION INSPECTION

A. In addition to the leakage and infiltration tests, closed-circuit television inspections will be conducted. The inspection shall be conducted after all utilities have been installed, the backfill compaction certified, and after the line has been flushed and tested but prior to final paving.

B. Closed-circuit television inspections shall be performed in accordance with the Regional Supplement Amendments to the SSPWC, Section 306.

C. The video format shall be DVD with viewing program indexing.

D. All defects and evidence of reverse slope by ponding of water or dips in pipe alignment revealed by the closed-circuit television inspection shall be repaired to the satisfaction of the District at the Contractors expense.

3.06 VACUUM TESTING OF MANHOLES

Vacuum testing of manholes shall be performed in accordance with Section 03461.

3.07 FINAL ACCEPTANCE

The requirements of this section shall be considered acceptable when each sewer section's air leakage rate is less than the maximum allowed, the television inspection is satisfactory, and the water infiltration rate is zero.

END OF SECTION

SECTION 15044
HYDROSTATIC TESTING OF PRESSURE PIPELINES

PART 1 - GENERAL

1.01 DESCRIPTION

This section describes the requirements and procedures for pressure and leakage testing of all ductile iron (DI) and polyvinyl chloride (PVC) pressure mains.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Disinfection of Pipe: Section 15041
B. Backflow Prevention: Section 15112
C. Ductile Iron Pipe and Fittings: Section 15056
D. PVC Pressure Pipe: Section 15064

1.03 SUBMITTALS

A. Submit shop drawings in accordance with Standard Specification Section 01300.

B. Submit plan testing pressure pipeline. Plan should indicate source of water to fill pipeline, locations of temporary air release valves and blow-offs, equipment and materials required to deliver the potable water to the testing area, temporary thrust block locations and proposed point of discharge of the test water.

C. Submit request for potable water source from the District 96 hours in advance of testing date.

1.04 REQUIREMENTS PRIOR TO TESTING

A. All piping, valves, fire hydrants, services, and related appurtenances shall be installed prior to testing.

B. The pipe trench shall have trench zone backfill placed and compacted with a minimum of 3.0-feet of material over the pipe.

C. All concrete anchor blocks shall be allowed to cure until a minimum strength of 2,500 psi is achieved before testing.

D. Pressure tests on exposed and aboveground piping shall be conducted only after the entire piping system has been installed and attached to pipe supports, hangers or anchors as shown on the Approved Plans.

1.05 CONCURRENT HYDROSTATIC TESTING AND DISINFECTION OF PIPELINES

Hydrostatic testing of pipelines shall be performed prior to or concurrently with the disinfection operations. In the event repairs are necessary, as indicated by the hydrostatic test, the District may require additional disinfection testing. Any costs associated with additional disinfection testing after said repairs shall be borne by the Contractor at no additional cost to the District.

1.06 CONNECTION TO EXISTING MAINS

Hydrostatic testing shall be performed prior to connections to existing mains. District authorization for connection to the existing system shall be given only on the basis of acceptable hydrostatic, disinfection and bacteriological test results. Connection to existing mains shall be performed in accordance with Section 15000, General Piping Systems and Appurtenances.

PART 2 - MATERIALS

2.01 WATER

A. Potable water shall be used for hydrostatic testing of potable and recycled water mains when such testing is performed separately from disinfection operations.

B. Potable water shall be supplied by a District-approved source. Make-up water for testing shall also be potable water.

C. A chlorinated water solution, in accordance with section 15041, shall be used to charge the line and for make-up water when hydrostatic testing and disinfection operations are combined.

2.02 CONNECTIONS

A. Testing water shall be supplied through a metered connection equipped with a backflow prevention device in accordance with Section 15112 at the point of connection to the potable water source used.

B. The Contractor shall provide any temporary piping needed to deliver potable water to the piping that is to be tested.

PART 3 - EXECUTION

3.01 GENERAL

A. The Contractor shall provide the District with a minimum of four working days notice prior to the requested date and time for hydrostatic tests.

B. The Contractor shall furnish all labor, materials, tools, and equipment for testing.

C. Temporary blocking during the tests will be permitted only at temporary plugs, caps or where otherwise directed by the District.

D. All valves and appurtenances shall be operated during the test period. The test shall be conducted with valves in the open position.

E. At the onset of testing, all valves, air vacuum assemblies, blowoffs, and services shall be monitored for possible leakage and repairs made, if necessary, before the test proceeds. The appurtenances shall be monitored through the duration of the testing.

F. For pipe with porous lining, such as cement mortar, the pipe shall be filled with water and placed under a slight pressure for a minimum of two working days prior to the actual hydrostatic test.

3.02 FIELD TEST PROCEDURE

A. Before applying the specified test pressure, care shall be taken to release all air within the pipe and appurtenances to be tested. Air shall be released through services, fire hydrants, air release valves, or other approved locations.

B. A four (4) hour hydrostatic pressure test shall be performed after the pipe and all appurtenances have been installed and after any trench backfill compaction with heavy-duty compaction equipment has been completed. The hydrostatic test pressure shall be 50 psi above the working pressure of the pipe at the lowest point in the section being tested and shall be at least equal to the design class of the pipe at the highest point in the line.

The test pressure shall be applied and continuously maintained by pumping for a period of four (4) hours. During the pumping phase of the test, the test pressure shall be maintained at not less than 95% of the specified test pressure at all times.

At the end of the fourth (4th) hour, the pressure shall meet the requirements stated above. Pumping shall then be discontinued for one hour and the drop in pressure shall be recorded. Pumping shall then be resumed to restore the initial test pressure, and the quantity of water pumped into the line shall be accurately measured. This measured quantity shall not exceed that which would result from leakage at the following rates:

1. The allowable leakage for steel (flanged or welded) and ductile iron (flanged) pipe shall be zero.

2. The leakage for polyvinyl chloride (PVC) pipe, and for steel or ductile- iron pipes with rubber joints shall be considered as the total amount of water pumped into the pipe system after the fifth (5th) hour of testing. Allowable leakage during the fifth (5th) hour shall be in accordance with the following formula:

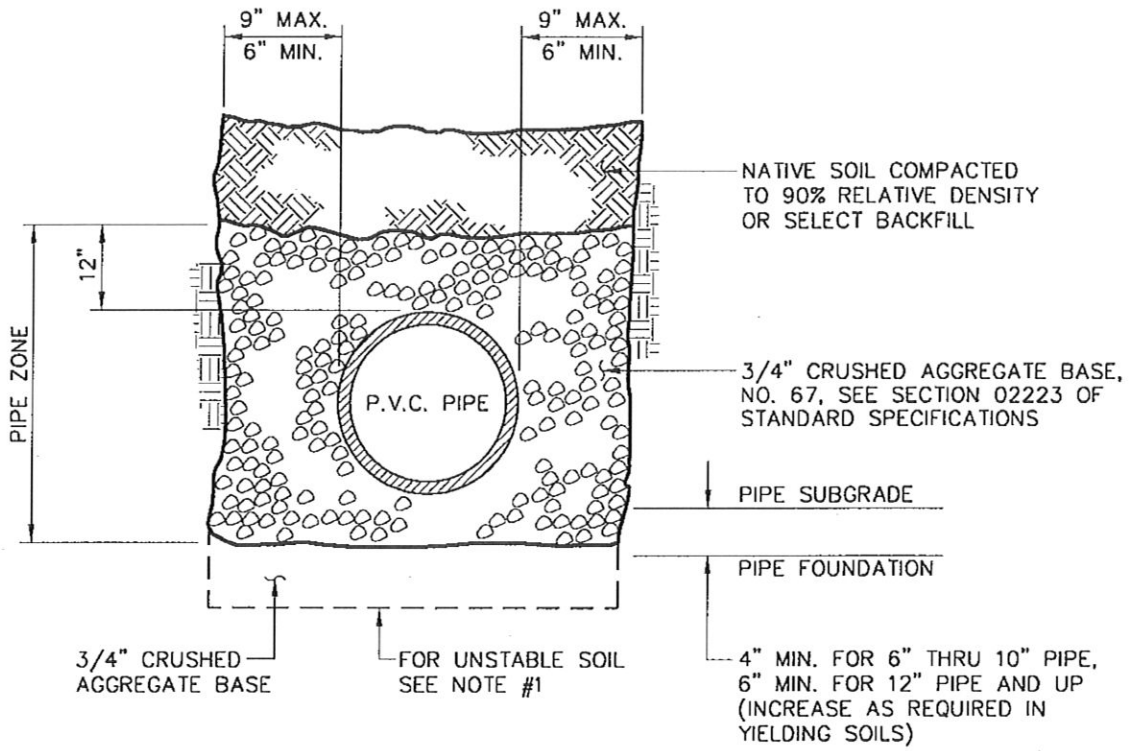
$$\frac{2 \text{ gal} \times \text{nominal diameter of pipe (in)} \times \text{length of pipe (ft)}}{24 \text{ (hrs)} \times 5{,}280 \text{ (ft)}}$$

If the leakage exceeds the allowable loss, the leak points shall be located and repaired as required by the District. All defective pipe, fittings, valves and other appurtenances discovered shall be removed and replaced with sound material. Additional disinfection shall be performed as necessary per Section 15041. The hydrostatic test shall be repeated until the leakage does not exceed the rate specified above. All visible leaks shall be similarly repaired.

END OF SECTION

Standard Drawings

Sewer



STANDARD BEDDING (P.V.C.)

NOTES:

1. IF UNSUITABLE SOIL IS ENCOUNTERED, DEPTH OF REMOVAL AND SIZE OF FOUNDATION ROCK WILL BE DETERMINED BY THE SOILS REPORT.
2. SEE STD. DWG. W-3 FOR REMAINDER OF TRENCH RESTORATION.
3. EXCAVATION, BACKFILL AND COMPACTION TO BE IN ACCORDANCE WITH SECTION 02223 OF THE STANDARD SPECIFICATIONS.

REVISION	BY	APPR	DATE

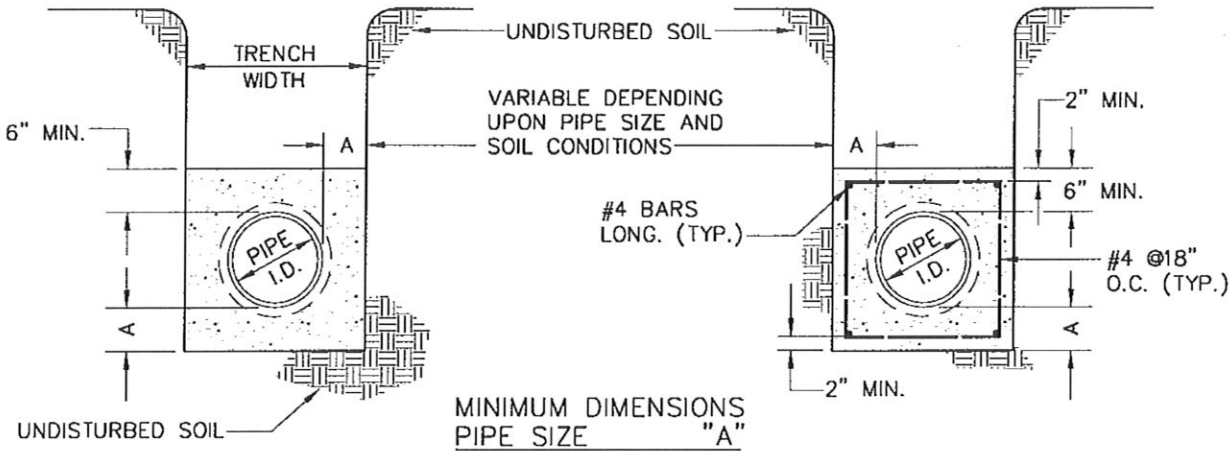
Elsinore Valley Municipal Water District

PHILLIP M. MILLER R.C.E. 30680 10/10/06 DATE

STANDARD SEWER PIPE BEDDING

STD. DWG. NO.

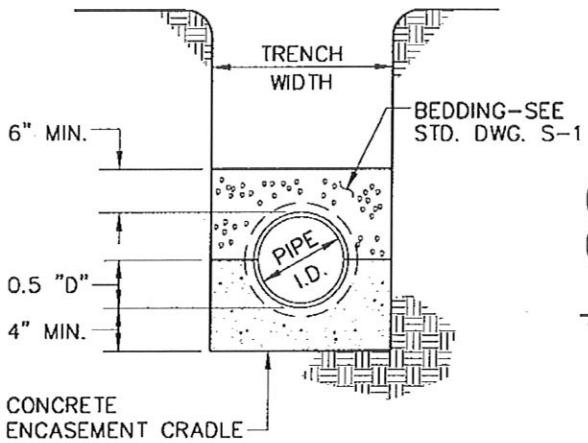
S-1



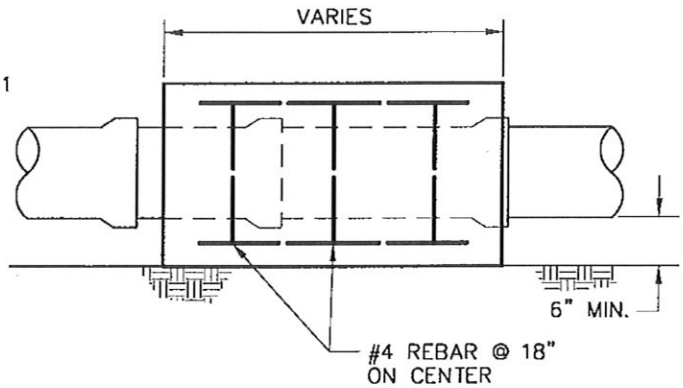
TYPE "A"

TYPE "B"

MINIMUM DIMENSIONS PIPE SIZE	"A"
≤24"	6"
27"	7"
30"–33"	8"
36"–39"	9"
>39"	PER DISTRICT AUTHORIZATION



TYPE "C"



SECTION

NOTES:

1. CONCRETE ENCASEMENT SHALL BE USED WHEN COVER IS UNDER 4' OR OVER 20', WHERE APPROVED BY DISTRICT.
2. ENCASEMENT TO BE PLACED AGAINST UNDISTURBED NATURAL GROUND OR FILL COMPACTED TO 95% RELATIVE DENSITY.
3. NO. 4 STEEL REINFORCING BARS SHALL BE USED AS SPECIFIED.
4. TYPE OF CONCRETE ENCASEMENT SHALL BE 480–B–2500 CONCRETE, UNLESS A DIFFERING RECOMMENDATION IS GIVEN BY GEOTECHNICAL INSPECTOR TO MEET UNFORSEEN SITE CONDITIONS.
5. WHERE SLOPED TRENCHES ARE USED, WALLS WILL NOT BEGIN TO SLOPE CLOSER THAN 12" FROM THE TOP OF THE PIPE.

REVISION	BY	APPR	DATE

Elsinore Valley Municipal Water District

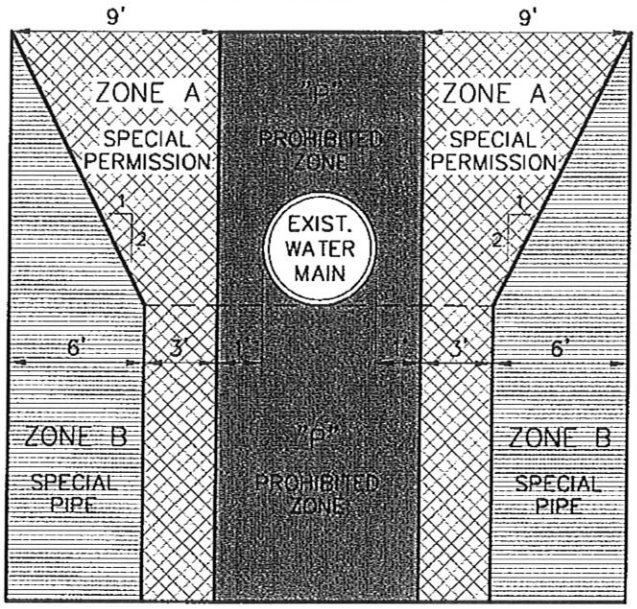
PHILLIP M. MILLER R.C.E. 30680 10/10/06 DATE

CONCRETE CRADLE AND ENCASEMENT

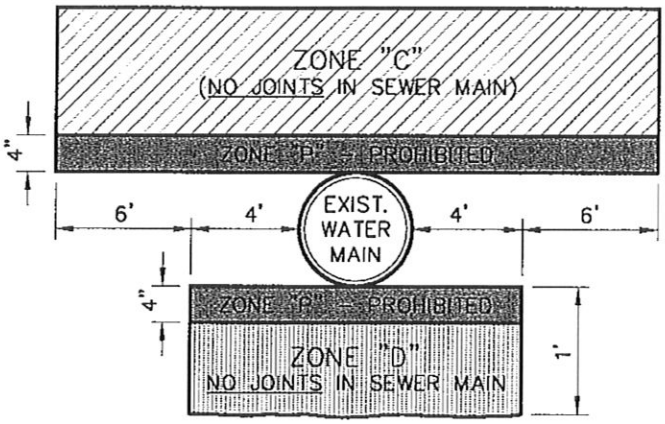
STD. DWG. NO.

S-2

PARALLEL CONSTRUCTION



PERPENDICULAR CONSTRUCTION



NOTES:

1. SEPARATION OF SEWER MAIN FROM WATER AND RECYCLED WATER MAINS SHALL BE IN ACCORDANCE WITH STATE OF CALIFORNIA DEPARTMENT OF HEALTH SERVICES GUIDANCE MEMO NO. 2003-02.
2. DIMENSIONS ARE FROM OUTSIDE OF SEWER MAIN TO OUTSIDE OF WATER OR RECYCLED WATER MAINS.
3. SANITARY SEWERS ARE NOT PERMITTED WITHIN ANY OF THE ABOVE INDICATED ZONES UNLESS CONSTRUCTED IN CONFORMANCE WITH THE SPECIAL REQUIREMENTS AS SHOWN BELOW.
4. WATER AND SEWER MAINS SHALL BE INSTALLED IN SEPARATE TRENCHES. SEWER MAINS SHALL BE INSTALLED AT LEAST 10-FEET HORIZONTALLY FROM, AND A MINIMUM OF 1-FOOT BELOW SANITARY SEWERS WHEN PARALLEL TO THE SEWER MAIN AND A MINIMUM OF 1-FOOT LOWER THAN SANITARY SEWERS WHEN CROSSING THE SEWER MAIN.

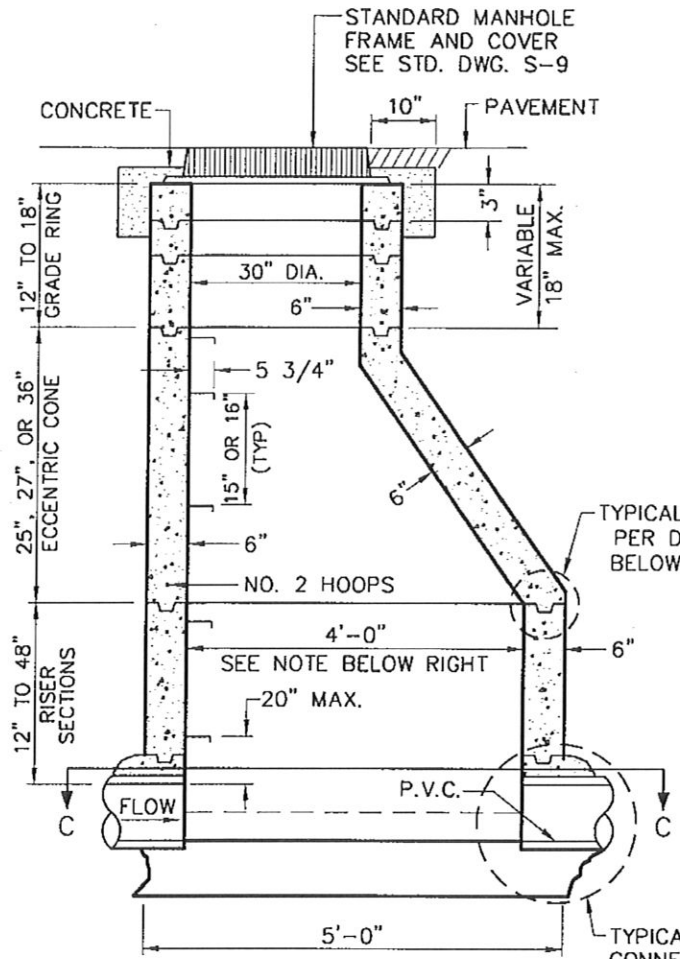
ZONE	SPECIAL WATER CONSTRUCTION REQUIREMENTS
ZONE A	NO SANITARY SEWER MAINS PARALLEL TO WATER OR RECYCLED WATER MAIN SHALL BE CONSTRUCTED WITHOUT PRIOR WRITTEN APPROVAL FROM THE DEPARTMENT OF HEALTH SERVICES.
ZONE B	SPECIAL SEWER PIPE - RUBBER GASKETED PVC SEWER PIPE (ASTM 3034) OR EQUIVALENT; OR HDPE PIPE WITH FUSION WELDED JOINTS.
ZONE C	NO JOINTS IN SEWER MAIN - SPECIAL SEWER PIPE MAY BE REQUIRED.
ZONE D	NO JOINTS IN SEWER MAIN - USE PIPE MATERIALS DESCRIBED IN ZONE B.
ZONE "P"	CONSTRUCTION PROHIBITED IN THIS AREA.

REVISION	BY	APPR	DATE

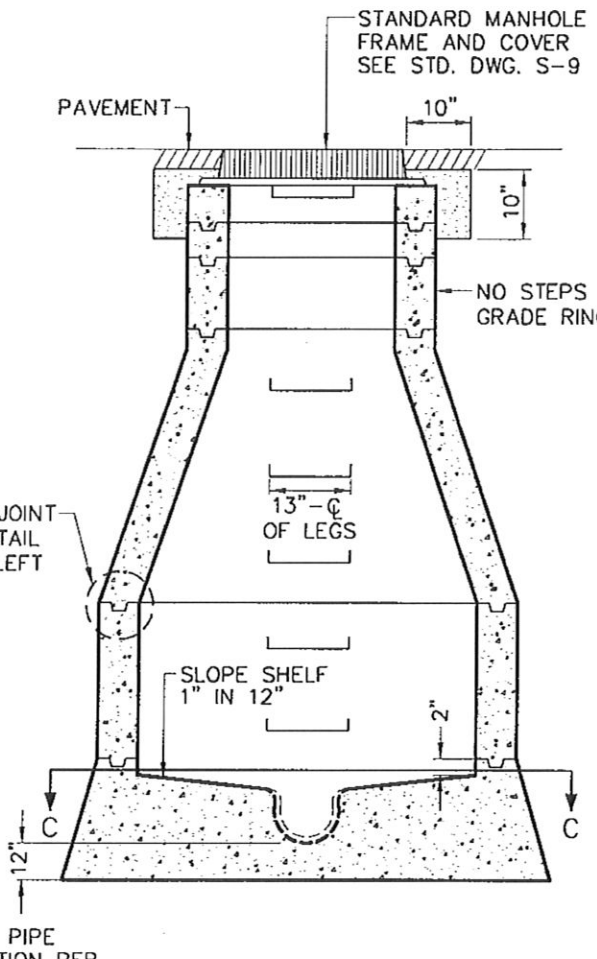
EVMWD
Elsinore Valley Municipal Water District
PHILIP M. MILLER R.C.E. 30688 10/10/06 DATE

PIPELINE SEPARATION REQUIREMENTS

STD. DWG. NO.
S-3



SECTION A–A
(SIDE INLETS NOT SHOWN)



SECTION B–B
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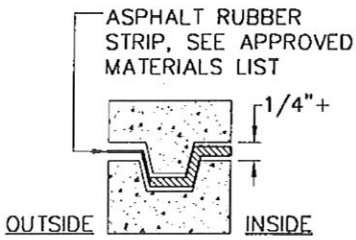
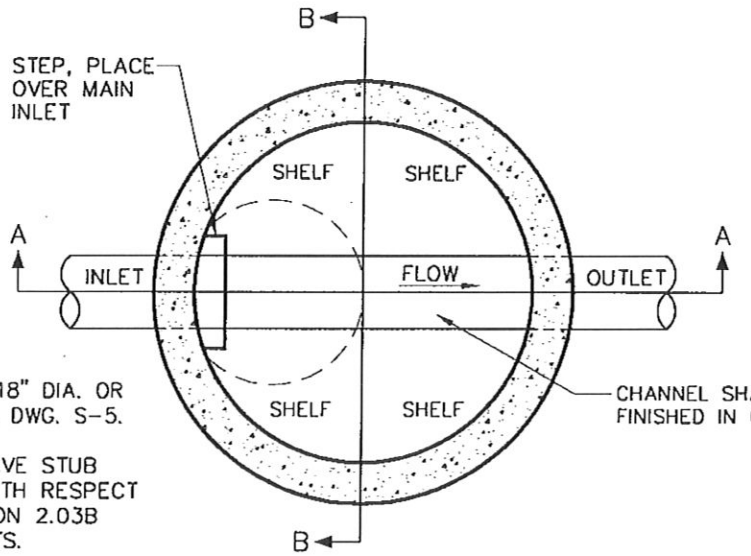


JOINT DETAIL



SECTION C–C
(PLAN MANHOLE BASE)

NOTES:

1. FOR SEWER GREATER THAN 12' DEEP OR 18" DIA. OR GREATER, USE 5' DIA. MANHOLE PER STD. DWG. S-5.
2. MANHOLES AT INTERSECTIONS SHALL HAVE STUB OUTS IN THE OTHER TWO DIRECTIONS WITH RESPECT TO THE INLET AND OUTLET. SEE SECTION 2.03B OF THE STANDARD DESIGN REQUIREMENTS.
3. SEE SECTION 2.03B OF THE STANDARD DESIGN REQUIREMENTS FOR INLET AND OUTLET PIPE OF DIFFERENT SIZES.

REVISION	BY	APPR	DATE

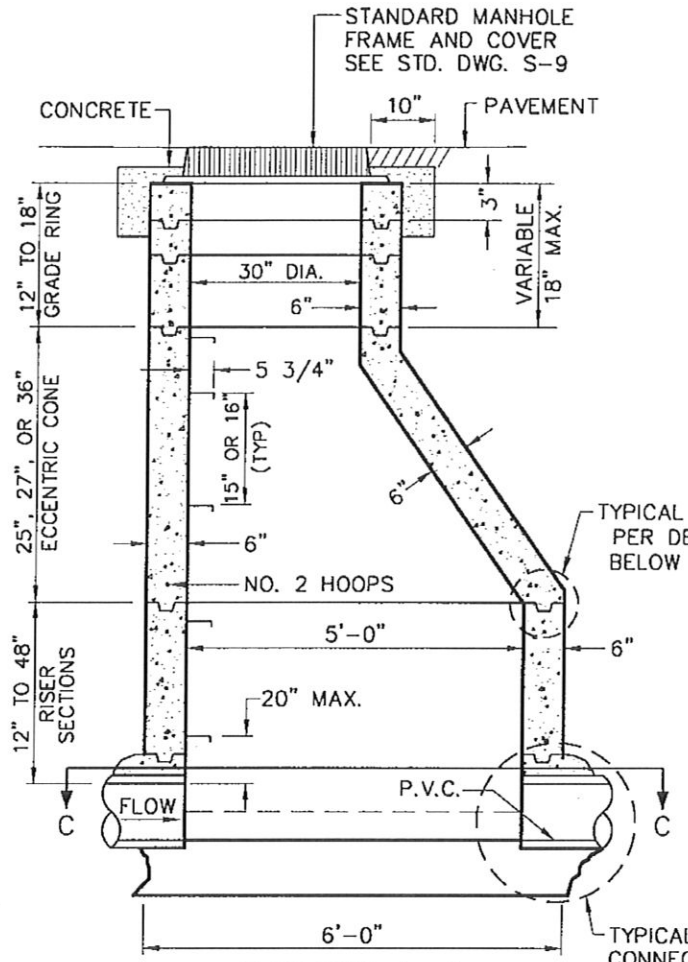
Elsinore Valley Municipal Water District

PHILLIP M. MILLER R.C.E. 30680 10/10/06 DATE

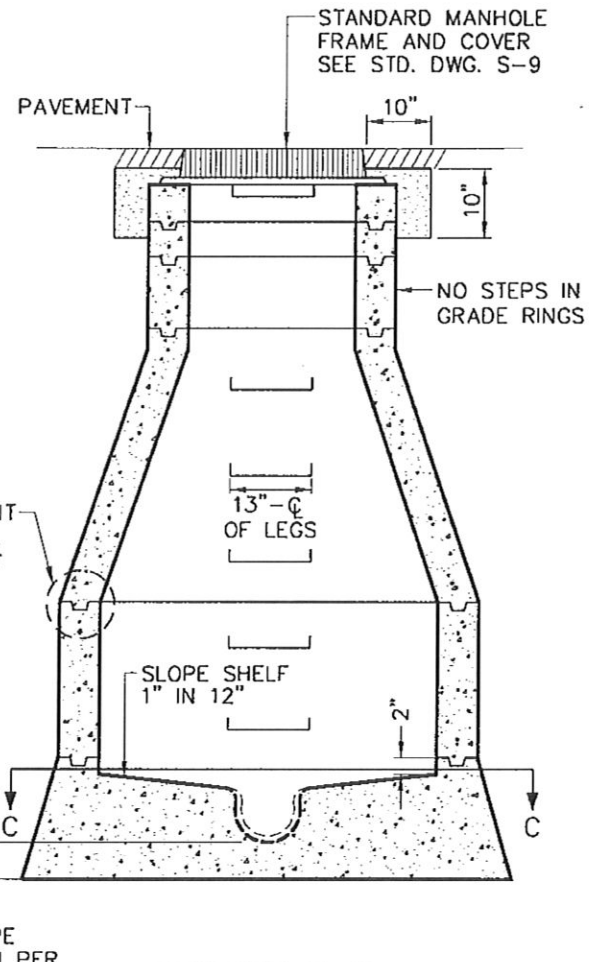
4' DIA. MANHOLE WITH CAST IN PLACE BASE

STD. DWG. NO.

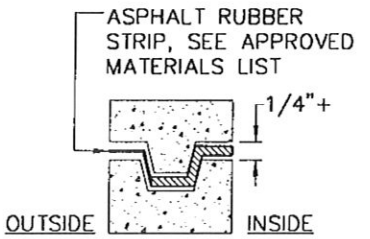
S-4



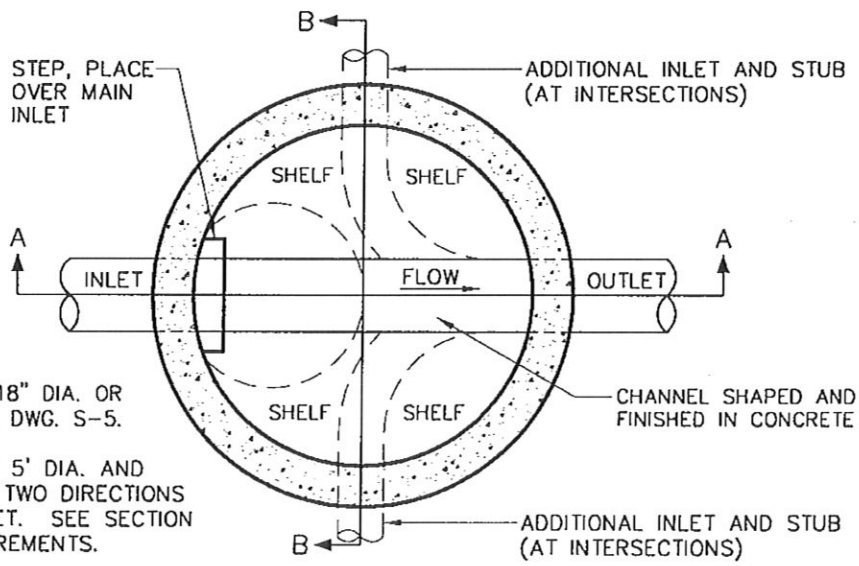
SECTION A–A
(SIDE INLETS NOT SHOWN)



SECTION B–B
(SIDE INLETS NOT SHOWN)



JOINT DETAIL



SECTION C–C
(PLAN MANHOLE BASE)

NOTES:

1. FOR SEWER GREATER THAN 12' DEEP OR 18" DIA. OR GREATER, USE 5' DIA. MANHOLE PER STD. DWG. S-5.
2. MANHOLES AT INTERSECTIONS SHALL BE 5' DIA. AND SHALL HAVE STUB OUTS IN THE OTHER TWO DIRECTIONS WITH RESPECT TO THE INLET AND OUTLET. SEE SECTION 2.03B OF THE STANDARD DESIGN REQUIREMENTS.
3. SEE SECTION 2.03B OF THE STANDARD DESIGN REQUIREMENTS FOR INLET AND OUTLET PIPE OF DIFFERENT SIZES.

REVISION	BY	APPR	DATE

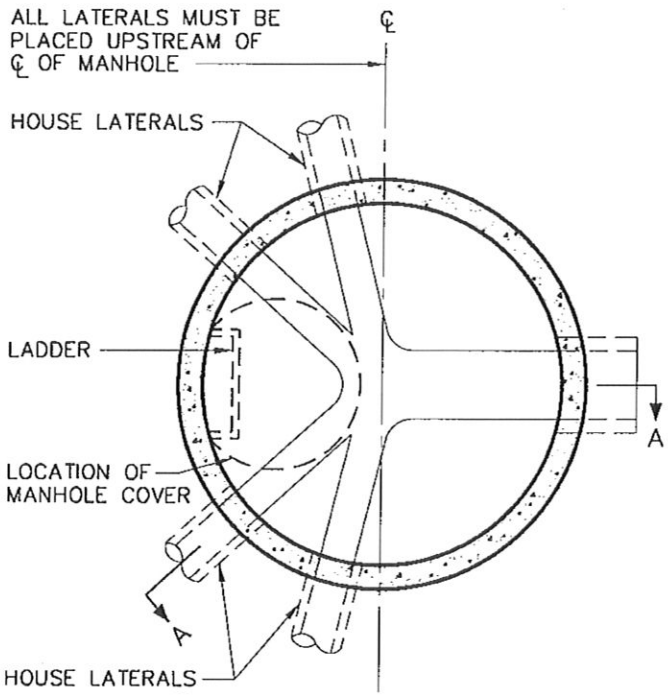
Elsinore Valley Municipal Water District

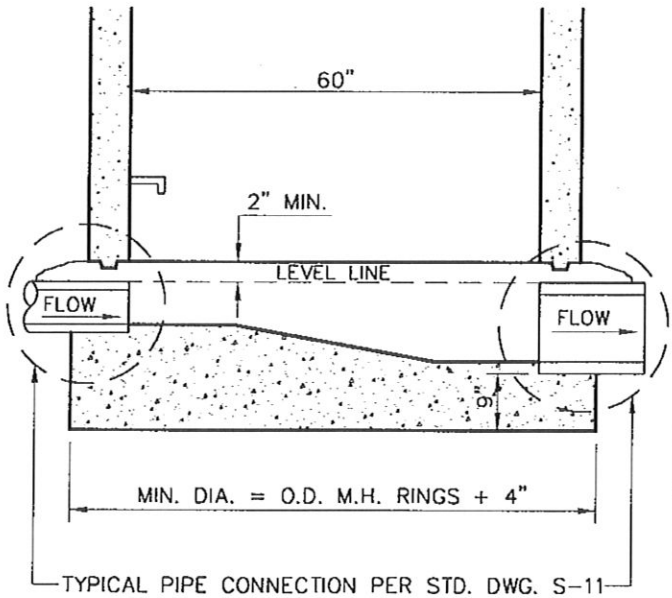
PHILLIP M. MILLER R.C.E. 30680 DATE 10/10/06

5' DIA. MANHOLE WITH CAST IN PLACE BASE

STD. DWG. NO.

S-5





PLAN

TERMINUS MANHOLE
WITH HOUSE LATERALS

SECTION A–A

NOTES:

1. REFER TO STANDARD DRAWINGS OF MANHOLES FOR DETAILS PERTAINING TO MANHOLES ONLY.
2. THE MAXIMUM NUMBER OF LATERALS INTO A TERMINUS MANHOLE SHALL BE LIMITED TO FOUR.
3. THE MAXIMUM NUMBER OF LATERALS INTO A KNUCKLE MANHOLE SHALL BE LIMITED TO TWO.
4. ALL LATERAL CONNECTIONS SHALL BE ORIENTED SUCH THAT THEY WILL NOT BE IN LINE WITH ANY OF THE CONNECTING SEWER MAINS.
5. ALL LATERAL CONNECTIONS IN A KNUCKLE MANHOLE SHALL NOT CONNECT OPPOSING THE DIRECTION OF FLOW IN THE MANHOLE.
6. ALL KNUCKLE MANHOLES WITH 1 OR MORE CONNECTION LATERALS SHALL BE 5' DIA.

REVISION	BY	APPR	DATE

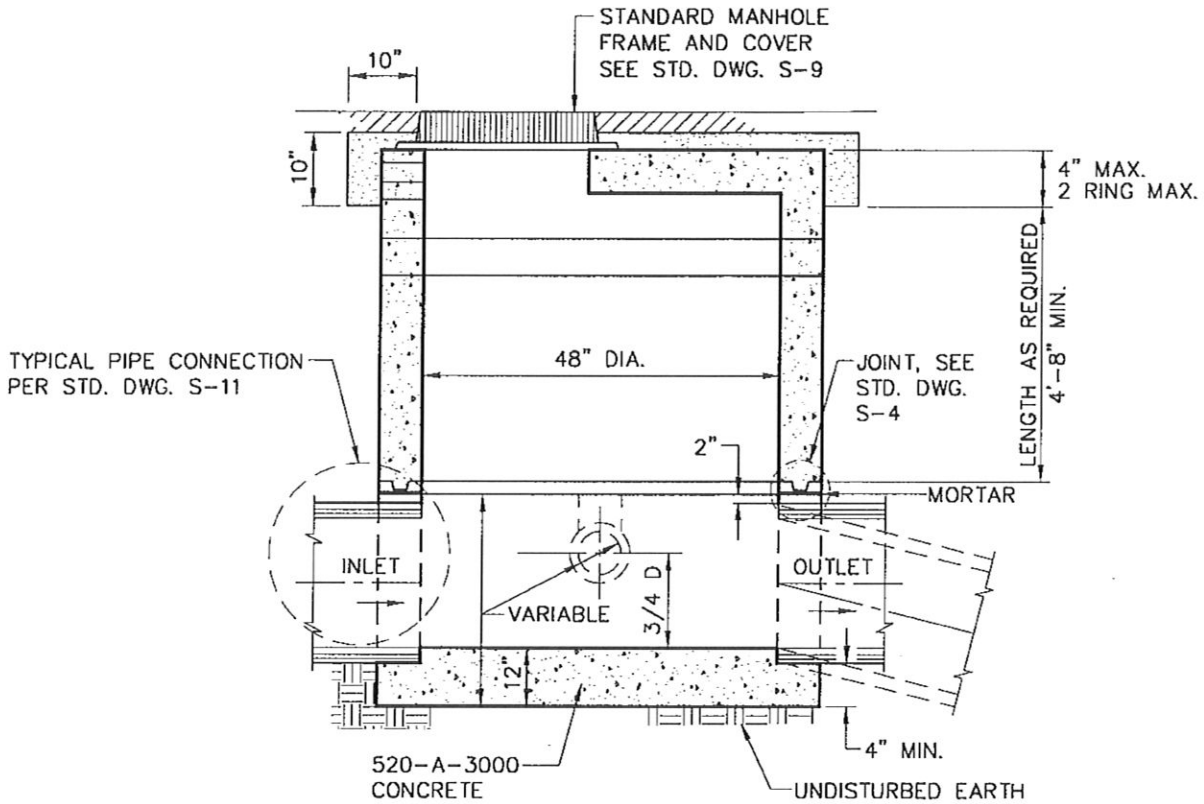
EVMWD
Elsinore Valley Municipal Water District

10/10/06
PHILLIP M. MILLER R.C.E. 30680 DATE

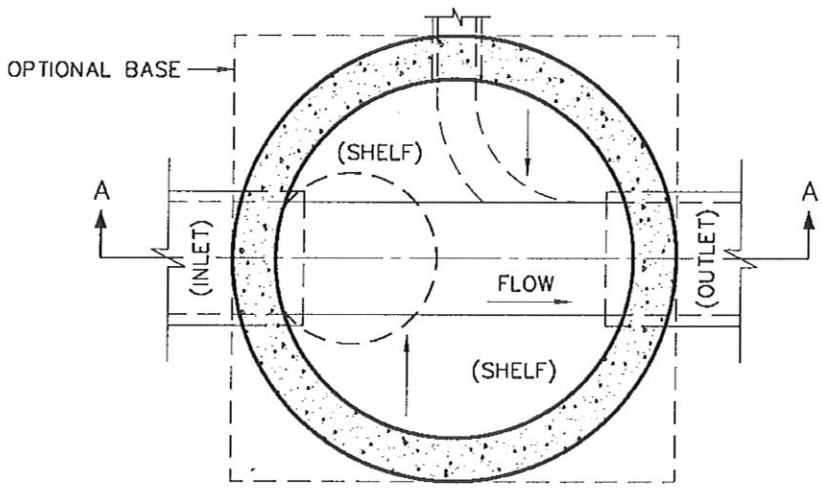
MANHOLES AT STREET KNUCKLE OR END OF CUL-DE-SAC

STD. DWG. NO.

S-6



SECTION A–A



PLAN

NOTES:

1. EXCEPT AS INDICATED HEREON OR ON THE PROJECT PLANS, MANHOLES SHALL CONFORM TO STD. DWG. S-4 PRECAST CONCRETE MANHOLE.
2. IN UNPAVED TRAFFIC AREAS FORM A CONCRETE COLLAR 10" WIDE AND 10" DEEP AROUND MANHOLE FRAME.
3. MAXIMUM DEPTH SHALL BE 6 FEET.

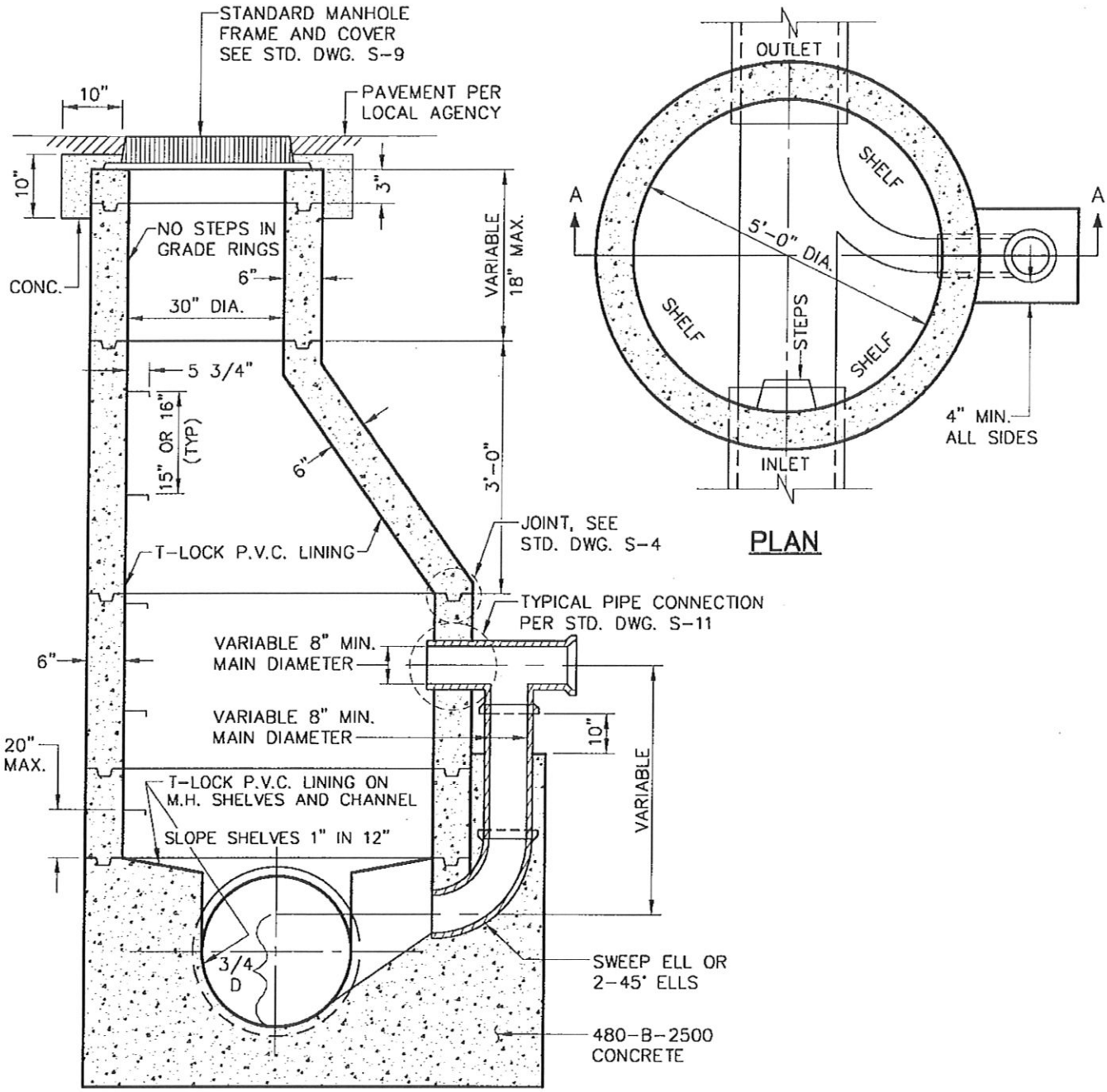
REVISION	BY	APPR	DATE

EVMWD
Elsinore Valley Municipal Water District
PHILLIP W. MILLER R.C.E. 30580 10/10/06 DATE

SHALLOW MANHOLE

STD. DWG. NO.

S-7



PLAN

SECTION A–A

NOTE:

1. THIS STD. DWG. TO BE USED ONLY WITH WRITTEN APPROVAL FROM EVMWD ENGINEERING DEPARTMENT.

2. SEE STD. DWG. S-4 FOR NOTES AND DETAILS.

REVISION	BY	APPR	DATE

Elsinore Valley Municipal Water District

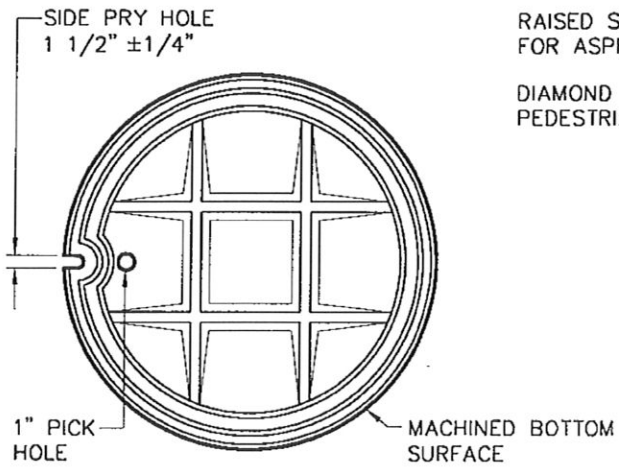
10/10/06

PHILIP W. MILLER R.C.E. 30680 DATE

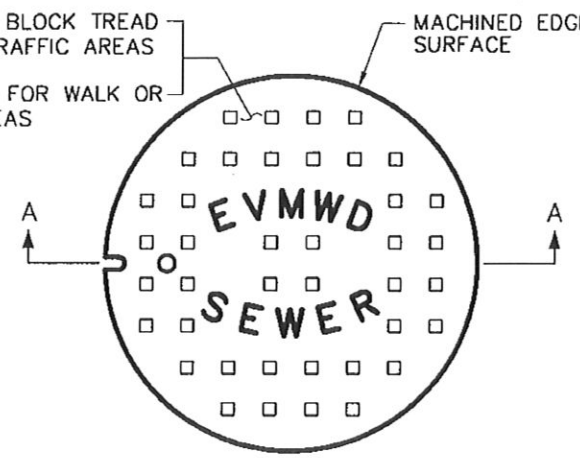
PRECAST CONCRETE DROP MANHOLE

STD. DWG. NO.

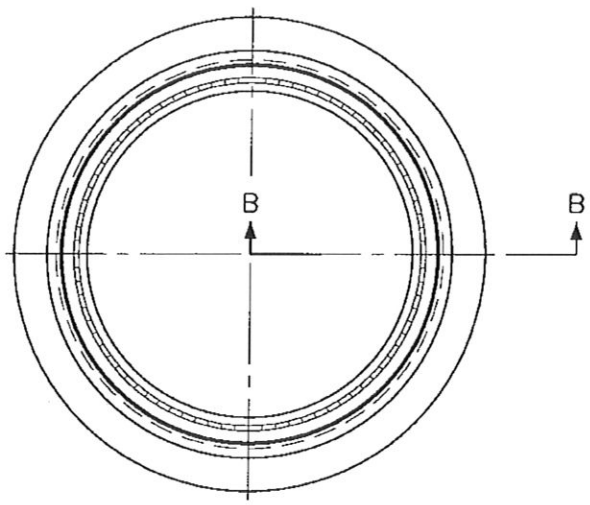
S-8



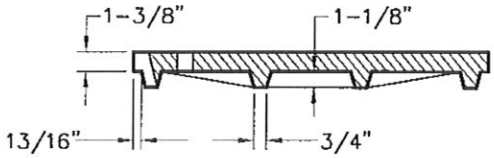
COVER–BOTTOM VIEW



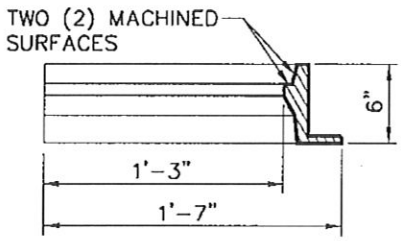
COVER–TOP VIEW



RING PLAN



SECTION A–A



SECTION B–B

TYPICAL INSTALLATION NOTES:

1. FRAME AND COVER SHALL BE MACHINED TO PROVIDE A NON–ROCKING SURFACE. MACHINED TOLERANCE BETWEEN FRAME AND COVER SHALL BE ±1/8" TOTAL. FRAME AND COVER TO BE SELECTED FROM APPROVED MATERIALS LIST.
2. GREY CAST IRON SHALL CONFORM TO A.S.T.M. A48, CLASS 35B.
3. MANHOLE COVERS 36" DIAMETER AND GREATER SHALL BE OF 2–PIECE CONSTRUCTION WITH INSERT NOT SMALLER THAN 24" IN DIAMETER.
4. THE 30" MANHOLE FRAME AND COVER WEIGHT SHALL CONFORM TO A.S.T.M. A48, CLASS 30.
5. THE MARKING LETTERS SHALL BE CAST IN THE COVER AND SHALL BE A MINIMUM 2 1/2" HIGH.

BOLT–DOWN COVER INSTALLATION NOTES:

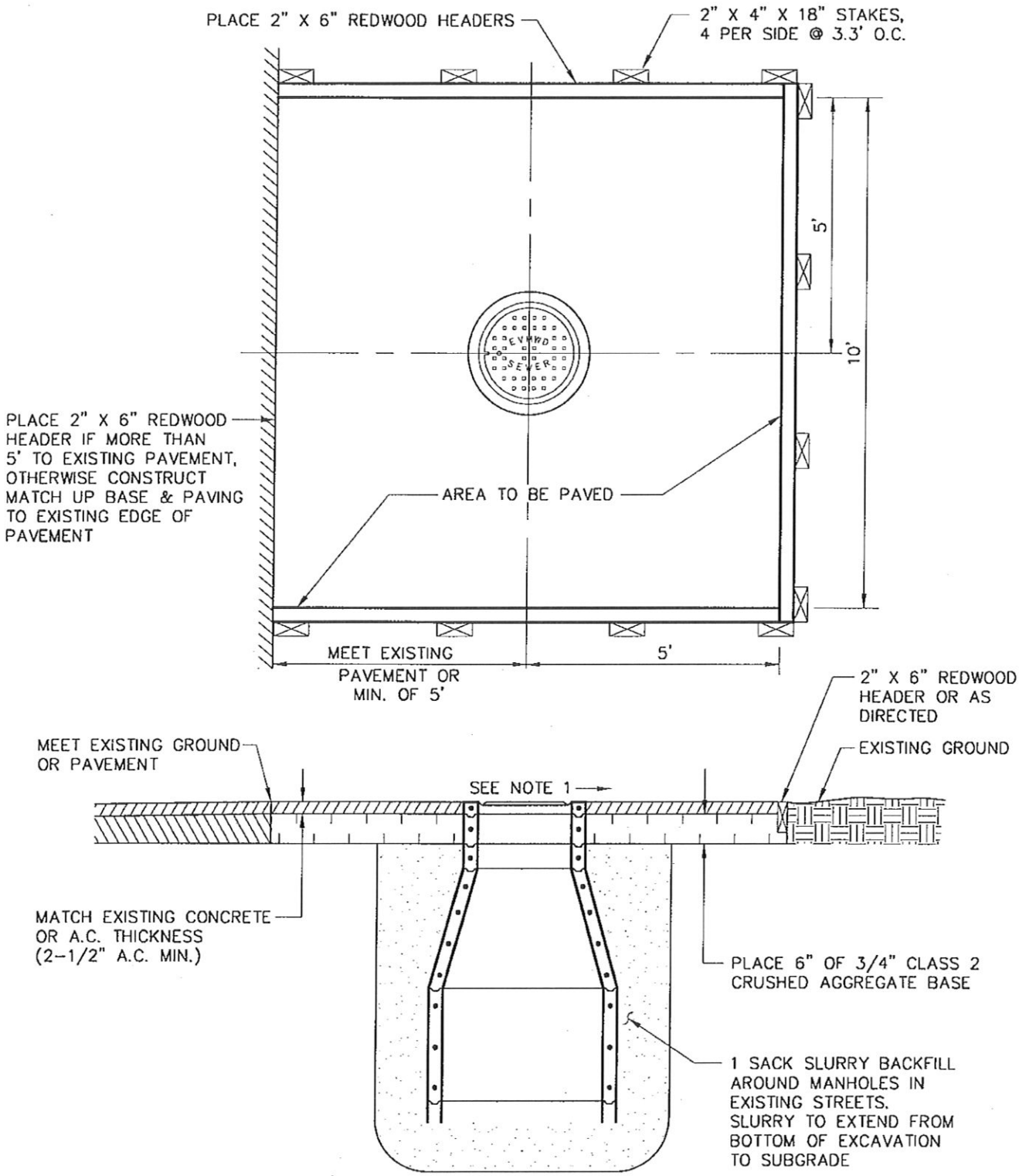
1. WATER PROOF, BOLT DOWN LIDS WITH S.S. BOLTS REQUIRED FOR COVERS NOT IN PUBLIC STREETS/ALLEYS.
   - A. SIDE PRY AND PICK HOLE SHALL BE REPLACED WITH A CLOSED PICK HOLE.
   - B. GASKET MATERIAL SHALL BE 1/2" x 1/2" NEOPRENE GASKET.
   - C. BOLTS SHALL BE 1 1/2" x 1/2" S.S. TYPE 307, SIX EQUALLY SPACED.
   - D. BOLT DOWN LIDS SHALL BE SELECTED FROM APPROVED MATERIALS LIST.

REVISION	BY	APPR	DATE

EVMWD
Elsinore Valley Municipal Water District
PHILLIP M. MILLER R.C.E. 50680 10/10/06 DATE

MANHOLE FRAME AND COVER

STD. DWG. NO.
S-9



NOTE:

1. SLOPE WILL CONFORM TO THE GOVERNING LOCAL AGENCIES' ROAD IMPROVEMENT STANDARDS AND SPECIFICATIONS, OR MEET EXISTING CONDITIONS AS DIRECTED BY ENGINEER.

REVISION	BY	APPR	DATE

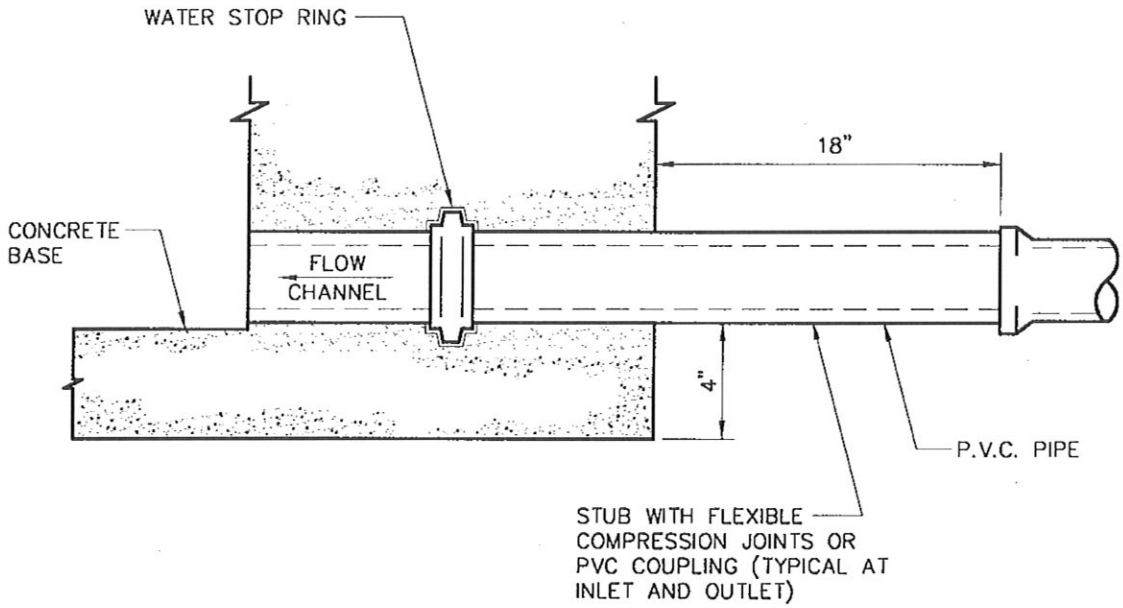
Elsinore Valley Municipal Water District

PHILLIP M. MILLER R.C.E. 30680 DATE 10/10/06

PAVING DETAIL AROUND MANHOLES

STD. DWG. NO.

S-10



NOTE:

1. SEE STD. NO. S-4 OR S-5 FOR MANHOLE.
2. SEE APPROVED MATERIALS LIST FOR WATER STOP.

DETAIL OF WATER STOP RING WITH P.V.C. PIPE

REVISION	BY	APPR	DATE

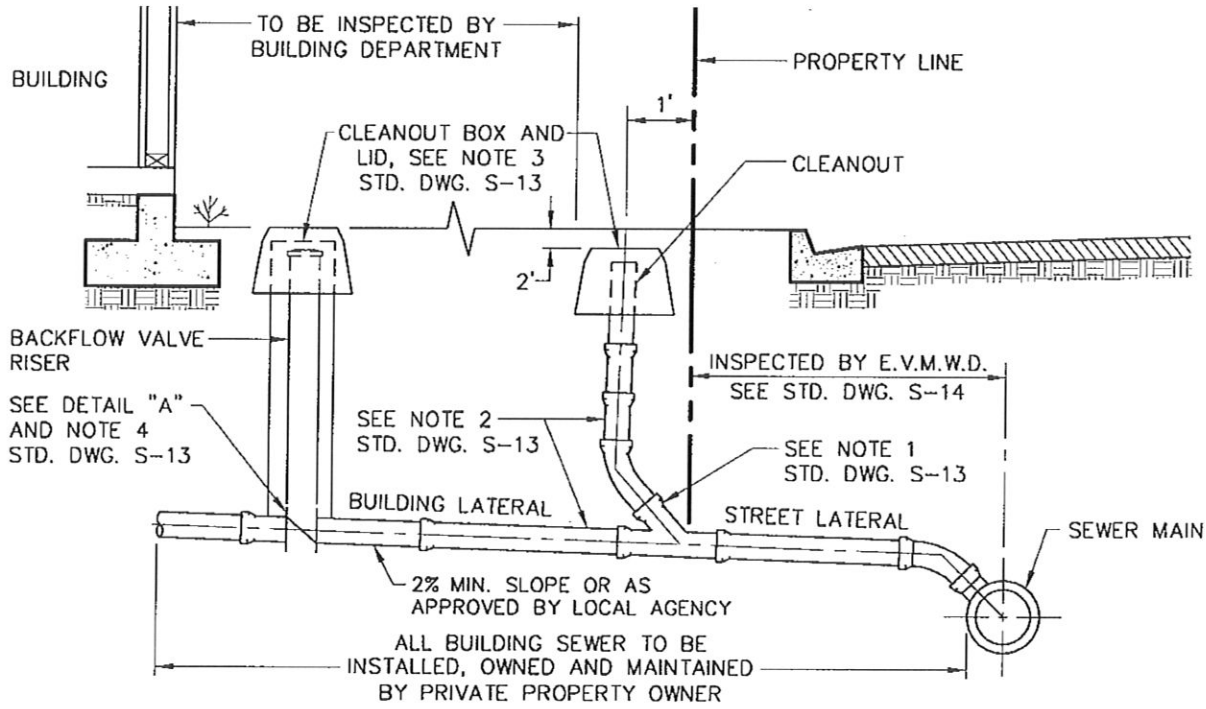
Elsinore Valley Municipal Water District

PHILIP M. MILLER R.C.E. 30680 10/10/06 DATE

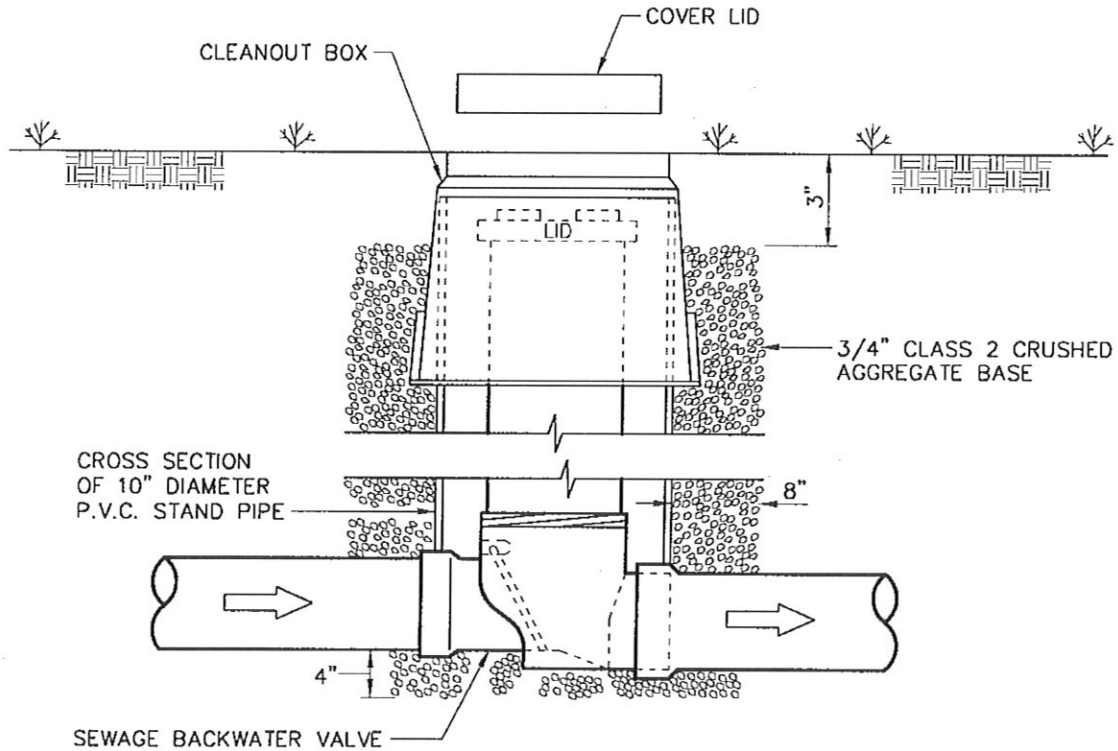
PIPE CONNECTION DETAILS FOR CAST-IN-PLACE CONCRETE BASE

STD. DWG. NO.

S-11



TYPICAL LATERAL ASSEMBLY



DETAIL "A" – SEWAGE BACKFLOW VALVE ASSEMBLY

REVISION	BY	APPR	DATE

Elsinore Valley Municipal Water District

PHILIP M. MILLER R.C.E. 30680 10/10/06 DATE

TYPICAL LATERAL ASSEMBLY

STD. DWG. NO.

S-12

NOTES:

1. ABS 45 DEGREE BEND AND STANDARD WYE BRANCH CONNECTION SHALL BE USED. THE 45 DEGREE BEND AND WYE BRANCH CONNECTION SHALL BE THE SAME DIAMETER AS THE SEWER LATERAL ENTERING FROM THE STREET AND SHALL BE SUPPORTED BY THE RECOMPACTION OF THE EXISTING SOIL IN THE TRENCH. DUCTILE IRON FITTINGS MAY BE USED IF AUTHORIZED BY THE DISTRICT.

2. THE BUILDING LATERAL SHALL BE CONSTRUCTED USING IAPMO LISTED MATERIALS (I.E. A.B.S. OR C.I. PIPE). THE MINIMUM DIAMETER SHALL BE PER PLUMBING CODE STANDARDS, THE CLEANOUT STAND PIPE (4" DIA. MIN.) SHALL BE THE SAME DIAMETER AS THE LATERAL ENTERING FROM THE STREET. THE STAND PIPE SHALL BE CONSTRUCTED USING IAMPO LISTED MATERIALS (I.E. A.B.S. OR C.I. PIPE). THE MINIMUM SLOPE OF THE LATERAL SHALL BE 2% OR AS PERMITTED BY LOCAL AGENCY.

3. A PLASTIC CLEANOUT BOX AND LID IS REQUIRED OVER THE CLEANOUT STACK (AND BACKWATER VALVE, IF USED) WHEN LOCATED IN <u>NON-VEHICULAR</u> TRAFFIC AREAS. IN <u>VEHICULAR</u> TRAFFIC AREAS (I.E. DRIVEWAYS) A CONCRETE CLEANOUT BOX WITH CAST IRON LID IS REQUIRED.

4. IF HOUSE SLAB DRAINAGE ELEVATION IS BELOW THE NEAREST UPSTREAM MANHOLE LID, A SEWAGE BACKFLOW VALVE ASSEMBLY WILL BE REQUIRED, IN ACCORDANCE WITH THE LATEST EDITION OF THE U.P.C., CHAPTER 7, SECTION 710.0 PARAGRAPH 710.1 READS:

   <u>SECTION 710.0:</u> DRAINAGE OF FIXTURES LOCATED BELOW THE NEXT UPSTREAM MANHOLE OR BELOW THE MAIN SEWER LEVEL. FOR ASSISTANCE CALL E.V.M.W.D.

   <u>(710.1):</u> "DRAINAGE PIPING SERVING FIXTURES WHICH HAVE FLOOD LEVEL RIMS LOCATED BELOW THE ELEVATION OF THE NEXT UPSTREAM MANHOLE COVER OF THE PUBLIC SEWER SERVING SUCH DRAINAGE PIPING SHALL BE PROTECTED FROM BACKFLOW OF SEWAGE BY INSTALLING AN APPROVED TYPE BACKWATER VALVE. FIXTURES ABOVE SUCH ELEVATION SHALL NOT DISCHARGE THROUGH THE BACKWATER VALVE."

5. THE BACKWATER VALVES SHALL BE LOCATED SO ACCESS FOR MAINTENANCE IS NOT IMPAIRED.

6. MATERIAL SHALL BE SELECTED FROM APPROVED MATERIALS LIST.

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EVMWD
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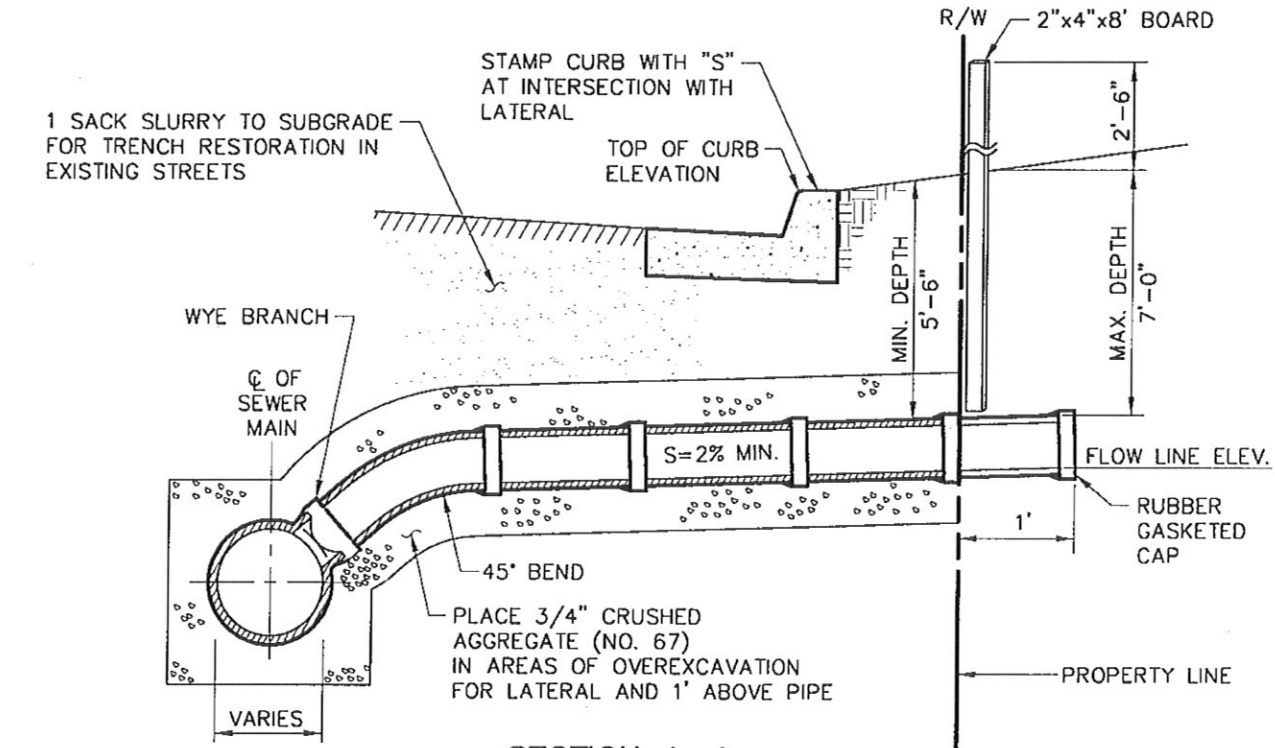
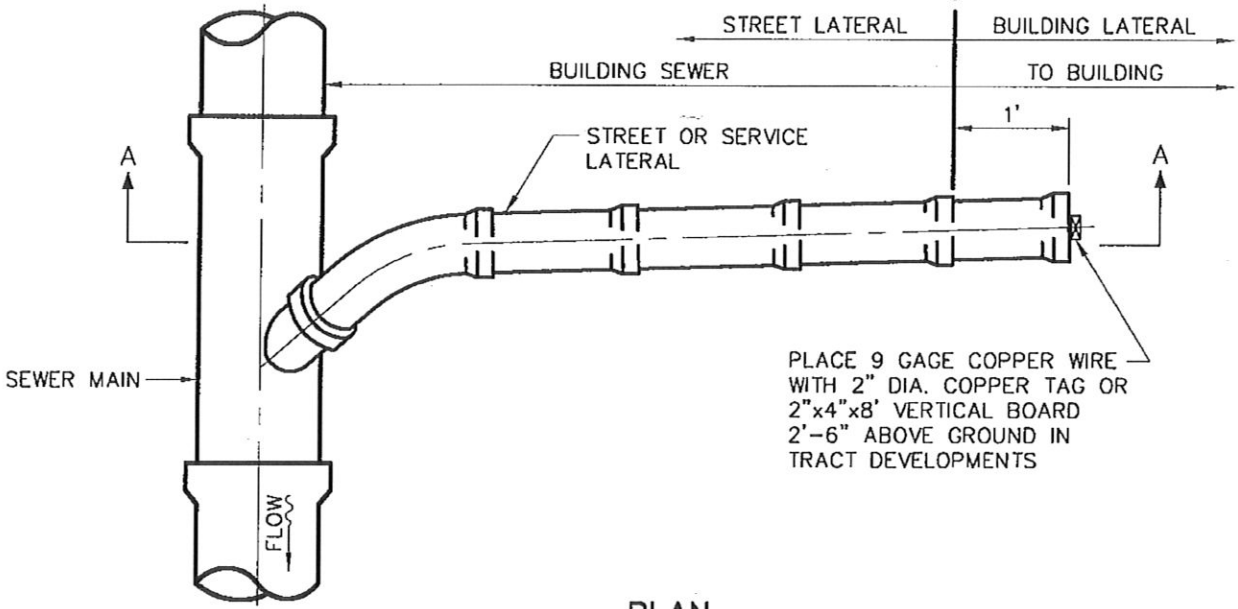
TYPICAL LATERAL ASSEMBLY NOTES

STD. DWG. NO.
S-13



SECTION A–A



PLAN

NOTES:

1. MINIMUM SEWER LATERAL SIZE (UNLESS OTHERWISE SHOWN ON PLANS) SHALL BE:

   6" FOR MULTI–UNIT RESIDENTIAL, COMMERCIAL, SCHOOLS AND INDUSTRIAL ZONED AREAS

   4" FOR SINGLE FAMILY DWELLING UNITS

2. SEE SECTION 02223 OF STANDARD SPECIFICATIONS FOR 3/4" CRUSHED AGGREGATE NO. 67.

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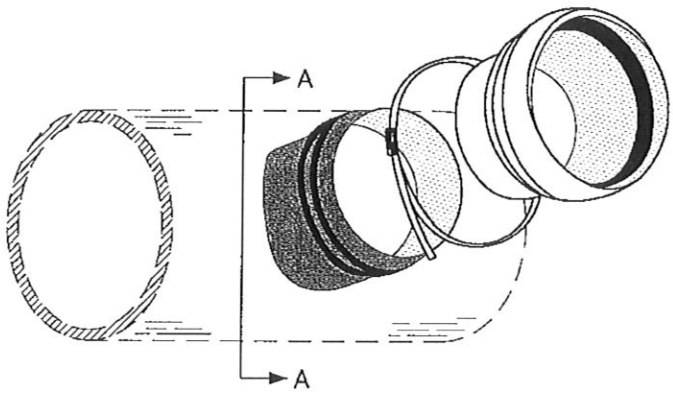
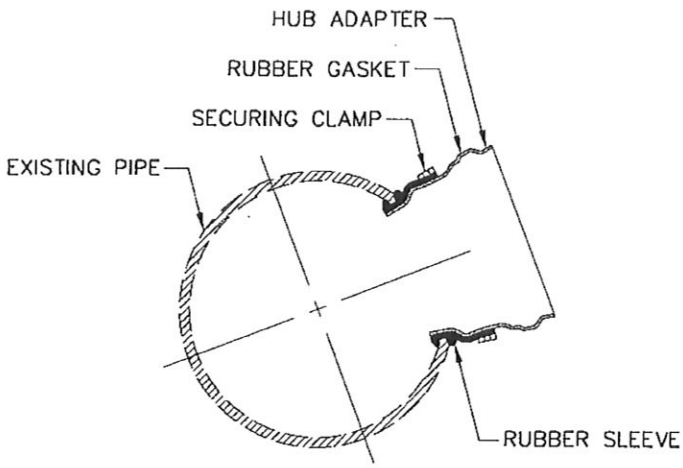
STREET SEWER LATERAL

STD. DWG. NO.

S-14



DETAIL



SECTION A–A

NOTES:

1. GASKETED BELL SHALL BE IN ACCORDANCE WITH APPROVED MATERIALS LIST.
2. THE INSTALLATION OF GASKETED BELLS SHALL COMPLY WITH THE MANUFACTURER'S INSTALLATION GUIDELINES.
3. THE HOLE FOR THE GASKETED BELL FITTING SHALL BE MADE WITH A TAPPING MACHINE OR PROPERLY SIZED CORE DRILL. THE HOLE SHALL BE CLEANLY MACHINED AND IF NECESSARY WORKED BY HAND WITH A RASP OR SANDED TO ACCOMPLISH A TRUE AND NEAT OPENING FOR THE COLLAR WYE.
4. THE APPLICANT SHALL KEEP ALL CHIPS, DIRT, AND OTHER FOREIGN MATTER OUT OF THE SEWER LATERAL CONNECTION AND SHALL PERFORM A CLEANING AND BALLING OF THE REACH LATERAL CONNECTION IF DIRECTED TO DO SO BY THE INSPECTOR.
5. THE APPLICANT SHALL REPAIR OR REPLACE ANY DAMAGED PIPE AS DIRECTED BY THE INSPECTOR.
6. THE APPLICANT SHALL CONTACT THE GASKETED BELL MANUFACTURER AND SPECIFY THE SEWER MAIN SIZE AND MATERIAL FOR THE CORRECT SEWER PIPE CONNECTION MODEL.

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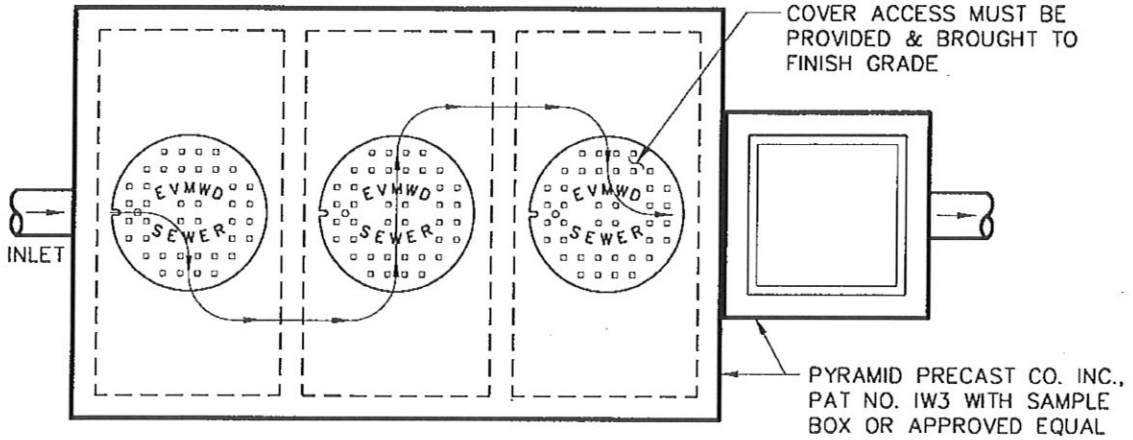
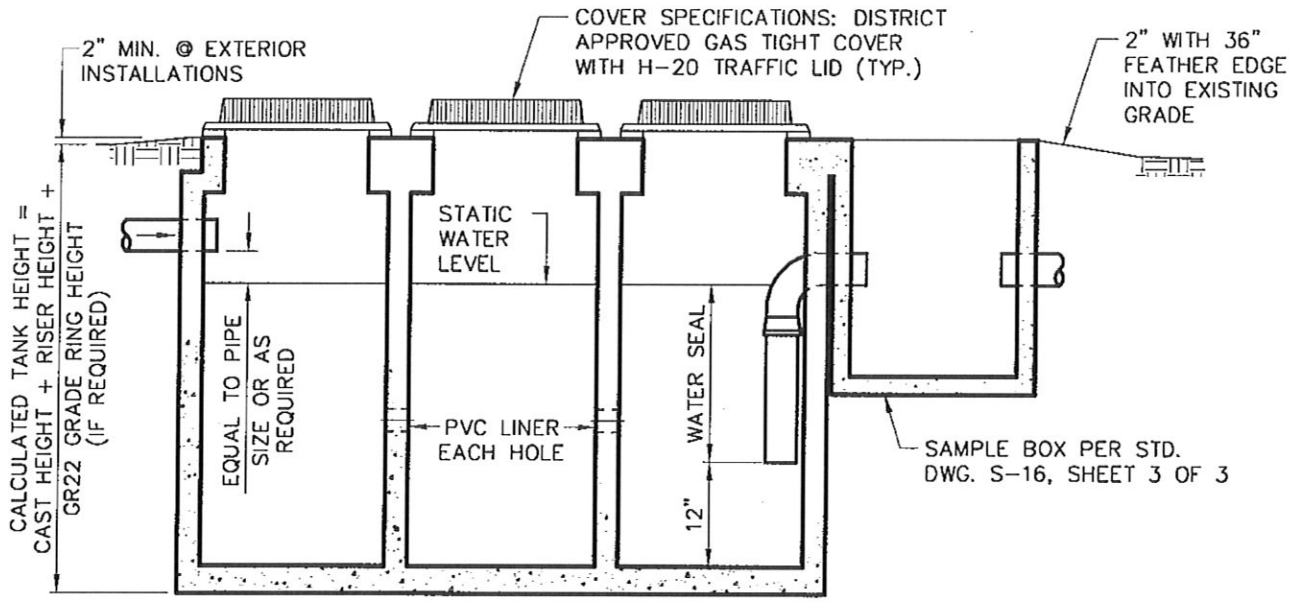
TYPICAL SEWER LATERAL CONNECTION TO EXISTING SEWER MAIN

STD. DWG. NO.

S-15



PLAN – 3 CHAMBERED INTERCEPTOR



SECTION

NOTES:

1. ALL INTERCEPTORS SHALL HAVE A MINIMUM LIQUID CAPACITY OF 750 GALLONS.
2. ALL INTERCEPTORS SHALL BE UPC/IAPMO ACCEPTED.
3. ALL WASTEWATER EXCLUDING RESTROOMS, MUST PASS THROUGH THE INTERCEPTOR.
4. ALL SURFACE WATER SHALL DRAIN AWAY FROM THE INTERCEPTOR.
5. ALL INTERCEPTORS, SEPARATORS, AND CLARIFIERS SUBJECT TO VEHICULAR TRAFFIC LOADING SHALL HAVE H-20 RATED TANK TOPS. ALL OTHER LOADING CONDITIONS SHALL BE PER MANUFACTURER SPECIFICATIONS.
6. EXTERNAL PLUMBING PER LOCAL PLUMBING CODE.

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SAND/OIL SEPARATOR

STD. DWG. NO.

S-16

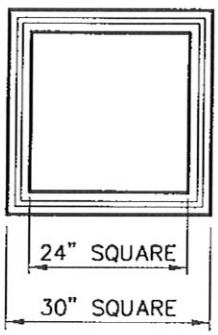
1 OF 3

CONSTRUCTION NOTES

1. GREASE TRAP SHALL BE DESIGNED TO RETAIN MAXIMUM AMOUNTS OF GREASE, SAND, CHEMICALS, AND OTHER INDUSTRIAL WASTES FROM ENTRANCE INTO THE SEWER SYSTEM.
2. INTERCEPTORS AND GRADE RING MANHOLES SHALL BE PRECAST CONCRETE OF 3000 P.S.I. COMPRESSIVE STRENGTH AT 28 DAYS, VIBRATED FOR DENSITY, REINFORCED WITH INTERMEDIATE OR HARD GRADE DEFORMED STEEL BARS CONFORMING TO ASTM SPEC. A615 GRADE 60. ALL CONTINUOUS MONOLITHIC CONST.
3. INTERIOR OF INTERCEPTOR TO BE BARE CONCRETE.
4. COMPONENTS SHALL BE IN ACCORDANCE WITH APPROVED MATERIALS LIST.

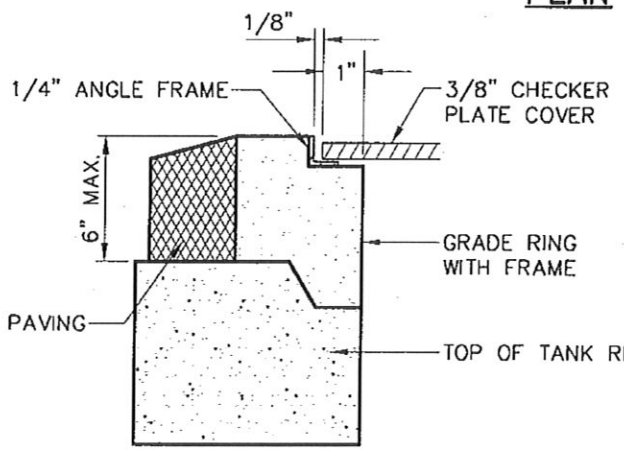
INSTALLATION NOTES

1. PRIOR TO INSTALLATION, CONTACT E.V.M.W.D. AND DEPARTMENT OF BUILDING AND SAFETY FOR REQUIRED TANK SIZE AND/OR SPECIAL INSTALLATION REQUIREMENTS.
2. ALL SURFACE WATER SHALL DRAIN AWAY FROM INTERCEPTOR EXCLUDING RAIN WATER FROM THE SEWER SYSTEM. WASTES ENTER THROUGH INLET PIPE ONLY.
3. TRAFFIC LOCATION INSTALLATIONS WILL REQUIRE THE TOP OF THE INTERCEPTOR TO BE PLACED BELOW THE PAVING. INSPECTION MANHOLES MUST BE BROUGHT TO THE SURFACE WITH A GRADE RING OF 8" MAXIMUM HEIGHT.
4. INTERCEPTOR SHALL REST ON FIRM LEVEL GROUND TO AVOID SETTLING.
5. SEPARATOR AND SAMPLE BOX COVER PLATES NOT SUBJECT TO VEHICULAR TRAFFIC MAY BE 3/8" STEEL CHECKER PLATES BY 24" SQUARE. AT TRAFFIC LOCATIONS USE STEEL H-20 RATED STEEL FRAMES AND COVERS.

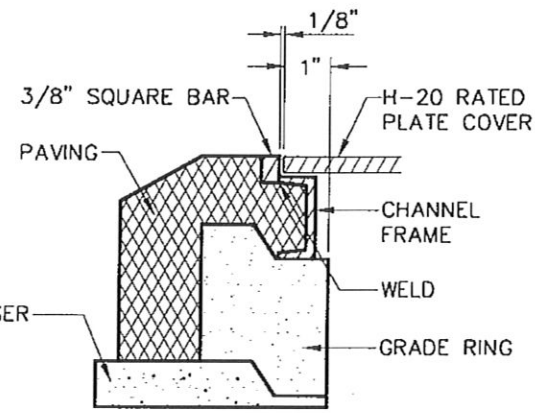


PLAN

GR-22 GRADE RING
WITH OR WITHOUT STEEL FRAME.
SIZES 3", 4", 5", 6" (HIGH)
SPECIAL AND FOUNDRY COVERS
AVAILABLE ON REQUEST.



NOT SUBJECT TO VEHICULAR TRAFFIC AREAS



TRAFFIC AREA

TYPICAL MANHOLE DETAILS

REVISION	BY	APPR	DATE

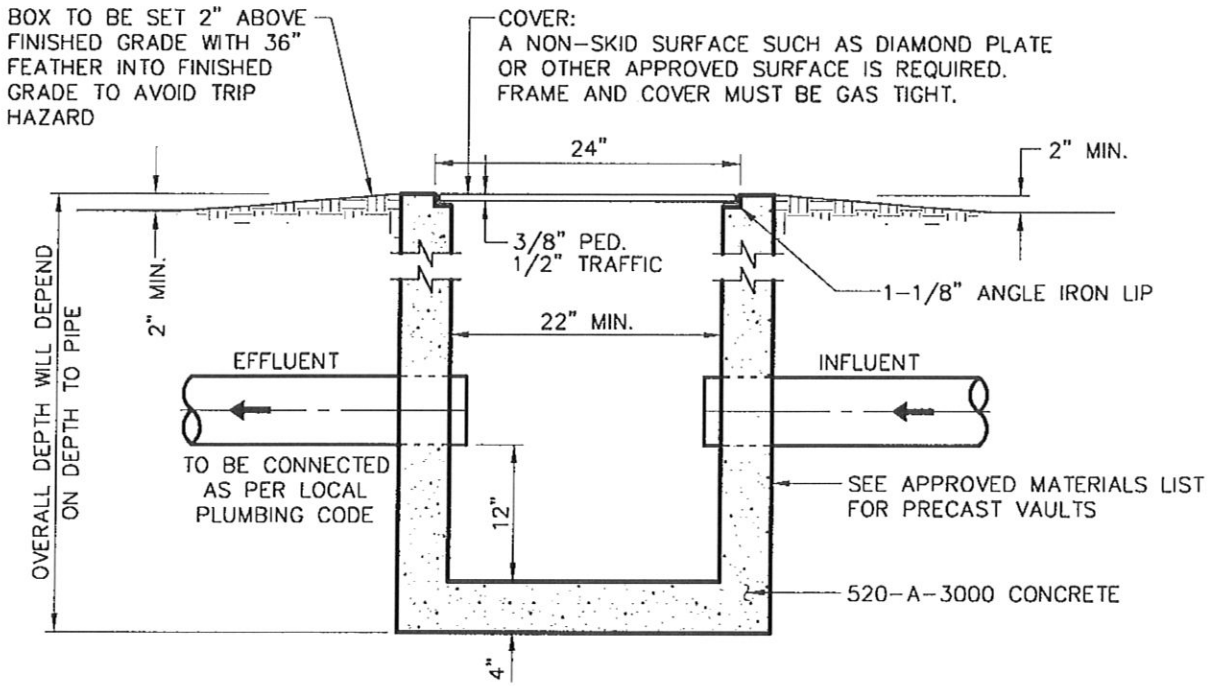
Elsinore Valley Municipal Water District

PHILLIP M. MILLER R.C.E. 30680 DATE 10/10/06

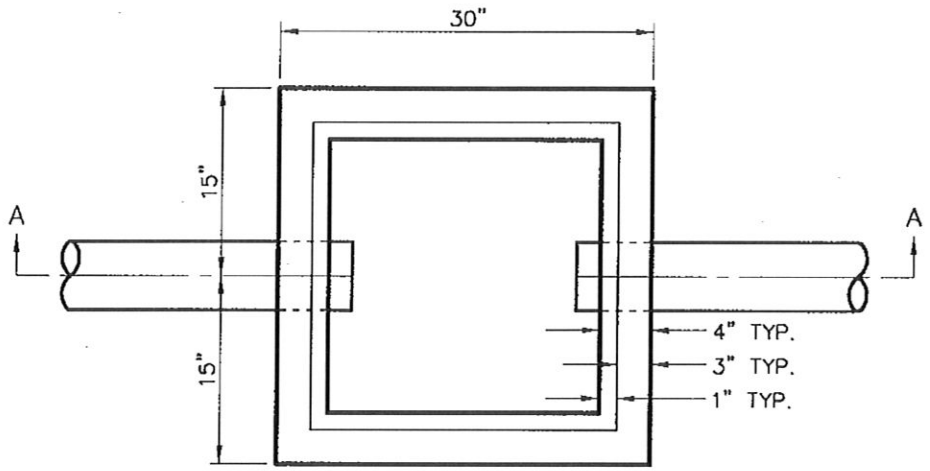
SAND/OIL SEPARATOR AND SAMPLE BOX COVER PLATE DETAIL

STD. DWG. NO.

S-16



SECTION A-A



PLAN

NOTES:

1. ALL SURFACE WATER SHALL DRAIN AWAY FROM THE SAMPLE BOX.
2. LID AND ANGLE IRON THICKNESS WILL DEPEND ON TRAFFIC PATTERNS IN SAMPLE BOX AREA.
3. INSTALLATION TO BE IN ACCORDANCE WITH ALL LOCAL PLUMBING CODES.
4. WHEN USED IN CONJUNCTION WITH AN INTERCEPTOR, SEPARATOR, OR CLARIFIER THE SAMPLE BOX SHALL BE POURED MONOLITHICALLY WITH THE TANK END WALL.

REVISION	BY	APPR	DATE

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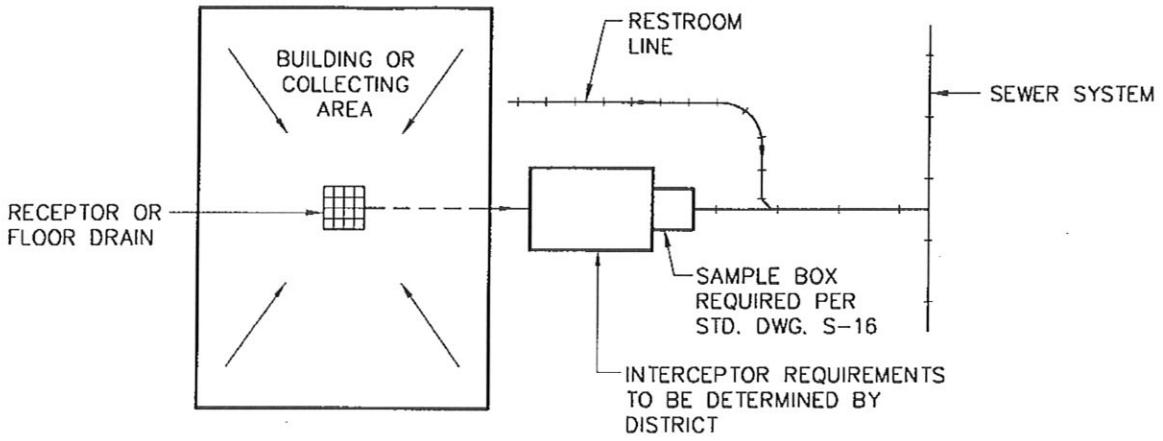
PHILLIP M. MILLER R.C.E. 30680 DATE 10/10/06

SAND/OIL SEPARATOR AND SAMPLE BOX

STD. DWG. NO.

S-16

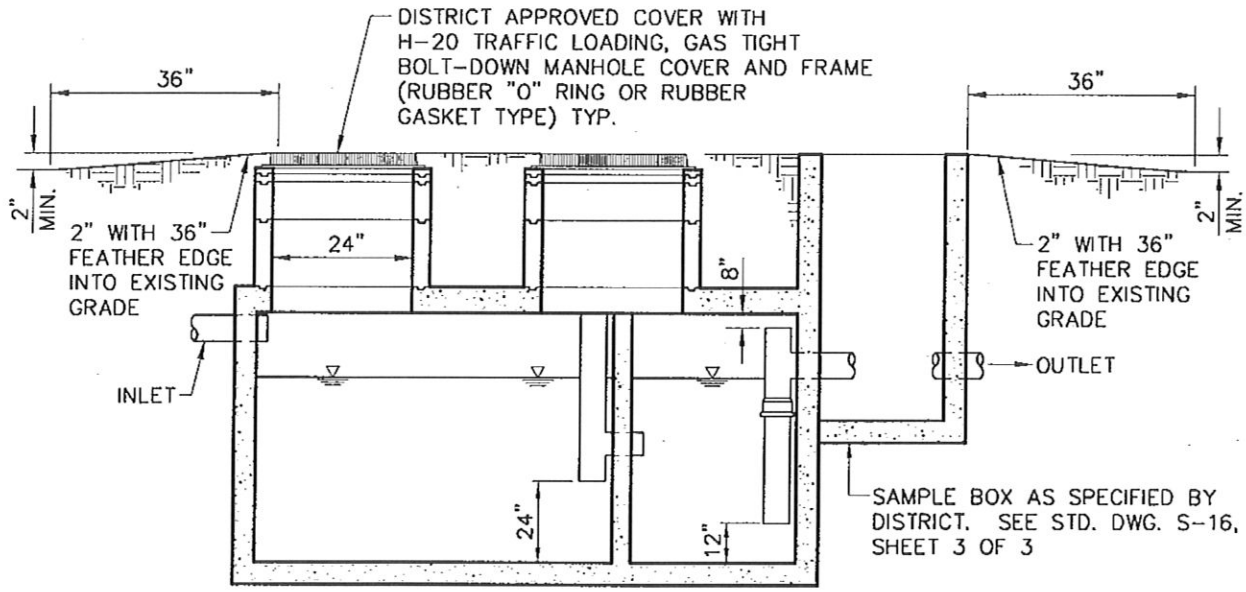
3 OF 3



NOTE:

1. SPACING OF SURFACE ACCESS POINTS TO INTERCEPTOR (RAISED MANHOLE COVERS) SHALL BE PROVIDED AT NOT LESS THAN 15' INTERVALS.

TYPICAL INSTALLATION



2 CHAMBER INTERCEPTOR

NOTES:

1. ALL INTERCEPTORS SHALL HAVE A MINIMUM LIQUID CAPACITY OF 750 GALLONS.
2. ALL INTERCEPTORS SHALL BE UPC/IAPMO ACCEPTED.
3. ALL WASTEWATER EXCLUDING RESTROOMS, MUST PASS THROUGH THE INTERCEPTOR.
4. ALL SURFACE WATER SHALL DRAIN AWAY FROM THE INTERCEPTOR.
5. ALL INTERCEPTORS, SEPARATORS, AND CLARIFIERS SUBJECT TO VEHICULAR TRAFFIC. LOADING SHALL HAVE H-20 RATED TANK TOPS AND ACCESS COVERS. ALL OTHER LOADING CONDITIONS SHALL BE PER MANUFACTURER SPECIFICATIONS.
6. EXTERNAL PLUMBING PER LOCAL PLUMBING CODE.

REVISION	BY	APPR	DATE

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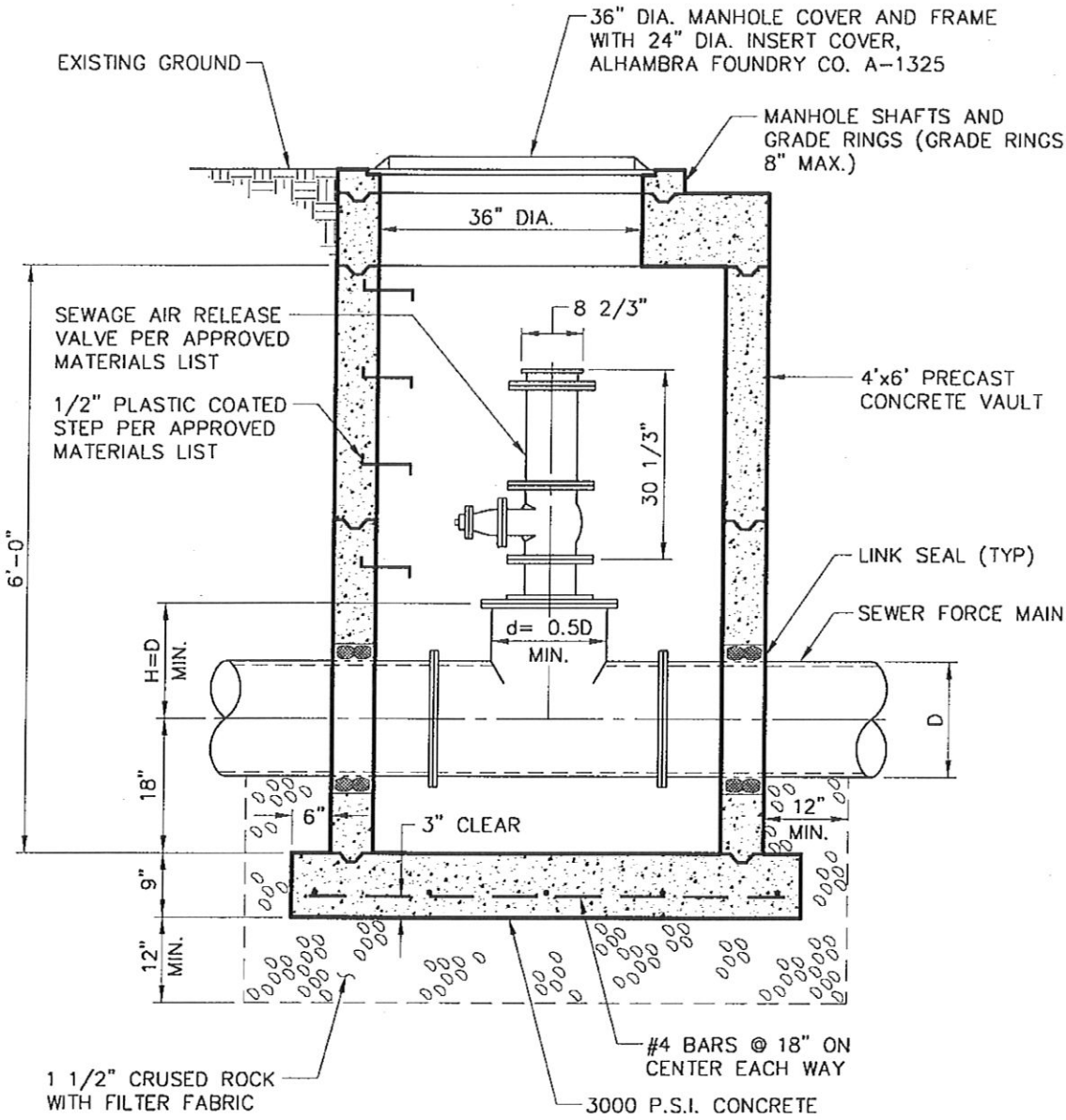
GREASE INTERCEPTOR

STD. DWG. NO.
S-17



PROFILE

NOTE:

1. SEE APPROVED MATERIALS LIST FOR MATERIALS AND EQUIPMENT MANUFACTURERS.

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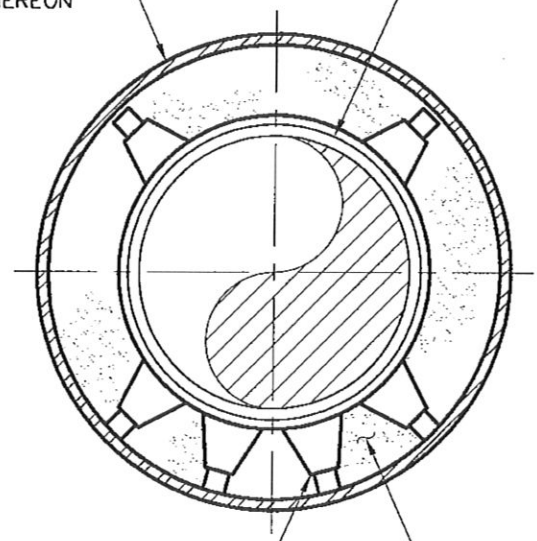
SEWAGE AIR RELEASE AND VAULT DETAIL

STD. DWG. NO.

S-18



CASING SCHEDULE		
NOMINAL PIPE SIZE	MINIMUM CASING SIZE	MIN. WALL
8"	16" I.D.	1/4"
10"	18" I.D.	1/4"
12"	20" I.D.	5/16"
15"	24" I.D.	5/16"
18"	30" I.D.	3/8"
21"	33" I.D.	3/8"
24"	36" I.D.	3/8"
27"	39" I.D.	1/2"
30"	42" I.D.	1/2"
36"	48" I.D.	5/8"
42"	54" I.D.	3/4"

NOTES:

1. SPACING BETWEEN THE CASING INSULATORS SHALL BE PER THE MANUFACTURERS RECOMMENDATIONS EXCEPT THAT THERE SHALL BE AT LEAST 4 CASING INSULATORS PER PIPE SECTION, ONE 12" FROM EACH JOINT AND ONE CENTERED. ADDITIONALLY, ONE INSULATOR SHALL BE INSTALLED 12" FROM EACH END OF THE CASING.
2. BOTH ENDS OF THE CASING BETWEEN THE CASING AND CARRIER PIPE MUST BE SEALED WATERTIGHT USING AN END SEAL, SELECTED FROM APPROVED MATERIALS LIST. BANDS SHALL BE TYPE 304 STAINLESS STEEL.
3. ALL STEEL CASING PIPE JOINTS SHALL BE WELDED FULL CIRCUMFERENCE.
4. ABOVE CASING THICKNESS ARE FOR OPEN TRENCH ONLY. FOR JACKED CASING SEE SPECIFICATION NO. 15130.

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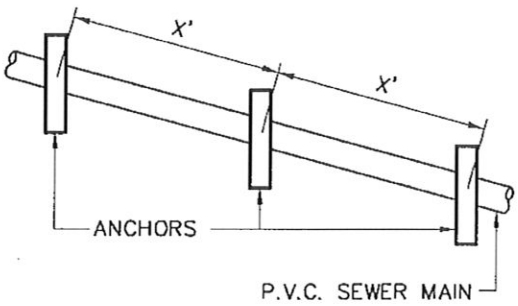
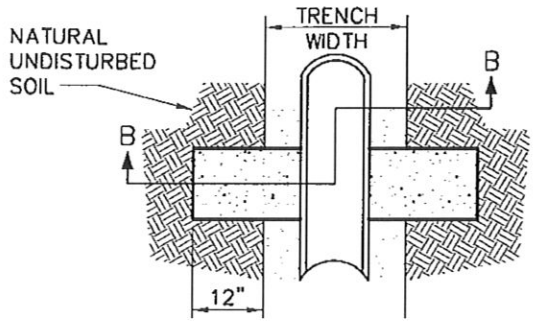
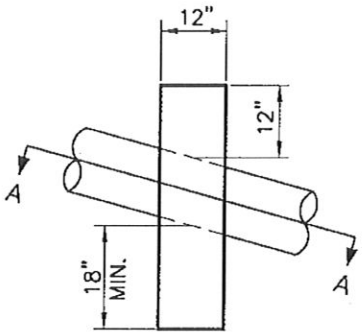
STEEL CASING FOR SEWER MAINS

STD. DWG. NO. **S-19**

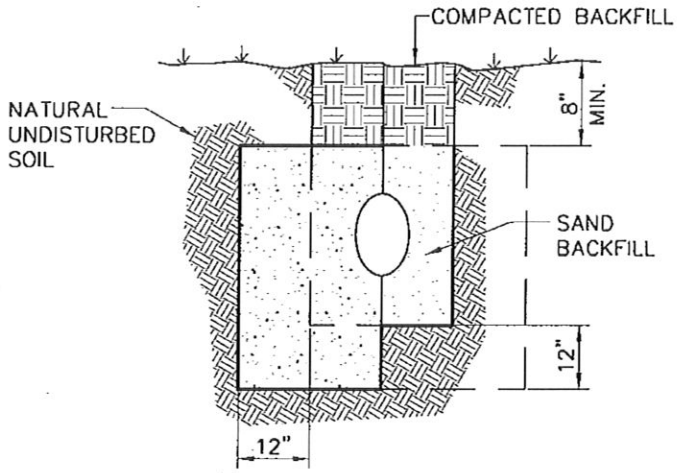




SECTION A–A

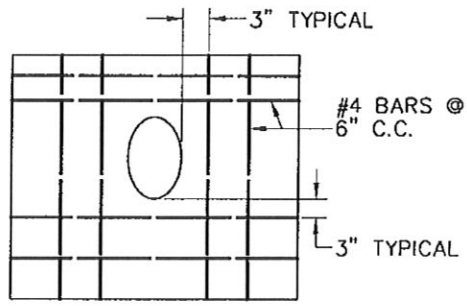


ANCHOR DETAIL



SECTION B–B

PIPE SLOPE	PIPE SLOPE	X DISTANCE
100%	1:1	12'
66.6%	1-1/2:1	14'
50%	2:1	16'
40%	2-1/2:1	18'
33.3%	3:1	20'



REINFORCING STEEL PATTERN

NOTES:

1. PIPE ANCHORS REQUIRED ON ALL SLOPES OF 3:1 OR GREATER.
2. ANCHOR SHALL EXTEND 12" INTO NATURAL UNDISTURBED SOIL.
3. CONCRETE SHALL BE 480-B-2500.
4. ANCHORS FOR TRAPEZOIDAL TRENCH SECTIONS WILL CONFORM TO TRENCH CROSS SECTION AND EXTEND 12" INTO UNDISTURBED SOIL.
5. DESIGN REQUIREMENTS FOR TRENCH DRAIN SUBDRAIN OR CANYON DRAIN SHALL BE IN ACCORDANCE WITH PROJECT GEOTECHNICAL ENGINEER'S RECOMMENDATIONS.

REVISION	BY	APPR	DATE

Elsinore Valley Municipal Water District

PHILLIP M. MILLER R.C.E. 30680 10/10/06 DATE

CONCRETE SLOPE ANCHORS

STD. DWG. NO.

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APPENDIX L – 2008 WASTEWATER MASTER PLAN EXECUTIVE SUMMARY

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This executive summary presents a brief background of the Elsinore Valley Municipal Water District (District) wastewater collection systems, the need for this master plan, proposed improvements to mitigate existing system deficiencies, and proposed expansion projects.

ES.1 STUDY OBJECTIVE

On June 28, 2007, the District authorized Carollo Engineers, P.C. (Carollo) to prepare this wastewater master plan (WWMP) study, which included the following tasks:

- Development of planning criteria and flow projections;
- Hydraulic model development and calibration, which included both dry weather and wet weather flow-monitoring programs;
- Evaluation of the District's existing collection systems and development of the future wastewater collection systems, including improvement recommendations to mitigate existing deficiencies and to serve future growth;
- Development of a wastewater Capital Improvement Program (CIP); and
- Preparation of the Wastewater Master Plan Report.

ES.2 STUDY AREA

The District, which was formed in 1950, is located in the southwestern portion of Riverside County and provides potable water, irrigation, sewer, and reclamation services to the City of Lake Elsinore, the City of Canyon Lake, portions of the City of Murrieta, and some unincorporated areas of Riverside County.

The District currently covers an area of approximately 96 square miles. The ultimate sphere of influence (SOI) of the District covers approximately 132 square miles. The study area for this master plan is shown on Figure ES.1. According to the 2007 Water Distribution System Master Plan (2007 WMP), development in areas within the District SOI but outside the current District service area is projected to occur after the year 2030. Additionally, the SOI development areas are not practically served by sanitary sewer due to the topography of the region.

This master plan identifies the wastewater collection system infrastructure necessary to service developed lands within the current District boundary only excluding the SOI development areas.

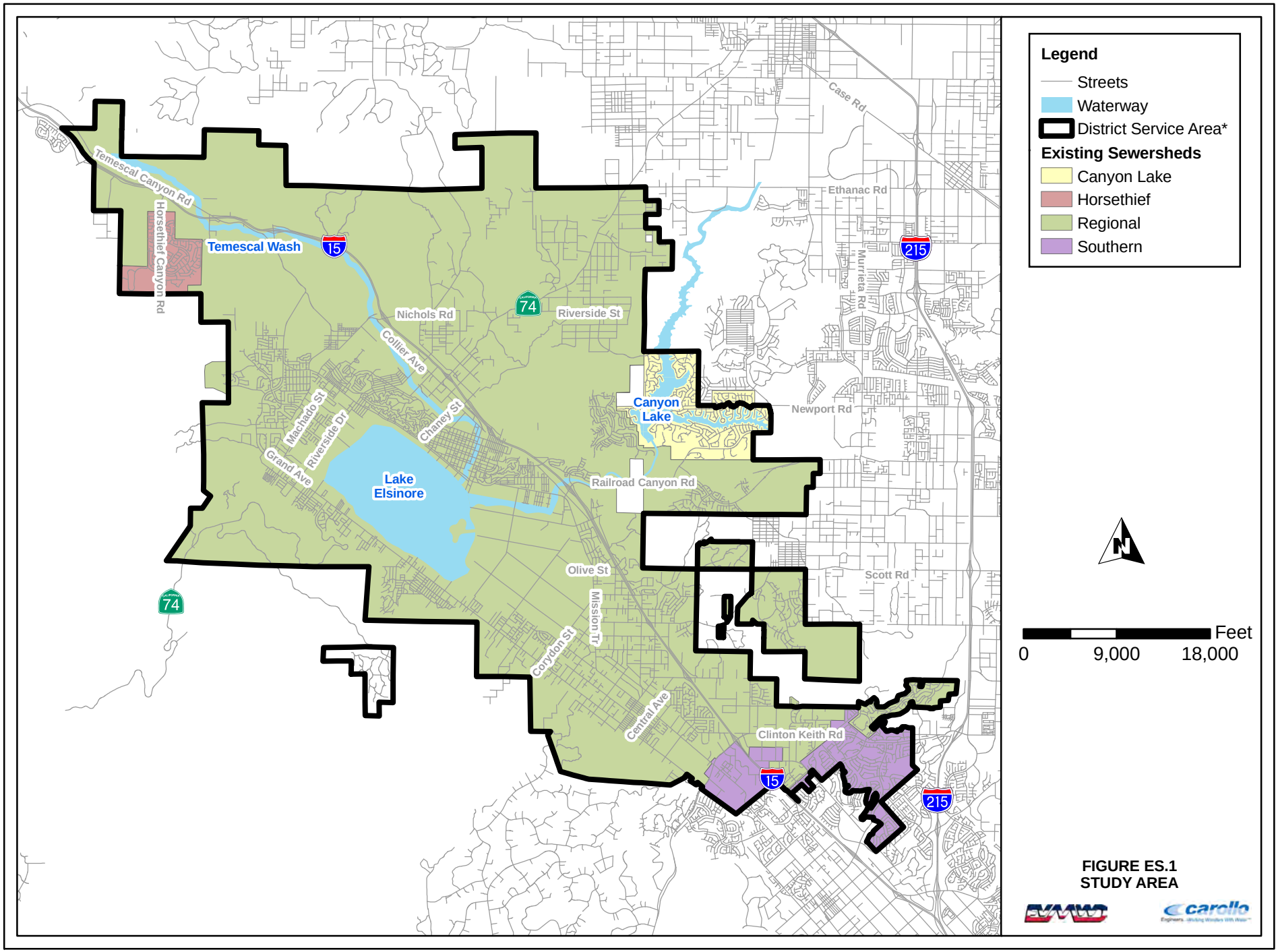

FIGURE ES.1
STUDY AREA

*Note: Master Plan Study Area does not include areas outside the District Service Area, but instead the District SOI.

ES.3 EXISTING WASTEWATER COLLECTION SYSTEMS OVERVIEW

The District's existing wastewater collection systems consist of approximately 358 miles of sewer mains up to 54 inches in diameter. The "backbone" of the system consists of trunk sewers, generally 10 inches in diameter and larger, that convey the collected wastewater to the District's Water Reclamation Facilities (WRFs). The locations of the District's wastewater collection system facilities are shown on Figure ES.2.

The District's current service area is delineated into four separate collection systems. These are the Regional, Canyon Lake, Horsethief, and Southern collection systems. The flows conveyed in the Regional, Canyon Lake, and Horsethief collection systems are treated by the District's Regional, Railroad Canyon, and Horsethief WRFs, respectively. Whereas wastewater discharged into the Southern collection system is conveyed through the Rancho California Water District's (RCWD's) wastewater collection system to the RCWD operated Santa Rosa WRF for treatment. These sewershed areas are also shown on Figure ES.3.

It should be noted that future wastewater flows generated within the Horsethief collection system will be routed to the planned Alberhill WRF for treatment. This master plan assumes that the Alberhill WRF will be operational by the year 2010.

ES.4 WASTEWATER FLOWS

Historical flows at the District's WRFs were reviewed and analyzed to determine daily, monthly, and seasonal fluctuations experienced in the wastewater collection systems. Existing dry weather flows were developed based on water meter data provided by the District. Future wastewater flows were projected based on the water demand projections provided in the 2007 WMP [2]. A 10-year, 24-hour storm event was used to simulate wet weather flows by simulating rainfall derived infiltration and inflow (RDII). Table ES.1 summarizes the District wide dry weather and wet weather flows used for this study.

Table ES.1 Wastewater Flows
Wastewater Master Plan
Elsinore Valley Municipal Water District

Planning Year	Average Dry Weather Flow (mgd)	Peak Wet Weather Flow[(2)] (mgd)
Existing	8.1[1]	23.4
2030	22.5	49.7
Build Out	30.0	63.9

Notes:
(1) Based on 2006 data.
(2) Peak wet weather flow was simulated using the hydraulic computer model.

ES.5 EVALUATION AND PROPOSED IMPROVEMENTS

The District's wastewater collection system facilities were analyzed under existing and future peak flow conditions. Figure ES.4 identifies District's existing facilities that were flagged as deficient under existing peak flow conditions. The proposed improvements to mitigate existing deficiencies and to serve future growth are shown on Figure ES.5. Details of each improvement are also provided in Table ES.2.

ES.5.1 Existing System Project Prioritization

This master plan assumes that the District will implement all of the improvements required to mitigate existing deficiencies in the first capital improvement phase (2008-2010). However, the District may not be capable of implementing all of the proposed improvements to mitigate existing deficiencies. For this reason, the existing system improvements were prioritized based on the severity of the existing deficiency. Table ES.3 summarizes the priority of the existing system improvements.

ES.5.2 Project Phasing

The phasing of the improvements recommended in this chapter is based on the development area assumptions presented in the 2007 WMP [2]. This master plan utilizes the following project phases:

- **Phase 1.** This short-term phase includes improvements that are allocated based on annual fiscal budgets between 2008 and 2010.
- **Phase 2.** This intermediate phase includes improvements that are allocated based on annual fiscal budgets between 2011 and 2015.
- **Phase 3.** This intermediate phase includes improvements that are allocated based on annual fiscal budgets between 2016 and 2020.
- **Phase 4.** This long-term phase includes improvements that are allocated based on annual fiscal budgets between 2021 and 2025.
- **Phase 5.** This long-term phase includes improvements that are allocated based on annual fiscal budgets between 2026 and 2030.
- **Phase 6.** This long-term phase includes improvements that are allocated based on annual fiscal budgets after 2030.

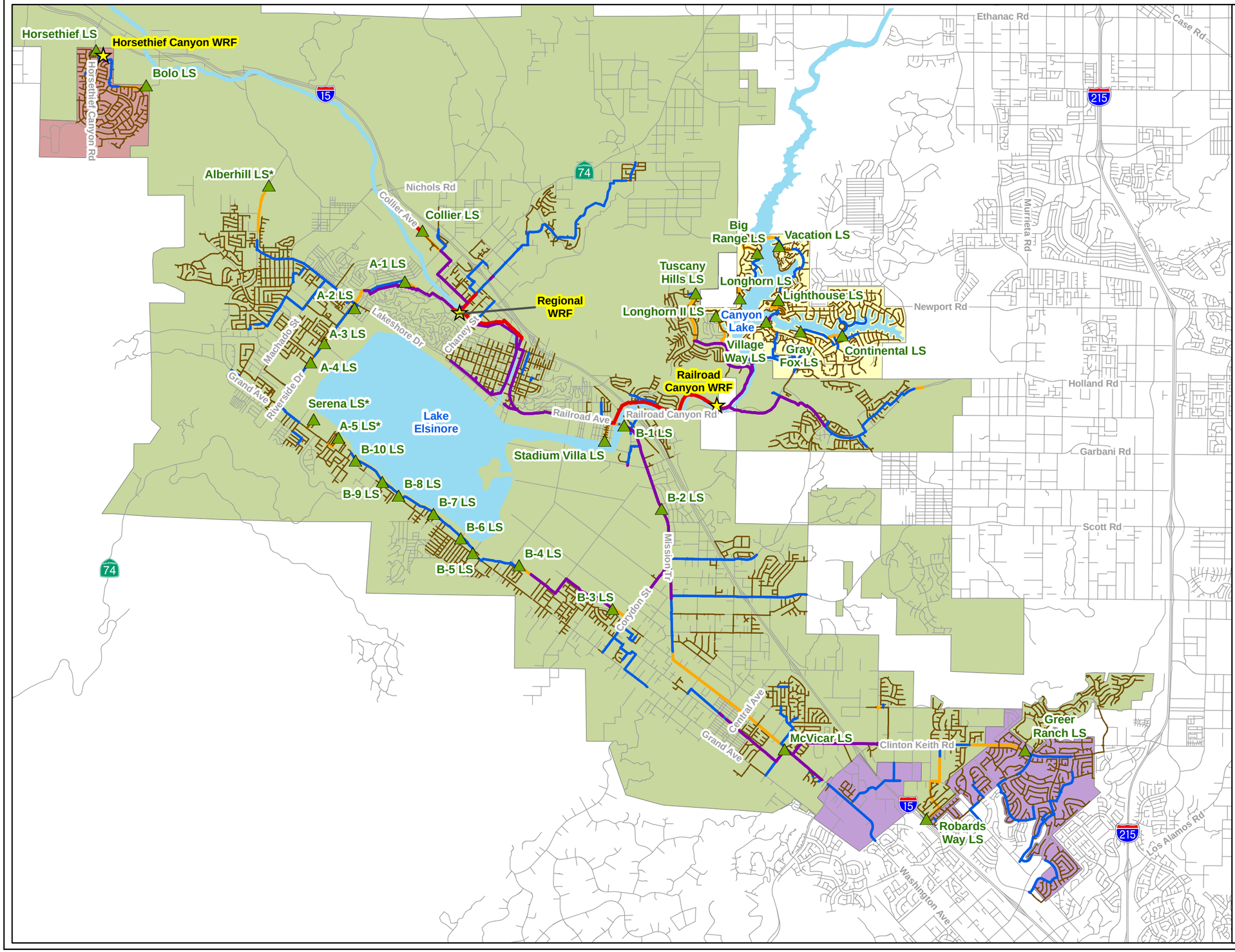

FIGURE ES.2
EXISTING WASTEWATER COLLECTION SYSTEM OVERVIEW

*Note: The Serena LS, A-5 LS, and Alberhill LS were not included in the District's hydraulic model.

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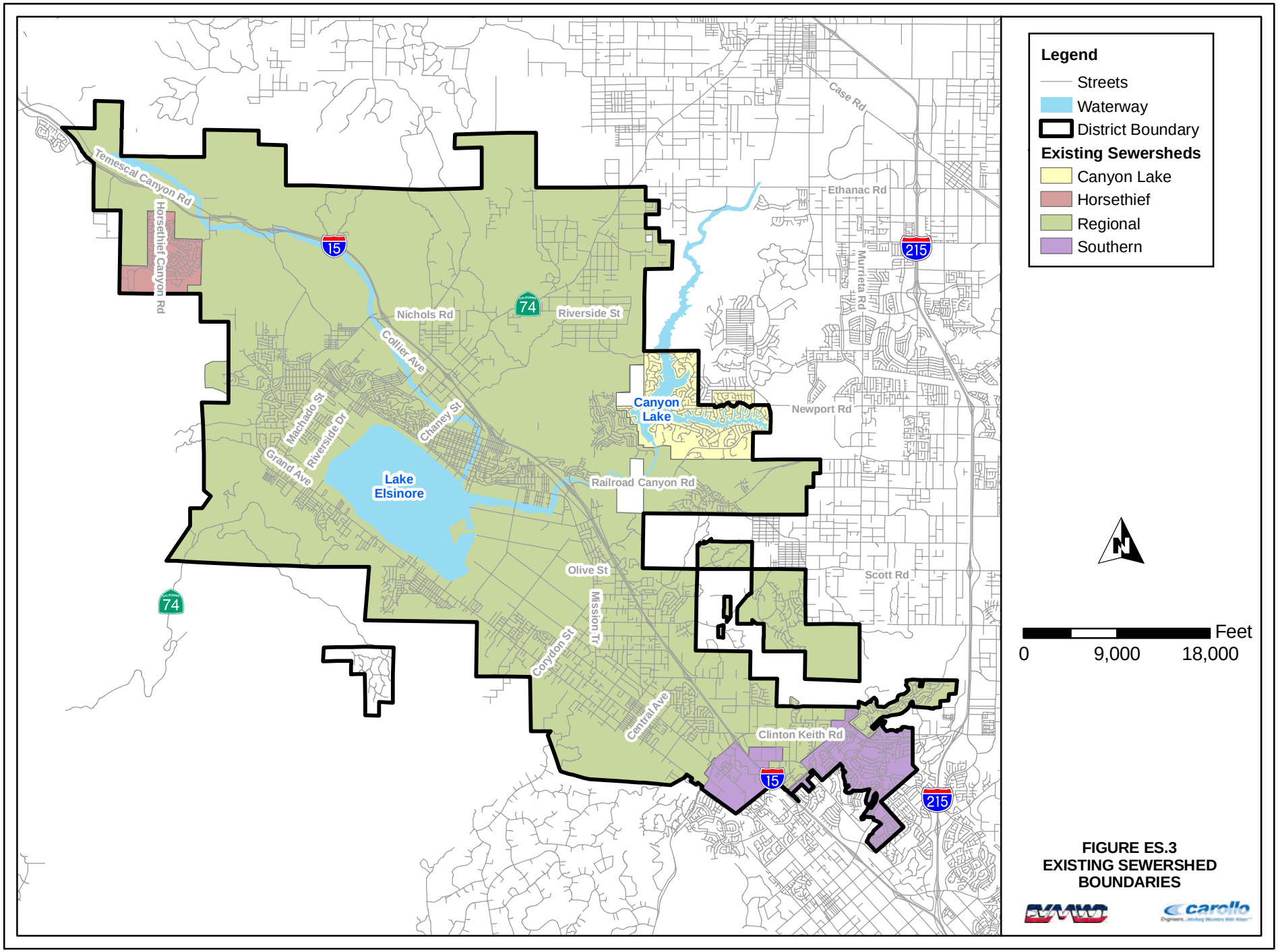

FIGURE ES.3
EXISTING SEWERSHED BOUNDARIES

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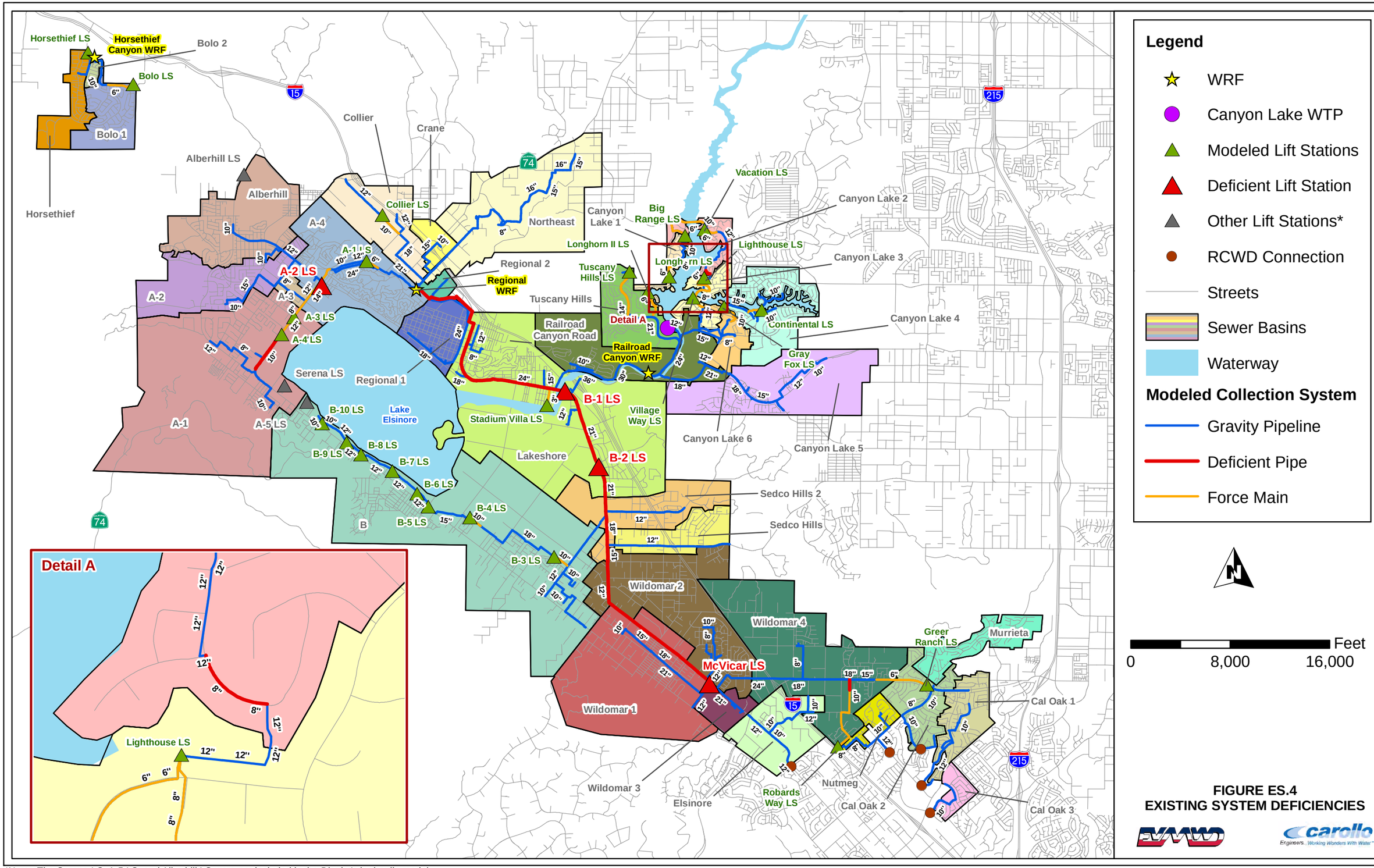

FIGURE ES.4
EXISTING SYSTEM DEFICIENCIES

*Note: The Serena LS, A-5 LS, and Alberhill LS were not included in the District's hydraulic model.

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Abbreviations	
A	Alberhill
AFM	Alberhill Force Main
ALS	Alberhill Lift Station
AP	Alberhill Gravity Pipe
CL	Canyon Lake
CLFM	Canyon Lake Force Main
CLLS	Canyon Lake Lift Station
CLP	Canyon Lake Gravity Pipe
FM	Force Main
LS	Lift Station
P	Gravity Pipe
R	Regional
RFM	Regional Force Main
RLS	Regional Lift Station
RP	Regional Gravity Pipe
WRF	Water Reclamation Facility

Legend

- WRF
- Abandoned WRF
- Canyon Lake WTP
- Modeled Lift Stations
- Abandoned Lift Station
- Gravity Pipeline
- Force Main
- Abandoned Pipeline
- Streets
- Waterway
- District Boundary

Proposed Lift Station Upgrade Improvement Phase

- 2008 - 2010
- 2011 - 2015
- 2016 - 2020
- 2021 - 2025
- 2026 - 2030
- Post 2030

Proposed Pipeline Upgrade Improvement Phase

- 2008 - 2010
- 2011 - 2015
- 2016 - 2020
- 2021 - 2025
- 2026 - 2030
- Post 2030

Future Sewersheds

- Alberhill
- Canyon Lake
- Regional
- Southern

Feet
0 10,000 20,000

FIGURE ES.5
PROPOSED IMPROVEMENTS

*Note: The Serena LS, A-5 LS, and Alberhill LS were not included in the District's hydraulic model.

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Table ES.2 Proposed Improvements
Wastewater Master Plan
Elsinore Valley Municipal Water District

No.	Coded No.	Type of Improvement	Description/ Street	Description/ Limits	Sewer Trunk/ Planned Trunk Name	Detail Figure (See Appendix G)	Existing Improvement	Ex. Size/Diam. (in.)	New Size/Diam. (in.)	Parallel/Replace New	Length (ft)
Regional Sewershed											
Gravity Main Improvements											
1	RP-1	Pipe	Riverside Dr.	Grand Ave. to 1,300' ne/o Grand Ave.	A Trunk	Figure 1	X	10	15	Replace	1,300
2	RP-2	Pipe	Riverside Dr.	1,300' ne/o Grand Ave. to 500' w/o A-4 LS	A Trunk	Figure 1	X	10	15	Replace	2,000
3	RP-3	Pipe	Mission Trail	McVicar Force Main Discharge to Bundy Canyon Rd.	Lakeshore South	Figure 4A	X	12/15	33	Parallel	4,700
4	RP-4	Pipe	Mission Trail	Bundy Canyon Rd. to Corydon St.	Lakeshore South	Figure 4A	X	18	33	Parallel	2,300
5	RP-5	Pipe	Mission Trail	Corydon St. to 600' s/o Sedco Blvd.	Lakeshore South	Figure 5	X	21	42	Parallel	3,700
6	RP-6	Pipe	Mission Trail	600' sw/o Sedco Blvd. to Malaga Rd.	Lakeshore South	Figure 5	X	21	48	Parallel	3,500
7	RP-7	Pipe	Malaga Rd.	Mission Trail to planned Lakeshore Regional LS	Lakeshore Malaga	Figure 5	X	-	48	New	2,400
8	RP-8	Pipe	w/o Mission Trail	Lakeshore Dr. to Malaga Rd.	Regional/Lakeshore South	Figure 5	X	-	21	New	2,700
9	RP-9	Pipe	Various Streets	B-1 Force Main Discharge to 3rd St.	Lakeshore North	Figure 6	X	24	54	Parallel	17,500
10	RP-10	Pipe	Jana Ln.	Robards Way LS Force Main Discharge End to Clinton Keith Rd.	Clinton Keith	Figure 3	X	10	15	Replace	900
11	RP-11	Pipe	Coal Ave.	se/o Robb Rd. to Terra Cotta Rd.	Nichols Road	Figure 9		-	10	New	2,700
12	RP-12	Pipe	Coal Ave.	Terra Cotta Rd. to Nichols Rd.	Nichols Road	Figure 9		-	12	New	3,200
13	RP-13	Pipe	Turnbull Ave. and Gunnerson St.	Bunker St. to the A-1 LS	Nichols Road	Figure 9		-	24	New	3,300
14	RP-14	Pipe	sw/o Ulla Ln.	w/o Ulla Ln. to w/o Riverside Dr.	A Trunk	Figure 1		-	8	New	1,000
15	RP-15	Pipe	Hammack Ave.	Telford Ave. to Mauricio St.	3rd Street Trunk Extension	Figure 11		-	10	New	7,500
16	RP-16	Pipe	No Existing Street	840' s/o Greenwald Ave. to New Tuscany Hills LS	North Tuscany Hills	Figure 8		-	15	New	2,800
17	RP-17	Pipe	Summerhill Drive Extension	Existing Temporary Tuscany Hills LS n/e to Tuscany Hills LS	North Tuscany Hills	Figure 8		-	15	New	1,900
18	RP-18	Pipe	Greenwald Ave.	Scenic Crest Dr. to 840' s/o Greenwald Ave.	North Tuscany Hills	Figure 8		-	15	New	4,700
19	RP-19	Pipe	Greenwald Ave.	n/o Hyatt Rd. to Scenic Crest Dr.	North Tuscany Hills	Figure 8		-	12	New	2,300
20	RP-20	Pipe	Mauricio St.	Penny Place to Greenwald Ave.	North Tuscany Hills	Figure 8		-	10	New	1,400
21	RP-21	Pipe	Read St.	Senola Ave. to Mauricio St.	North Tuscany Hills	Figure 8		-	10	New	3,900
22	RP-22	Pipe	s/o Lakeshore Dr.	e/o Lakepoint Park to e/o San Jacinto River	East Lake Subtrunk	Figure 10		-	15	New	7,000
23	RP-23	Pipe	Bundy Canyon Road	e/o The Farm Rd. to w/o Tulip Ln.	Bundy Canyon Road Trunk Extension	Figure 13		-	10	New	8,600
24	RP-24	Pipe	Lost Rd.	Crooked Arrow Dr. to Lemon St.	Lemon Street Trunk Extension	Figure 14		-	10	New	6,500
25	RP-25	Pipe	Croydon St.	Cereal Street to Mission Trail	B Trunk	Figure 2A		18	27	Replace	1,900
26	RP-26	Pipe	Croydon St.	e/o Melinda Ln. to Cereal St.	B Trunk	Figure 2A		18	24	Replace	1,500
27	RP-27	Pipe	Parallel to Interstate 15	Frederick St. to Clinton Keith Rd.	Interstate 15 Subtrunk	Figure 15		-	12	New	7,400
28	RP-28	Pipe	Orange St. and Gruwell St.	Laguna Rd. to Front St.	Orange/Gruwell Street Subtrunk Extension	Figure 16		-	10	New	3,700
29	RP-29	Pipe	Wesley St.	Grand Ave. to Union St.	Front Street Subtrunk Extension	Figure 16		-	10	New	1,400
30	RP-30	Pipe	Arcadia Ln. and Lynx Rd.	Sunset Ridge LS force main to Bundy Canyon Rd.	Sunset Ridge	Figure 12		-	12	New	6,200
31	RP-31	Pipe	Cottonwood Canyon Rd.	Bundy Canyon Rd. to n/o Hemlock St.	Sunset Ridge	Figure 12		-	12	New	10,000
32	RP-32A	Pipe	El Toro Rd.	Lindell Rd. to Dexter Ave.	North Peak	Figure 7		-	12	New	4,100
33	RP-32B	Pipe	Dexter Ave.	El Toro Rd. to Highway 74	North Peak	Figure 7		-	15	New	4,200
34	RP-33	Pipe	El Toro Rd.	North Peak Development to Lindell Rd.	North Peak	Figure 7		-	12	New	7,800
35	RP-34	Pipe	El Toro Rd.	North Peak LS force main 5,300' sw/o force main	North Peak	Figure 7		-	12	New	5,300
36	RP-35	Pipe	El Toro Rd.	n/o North Peak LS to North Peak LS	North Peak	Figure 7		-	10	New	2,000
37	RP-36	Pipe	Lindell Road	1,300' n/o El Toro Road to El Toro Rd.	North Peak	Figure 7		-	10	New	1,300
38	RP-37	Pipe	Corydon St.	B-3 LS Force Main outlet to e/o Melinda Ln.	B Trunk	Figure 2A		18	24	Replace	2,000
Lift Station Improvements											
39	RLS-1	Lift Station	se/o Riverside Dr.	A-2 LS Upgrade	A Trunk	Figure 1	X	2,400 gpm	7.5 mgd	Replace	-
40	RLS-2	Lift Station	McVicar St.	McVicar LS Upgrade	Mission Trail	Figure 4B	X	1,350 gpm	8.5 mgd	Replace	-
41	RLS-3	Lift Station	Malaga Rd.	New Lakeshore Regional Lift Station	Lakeshore Malaga	Figure 5	X	-	22.5 mgd	New	-
42	RLS-4	Lift Station	Strickland Ave.	A-1 LS Upgrade	A Trunk	Figure 9		255 gpm	1.5 mgd	Replace	-
43	RLS-5	Lift Station	Grand Ave.	B-3 LS Upgrade	B Trunk	Figure 2A		1,050 gpm	3.0 mgd	Replace	-
44	RLS-6	Lift Station	Clinton Keith Rd.	Greer Ranch LS Upgrade	Clinton Keith	Figure 3		350 gpm	0.75 mgd	Replace	-
45	RLS-7	Lift Station	Nichols Rd.	New Nichols Rd. LS	Nichols Road	Figure 9		-	1.0 mgd	New	-
46	RLS-8	Lift Station	ne/o Existing Tuscany Hills LS	New Tuscany Hills LS	North Tuscany Hills	Figure 8		-	2.5 mgd	New	-
47	RLS-9	Lift Station	Greenwald Ave.	New Greenwald LS	North Tuscany Hills	Figure 8		-	0.5 mgd	New	-
48	RLS-10	Lift Station	Herbert St.	New Herbert LS	North Tuscany Hills	Figure 8		-	0.25 mgd	New	-

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Table ES.2 Proposed Improvements
Wastewater Master Plan
Elsinore Valley Municipal Water District

No.	Coded No.	Type of Improvement	Description/ Street	Description/ Limits	Sewer Trunk/ Planned Trunk Name	Detail Figure (See Appendix G)	Existing Improvement	Ex. Size/Diam. (in.)	New Size/Diam. (in.)	Parallel/Replace New	Length (ft)
49	RLS-11	Lift Station	Sunset Ridge Development	New Sunset Ridge LS	Sunset Ridge	Figure 12		-	0.5 mgd	New	-
50	RLS-12	Lift Station	North Peak Development	New North Peak LS	North Peak	Figure 7		-	0.5 mgd	New	-
51	RLS-13	Lift Station	e/o Grand Ave.	B-4 LS Upgrade	B Trunk	Figure 2B		1,010 gpm	2.5 mgd	Replace	-
52	RLS-14	Lift Station	Grand Ave.	B-9 LS Upgrade	B Trunk	Figure 2B		260 gpm	0.75 mgd	Replace	-
Force Main Improvements											
53	RFM-1	Force Main	Palomar St.	McVicar St. to Mission Trail	Mission Trail	Figure 4B	X	12	24	Replace	11,100
54	RFM-2	Force Main	w/o Mission Trail	Lakeshore Regional Lift Station FM-1	Lakeshore Malaga	Figure 5	X	-	24	New	3,600
55	RFM-3	Force Main	w/o Mission Trail	Lakeshore Regional Lift Station FM-2	Lakeshore Malaga	Figure 5	X	-	24	New	3,600
56	RFM-4 [2]	Force Main	Riverside Dr.	A-2 LS Force Main Upgrade	A Trunk	Figure 1		14	20	Replace	1,700
57	RFM-5	Force Main	Strickland Ave.	A-1 LS Force Main Upgrade	A Trunk	Figure 9		6	12	Replace	1,100
58	RFM-6	Force Main	Nichols Rd.	New Nichols Rd. LS Force Main	Nichols Road	Figure 9		-	12	New	6,700
59	RFM-7	Force Main	ne/o Existing Tuscany Hills LS	New Tuscany Hills LS Force Main	North Tuscany Hills	Figure 8		-	14	New	1,900
60	RFM-8	Force Main	ne/o Existing Tuscany Hills LS	New Tuscany Hills LS Force Main	North Tuscany Hills	Figure 8		-	14	New	1,900
61	RFM-9	Force Main	Greenwald Ave.	New Greenwald LS Force Main	North Tuscany Hills	Figure 8		-	8	New	1,600
62	RFM-10	Force Main	Herbert St.	New Herbert LS Force Main	North Tuscany Hills	Figure 8		-	6	New	6,300
63	RFM-11	Force Main	Sunset Ridge Development	New Sunset Ridge LS Force Main	Sunset Ridge	Figure 12		-	8	New	7,100
64	RFM-12	Force Main	North Peak Development	New North Peak LS Force Main	North Peak	Figure 7		-	6	New	2,500
65	RFM-13	Force Main	Grand Ave.	B-3 LS Force Main	B Trunk	Figure 2A		10	15	Replace	1,400
66	RFM-14	Force Main	Grand Ave.	B-9 LS Force Main	B Trunk	Figure 2B		6	8	Replace	8,700
Canyon Lake Sewershed											
Gravity Main Improvements											
67	CLP-1	Pipe	Redwood Dr.	Boating Way to 470' se/o Boating Way	Canyon Lake	Figure 17	X	8	12	Replace	500
68	CLP-2 [2]	Pipe	Cottonwood Canyon Rd.	e/o San Jacinto River	Canyon Lake Railroad Canyon Road	Figure 18		15	21	Replace	300
69	CLP-3 [2]	Pipe	Siphon Under San Jacinto River	Parallel Siphon with 2 10-inch pipes	Canyon Lake Railroad Canyon Road	Figure 18		-	10	Parallel	300
70	CLP-4 [2]	Pipe	Siphon Under San Jacinto River	Parallel Siphon with 2 10-inch pipes	Canyon Lake Railroad Canyon Road	Figure 18		-	10	Parallel	300
Lift Station Improvements											
71	CLLS-1	Lift Station	Village Way	Village Way LS Upgrade	Canyon Lake	Figure 17		1,075 gpm	1.75 mgd	Replace	-
Alberhill Sewershed											
Gravity Main Improvements											
72	AP-1	Pipe	Lake St.	3,560' se/oTemescal Canyon Rd. to Temescal Canyon Rd.	Pacific Clay	Figure 21		-	15	New	3,600
73	AP-2	Pipe	Lake St.	nw/o Coal Rd. to 3,560' se/o Temescal Canyon Rd.	Pacific Clay	Figure 21		-	15	New	3,900
74	AP-3	Pipe	Parallel to Interstate 15	4,700' e/o Lake St. to Lake St.	East Alberhill CFD	Figure 20		-	18	New	4,700
75	AP-4	Pipe	Parallel to Interstate 15	Lake Street to 2,660' w/o Lake St.	East Alberhill CFD	Figure 20		-	24	New	2,700
76	AP-5	Pipe	Parallel to Interstate 15	s/o Interstate 15 to e/o Horsethief Canyon Rd.	East Alberhill CFD	Figure 20		-	27	New	6,800
77	AP-5a	Casing[1]	Interstate 15	Crossing Under Interstate 15	East Alberhill CFD	Figure 20		-	27/48	New	350
78	AP-6	Pipe	e/o Horsethief Canyon Rd.	Interstate 15 to the Alberhill WRF	Glen Eden	Figure 19		-	30	New	1,200
79	AP-7	Pipe	Parallel to Interstate 15	Horsethief Canyon Rd. to e/o Horsethief Canyon Rd.	Glen Eden	Figure 19		-	15	New	1,100
80	AP-8	Pipe	Near Interstate 15	Glen Eden to the Glen Eden LS	Glen Eden	Figure 19		-	12	New	2,900
81	AP-8a	Casing[1]	Interstate 15	Crossing Under Interstate 15	Glen Eden	Figure 19		-	12/30	New	300
82	AP-9	Pipe	Horsethief Canyon Rd.	s/o Intersate 15 to Temescal Canyon Rd.	Horsethief Canyon Road Connector Trunk	Figure 22		-	15	New	1,200
83	AP-9a	Casing[1]	Interstate 15	Crossing Under Interstate 15	Horsethief Canyon Road Connector Trunk	Figure 22		-	15/35	New	300
84	AP-10	Pipe	Horsethief Canyon Rd.	n/o Kicking Horse Dr. to s/o Interstate 15	Horsethief Canyon Road Connector Trunk	Figure 22		-	12	New	1,700
85	AP-11	Pipe	n/o Kicking Horse Dr.	near Horsethief WRF to Horsethief Canyon Rd.	Horsethief Canyon Road Connector Trunk	Figure 22		-	18	New	300
Lift Station Improvements											
86	ALS-1	Lift Station	Bolo St.	Bolo LS upgrade	Bolo Trunk	Figure 23		200 gpm	0.40 mgd	Replace	-
87	ALS-2	Lift Station	Temescal Canyon Rd.	New Glen Eden LS	Glen Eden	Figure 19		-	0.75 mgd	New	-
Force Main Improvements											
88	AFM-1	Force Main	Parallel to Interstate 15	From the Glen Eden LS to Horsethief Canyon Rd.	Glen Eden	Figure 19		-	8	New	6,800

Note:
(1) Proposed casing size and carrier pipe size.

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Table ES.3 Existing System Project Prioritization Wastewater Master Plan Elsinore Valley Municipal Water District	
Priority	**Improvement Number**
Highest Priority - Severe surcharging with potential for extended SSOs during a large storm; PWWF is greatly above lift station firm capacity.	RP-9, RLS-1
High Priority - Severe surcharging with potential for SSOs during a large storm; PWWF is greatly above lift station firm capacity.	RP-1, RP-2, RP-3, RP-4, RP-5, RP-6, RP-7, RLS-3, RFM-2, RFM-3,
Medium Priority - Surcharging in pipelines; PWWF is appreciably above lift station firm capacity.	RP-8, RLS-2,
Lower Priority - Slight Surcharging in pipelines; PWWF is slightly above lift station firm capacity.	RP-10, CLP-1, RFM-1

As noted previously, it is assumed that all improvements necessary to mitigate existing deficiencies are implemented in the first capital improvement phase (2008 - 2010). Improvements within the existing collection system that are not required to mitigate existing deficiencies are phased in the period in which the deficiency is expected to occur.

Expansion projects were phased so that high priority was given to the construction of new pipelines and lift stations in the phase in which the development is expected to come online. For example, if growth within a specific plan area, such as Sunset Ridge, is projected to occur from 2011 to 2020, then the infrastructure necessary to service the development would be required in improvement Phase 2 (2011 -2015). For this reason, many of the improvements recommended in this master plan are stacked in earlier phases (such as Phases 2 and 3).

ES.6 CAPITAL IMPROVEMENT PROGRAM

The cost estimates presented in the CIP include a 30-percent contingency cost, 15-percent engineering and administrative cost, and a 10-percent construction management cost, all of which are applied to the baseline construction cost. Table ES.4 summarizes the District's Sewer System CIP by phase and by user category.

Table ES.4 Capital Improvement Program Summary by Phases/User Categories
Wastewater Master Plan
Elsinore Valley Municipal Water District

Planning Period	Years	Existing Users[(1)]	Future Users[(1)]	Capital Cost[(1)]
Phase 1	2008-2010	$31.6	$33.5	$65.2
Phase 2	2011-2015	$0.0	$73.7	$73.7
Phase 3	2016-2020	$0.0	$15.0	$15.0
Phase 4	2021-2025	$0.0	$27.9	$27.9
Phase 5	2026-2030	$0.0	$10.8	$10.8
Phase 6	Post 2030	$0.0	$14.3	$14.3
Total		**$31.6**	**$175.3**	**$206.9**

Note:
(1) All costs are in millions of dollars (ENR CCI 9,895, Los Angeles Oct 2008)

As shown in ES.2, the majority of improvements and capital costs are associated with growth and are therefore allocated to future customers ($168.2 million). The total CIP is estimated to cost approximately $207 million, of which 15.3 percent ($31.6 million) is allocated to existing customers. Table ES.5 provides a breakdown of cost by facility type per planning phase. As can be seen in the table the greatest percentage of cost comes from Lift Stations ($101.2 million).

Table ES.5 Capital Improvement Program Summary by Phases/Facility Type
Wastewater Master Plan
Elsinore Valley Municipal Water District

Improvement Type	Phase 1 2007-2010	Phase 2 2010-2015	Phase 3 2015-2020	Phase 4 2020-2025	Phase 5 2025-2030	Phase 6 Post 2030	Total
Gravity Pipelines	$8.3	$46.6	$11.1	$15.6	$3.1	$1.8	**$86.5**
Lift Stations	$49.6	$19.4	$3.1	$11.3	$7.8	$10.1	**$101.2**
Force Mains	$7.2	$7.8	$0.8	$1.0	$0.0	$2.4	**$19.3**
Total	**$65.2**	**$73.7**	**$15.0**	**$27.9**	**$10.8**	**$14.3**	**$206.9**

Note:
(1) All costs are in millions of dollars (ENR CCI 9,895, Los Angeles Oct 2008)

APPENDIX M – SSMP ADOPTING RESOLUTION

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APPENDIX N – NOTICE OF PUBLIC HEARING

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APPENDIX O – SWRCB SSMP CERTIFICATION FORM

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Appendix N:

Rancho California Water District Reference Materials

Appendix N1:

2005 Urban Water Management Plan

2005 Update of the Urban Water Management Plan

Rancho California Water District

42135 Winchester Road
Temecula, CA 92590
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December 2005

Report Prepared by

CDM
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(760) 438-7755

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Section 1
Introduction

1.1 Overview

The Rancho California Water District (RCWD) is a "Special District" organized and operated pursuant to the California Water Code. RCWD is governed by a seven-member Board of Directors (Board) that is elected by the voters of the region. The District serves the area known as Temecula/Rancho California, which includes the City of Temecula, portions of the City of Murrieta, and unincorporated areas of Riverside County.

As an urban water supplier providing municipal and industrial water to more than 3,000 customers, RCWD is required to comply with The Urban Water Management Planning Act (Act). The Act became effective on January 1, 1984 and requires that urban water suppliers prepare and adopt an urban water management plan, in accordance with prescribed requirements

The Act was originally developed as a result of concerns for potential water supply shortages throughout the State. Therefore, it required information that focused primarily on water supply reliability and water use efficiency measures. Since its original passage in 1983, there have been several amendments added, the most recent adopted in 2004. Some of the recent amendments include: providing additional emphasis on drought contingency planning and recycled water, as well as incorporation of water quality issues and how they might affect water supply reliability.

With the passage of Senate Bills 610 and 221, in 2001, Urban Water Management Plans take on even more importance. SB 610 and 221 require that counties and cities consider the availability of adequate water supplies for certain new large developments. These statutes require written verification of sufficient water supply to serve the new development, and Urban Water Management Plans are identified as key source documents for this verification.

The RCWD 2005 UWMP updates the 2000 UWMP and takes into account new Act requirements and changes in demographics, water demand and supplies.

Compliance with the Act helps RCWD to fulfill its mission: "to deliver reliable, high quality water, sewer, and reclamation services to its customers and communities in a prudent and sustainable manner."

1.1.1 History

RCWD's history started when the developers of the Temecula/Rancho California formed the original "Rancho District" in 1965, which served 41,000 acres of the easterly portion of the community. In 1968, the Santa Rosa Ranches Water District was organized to serve the westerly 44,800 acres of the community. To gain access to

imported water to meet growing water demands and supplement local groundwater, the Rancho District was annexed in 1966 to the Eastern Municipal Water District (EMWD); while the Santa Rosa Ranches Water District was annexed into the Western Municipal Water District of Riverside County (WMWD) in 1968. Both EMWD and WMWD are member agencies of the Metropolitan Water District of Southern California (MWD). MWD operates the Colorado River Aqueduct and is a State Water Contractor, allowing imported water from Northern California to be delivered to Southern California.

In 1977, the Rancho and Santa Rosa water districts were consolidated under the name Rancho California Water District, in accordance with LAFCO resolutions. RCWD has the authority to operate, maintain, and furnish facilities for all water systems within the District's service area, and for the collection and treatment of wastewater for the Santa Rosa Division. EMWD remains responsible for wastewater treatment in the Rancho Division.

The District is about 85 miles southeast of Los Angeles and 65 miles north of San Diego. RCWD provides water for urban and agricultural uses to the City of Temecula, portions of the City of Murrieta, and unincorporated Riverside County lands in the surrounding area. The District's current service area is bounded on the southwest by the Santa Ana Mountains and on the northeast by Gavilan Hills. Figure 1-1 shows the RCWD service area.

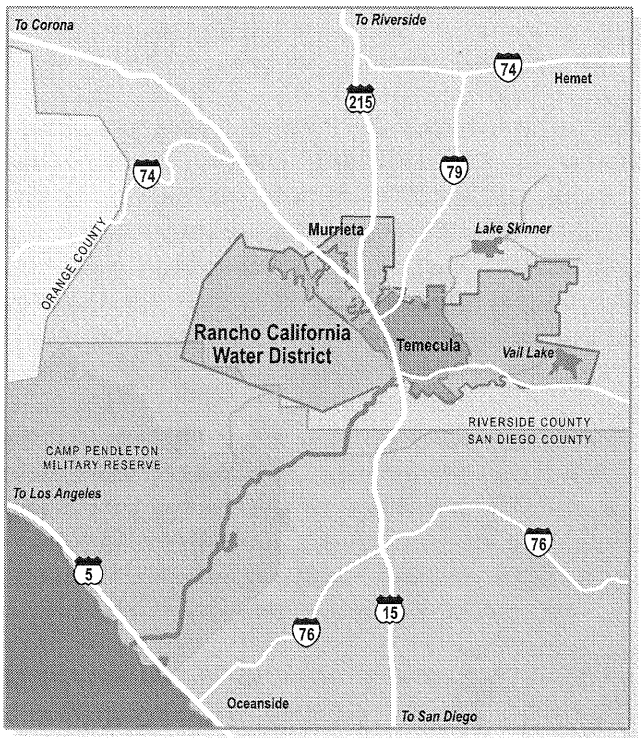

Figure 1-1
RCWD Service Area

The elevation of the valley floor range from 900 to 1,200 feet above sea level, however, the District pumps to a maximum elevation of 2,850 feet for some pressure zones in its service area.

1.1.2 Service Area Description

Land Use

RCWD comprises approximately 99,000 acres in the southwestern portion of Riverside County. Figure 1-2 shows the breakdown in land uses within RCWD.

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RCWD comprises approximately 99,000 acres in the southwestern portion of Riverside County. Figure 1-2 shows the breakdown in land uses within RCWD.

Because of their proximity to major cities in Southern California and lower relative living prices, the cities of Temecula and Murietta are becoming more desirable places to live. Both cities are experiencing rapid population growth and have a need for reliable water supplies. RCWD includes about 18,000 acres of agriculture and ranch lands, primarily vineyards, avocado, and citrus trees. The Temecula Valley is becoming a premiere wine grape growing area in California, which coupled with other high-value crops, requires a consistent irrigation supply. Major agricultural acreage is concentrated in the southwestern and eastern portions of the district.

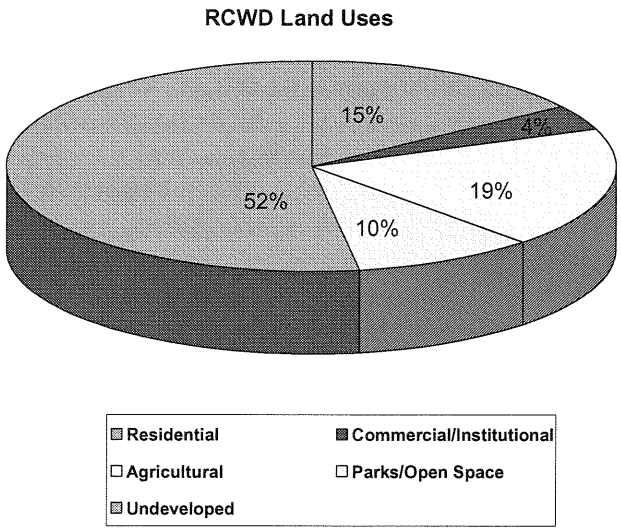

Figure 1-2
Land Use in RCWD's Service Area

Demographics

Current demographics were obtained for the RCWD service area from the Metropolitan Water District (MWD), using land-use and census tract level data from the Southern California Association of Governments (SCAG). Table 1-1 presents these demographics in five year intervals beginning in 2005 and ending in 2030.

Table 1-1
Demographic Projections for RCWD Service Area

	2005	2010	2015	2020	2025	2030
Population	109,123	121,324	134,184	145,631	155,772	165,151
Occupied Housing						
Single-Family	27,518	31,717	35,409	39,384	43,101	46,152
Multi-Family	6,336	7,084	8,223	8,951	9,652	10,923
Total Housing	33,856	38,802	43,633	48,336	52,754	57,075
Total Employment	33,838	43,848	52,947	62,273	71,656	81,277

Source: MWD, based on SCAG census tract data from SCAG RTP.

Within the RCWD service area population is expected to continue to grow over the next 25 years at an average rate of approximately 2,240 persons, representing a 2.6 percent annual growth rate per year for a total growth rate of approximately 66 percent over the projection period. Over the projection period this will lead to approximately 56,000 new residents.

Housing, as a whole, is projected to increase at a slightly slower pace of 2.4 percent annually for a total growth rate of approximately 59 percent over the projection period. Single-family and multi-family housing are projected to grow at similar rates over the projection period. Approximately 23,200 additional housing units are expected to be added over the projection period.

Total employment within RCWD's service area is expected to lag population and housing unit growth with an annual increase of approximately 1.7 percent and a total population increase of approximately 42 percent over the projection period. Total employment is expected to increase by approximately 47,000 by 2030. Employment growth that lags behind population growth indicates that many residents will commute out of the service area to their places of employment.

Climate

The climate within the RCWD service area is Mediterranean with hot, dry summers and cool, wet winters. Summer daytime temperatures are in the mid-80 to high-90 degrees range. The area's temperature is influenced by prevailing onshore winds from the Pacific Ocean and the rain shadow effect from the Santa Rosa Mountains. The "Santa Ana winds" can cause periods of extremely hot weather with dry winds. Winter daytime temperatures are mild, averaging in the mid-60 degree range. The region's average monthly maximum temperature is 80.63 degrees. This is based on weather data readings from October 1948 through December 2004 at the Elsinore weather station, the closest weather station to the service area. Table 1-2 presents average climate data for the RCWD service area.

Table 1-2
Climate Data for RCWD Service Area

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Annual
Standard Average E to (feet per year)[1]	2.30	2.34	4.14	5.01	6.47	6.98	7.92	7.58	5.79	4.20	2.64	2.26	4.80
Average Rainfall (inches)[2]	2.33	2.31	1.78	0.65	0.17	0.02	0.07	0.10	0.24	0.40	1.03	1.63	10.74
Average Max Temperature (F) [2]	65.4	67.9	71.0	76.5	82.0	90.6	98.2	98.3	93.4	83.8	73.6	66.8	80.6

[1]Source: http://www.cimis.water.ca.gov/cimis/frontMonthlyReport.doc. Station #137 - Temecula East II 11/97 through 7/05
[2] October 1948 through December 2004 for Station ID 2805, Elsinore

The standard annual average evapotranspiration rate (ETo) for the region is 4.80 feet per year with the highest rates occurring during the summer months. ETo measures

the loss of water to the atmosphere by evaporation from soil and plant surfaces and transpiration from plants. ETo serves as an indicator of how much water plants need for healthy growth.

Total annual precipitation at the Elsinore weather station averages 10.74 inches per year. During very wet years, rainfall can exceed 25 inches, while during very dry years rainfall can be less than 4 inches. Rainfall is more prevalent during the months of November through April.

1.2 Regional Integrated Resources Plan

To help achieve its mission, RCWD recently developed a Regional Integrated Resources Plan (CDM 2005). The purpose of the Regional Integrated Resources Plan (or IRP) was to develop a long-range water supply plan to reliably meet the needs of the District from now until 2050. The IRP examined different alternatives such as increased water conservation, additional groundwater, conversion of agriculture currently using treated imported water to raw imported water and/or advanced-treated recycled water, groundwater recharge using advanced-treated recycled water, and water transfers.

These alternatives were evaluated against a set of objectives such as:

- Reliably meet water demands
- Provide sustainable supply
- Maximize local control
- Manage costs
- Manage water quality
- Maintain quality of life
- Maximize implementation potential

Over a dozen alternatives were evaluated. The preferred plan, called Hybrid 1, involves the following components:

1. Implement baseline water conservation measures
2. Connect imported water connection EM-21 to Vail Lake to expand groundwater recharge
3. Convert eastern area agriculture, currently using treated imported water, to raw water, delivered from Vail Lake

4. Construct up to 18 new groundwater wells, along with increased imported water for recharge during non-drought years

5. Construct a MF/RO treatment facility to reduced the salinity of recycled water so that it can be used to meet western area agricultural demands, as well as potential groundwater replenishment in the future

The benefits of this preferred IRP alternative are:

- Increased groundwater production of about 18,000 acre-feet per year
- Increased use of recycled water of about 13,600 acre-feet per year
- Reduction in peaking on MWD by about 144 cubic feet per second (cfs)
- Cost efficiency by: (1) converting eastern area agricultural users from treated imported water to untreated, (2) reducing the peaking charge paid to MWD, and (3) by maximizing MWD's discounted replenishment water rate for groundwater recharge

1.3 Agency Coordination

To develop the IRP and 2005 UWMP, RCWD worked with its wholesale water agencies, EMWD, WMWD and MWD. Table 1-3 shows this coordination.

Table 1-3
Agency Coordination in Preparation of 2005 UWMP

	Participated in Plan Development	Commented on the Draft Plan	Attended Public Meetings	Was Contacted for Assistance	Was sent a Copy of the Draft plan
Eastern MWD	Yes*	No	Yes*	Yes	Yes
Western MWD	Yes*	No	Yes*	Yes	Yes
MWD	Yes*	No	Yes*	Yes	No

* Participated in agency stakeholder meeting for RCWD's Regional Integrated Resources Plan (2005).

Section 2
Water Supply Sources

2.1 Current Water Supply Sources

RCWD's current water supply sources include local groundwater, imported water from MWD, and recycled water. Historically, groundwater has supplied between 25 to 40 percent of total water supply and imported water has supplied between 60 to 70 percent. Recycled water has provided less than 5 percent of the total water supply. Table 2-1 summarizes RCWD's water supplies for 2005.

Table 2-1
Current Water Supplies (AF/Y)

Water Supply Sources	2005
Imported Water (MWD)	
Treated	33,000
Untreated [1]	18,000
Local Groundwater Pumping	38,000
Recycled Water	6,700
Total	**95,700**

Source: RCWD Regional Integrated Resources Plan (CDM, 2005)
[1] Used for groundwater recharge and for flows to Gorge.

RCWD pumps groundwater from 54 district wells and recycles water at its Santa Rosa Water Reclamation Facility (SRWRF). Additional recycled water is available from EMWD's Temecula Valley Regional Water Reclamation Facility (TVRWRF).

RCWD owns and operates 37 storage reservoirs and one surface reservoir, Vail Lake. The storage capacity of Vail Lake is 50,000 acre-feet and it is used to help recharge groundwater, using natural runoff.

RCWD receives its imported water (treated and untreated) directly through six MWD water turnouts, three in EMWD's service area and three in WMWD's service area.

RCWD's transmission system includes about 900 miles of water pipelines to convey water from its source to water customers.

2.1.1 Groundwater

RCWD overlies the Temecula and Pauba groundwater basins, and numerous studies have been conducted regarding these basins. However, it was not until 1980 that studies and reporting were officially documented on a regular basis. Since 1980 RCWD has annually prepared a Groundwater Audit and a Recommended Groundwater Production Report (RGPR).

Surface water and groundwater supporting surface water have been under some form of court jurisdiction since 1928. Rights to utilize the groundwater and the water stored in Vail Lake are defined in the 1940 Stipulated Judgment in the case of Santa Margarita versus Vail and Appropriations Permit 7032 issued by the State Water Resources Control Board. A Watermaster has been assigned by the court to oversee all uses within the Santa Margarita Watershed. Specific water rights have not been adjudicated. However, the Stipulated Judgment assigns two-thirds of all natural waters to the United States of America (Camp Pendleton) and the remaining one-third to RCWD. Thus, inflow to Vail Lake is not stored, but rather is passed through to Temecula Creek from May through October as required by State permits.

RCWD relies on eight groundwater basins for its local water supply. The amount of groundwater produced annually from these basins varies depending on rainfall, recharge, and the amount and location of pumping.

Groundwater basin inflows occur through a variety of processes:

- Areal recharge - deep percolation of direct precipitation on the ground surface that eventually recharges the aquifers within the basins
- Return flow - portion of water applied to the ground surface that reaches the groundwater as a result of deep percolation; sources of return flow include agricultural, domestic, and commercial irrigation
- Stream percolation - the stream loses water to the aquifer because of a higher hydraulic head in the stream than in the aquifer
- Underflow - flow from one basin to another
- Artificial recharge – spreading imported water at the Valle del los Caballos (VDC) spreading basins

A real recharge, return flow, stream percolation and underflow are classified as "natural inflow". According to the District's groundwater model, the average natural inflow for all eight basins is 41,000 acre-feet/year (AFY) when no artificial recharge is occurring. Figure 2-1 presents the annual estimated natural inflow for all eight basins from 1935 to 1998. As shown, there are seven years in which the natural inflow exceeds 70,000 AFY. Most of the years of record, however, show natural inflow at approximately 30,000 AFY.

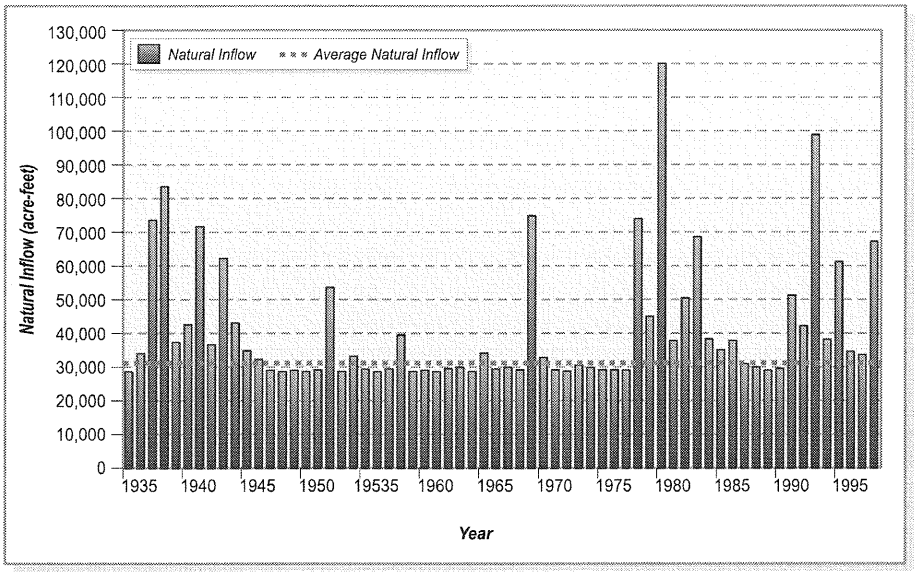

Figure 2-1
Natural Inflow for Eight Ground Water Basins Used by RCWD

Natural basin outflows also occur in several ways:

- Evapotranspiration - direct evaporation from surface water and bare soil as well as the transpiration of water by plants such that the water is not available for groundwater recharge
- Gaining streams – the stream gains water because the hydraulic head in the stream is lower than the head in the aquifer
- Underflow - flow from one basin to another

The average natural basin outflow for all eight groundwater basins from 1935 to 1998 was 6,600 AFY.

The natural yield of the eight basins equals the natural inflows less the natural losses, which would be 34,400 AFY (41,000 AFY less 6,660 AFY). However, besides RCWD, others pump from the eight basins, including: Eastern Municipal Water District (EMWD), Murrieta County Water District (MCWD), Pechanga and other private pumpers. Accounting for these users, the total natural yield available to RCWD is approximately 29,500 AFY.

RCWD currently has 52 production wells in the eight basins with a total instantaneous capacity of 46,400 gallons per minute (or 104 cfs), not including four existing recovery wells in the VDC area (VDC recovery wells). Table 2-2 summarizes the number of production wells per pressure zone and basin.

Table 2-2
Summary of Existing Production Wells

Pressure Zone	Basin	No. of Production Wells
1305	Pauba Valley	16
	Lower Mesa	3
	North Murrieta	3
	San Gertrudis	4
	South Murrieta	2
	Wolf Valley	3
1380	Pauba Valley	5
	Lower Mesa	3
1610	Upper Mesa	5
	Lower Mesa	1
1790	Palomar	1
1500	North Murrieta	2

Groundwater Recharge with Imported Water

In addition to the extraction of the natural yield of the basins, RCWD artificially recharges the Pauba Valley Basin with untreated imported water for enhanced groundwater production. RCWD purchases imported water from the MWD and delivers it from the San Diego aqueduct turnout EM-19 to the VDC recharge basins. In the past, the VDC recharge basins have provided up to 16,000 AFY of artificial groundwater recharge.

Groundwater Recharge from Vail Lake

RCWD stores local runoff in Vail Lake, which was created in 1948 through construction of Vail Dam on Temecula Creek. RCWD has a surface water storage permit in Vail Lake for up to 40,000 AF from November 1 to April 30. During these months, RCWD releases available water from Vail Lake to the Valle de los Caballos (VDC) spreading basins, about 1.5 miles downstream, for groundwater recharge. From May through October, existing State permits prohibit storage and require inflow to pass through Vail Lake to Temecula Creek.

The amount of local runoff reaching the lake can vary widely depending on hydrological conditions. From 1962 to 2000, flows into Vail Lake ranged from 218 AFY to 29,570 AFY, with an average flow of 5,150 AFY.

The storage capacity of the lake is approximately 40,000 AF, with a surface area of 1,000 acres. Currently, RCWD only uses Vail Lake to store local runoff. The historical available storage of the lake has varied widely as well, including two periods when the reservoir was full in March 1984 and February 1997. Figure 2-2 illustrates available storage capacity from 1962 to 2002. The average available storage is approximately 30,900 AF.

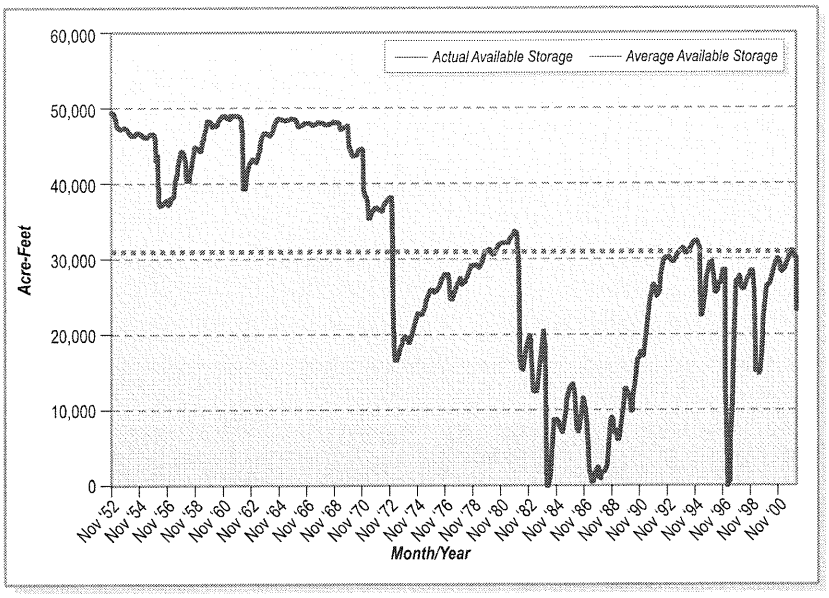

Figure 2-2
Historical Available Storage in Vail Lake

Historical Pumping from Groundwater Basins

Figure 2-3 illustrates historical total groundwater recharge and total pumping in the last 10 years. Table 2-3 shows the amount of groundwater pumped by each sub-basin in 2005. RCWD has increased pumping over the past 10 years to meet increased demands. Groundwater recharge from Vail Lake after 1999 has been unavailable due to local drought conditions, and RCWD has increased recharge by purchasing additional imported water.

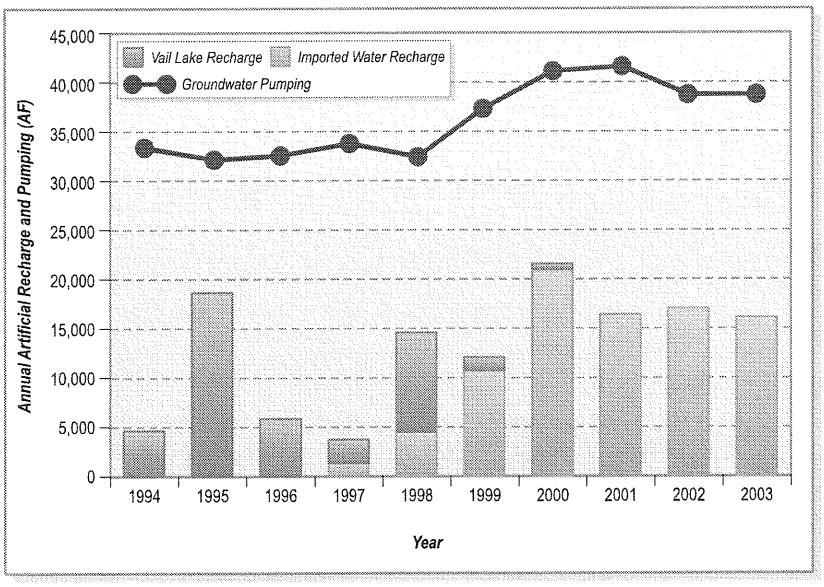

Figure 2-3
Historical Annual Artificial Recharge and Pumping

2.1.2 Imported Water

RCWD is a member agency to both EMWD and WMWD, which are member agencies to MWD. MWD is the regional water wholesaler for Southern California. Imported water, treated and untreated, is received through six MWD turnouts (three in each of EMWD's and WMWD's service areas). However, EMWD and WMWD do not convey the water through their facilities to RCWD, rather RCWD receives the water directly at these turnouts. As shown in Table 2-1, RCWD currently obtains approximately 33,000 AFY of treated water and 18,000 AFY of untreated water from MWD. Untreated, or raw imported water purchases did not begin until 1998. Figure 2-4 shows historical MWD water purchases from 1990 to 2003. During this period imported water purchases have increased from approximately 25,000 AFY to almost 51,000 AFY, including imported water used for groundwater recharge.

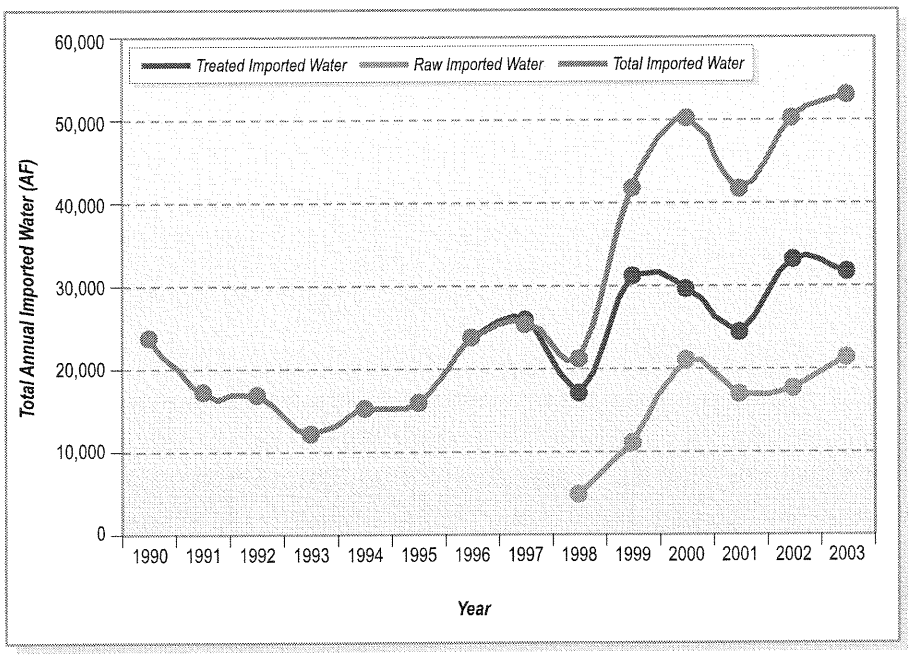

Figure 2-4
Historical Imported Water Purchased by RCWD

MWD owns and operates the Colorado River Aqueduct (CRA) along with major reservoirs such as Diamond Valley Lake and Lake Skinner, 5 regional water treatment plants, and large transmission pipelines to move imported water to its 26 public member agencies. MWD is also the largest State Water Contractor, with a contract of 2.0 million acre-feet for State Water Project (SWP) supply. Over the last few years CRA supply, historically providing over 1.2 million AFY to the region, has been severely cut. This was due to the development of the California Plan for Colorado River, which forces California to live within its 4.4 million AF entitlement of Colorado River.

The SWP is subject to extreme variability in hydrology due to a lack of storage. The SWP has also been affected by the Endangered Species Act (ESA), which has limited the amount of water coming from Bay-Delta. Although MWD has a contract for 2.0 million AFY, it rarely has received that amount (only in the very wettest of years). Average deliveries have been closer to 1.2 million AFY. In severe droughts, SWP supplies to MWD have been less than 0.5 million AFY.

MWD augments its imported water from the CRA and SWP with stored water in water banks such as Semitropic and Arvin-Edison, conjunctive use storage in local groundwater basins, and voluntary water transfers during certain dry years. In addition, MWD's recently completed Diamond Valley Lake can store 800,000 AF of imported water, which is used to meet demands during dry years and emergencies.

2.1.3 Recycled Water

Recycled water is produced to from two facilities, the Santa Rosa Water Reclamation Facility (SRWRF) operated by RCWD, and the Temecula Valley Regional Water Reclamation Facility (TVRWRF) operated by EMWD. Both plants treat wastewater to Title 22 standards. Currently, RCWD is maximizing recycled water from these two plants to meet landscape irrigation demands. Additional recycled water from TVRWRF could be used if advanced treatment beyond Title 22 standards was applied. As a result, not all of the recycled water from TVWRF is beneficially used and must be discharged to Temescal Creek. Currently, recycled water use is 6,700 AFY as summarized in Table 2-1. The recycled water system is discussed in further detail in Section 6.

2.2 Planned Water Supply Sources (the "IRP")

RCWD recently completed its Regional Integrated Resources Plan, or IRP, in order to develop a long-term water supply that can meet demands from now until 2050 (CDM, 2005). The IRP was developed in conjunction with RCWD's senior staff and Board of Directors by applying a multi-objective approach, integrating both demand and supply-side options.

The approach first develops and weights key objectives, which along with associated performance measures, will be used to evaluate alternatives to meet future demands (see Figure 2-5). The objectives and performance measures developed for the IRP are summarized in Figure 2-6.

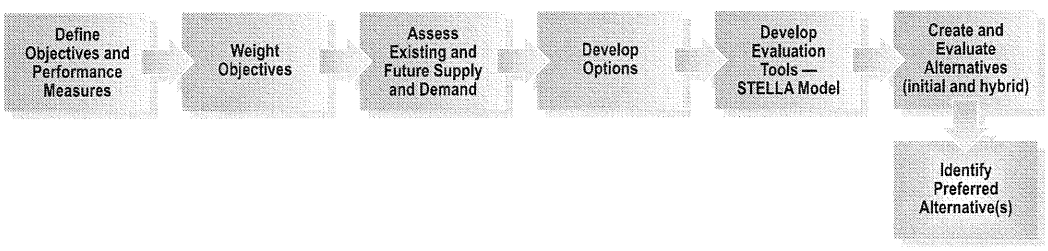

Figure 2-5
RCWD's IRP Process

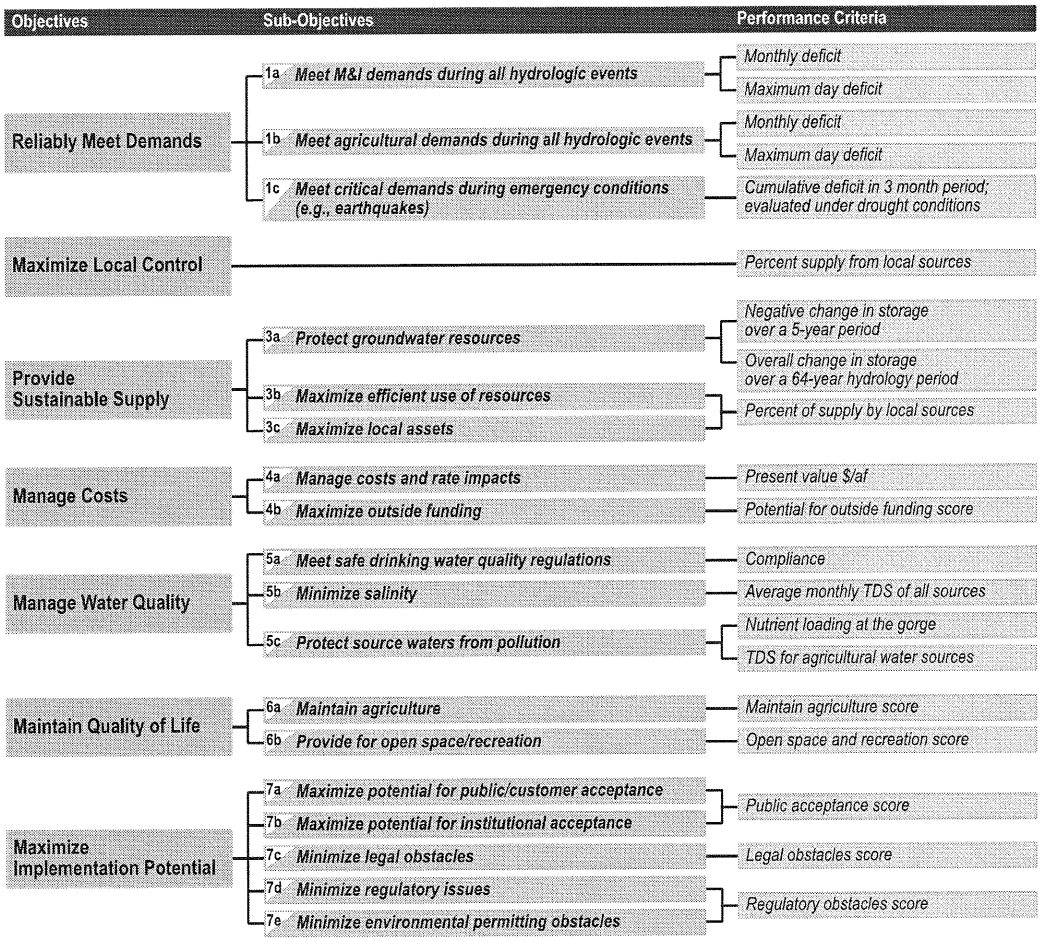

Figure 2-6
IRP Objectives, Sub-Objectives and Performance Measures

Over a dozen alternatives were evaluated using a systems model called STELLA. The model was able to simulate demands and supplies (existing and potential) under different climate and hydrologic scenarios, as well as identify distribution constraints. The model was also able to simulate water quality, storage conditions in the groundwater basins and Vail Lake, and estimate the total cost (capital and O&M) for any potential supply or demand-side management option(s).

The output from the model was used along with the objectives in Figure 2-7 to develop a comprehensive score card for each alternative. RCWD senior staff and Board weighed the objectives in terms of relative importance in order to rank the IRP alternatives (see Figures 2-7 and 2-8 for this ranking).

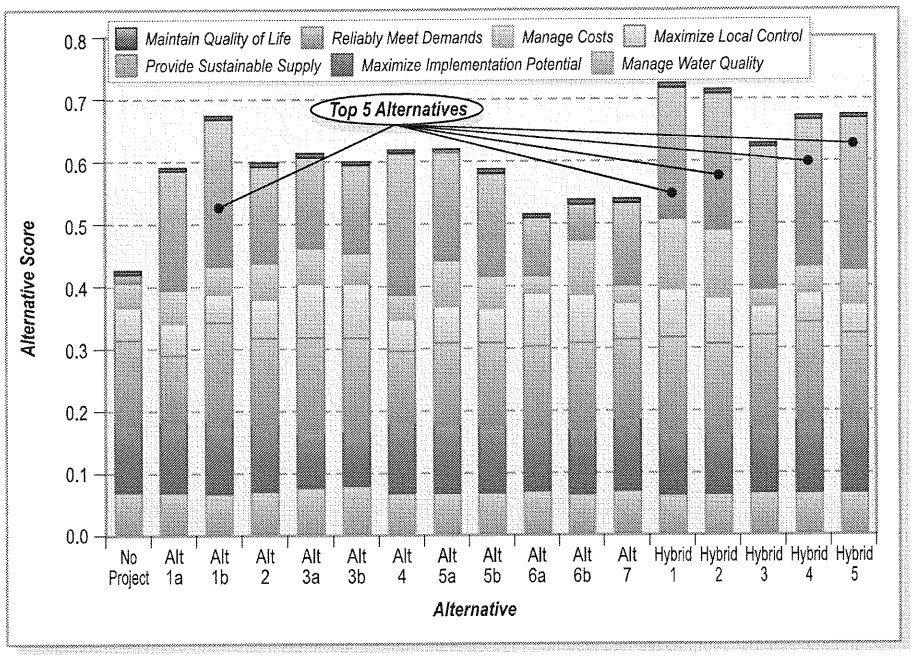

Figure 2-7
Alternatives Ranking for the Average of RCWD Senior Staff

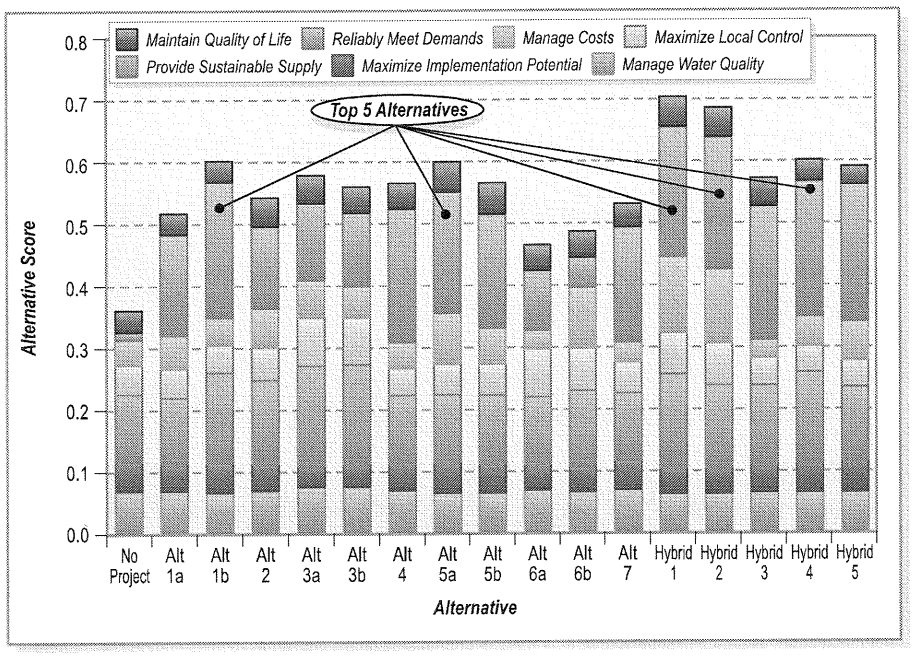

Figure 2-8
Alternatives Ranking for the Average of RCWD Board Members

The preferred plan, called Hybrid 1, involves the following components:

1. Implement baseline water conservation measures
2. Connect imported water connection EM-21 to Vail Lake to expand groundwater recharge
3. Convert eastern area agriculture, currently using treated imported water, to raw water, delivered from Vail Lake
4. Construct up to 18 new groundwater wells, along with increased imported water for recharge during non-drought years
5. Construct a MF/RO treatment facility to reduced the salinity of recycled water so that it can be used to meet western area agricultural demands, as well as potential groundwater replenishment in the future

The benefits of this preferred IRP alternative are:

- Increased groundwater production of about 18,000 acre-feet per year
- Increased use of recycled water of about 13,600 acre-feet per year
- Reduction in peaking on MWD by about 144 cubic feet per second (cfs)
- Cost efficiency by: (1) converting eastern area agricultural users from treated imported water to untreated, (2) reducing the peaking charge paid to MWD, and (3) by maximizing MWD's discounted replenishment water rate for groundwater recharge

Although the conversion of eastern area agricultural demands from treated to raw imported water is beneficial in terms of meeting peak day demands and reducing costs to RCWD, it does not produce "new" wet water supply. However, the construction of 18 new groundwater wells and a MF/RO treatment facility does produce additional water supply.

Because demands and supplies vary from year to year due to weather and hydrologic conditions, it is also important to plan for this variation. Because of the semi-arid climate of RCWD's service area, water demands can be as much as 9 percent greater than normal during dry years and 15 percent lower during wet years (see Figure 2-9).

Groundwater pumping can also vary due to hydrologic conditions. Based on RCWD's groundwater model, groundwater production from new wells averages 18,000 AFY. But in dry and critically dry years, groundwater production can be as low as 15,000 AFY.

Table 2-3 summarizes the hydrologic years used to assess supply reliability for the 2005 UWMP. The hydrologic years were selected based on local weather and hydrology.

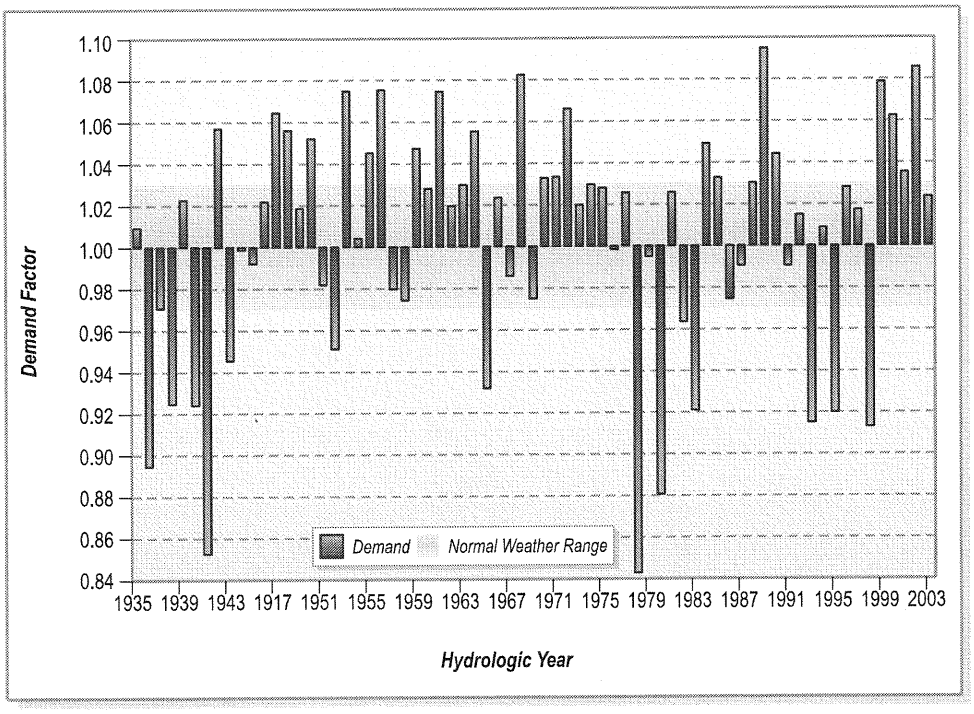

Figure 2-9
Weather Factors for RCWD Water Demands

Table 2-3
Basis of Water Year Data

Water Year Type	Base Year(s)	Historical Sequence
Normal Water Year	Average*	1935-1998
Single-Dry Water Year	1989	1935-1998
Multiple-Dry Water Years	1987-1991	1935-1999

* Average of historical sequence.

Based on RCWD's IRP, Table 2-4 summarizes the timing of new water supplies, as well as the reliability of these supplies under different water year types. As shown on the table, only the new groundwater supply is subject to hydrologic variation. The new recycled water as a result of the MF/RO facility is essentially drought proof.

Table 2-4
Future Water Supply Projects (AF/Y)

Project Name	Project Start	Average Year	Single Dry Year	Multiple- Dry Years				
				Year 1	Year 2	Year 3	Year 4	Year 5
18 New Groundwater Wells	2020	18,000	16,700	16,700	15,900	15,500	15,500	14,000
MF/RO Facility for Recycled Water	2025	13,600	13,600	13,600	13,600	13,600	13,600	13,600

Note: Supply reported are for years in which project starts

Table 2-5 summarizes the planned water supply for RCWD through 2030, under normal weather conditions. The planned supply includes existing as well as the future projects shown in Table 2-4.

As the new conversion of eastern agricultural demands from treated to raw imported water, new groundwater wells, and MF/RO facility for recycled water are brought online, the amount of treated imported water from MWD decreases from almost 40,000 AFY in 2010 to 20,700 AFY in 2030.

Table 2-5
Planned Water Supplies (AF/Y)

Water Supply Sources	2010	2015	2020	2025	2030
Imported Water (MWD)					
Treated	39,310	32,410	20,010	14,100	20,700
Untreated [1]	15,500	28,500	38,500	38,500	38,500
Local Groundwater Pumping	38,000	38,000	56,000	56,000	56,000
Recycled Water	7,890	9,090	9,890	24,300	25,200
Total	**100,700**	**108,000**	**124,400**	**132,900**	**140,400**

Source: RCWD Regional Integrated Resources Plan (CDM, 2005)
[1] Used for groundwater recharge, flows to Gorge, and eastern service area agriculture (after conversion of system).

2.2.1 Future Groundwater Supplies

With implementation of the Hybrid 1 Alternative identified in RCWD's IRP, groundwater supplies are expected to increase from their current level of 38,000 AFY to 56,000 AFY by 2020. Increased pumping and groundwater recharge is necessary to compensate for higher demands as growth in the area increase. Up to 18 new groundwater wells will be constructed. The Pauba Valley sub-basin will experience the gain in groundwater pumping; as this is the sub-basin that receives recharge from imported water (see Table 2-6).

Table 2-6
Groundwater Pumping in RCWD Service Area (AF/Y) [1]

Sub-Basin Name	2005	2010	2015	2020	2025	2030
Pauba	22,216	27,766	27,766	45,766	45,766	45,766
South Murrieta	1,881	260	260	260	260	260
Lower Mesa	5,966	3,646	3,646	3,646	3,646	3,646
North Murrieta	1,289	404	404	404	404	404
Wolf Valley	2,536	1,566	1,566	1,566	1,566	1,566
San Gertrudis	4,480	4,056	4,056	4,056	4,056	4,056
Upper Mesa	13	76	76	76	76	76
Palomar	567	226	226	226	226	226
Total	**38,948**	**38,000**	**38,000**	**56,000**	**56,000**	**56,000**
% of Total Water Supply [2]	51%	38%	35%	45%	42%	40%

Source: RCWD Regional Integrated Resources Plan (CDM, 2005)
[1] 2005 data is actual, 2010 to 2030 is projected based on normal hydrologic conditions.
[2] Net total supply, which does not include imported water for groundwater replenishment.

2.2.2 Future Imported Water

To support the increase in groundwater pumping, a new untreated (raw) water connection is being built by MWD, called EM-21. Once constructed it will increase the ability for RCWD to recharge the groundwater basin and maximize a vital local resource.

Between 2025 and 2030, MWD may also increase treated imported water capacity for use by RCWD and others by constructing a new imported water line from its Skinner Treatment Plant or a new treatment plant that is being explored.

2.2.3 Future Recycled Water

Currently, recycled water from RCWD's SRWRF is being used 100 percent to meet landscape irrigation demands. However, another 16,000 AFY of recycled water from EMWD's TVRWRF could be used if the salinity of the product water was under 500 parts per million. This salinity target is needed if recycled water is to be used for crop sensitive agriculture and/or groundwater recharge. Therefore, as part of the IRP, RCWD will construct a MF/RO facility to treat recycled water so it can be used to meet western area agricultural demands currently using treated imported water. Because of the waste or brine produce produced by the advanced treatment, 15 percent of the water is lost. Therefore, the new recycled water supply is 13,600 AFY. A more detailed discussion of recycled water is presented in Section 6.

2.2.4 Future Water Transfers

During the IRP process, RCWD investigated obtaining water transfers to bolster supplies. Water transfers are the voluntary exchange of water between a willing

buyer and a willing seller. The IRP examined wet water transfers and dry water transfers, the difference being that wet water transfers occur in years of above normal rainfall and dry water transfers occur in years of below normal rainfall. The IRP recommendations allow for the possibility of such transfers to be executed should RCWD and its customers deem them cost-effective.

2.2.5 Desalination

Desalination (seawater or brackish) was not examined as an option in the IRP. Desalination of ocean water is not viable for RCWD given its distance from the Pacific Ocean. Desalination of brackish groundwater is not necessary, given the water quality of the sub-basins used by RCWD.

Section 3
Water Demands

3.1 Overview

Because of affordable housing, relative to Los Angeles and Orange Counties, and a Mediterranean climate, the Cities of Murietta and Temecula (and surrounding communities) are desirable places to live. As such, population within RCWD's service area has grown significantly. Even agriculture, which is mainly orchards, citrus, avocados, and vineyards has grown, unlike in many other areas in Southern California.

This urban and agricultural growth has lead to increases in water demands. And because of the semi-arid climate, summer peaking in demands is fast becoming an issue.

3.2 Historical Water Demands

Combined agricultural and urban water demands have steadily increased in the RCWD service area between 1978 and 2003 as illustrated in Figure 3-1.

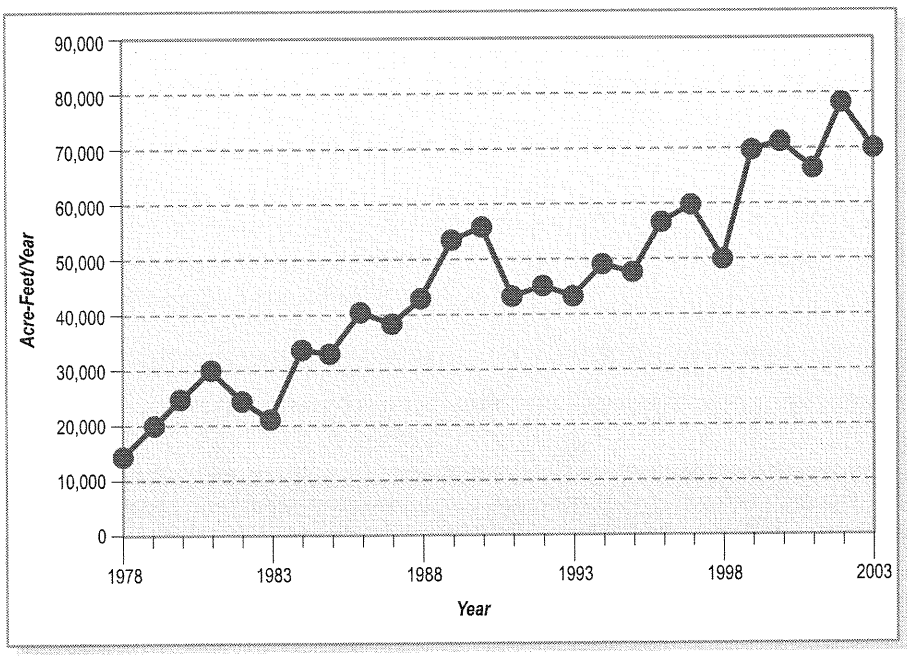

Figure 3-1
RCWD Historical Water Demands

Table 3-1 shows the distribution of actual billing accounts by customer class. "AG & A/D" refers to agricultural and agricultural/domestic areas. "Domestic" is inclusive of very low density, low density, medium density, and medium high density single-family residential. "Multiple Dwelling" is multi-family residences, such as apartments and condos. The "Other" category includes freeway, and construction meters. Most water users classified in the "Other" category have either little or no reported water use.

Table 3-1
RCWD Customer Accounts

Customer Class	2000	2005
AG & AG/D	1,310	1,699
Domestic	23,320	33,378
Multiple Dwelling	160	178
Commercial	827	1,280
Landscape	674	1,059
Schools, Etc	51	65
Golf	6	6
Reclaimed	54	130
Others[1]	143	1,391
Total	**26,545**	**39,186**

[1] Mostly construction and other temporary accounts.

3.3 Future Water Demands

Projecting water demands allows RCWD to determine future water supply investments needed to match expected demands. Water demand projections are used to schedule these investments to ensure they are online when needed thus minimizing cost impacts of idle facilities. Future water demands included here were developed as a part of the IRP to aid in the selection of a preferred alternative for meeting future water demands.

3.3.1 Forecast Methodology

Projected water demands to 2050 were estimated using RCWD's 2000 billing data and water demand projections at ultimate build-out from the 2005 RCWD Water Facilities Master Plan. In the IRP demands were forecasted to 2050, but only forecast demands to 2030 are included in the 2005 UWMP.

The 2000 billing data was used to determine the starting point in the demand projection, while the ultimate build-out demands in the Master Plan represent the end-point. The 2000 billing data contains different classifications than the Master Plan classifications. Billing data is based on customer classes while Master Plan classification are based on land use categories. Thus, the first step was to match the two classification systems. Matching the two systems resulted in the IRP Sectors in Table 3-2. IRP Sectors are the sectors used in the demand forecast.

Table 3-2
Matching of Billing Data Classifications and Land Use Categories

2000 Billing Data Classifications	IRP Sectors	Master Plan Classifications
AGRICULTURAL AG/DOMESTIC	Agricultural and Agricultural Domestic	Ag/Vineyard Planning Area Estate 20 Estate 10 Estate 5 Estate 2
DOMESTIC	Single-Family	Very Low Density Low Density Medium Density Medium High Density High Density
MULTIPLE DWELLING	Multi-Family	Multi-Family
COMMERCIAL SCHOOLS MISC GOV OTHER	Commercial/Institutional	Commercial Business Park / Industrial
GOLF LANDSCAPE RECLAIMED WATER	Landscape/Golf	Open Space – Recreational

Source: RCWD Regional Integrated Resources Plan (CDM, 2005)

Estimating Year of Build-Out

The term "build-out" indicates a city is no longer growing, and the associated water demand would be at the maximum or ultimate demand. The build-out forecast obtained from the 2005 RCWD Water Facilities Master Plan did not specify the estimated year for build-out. It did, however, provide an estimated number of dwelling units for each land-use category. The IRP analysis estimated a year for build-out by comparing the number of build-out dwelling units in the Master Plan with the demographic projections developed by the SCAG Regional Transportation Plan discussed in Section 1.1.2. The SCAG demographic data contains single-family and multi-family data that correlate with the domestic and multiple dwelling categories under the Master Plan classifications.

SCAG projects demographics out until year 2030. Because the SCAG housing units were lower than those reported at build-out in the Master Plan, it was deemed that build-out was beyond 2030. To determine the year of build-out, a linear extrapolation of the SCAG housing projections was done. The SCAG demographic data for population and housing largely follow a linear pattern as shown in Figure 3-2. Although the rates of growth are not perfectly linear, there is not enough variation in the growth rate to warrant a non-linear growth pattern for demand projections.

Comparing the estimated number of dwelling units from the Master Plan build-out forecast and the extrapolated SCAG demographic data indicated that overall build-out would occur around 2050.

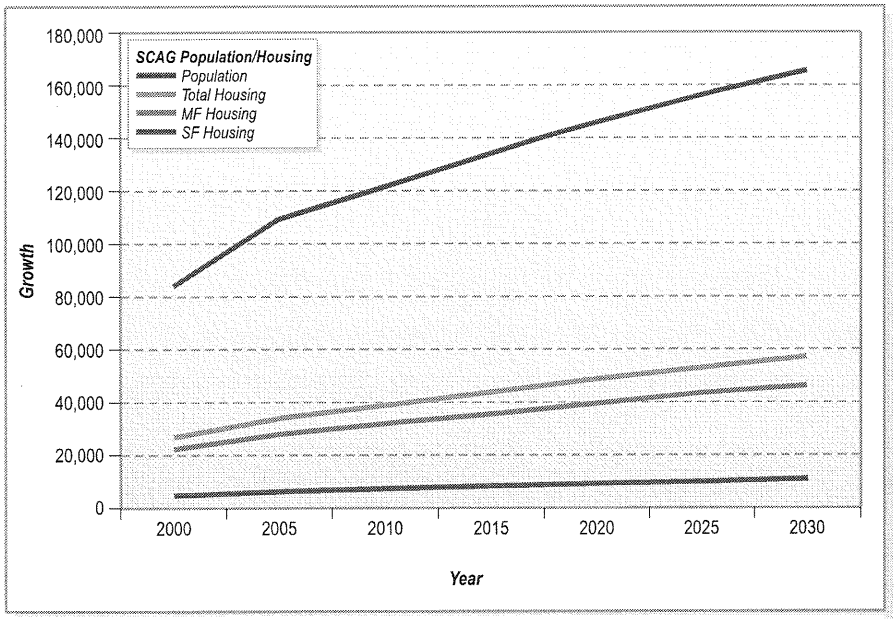

Figure 3-2
Demographic Projections for RCWD Service Area

3.3.2 Consumptive Water Demand Forecast

Projected water demands in the IRP were estimated in 5-year intervals up to 2050 based on water billing data and the 2005 RCWD Master Plan build-out demand projections. For purposes of the UWMP, estimated demand projections are provided to 2030.

Results of the water demand forecast for normal weather conditions are summarized by sectors in Table 3-3. Total annual average water demands are projected to increase from the current 76,100 AFY to 112,700 AFY in 2030, a 36,600 AF increase. The largest growth is expected to occur in the Single-Family Domestic Sector from 25,500 AFY in 2005 to 44,300 in 2030.

Table 3-3
Annual Average Consumptive Water Demands in RCWD Service Area

Year	2000	2005	2010	2015	2020	2025	2030
Agriculture/Ag Domestic Demands	33,900	35,900	38,000	40,000	41,00	44,000	46,000
Single-Family Domestic	21,700	25,500	29,300	33,000	36,800	40,600	44,300
Multi-Family Domestic	1,400	1,900	2,300	2,800	3,200	3,700	4,200
Commercial/Institutional	3,500	4,100	4,800	5,400	6,100	6,700	7,400
Landscape/Golf Course	8,300	8,700	9,100	9,500	9,900	10,300	10,800
Total	**68,800**	**76,100**	**83,500**	**90,700**	**97,00**	**105,300**	**112,700**

2000 represents actual demand, 2005-2030 projected based on average weather conditions

3.3.3 Sales to Other Agencies

RCWD does not engage in water sales to other agencies, including wholesale water, exchanges, and non-recurring agreements, at this time nor are any projected in the forecast period ending in 2030.

3.3.4 Additional Water Uses

Additional water uses include imported water purchased for groundwater recharge, water required to meet the Gorge discharge requirements due to the water rights settlement, and unaccounted for water. Given RCWD's system is relatively new and modern, unaccounted for water is very small, averaging around 2 percent. Table 3-4 summarizes this additional water use.

Table 3-4
Additional Water Uses and Losses (AF/Y) [1]

Water Use	2005	2010	2015	2020	2025	2030
Groundwater Recharge with Imported Water	13,000	13,000	13,000	23,000	23,000	23,000
Gorge Discharge (per water rights agreement)	2,500	2,500	2,500	2,500	2,500	2,500
Unaccounted Water	1,500	1,700	1,800	1,900	2,100	2,200
Total	**17,000**	**17,200**	**17,300**	**27,400**	**27,600**	**27,700**

[1] Based on average runoff and weather conditions.

3.3.5 Total Water Uses

Total water use is the summation of the consumptive water demands presented in Table 3-3 and the additional water uses in Table 3-4. Table 3-5 summarizes the total future water uses under normal weather conditions.

Table 3-5
Total Water Use (AF/Y) [1]

Water Use	2005	2010	2015	2020	2025	2030
Consumptive Demand	76,100	83,500	90,700	97,000	105,300	112,700
Sales to Other Agencies	0	0	0	0	0	0
Additional Water Uses and Losses	17,000	17,200	17,300	27,400	27,600	27,700
Total Projected Water Use	**93,100**	**100,700**	**108,000**	**124,400**	**132,900**	**140,400**

[1] Based on average runoff and weather conditions.

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Section 4
Conservation

4.1 Introduction

Increasing urban water conservation is a means towards providing additional water supply by reducing demands. Effective water conservation practices are necessary to be able to provide adequate supplies to meet growing demands in the RCWD service area. Demographic projections indicate that agriculture land use will continue to decline in the future as RCWD's service area continues to become more urbanized. Through its membership in the California Urban Water Conservation Council (CUWCC), initiatives of EMWD and WMWD, and its own initiatives RCWD is committed to increasing water conservation.

RCWD is a recent signatory to the Memorandum of Understanding Regarding Urban Water Conservation in California (MOU) developed by the members of the CUWCC. As a signatory to the MOU, RCWD is obligated to implement a set of 14 water conservation Best Management Practices (BMPs) also commonly referred to as Demand Management Measures. The MOU established the CUWCC in 1991 to monitor implementation of the BMPs and to maintain the list of BMPs. Biennially member agencies are required to submit a report to CUWCC detailing progress towards implementing the 14 BMPs. Participation and compliance with the BMPs is monitored by CUWCC which offers guidelines on the implementation and assessment of the BMPs.

4.2 Urban BMP Implementation

The MOU commits RCWD and other signatories to develop comprehensive conservation programs utilizing feasible economic criteria and to consider water conservation as a viable water management option through the implementation of Urban BMPs. BMPs are defined in the MOU as:

(a) An established and generally accepted practice among water suppliers that results in more efficient use or conservation of water.

(b) A practice for which sufficient data are available from existing water conservation projects to indicate that significant conservation or conservation-related benefits can be achieved; that the practice is technically and economically reasonable and not environmentally or socially unacceptable; and that the practice is not otherwise unreasonable for most water suppliers to carry out.

RCWD is obligated to implement all of the BMPs, except BMP 10. BMP 10 pertains to wholesale agencies only. Table 4-1 provides a listing of each BMP and summarizes RCWD's status in implementing the BMPs. As a recent signatory to the MOU, RCWD has only submitted the reports once, thus prior years are not included in the plan.

Table 4-1
CUWCC BMPs For Urban Conservation In California

BMP #	PRACTICES	STATUS
1	Water surveys programs for single-family residential and multi-family residential customers	Implemented
2	Residential plumbing retrofit	Implemented
3	System water audits, leak detection and repair	Implemented
4	Metering with commodity rates for all new connections, and retrofit of existing connections	Implemented
5	Large landscape conservation programs and incentives	Implemented
6	High efficiency washing machine rebate program	Implemented
7	Public information programs	Implemented
8	School education programs	Implemented
9	Commercial/Industrial/Institutional water conservation	Outdoor Only
10	Wholesale agency assistance program	Not applicable
11	Conservation pricing	Implemented
12	Water conservation coordinator	Implemented
13	Water waste prohibition	Implemented
14	Residential ULFT replacement program	Implemented

BMP 1: Water Survey Programs for Single-Family and Multi-Family Residential Customers

RCWD is currently surveying outdoor water use of single-family accounts that use two hundred percent more water than the district-wide average. During these surveys RCWD checks the irrigation system and makes necessary adjustments such as changing the irrigation timers, there is no cost to the customer. The CUWCC suggests an estimated savings of ten percent when quantifying savings for outdoor surveys under this BMP.

RCWD began this program in July 2004 and has an annual budget of $100,000 for five hundred surveys. The savings for this BMP were calculated by taking the average gallons per day per account water use and multiplying it by two hundred percent. This results in an estimated value that represents per account per day water use among the households target by the program. This value was then multiplied by the percent of total water use that is used outdoors. After assessing annual water use patterns, outdoor water use was estimated to be fifty-one percent of total water use. CUWCC estimates a ten percent reduction in outdoor use will result from the surveys. The average outdoor water use of the targeted accounts (848.47 gpd per account) was multiplied by ten percent. The resulting 85 gpd per account was multiplied by 500 (number of surveys per year) to calculate total annual savings in gallons. The resulting 15.48 MG (or 47.52 AF) was further processed into a lifetime savings and a cost per lifetime savings. Savings resulting from this program were

estimated to have a life of three years. Under this assumption the lifetime savings are estimated to be 142.56 AF at a cost of $701.45 per AF.

RCWD currently offers multifamily outdoor surveys on a voluntary basis. However, up to this point they have received no requests. In 2007, RCWD will begin indoor multifamily surveys; they plan to conduct 50 surveys per year. The surveys will include leak detection and flow rate tests for faucets and showerheads. Leaks will be resolved and faucet aerators and low flow showerheads will be provided when necessary. Toilets will also be checked for flush volume and leaky flappers. When appropriate the customer will be directed to the ULFT program. These surveys will augment RCWD's plumbing retrofit program and the ULFT program.

CUWCC's methodology for calculating savings resulting from indoor water surveys assumes savings for showerhead retrofits, ULFT retrofits, and leak repairs. It is not reasonable to assume each survey will result in all or any of these changes. Further this methodology introduces potential double counting of toilet and showerhead retrofits because these fixtures are offered as part of separate BMPs (BMP 2 and 14).

Table 4-2
CUWCC BMP 1 Savings Assumptions

	Pre-1980 Construction	Post-1980 Construction
Low-Flow Showerhead Retrofit	7.2 gcd	2.9 gcd
Toilet Retrofit (five year life)	1.3 gcd	0.0 gcd
Leak Repair	0.5 gcd	0.5 gcd
Landscape Survey (outdoor use reduction)	10%	10%

Source: CUWCC
http://www.cuwcc.org/m_bmp1.lasso

Grossly assuming 0.5 gcd savings per survey, and 2.84 persons per multifamily household[1], 50 multifamily surveys will save 25,915 gallons per year. RCWD estimates the MF surveys will cost $75 per survey, therefore conducting 50 surveys in one year will cost $3,750.

BMP 2: Residential Plumbing Retrofit

RCWD is fulfilling BMP 2 through the dissemination of a residential plumbing retrofit kit free of charge to eligible RCWD customers. Eligible customers pick up the retrofit kits in the RCWD reception area. The kit includes low-flow shower heads, garden hose shut-off nozzles, faucet aerators, and toilet leak detection tablets. The kit is available to customers living in homes that were built prior to 1994. The low-flow

[1] Census SF3 Data for City of Temecula.

shower heads are limited to two per household, and the aerators and the shut-off valves are limited to one per household.

RCWD began this program in September 2004 and through March 2005 distributed 327 low-flow shower heads, 442 faucet aerators, and 240 garden hose shut-off nozzles. The faucet aerators and the shut-off nozzles are considered to have nominal savings for this analysis. Savings were calculated for the shower heads based on a gallon per capita per day assumption recommended by the CUWCC. They recommend a gallon per capita per day savings of 7.2 gpcd for pre-1980 homes and 2.9 gpcd for post-1980 construction. The percent of homes in the RCWD service area that were built prior to 1980 is estimated using 2000 Census SF3 data for Temecula California. Census data lists housing units built by decade up to 1980 and then in smaller increments through 2000. Based on this data, fourteen percent of the homes in the RCWD service area are estimated to be built prior to 1980. Thus it was assumed that 42 of the low-flow showerheads (fourteen percent) distributed by RCWD went to homes built prior to 1980 and the remaining 258 (eighty-six percent) went to post-1980 construction homes. The 42 showerheads assumed to be retrofit in pre-1980 housing were multiplied by 7.2 gallons per capita per day, and the 258 showerheads that were assumed to be retrofit in post-1980 homes were multiplied by 2.9 gallons per capita per day. The products of these multiplications were then added, multiplied by the average number of persons per household (as obtained from the U.S. Census Bureau's 2000 SF3 data for Temecula California), and then divided by the total number of showerhead retrofits. This resulted in an average savings in gallons per day per account for each low-flow shower head distributed. This value was then multiplied by the total number of shower heads distributed by RCWD and 365 days to estimate annual savings.

As noted above, RCWD began this program in September 2004 and the data are for seven months. To make savings and costs reflect an annual time period a monthly participation rate was estimated and multiplied by twelve. The estimated participation for a year is 514 low-flow showerhead retrofits, resulting in an annual water savings of 6.35 AF. The lifetime of a showerhead is estimated to be ten years making the lifetime savings of this program 63.51 AF and the cost per lifetime savings $134.93 per AF.

The CUWCC methodology described above was used in estimating savings from low-flow showerheads for RCWD. However, it is important to note that this methodology is nearly outdated. If indeed showerheads have a ten year life then it is likely that all pre-1980 homes have been retrofitted. Further, it could be argued that homes constructed pre 1994 also have retrofitted showerheads, or will in the very near future. The efficacy of this program may need to be reevaluated.

Currently there is not a local enforceable ordinance in effect in the RCWD service area requiring the replacement of high-flow showerheads and other water using fixtures with low flow counterparts. However, California State law since 1992 prohibits the sale or installation of non conserving showerheads. RCWD is a recent signatory to the MOU and has not completed the required customer surveys regarding low-flow

showerhead installation. These surveys are to demonstrate that 75 percent of the single-family and multifamily households built prior to 1992 in the RCWD service area have been retrofitted with low flow showerheads.

BMP 3: System Water Audits, Leak Detection, and Repair

RCWD conducts water audits of its distribution system on a monthly basis to determine if leaks are occurring and/or repairs are necessary. Sales in each pressure zone, inclusive of construction, water, sewer flushing, and mainline flushing, are compared to delivery records and sales production. Monthly auditing results in the ability to implement corrective actions prior to excessive losses. Unaccounted water has historically ranged between 3 and 6 percent. In 2004 unaccounted water averaged 4.7 percent. RCWD strives to maintain average yearly system losses to less than 5 percent.

RCWD is proactive in reducing system water losses. Through its corrosion control program RCWD determines the corrosion potential of soils by measuring pipe to soil potential and if necessary installing cathodic protection equipment for both new and existing infrastructure. RCWD also verifies the integrity of valves within the system. A special truck is outfitted with equipment to check all valves within the system on a periodic basis. Valves that are not maintained can leak or malfunction. Inoperable valves are replaced or repaired.

BMP 4: Metering with Commodity Rates for all new Connections and Retrofit of Existing Connections

All of RCWD's customers are metered and charged a commodity rate for water service (see Appendix A for water rate schedules).

BMP 5: Large Landscape Conservation Programs and Incentives

RCWD provides a large landscape water audit program to its customers. In August 2005, RCWD began conducting commercial outdoor water use surveys. Under this program, RCWD performs a large landscape water audit and incorporates a demonstration garden and various educational seminars. RCWD is also taking advantage of MWDSC's WBIC (weather-based irrigation controllers) incentive program for large landscape customers. Under this program it is estimated the RCWD will perform up to 40 landscape audits and install up to 40 WBIC systems. As of October 2005, RCWD has completed 30 survey/installations.

MWDSC offers incentives to commercial/industrial/institutional (CII) accounts for the utilization of WBIC's MWDSC offers $500 per acre of CII land that is irrigated with a WBIC and $5.50 per station. A station is a valve on the WBIC unit.

These survey/installations cost $1,200 on average. The CUWCC methodology recommends estimating a 15 percent reduction in outdoor commercial water use. Water demand for CII in RCWD in 2000 was 3,482 AF. There are 877 commercial accounts giving an annual average of 3.97 AF water demand per account. It is estimated that 51 percent of water use is outdoor. Therefore, estimated annual

outdoor water use per account is 2.02 AF. RCWD has conducted 30 survey/installations in three months. If this trend continues they will be able to complete 120 in one year. In 2000 these 120 accounts had a total annual water demand of 243 AF. Reducing this by the CUWCC suggested 15 percent equals 36.45 AF of savings in one year. The life of a WBIC is estimated at 10-15 years, or an average of 12.5 years[2]. The lifetime savings of this program is 455.60 AF and the cost per lifetime savings is $316.07 per AF.

BMP 6: High-Efficiency Washing Machine Rebate Program

MWDSC offers rebates ranging from $85 to $150 for purchases of high efficiency clothes washers. As part of RCWD's conservation efforts they facilitate a pass-through of the MWD rebates to their customers. Customers receive the rebate via a credit on their water account. The only costs RCWD incur are administrative, at $10 per unit. This program began in 2003 and through March 2005 had 499 participants. Savings and costs were estimated based on rebates given in 2004.

Three hundred ninety-seven rebates were given in 2004 for purchases of high-efficiency clothes washers with varying efficiency ratings. Clothes washers are assigned a water factor to describe their efficiency. The water factor is the number of gallons required by the washing machine for each cubic foot of laundry. Thus, lower water factors indicate more water efficiency. The water factors for the washers rebated in 2004 range from 4.0 to 9.47.

RCWD keeps track of the water factors of each high-efficiency washing machine that receives a rebate through MWDSC's program. This is very important in calculating the savings of clothes washers based on the methodology put forth by the CUWCC. In this analysis, the CUWCC methodology was slightly modified. The CUWCC equation for estimating savings is:

$$GWS = 14\ \text{yr.} \times \sum_i N_i \times (13.3 - i) \times 1{,}170\ \frac{\text{gal.}}{\text{yr.}}$$

GWS is gross water savings, 14 yr. is the average life of a clothes washer, N is the number of machines replaced with the water factor i, 13.3 is the baseline water factor for machines sold in 1994 as supplied to DOE by the Association of Home Appliance Manufacturers (AHAM), and 1170 is the average unit change in water use per unit change in water factor (developed by the California Energy Commission).

This analysis used all of the factors in the CUWCC equation, however the summation was modified. The frequency (N) of rebates for each water factor was determined.

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[2] Assumption taken from: Residential Weather-Based Irrigation Scheduling: Evidence from the Irvine "ET Controller" Study June 2001
"The useful life is expected to be between 10 and 15 years" (pg. 7).

Then the equation was applied to each water factor independently. In the example below 4.5 is the water factor and 10 is the frequency, or number of retrofits for the water factor 4.5:

[14year*(10*[13.3-4.5])*1170]

Results calculated for each water factor were summed to derive total water savings.

Program lifetime savings based on the rebates given in 2004 are estimated to be 145.99 AF, the program cost per lifetime savings $27.19 per AF.

BMP 7: Public Information Programs

RCWD along with EMWD, WMWD, and MWDSC have public information programs in place designed to educate the public and businesses on how to reduce water consumption and learn about water supply issues. As a member agency of both WMWD and EMWD, RCWD participates in both of their conservation programs and MWDSC's conservation programs. The public information program at RCWD is designed to reach as many residents as possible. RCWD budgets approximately $30,000 per year for its program.

Various mediums are used to convey information to residents and businesses within the service area by RCWD. Media outlets include news releases, community events, seminars, internet, and newsletters. RCWD creates feature public information articles for distribution to local newspapers and radio stations. During community events RCWD participates through its commitment, membership, and representation to local service organizations. Seminars for professional landscapers and homeowners are also sponsored by RCWD. Quarterly, RCWD publishes *Waternews*, for its customers. Articles are included on water conservation measures. RCWD's lobby has a plethora of hand outs, including handouts such as water conservation, water wise gardening, water use outdoors, and indoor water use, available for free in the reception area.

BMP 8: School Education Programs

Since 1984 RCWD has implemented a water education program to provide water and wastewater knowledge to teachers, students, and parents. Through its program, RCWD is able to educate students at an early age on the benefits of conserving water so that this knowledge flows into their homes and develops future water conserving habits.

Coordination between schools and RCWD's water education program occurs through RCWD's Public Information Specialist. The Public Information Specialist is tasked with managing the relationship between RCWD's various departments and other work groups with local school districts and external agencies. A key highlight of the program is to encourage and assist teachers in educating students about water. Through the program students develop an early appreciation for water.

RCWD's water education program involves all elementary and secondary schools within the service area encompassing18 public schools and 6 private schools. Training

is provided for teachers at all grade levels. Distributed materials meet the Science Framework for California Schools and the Murrieta and Temecula Valley Unified School District's Science Curriculum Guide. Materials are appropriate for respective grade levels. Teachers can choose to participate by ordering education materials from RCWD with all costs paid by RCWD.

Approximately 9,000 students are contacted per year through school assemblies, educational theater productions, field trips, and classroom presentations. On average RCWD provides over 20,000 brochures, booklets, stickers, and other water related items to students per year. RCWD also has sponsored such items as an essay contest, t-shirt design contest, and local science fairs.

Between 2001 and 2005 the approximate average yearly basis for impressions on students was:

Number of schools served: 24

Number of teachers served: 150

Number of students served: 5,000

Number of education materials distributed: 25,000 pieces

Number of classroom presentations: 40

BMP 9: Commercial/Industrial/Institutional Conservation Programs

Currently RCWD has implemented outdoor commercial, industrial, and institutional (CII) conservation programs in the form of surveys, but has not implemented indoor CII conservation programs. The outdoor program is discussed in detail for BMP 5.

RCWD could implement programs such as the Commercial and Industrial Rebate Program and CII indoor surveys. The CI rebate program offers rebates on seven water using devices. RCWD could implement this rebate program with a cost similar to their ULFT and high-efficiency clothes washer programs. Since MWDSC pays for the rebate, RCWD pays only a small administrative cost for significant savings. Table 4-3 below lists available rebate amounts and estimated savings.

Table 4-3
MWDSC CII Rebate Programs

Device:	MET Rebate Amount	Savings per Unit GP Year	Savings per Unit GPD
Cooling Tower Conductivity Controller	$500.00	800,000	2,191
Water-saving Toilet/Urinal	$60.00	14,600	40
High-efficiency Washing Machine	$100.00	150,000	411
Pre-rinse Kitchen Sprayer	$50.00	75,000	205
Dual Flush Toilets	$80.00	14,600	40
Water-pressurized Broom	$100.00	50,000	137
Film Processor Recirculating System	$2,000.00	1,000,000	2,740

Source: CUWCC
http://www.mwdh2o.com/mwdh2o/pages/conserv/program02.html

Another incentive program available is the CII weather-based irrigation controllers discussed in detail under BMP 5.

In 2009 RCWD will begin indoor commercial surveys. While this program is still in the planning stages it will likely follow standard survey methods and focus. Because this is a future program actual costs are unknown. Based on an assessment of agencies currently participating in this portion of BMP 9 and review of a paper by Santa Clara Valley Water District, a cost per survey was estimated to be about $3000. The other cost figures were found in the CUWCC BMP reporting data base for the following agencies: City of San Diego, City of Pasadena, East Bay Municipal Utility District, and San Juan Water District. The database was randomly searched and these four were found to have realistic data (i.e., some agencies reported doing surveys but did not report a cost, or reported extremely high costs). Costs for these agencies ranged from $950.00 to $6,500.00 per survey.

CUWCC recommends estimating a savings of 12 percent of the current gallons per employee per day for the CII surveys. A gallons per employee per day (GED) value was calculated for RCWD from CII water use for 2000 and the total number of employees in 2000. The employment data was furnished by SCAG. The resulting GED is 112.61 for RCWD. Potential savings are estimated as12 percent, or 13.51 GED.

CUWCC's guidelines indicate that 10 percent of CII accounts are to be surveyed in 10 years . There are 877 commercial accounts in RCWD and no industrial accounts.

Thus, it is assumed that RCWD will conduct 88 surveys in ten years or 9 surveys per year.

SCAG data reported 27,602 employees in 2000 for the RCWD service area. Given the 877 CII accounts, this is an average of 31.5 employees per account.

With these assumptions each account surveyed is estimated to save 426 gallons per day; this is derived by multiplying the 13.51 GED savings by 31.5 employees per account. Savings per year can be estimated by multiplying 426 gallons per day (savings per account) by 9 (the number of surveys conducted annually) and by 365 days. The resulting estimate of annual savings is 1.4 MG. Assuming a five year life of savings resulting from the indoor surveys , the lifetime savings is 21.45 AF and the cost per lifetime savings is $1,256.53 per AF.

BMP 11: Conservation Pricing

RCWD has implemented two tier blocks to encourage conservation for all customer classes effective as of July 2005. Water and wastewater rates are different depending upon the location of the service address. RCWD is divided into the Rancho and Santa Rosa Divisions for water service and is further divided into pressure zones. Wastewater service is provided by both RCWD and EMWD.

Water customers pay a base rate per hundred cubic feet (HCF), an energy rate based on pressure zone locations, and a monthly service charge based upon meter size. Agricultural and domestic rates are calculated at the domestic rate for water use up to 16 HCF. Water use in excess of 16 HCF is calculated at the lower Agricultural Rate. The Tier 2 conservation rate is an additional $0.18595 per hundred cubic feet. This additional rate applies to customers that exceed their water allocation as determined by customer class.

Recycled water customers are billed based on a monthly service charge and use per acre-foot. Acre-foot charges vary based upon whether the user requires tertiary treated water, agricultural treated water, or uses the water for construction activities.

Wastewater customers pay a flat fee based on location and the service provider, RCWD or EMWD. For RCWD the flat rate is based on equivalent dwelling units per customer, while EMWD is a flat rate regardless of equivalent dwelling units.

Appendix A contains a copy of the water and sewer rate structures.

BMP 12: Conservation Coordinator

RCWD employs one full-time water conservation coordinator. The coordinator is tasked with interacting with coordinators from other agencies, overseeing all aspects of water conservation, and developing new programs. Since 2000 RCWD has spent approximately $150,000 to satisfy this BMP.

BMP 13: Water Waste Prohibition

RCWD has actively enforced "No-Waste" water provisions included in its water conservation program for dealing with water supply shortages (see Appendix B). This program was adopted in January 1991 (Resolution 91-1-3), then later amended in February 1991 (Resolution 91-2-3) and again in May 1991 (Resolution 91-5-8). The program contains four stages of water supply conditions. Under each stage the condition of the supply is defined along with prohibited uses. RCWD does respond to customers who complain about wasteful use of water. On average, RCWD send out approximately 10 letters per year to customers who have been identified as using water in a wasteful manner.

RCWD does not have a water softener ordinance nor does it conduct water softener checks as part of its home surveys.

BMP 14: Residential ULFT Replacement Programs

Since 1997 RCWD has participated in MWDSC's Ultra Low Flush Toilet (ULFT) rebate program. MWDSC offers a rebate of $60 for a ULFT and RCWD passes this through to their customers as a credit in their water account. The only costs RCWD incurs are administrative, at $10 per unit. This program began in 1997 and through March 2005 has had 1,089 participants. RCWD has also distributed toilets in coordination with the Temecula Valley High School's Rotary Interact Club. Cooperative Technologies & Services International trained students to market and assist distribution of ULFT's for a $20 co-pay. Through this program the ULFTs provide long term water savings throughout their usable life, RCWD gains public exposure, students gain skills, and the high school earned money for academic and extracurricular activities. Through these programs starting in 1997 and through March 2005 RCWD has had 1,089 participants.

An annualized savings and cost estimate were based on an average from 1997 through 2004. On average annual participation in the ULFT program is 155. Total annual savings for an average year (based on participation from 1997 through 2004) is 6.25 AF based on CUWCC's methodology. Assuming a 25 year life for a toilet, the lifetime savings is 156.36 AF and the cost per lifetime savings is $9.98 per AF.

4.3 Agricultural Conservation Programs

In conjunction with other agencies, RCWD has funded numerous programs with the goal of increasing conservation of water used in agriculture. Agricultural water use represented 36 percent of RCWD's total water use during fiscal year 2003-2004. The potential for water savings from conservation in the agricultural sector are great and reductions in agricultural water use may have a considerable impact on RCWD's total demand. RCWD's current efforts to save water in the agricultural sector include:

- Irrigation system evaluations.
- The PRISM Winegrape Irrigation Scheduling and Regulated Deficit Program.

- The development of an agricultural discount program that has yet to be funded and implemented.

Irrigation System Evaluations

RCWD, in conjunction with San Jacinto Basin Conservation District, conducts agricultural irrigation system evaluations under its Irrigation System Evaluation Program. This program began in 2003 and to date 32 evaluations have been completed. The goal of the program is to conduct 45 evaluations by 2006. Of the 32 evaluations performed average farm acreage ranges from 5 to 55 acres with an average of 12 acres. Per farm savings resulting from the evaluations ranges from . 23 AFY to .47 AFY with an average of .40 AFY. The 32 evaluations covered 384 acres and save approximately 154 AFY. Savings from this program result primarily from improvements in application uniformity and scheduling accuracy. The irrigation evaluation program has cost RCWD about $15,000 since 2003. The program expires in 2006, but with its success will likely continue.

PRISM Scheduling and Regulated Deficit Program

The Precision Irrigation Scheduling Method (PRISM) uses a high frequency radio wave emitting soil probe that collects soil moisture information that can be downloaded to a computer. Once downloaded, PRISM software can be employed to determine irrigation needs. Originally the (PRISM) Wine Grape program was funded by growers at $15 per week per site for a 30 week season. Twelve vineyards participated in the program. Crop losses suffered by farmers due to Pierce Disease prompted the United States Bureau of Reclamation (USBR) to invest in the program in 2000.

The program provided weekly soil moisture monitoring with a portable Time Domain Reflectometry (TDR) device and irrigation scheduling designed to prevent water stress in an environment with Pierce Disease. In 2001, 20 additional vineyards were added to the program and the program added a new component for computing site-specific crop coefficients. The California Department of Conservation provided matching funds to aid the expansion of services. In 2002 the program added weekly shoot length measurements in order to monitor growth rates. In 2003 RCWD provided funding for a new component to the program, the Vine Moisture Stress Component.

For the years 2003-2005 RCWD provided a total of $43,000 in funding to this program. Vine moisture stress or more commonly known as Regulated Deficit Irrigation, utilizes techniques that apply less water than the vine requires thereby causing mild stress. This technique reportedly results in improved wine quality and conservation of water and energy. Yields may be reduced but the wine grower may find this an acceptable tradeoff for improved wine quality. Savings data for the PRISM Wine Grape Irrigation Scheduling and Regulated Deficit Program are provided in Table 4-4.

Table 4-4
PRISM and Regulated Deficit Savings

2002	0.077	1,242	95.63
2003	0.444	1,213	538.40
2004	0.208	1,224	254.51
Total			**888.54**

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Section 5
Water Shortage Contingency Plan

5.1 Overview

In order to ensure a reliable water supply in a water shortage situation, RCWD developed a water shortage contingency plan in accordance with the Urban Water Management Planning Act. A water shortage situation may be brought on by drought conditions caused by hot and dry weather, or a failure of the water delivery system due to seismic activity or other catastrophic event. A large portion of the water RCWD sells to its customers is imported from the MWD via EMWD and WMWD. Therefore, as part of RCWD's Water Shortage Contingency Plan it is important to present MWD's plan in the case of a water shortage. The next section discusses MWD's Water Surplus and Drought Management Plan and EMWD and WMWD's Water Shortage Contingency Plans. Section 5.5 discusses RCWD's compliance with Water Code Section 10632.

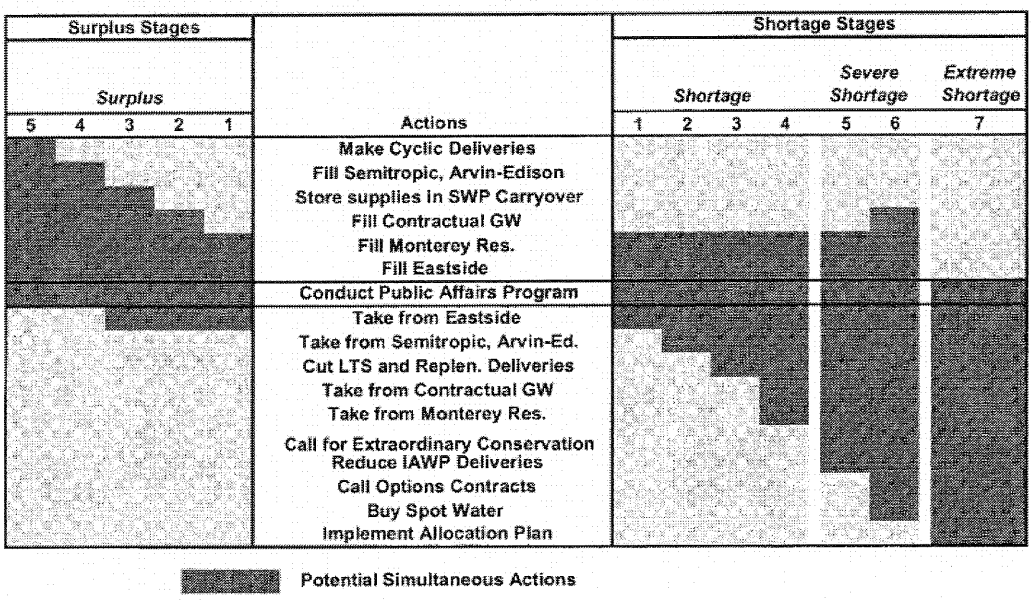
5.2 Metropolitan Water District of Southern California

RCWD receives MWD imported water deliveries from EMWD and WMWD. Both EMWD and WMWD are member agencies of MWD and therefore RCWD is subject to MWD policies during a water shortage. During fiscal year 2004 RCWD purchased 41,312 acre-feet of water from MWD, which represents 49.5 percent of total annual water production. Metropolitan Water District of Southern California's 1999 Water Surplus and Drought Management Plan (WSDM) provides a plan to provide 100 percent reliability of the agency's water service. Protocols are provided for times of water surplus and water shortage. MWD strategically manages water in times of surplus to ensure there is an adequate supply during a shortage. The WSDM plan defines surplus, shortage, severe shortage, and extreme shortage as follows:

> "**Surplus**: Supplies are sufficient to allow MWD to meet Full Service demands, make deliveries to all interruptible programs (replenishment, long-term seasonal storage, and agricultural deliveries), and deliver water to regional and local facilities for storage.
>
> **Shortage**: Supplies are sufficient to allow MWD to meet Full Service demands and make partial or full deliveries to interruptible programs, sometimes using stored water and voluntary water transfers.
>
> **Severe Shortage**: Supplies are insufficient and MWD is required to make withdrawals from storage, call on its water transfers, and possibly call for extraordinary drought conservation and reduce deliveries under the Interim Agriculture Water Program (IAWP).
>
> **Extreme Shortage**: Supplies are insufficient and MWD is required to allocate available imported supplies".

During shortages MWD will be able to meet municipal and industrial (M&I) demands with management of existing water supplies with no negative impact to the end user. Severe and extreme shortages will require MWDSC to implement the following shortage actions as stated in the WSDM:

- Draw on storage in the Diamond Valley Lake
- Draw on out-of-region storage in Semitropic and Arvin-Edison
- Reduce/suspend long-term seasonal and groundwater replenishment deliveries
- Draw on contractual groundwater storage programs in the region
- Draw on SWP terminal reservoir storage (per Monterey Agreement)
- Call for extraordinary drought conservation and public education
- Reduce IAWP (agricultural) deliveries
- Call on water transfer options contracts
- Purchase transfers on the spot market
- Allocation of MWD's firm imported supplies to its member agencies



Source: MWDSC WSDM Plan

Figure 5-1
MWD Stages and Action Matrix

Figure 5-1 illustrates MWD actions during times of surplus and shortage. If a severe shortage occurs IAWP deliveries will be reduced. In 2000, RCWD served approximately 1,300 Agriculture and Agriculture/Domestic accounts and delivered 33,857 AF of water to these customers; 49 percent of total deliveries. The action above calling for a reduction of IAWP will impact RCWD's agricultural customers in a severe shortage, as agricultural water deliveries are interruptible. The WSDM states:

> "**Reduce agricultural deliveries:** The IAWP offers interruptible water to southern California's agricultural industry at discounted rates. These supplies will be interrupted as part of MWD's shortage actions. MWD will work with IAWP participants to provide as much advance warning of interruption as possible. The IAWP reflects current policies toward agricultural water users. The policies underlying this program are due to be reviewed during the ten-year period of the WSDM Plan. The WSDM Plan will be changed accordingly".

According to MWD's IAWP Reduction Guidelines, MWD has the right to discontinue surplus water service in whole or in part with one year's written notice. After a purchaser is given a notice of discontinuation, MWD's CEO may reduce IAWP deliveries up to 30 percent prior to any urban water allocation action under the WSDM Plan.

The timing of potential IAWP reductions is important to note as Colorado River and State Water Project (SWP) supplies are determined annually. The initial supply allocation is estimated in December; however the SWP supply is uncertain and not final until May 1. Typically May 1 is when a notification would be made by MWDSC regarding a reduction in IAWP water deliveries, with actual reductions occurring 60 days later on July 1.

If MWD requires a utility to reduce IAWP water usage, water usage targets for the upcoming year are established based on water use during the previous year. Once this baseline water use target is established it will remain in place as long as the reduction is in effect, even if it goes beyond the fiscal year. Actual IAWP water consumption will be measured every six months. If an agency used less water than it was allotted it receives a credit that carries over into the next six month period. If the agency used more water than it was allotted via the established baseline then it is assigned a debit. If an agency uses more water than it is allotted they have to pay MWDSC's penalty rate for the amount of water over the established baseline.

5.3 Eastern Municipal Water District Water Shortage Contingency Plan

EMWD's Water Shortage Contingency Plan presents restrictions for residential, commercial, institutional, and industrial (CII), and agricultural sector customers during the four established water stages. Stage 1 is defined as having water deficiencies between 5 and 10 percent and restrictions are voluntary, Stage 2 is defined as water deficiencies from 10 to 25 percent, Stage 3 represents a deficiency of

25 to 50 percent, and in Stage 4 deficiencies are greater than 50 percent. During Stages 2-4 the restrictions set forth by EMWD are mandatory. During water shortages all of EMWD's customers are requested to adhere to restrictions. The Water Shortage Contingency Plan defines a customer as, "any person, company, agency, or organization using water supplied by EMWD." Therefore RCWD will be impacted by EMWD's water use restrictions in the event of a water shortage.

Restrictions pertaining for Stages 1-4 are below. The restrictions are voluntary for Stage 1 but are mandatory for Stages 2-4.

Residential water shortage contingency measures:

Stage 1:

1. "Do not hose down driveways or any other hard surfaces except for health or sanitary reasons.

2. Irrigate lawns and landscape only between midnight and 6:00 a.m. (unless hand watering). Adjust automatic timer clocks accordingly.

3. Adjust and operate all landscape irrigation systems in a manner that will maximize irrigation efficiency and avoid over watering or watering of hardscape and the resulting runoff.

4. Refrain from using decorative fountains unless they are equipped with a recycling system.

5. Where possible, install pool and spa covers to minimize water loss due to evaporation.

6. Do not allow hoses to run while washing vehicles. Use a bucket or a hose with an automatic shutoff valve".

Stage 2:

1. "No replacement water will be provided for ponds, lakes, etc".

Stage 3:

1. "Water used on a one-time basis for purposes such as construction and dust control shall be limited to that quantity identified in a plan submitted by the user describing water use requirements. The plan shall be submitted to the District for approval.

2. The use of water from fire hydrants shall be limited to activities necessary to maintain the public health safety and welfare.

3. Water for municipal purposes shall be limited to activities necessary to maintain the public, health, safety, and welfare.

4. Outdoor irrigation by sprinklers will only be allowed on even-numbered days of the month for those locations with a street address ending in an even last digit. Outdoor irrigation of locations not having a street address shall irrigate on even-numbered days of the month.

5. Outdoor irrigation by sprinklers will only be allowed on odd-numbered days of the month for those locations with a street address in an odd last digit.

6. Washing of autos, trucks, trailers, motor homes, boats, airplanes, or other types of mobile equipment is prohibited. However, such washings are exempted from these regulations for municipalities or commercial entities where the health, safety and welfare of the public is contingent upon frequent vehicle cleaning such as garbage trucks or vehicles used to transport food and perishables".

Stage 4:

1. "Irrigation of landscaping is only allowed twice per week with hand-held hose only.

2. No replacement water provided for pools and spas until such time as Stage 4 restrictions are deemed no longer in effect.

3. No one shall cause the emptying or refilling of existing pools or spas for cleaning purposes. Current water levels will be maintained.

4. All new landscaping shall be limited to drought-tolerant plantings as determined by the District.

5. No new lawn/turf, whether by seed or sod, shall be permitted.

6. No person or entity shall be required to implement any new landscaping requirements of any association, developer, or governing agency until the termination of Stage 4.

7. Use of water by all types of commercial car washes shall be reduced in volume by 50 percent".

CII water shortage contingency measures:

Stage 1:

1. "Reference evapotranspiration (ET) factors for individually metered landscape projects will be reduced from 1.0 (100 percent of ET) to 0.8 (80 percent of ET)".

Stage 2: No additional measure, however Stage 1 becomes mandatory.

Stage 3:

1. "Landscape meters to 75 percent of ET.

Stage 4:

1. Landscape meters to 60 percent of ET.

Agricultural water shortage measures:

Stage 4:

1. Based on interruptible agriculture (sic) water from MWDSC, field and row crops may be discontinued".

Note there are no agricultural water use restrictions for Stages 1-3.

5.4 Western Municipal Water District Water Shortage Contingency Plan

During a water shortage WMWD will adopt an Ordinance that restricts water usage and penalizes excess usage. Prohibitions of water use that may be imposed by WMWD include street/sidewalk cleaning, washing cars, lawn/landscape watering, non-permanent agriculture, uncorrected plumbing leaks, gutter flooding, and restrictions on construction use. According to the WMWD's Water Shortage Contingency Plan, the stages when these prohibitions become mandatory may vary. Unlike EMWD's plan which has specific measures to be taken during each of its four stages. The measures WMWD takes during a water shortage will apply to all retail and wholesale customers.

WMWD has prepared actions to be taken should a catastrophic event occur. Possible catastrophes it is prepared for include: regional power outage, earthquake, extreme weather, terrorism/sabotage, water borne diseases, and system failure.

In February 2005 WMWD was required to enact Ordinance 358 due to a five day shutdown of a MWDSC treatment plant. The Ordinance prohibited use of potable water for non-essential indoor and outdoor water use. More specifically irrigation;

hosing down sidewalks, driveways, patios, etc.; washing cars; and certain construction uses were prohibited.

WMWD's Water Shortage Contingency Plan states that it may stop wholesale water sales during a water shortage emergency period, which will have a direct impact on RCWD supplies.

5.5 RCWD Water Shortage Contingency Plan

As required by the Urban Water Management Plan Act, RCWD has developed a water shortage contingency plan so that it may provide a reliable supply of water to its customers in the event of a water shortage situation (see Appendix B). Below sections 10632 (a) through (i) are discussed.

5.5.1 Water Code Section 10632 (a)

The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier: (a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.

Currently RCWD has a resolution that establishes water conservation guidelines based on the availability of supply. There are four stages of action and each stage has a set of conservation measures. Water code section 10632 of the Urban Water Management Plan Act requires a shortage situation of 50 percent reduction in water supply to be addressed. Presented below are four water stages and the actions that are taken for each stage. Stage IV, water emergency, will provide adequate conservation during a water shortage of up to a 50 percent reduction in water supply and is discussed below.

Stage I - Normal Condition (The District is able to meet the water demands of its customers in the immediate future).

1. When the General Manager has declared that the District's water supply is in a "Normal Condition," customers are requested to use water wisely and to practice water conservation measures so that water is not wasted.

2. Customers are to avoid use of water in a manner that creates runoff or drainage onto adjacent properties or onto public or private roadways.

3. Water waste is a violation of California Law and District Regulations at any time.

Stage II - Water Alert (There is a probability that the District will not be able to meet all of the water demands of its customers).

1. Parks, school grounds, and golf courses are to be watered at night only.

2. Lawns and landscaping are to be watered after 6:00 p.m. and before 6 a.m.

3. Driveways, parking lots and other paved surfaces are not to be washed with water.

4. Private vehicles are to be washed with a bucket; hoses must have positive shut off nozzles.

5. Commercial car washes must recycle water.

6. Restaurant customers are to receive water only upon request.

7. A limited number of fire hydrant construction meters will be issued by the District. Applicant must present current, valid grading or building permit.

8. Livestock or animals may be watered at any time.

9. Decorative ponds, golf course water hazards which are not an integral part of the permanent irrigation or fire protection system, fountains and other waterscape features are not to be filled. Fountain pumps must remain off to minimize evaporation.

Stage III - Water Warning (The District is not able to meet all of the water demands of its customers).

1. Parks are to be watered at night no more than two times per week.

2. School grounds are to be watered at night no more than two times per week.

3. Golf courses, greens and tees only, are to be watered at night. Fairways may be watered on alternate days at night.

4. Lawns and landscaping are to be watered no more than two times per week after 6:00 p.m. and before 6:00 a.m.

5. Restaurant customers are to receive water only upon request using disposable cups.

6. Driveways, parking lots, or other paved surfaces are not to be washed with water.

7. Swimming pools are not to be filled.

8. Commercial car washes must recycle water.

9. New fire hydrant construction meters will not be issued by the District.

10. Water service through fire hydrant construction meters for grading or other constructions is to be used after 5:00 p.m. and before 10:00 a.m.

11. Agricultural customers are to use water on alternate days only.

12. Commercial nurseries are to use water only on alternate days between 6:00 p.m. and 6:00 a.m.

13. Livestock or animals may be watered at any time.

Stage IV – Water Emergency (A major deficiency of any supply or failure of a distribution facility is declared).

1. Lawns and landscaping are not to be watered.

2. Parks, school grounds and golf course fairways are to be watered with reclaimed water, if available, or not at all. Golf course greens and tees may be watered only on alternate nights.

3. Driveways, parking lots, or other paved surfaces are not to be washed.

4. Commercial car washes using recycled or reclaimed water are to be used for washing vehicles. Consumption of District water for this use must be reduced to 50 percent of average consumption for the year.

5. Restaurant customers are to receive water only upon request, using disposable cups.

6. Swimming pools are not to be filled.

7. New fire hydrant construction meters will not be issued by the District.

8. Water service through fire hydrant construction meters will not be available by the District.

9. Permanent orchard crop irrigation is to be limited to no more that two times per week. In the event of a temporary service outage, agricultural irrigation is to be discontinued.

10. Other agricultural and commercial nursery irrigation is to be discontinued.

11. Livestock or animals may be watered at any time.

The conservation actions listed under Stage IV- Water Emergency primarily target outdoor water use. The only indoor water use that is restricted is in regard to restaurant customers receiving water only upon request. The savings from this are likely insignificant, but help promote public awareness of the crisis. The other measures virtually eliminate outdoor water use with exception to watering livestock and animals, minimal orchard crop irrigation, and golf course greens and tees on

alternate nights. Other uses such as commercial car washes and parks, school, and golf course fairway watering are to use reclaimed water.

The sectors using the most water during fiscal year 2003-2004 were domestic (including Ag/Domestic) and the agricultural sector with 41 percent and 36 percent of total water use respectively, for a combined total of 77 percent. An analysis of RCWD billing data suggests that outdoor water use accounts for 51 percent of all total use in the domestic sector. In a severe water shortage, a complete restriction of outdoor domestic water use could potentially reduce total District water use by 22 percent.

Making the gross assumption that livestock and animal watering and the minimal orchard irrigation permitted make up 20 percent of total agricultural water use, the restrictions during a water emergency can reduce agricultural water use by 80 percent and total District water use by 29 percent.

The impacts of Stage IV would reduce total water use by an estimated 51 percent in the domestic and agricultural sectors alone. The Stage IV restrictions would create savings in the sectors that make up the remaining 33 percent of total water use as well. Golf, construction, commercial, landscape, multiple dwelling, and schools and government would all realize reductions in water use under restrictions of Stage IV water emergency. In the event of a 50 percent water shortage RCWD's Drought Ordinance Stage IV will provide the appropriate measures to save water.

5.5.2 Water Code Section 10632 (b)

An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.

If conditions during the three years following 2005 are equal to the driest three-year historic sequence for RCWD's water supply, RCWD would have to take measures to meet water demand within its service area. Most likely RCWD will increasingly rely on MWDSC for imported water. The results of a simulation using the three driest historic years are presented below in Table 5-1.

Table 5-1
Driest Three-year Water Supply Sequence

Supply & Demand (Acre-Feet)	Current Conditions	Followed by Driest Three Consecutive Years (1988-1990)		
	2005	2006	2007	2008
Treated Imported Water	31,084	34,761	40,226	32,777
Groundwater	38,130	38,931	39,636	39,378
Reclaimed Water	6,044	6,093	6,161	6,068
Demand	75,258	79,786	86,023	83,634
M&I Deficit	0	0	0	0
Ag Deficit	0	0	0	5,411

The driest three consecutive years are based on historical rainfall data from 1935 to 1998. Using projected demand data for 2005 and 2010, and assuming a normal

hydrology; the demands for 2006, 2007, and 2008 were interpolated. Then the hydrology factors for 1988, 1989, and 1990 were applied to the 2006, 2007, and 2008 estimates to obtain the estimates presented in Table 3.1. Treated imported water supply decreases from 2007 to 2008 due to the model assumption of applying the 1990 hydrology. The year 1990 was a hydrology year in which MWDSC limited treated water supply for agricultural demands by 25 percent, which is also reflected in the agricultural deficit presented in Table 5-1. If a severe drought period were to occur MWDSC may be required to implement savings strategies from the WSDM Plan discussed in Section 5.2 and RCWD may enact its drought resolution. If RCWD were in a situation of increased reliance on imported water it will experience higher operating costs. This is discussed further in Section 5.5.6.

5.5.3 Water Code Section 10632 (c)

Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

RCWD operates in an area where the probability of an earthquake is high. Depending on the severity, an earthquake may damage the water system. RCWD's Emergency Response Plan provides a framework for an organized response to an earthquake emergency. The primary objectives of the plan are to maintain the functionality of the water distribution system, assess the system and if necessary make rapid repair to any damage, and prevent any further damage. The District's response to an earthquake will be directed by the General Manager.

RCWD has Response Phases in the event of an Earthquake:

Phase I - Inspection: A rapid inspection to determine injuries and any damage which might affect the distribution system.

Phase II - Report Back: Emergency communications flow: additional inspection procedures.

Phase III - Repair: Coordination of maintenance forces.

Phase IV - Management Procedures: Key Management responsibilities for the emergency.

Phase V - Operating/Maintenance/Engineering: Outlines procedures for division personnel.

Prior to Phase I inspections, System Operators and Inspectors report to the Emergency Operating Center to receive assigned inspection routes. The Emergency Operating Center creates a communications hub for the District to efficiently manage their available resources. For example personnel inspecting Vail Dam, wastewater treatment facilities, and wells receive their assignments from and report their findings to the Emergency Operating Center. The Emergency Response Plan contains ten areas

that are inspected with driving directions for specific inspections routes. If inspections reveal damage to any of the areas the necessary repairs are made. Communications are ongoing at all phases of the response to an earthquake. The District has a primary and secondary radio systems to insure communications will be available during an emergency.

The Emergency Response Plan also includes an analysis of the potential of an electrical power outage. RCWD depends on electricity to boost water to higher elevations via pumping stations, although some wells use natural gas as their energy source. The Plan discusses RCWD's sources of electricity and analyzes a history of power outages. The history of power outages includes the name of the circuit, reason for the power outage, the date and time of outage, and the length of the power outage. In an emergency situation involving a power outage RCWD will utilize emergency generators to provide customers with a reliable source of water.

5.5.4 Water Code Section 10632 (d-f)

(d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning. (e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply. (f) Penalties or charges for excessive use, where applicable.

As presented in Section 5.5.1, during Stage I - Normal Condition RCWD requests its customers use water wisely and practice water conservation measures as to not waste water. Customers are to avoid use of water that creates runoff and drainage. RCWD states that water waste is a violation of California Law and District Regulations even if there is not a water shortage.

Currently, RCWD does not have set charges for excessive water other than its Tier II rate structure. The Tier II rate charge is $81 per acre-foot ($0.18595 per hcf) in addition to the normal water rate. This is applied to customers who exceed their water allocation determined by their customer class. When it is required, RCWD will pass through penalties from MWDSC to its customers. No other prohibitions are set forth by RCWD beyond those presented in Section 5.5.1.

5.5.5 Water Code Section 10632 (g)

An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

RCWD's current rate structure is designed to mitigate the impacts of reduced sales volumes through adequate fixed revenue coverage. As stated in RCWD's 2004 Comprehensive Financial Report, "It is the intent of the Board of Directors that the costs of providing water and sewer services are financed primarily through user

charges, and that fixed costs are recovered through fixed revenues and variable costs are recovered through variable revenues. This method better positions the District to maintain a stable and equitable rate structure during normal and abnormal weather conditions, as well as periods of drought that result in material reductions of water sales".

According to the Fiscal year 2005-2006 Operating and Non-Operating Budget report, local water production saves the district $9,000,000 in annual operating costs when compared to the cost of import water. In ideal conditions the District's goal is to produce 30,000 acre-feet of local water annually. In a prolonged drought situation the goal may be dropped to 25,000 acre-feet. This would increase RCWD's water production costs by $1,500,000. Further, prolonged drought conditions will likely result in MWDSC discontinuing the reduced rate for recharge water, and its agricultural credit program. The discontinuation of these programs would increase RCWD's costs by $1,000,000 and $1,800,000 respectively. Therefore, if drought conditions caused local groundwater production to be reduced by 5,000 acre-feet, and MWDSC discontinued its reduced rate for recharge water and its agricultural credit program the District's operating charges would increase by $4,300,000. In preparation for such a condition, RCWD has a Drought Reserve that is set at one year's impact of estimated drought costs. The reserve requirement is $4,300,000 and protects RCWD and its customers should a drought situation arise.

5.5.6 Water Code Section 10632 (h & i)

(h) A draft water shortage contingency resolution or ordinance. (i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

RCWD's water shortage resolution was discussed in Section 5.5.1, and a copy of the ordinance is attached in Appendix B. The last ordinance was drafted in 1991, however, the District's fiscal year 2005-2006 report on Operating and Non-Operating Budgets lists updating the current Drought Ordinance as an objective. The target date for the update is December 2005.

If the water saving actions contained within the ordinance are ever necessitated by water shortage conditions, the District will be able to track actual reductions in water use through its billing system. The billing system tracks actual use on a monthly basis no matter the supply situation. RCWD has over ten years of consumption history for each customer. RCWD's aggressive water meter replacement ensures the use being tracked via the billing system is reliable and accurate.

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Section 6
Water Recycling

6.1 Agency Participation in Recycled Water Planning

Recycled water planning within Rancho California Water District's (RCWD) service area requires close coordination with several agencies. RCWD has recently developed a Regional Integrated Resources Plan or IRP. The IRP evaluated a number of alternatives to increase recycled water within RCWD's service area.

Additionally, the Santa Margarita Water Supply Augmentation Study was conducted by Eastern Municipal Water District (EMWD), RCWD and the Bureau of Reclamation. This study examined the feasibility of advanced treatment using MF/RO to increase the usability of recycled water from EMWD's recycled water plant.

Participating agencies for both the IRP and Santa Margarita Water Supply Augmentation Study are summarized in Table 6-1.

Table 6-1
Participating Agencies in Recycled Water Plan

Participating Agencies	Santa Margarita Water Supply Augmentation Study[1]	RCWD IRP[2]
RCWD	x	x
Metropolitan Water District of Southern California		x
Eastern MWD	x	x
Western MWD		x
US Bureau of Reclamation	x	
1 - Santa Margarita Water Supply Augmentation Study (CDM 2005)		
2 - RCWD Regional Integrated Resources Plan (CDM 2005)		

6.2 Wastewater Collection and Treatment Systems

Wastewater in the upper Santa Margarita watershed is collected by sewer system in the more densely populated areas and by septic systems in the rural areas. RCWD and EMWD both collect wastewater within their systems and treat it at two water reclamation facilities: the Santa Rosa Water Reclamation facility (SRWRF), operated by RCWD; and the Temecula Valley Regional Water Reclamation Facility (TVRWRF), operated by EMWD.

Table 6-2 summarizes the past, current, and projected average dry weather wastewater volumes collected and treated and the quantity of wastewater treated to recycled water standards for treatment plants within RCWD's service area. Between 2005 and 2030 the average wastewater collected between the two treatment plants is

expected to almost double from 18,594 million gallons per day (mgd) to 34,780 mgd. The entire amount of wastewater collected is expected to meet recycled water standards. Utilization of treated effluent for recycled water use after further treatment is projected to increase from 36 percent in 2005 to 79 percent in 2030.

Table 6-2
Wastewater Collection and Treatment

Average Wastewater Collected (Acre-Feet)						
Wastewater Plant	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
TVRWRF (EMWD)	14,114	16,970	19,827	21,693	23,560	25,427
SRWRF (RCWD)	4,481	5,685	6,889	7,710	8,532	9,353
Total	18,594	22,655	26,715	29,404	32,092	34,780
Quantity Meeting Recycled Water Standards (Acre-Feet)						
Wastewater Plant	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
TVRWRF (EMWD)	14,114	16,970	19,827	21,693	23,560	25,427
SRWRF (RCWD)	4,481	5,685	6,889	7,710	8,532	9,353
Total	18,594	22,655	26,715	29,404	32,092	34,780

Source: Santa Margarita Water Supply Augmentation Study (CDM, 2005).

All recycled water must meet Title 22 standards. Title 22, Chapter 4, of the California Code of Regulations establishes recycled water quality standards and treatment reliability criteria dependent upon the end use of recycled water to protect public health. Both secondary and tertiary treated wastewater can meet Title 22 standards dependent upon the end use of the water. Recycled water produced in excess of demands is disposed and eventually ends up in the ocean.

Table 6-3 summarizes the disposal method, treatment levels, and past, current, and projected discharge volumes. All effluent at TVWRF is treated to Title 22 standards. Portions of the effluent that are not used immediately or stored are discharged to Temescal Creek and ultimately the Pacific Ocean. As indicated in the table, SRWRF does not discharge effluent, rather all water is treated to Title 22 standards and either immediately used or stored for future use. The amount of water discharged is expected to increase by 9,521 acre-feet between 2005 and 2030.

Table 6-3
Wastewater Treatment and Disposal (Acre-Feet)

Wastewater Plant	Disposal Method	Treatment	2005	2010	2015	2020	2025	2030
TVRWRF (EMWD)	Ocean via Temescal Creek	Title 22	6,945	9,017	11,089	12,882	14,674	16,466
SRWRF (RCWD)	All Recycled Water Used	Title 22	0	0	0	0	0	0
Total			**6,945**	**9,017**	**11,089**	**12,882**	**14,674**	**16,466**

Source: Santa Margarita Water Supply Augmentation Study (CDM, 2005).

6.2.1 Santa Rosa Water Reclamation Facility

SRWRF has a current capacity of 5 mgd or approximately 5,598 AFY. The plant collects flow from areas within portions of RCWD's service area, Murrieta County Water District (MCWD), and a portion of Elsinore Valley Water District (EVMWD). The MCWD area is expected to have the greatest population grown leading to an increase in flows from 851 AFY in 2005 to 3,663 AFY in 2030 or 0.76 mgd to 3.3 mgd. The portion of EVMWD's service area served by this facility is expected to have the least growth increasing from 1,535 AFY in 2005 to 1,647 AFY in 2030 or 1,4 mgd to 1.5 mgd. Total projected wastewater flows will almost double for this facility between 2005 and 2030.

All reclaimed water produced at this plant is currently reused for landscape irrigation. Seasonal storage ponds near the SRWRF store effluent during the winter months (low demand period) to prevent discharges and provide reclaimed water supply to meet peak summer demands. The current pond storage capacity is approximately 1,100 AF, with an expected ultimate capacity of 2,700 AF.

6.2.2 Temecula Valley Regional Water Reclamation Facility

The TVRWRF treats wastewater from a service area which includes the "Golden Triangle" region between Interstates 15 and 215, the Murrieta Hot Springs area, and portions of the Rancho Division of RCWD. The TVRWRF may also receive and treat wastewater generated in MCWD and EVMWD service areas. Projected wastewater flows will increase most dramatically from EMWD will increase more than twofold from 4,481 AFY to 9,521 AFY or 4 mgd to 10 mgd. Total flows for TVWRF will increase from 12,658 AFY to 25,539 AFY or 11.3 mgd to 22.7 mgd.

Effluent from TVRWRF is conveyed to on-site storage ponds prior to distribution. There are 225 million gallons (MG) of temporary on-site storage capacity. When additional storage is required, reclaimed water is conveyed to 450 MG storage ponds located 10 miles north in Winchester, providing reclaimed water supply for irrigation users along the way. When the ponds are full or there is not enough demand, the effluent is discharged to Temescal Creek, a tributary of the Santa Ana River, for ultimate disposal to the Pacific Ocean.

Reclaimed water produced by the TVRWRF is currently distributed to a variety of users, including users in the RCWD service area. From 1999 to 2003, effluent use on average was 256 mgd, with summer peaks increasing each year from about 400 mgd in 1999 to about 650 mgd in 2003.

6.3 Current and Projected Uses of Recycled Water

Historically, recycled water has provided less than 5 percent of total water supply for RCWD, while groundwater has supplied between 25 to 40 percent and imported water has supplied between 60 to 70 percent. In 2005, the total recycled water used was 6,691 acre-feet per year.

Water quality concerns in the Santa Margarita River Watershed prevent RCWD from discharging reclaimed water (Title 22) to the local streams. At the same time, the District needs to comply with legal requirements for flow to downstream users. Currently, raw imported supply has been used to meet flow requirements, while the effluent from the reclamation facilities is utilized for irrigation and other uses.

As stated in Section 6.2.1, SRWRF currently recycles all of its reclaimed water. Its reclaimed water is used solely for landscape irrigation. When supplies exceed demands, typically during the winter months, excess supplies are stored for use during the summer months when demand is higher. The ponds have a storage capacity of approximately 1,100 AF with an expected ultimate capacity of 2,700 AF.

Effluent from TVRWRF is conveyed to on-site ponds with 225 MG of capacity, prior to distribution. There is an additional 450 MG of storage available north of Winchester, and reclaimed water supply is provided for irrigation along the way. When the ponds are full or there is not enough demand, the effluent is discharged to Temescal Creek (which ultimately enters the Pacific Ocean via the Santa Ana River).

Tables 6-4 and 6-5 summarize current and projected recycled water use, respectively. The use of recycled water for landscaping will be the largest use until 2025, when the projected MF/RO facility will start serving agricultural users with highly treated recycled water.

Table 6-4
Current Recycled Water Uses (AFY)

User type	Treatment Level	2005
Landscape[1]	Title 22	6,497
Agriculture[2]	Title 22	194
	Total	6,691

Source: Santa Margurita Water Supply Augmentation Study, 2005.
[1]Includes flow supplied by both TVRWRF and SRWRF.
[2]Includes flow supplied by TVRWRF.

Table 6-5
Projected Future Use of Recycled Water in RCWD Service Area (AFY)

User type	2010	2015	2020	2025	2030
Landscape	7,700	8,900	9,700	10,500	11,400
Agriculture	190	190	190	13,800	13,800
Total	7,890	9,090	9,890	24,300	25,200

Source: RCWD Regional Integrated Resources Plan (CDM, 2005)

Table 6-6 compares the 2000 UWMP projections for recycled water use to the actual amount of recycled water used for year 2005. Actual recycled water use in 2005 exceeded projected water use by 2,317 acre-feet.

Table 6-6
Recycled Water Uses - 2000 Projection compared with 2005 actual (AFY)

User type	2000 Projection for 2005	2005 Actual Use
Landscape[1]	4,180	6,497
Total	4,180	6,497

Source: 2000 RCWD UWMP, 2000 and Santa Margurita Water Supply Augmentation Study, 2005

Potential recycled water uses in the RCWD area are illustrated in Table 6-7. These potential uses represent the demands for water that could be served with recycled water, but do not account for water quality requirements or availability of recycled water supply. For example, the maximum available recycled water supply for RCWD by 2030 from both the SRWRF and the TVRWRF is approximately 27,000 AFY, whereas the potential recycled water demand by 2030 is approximately 90,000 AFY.

Table 6-7
Potential Recycled Water Uses (AFY)

User type	Treatment Level	2010	2015	2020	2025	2030
Groundwater Recharge	MF/RO[2]	35,000	35,000	35,000	35,000	35,000
Landscape	Title 22	4,481	5,699	6,917	8,135	9,353
Tolerant Agriculture	MF/RO[2]	38,000	39,500	41,000	43,500	46,000
Total		77,481	80,199	82,917	86,635	90,353

Source: Santa Margurita Water Supply Augmentation Study, 2005.
[1] This potential does not take into account the availability of recycled water or the required quality needed.
[2] MF/RO = microfiltration/reverse osmosis.

6.4 Encouraging Recycled Water Use

Numerous methods are utilized by RCWD to encourage recycled water use. These methods are further described below.

6.4.1 Funding

Capital risks associated with recycled water projects are significant hurdles towards increase recycled water production and use. Similar to a potable water system, treatment facilities, distribution networks, pumping stations, and storage reservoirs are required to adequately supply a reliable source of recycled water. These expensive capital investments result in high per unit acre costs, especially if demand is limited in the beginning of the project. Many times the cost per unit is more than purchasing other non-recycled supplies.

RCWD offers recycled water to its customers at a cost less than that of potable water as a financial incentive through its local projects program to encourage the use of recycled water. Additionally, RCWD will construct the MF/RO facility, expected to be online by 2025, that will provide an additional 16,000 AFY of recycled water.

State propositions have dedicated allocations towards water recycling. Proposition 204 provides funding up to $60 million for water recycling loans in California. Proposition 13 provides up to $40 million in grants and low interest loans.

Financial incentives tend to drive the per unit cost of recycled water down and assist in the encouragement of recycled water use. Projects that tend to spread the capital CALFED has recommended that the state and federal government spend $1.5 to 2 billion over the next seven years on water use efficiency, including water recycling.

6.4.2 Partnerships to Encourage Water Recycling

Partnerships between agencies are another means of encouraging recycled water use. Financially, the initial capital investment is spread between two agencies instead of one. Most recycled water production efforts require close coordination between multiple agencies. At a minimum wastewater, groundwater, and water agencies are all impacted by recycled water production. Recycled water production efforts tend to cross existing jurisdiction boundaries and require new management strategies to ensure all parties concerns are met. Additionally, the previously discussed Santa Margarita Water Supply Augmentation Study fostered coordination among EMWD, RCWD and the Bureau of Reclamation.

Projected yields from encouraging partnerships to encourage recycled water use are unknown and cannot be readily allocated from total project yields.

6.4.3 Regulatory Issues

Both the RWQCB and DHS are involved with water recycling use. The local RWQCB is the permitting authority and DHS regulates recycled water use from a health concern and standards viewpoint. Title 22 of the California Administrative Code provides specific regulations for treatment levels and reuse applications. Currently, there is no uniform criteria for regulating groundwater recharge applications requiring state agency review on a case-by-case basis. A uniform criteria for regulating groundwater recharge would encourage agencies that are reluctant to currently pursue such options based on unknown requirements to pursue groundwater recharge with recycled water.

Projected yields from involvement in regulatory issues to encourage recycled water use are unknown and cannot be readily allocated from total project yields.

6.4.4 Research to Encourage Recycled Water Use

RCWD supports research efforts to encourage recycled water efforts. These include conducting studies and research to address public concerns, develop new technologies, and health effects assessments. Addressing public concerns is required to gain the support of stakeholders early on in the planning process. From an aesthetic standpoint the public tends to have negative connotations associated with recycling wastewater. Education is required to inform the public of treatment processes. Developing new technologies is a prerequisite to reduce recycled water production costs. Cost is a major factor deterring agencies from increasing recycled water production. Health effects assessments have a two-fold purpose of alleviating public concerns and ensuring the protection of the public and environment.

Projected yields from research to encourage recycled water use are unknown and cannot be readily allocated from total project yields.

6.5 Optimizing Recycled Water Use

Over the next twenty five years, recycled water use is projected to increase over three times current levels to 25,200 AFY in 2030. This will reuse over 85 percent of the wastewater generated in RCWD's service area and surrounding areas.

RCWD plans to take numerous actions to facilitate the use and production of recycled water by water and wastewater agencies within RCWD's service area to assist in meeting these projections.

- Install the MR/RO facility to add almost 14,000 AFY of reclaimed water by 2025.
- Apply for Bond funding such as Prop 50.
- Encourage MWD to participate in studies that will benefit recycled water production
- Support MWD in deriving solutions to regulatory issues
- Participation in sub-regional MWD facility studies, such as the Riverside/ San Diego area study

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Section 7
Water Quality Impacts on Reliability

7.1 Introduction

Potable water supplies within RCWD's service area are derived from a combination of local groundwater and imported water from MWDSC. Contamination of these sources or more stringent regulatory requirements has the potential to result in adjustments to water resource management strategies and, in a worse case scenario, impact supply reliability. As with most water districts, RCWD currently blends its available supply sources to mitigate against water quality impacts. On average residents and businesses receive water composed of 40 percent groundwater and 60 imported MWDSC water.

California Title 22 Drinking Water Standards (Title 22) incorporates the federal requirements of the Safe Drinking Water Act, and compliance with Title 22 is required by all water service providers. Therefore, Title 22 Monitoring of all regulated chemicals as well as a number of unregulated chemicals is conducted by RCWD and MWDSC. In order to be in compliance with Title 22, each agency must ensure that the regulated chemicals meet established primary drinking water standards to ensure the safety of the water supply. In addition to the primary drinking water standards, secondary drinking water standards have been set for some minerals based on non-health related aesthetics, such as taste and odor. Both primary and secondary standards are expressed as the maximum contaminated levels (MCL) that are allowable for a given constituent. Unregulated chemicals do not have established drinking water standards, but are chemicals of concern for which standards may be eventually adopted. These unregulated chemicals often have a "notification level", which is a health based advisory level established by Department of Health Services for chemicals in drinking water that lack MCLs.

As illustrated in Table 7-1, RCWD has accounted for known and foreseeable water quality impacts in their current management strategies. RCWD does not anticipate water quality impacts that would either reduce the water supply available or that cannot be handled through existing management strategies.

Table 7-1
Current & Projected Water Supply Changes Due to Water Quality Percentage

Water Source	2005	2010	2015	2020	2025	2030
Local Groundwater Production	0	0	0	0	0	0
MWD	0	0	0	0	0	0
Total	0	0	0	0	0	0

Each of the water sources and any current or future impacts to water quality are discussed below.

7.2 Groundwater Quality

RCWD continually monitors the water quality of its eight groundwater basins and 54 wells. Every year RCWD conducts over 2,000 tests for water quality on each of its wells and throughout the distribution system.

Exceedances of Drinking Water Standards

Sampling at RCWD's wells between 2002 and 2004 has indicated that the primary MCL standard of 2 mg/L for Fluoride has ranged between 0.2 and 7.6. Fluoride occurs in the groundwater basins as a result of natural erosion. Well sampling ranges reflect the highest reading and lowest reading from all of RCWD's wells and do not reflect average readings for all the wells. After well water is extracted it is blended with other well water and imported MWD water. The distribution system average level of fluoride was 0.4 mg/L, well below the MCL.

Well sampling has also indicated that the secondary MCL of 50 ug/L for manganese has ranged between non-detect and 250 ug/L. Secondary MCLs are set based upon aesthetics and odor and are not set based on health standards. Non-detect measurements occur when a sample has concentrations below the detectable range of measurement instruments. Manganese is present in the groundwater as a result of leaching from natural deposits. Sampling in the distribution system has indicated that blending reduces the manganese concentration to the non-detect level.

7.3 Metropolitan Water District of Southern California

RCWD is a member agency of both EMWD and WMWD. Both of theses wholesalers are members of the MWD. RCWD purchases its water through EMWD and WMWD, but receives its water directly from turnouts in MWD's pipelines. MWD has two primary sources of water, the State Water Project (SWP) and the Colorado River Aqueduct (CRA). Imported water is served as a blend of both sources dependent upon seasonality. Colorado River water tends to be higher in Total Dissolved Solids and lower in dissolved organics. SWP water usually has a lower TDS but higher organic material, which can lead to formation of disinfection byproducts (DBP's). MWD recognizes the impacts of water quality on its member agencies and has embraced water quality planning in its Integrated Resources Plan and monitoring efforts to address water quality issues. Planning efforts have identified management strategies that allow flexibility in operations to improve water quality and source protection while maintaining reliability. MWD's water quality staff conducts both required monitoring and monitoring for constituents of concern that are currently unregulated. Over 300,000 water quality tests are performed each year.

7.3.1 MWD Water Quality Issues

Total Dissolved Solids Management

High TDS levels in imported water delivered by MWD to RCWD impacts RCWD's management of water resources and can adversely affect agriculture. High TDS levels

in potable water leads to increased recycled water treatment costs, results in increased water losses during the recycled water treatment processes, reductions in recycled water use as demand decreases for recycled water with high TDS levels, recycled water does not meet RWQCB standards, brine volumes increase, and ultimately the ability to use the underlying groundwater basins for water storage could be diminished. MWD has established an operational policy objective to deliver water to each of its member agencies at a TDS of 500 mg/l when feasible. This requires careful operational planning and management to achieve.

Colorado River Aqueduct
CRA water has high TDS levels, averaging 650 mg/L during normal water years. Salinity levels are dependent upon precipitation in the Colorado River Basin. During drought years salinity levels increase and during years with above normal precipitation salinity levels decline as naturally occurring salt concentrations decline. In times of extreme droughts salinity levels could exceed 900mg/L. A long term salinity management strategy is in place at the state and federal level for the Colorado River Basin. Funds are appropriated annually to help fund salinity mitigation and reduction projects throughout the watershed.

State Water Project
SWP TDS levels are significantly lower than CRA water, averaging 250mg/L for water delivered via the East Branch of the SWP and 325 mg/L for the West Branch deliveries. West Branch deliveries have higher TDS levels as a result of salt loading in local streams, operational issues, and evaporation losses at Pyramid and Castaic Lakes. TDS levels and available supply vary based on hydrologic conditions in the Sacramento-San Joaquin watersheds, introduction of saline non project waters by upstream parties, as well as saline intrusion in the Sacramento San Joaquin Bay Delta. Variations of TDS levels over short periods of time are attributed to seasonal and tidal flow patterns presenting a unique challenge in trying to achieve MWDSC's 500 mg/L TDS objective. During periods when TDS levels are high at the SWP intake facilities and in the Colorado River it may not be possible to meet MWDSC's salinity objective and maintain water supply reliability. MWD's Board has adopted a statement of needs "to meet Metropolitan's 500 mg/L salinity-by-blending objective in a cost-effective manner while minimizing resource losses and ensuring the viability of recycling and groundwater management programs."

Management Actions
MWD has taken numerous actions to reduce TDS concentrations in its water supplies. In 1999, MWD's Board adopted a Salinity Action Plan and a Salinity Management Policy with the goal of delivering water with salinity levels less than 500mg/L. A three year joint effort between the US Bureau of Reclamation and a task force of stakeholders led to the development of the Action Plan. A Salinity Summit attended by representatives from over 60 agencies was held as the Action Plan neared completion to discuss regional salinity issues and how to work together to attain salinity management goals. Components of the action plan include:

- Imported water source control and salinity reductions
- Distribution system salinity management actions
- Collaborative actions with other agencies
- Local salinity management actions to protect groundwater and recycled water supplies.

Under the Action Plan, MWD is reliant upon blending of its source water to meet salinity goals. It is anticipated that the TDS goal will be met in 7 out of 10 years. Hydrologic conditions would result in MWD not achieving this goal in the other three years. Agencies receiving water from MWD, such as RCWD, are cognizant of this and have taken this concern into development of their management strategies.

MWD has obtained Proposition 13 funding to improve salinity levels for The Water Quality Exchange Partnership and The Desalination Research and Innovation Partnership (DRIP) programs. MWD received $20 million to develop a water exchange partnership to access high quality water from the Sierras in exchange for SWP water. Funds are being used to develop the program and construct additional infrastructure. A total of $4 million was received for the DRIP program to develop cost-effective advanced water treatment technologies for removing salts from the CRA, brackish groundwater, wastewater, and agricultural drainage.

Under the CALFED Bay-Delta Program actions are already reducing TDS loading in SWP water and more actions are planned for the next 30 years. Actions in progress include improved management of salts in the San Joaquin Valley, upstream source control, desalination demonstration projects, and programs to control stormwater runoff into SWP aqueducts. In the long-term, additional projects are planned to reduce short-term variations in TDS levels and the long-term average salinity levels.

Without reductions in TDS levels in both the short-term variations and long term average, desalination of CRA water may be needed. However, at the present time current technologies are expensive and 5 to 10 percent of the CRA water would be lost during the treatment process. The DRIP program is designed to assist in obtaining a viable solution to reducing CRA TDS levels.

Perchlorate Management

Perchlorate has been detected at low levels in the CRA water supply, but not in the SWP water supply thus this discussion will focus on the CRA water supply. An exceedance level for perchlorate has not been adopted at this time by DHS. However, DHS has adopted a notification level of 6 µg/L, requiring agencies to inform their governing bodies. Notification of customers and the potential health risks is also recommended. DHS recommends non-utilization of sources with perchlorate levels greater than 60 µg/L. Perchlorate primarily interferes with the production of

hormones for normal growth and development in the thyroid gland. Further research on the health effects of Perchlorate is pending.

MWD began monitoring for perchlorate in June 1997 after it was detected in the Colorado River and the Lake Mead outlet at Hoover Dam. Sampling was able to isolate the source to the Las Vegas Wash and its potential source in Henderson, Nevada. A quarterly monitoring program for Lake Mead was initiated in August 1997 followed by monthly monitoring of the CRA. The Nevada Department of Environmental Protection manages a remediation project in Henderson area. Since inception the amount of perchlorate entering the Colorado River has been reduced from 900 pounds per day in 1997 to less than 150 pounds per day as of December 2004.

Management Actions
In 2002, MWD adopted a Perchlorate Action Plan. Plan objectives include:

- Expand monitoring and reporting programs
- Assess the impact of perchlorate on local groundwater supplies
- Track remediation efforts in the Las Vegas Wash
- Initiate modeling of perchlorate levels in the Colorado River
- Investigate the need for additional resource management strategies
- Pursue legislative and regulatory options
- Include information on perchlorate in outreach activities
- Provide periodic updates to the MWD Board and member agencies

Through its Perchlorate Action Plan, MWD has taken a proactive approach towards addressing a potential water quality issue and ensuring minimal or no water supply losses associated with perchlorate.

Total Organic Carbon and Bromide Management

Treatment of SWP water supplies containing high levels of total organic carbon (TOC) and bromide with disinfectants, such as chlorine, creates disinfection byproducts (DBPs) linked to specific cancer types. CRA water does not have high levels of TOCs and bromide. TOC and bromide in the Delta region of the SWP are of a significant concern to MWD as concentration levels increase as Delta water is impacted by agricultural drainage and seawater intrusion. In 1998, the USEPA adopted more stringent regulations for DBPs that took effect in 2002. Even more stringent regulations are expected to be proposed in 2005.

Management Actions

MWD's Board adopted a Statement of Needs for the CALFED Bay-Delta Program in 1999 stating that MWD requires a safe drinking water supply for compliance with existing and future regulatory requirements. CALFED's Program has developed numerous conceptual actions to improve Bay/Delta water, however MWD desires CALFED to adopt water quality improvement milestones. These milestones are necessary to assure that MWD and its member agencies will be able to comply with pending water quality regulations.

MWD's Board has committed to install ozone treatment processes at its two treatment plants that solely treat SWP water to avoid the production of DBPs through chlorination. In addition to the concern of DBPs, some studies have linked negative reproductive and developmental effects to chlorinated water. The other three treatment plants that receive a combination of SWP and CRA water utilize blending to reduce levels of DBPs below regulatory requirements. By 2009 MWD plans on installing ozonation facilities at the remainder of its treatment faculties removing the percentage of SWP water that requires blending.

Other Contaminants of Concern

MWD has identified various other contaminants of concern to MWDSC water supply sources.

MTBE

As previously discussed, the use of MTBE as a gasoline oxygenate has resulted in the contamination of surface waters and groundwater. MWD operates boating facilities at its reservoirs. Therefore, these facilities were previously subjected to the introduction of MTBE. MTBE is discharged into surface water from the exhaust of recreational watercraft. MTBE and other oxygenates are regularly monitored in MWD's water supplies. Past monitoring has detected MTBE concentrations varying from non-detect to 3.9 µg/L in treatment plant effluent and up to 6.4 µg/L in source water effluent.

MWD has taken numerous actions to reduce the contamination of its supplies with MTBE including supporting state and federal legislation to reduce the impacts of MTBE. At its Diamond Valley Lake and Lake Skinner, MTBE free-fuel and clean burning engines are required to minimize the introduction of MTBE into surface waters. Water monitoring programs for MTBE and other gasoline components were instituted at the lakes. MWD has also investigated various treatment mechanisms for MTBE. Future contamination of water supplies will more than likely decrease as time elapses since the phase-out of MTBE. However, the extent of future contamination is unknown as MTBE is still within the environment.

Arsenic

Effective 2006, a federal MCL of 10 µg/L (10 parts per billion) will go into effect for domestic water supplies. MWD's water supplies contain low levels of this contaminant within the regulatory requirements. Currently, the California Office of

Environmental Health Hazard Assessment has set a public health goal of 0.004 µg/L for arsenic.

Radon
The USEPA has proposed a radon MCL of 300 pCi/L for drinking water supplies in states where there are no approved Multimedia Mitigation programs for reducing indoor radon. For states with approved programs the standard is 4,000 pCi/L. MWDSC's supplies have radon levels well below the MCL.

Uranium
Uranium is high priority with MWDSC as a 10.5 million ton pile of uranium mine tailings is 600 hundred feet from the Colorado River in Moab, Utah. Percolation of rainwater through the pile occurs causing contamination of local groundwater resources and flows of uranium into the River. During a large flood or other natural disaster there is the potential for large volumes of the contaminated material to flow enter the River. Interim action measures instituted by the Department of Energy (DOE) include intercepting portions of the contaminated groundwater before it enters the River. Concentrations ranging from 950 to 1,190 pCi/L have been detected at the point local groundwater enters the River. At MWD's intake at the River uranium concentrations of 1 to 5 pCi/L have been detected. California has a drinking water standard for uranium of 20 pCi/L. MWD continues to monitor DOE in clean-up effort.

Emerging Contaminants
NDMA is an emerging contaminant of concern believed to be widespread. NDMA is a disinfection-product of water and wastewater treatment processes. Chlorine and monochloramines can react with organic nitrogen precursors to form NDMA. California notification level is 0.010 µg/L. Concentrations ranging from non-detect (reporting limit of 0.002 µg/L) to 0.012 µg/L. Action measures may be required in the future to control or remove NDMA from water supplies.

Hexavalent chromium or chromium VI is a potential surface water and groundwater contaminant. It is an inorganic chemical used in cooling towers for corrosion control, electroplating, leather tanning, wood treatment, and pigment manufacturing. Contaminant pathways include discharges from industrial users, leaching from hazardous waste sites, and erosion of naturally occurring deposits. California has a current MCL for total chromium (includes chromium VI) of 0.05 mg/L. This level is currently under review by DHS. The California Legislature required DHS to set a MCL specifically for chromium VI by January 1, 2004. However, this has not been set at this time. MWD participates in a Technical Work Group reviewing remediation plans for chromium VI near Topock, Arizona along the Colorado River.

7.3.2 Water Quality Protection Programs

MWD participates in multiple programs to improve water quality supplies, which include:

- Watershed Sanitary Survey
- Source Water Assessment
- Support of DWR policies and programs improving the quality of deliveries to MWD
- Support of the Sacramento River Watershed Program
- Water quality exchange partnerships
- Implementation of additional security measures.

Through its management strategies and in coordination with member agencies, MWD is able provide member agencies supply options that allow local agencies to meet regulatory standards. Currently known and foreseeable water quality issues are already incorporated into existing management strategies and the reliability of MWD's supplies for the next 25 years. However, unforeseeable water quality issues could potentially alter MWD water and potentially impact MWD's supply reliability.

Section 8
Water Service Reliability

8.1 Introduction

The implementation of RCWD's IRP will allow the District to meet demands over the next 45 years in a sustainable and cost-effective manner. It will also reduce the dependency on treated imported water from MWD, and help hedge against droughts and other emergencies by maximizing local groundwater.

8.2 Weather Factors

During the IRP process a statistical model using population and rainfall as explanatory variables for the period 1935-2003 was developed. The model determined that rainfall has a significant effect on annual water demands in RCWD's service area. Temperature is more likely to have an impact on monthly seasonality of water demands. Figure 8-1 illustrates weather demand factors for 1935-2003.

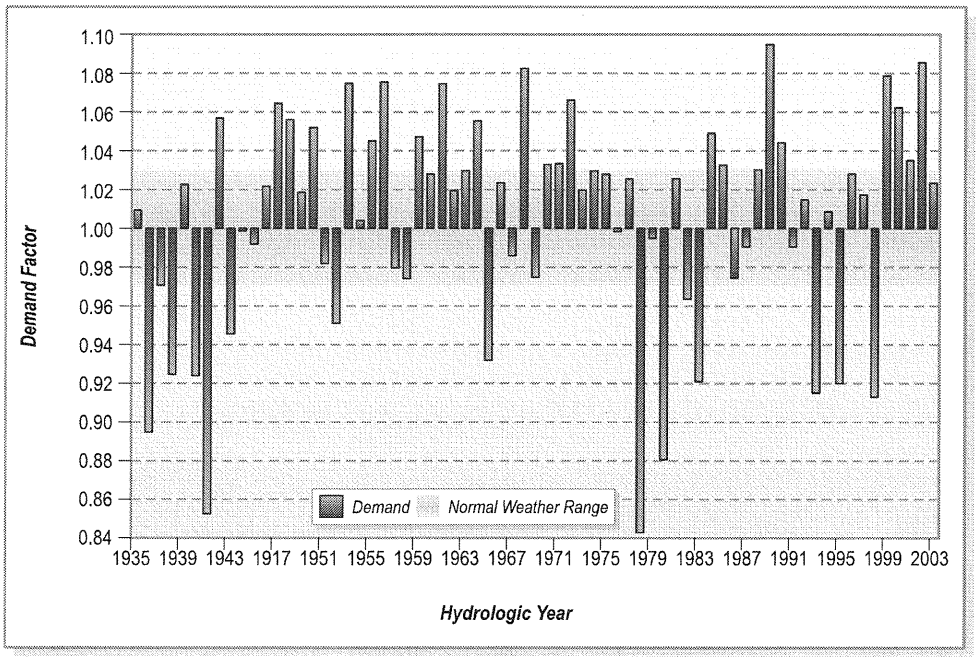

Figure 8-1
Weather Factors for RCWD Water Demands

Seasonal demands were also analyzed in the IRP using historical data from 1995-2004 Figure 8-2 shows the fluctuations on a monthly basis in demand based on agricultural and municipal and industrial water uses. The hotter drier summer months result in increased demands with reduced demands in the colder and wetter winter months.

2005 Update of the Urban Water Management Plan

Rancho California Water District

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December 2005

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Section 1
Introduction

1.1 Overview

The Rancho California Water District (RCWD) is a "Special District" organized and operated pursuant to the California Water Code. RCWD is governed by a seven-member Board of Directors (Board) that is elected by the voters of the region. The District serves the area known as Temecula/Rancho California, which includes the City of Temecula, portions of the City of Murrieta, and unincorporated areas of Riverside County.

As an urban water supplier providing municipal and industrial water to more than 3,000 customers, RCWD is required to comply with The Urban Water Management Planning Act (Act). The Act became effective on January 1, 1984 and requires that urban water suppliers prepare and adopt an urban water management plan, in accordance with prescribed requirements

The Act was originally developed as a result of concerns for potential water supply shortages throughout the State. Therefore, it required information that focused primarily on water supply reliability and water use efficiency measures. Since its original passage in 1983, there have been several amendments added, the most recent adopted in 2004. Some of the recent amendments include: providing additional emphasis on drought contingency planning and recycled water, as well as incorporation of water quality issues and how they might affect water supply reliability.

With the passage of Senate Bills 610 and 221, in 2001, Urban Water Management Plans take on even more importance. SB 610 and 221 require that counties and cities consider the availability of adequate water supplies for certain new large developments. These statutes require written verification of sufficient water supply to serve the new development, and Urban Water Management Plans are identified as key source documents for this verification.

The RCWD 2005 UWMP updates the 2000 UWMP and takes into account new Act requirements and changes in demographics, water demand and supplies.

Compliance with the Act helps RCWD to fulfill its mission: "to deliver reliable, high quality water, sewer, and reclamation services to its customers and communities in a prudent and sustainable manner."

1.1.1 History

RCWD's history started when the developers of the Temecula/Rancho California formed the original "Rancho District" in 1965, which served 41,000 acres of the easterly portion of the community. In 1968, the Santa Rosa Ranches Water District was organized to serve the westerly 44,800 acres of the community. To gain access to

imported water to meet growing water demands and supplement local groundwater, the Rancho District was annexed in 1966 to the Eastern Municipal Water District (EMWD); while the Santa Rosa Ranches Water District was annexed into the Western Municipal Water District of Riverside County (WMWD) in 1968. Both EMWD and WMWD are member agencies of the Metropolitan Water District of Southern California (MWD). MWD operates the Colorado River Aqueduct and is a State Water Contractor, allowing imported water from Northern California to be delivered to Southern California.

In 1977, the Rancho and Santa Rosa water districts were consolidated under the name Rancho California Water District, in accordance with LAFCO resolutions. RCWD has the authority to operate, maintain, and furnish facilities for all water systems within the District's service area, and for the collection and treatment of wastewater for the Santa Rosa Division. EMWD remains responsible for wastewater treatment in the Rancho Division.

The District is about 85 miles southeast of Los Angeles and 65 miles north of San Diego. RCWD provides water for urban and agricultural uses to the City of Temecula, portions of the City of Murrieta, and unincorporated Riverside County lands in the surrounding area. The District's current service area is bounded on the southwest by the Santa Ana Mountains and on the northeast by Gavilan Hills. Figure 1-1 shows the RCWD service area.

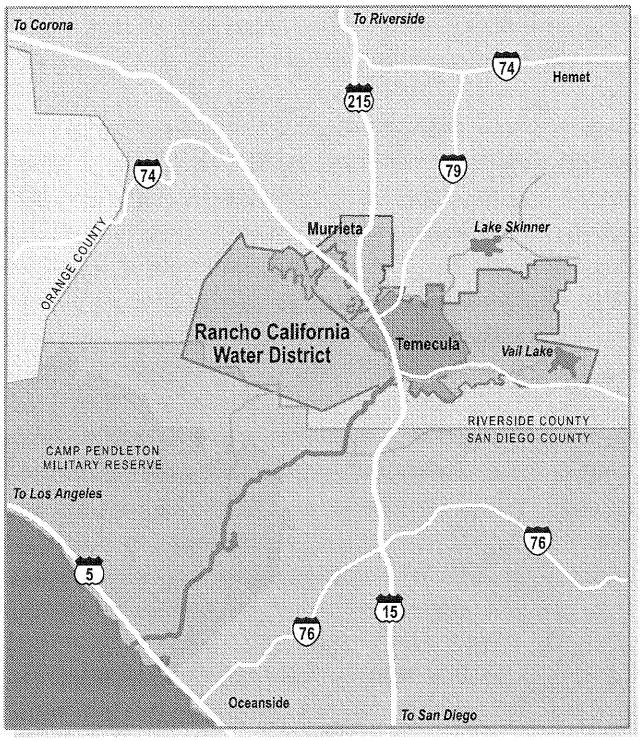

Figure 1-1
RCWD Service Area

The elevation of the valley floor range from 900 to 1,200 feet above sea level, however, the District pumps to a maximum elevation of 2,850 feet for some pressure zones in its service area.

1.1.2 Service Area Description

Land Use

RCWD comprises approximately 99,000 acres in the southwestern portion of Riverside County. Figure 1-2 shows the breakdown in land uses within RCWD.

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RCWD comprises approximately 99,000 acres in the southwestern portion of Riverside County. Figure 1-2 shows the breakdown in land uses within RCWD.

Because of their proximity to major cities in Southern California and lower relative living prices, the cities of Temecula and Murietta are becoming more desirable places to live. Both cities are experiencing rapid population growth and have a need for reliable water supplies. RCWD includes about 18,000 acres of agriculture and ranch lands, primarily vineyards, avocado, and citrus trees. The Temecula Valley is becoming a premiere wine grape growing area in California, which coupled with other high-value crops, requires a consistent irrigation supply. Major agricultural acreage is concentrated in the southwestern and eastern portions of the district.

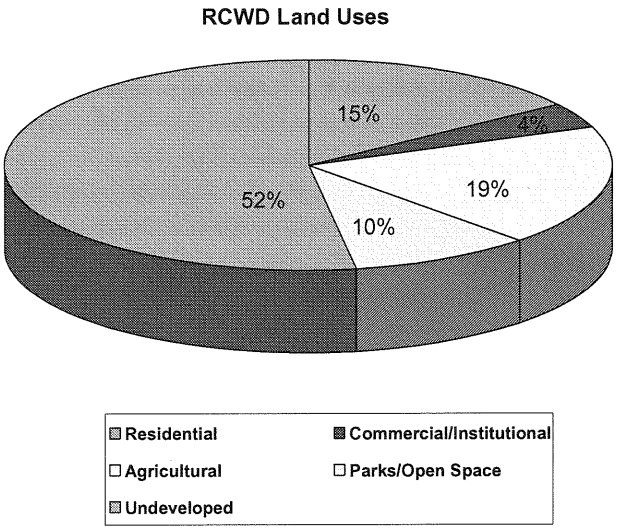

Figure 1-2
Land Use in RCWD's Service Area

Demographics

Current demographics were obtained for the RCWD service area from the Metropolitan Water District (MWD), using land-use and census tract level data from the Southern California Association of Governments (SCAG). Table 1-1 presents these demographics in five year intervals beginning in 2005 and ending in 2030.

Table 1-1
Demographic Projections for RCWD Service Area

	2005	2010	2015	2020	2025	2030
Population	109,123	121,324	134,184	145,631	155,772	165,151
Occupied Housing						
Single-Family	27,518	31,717	35,409	39,384	43,101	46,152
Multi-Family	6,336	7,084	8,223	8,951	9,652	10,923
Total Housing	33,856	38,802	43,633	48,336	52,754	57,075
Total Employment	33,838	43,848	52,947	62,273	71,656	81,277

Source: MWD, based on SCAG census tract data from SCAG RTP.

Within the RCWD service area population is expected to continue to grow over the next 25 years at an average rate of approximately 2,240 persons, representing a 2.6 percent annual growth rate per year for a total growth rate of approximately 66 percent over the projection period. Over the projection period this will lead to approximately 56,000 new residents.

Housing, as a whole, is projected to increase at a slightly slower pace of 2.4 percent annually for a total growth rate of approximately 59 percent over the projection period. Single-family and multi-family housing are projected to grow at similar rates over the projection period. Approximately 23,200 additional housing units are expected to be added over the projection period.

Total employment within RCWD's service area is expected to lag population and housing unit growth with an annual increase of approximately 1.7 percent and a total population increase of approximately 42 percent over the projection period. Total employment is expected to increase by approximately 47,000 by 2030. Employment growth that lags behind population growth indicates that many residents will commute out of the service area to their places of employment.

Climate

The climate within the RCWD service area is Mediterranean with hot, dry summers and cool, wet winters. Summer daytime temperatures are in the mid-80 to high-90 degrees range. The area's temperature is influenced by prevailing onshore winds from the Pacific Ocean and the rain shadow effect from the Santa Rosa Mountains. The "Santa Ana winds" can cause periods of extremely hot weather with dry winds. Winter daytime temperatures are mild, averaging in the mid-60 degree range. The region's average monthly maximum temperature is 80.63 degrees. This is based on weather data readings from October 1948 through December 2004 at the Elsinore weather station, the closest weather station to the service area. Table 1-2 presents average climate data for the RCWD service area.

Table 1-2
Climate Data for RCWD Service Area

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Annual
Standard Average E to (feet per year)[1]	2.30	2.34	4.14	5.01	6.47	6.98	7.92	7.58	5.79	4.20	2.64	2.26	4.80
Average Rainfall (inches)[2]	2.33	2.31	1.78	0.65	0.17	0.02	0.07	0.10	0.24	0.40	1.03	1.63	10.74
Average Max Temperature (F) [2]	65.4	67.9	71.0	76.5	82.0	90.6	98.2	98.3	93.4	83.8	73.6	66.8	80.6

[1]Source: http://www.cimis.water.ca.gov/cimis/frontMonthlyReport.doc. Station #137 - Temecula East II 11/97 through 7/05
[2] October 1948 through December 2004 for Station ID 2805, Elsinore

The standard annual average evapotranspiration rate (ETo) for the region is 4.80 feet per year with the highest rates occurring during the summer months. ETo measures

the loss of water to the atmosphere by evaporation from soil and plant surfaces and transpiration from plants. ETo serves as an indicator of how much water plants need for healthy growth.

Total annual precipitation at the Elsinore weather station averages 10.74 inches per year. During very wet years, rainfall can exceed 25 inches, while during very dry years rainfall can be less than 4 inches. Rainfall is more prevalent during the months of November through April.

1.2 Regional Integrated Resources Plan

To help achieve its mission, RCWD recently developed a Regional Integrated Resources Plan (CDM 2005). The purpose of the Regional Integrated Resources Plan (or IRP) was to develop a long-range water supply plan to reliably meet the needs of the District from now until 2050. The IRP examined different alternatives such as increased water conservation, additional groundwater, conversion of agriculture currently using treated imported water to raw imported water and/or advanced-treated recycled water, groundwater recharge using advanced-treated recycled water, and water transfers.

These alternatives were evaluated against a set of objectives such as:

- Reliably meet water demands
- Provide sustainable supply
- Maximize local control
- Manage costs
- Manage water quality
- Maintain quality of life
- Maximize implementation potential

Over a dozen alternatives were evaluated. The preferred plan, called Hybrid 1, involves the following components:

1. Implement baseline water conservation measures
2. Connect imported water connection EM-21 to Vail Lake to expand groundwater recharge
3. Convert eastern area agriculture, currently using treated imported water, to raw water, delivered from Vail Lake

4. Construct up to 18 new groundwater wells, along with increased imported water for recharge during non-drought years

5. Construct a MF/RO treatment facility to reduced the salinity of recycled water so that it can be used to meet western area agricultural demands, as well as potential groundwater replenishment in the future

The benefits of this preferred IRP alternative are:

- Increased groundwater production of about 18,000 acre-feet per year
- Increased use of recycled water of about 13,600 acre-feet per year
- Reduction in peaking on MWD by about 144 cubic feet per second (cfs)
- Cost efficiency by: (1) converting eastern area agricultural users from treated imported water to untreated, (2) reducing the peaking charge paid to MWD, and (3) by maximizing MWD's discounted replenishment water rate for groundwater recharge

1.3 Agency Coordination

To develop the IRP and 2005 UWMP, RCWD worked with its wholesale water agencies, EMWD, WMWD and MWD. Table 1-3 shows this coordination.

Table 1-3
Agency Coordination in Preparation of 2005 UWMP

	Participated in Plan Development	Commented on the Draft Plan	Attended Public Meetings	Was Contacted for Assistance	Was sent a Copy of the Draft plan
Eastern MWD	Yes*	No	Yes*	Yes	Yes
Western MWD	Yes*	No	Yes*	Yes	Yes
MWD	Yes*	No	Yes*	Yes	No

* Participated in agency stakeholder meeting for RCWD's Regional Integrated Resources Plan (2005).

Section 2
Water Supply Sources

2.1 Current Water Supply Sources

RCWD's current water supply sources include local groundwater, imported water from MWD, and recycled water. Historically, groundwater has supplied between 25 to 40 percent of total water supply and imported water has supplied between 60 to 70 percent. Recycled water has provided less than 5 percent of the total water supply. Table 2-1 summarizes RCWD's water supplies for 2005.

Table 2-1
Current Water Supplies (AF/Y)

Water Supply Sources	2005
Imported Water (MWD)	
Treated	33,000
Untreated [1]	18,000
Local Groundwater Pumping	38,000
Recycled Water	6,700
Total	**95,700**

Source: RCWD Regional Integrated Resources Plan (CDM, 2005)
[1] Used for groundwater recharge and for flows to Gorge.

RCWD pumps groundwater from 54 district wells and recycles water at its Santa Rosa Water Reclamation Facility (SRWRF). Additional recycled water is available from EMWD's Temecula Valley Regional Water Reclamation Facility (TVRWRF).

RCWD owns and operates 37 storage reservoirs and one surface reservoir, Vail Lake. The storage capacity of Vail Lake is 50,000 acre-feet and it is used to help recharge groundwater, using natural runoff.

RCWD receives its imported water (treated and untreated) directly through six MWD water turnouts, three in EMWD's service area and three in WMWD's service area.

RCWD's transmission system includes about 900 miles of water pipelines to convey water from its source to water customers.

2.1.1 Groundwater

RCWD overlies the Temecula and Pauba groundwater basins, and numerous studies have been conducted regarding these basins. However, it was not until 1980 that studies and reporting were officially documented on a regular basis. Since 1980 RCWD has annually prepared a Groundwater Audit and a Recommended Groundwater Production Report (RGPR).

Surface water and groundwater supporting surface water have been under some form of court jurisdiction since 1928. Rights to utilize the groundwater and the water stored in Vail Lake are defined in the 1940 Stipulated Judgment in the case of Santa Margarita versus Vail and Appropriations Permit 7032 issued by the State Water Resources Control Board. A Watermaster has been assigned by the court to oversee all uses within the Santa Margarita Watershed. Specific water rights have not been adjudicated. However, the Stipulated Judgment assigns two-thirds of all natural waters to the United States of America (Camp Pendleton) and the remaining one-third to RCWD. Thus, inflow to Vail Lake is not stored, but rather is passed through to Temecula Creek from May through October as required by State permits.

RCWD relies on eight groundwater basins for its local water supply. The amount of groundwater produced annually from these basins varies depending on rainfall, recharge, and the amount and location of pumping.

Groundwater basin inflows occur through a variety of processes:

- Areal recharge - deep percolation of direct precipitation on the ground surface that eventually recharges the aquifers within the basins
- Return flow - portion of water applied to the ground surface that reaches the groundwater as a result of deep percolation; sources of return flow include agricultural, domestic, and commercial irrigation
- Stream percolation - the stream loses water to the aquifer because of a higher hydraulic head in the stream than in the aquifer
- Underflow - flow from one basin to another
- Artificial recharge – spreading imported water at the Valle del los Caballos (VDC) spreading basins

A real recharge, return flow, stream percolation and underflow are classified as "natural inflow". According to the District's groundwater model, the average natural inflow for all eight basins is 41,000 acre-feet/year (AFY) when no artificial recharge is occurring. Figure 2-1 presents the annual estimated natural inflow for all eight basins from 1935 to 1998. As shown, there are seven years in which the natural inflow exceeds 70,000 AFY. Most of the years of record, however, show natural inflow at approximately 30,000 AFY.

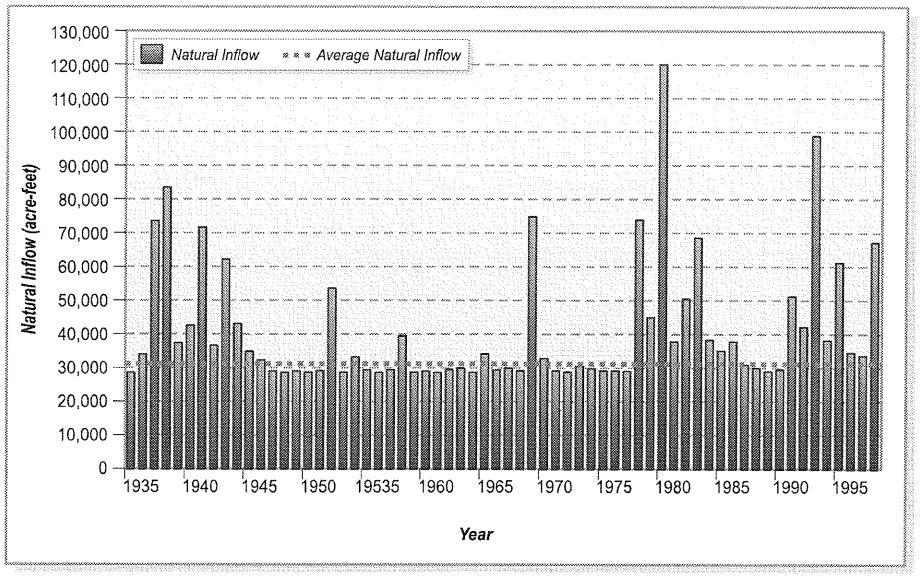

Figure 2-1
Natural Inflow for Eight Ground Water Basins Used by RCWD

Natural basin outflows also occur in several ways:

- Evapotranspiration - direct evaporation from surface water and bare soil as well as the transpiration of water by plants such that the water is not available for groundwater recharge
- Gaining streams – the stream gains water because the hydraulic head in the stream is lower than the head in the aquifer
- Underflow - flow from one basin to another

The average natural basin outflow for all eight groundwater basins from 1935 to 1998 was 6,600 AFY.

The natural yield of the eight basins equals the natural inflows less the natural losses, which would be 34,400 AFY (41,000 AFY less 6,660 AFY). However, besides RCWD, others pump from the eight basins, including: Eastern Municipal Water District (EMWD), Murrieta County Water District (MCWD), Pechanga and other private pumpers. Accounting for these users, the total natural yield available to RCWD is approximately 29,500 AFY.

RCWD currently has 52 production wells in the eight basins with a total instantaneous capacity of 46,400 gallons per minute (or 104 cfs), not including four existing recovery wells in the VDC area (VDC recovery wells). Table 2-2 summarizes the number of production wells per pressure zone and basin.

Table 2-2
Summary of Existing Production Wells

Pressure Zone	Basin	No. of Production Wells
1305	Pauba Valley	16
	Lower Mesa	3
	North Murrieta	3
	San Gertrudis	4
	South Murrieta	2
	Wolf Valley	3
1380	Pauba Valley	5
	Lower Mesa	3
1610	Upper Mesa	5
	Lower Mesa	1
1790	Palomar	1
1500	North Murrieta	2

Groundwater Recharge with Imported Water

In addition to the extraction of the natural yield of the basins, RCWD artificially recharges the Pauba Valley Basin with untreated imported water for enhanced groundwater production. RCWD purchases imported water from the MWD and delivers it from the San Diego aqueduct turnout EM-19 to the VDC recharge basins. In the past, the VDC recharge basins have provided up to 16,000 AFY of artificial groundwater recharge.

Groundwater Recharge from Vail Lake

RCWD stores local runoff in Vail Lake, which was created in 1948 through construction of Vail Dam on Temecula Creek. RCWD has a surface water storage permit in Vail Lake for up to 40,000 AF from November 1 to April 30. During these months, RCWD releases available water from Vail Lake to the Valle de los Caballos (VDC) spreading basins, about 1.5 miles downstream, for groundwater recharge. From May through October, existing State permits prohibit storage and require inflow to pass through Vail Lake to Temecula Creek.

The amount of local runoff reaching the lake can vary widely depending on hydrological conditions. From 1962 to 2000, flows into Vail Lake ranged from 218 AFY to 29,570 AFY, with an average flow of 5,150 AFY.

The storage capacity of the lake is approximately 40,000 AF, with a surface area of 1,000 acres. Currently, RCWD only uses Vail Lake to store local runoff. The historical available storage of the lake has varied widely as well, including two periods when the reservoir was full in March 1984 and February 1997. Figure 2-2 illustrates available storage capacity from 1962 to 2002. The average available storage is approximately 30,900 AF.

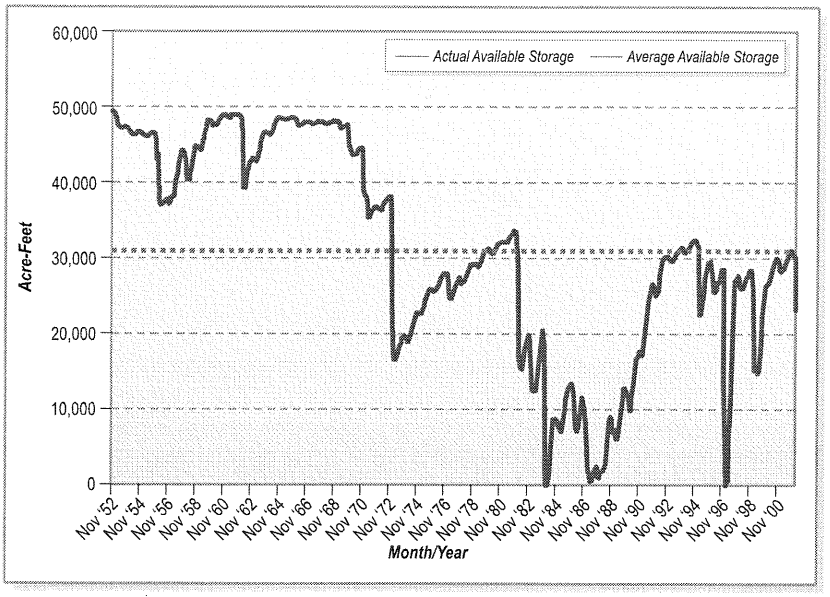

Figure 2-2
Historical Available Storage in Vail Lake

Historical Pumping from Groundwater Basins

Figure 2-3 illustrates historical total groundwater recharge and total pumping in the last 10 years. Table 2-3 shows the amount of groundwater pumped by each sub-basin in 2005. RCWD has increased pumping over the past 10 years to meet increased demands. Groundwater recharge from Vail Lake after 1999 has been unavailable due to local drought conditions, and RCWD has increased recharge by purchasing additional imported water.

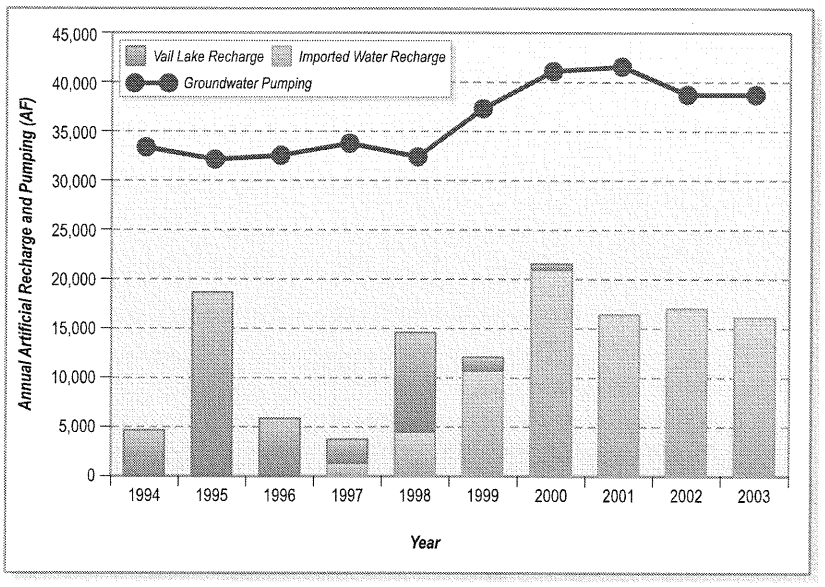

Figure 2-3
Historical Annual Artificial Recharge and Pumping

2.1.2 Imported Water

RCWD is a member agency to both EMWD and WMWD, which are member agencies to MWD. MWD is the regional water wholesaler for Southern California. Imported water, treated and untreated, is received through six MWD turnouts (three in each of EMWD's and WMWD's service areas). However, EMWD and WMWD do not convey the water through their facilities to RCWD, rather RCWD receives the water directly at these turnouts. As shown in Table 2-1, RCWD currently obtains approximately 33,000 AFY of treated water and 18,000 AFY of untreated water from MWD. Untreated, or raw imported water purchases did not begin until 1998. Figure 2-4 shows historical MWD water purchases from 1990 to 2003. During this period imported water purchases have increased from approximately 25,000 AFY to almost 51,000 AFY, including imported water used for groundwater recharge.

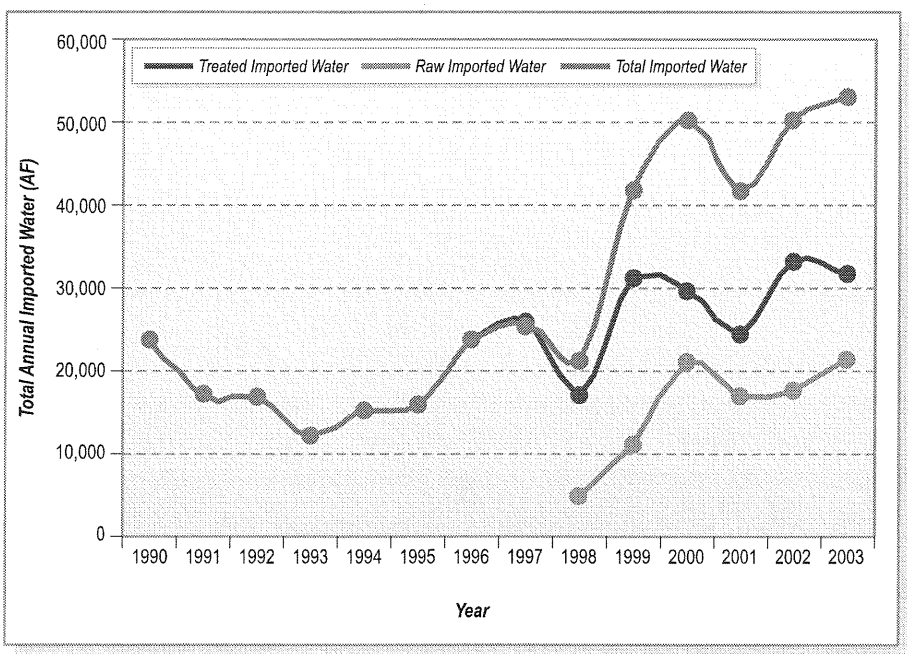

Figure 2-4
Historical Imported Water Purchased by RCWD

MWD owns and operates the Colorado River Aqueduct (CRA) along with major reservoirs such as Diamond Valley Lake and Lake Skinner, 5 regional water treatment plants, and large transmission pipelines to move imported water to its 26 public member agencies. MWD is also the largest State Water Contractor, with a contract of 2.0 million acre-feet for State Water Project (SWP) supply. Over the last few years CRA supply, historically providing over 1.2 million AFY to the region, has been severely cut. This was due to the development of the California Plan for Colorado River, which forces California to live within its 4.4 million AF entitlement of Colorado River.

The SWP is subject to extreme variability in hydrology due to a lack of storage. The SWP has also been affected by the Endangered Species Act (ESA), which has limited the amount of water coming from Bay-Delta. Although MWD has a contract for 2.0 million AFY, it rarely has received that amount (only in the very wettest of years). Average deliveries have been closer to 1.2 million AFY. In severe droughts, SWP supplies to MWD have been less than 0.5 million AFY.

MWD augments its imported water from the CRA and SWP with stored water in water banks such as Semitropic and Arvin-Edison, conjunctive use storage in local groundwater basins, and voluntary water transfers during certain dry years. In addition, MWD's recently completed Diamond Valley Lake can store 800,000 AF of imported water, which is used to meet demands during dry years and emergencies.

2.1.3 Recycled Water

Recycled water is produced to from two facilities, the Santa Rosa Water Reclamation Facility (SRWRF) operated by RCWD, and the Temecula Valley Regional Water Reclamation Facility (TVRWRF) operated by EMWD. Both plants treat wastewater to Title 22 standards. Currently, RCWD is maximizing recycled water from these two plants to meet landscape irrigation demands. Additional recycled water from TVRWRF could be used if advanced treatment beyond Title 22 standards was applied. As a result, not all of the recycled water from TVWRF is beneficially used and must be discharged to Temescal Creek. Currently, recycled water use is 6,700 AFY as summarized in Table 2-1. The recycled water system is discussed in further detail in Section 6.

2.2 Planned Water Supply Sources (the "IRP")

RCWD recently completed its Regional Integrated Resources Plan, or IRP, in order to develop a long-term water supply that can meet demands from now until 2050 (CDM, 2005). The IRP was developed in conjunction with RCWD's senior staff and Board of Directors by applying a multi-objective approach, integrating both demand and supply-side options.

The approach first develops and weights key objectives, which along with associated performance measures, will be used to evaluate alternatives to meet future demands (see Figure 2-5). The objectives and performance measures developed for the IRP are summarized in Figure 2-6.

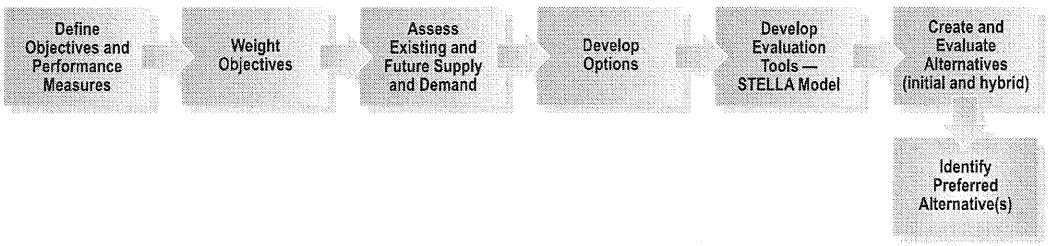

Figure 2-5
RCWD's IRP Process

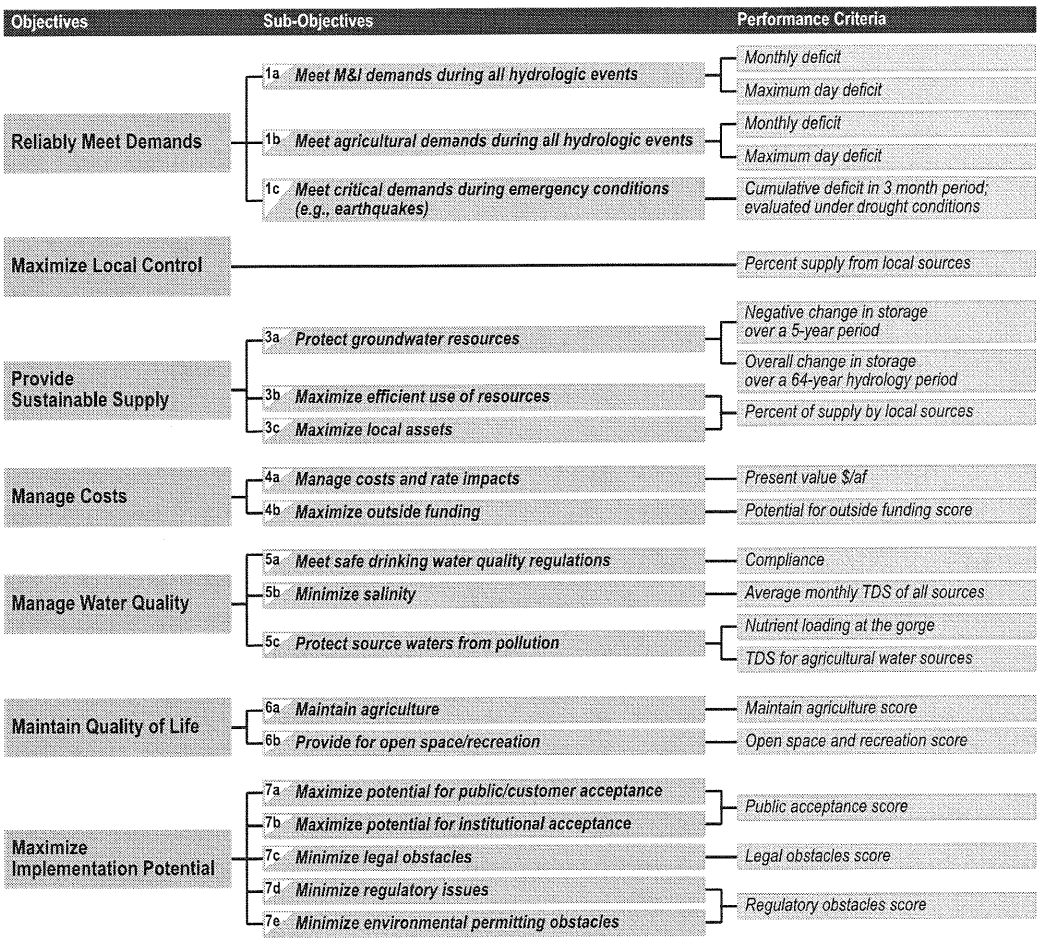

Figure 2-6
IRP Objectives, Sub-Objectives and Performance Measures

Over a dozen alternatives were evaluated using a systems model called STELLA. The model was able to simulate demands and supplies (existing and potential) under different climate and hydrologic scenarios, as well as identify distribution constraints. The model was also able to simulate water quality, storage conditions in the groundwater basins and Vail Lake, and estimate the total cost (capital and O&M) for any potential supply or demand-side management option(s).

The output from the model was used along with the objectives in Figure 2-7 to develop a comprehensive score card for each alternative. RCWD senior staff and Board weighed the objectives in terms of relative importance in order to rank the IRP alternatives (see Figures 2-7 and 2-8 for this ranking).

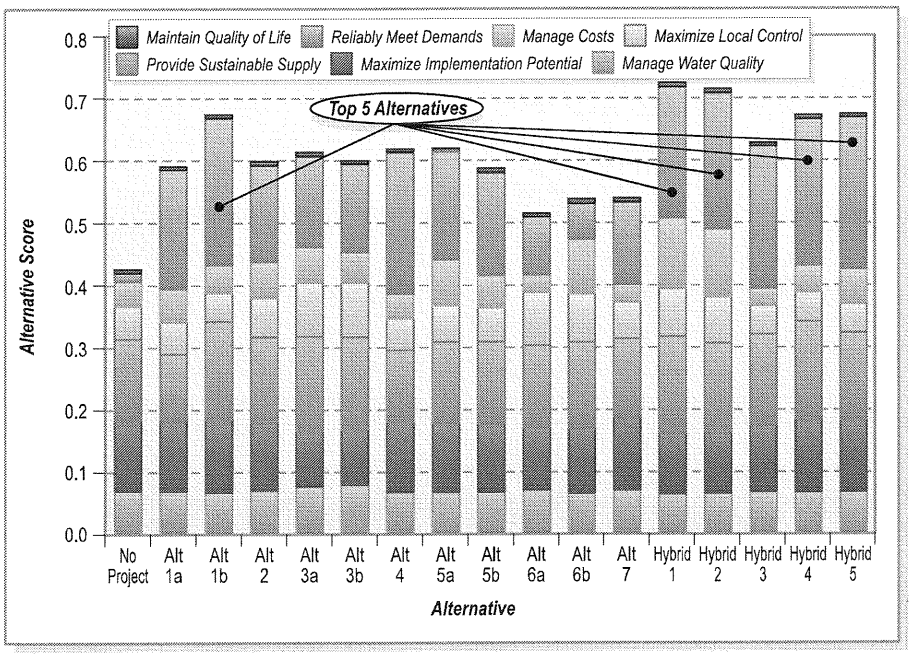

Figure 2-7
Alternatives Ranking for the Average of RCWD Senior Staff

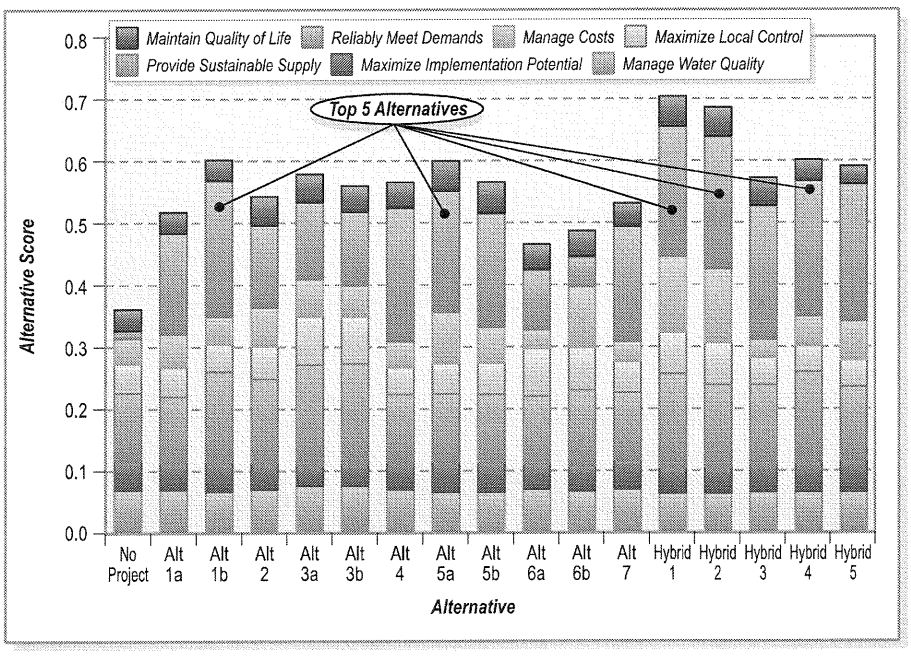

Figure 2-8
Alternatives Ranking for the Average of RCWD Board Members

The preferred plan, called Hybrid 1, involves the following components:

1. Implement baseline water conservation measures
2. Connect imported water connection EM-21 to Vail Lake to expand groundwater recharge
3. Convert eastern area agriculture, currently using treated imported water, to raw water, delivered from Vail Lake
4. Construct up to 18 new groundwater wells, along with increased imported water for recharge during non-drought years
5. Construct a MF/RO treatment facility to reduced the salinity of recycled water so that it can be used to meet western area agricultural demands, as well as potential groundwater replenishment in the future

The benefits of this preferred IRP alternative are:

- Increased groundwater production of about 18,000 acre-feet per year
- Increased use of recycled water of about 13,600 acre-feet per year
- Reduction in peaking on MWD by about 144 cubic feet per second (cfs)
- Cost efficiency by: (1) converting eastern area agricultural users from treated imported water to untreated, (2) reducing the peaking charge paid to MWD, and (3) by maximizing MWD's discounted replenishment water rate for groundwater recharge

Although the conversion of eastern area agricultural demands from treated to raw imported water is beneficial in terms of meeting peak day demands and reducing costs to RCWD, it does not produce "new" wet water supply. However, the construction of 18 new groundwater wells and a MF/RO treatment facility does produce additional water supply.

Because demands and supplies vary from year to year due to weather and hydrologic conditions, it is also important to plan for this variation. Because of the semi-arid climate of RCWD's service area, water demands can be as much as 9 percent greater than normal during dry years and 15 percent lower during wet years (see Figure 2-9).

Groundwater pumping can also vary due to hydrologic conditions. Based on RCWD's groundwater model, groundwater production from new wells averages 18,000 AFY. But in dry and critically dry years, groundwater production can be as low as 15,000 AFY.

Table 2-3 summarizes the hydrologic years used to assess supply reliability for the 2005 UWMP. The hydrologic years were selected based on local weather and hydrology.

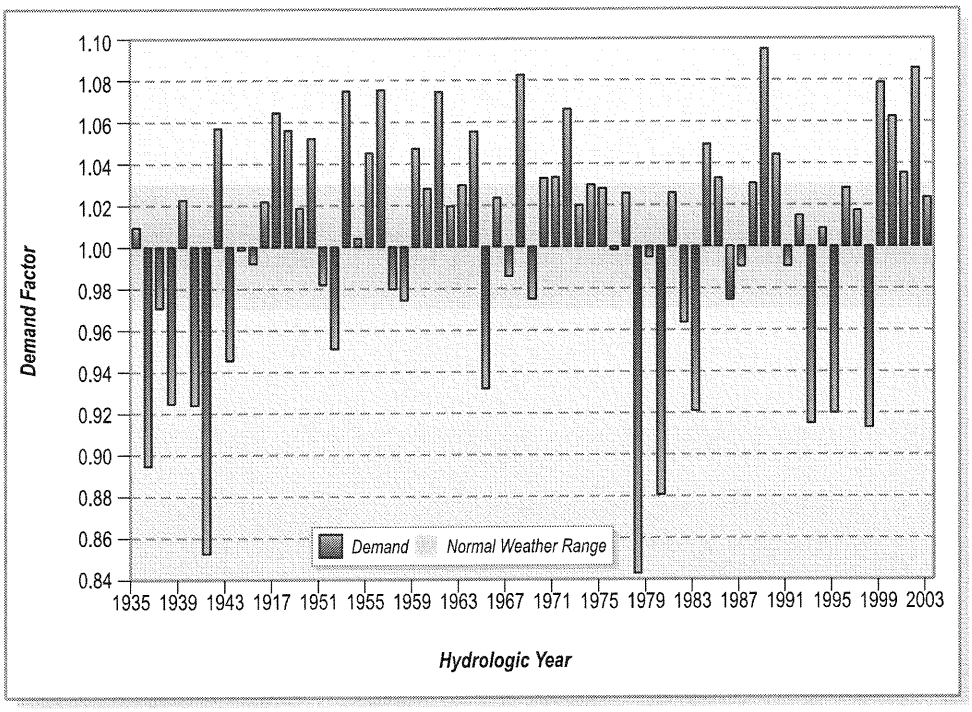

Figure 2-9
Weather Factors for RCWD Water Demands

Table 2-3
Basis of Water Year Data

Water Year Type	Base Year(s)	Historical Sequence
Normal Water Year	Average*	1935-1998
Single-Dry Water Year	1989	1935-1998
Multiple-Dry Water Years	1987-1991	1935-1999

* Average of historical sequence.

Based on RCWD's IRP, Table 2-4 summarizes the timing of new water supplies, as well as the reliability of these supplies under different water year types. As shown on the table, only the new groundwater supply is subject to hydrologic variation. The new recycled water as a result of the MF/RO facility is essentially drought proof.

Table 2-4
Future Water Supply Projects (AF/Y)

Project Name	Project Start	Average Year	Single Dry Year	Multiple- Dry Years				
				Year 1	Year 2	Year 3	Year 4	Year 5
18 New Groundwater Wells	2020	18,000	16,700	16,700	15,900	15,500	15,500	14,000
MF/RO Facility for Recycled Water	2025	13,600	13,600	13,600	13,600	13,600	13,600	13,600

Note: Supply reported are for years in which project starts

Table 2-5 summarizes the planned water supply for RCWD through 2030, under normal weather conditions. The planned supply includes existing as well as the future projects shown in Table 2-4.

As the new conversion of eastern agricultural demands from treated to raw imported water, new groundwater wells, and MF/RO facility for recycled water are brought online, the amount of treated imported water from MWD decreases from almost 40,000 AFY in 2010 to 20,700 AFY in 2030.

Table 2-5
Planned Water Supplies (AF/Y)

Water Supply Sources	2010	2015	2020	2025	2030
Imported Water (MWD)					
Treated	39,310	32,410	20,010	14,100	20,700
Untreated [1]	15,500	28,500	38,500	38,500	38,500
Local Groundwater Pumping	38,000	38,000	56,000	56,000	56,000
Recycled Water	7,890	9,090	9,890	24,300	25,200
Total	**100,700**	**108,000**	**124,400**	**132,900**	**140,400**

Source: RCWD Regional Integrated Resources Plan (CDM, 2005)
[1] Used for groundwater recharge, flows to Gorge, and eastern service area agriculture (after conversion of system).

2.2.1 Future Groundwater Supplies

With implementation of the Hybrid 1 Alternative identified in RCWD's IRP, groundwater supplies are expected to increase from their current level of 38,000 AFY to 56,000 AFY by 2020. Increased pumping and groundwater recharge is necessary to compensate for higher demands as growth in the area increase. Up to 18 new groundwater wells will be constructed. The Pauba Valley sub-basin will experience the gain in groundwater pumping; as this is the sub-basin that receives recharge from imported water (see Table 2-6).

Table 2-6
Groundwater Pumping in RCWD Service Area (AF/Y) [1]

Sub-Basin Name	2005	2010	2015	2020	2025	2030
Pauba	22,216	27,766	27,766	45,766	45,766	45,766
South Murrieta	1,881	260	260	260	260	260
Lower Mesa	5,966	3,646	3,646	3,646	3,646	3,646
North Murrieta	1,289	404	404	404	404	404
Wolf Valley	2,536	1,566	1,566	1,566	1,566	1,566
San Gertrudis	4,480	4,056	4,056	4,056	4,056	4,056
Upper Mesa	13	76	76	76	76	76
Palomar	567	226	226	226	226	226
Total	**38,948**	**38,000**	**38,000**	**56,000**	**56,000**	**56,000**
% of Total Water Supply [2]	51%	38%	35%	45%	42%	40%

Source: RCWD Regional Integrated Resources Plan (CDM, 2005)
[1] 2005 data is actual, 2010 to 2030 is projected based on normal hydrologic conditions.
[2] Net total supply, which does not include imported water for groundwater replenishment.

2.2.2 Future Imported Water

To support the increase in groundwater pumping, a new untreated (raw) water connection is being built by MWD, called EM-21. Once constructed it will increase the ability for RCWD to recharge the groundwater basin and maximize a vital local resource.

Between 2025 and 2030, MWD may also increase treated imported water capacity for use by RCWD and others by constructing a new imported water line from its Skinner Treatment Plant or a new treatment plant that is being explored.

2.2.3 Future Recycled Water

Currently, recycled water from RCWD's SRWRF is being used 100 percent to meet landscape irrigation demands. However, another 16,000 AFY of recycled water from EMWD's TVRWRF could be used if the salinity of the product water was under 500 parts per million. This salinity target is needed if recycled water is to be used for crop sensitive agriculture and/or groundwater recharge. Therefore, as part of the IRP, RCWD will construct a MF/RO facility to treat recycled water so it can be used to meet western area agricultural demands currently using treated imported water. Because of the waste or brine produce produced by the advanced treatment, 15 percent of the water is lost. Therefore, the new recycled water supply is 13,600 AFY. A more detailed discussion of recycled water is presented in Section 6.

2.2.4 Future Water Transfers

During the IRP process, RCWD investigated obtaining water transfers to bolster supplies. Water transfers are the voluntary exchange of water between a willing

buyer and a willing seller. The IRP examined wet water transfers and dry water transfers, the difference being that wet water transfers occur in years of above normal rainfall and dry water transfers occur in years of below normal rainfall. The IRP recommendations allow for the possibility of such transfers to be executed should RCWD and its customers deem them cost-effective.

2.2.5 Desalination

Desalination (seawater or brackish) was not examined as an option in the IRP. Desalination of ocean water is not viable for RCWD given its distance from the Pacific Ocean. Desalination of brackish groundwater is not necessary, given the water quality of the sub-basins used by RCWD.

Section 3
Water Demands

3.1 Overview

Because of affordable housing, relative to Los Angeles and Orange Counties, and a Mediterranean climate, the Cities of Murietta and Temecula (and surrounding communities) are desirable places to live. As such, population within RCWD's service area has grown significantly. Even agriculture, which is mainly orchards, citrus, avocados, and vineyards has grown, unlike in many other areas in Southern California.

This urban and agricultural growth has lead to increases in water demands. And because of the semi-arid climate, summer peaking in demands is fast becoming an issue.

3.2 Historical Water Demands

Combined agricultural and urban water demands have steadily increased in the RCWD service area between 1978 and 2003 as illustrated in Figure 3-1.

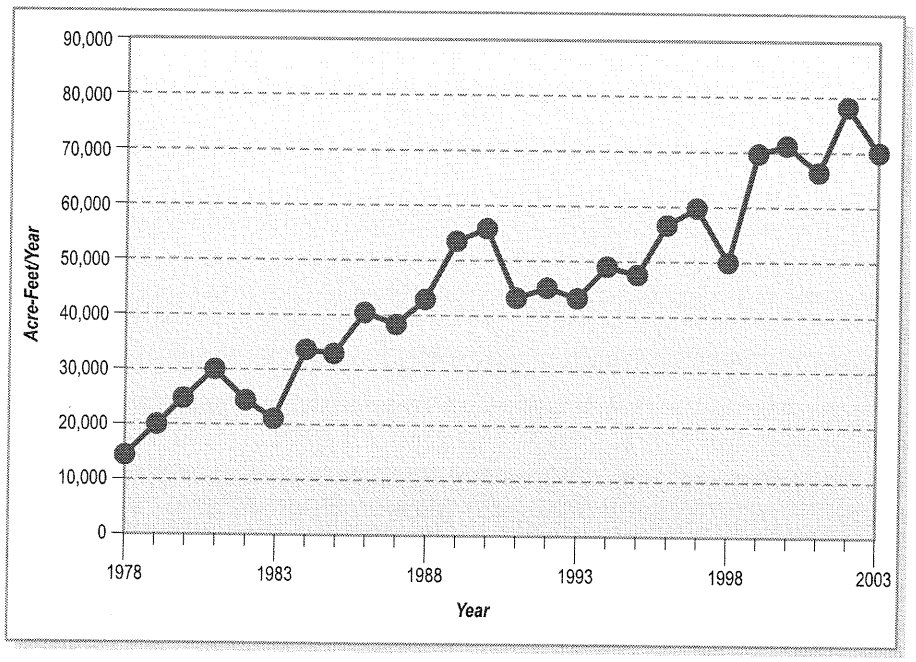

Figure 3-1
RCWD Historical Water Demands

Table 3-1 shows the distribution of actual billing accounts by customer class. "AG & A/D" refers to agricultural and agricultural/domestic areas. "Domestic" is inclusive of very low density, low density, medium density, and medium high density single-family residential. "Multiple Dwelling" is multi-family residences, such as apartments and condos. The "Other" category includes freeway, and construction meters. Most water users classified in the "Other" category have either little or no reported water use.

Table 3-1
RCWD Customer Accounts

Customer Class	2000	2005
AG & AG/D	1,310	1,699
Domestic	23,320	33,378
Multiple Dwelling	160	178
Commercial	827	1,280
Landscape	674	1,059
Schools, Etc	51	65
Golf	6	6
Reclaimed	54	130
Others[1]	143	1,391
Total	**26,545**	**39,186**

[1] Mostly construction and other temporary accounts.

3.3 Future Water Demands

Projecting water demands allows RCWD to determine future water supply investments needed to match expected demands. Water demand projections are used to schedule these investments to ensure they are online when needed thus minimizing cost impacts of idle facilities. Future water demands included here were developed as a part of the IRP to aid in the selection of a preferred alternative for meeting future water demands.

3.3.1 Forecast Methodology

Projected water demands to 2050 were estimated using RCWD's 2000 billing data and water demand projections at ultimate build-out from the 2005 RCWD Water Facilities Master Plan. In the IRP demands were forecasted to 2050, but only forecast demands to 2030 are included in the 2005 UWMP.

The 2000 billing data was used to determine the starting point in the demand projection, while the ultimate build-out demands in the Master Plan represent the end-point. The 2000 billing data contains different classifications than the Master Plan classifications. Billing data is based on customer classes while Master Plan classification are based on land use categories. Thus, the first step was to match the two classification systems. Matching the two systems resulted in the IRP Sectors in Table 3-2. IRP Sectors are the sectors used in the demand forecast.

Table 3-2
Matching of Billing Data Classifications and Land Use Categories

2000 Billing Data Classifications	IRP Sectors	Master Plan Classifications
AGRICULTURAL AG/DOMESTIC	Agricultural and Agricultural Domestic	Ag/Vineyard Planning Area Estate 20 Estate 10 Estate 5 Estate 2
DOMESTIC	Single-Family	Very Low Density Low Density Medium Density Medium High Density High Density
MULTIPLE DWELLING	Multi-Family	Multi-Family
COMMERCIAL SCHOOLS MISC GOV OTHER	Commercial/Institutional	Commercial Business Park / Industrial
GOLF LANDSCAPE RECLAIMED WATER	Landscape/Golf	Open Space – Recreational

Source: RCWD Regional Integrated Resources Plan (CDM, 2005)

Estimating Year of Build-Out

The term "build-out" indicates a city is no longer growing, and the associated water demand would be at the maximum or ultimate demand. The build-out forecast obtained from the 2005 RCWD Water Facilities Master Plan did not specify the estimated year for build-out. It did, however, provide an estimated number of dwelling units for each land-use category. The IRP analysis estimated a year for build-out by comparing the number of build-out dwelling units in the Master Plan with the demographic projections developed by the SCAG Regional Transportation Plan discussed in Section 1.1.2. The SCAG demographic data contains single-family and multi-family data that correlate with the domestic and multiple dwelling categories under the Master Plan classifications.

SCAG projects demographics out until year 2030. Because the SCAG housing units were lower than those reported at build-out in the Master Plan, it was deemed that build-out was beyond 2030. To determine the year of build-out, a linear extrapolation of the SCAG housing projections was done. The SCAG demographic data for population and housing largely follow a linear pattern as shown in Figure 3-2. Although the rates of growth are not perfectly linear, there is not enough variation in the growth rate to warrant a non-linear growth pattern for demand projections.

Comparing the estimated number of dwelling units from the Master Plan build-out forecast and the extrapolated SCAG demographic data indicated that overall build-out would occur around 2050.

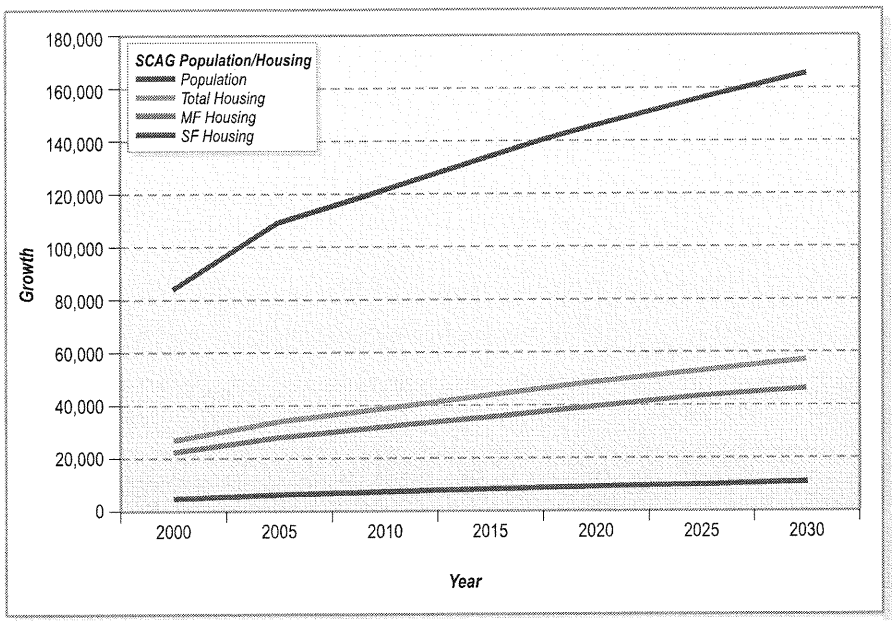

Figure 3-2
Demographic Projections for RCWD Service Area

3.3.2 Consumptive Water Demand Forecast

Projected water demands in the IRP were estimated in 5-year intervals up to 2050 based on water billing data and the 2005 RCWD Master Plan build-out demand projections. For purposes of the UWMP, estimated demand projections are provided to 2030.

Results of the water demand forecast for normal weather conditions are summarized by sectors in Table 3-3. Total annual average water demands are projected to increase from the current 76,100 AFY to 112,700 AFY in 2030, a 36,600 AF increase. The largest growth is expected to occur in the Single-Family Domestic Sector from 25,500 AFY in 2005 to 44,300 in 2030.

Table 3-3
Annual Average Consumptive Water Demands in RCWD Service Area

Year	2000	2005	2010	2015	2020	2025	2030
Agriculture/Ag Domestic Demands	33,900	35,900	38,000	40,000	41,00	44,000	46,000
Single-Family Domestic	21,700	25,500	29,300	33,000	36,800	40,600	44,300
Multi-Family Domestic	1,400	1,900	2,300	2,800	3,200	3,700	4,200
Commercial/Institutional	3,500	4,100	4,800	5,400	6,100	6,700	7,400
Landscape/Golf Course	8,300	8,700	9,100	9,500	9,900	10,300	10,800
Total	**68,800**	**76,100**	**83,500**	**90,700**	**97,00**	**105,300**	**112,700**

2000 represents actual demand, 2005-2030 projected based on average weather conditions

3.3.3 Sales to Other Agencies

RCWD does not engage in water sales to other agencies, including wholesale water, exchanges, and non-recurring agreements, at this time nor are any projected in the forecast period ending in 2030.

3.3.4 Additional Water Uses

Additional water uses include imported water purchased for groundwater recharge, water required to meet the Gorge discharge requirements due to the water rights settlement, and unaccounted for water. Given RCWD's system is relatively new and modern, unaccounted for water is very small, averaging around 2 percent. Table 3-4 summarizes this additional water use.

Table 3-4
Additional Water Uses and Losses (AF/Y) [1]

Water Use	2005	2010	2015	2020	2025	2030
Groundwater Recharge with Imported Water	13,000	13,000	13,000	23,000	23,000	23,000
Gorge Discharge (per water rights agreement)	2,500	2,500	2,500	2,500	2,500	2,500
Unaccounted Water	1,500	1,700	1,800	1,900	2,100	2,200
Total	**17,000**	**17,200**	**17,300**	**27,400**	**27,600**	**27,700**

[1] Based on average runoff and weather conditions.

3.3.5 Total Water Uses

Total water use is the summation of the consumptive water demands presented in Table 3-3 and the additional water uses in Table 3-4. Table 3-5 summarizes the total future water uses under normal weather conditions.

Table 3-5
Total Water Use (AF/Y) [1]

Water Use	2005	2010	2015	2020	2025	2030
Consumptive Demand	76,100	83,500	90,700	97,000	105,300	112,700
Sales to Other Agencies	0	0	0	0	0	0
Additional Water Uses and Losses	17,000	17,200	17,300	27,400	27,600	27,700
Total Projected Water Use	**93,100**	**100,700**	**108,000**	**124,400**	**132,900**	**140,400**

[1] Based on average runoff and weather conditions.

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Section 4
Conservation

4.1 Introduction

Increasing urban water conservation is a means towards providing additional water supply by reducing demands. Effective water conservation practices are necessary to be able to provide adequate supplies to meet growing demands in the RCWD service area. Demographic projections indicate that agriculture land use will continue to decline in the future as RCWD's service area continues to become more urbanized. Through its membership in the California Urban Water Conservation Council (CUWCC), initiatives of EMWD and WMWD, and its own initiatives RCWD is committed to increasing water conservation.

RCWD is a recent signatory to the Memorandum of Understanding Regarding Urban Water Conservation in California (MOU) developed by the members of the CUWCC. As a signatory to the MOU, RCWD is obligated to implement a set of 14 water conservation Best Management Practices (BMPs) also commonly referred to as Demand Management Measures. The MOU established the CUWCC in 1991 to monitor implementation of the BMPs and to maintain the list of BMPs. Biennially member agencies are required to submit a report to CUWCC detailing progress towards implementing the 14 BMPs. Participation and compliance with the BMPs is monitored by CUWCC which offers guidelines on the implementation and assessment of the BMPs.

4.2 Urban BMP Implementation

The MOU commits RCWD and other signatories to develop comprehensive conservation programs utilizing feasible economic criteria and to consider water conservation as a viable water management option through the implementation of Urban BMPs. BMPs are defined in the MOU as:

(a) An established and generally accepted practice among water suppliers that results in more efficient use or conservation of water.

(b) A practice for which sufficient data are available from existing water conservation projects to indicate that significant conservation or conservation-related benefits can be achieved; that the practice is technically and economically reasonable and not environmentally or socially unacceptable; and that the practice is not otherwise unreasonable for most water suppliers to carry out.

RCWD is obligated to implement all of the BMPs, except BMP 10. BMP 10 pertains to wholesale agencies only. Table 4-1 provides a listing of each BMP and summarizes RCWD's status in implementing the BMPs. As a recent signatory to the MOU, RCWD has only submitted the reports once, thus prior years are not included in the plan.

Table 4-1
CUWCC BMPs For Urban Conservation In California

BMP #	PRACTICES	STATUS
1	Water surveys programs for single-family residential and multi-family residential customers	Implemented
2	Residential plumbing retrofit	Implemented
3	System water audits, leak detection and repair	Implemented
4	Metering with commodity rates for all new connections, and retrofit of existing connections	Implemented
5	Large landscape conservation programs and incentives	Implemented
6	High efficiency washing machine rebate program	Implemented
7	Public information programs	Implemented
8	School education programs	Implemented
9	Commercial/Industrial/Institutional water conservation	Outdoor Only
10	Wholesale agency assistance program	Not applicable
11	Conservation pricing	Implemented
12	Water conservation coordinator	Implemented
13	Water waste prohibition	Implemented
14	Residential ULFT replacement program	Implemented

BMP 1: Water Survey Programs for Single-Family and Multi-Family Residential Customers

RCWD is currently surveying outdoor water use of single-family accounts that use two hundred percent more water than the district-wide average. During these surveys RCWD checks the irrigation system and makes necessary adjustments such as changing the irrigation timers, there is no cost to the customer. The CUWCC suggests an estimated savings of ten percent when quantifying savings for outdoor surveys under this BMP.

RCWD began this program in July 2004 and has an annual budget of $100,000 for five hundred surveys. The savings for this BMP were calculated by taking the average gallons per day per account water use and multiplying it by two hundred percent. This results in an estimated value that represents per account per day water use among the households target by the program. This value was then multiplied by the percent of total water use that is used outdoors. After assessing annual water use patterns, outdoor water use was estimated to be fifty-one percent of total water use. CUWCC estimates a ten percent reduction in outdoor use will result from the surveys. The average outdoor water use of the targeted accounts (848.47 gpd per account) was multiplied by ten percent. The resulting 85 gpd per account was multiplied by 500 (number of surveys per year) to calculate total annual savings in gallons. The resulting 15.48 MG (or 47.52 AF) was further processed into a lifetime savings and a cost per lifetime savings. Savings resulting from this program were

estimated to have a life of three years. Under this assumption the lifetime savings are estimated to be 142.56 AF at a cost of $701.45 per AF.

RCWD currently offers multifamily outdoor surveys on a voluntary basis. However, up to this point they have received no requests. In 2007, RCWD will begin indoor multifamily surveys; they plan to conduct 50 surveys per year. The surveys will include leak detection and flow rate tests for faucets and showerheads. Leaks will be resolved and faucet aerators and low flow showerheads will be provided when necessary. Toilets will also be checked for flush volume and leaky flappers. When appropriate the customer will be directed to the ULFT program. These surveys will augment RCWD's plumbing retrofit program and the ULFT program.

CUWCC's methodology for calculating savings resulting from indoor water surveys assumes savings for showerhead retrofits, ULFT retrofits, and leak repairs. It is not reasonable to assume each survey will result in all or any of these changes. Further this methodology introduces potential double counting of toilet and showerhead retrofits because these fixtures are offered as part of separate BMPs (BMP 2 and 14).

Table 4-2
CUWCC BMP 1 Savings Assumptions

	Pre-1980 Construction	Post-1980 Construction
Low-Flow Showerhead Retrofit	7.2 gcd	2.9 gcd
Toilet Retrofit (five year life)	1.3 gcd	0.0 gcd
Leak Repair	0.5 gcd	0.5 gcd
Landscape Survey (outdoor use reduction)	10%	10%

Source: CUWCC
http://www.cuwcc.org/m_bmp1.lasso

Grossly assuming 0.5 gcd savings per survey, and 2.84 persons per multifamily household[1], 50 multifamily surveys will save 25,915 gallons per year. RCWD estimates the MF surveys will cost $75 per survey, therefore conducting 50 surveys in one year will cost $3,750.

BMP 2: Residential Plumbing Retrofit

RCWD is fulfilling BMP 2 through the dissemination of a residential plumbing retrofit kit free of charge to eligible RCWD customers. Eligible customers pick up the retrofit kits in the RCWD reception area. The kit includes low-flow shower heads, garden hose shut-off nozzles, faucet aerators, and toilet leak detection tablets. The kit is available to customers living in homes that were built prior to 1994. The low-flow

[1] Census SF3 Data for City of Temecula.

shower heads are limited to two per household, and the aerators and the shut-off valves are limited to one per household.

RCWD began this program in September 2004 and through March 2005 distributed 327 low-flow shower heads, 442 faucet aerators, and 240 garden hose shut-off nozzles. The faucet aerators and the shut-off nozzles are considered to have nominal savings for this analysis. Savings were calculated for the shower heads based on a gallon per capita per day assumption recommended by the CUWCC. They recommend a gallon per capita per day savings of 7.2 gpcd for pre-1980 homes and 2.9 gpcd for post-1980 construction. The percent of homes in the RCWD service area that were built prior to 1980 is estimated using 2000 Census SF3 data for Temecula California. Census data lists housing units built by decade up to 1980 and then in smaller increments through 2000. Based on this data, fourteen percent of the homes in the RCWD service area are estimated to be built prior to 1980. Thus it was assumed that 42 of the low-flow showerheads (fourteen percent) distributed by RCWD went to homes built prior to 1980 and the remaining 258 (eighty-six percent) went to post-1980 construction homes. The 42 showerheads assumed to be retrofit in pre-1980 housing were multiplied by 7.2 gallons per capita per day, and the 258 showerheads that were assumed to be retrofit in post-1980 homes were multiplied by 2.9 gallons per capita per day. The products of these multiplications were then added, multiplied by the average number of persons per household (as obtained from the U.S. Census Bureau's 2000 SF3 data for Temecula California), and then divided by the total number of showerhead retrofits. This resulted in an average savings in gallons per day per account for each low-flow shower head distributed. This value was then multiplied by the total number of shower heads distributed by RCWD and 365 days to estimate annual savings.

As noted above, RCWD began this program in September 2004 and the data are for seven months. To make savings and costs reflect an annual time period a monthly participation rate was estimated and multiplied by twelve. The estimated participation for a year is 514 low-flow showerhead retrofits, resulting in an annual water savings of 6.35 AF. The lifetime of a showerhead is estimated to be ten years making the lifetime savings of this program 63.51 AF and the cost per lifetime savings $134.93 per AF.

The CUWCC methodology described above was used in estimating savings from low-flow showerheads for RCWD. However, it is important to note that this methodology is nearly outdated. If indeed showerheads have a ten year life then it is likely that all pre-1980 homes have been retrofitted. Further, it could be argued that homes constructed pre 1994 also have retrofitted showerheads, or will in the very near future. The efficacy of this program may need to be reevaluated.

Currently there is not a local enforceable ordinance in effect in the RCWD service area requiring the replacement of high-flow showerheads and other water using fixtures with low flow counterparts. However, California State law since 1992 prohibits the sale or installation of non conserving showerheads. RCWD is a recent signatory to the MOU and has not completed the required customer surveys regarding low-flow

showerhead installation. These surveys are to demonstrate that 75 percent of the single-family and multifamily households built prior to 1992 in the RCWD service area have been retrofitted with low flow showerheads.

BMP 3: System Water Audits, Leak Detection, and Repair

RCWD conducts water audits of its distribution system on a monthly basis to determine if leaks are occurring and/or repairs are necessary. Sales in each pressure zone, inclusive of construction, water, sewer flushing, and mainline flushing, are compared to delivery records and sales production. Monthly auditing results in the ability to implement corrective actions prior to excessive losses. Unaccounted water has historically ranged between 3 and 6 percent. In 2004 unaccounted water averaged 4.7 percent. RCWD strives to maintain average yearly system losses to less than 5 percent.

RCWD is proactive in reducing system water losses. Through its corrosion control program RCWD determines the corrosion potential of soils by measuring pipe to soil potential and if necessary installing cathodic protection equipment for both new and existing infrastructure. RCWD also verifies the integrity of valves within the system. A special truck is outfitted with equipment to check all valves within the system on a periodic basis. Valves that are not maintained can leak or malfunction. Inoperable valves are replaced or repaired.

BMP 4: Metering with Commodity Rates for all new Connections and Retrofit of Existing Connections

All of RCWD's customers are metered and charged a commodity rate for water service (see Appendix A for water rate schedules).

BMP 5: Large Landscape Conservation Programs and Incentives

RCWD provides a large landscape water audit program to its customers. In August 2005, RCWD began conducting commercial outdoor water use surveys. Under this program, RCWD performs a large landscape water audit and incorporates a demonstration garden and various educational seminars. RCWD is also taking advantage of MWDSC's WBIC (weather-based irrigation controllers) incentive program for large landscape customers. Under this program it is estimated the RCWD will perform up to 40 landscape audits and install up to 40 WBIC systems. As of October 2005, RCWD has completed 30 survey/installations.

MWDSC offers incentives to commercial/industrial/institutional (CII) accounts for the utilization of WBIC's MWDSC offers $500 per acre of CII land that is irrigated with a WBIC and $5.50 per station. A station is a valve on the WBIC unit.

These survey/installations cost $1,200 on average. The CUWCC methodology recommends estimating a 15 percent reduction in outdoor commercial water use. Water demand for CII in RCWD in 2000 was 3,482 AF. There are 877 commercial accounts giving an annual average of 3.97 AF water demand per account. It is estimated that 51 percent of water use is outdoor. Therefore, estimated annual

outdoor water use per account is 2.02 AF. RCWD has conducted 30 survey/installations in three months. If this trend continues they will be able to complete 120 in one year. In 2000 these 120 accounts had a total annual water demand of 243 AF. Reducing this by the CUWCC suggested 15 percent equals 36.45 AF of savings in one year. The life of a WBIC is estimated at 10-15 years, or an average of 12.5 years[2]. The lifetime savings of this program is 455.60 AF and the cost per lifetime savings is $316.07 per AF.

BMP 6: High-Efficiency Washing Machine Rebate Program

MWDSC offers rebates ranging from $85 to $150 for purchases of high efficiency clothes washers. As part of RCWD's conservation efforts they facilitate a pass-through of the MWD rebates to their customers. Customers receive the rebate via a credit on their water account. The only costs RCWD incur are administrative, at $10 per unit. This program began in 2003 and through March 2005 had 499 participants. Savings and costs were estimated based on rebates given in 2004.

Three hundred ninety-seven rebates were given in 2004 for purchases of high-efficiency clothes washers with varying efficiency ratings. Clothes washers are assigned a water factor to describe their efficiency. The water factor is the number of gallons required by the washing machine for each cubic foot of laundry. Thus, lower water factors indicate more water efficiency. The water factors for the washers rebated in 2004 range from 4.0 to 9.47.

RCWD keeps track of the water factors of each high-efficiency washing machine that receives a rebate through MWDSC's program. This is very important in calculating the savings of clothes washers based on the methodology put forth by the CUWCC. In this analysis, the CUWCC methodology was slightly modified. The CUWCC equation for estimating savings is:

$$GWS = 14\ \text{yr.} \times \sum_i N_i \times (13.3 - i) \times 1{,}170\ \frac{\text{gal.}}{\text{yr.}}$$

GWS is gross water savings, 14 yr. is the average life of a clothes washer, N is the number of machines replaced with the water factor i, 13.3 is the baseline water factor for machines sold in 1994 as supplied to DOE by the Association of Home Appliance Manufacturers (AHAM), and 1170 is the average unit change in water use per unit change in water factor (developed by the California Energy Commission).

This analysis used all of the factors in the CUWCC equation, however the summation was modified. The frequency (N) of rebates for each water factor was determined.

---

[2] Assumption taken from: Residential Weather-Based Irrigation Scheduling: Evidence from the Irvine "ET Controller" Study June 2001
"The useful life is expected to be between 10 and 15 years" (pg. 7).

Then the equation was applied to each water factor independently. In the example below 4.5 is the water factor and 10 is the frequency, or number of retrofits for the water factor 4.5:

[14year*(10*[13.3-4.5])*1170]

Results calculated for each water factor were summed to derive total water savings.

Program lifetime savings based on the rebates given in 2004 are estimated to be 145.99 AF, the program cost per lifetime savings $27.19 per AF.

BMP 7: Public Information Programs

RCWD along with EMWD, WMWD, and MWDSC have public information programs in place designed to educate the public and businesses on how to reduce water consumption and learn about water supply issues. As a member agency of both WMWD and EMWD, RCWD participates in both of their conservation programs and MWDSC's conservation programs. The public information program at RCWD is designed to reach as many residents as possible. RCWD budgets approximately $30,000 per year for its program.

Various mediums are used to convey information to residents and businesses within the service area by RCWD. Media outlets include news releases, community events, seminars, internet, and newsletters. RCWD creates feature public information articles for distribution to local newspapers and radio stations. During community events RCWD participates through its commitment, membership, and representation to local service organizations. Seminars for professional landscapers and homeowners are also sponsored by RCWD. Quarterly, RCWD publishes *Waternews*, for its customers. Articles are included on water conservation measures. RCWD's lobby has a plethora of hand outs, including handouts such as water conservation, water wise gardening, water use outdoors, and indoor water use, available for free in the reception area.

BMP 8: School Education Programs

Since 1984 RCWD has implemented a water education program to provide water and wastewater knowledge to teachers, students, and parents. Through its program, RCWD is able to educate students at an early age on the benefits of conserving water so that this knowledge flows into their homes and develops future water conserving habits.

Coordination between schools and RCWD's water education program occurs through RCWD's Public Information Specialist. The Public Information Specialist is tasked with managing the relationship between RCWD's various departments and other work groups with local school districts and external agencies. A key highlight of the program is to encourage and assist teachers in educating students about water. Through the program students develop an early appreciation for water.

RCWD's water education program involves all elementary and secondary schools within the service area encompassing18 public schools and 6 private schools. Training

is provided for teachers at all grade levels. Distributed materials meet the Science Framework for California Schools and the Murrieta and Temecula Valley Unified School District's Science Curriculum Guide. Materials are appropriate for respective grade levels. Teachers can choose to participate by ordering education materials from RCWD with all costs paid by RCWD.

Approximately 9,000 students are contacted per year through school assemblies, educational theater productions, field trips, and classroom presentations. On average RCWD provides over 20,000 brochures, booklets, stickers, and other water related items to students per year. RCWD also has sponsored such items as an essay contest, t-shirt design contest, and local science fairs.

Between 2001 and 2005 the approximate average yearly basis for impressions on students was:

Number of schools served: 24

Number of teachers served: 150

Number of students served: 5,000

Number of education materials distributed: 25,000 pieces

Number of classroom presentations: 40

BMP 9: Commercial/Industrial/Institutional Conservation Programs

Currently RCWD has implemented outdoor commercial, industrial, and institutional (CII) conservation programs in the form of surveys, but has not implemented indoor CII conservation programs. The outdoor program is discussed in detail for BMP 5.

RCWD could implement programs such as the Commercial and Industrial Rebate Program and CII indoor surveys. The CI rebate program offers rebates on seven water using devices. RCWD could implement this rebate program with a cost similar to their ULFT and high-efficiency clothes washer programs. Since MWDSC pays for the rebate, RCWD pays only a small administrative cost for significant savings. Table 4-3 below lists available rebate amounts and estimated savings.

Table 4-3
MWDSC CII Rebate Programs

Device:	MET Rebate Amount	Savings per Unit GP Year	Savings per Unit GPD
Cooling Tower Conductivity Controller	$500.00	800,000	2,191
Water-saving Toilet/Urinal	$60.00	14,600	40
High-efficiency Washing Machine	$100.00	150,000	411
Pre-rinse Kitchen Sprayer	$50.00	75,000	205
Dual Flush Toilets	$80.00	14,600	40
Water-pressurized Broom	$100.00	50,000	137
Film Processor Recirculating System	$2,000.00	1,000,000	2,740

Source: CUWCC
http://www.mwdh2o.com/mwdh2o/pages/conserv/program02.html

Another incentive program available is the CII weather-based irrigation controllers discussed in detail under BMP 5.

In 2009 RCWD will begin indoor commercial surveys. While this program is still in the planning stages it will likely follow standard survey methods and focus. Because this is a future program actual costs are unknown. Based on an assessment of agencies currently participating in this portion of BMP 9 and review of a paper by Santa Clara Valley Water District, a cost per survey was estimated to be about $3000. The other cost figures were found in the CUWCC BMP reporting data base for the following agencies: City of San Diego, City of Pasadena, East Bay Municipal Utility District, and San Juan Water District. The database was randomly searched and these four were found to have realistic data (i.e., some agencies reported doing surveys but did not report a cost, or reported extremely high costs). Costs for these agencies ranged from $950.00 to $6,500.00 per survey.

CUWCC recommends estimating a savings of 12 percent of the current gallons per employee per day for the CII surveys. A gallons per employee per day (GED) value was calculated for RCWD from CII water use for 2000 and the total number of employees in 2000. The employment data was furnished by SCAG. The resulting GED is 112.61 for RCWD. Potential savings are estimated as12 percent, or 13.51 GED.

CUWCC's guidelines indicate that 10 percent of CII accounts are to be surveyed in 10 years . There are 877 commercial accounts in RCWD and no industrial accounts.

Thus, it is assumed that RCWD will conduct 88 surveys in ten years or 9 surveys per year.

SCAG data reported 27,602 employees in 2000 for the RCWD service area. Given the 877 CII accounts, this is an average of 31.5 employees per account.

With these assumptions each account surveyed is estimated to save 426 gallons per day; this is derived by multiplying the 13.51 GED savings by 31.5 employees per account. Savings per year can be estimated by multiplying 426 gallons per day (savings per account) by 9 (the number of surveys conducted annually) and by 365 days. The resulting estimate of annual savings is 1.4 MG. Assuming a five year life of savings resulting from the indoor surveys , the lifetime savings is 21.45 AF and the cost per lifetime savings is $1,256.53 per AF.

BMP 11: Conservation Pricing

RCWD has implemented two tier blocks to encourage conservation for all customer classes effective as of July 2005. Water and wastewater rates are different depending upon the location of the service address. RCWD is divided into the Rancho and Santa Rosa Divisions for water service and is further divided into pressure zones. Wastewater service is provided by both RCWD and EMWD.

Water customers pay a base rate per hundred cubic feet (HCF), an energy rate based on pressure zone locations, and a monthly service charge based upon meter size. Agricultural and domestic rates are calculated at the domestic rate for water use up to 16 HCF. Water use in excess of 16 HCF is calculated at the lower Agricultural Rate. The Tier 2 conservation rate is an additional $0.18595 per hundred cubic feet. This additional rate applies to customers that exceed their water allocation as determined by customer class.

Recycled water customers are billed based on a monthly service charge and use per acre-foot. Acre-foot charges vary based upon whether the user requires tertiary treated water, agricultural treated water, or uses the water for construction activities.

Wastewater customers pay a flat fee based on location and the service provider, RCWD or EMWD. For RCWD the flat rate is based on equivalent dwelling units per customer, while EMWD is a flat rate regardless of equivalent dwelling units.

Appendix A contains a copy of the water and sewer rate structures.

BMP 12: Conservation Coordinator

RCWD employs one full-time water conservation coordinator. The coordinator is tasked with interacting with coordinators from other agencies, overseeing all aspects of water conservation, and developing new programs. Since 2000 RCWD has spent approximately $150,000 to satisfy this BMP.

BMP 13: Water Waste Prohibition

RCWD has actively enforced "No-Waste" water provisions included in its water conservation program for dealing with water supply shortages (see Appendix B). This program was adopted in January 1991 (Resolution 91-1-3), then later amended in February 1991 (Resolution 91-2-3) and again in May 1991 (Resolution 91-5-8). The program contains four stages of water supply conditions. Under each stage the condition of the supply is defined along with prohibited uses. RCWD does respond to customers who complain about wasteful use of water. On average, RCWD send out approximately 10 letters per year to customers who have been identified as using water in a wasteful manner.

RCWD does not have a water softener ordinance nor does it conduct water softener checks as part of its home surveys.

BMP 14: Residential ULFT Replacement Programs

Since 1997 RCWD has participated in MWDSC's Ultra Low Flush Toilet (ULFT) rebate program. MWDSC offers a rebate of $60 for a ULFT and RCWD passes this through to their customers as a credit in their water account. The only costs RCWD incurs are administrative, at $10 per unit. This program began in 1997 and through March 2005 has had 1,089 participants. RCWD has also distributed toilets in coordination with the Temecula Valley High School's Rotary Interact Club. Cooperative Technologies & Services International trained students to market and assist distribution of ULFT's for a $20 co-pay. Through this program the ULFTs provide long term water savings throughout their usable life, RCWD gains public exposure, students gain skills, and the high school earned money for academic and extracurricular activities. Through these programs starting in 1997 and through March 2005 RCWD has had 1,089 participants.

An annualized savings and cost estimate were based on an average from 1997 through 2004. On average annual participation in the ULFT program is 155. Total annual savings for an average year (based on participation from 1997 through 2004) is 6.25 AF based on CUWCC's methodology. Assuming a 25 year life for a toilet, the lifetime savings is 156.36 AF and the cost per lifetime savings is $9.98 per AF.

4.3 Agricultural Conservation Programs

In conjunction with other agencies, RCWD has funded numerous programs with the goal of increasing conservation of water used in agriculture. Agricultural water use represented 36 percent of RCWD's total water use during fiscal year 2003-2004. The potential for water savings from conservation in the agricultural sector are great and reductions in agricultural water use may have a considerable impact on RCWD's total demand. RCWD's current efforts to save water in the agricultural sector include:

- Irrigation system evaluations.
- The PRISM Winegrape Irrigation Scheduling and Regulated Deficit Program.

- The development of an agricultural discount program that has yet to be funded and implemented.

Irrigation System Evaluations

RCWD, in conjunction with San Jacinto Basin Conservation District, conducts agricultural irrigation system evaluations under its Irrigation System Evaluation Program. This program began in 2003 and to date 32 evaluations have been completed. The goal of the program is to conduct 45 evaluations by 2006. Of the 32 evaluations performed average farm acreage ranges from 5 to 55 acres with an average of 12 acres. Per farm savings resulting from the evaluations ranges from . 23 AFY to .47 AFY with an average of .40 AFY. The 32 evaluations covered 384 acres and save approximately 154 AFY. Savings from this program result primarily from improvements in application uniformity and scheduling accuracy. The irrigation evaluation program has cost RCWD about $15,000 since 2003. The program expires in 2006, but with its success will likely continue.

PRISM Scheduling and Regulated Deficit Program

The Precision Irrigation Scheduling Method (PRISM) uses a high frequency radio wave emitting soil probe that collects soil moisture information that can be downloaded to a computer. Once downloaded, PRISM software can be employed to determine irrigation needs. Originally the (PRISM) Wine Grape program was funded by growers at $15 per week per site for a 30 week season. Twelve vineyards participated in the program. Crop losses suffered by farmers due to Pierce Disease prompted the United States Bureau of Reclamation (USBR) to invest in the program in 2000.

The program provided weekly soil moisture monitoring with a portable Time Domain Reflectometry (TDR) device and irrigation scheduling designed to prevent water stress in an environment with Pierce Disease. In 2001, 20 additional vineyards were added to the program and the program added a new component for computing site-specific crop coefficients. The California Department of Conservation provided matching funds to aid the expansion of services. In 2002 the program added weekly shoot length measurements in order to monitor growth rates. In 2003 RCWD provided funding for a new component to the program, the Vine Moisture Stress Component.

For the years 2003-2005 RCWD provided a total of $43,000 in funding to this program. Vine moisture stress or more commonly known as Regulated Deficit Irrigation, utilizes techniques that apply less water than the vine requires thereby causing mild stress. This technique reportedly results in improved wine quality and conservation of water and energy. Yields may be reduced but the wine grower may find this an acceptable tradeoff for improved wine quality. Savings data for the PRISM Wine Grape Irrigation Scheduling and Regulated Deficit Program are provided in Table 4-4.

Table 4-4
PRISM and Regulated Deficit Savings

2002	0.077	1,242	95.63
2003	0.444	1,213	538.40
2004	0.208	1,224	254.51
Total			**888.54**

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Section 5
Water Shortage Contingency Plan

5.1 Overview

In order to ensure a reliable water supply in a water shortage situation, RCWD developed a water shortage contingency plan in accordance with the Urban Water Management Planning Act. A water shortage situation may be brought on by drought conditions caused by hot and dry weather, or a failure of the water delivery system due to seismic activity or other catastrophic event. A large portion of the water RCWD sells to its customers is imported from the MWD via EMWD and WMWD. Therefore, as part of RCWD's Water Shortage Contingency Plan it is important to present MWD's plan in the case of a water shortage. The next section discusses MWD's Water Surplus and Drought Management Plan and EMWD and WMWD's Water Shortage Contingency Plans. Section 5.5 discusses RCWD's compliance with Water Code Section 10632.

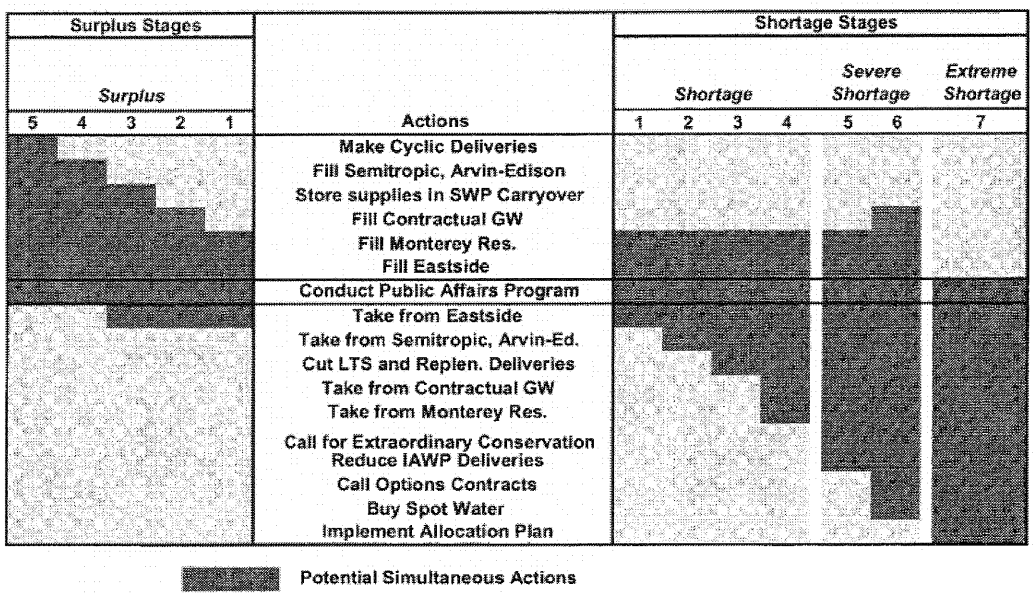
5.2 Metropolitan Water District of Southern California

RCWD receives MWD imported water deliveries from EMWD and WMWD. Both EMWD and WMWD are member agencies of MWD and therefore RCWD is subject to MWD policies during a water shortage. During fiscal year 2004 RCWD purchased 41,312 acre-feet of water from MWD, which represents 49.5 percent of total annual water production. Metropolitan Water District of Southern California's 1999 Water Surplus and Drought Management Plan (WSDM) provides a plan to provide 100 percent reliability of the agency's water service. Protocols are provided for times of water surplus and water shortage. MWD strategically manages water in times of surplus to ensure there is an adequate supply during a shortage. The WSDM plan defines surplus, shortage, severe shortage, and extreme shortage as follows:

> "**Surplus**: Supplies are sufficient to allow MWD to meet Full Service demands, make deliveries to all interruptible programs (replenishment, long-term seasonal storage, and agricultural deliveries), and deliver water to regional and local facilities for storage.
>
> **Shortage**: Supplies are sufficient to allow MWD to meet Full Service demands and make partial or full deliveries to interruptible programs, sometimes using stored water and voluntary water transfers.
>
> **Severe Shortage**: Supplies are insufficient and MWD is required to make withdrawals from storage, call on its water transfers, and possibly call for extraordinary drought conservation and reduce deliveries under the Interim Agriculture Water Program (IAWP).
>
> **Extreme Shortage**: Supplies are insufficient and MWD is required to allocate available imported supplies".

During shortages MWD will be able to meet municipal and industrial (M&I) demands with management of existing water supplies with no negative impact to the end user. Severe and extreme shortages will require MWDSC to implement the following shortage actions as stated in the WSDM:

- Draw on storage in the Diamond Valley Lake
- Draw on out-of-region storage in Semitropic and Arvin-Edison
- Reduce/suspend long-term seasonal and groundwater replenishment deliveries
- Draw on contractual groundwater storage programs in the region
- Draw on SWP terminal reservoir storage (per Monterey Agreement)
- Call for extraordinary drought conservation and public education
- Reduce IAWP (agricultural) deliveries
- Call on water transfer options contracts
- Purchase transfers on the spot market
- Allocation of MWD's firm imported supplies to its member agencies



Source: MWDSC WSDM Plan

Figure 5-1
MWD Stages and Action Matrix

Figure 5-1 illustrates MWD actions during times of surplus and shortage. If a severe shortage occurs IAWP deliveries will be reduced. In 2000, RCWD served approximately 1,300 Agriculture and Agriculture/Domestic accounts and delivered 33,857 AF of water to these customers; 49 percent of total deliveries. The action above calling for a reduction of IAWP will impact RCWD's agricultural customers in a severe shortage, as agricultural water deliveries are interruptible. The WSDM states:

> "**Reduce agricultural deliveries:** The IAWP offers interruptible water to southern California's agricultural industry at discounted rates. These supplies will be interrupted as part of MWD's shortage actions. MWD will work with IAWP participants to provide as much advance warning of interruption as possible. The IAWP reflects current policies toward agricultural water users. The policies underlying this program are due to be reviewed during the ten-year period of the WSDM Plan. The WSDM Plan will be changed accordingly".

According to MWD's IAWP Reduction Guidelines, MWD has the right to discontinue surplus water service in whole or in part with one year's written notice. After a purchaser is given a notice of discontinuation, MWD's CEO may reduce IAWP deliveries up to 30 percent prior to any urban water allocation action under the WSDM Plan.

The timing of potential IAWP reductions is important to note as Colorado River and State Water Project (SWP) supplies are determined annually. The initial supply allocation is estimated in December; however the SWP supply is uncertain and not final until May 1. Typically May 1 is when a notification would be made by MWDSC regarding a reduction in IAWP water deliveries, with actual reductions occurring 60 days later on July 1.

If MWD requires a utility to reduce IAWP water usage, water usage targets for the upcoming year are established based on water use during the previous year. Once this baseline water use target is established it will remain in place as long as the reduction is in effect, even if it goes beyond the fiscal year. Actual IAWP water consumption will be measured every six months. If an agency used less water than it was allotted it receives a credit that carries over into the next six month period. If the agency used more water than it was allotted via the established baseline then it is assigned a debit. If an agency uses more water than it is allotted they have to pay MWDSC's penalty rate for the amount of water over the established baseline.

5.3 Eastern Municipal Water District Water Shortage Contingency Plan

EMWD's Water Shortage Contingency Plan presents restrictions for residential, commercial, institutional, and industrial (CII), and agricultural sector customers during the four established water stages. Stage 1 is defined as having water deficiencies between 5 and 10 percent and restrictions are voluntary, Stage 2 is defined as water deficiencies from 10 to 25 percent, Stage 3 represents a deficiency of

25 to 50 percent, and in Stage 4 deficiencies are greater than 50 percent. During Stages 2-4 the restrictions set forth by EMWD are mandatory. During water shortages all of EMWD's customers are requested to adhere to restrictions. The Water Shortage Contingency Plan defines a customer as, "any person, company, agency, or organization using water supplied by EMWD." Therefore RCWD will be impacted by EMWD's water use restrictions in the event of a water shortage.

Restrictions pertaining for Stages 1-4 are below. The restrictions are voluntary for Stage 1 but are mandatory for Stages 2-4.

Residential water shortage contingency measures:

Stage 1:

1. "Do not hose down driveways or any other hard surfaces except for health or sanitary reasons.
2. Irrigate lawns and landscape only between midnight and 6:00 a.m. (unless hand watering). Adjust automatic timer clocks accordingly.
3. Adjust and operate all landscape irrigation systems in a manner that will maximize irrigation efficiency and avoid over watering or watering of hardscape and the resulting runoff.
4. Refrain from using decorative fountains unless they are equipped with a recycling system.
5. Where possible, install pool and spa covers to minimize water loss due to evaporation.
6. Do not allow hoses to run while washing vehicles. Use a bucket or a hose with an automatic shutoff valve".

Stage 2:

1. "No replacement water will be provided for ponds, lakes, etc".

Stage 3:

1. "Water used on a one-time basis for purposes such as construction and dust control shall be limited to that quantity identified in a plan submitted by the user describing water use requirements. The plan shall be submitted to the District for approval.
2. The use of water from fire hydrants shall be limited to activities necessary to maintain the public health safety and welfare.

3. Water for municipal purposes shall be limited to activities necessary to maintain the public, health, safety, and welfare.

4. Outdoor irrigation by sprinklers will only be allowed on even-numbered days of the month for those locations with a street address ending in an even last digit. Outdoor irrigation of locations not having a street address shall irrigate on even-numbered days of the month.

5. Outdoor irrigation by sprinklers will only be allowed on odd-numbered days of the month for those locations with a street address in an odd last digit.

6. Washing of autos, trucks, trailers, motor homes, boats, airplanes, or other types of mobile equipment is prohibited. However, such washings are exempted from these regulations for municipalities or commercial entities where the health, safety and welfare of the public is contingent upon frequent vehicle cleaning such as garbage trucks or vehicles used to transport food and perishables".

Stage 4:

1. "Irrigation of landscaping is only allowed twice per week with hand-held hose only.

2. No replacement water provided for pools and spas until such time as Stage 4 restrictions are deemed no longer in effect.

3. No one shall cause the emptying or refilling of existing pools or spas for cleaning purposes. Current water levels will be maintained.

4. All new landscaping shall be limited to drought-tolerant plantings as determined by the District.

5. No new lawn/turf, whether by seed or sod, shall be permitted.

6. No person or entity shall be required to implement any new landscaping requirements of any association, developer, or governing agency until the termination of Stage 4.

7. Use of water by all types of commercial car washes shall be reduced in volume by 50 percent".

CII water shortage contingency measures:

Stage 1:

1. "Reference evapotranspiration (ET) factors for individually metered landscape projects will be reduced from 1.0 (100 percent of ET) to 0.8 (80 percent of ET)".

Stage 2: No additional measure, however Stage 1 becomes mandatory.

Stage 3:

1. "Landscape meters to 75 percent of ET.

Stage 4:

1. Landscape meters to 60 percent of ET.

Agricultural water shortage measures:

Stage 4:

1. Based on interruptible agriculture (sic) water from MWDSC, field and row crops may be discontinued".

Note there are no agricultural water use restrictions for Stages 1-3.

5.4 Western Municipal Water District Water Shortage Contingency Plan

During a water shortage WMWD will adopt an Ordinance that restricts water usage and penalizes excess usage. Prohibitions of water use that may be imposed by WMWD include street/sidewalk cleaning, washing cars, lawn/landscape watering, non-permanent agriculture, uncorrected plumbing leaks, gutter flooding, and restrictions on construction use. According to the WMWD's Water Shortage Contingency Plan, the stages when these prohibitions become mandatory may vary. Unlike EMWD's plan which has specific measures to be taken during each of its four stages. The measures WMWD takes during a water shortage will apply to all retail and wholesale customers.

WMWD has prepared actions to be taken should a catastrophic event occur. Possible catastrophes it is prepared for include: regional power outage, earthquake, extreme weather, terrorism/sabotage, water borne diseases, and system failure.

In February 2005 WMWD was required to enact Ordinance 358 due to a five day shutdown of a MWDSC treatment plant. The Ordinance prohibited use of potable water for non-essential indoor and outdoor water use. More specifically irrigation;

hosing down sidewalks, driveways, patios, etc.; washing cars; and certain construction uses were prohibited.

WMWD's Water Shortage Contingency Plan states that it may stop wholesale water sales during a water shortage emergency period, which will have a direct impact on RCWD supplies.

5.5 RCWD Water Shortage Contingency Plan

As required by the Urban Water Management Plan Act, RCWD has developed a water shortage contingency plan so that it may provide a reliable supply of water to its customers in the event of a water shortage situation (see Appendix B). Below sections 10632 (a) through (i) are discussed.

5.5.1 Water Code Section 10632 (a)

The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier: (a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.

Currently RCWD has a resolution that establishes water conservation guidelines based on the availability of supply. There are four stages of action and each stage has a set of conservation measures. Water code section 10632 of the Urban Water Management Plan Act requires a shortage situation of 50 percent reduction in water supply to be addressed. Presented below are four water stages and the actions that are taken for each stage. Stage IV, water emergency, will provide adequate conservation during a water shortage of up to a 50 percent reduction in water supply and is discussed below.

Stage I - Normal Condition (The District is able to meet the water demands of its customers in the immediate future).

1. When the General Manager has declared that the District's water supply is in a "Normal Condition," customers are requested to use water wisely and to practice water conservation measures so that water is not wasted.

2. Customers are to avoid use of water in a manner that creates runoff or drainage onto adjacent properties or onto public or private roadways.

3. Water waste is a violation of California Law and District Regulations at any time.

Stage II - Water Alert (There is a probability that the District will not be able to meet all of the water demands of its customers).

1. Parks, school grounds, and golf courses are to be watered at night only.

2. Lawns and landscaping are to be watered after 6:00 p.m. and before 6 a.m.

3. Driveways, parking lots and other paved surfaces are not to be washed with water.

4. Private vehicles are to be washed with a bucket; hoses must have positive shut off nozzles.

5. Commercial car washes must recycle water.

6. Restaurant customers are to receive water only upon request.

7. A limited number of fire hydrant construction meters will be issued by the District. Applicant must present current, valid grading or building permit.

8. Livestock or animals may be watered at any time.

9. Decorative ponds, golf course water hazards which are not an integral part of the permanent irrigation or fire protection system, fountains and other waterscape features are not to be filled. Fountain pumps must remain off to minimize evaporation.

Stage III - Water Warning (The District is not able to meet all of the water demands of its customers).

1. Parks are to be watered at night no more than two times per week.

2. School grounds are to be watered at night no more than two times per week.

3. Golf courses, greens and tees only, are to be watered at night. Fairways may be watered on alternate days at night.

4. Lawns and landscaping are to be watered no more than two times per week after 6:00 p.m. and before 6:00 a.m.

5. Restaurant customers are to receive water only upon request using disposable cups.

6. Driveways, parking lots, or other paved surfaces are not to be washed with water.

7. Swimming pools are not to be filled.

8. Commercial car washes must recycle water.

9. New fire hydrant construction meters will not be issued by the District.

10. Water service through fire hydrant construction meters for grading or other constructions is to be used after 5:00 p.m. and before 10:00 a.m.

11. Agricultural customers are to use water on alternate days only.

12. Commercial nurseries are to use water only on alternate days between 6:00 p.m. and 6:00 a.m.

13. Livestock or animals may be watered at any time.

Stage IV - Water Emergency (A major deficiency of any supply or failure of a distribution facility is declared).

1. Lawns and landscaping are not to be watered.

2. Parks, school grounds and golf course fairways are to be watered with reclaimed water, if available, or not at all. Golf course greens and tees may be watered only on alternate nights.

3. Driveways, parking lots, or other paved surfaces are not to be washed.

4. Commercial car washes using recycled or reclaimed water are to be used for washing vehicles. Consumption of District water for this use must be reduced to 50 percent of average consumption for the year.

5. Restaurant customers are to receive water only upon request, using disposable cups.

6. Swimming pools are not to be filled.

7. New fire hydrant construction meters will not be issued by the District.

8. Water service through fire hydrant construction meters will not be available by the District.

9. Permanent orchard crop irrigation is to be limited to no more that two times per week. In the event of a temporary service outage, agricultural irrigation is to be discontinued.

10. Other agricultural and commercial nursery irrigation is to be discontinued.

11. Livestock or animals may be watered at any time.

The conservation actions listed under Stage IV- Water Emergency primarily target outdoor water use. The only indoor water use that is restricted is in regard to restaurant customers receiving water only upon request. The savings from this are likely insignificant, but help promote public awareness of the crisis. The other measures virtually eliminate outdoor water use with exception to watering livestock and animals, minimal orchard crop irrigation, and golf course greens and tees on

alternate nights. Other uses such as commercial car washes and parks, school, and golf course fairway watering are to use reclaimed water.

The sectors using the most water during fiscal year 2003-2004 were domestic (including Ag/Domestic) and the agricultural sector with 41 percent and 36 percent of total water use respectively, for a combined total of 77 percent. An analysis of RCWD billing data suggests that outdoor water use accounts for 51 percent of all total use in the domestic sector. In a severe water shortage, a complete restriction of outdoor domestic water use could potentially reduce total District water use by 22 percent.

Making the gross assumption that livestock and animal watering and the minimal orchard irrigation permitted make up 20 percent of total agricultural water use, the restrictions during a water emergency can reduce agricultural water use by 80 percent and total District water use by 29 percent.

The impacts of Stage IV would reduce total water use by an estimated 51 percent in the domestic and agricultural sectors alone. The Stage IV restrictions would create savings in the sectors that make up the remaining 33 percent of total water use as well. Golf, construction, commercial, landscape, multiple dwelling, and schools and government would all realize reductions in water use under restrictions of Stage IV water emergency. In the event of a 50 percent water shortage RCWD's Drought Ordinance Stage IV will provide the appropriate measures to save water.

5.5.2 Water Code Section 10632 (b)

An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.

If conditions during the three years following 2005 are equal to the driest three-year historic sequence for RCWD's water supply, RCWD would have to take measures to meet water demand within its service area. Most likely RCWD will increasingly rely on MWDSC for imported water. The results of a simulation using the three driest historic years are presented below in Table 5-1.

Table 5-1
Driest Three-year Water Supply Sequence

Supply & Demand (Acre-Feet)	Current Conditions	Followed by Driest Three Consecutive Years (1988-1990)		
	2005	2006	2007	2008
Treated Imported Water	31,084	34,761	40,226	32,777
Groundwater	38,130	38,931	39,636	39,378
Reclaimed Water	6,044	6,093	6,161	6,068
Demand	75,258	79,786	86,023	83,634
M&I Deficit	0	0	0	0
Ag Deficit	0	0	0	5,411

The driest three consecutive years are based on historical rainfall data from 1935 to 1998. Using projected demand data for 2005 and 2010, and assuming a normal

hydrology; the demands for 2006, 2007, and 2008 were interpolated. Then the hydrology factors for 1988, 1989, and 1990 were applied to the 2006, 2007, and 2008 estimates to obtain the estimates presented in Table 3.1. Treated imported water supply decreases from 2007 to 2008 due to the model assumption of applying the 1990 hydrology. The year 1990 was a hydrology year in which MWDSC limited treated water supply for agricultural demands by 25 percent, which is also reflected in the agricultural deficit presented in Table 5-1. If a severe drought period were to occur MWDSC may be required to implement savings strategies from the WSDM Plan discussed in Section 5.2 and RCWD may enact its drought resolution. If RCWD were in a situation of increased reliance on imported water it will experience higher operating costs. This is discussed further in Section 5.5.6.

5.5.3 Water Code Section 10632 (c)

Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

RCWD operates in an area where the probability of an earthquake is high. Depending on the severity, an earthquake may damage the water system. RCWD's Emergency Response Plan provides a framework for an organized response to an earthquake emergency. The primary objectives of the plan are to maintain the functionality of the water distribution system, assess the system and if necessary make rapid repair to any damage, and prevent any further damage. The District's response to an earthquake will be directed by the General Manager.

RCWD has Response Phases in the event of an Earthquake:

Phase I - Inspection: A rapid inspection to determine injuries and any damage which might affect the distribution system.

Phase II - Report Back: Emergency communications flow: additional inspection procedures.

Phase III - Repair: Coordination of maintenance forces.

Phase IV - Management Procedures: Key Management responsibilities for the emergency.

Phase V - Operating/Maintenance/Engineering: Outlines procedures for division personnel.

Prior to Phase I inspections, System Operators and Inspectors report to the Emergency Operating Center to receive assigned inspection routes. The Emergency Operating Center creates a communications hub for the District to efficiently manage their available resources. For example personnel inspecting Vail Dam, wastewater treatment facilities, and wells receive their assignments from and report their findings to the Emergency Operating Center. The Emergency Response Plan contains ten areas

that are inspected with driving directions for specific inspections routes. If inspections reveal damage to any of the areas the necessary repairs are made. Communications are ongoing at all phases of the response to an earthquake. The District has a primary and secondary radio systems to insure communications will be available during an emergency.

The Emergency Response Plan also includes an analysis of the potential of an electrical power outage. RCWD depends on electricity to boost water to higher elevations via pumping stations, although some wells use natural gas as their energy source. The Plan discusses RCWD's sources of electricity and analyzes a history of power outages. The history of power outages includes the name of the circuit, reason for the power outage, the date and time of outage, and the length of the power outage. In an emergency situation involving a power outage RCWD will utilize emergency generators to provide customers with a reliable source of water.

5.5.4 Water Code Section 10632 (d-f)

(d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning. (e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply. (f) Penalties or charges for excessive use, where applicable.

As presented in Section 5.5.1, during Stage I - Normal Condition RCWD requests its customers use water wisely and practice water conservation measures as to not waste water. Customers are to avoid use of water that creates runoff and drainage. RCWD states that water waste is a violation of California Law and District Regulations even if there is not a water shortage.

Currently, RCWD does not have set charges for excessive water other than its Tier II rate structure. The Tier II rate charge is $81 per acre-foot ($0.18595 per hcf) in addition to the normal water rate. This is applied to customers who exceed their water allocation determined by their customer class. When it is required, RCWD will pass through penalties from MWDSC to its customers. No other prohibitions are set forth by RCWD beyond those presented in Section 5.5.1.

5.5.5 Water Code Section 10632 (g)

An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

RCWD's current rate structure is designed to mitigate the impacts of reduced sales volumes through adequate fixed revenue coverage. As stated in RCWD's 2004 Comprehensive Financial Report, "It is the intent of the Board of Directors that the costs of providing water and sewer services are financed primarily through user

charges, and that fixed costs are recovered through fixed revenues and variable costs are recovered through variable revenues. This method better positions the District to maintain a stable and equitable rate structure during normal and abnormal weather conditions, as well as periods of drought that result in material reductions of water sales".

According to the Fiscal year 2005-2006 Operating and Non-Operating Budget report, local water production saves the district $9,000,000 in annual operating costs when compared to the cost of import water. In ideal conditions the District's goal is to produce 30,000 acre-feet of local water annually. In a prolonged drought situation the goal may be dropped to 25,000 acre-feet. This would increase RCWD's water production costs by $1,500,000. Further, prolonged drought conditions will likely result in MWDSC discontinuing the reduced rate for recharge water, and its agricultural credit program. The discontinuation of these programs would increase RCWD's costs by $1,000,000 and $1,800,000 respectively. Therefore, if drought conditions caused local groundwater production to be reduced by 5,000 acre-feet, and MWDSC discontinued its reduced rate for recharge water and its agricultural credit program the District's operating charges would increase by $4,300,000. In preparation for such a condition, RCWD has a Drought Reserve that is set at one year's impact of estimated drought costs. The reserve requirement is $4,300,000 and protects RCWD and its customers should a drought situation arise.

5.5.6 Water Code Section 10632 (h & i)

(h) A draft water shortage contingency resolution or ordinance. (i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

RCWD's water shortage resolution was discussed in Section 5.5.1, and a copy of the ordinance is attached in Appendix B. The last ordinance was drafted in 1991, however, the District's fiscal year 2005-2006 report on Operating and Non-Operating Budgets lists updating the current Drought Ordinance as an objective. The target date for the update is December 2005.

If the water saving actions contained within the ordinance are ever necessitated by water shortage conditions, the District will be able to track actual reductions in water use through its billing system. The billing system tracks actual use on a monthly basis no matter the supply situation. RCWD has over ten years of consumption history for each customer. RCWD's aggressive water meter replacement ensures the use being tracked via the billing system is reliable and accurate.

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Section 6
Water Recycling

6.1 Agency Participation in Recycled Water Planning

Recycled water planning within Rancho California Water District's (RCWD) service area requires close coordination with several agencies. RCWD has recently developed a Regional Integrated Resources Plan or IRP. The IRP evaluated a number of alternatives to increase recycled water within RCWD's service area.

Additionally, the Santa Margarita Water Supply Augmentation Study was conducted by Eastern Municipal Water District (EMWD), RCWD and the Bureau of Reclamation. This study examined the feasibility of advanced treatment using MF/RO to increase the usability of recycled water from EMWD's recycled water plant.

Participating agencies for both the IRP and Santa Margarita Water Supply Augmentation Study are summarized in Table 6-1.

Table 6-1
Participating Agencies in Recycled Water Plan

Participating Agencies	Santa Margarita Water Supply Augmentation Study[1]	RCWD IRP[2]
RCWD	x	x
Metropolitan Water District of Southern California		x
Eastern MWD	x	x
Western MWD		x
US Bureau of Reclamation	x	
1 - Santa Margarita Water Supply Augmentation Study (CDM 2005)		
2 - RCWD Regional Integrated Resources Plan (CDM 2005)		

6.2 Wastewater Collection and Treatment Systems

Wastewater in the upper Santa Margarita watershed is collected by sewer system in the more densely populated areas and by septic systems in the rural areas. RCWD and EMWD both collect wastewater within their systems and treat it at two water reclamation facilities: the Santa Rosa Water Reclamation facility (SRWRF), operated by RCWD; and the Temecula Valley Regional Water Reclamation Facility (TVRWRF), operated by EMWD.

Table 6-2 summarizes the past, current, and projected average dry weather wastewater volumes collected and treated and the quantity of wastewater treated to recycled water standards for treatment plants within RCWD's service area. Between 2005 and 2030 the average wastewater collected between the two treatment plants is

expected to almost double from 18,594 million gallons per day (mgd) to 34,780 mgd. The entire amount of wastewater collected is expected to meet recycled water standards. Utilization of treated effluent for recycled water use after further treatment is projected to increase from 36 percent in 2005 to 79 percent in 2030.

Table 6-2
Wastewater Collection and Treatment

Average Wastewater Collected (Acre-Feet)						
Wastewater Plant	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
TVRWRF (EMWD)	14,114	16,970	19,827	21,693	23,560	25,427
SRWRF (RCWD)	4,481	5,685	6,889	7,710	8,532	9,353
Total	18,594	22,655	26,715	29,404	32,092	34,780
Quantity Meeting Recycled Water Standards (Acre-Feet)						
Wastewater Plant	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
TVRWRF (EMWD)	14,114	16,970	19,827	21,693	23,560	25,427
SRWRF (RCWD)	4,481	5,685	6,889	7,710	8,532	9,353
Total	18,594	22,655	26,715	29,404	32,092	34,780

Source: Santa Margarita Water Supply Augmentation Study (CDM, 2005).

All recycled water must meet Title 22 standards. Title 22, Chapter 4, of the California Code of Regulations establishes recycled water quality standards and treatment reliability criteria dependent upon the end use of recycled water to protect public health. Both secondary and tertiary treated wastewater can meet Title 22 standards dependent upon the end use of the water. Recycled water produced in excess of demands is disposed and eventually ends up in the ocean.

Table 6-3 summarizes the disposal method, treatment levels, and past, current, and projected discharge volumes. All effluent at TVWRF is treated to Title 22 standards. Portions of the effluent that are not used immediately or stored are discharged to Temescal Creek and ultimately the Pacific Ocean. As indicated in the table, SRWRF does not discharge effluent, rather all water is treated to Title 22 standards and either immediately used or stored for future use. The amount of water discharged is expected to increase by 9,521 acre-feet between 2005 and 2030.

Table 6-3
Wastewater Treatment and Disposal (Acre-Feet)

Wastewater Plant	Disposal Method	Treatment	2005	2010	2015	2020	2025	2030
TVRWRF (EMWD)	Ocean via Temescal Creek	Title 22	6,945	9,017	11,089	12,882	14,674	16,466
SRWRF (RCWD)	All Recycled Water Used	Title 22	0	0	0	0	0	0
Total			**6,945**	**9,017**	**11,089**	**12,882**	**14,674**	**16,466**

Source: Santa Margarita Water Supply Augmentation Study (CDM, 2005).

6.2.1 Santa Rosa Water Reclamation Facility

SRWRF has a current capacity of 5 mgd or approximately 5,598 AFY. The plant collects flow from areas within portions of RCWD's service area, Murrieta County Water District (MCWD), and a portion of Elsinore Valley Water District (EVMWD). The MCWD area is expected to have the greatest population grown leading to an increase in flows from 851 AFY in 2005 to 3,663 AFY in 2030 or 0.76 mgd to 3.3 mgd. The portion of EVMWD's service area served by this facility is expected to have the least growth increasing from 1,535 AFY in 2005 to 1,647 AFY in 2030 or 1,4 mgd to 1.5 mgd. Total projected wastewater flows will almost double for this facility between 2005 and 2030.

All reclaimed water produced at this plant is currently reused for landscape irrigation. Seasonal storage ponds near the SRWRF store effluent during the winter months (low demand period) to prevent discharges and provide reclaimed water supply to meet peak summer demands. The current pond storage capacity is approximately 1,100 AF, with an expected ultimate capacity of 2,700 AF.

6.2.2 Temecula Valley Regional Water Reclamation Facility

The TVRWRF treats wastewater from a service area which includes the "Golden Triangle" region between Interstates 15 and 215, the Murrieta Hot Springs area, and portions of the Rancho Division of RCWD. The TVRWRF may also receive and treat wastewater generated in MCWD and EVMWD service areas. Projected wastewater flows will increase most dramatically from EMWD will increase more than twofold from 4,481 AFY to 9,521 AFY or 4 mgd to 10 mgd. Total flows for TVWRF will increase from 12,658 AFY to 25,539 AFY or 11.3 mgd to 22.7 mgd.

Effluent from TVRWRF is conveyed to on-site storage ponds prior to distribution. There are 225 million gallons (MG) of temporary on-site storage capacity. When additional storage is required, reclaimed water is conveyed to 450 MG storage ponds located 10 miles north in Winchester, providing reclaimed water supply for irrigation users along the way. When the ponds are full or there is not enough demand, the effluent is discharged to Temescal Creek, a tributary of the Santa Ana River, for ultimate disposal to the Pacific Ocean.

Reclaimed water produced by the TVRWRF is currently distributed to a variety of users, including users in the RCWD service area. From 1999 to 2003, effluent use on average was 256 mgd, with summer peaks increasing each year from about 400 mgd in 1999 to about 650 mgd in 2003.

6.3 Current and Projected Uses of Recycled Water

Historically, recycled water has provided less than 5 percent of total water supply for RCWD, while groundwater has supplied between 25 to 40 percent and imported water has supplied between 60 to 70 percent. In 2005, the total recycled water used was 6,691 acre-feet per year.

Water quality concerns in the Santa Margarita River Watershed prevent RCWD from discharging reclaimed water (Title 22) to the local streams. At the same time, the District needs to comply with legal requirements for flow to downstream users. Currently, raw imported supply has been used to meet flow requirements, while the effluent from the reclamation facilities is utilized for irrigation and other uses.

As stated in Section 6.2.1, SRWRF currently recycles all of its reclaimed water. Its reclaimed water is used solely for landscape irrigation. When supplies exceed demands, typically during the winter months, excess supplies are stored for use during the summer months when demand is higher. The ponds have a storage capacity of approximately 1,100 AF with an expected ultimate capacity of 2,700 AF.

Effluent from TVRWRF is conveyed to on-site ponds with 225 MG of capacity, prior to distribution. There is an additional 450 MG of storage available north of Winchester, and reclaimed water supply is provided for irrigation along the way. When the ponds are full or there is not enough demand, the effluent is discharged to Temescal Creek (which ultimately enters the Pacific Ocean via the Santa Ana River).

Tables 6-4 and 6-5 summarize current and projected recycled water use, respectively. The use of recycled water for landscaping will be the largest use until 2025, when the projected MF/RO facility will start serving agricultural users with highly treated recycled water.

Table 6-4
Current Recycled Water Uses (AFY)

User type	Treatment Level	2005
Landscape[1]	Title 22	6,497
Agriculture[2]	Title 22	194
	Total	6,691

Source: Santa Margurita Water Supply Augmentation Study, 2005.
[1]Includes flow supplied by both TVRWRF and SRWRF.
[2]Includes flow supplied by TVRWRF.

Table 6-5
Projected Future Use of Recycled Water in RCWD Service Area (AFY)

User type	2010	2015	2020	2025	2030
Landscape	7,700	8,900	9,700	10,500	11,400
Agriculture	190	190	190	13,800	13,800
Total	7,890	9,090	9,890	24,300	25,200

Source: RCWD Regional Integrated Resources Plan (CDM, 2005)

Table 6-6 compares the 2000 UWMP projections for recycled water use to the actual amount of recycled water used for year 2005. Actual recycled water use in 2005 exceeded projected water use by 2,317 acre-feet.

Table 6-6
Recycled Water Uses - 2000 Projection compared with 2005 actual (AFY)

User type	2000 Projection for 2005	2005 Actual Use
Landscape[1]	4,180	6,497
Total	4,180	6,497

Source: 2000 RCWD UWMP, 2000 and Santa Margurita Water Supply Augmentation Study, 2005

Potential recycled water uses in the RCWD area are illustrated in Table 6-7. These potential uses represent the demands for water that could be served with recycled water, but do not account for water quality requirements or availability of recycled water supply. For example, the maximum available recycled water supply for RCWD by 2030 from both the SRWRF and the TVRWRF is approximately 27,000 AFY, whereas the potential recycled water demand by 2030 is approximately 90,000 AFY.

Table 6-7
Potential Recycled Water Uses (AFY)

User type	Treatment Level	2010	2015	2020	2025	2030
Groundwater Recharge	MF/RO[2]	35,000	35,000	35,000	35,000	35,000
Landscape	Title 22	4,481	5,699	6,917	8,135	9,353
Tolerant Agriculture	MF/RO[2]	38,000	39,500	41,000	43,500	46,000
Total		77,481	80,199	82,917	86,635	90,353

Source: Santa Margurita Water Supply Augmentation Study, 2005.
[1] This potential does not take into account the availability of recycled water or the required quality needed.
[2] MF/RO = microfiltration/reverse osmosis.

6.4 Encouraging Recycled Water Use

Numerous methods are utilized by RCWD to encourage recycled water use. These methods are further described below.

6.4.1 Funding

Capital risks associated with recycled water projects are significant hurdles towards increase recycled water production and use. Similar to a potable water system, treatment facilities, distribution networks, pumping stations, and storage reservoirs are required to adequately supply a reliable source of recycled water. These expensive capital investments result in high per unit acre costs, especially if demand is limited in the beginning of the project. Many times the cost per unit is more than purchasing other non-recycled supplies.

RCWD offers recycled water to its customers at a cost less than that of potable water as a financial incentive through its local projects program to encourage the use of recycled water. Additionally, RCWD will construct the MF/RO facility, expected to be online by 2025, that will provide an additional 16,000 AFY of recycled water.

State propositions have dedicated allocations towards water recycling. Proposition 204 provides funding up to $60 million for water recycling loans in California. Proposition 13 provides up to $40 million in grants and low interest loans.

Financial incentives tend to drive the per unit cost of recycled water down and assist in the encouragement of recycled water use. Projects that tend to spread the capital CALFED has recommended that the state and federal government spend $1.5 to 2 billion over the next seven years on water use efficiency, including water recycling.

6.4.2 Partnerships to Encourage Water Recycling

Partnerships between agencies are another means of encouraging recycled water use. Financially, the initial capital investment is spread between two agencies instead of one. Most recycled water production efforts require close coordination between multiple agencies. At a minimum wastewater, groundwater, and water agencies are all impacted by recycled water production. Recycled water production efforts tend to cross existing jurisdiction boundaries and require new management strategies to ensure all parties concerns are met. Additionally, the previously discussed Santa Margarita Water Supply Augmentation Study fostered coordination among EMWD, RCWD and the Bureau of Reclamation.

Projected yields from encouraging partnerships to encourage recycled water use are unknown and cannot be readily allocated from total project yields.

6.4.3 Regulatory Issues

Both the RWQCB and DHS are involved with water recycling use. The local RWQCB is the permitting authority and DHS regulates recycled water use from a health concern and standards viewpoint. Title 22 of the California Administrative Code provides specific regulations for treatment levels and reuse applications. Currently, there is no uniform criteria for regulating groundwater recharge applications requiring state agency review on a case-by-case basis. A uniform criteria for regulating groundwater recharge would encourage agencies that are reluctant to currently pursue such options based on unknown requirements to pursue groundwater recharge with recycled water.

Projected yields from involvement in regulatory issues to encourage recycled water use are unknown and cannot be readily allocated from total project yields.

6.4.4 Research to Encourage Recycled Water Use

RCWD supports research efforts to encourage recycled water efforts. These include conducting studies and research to address public concerns, develop new technologies, and health effects assessments. Addressing public concerns is required to gain the support of stakeholders early on in the planning process. From an aesthetic standpoint the public tends to have negative connotations associated with recycling wastewater. Education is required to inform the public of treatment processes. Developing new technologies is a prerequisite to reduce recycled water production costs. Cost is a major factor deterring agencies from increasing recycled water production. Health effects assessments have a two-fold purpose of alleviating public concerns and ensuring the protection of the public and environment.

Projected yields from research to encourage recycled water use are unknown and cannot be readily allocated from total project yields.

6.5 Optimizing Recycled Water Use

Over the next twenty five years, recycled water use is projected to increase over three times current levels to 25,200 AFY in 2030. This will reuse over 85 percent of the wastewater generated in RCWD's service area and surrounding areas.

RCWD plans to take numerous actions to facilitate the use and production of recycled water by water and wastewater agencies within RCWD's service area to assist in meeting these projections.

- Install the MR/RO facility to add almost 14,000 AFY of reclaimed water by 2025.
- Apply for Bond funding such as Prop 50.
- Encourage MWD to participate in studies that will benefit recycled water production
- Support MWD in deriving solutions to regulatory issues
- Participation in sub-regional MWD facility studies, such as the Riverside/ San Diego area study

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Section 7
Water Quality Impacts on Reliability

7.1 Introduction

Potable water supplies within RCWD's service area are derived from a combination of local groundwater and imported water from MWDSC. Contamination of these sources or more stringent regulatory requirements has the potential to result in adjustments to water resource management strategies and, in a worse case scenario, impact supply reliability. As with most water districts, RCWD currently blends its available supply sources to mitigate against water quality impacts. On average residents and businesses receive water composed of 40 percent groundwater and 60 imported MWDSC water.

California Title 22 Drinking Water Standards (Title 22) incorporates the federal requirements of the Safe Drinking Water Act, and compliance with Title 22 is required by all water service providers. Therefore, Title 22 Monitoring of all regulated chemicals as well as a number of unregulated chemicals is conducted by RCWD and MWDSC. In order to be in compliance with Title 22, each agency must ensure that the regulated chemicals meet established primary drinking water standards to ensure the safety of the water supply. In addition to the primary drinking water standards, secondary drinking water standards have been set for some minerals based on non-health related aesthetics, such as taste and odor. Both primary and secondary standards are expressed as the maximum contaminated levels (MCL) that are allowable for a given constituent. Unregulated chemicals do not have established drinking water standards, but are chemicals of concern for which standards may be eventually adopted. These unregulated chemicals often have a "notification level", which is a health based advisory level established by Department of Health Services for chemicals in drinking water that lack MCLs.

As illustrated in Table 7-1, RCWD has accounted for known and foreseeable water quality impacts in their current management strategies. RCWD does not anticipate water quality impacts that would either reduce the water supply available or that cannot be handled through existing management strategies.

Table 7-1
Current & Projected Water Supply Changes Due to Water Quality Percentage

Water Source	2005	2010	2015	2020	2025	2030
Local Groundwater Production	0	0	0	0	0	0
MWD	0	0	0	0	0	0
Total	0	0	0	0	0	0

Each of the water sources and any current or future impacts to water quality are discussed below.

7.2 Groundwater Quality

RCWD continually monitors the water quality of its eight groundwater basins and 54 wells. Every year RCWD conducts over 2,000 tests for water quality on each of its wells and throughout the distribution system.

Exceedances of Drinking Water Standards

Sampling at RCWD's wells between 2002 and 2004 has indicated that the primary MCL standard of 2 mg/L for Fluoride has ranged between 0.2 and 7.6. Fluoride occurs in the groundwater basins as a result of natural erosion. Well sampling ranges reflect the highest reading and lowest reading from all of RCWD's wells and do not reflect average readings for all the wells. After well water is extracted it is blended with other well water and imported MWD water. The distribution system average level of fluoride was 0.4 mg/L, well below the MCL.

Well sampling has also indicated that the secondary MCL of 50 ug/L for manganese has ranged between non-detect and 250 ug/L. Secondary MCLs are set based upon aesthetics and odor and are not set based on health standards. Non-detect measurements occur when a sample has concentrations below the detectable range of measurement instruments. Manganese is present in the groundwater as a result of leaching from natural deposits. Sampling in the distribution system has indicated that blending reduces the manganese concentration to the non-detect level.

7.3 Metropolitan Water District of Southern California

RCWD is a member agency of both EMWD and WMWD. Both of theses wholesalers are members of the MWD. RCWD purchases its water through EMWD and WMWD, but receives its water directly from turnouts in MWD's pipelines. MWD has two primary sources of water, the State Water Project (SWP) and the Colorado River Aqueduct (CRA). Imported water is served as a blend of both sources dependent upon seasonality. Colorado River water tends to be higher in Total Dissolved Solids and lower in dissolved organics. SWP water usually has a lower TDS but higher organic material, which can lead to formation of disinfection byproducts (DBP's). MWD recognizes the impacts of water quality on its member agencies and has embraced water quality planning in its Integrated Resources Plan and monitoring efforts to address water quality issues. Planning efforts have identified management strategies that allow flexibility in operations to improve water quality and source protection while maintaining reliability. MWD's water quality staff conducts both required monitoring and monitoring for constituents of concern that are currently unregulated. Over 300,000 water quality tests are performed each year.

7.3.1 MWD Water Quality Issues

Total Dissolved Solids Management

High TDS levels in imported water delivered by MWD to RCWD impacts RCWD's management of water resources and can adversely affect agriculture. High TDS levels

in potable water leads to increased recycled water treatment costs, results in increased water losses during the recycled water treatment processes, reductions in recycled water use as demand decreases for recycled water with high TDS levels, recycled water does not meet RWQCB standards, brine volumes increase, and ultimately the ability to use the underlying groundwater basins for water storage could be diminished. MWD has established an operational policy objective to deliver water to each of its member agencies at a TDS of 500 mg/l when feasible. This requires careful operational planning and management to achieve.

Colorado River Aqueduct

CRA water has high TDS levels, averaging 650 mg/L during normal water years. Salinity levels are dependent upon precipitation in the Colorado River Basin. During drought years salinity levels increase and during years with above normal precipitation salinity levels decline as naturally occurring salt concentrations decline. In times of extreme droughts salinity levels could exceed 900mg/L. A long term salinity management strategy is in place at the state and federal level for the Colorado River Basin. Funds are appropriated annually to help fund salinity mitigation and reduction projects throughout the watershed.

State Water Project

SWP TDS levels are significantly lower than CRA water, averaging 250mg/L for water delivered via the East Branch of the SWP and 325 mg/L for the West Branch deliveries. West Branch deliveries have higher TDS levels as a result of salt loading in local streams, operational issues, and evaporation losses at Pyramid and Castaic Lakes. TDS levels and available supply vary based on hydrologic conditions in the Sacramento-San Joaquin watersheds, introduction of saline non project waters by upstream parties, as well as saline intrusion in the Sacramento San Joaquin Bay Delta. Variations of TDS levels over short periods of time are attributed to seasonal and tidal flow patterns presenting a unique challenge in trying to achieve MWDSC's 500 mg/L TDS objective. During periods when TDS levels are high at the SWP intake facilities and in the Colorado River it may not be possible to meet MWDSC's salinity objective and maintain water supply reliability. MWD's Board has adopted a statement of needs "to meet Metropolitan's 500 mg/L salinity-by-blending objective in a cost-effective manner while minimizing resource losses and ensuring the viability of recycling and groundwater management programs."

Management Actions

MWD has taken numerous actions to reduce TDS concentrations in its water supplies. In 1999, MWD's Board adopted a Salinity Action Plan and a Salinity Management Policy with the goal of delivering water with salinity levels less than 500mg/L. A three year joint effort between the US Bureau of Reclamation and a task force of stakeholders led to the development of the Action Plan. A Salinity Summit attended by representatives from over 60 agencies was held as the Action Plan neared completion to discuss regional salinity issues and how to work together to attain salinity management goals. Components of the action plan include:

- Imported water source control and salinity reductions
- Distribution system salinity management actions
- Collaborative actions with other agencies
- Local salinity management actions to protect groundwater and recycled water supplies.

Under the Action Plan, MWD is reliant upon blending of its source water to meet salinity goals. It is anticipated that the TDS goal will be met in 7 out of 10 years. Hydrologic conditions would result in MWD not achieving this goal in the other three years. Agencies receiving water from MWD, such as RCWD, are cognizant of this and have taken this concern into development of their management strategies.

MWD has obtained Proposition 13 funding to improve salinity levels for The Water Quality Exchange Partnership and The Desalination Research and Innovation Partnership (DRIP) programs. MWD received $20 million to develop a water exchange partnership to access high quality water from the Sierras in exchange for SWP water. Funds are being used to develop the program and construct additional infrastructure. A total of $4 million was received for the DRIP program to develop cost-effective advanced water treatment technologies for removing salts from the CRA, brackish groundwater, wastewater, and agricultural drainage.

Under the CALFED Bay-Delta Program actions are already reducing TDS loading in SWP water and more actions are planned for the next 30 years. Actions in progress include improved management of salts in the San Joaquin Valley, upstream source control, desalination demonstration projects, and programs to control stormwater runoff into SWP aqueducts. In the long-term, additional projects are planned to reduce short-term variations in TDS levels and the long-term average salinity levels.

Without reductions in TDS levels in both the short-term variations and long term average, desalination of CRA water may be needed. However, at the present time current technologies are expensive and 5 to 10 percent of the CRA water would be lost during the treatment process. The DRIP program is designed to assist in obtaining a viable solution to reducing CRA TDS levels.

Perchlorate Management

Perchlorate has been detected at low levels in the CRA water supply, but not in the SWP water supply thus this discussion will focus on the CRA water supply. An exceedance level for perchlorate has not been adopted at this time by DHS. However, DHS has adopted a notification level of 6 μg/L, requiring agencies to inform their governing bodies. Notification of customers and the potential health risks is also recommended. DHS recommends non-utilization of sources with perchlorate levels greater than 60 μg/L. Perchlorate primarily interferes with the production of

hormones for normal growth and development in the thyroid gland. Further research on the health effects of Perchlorate is pending.

MWD began monitoring for perchlorate in June 1997 after it was detected in the Colorado River and the Lake Mead outlet at Hoover Dam. Sampling was able to isolate the source to the Las Vegas Wash and its potential source in Henderson, Nevada. A quarterly monitoring program for Lake Mead was initiated in August 1997 followed by monthly monitoring of the CRA. The Nevada Department of Environmental Protection manages a remediation project in Henderson area. Since inception the amount of perchlorate entering the Colorado River has been reduced from 900 pounds per day in 1997 to less than 150 pounds per day as of December 2004.

Management Actions
In 2002, MWD adopted a Perchlorate Action Plan. Plan objectives include:

- Expand monitoring and reporting programs
- Assess the impact of perchlorate on local groundwater supplies
- Track remediation efforts in the Las Vegas Wash
- Initiate modeling of perchlorate levels in the Colorado River
- Investigate the need for additional resource management strategies
- Pursue legislative and regulatory options
- Include information on perchlorate in outreach activities
- Provide periodic updates to the MWD Board and member agencies

Through its Perchlorate Action Plan, MWD has taken a proactive approach towards addressing a potential water quality issue and ensuring minimal or no water supply losses associated with perchlorate.

Total Organic Carbon and Bromide Management

Treatment of SWP water supplies containing high levels of total organic carbon (TOC) and bromide with disinfectants, such as chlorine, creates disinfection byproducts (DBPs) linked to specific cancer types. CRA water does not have high levels of TOCs and bromide. TOC and bromide in the Delta region of the SWP are of a significant concern to MWD as concentration levels increase as Delta water is impacted by agricultural drainage and seawater intrusion. In 1998, the USEPA adopted more stringent regulations for DBPs that took effect in 2002. Even more stringent regulations are expected to be proposed in 2005.

Management Actions

MWD's Board adopted a Statement of Needs for the CALFED Bay-Delta Program in 1999 stating that MWD requires a safe drinking water supply for compliance with existing and future regulatory requirements. CALFED's Program has developed numerous conceptual actions to improve Bay/Delta water, however MWD desires CALFED to adopt water quality improvement milestones. These milestones are necessary to assure that MWD and its member agencies will be able to comply with pending water quality regulations.

MWD's Board has committed to install ozone treatment processes at its two treatment plants that solely treat SWP water to avoid the production of DBPs through chlorination. In addition to the concern of DBPs, some studies have linked negative reproductive and developmental effects to chlorinated water. The other three treatment plants that receive a combination of SWP and CRA water utilize blending to reduce levels of DBPs below regulatory requirements. By 2009 MWD plans on installing ozonation facilities at the remainder of its treatment faculties removing the percentage of SWP water that requires blending.

Other Contaminants of Concern

MWD has identified various other contaminants of concern to MWDSC water supply sources.

MTBE

As previously discussed, the use of MTBE as a gasoline oxygenate has resulted in the contamination of surface waters and groundwater. MWD operates boating facilities at its reservoirs. Therefore, these facilities were previously subjected to the introduction of MTBE. MTBE is discharged into surface water from the exhaust of recreational watercraft. MTBE and other oxygenates are regularly monitored in MWD's water supplies. Past monitoring has detected MTBE concentrations varying from non-detect to 3.9 µg/L in treatment plant effluent and up to 6.4 µg/L in source water effluent.

MWD has taken numerous actions to reduce the contamination of its supplies with MTBE including supporting state and federal legislation to reduce the impacts of MTBE. At its Diamond Valley Lake and Lake Skinner, MTBE free-fuel and clean burning engines are required to minimize the introduction of MTBE into surface waters. Water monitoring programs for MTBE and other gasoline components were instituted at the lakes. MWD has also investigated various treatment mechanisms for MTBE. Future contamination of water supplies will more than likely decrease as time elapses since the phase-out of MTBE. However, the extent of future contamination is unknown as MTBE is still within the environment.

Arsenic

Effective 2006, a federal MCL of 10 µg/L (10 parts per billion) will go into effect for domestic water supplies. MWD's water supplies contain low levels of this contaminant within the regulatory requirements. Currently, the California Office of

Environmental Health Hazard Assessment has set a public health goal of 0.004 µg/L for arsenic.

Radon
The USEPA has proposed a radon MCL of 300 pCi/L for drinking water supplies in states where there are no approved Multimedia Mitigation programs for reducing indoor radon. For states with approved programs the standard is 4,000 pCi/L. MWDSC's supplies have radon levels well below the MCL.

Uranium
Uranium is high priority with MWDSC as a 10.5 million ton pile of uranium mine tailings is 600 hundred feet from the Colorado River in Moab, Utah. Percolation of rainwater through the pile occurs causing contamination of local groundwater resources and flows of uranium into the River. During a large flood or other natural disaster there is the potential for large volumes of the contaminated material to flow enter the River. Interim action measures instituted by the Department of Energy (DOE) include intercepting portions of the contaminated groundwater before it enters the River. Concentrations ranging from 950 to 1,190 pCi/L have been detected at the point local groundwater enters the River. At MWD's intake at the River uranium concentrations of 1 to 5 pCi/L have been detected. California has a drinking water standard for uranium of 20 pCi/L. MWD continues to monitor DOE in clean-up effort.

Emerging Contaminants
NDMA is an emerging contaminant of concern believed to be widespread. NDMA is a disinfection-product of water and wastewater treatment processes. Chlorine and monochloramines can react with organic nitrogen precursors to form NDMA. California notification level is 0.010 µg/L. Concentrations ranging from non-detect (reporting limit of 0.002 µg/L) to 0.012 µg/L. Action measures may be required in the future to control or remove NDMA from water supplies.

Hexavalent chromium or chromium VI is a potential surface water and groundwater contaminant. It is an inorganic chemical used in cooling towers for corrosion control, electroplating, leather tanning, wood treatment, and pigment manufacturing. Contaminant pathways include discharges from industrial users, leaching from hazardous waste sites, and erosion of naturally occurring deposits. California has a current MCL for total chromium (includes chromium VI) of 0.05 mg/L. This level is currently under review by DHS. The California Legislature required DHS to set a MCL specifically for chromium VI by January 1, 2004. However, this has not been set at this time. MWD participates in a Technical Work Group reviewing remediation plans for chromium VI near Topock, Arizona along the Colorado River.

7.3.2 Water Quality Protection Programs

MWD participates in multiple programs to improve water quality supplies, which include:

- Watershed Sanitary Survey
- Source Water Assessment
- Support of DWR policies and programs improving the quality of deliveries to MWD
- Support of the Sacramento River Watershed Program
- Water quality exchange partnerships
- Implementation of additional security measures.

Through its management strategies and in coordination with member agencies, MWD is able provide member agencies supply options that allow local agencies to meet regulatory standards. Currently known and foreseeable water quality issues are already incorporated into existing management strategies and the reliability of MWD's supplies for the next 25 years. However, unforeseeable water quality issues could potentially alter MWD water and potentially impact MWD's supply reliability.

Section 8
Water Service Reliability

8.1 Introduction

The implementation of RCWD's IRP will allow the District to meet demands over the next 45 years in a sustainable and cost-effective manner. It will also reduce the dependency on treated imported water from MWD, and help hedge against droughts and other emergencies by maximizing local groundwater.

8.2 Weather Factors

During the IRP process a statistical model using population and rainfall as explanatory variables for the period 1935-2003 was developed. The model determined that rainfall has a significant effect on annual water demands in RCWD's service area. Temperature is more likely to have an impact on monthly seasonality of water demands. Figure 8-1 illustrates weather demand factors for 1935-2003.

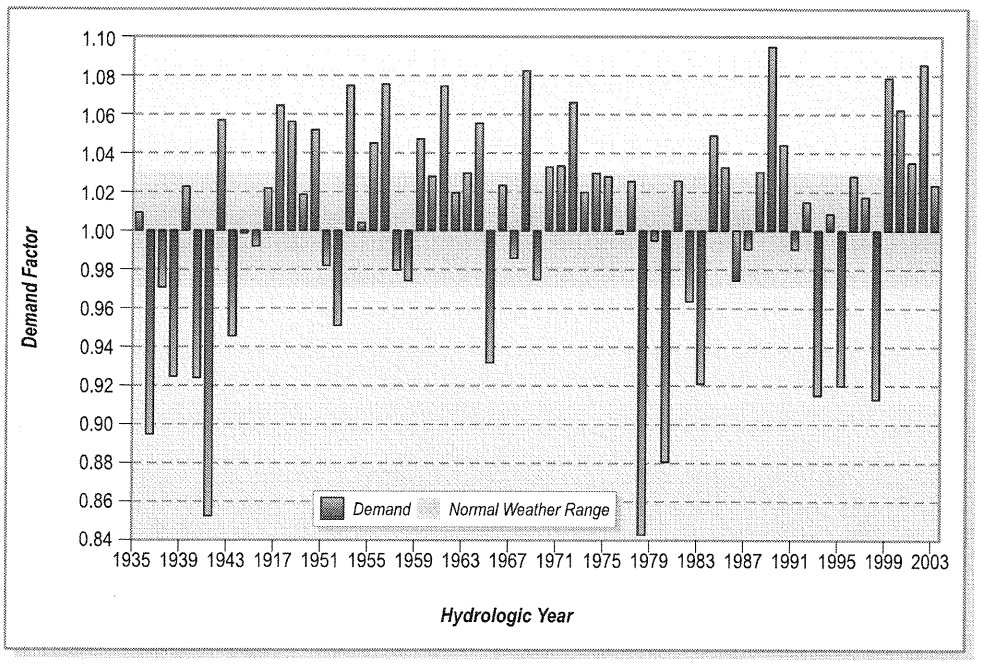

Figure 8-1
Weather Factors for RCWD Water Demands

Seasonal demands were also analyzed in the IRP using historical data from 1995-2004 Figure 8-2 shows the fluctuations on a monthly basis in demand based on agricultural and municipal and industrial water uses. The hotter drier summer months result in increased demands with reduced demands in the colder and wetter winter months.

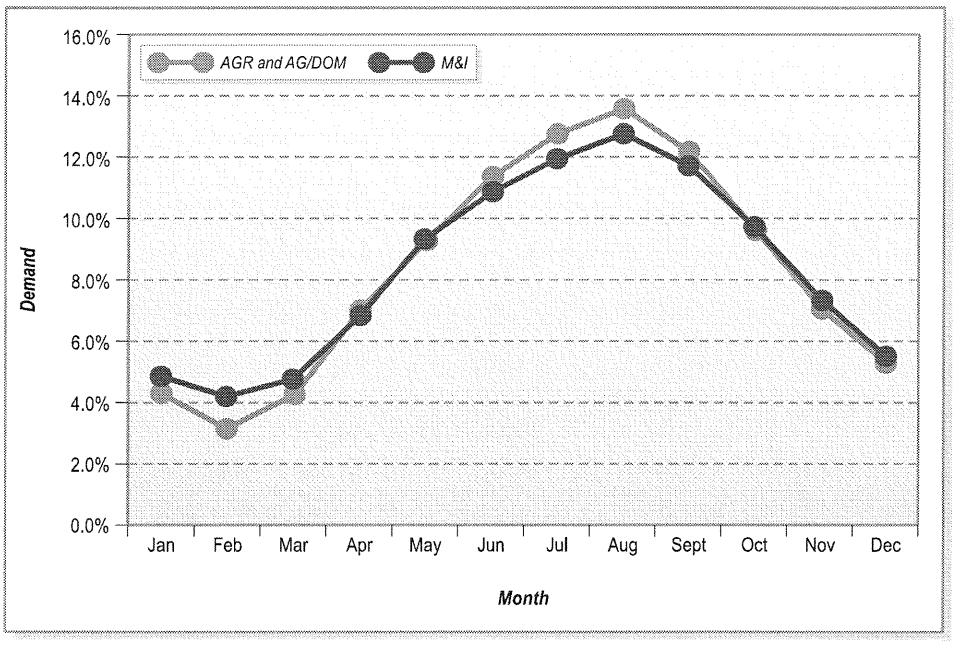

Figure 8-2
Monthly Pattern of RCWD Water Demand

8.3 Local Supply Reliability

RCWD's IRP has determined that its local supply of groundwater and recycled water is 100 percent reliable for the period extending to 2030. To minimize fluctuations in groundwater production, the IRP recommends increasing groundwater recharge with additional purchases of imported water. This increase will permit increased withdrawals of groundwater while minimizing the chance of overdraft conditions and allow for storage of excess water for use in years when natural recharge is diminished as a result of hydrologic conditions. Recycled water supplies may insignificantly fluctuate during varying hydrologic conditions as conservation increases, but these slight fluctuations will not reduce the reliability of the recycled water supply. Table 8-1 summarizes the projected local water supply mix during single-year and multiple-year droughts as a percent of a normal year supply. Normal year supplies vary and will continue to increase in the future as the population base in the service area increases requiring additional groundwater withdrawals and recycled water.

Table 8-1
Local Supply Reliability

			Multiple Dry Water Years (% of Normal)			
Source	**Normal Water Year**	**Single Dry Water Year (%of Normal)**	Year 1	Year 2	Year 3	Year 4
Groundwater	Varies (See Table 2-1 and 2-3)	100	100	100	100	100
Recycled Water	Varies (See Table 2-1 and 2-3)	100	100	100	100	100

The basis for determining normal, single-dry, and multiple-dry years is dependent upon the watershed from which the water supply is obtained. A normal water year is a year in the historical sequence that represents median runoff levels. For purposes, of the UWMP the normal year is 1954. A single-dry year is a year in the historical sequence with the lowest annual runoff for a watershed since 1903, defined as 1989 in this UWMP. A multiple-dry year period is the lowest average runoff for a consecutive multiple year period of three or more years for a watershed since 1903, which has been determined as 1987-1991 for this UWMP. Local groundwater has a different basis of water year data than imported water. Table 8-2 summarizes the basis of water year data for local groundwater. Recycled water is not reflected in the tables as recycled water supplies are not dependent upon hydrologic conditions.

Table 8-2
Local Supply Basis of Water Year Data

Water Year Type	Base Year(s)	Historical Sequence
Normal Water Year	1954	1935-1998
Single-Dry Water Year	1989	1935-1998
Multiple-Dry Water Years	1987-1991	1935-1998

RCWD's IRP is designed to minimize any inconsistencies in its local supply sources and provide multiple flexible sources of water. Inconsistencies that could impact groundwater production include legal, environmental, water quality, and climatic conditions. Legal issues include use of the groundwater basin by other producers, the right to store water at Vail Lake for recharge outside of the current period between November 1 and April 30. Environmental issues include disposal of brine associated with construction of a microfiltration/reverse osmosis (MF/RO) recycled water facility. Water quality issues revolve around contamination of groundwater basins, potential changes to water quality standards, and the use of MF/RO water for agricultural use. Climatic conditions could result in an inconsistency in groundwater recharge by reducing available natural recharge. Table 8-3 summarizes factors that could potentially result in local supply inconsistency. Recycled water is expected to be consistent and is not included within Table 8-3. Implementation of the IRP will minimize supply inconsistencies for both local and imported water supplies. Together local and imported supplies will supplement each other dramatically reducing supply inconsistencies.

Table 8-3
Inconsistency in Local Supply Factors

Name of Supply	Legal	Environmental	Water Quality	Climatic
Groundwater	Use of groundwater basin by others. Right to store water at Valil Lake outside of November 1 to April 30 time period.	Disposal of brine from microfiltration/reverse osmosis facility.	Contamination so supply. Changes in water quality standards. Use of recycled water for agricultural use.	Drought

8.4 Imported Supply Reliability

RCWD utilizes imported water as a part of its resource mix to ensure reliability of its supply. Table 8-4 summarizes the projected imported water RCWD expects to receive from MWD via EMWD and WMWD.

Table 8-4
Agency Demand Projection Provided to Wholesale Agency (AFY)

Wholesaler	2010	2015	2020	2025	2030
MWD via EMWD and WMWD					
Treated Water	39,095	22,461	23,348	35,864	36,792
Untreated Water	25,824	23,207	26,585	19,887	18,292
Total	64,919	45,669	49,933	55,751	55,084

RCWD's imported water supply is purchased through EMWD and WMWD, but is obtained directly from MWD's facilities. As previously explained, the agency demand projections for these two wholesalers are combined to arrive at one demand on MWD. Table 8-5 illustrates MWD's existing and planned sources of water for the period 2010-2030. These numbers reflect RCWD's demands on MWD as listed in Table 8-4.

Table 8-5
MWD Current and Planned (AFY)*

	2010	2015	2020	2025	2030
Current Supplies					
Colorado River	885,700	1,042,700	1,135,200	1,142,700	1,142,700
California Aqueduct	1,396,100	1,166,100	1,140,300	1,140,300	1,140,300
In-Basin Storage	531,700	530,400	513,000	499,200	499,200
Under Development					
Colorado River	0	150,000	114,800	107,300	107,300
California Aqueduct	175,000	370,000	370,000	370,000	370,000
In-Basin Storage	89,000	200,00	200,000	200,000	200,000
Total	**3,077,500**	**3,459,200**	**3,473,300**	**3,459,500**	**3,459,500**

Source: Draft 2005 Regional Urban Water Management Plan (MWD, 2005)
Projected under a repeat of 1990-92 hydrology ending in each of the five year period

MWD has determined in its 2005 UWMP that its resource mix is 100 percent reliable for non-discounted non-interruptible demands using previous dry periods for the forecast period 2005-2030. Table 8-6 summarizes the projected imported water supply mix during single-year and multiple-year droughts as a percentage of a normal year supply. Even though MWD can reliably meet RCWD's demands, the capacity constraint issue associated with the turnouts will potentially cause future peak day water shortages after 2025. Implementation of RCWD's IRP will eliminate the capacity constraints and resolve any peak day water shortages.

Table 8-6
Imported/Wholesale Supply Reliability

		Multiple Dry Water Years (%of Normal)				
Source	Normal Water Year	Single Dry Water Year (% of Normal)	Year 1	Year 2	Year 3	Year 4
MWDSC Supplies	Varies (See Table 2-1 and 2-3	100	100	100	100	100

MWD's basis of water year data is reflected in Table 8-7.

Table 8-7
Imported/Wholesale Supply Basis of Water Year Data

Water Year Type	Base Year(s)	Historical Sequence
Normal Water Year	Not Applicable - Determined by model	
Single-Water Year	1977	1922-1991
Multiple-Dry Water Years	1990-1992	1922-1991

RCWD relies on imported water from MWD that is classified as agricultural water (discounted, interruptible water). The portion of water considered agricultural water is subject to up to a 50 percent reduction by MWD during dry weather or emergencies. Agricultural customers could experience a shortage of up to 4,000 AFY with implementation of the IRP in the eastern service area unless dry year water transfers are implemented by RCWD as discussed under section 2.2.4.

MWD has developed an IRP to manage its water supplies and minimize any inconsistency in its supplies. Factors that may cause an inconsistency in MWD's supplies are listed in Table 8-8.

Table 8-8
Inconsistency in Wholesaler/Imported Supply Factors

Name of Supply	Legal	Environmental	Water Quality	Climatic
MWDSC Imported	Competition for new supplies	Endangered species	Contamination of supply. More stringent water quality standards	Drought Conditions

MWD has identified contamination of its water supplies and the implementation of more stringent water quality standards in its 2005 UWMP as having the possibility of causing an inconsistency in supplies. Development of new supplies could be reduced as a result of the competitive nature of obtaining new supplies. Endangered species may impact imported supplies by requiring minimum flows in waterways or other measures that may reduce flows. Droughts are unpredictable and may reduce available supplies from areas such as the Colorado River Basin and the Bay-Delta even if local climatic conditions are normal. Through implementation of the IRP, MWD has developed and identified a plethora of resources and measures to counteract any inconsistency in supplies.

8.5 RCWD Service Reliability

Overall, during single-dry and multiple-dry years RCWD's combined local and imported resource mix is 100 percent reliable for non-agricultural customers with implementation of RCWD's IRP. RCWD's IRP delineated supply sources are flexible and designed to supplement each other if one source is reduced. With implementation of the Hybrid 1 alternative of RCWD's IRP, peak day water shortages associated with imported treated water will be eliminated. Additionally, RCWD's IRP calls for increased utilization of recycled water, a relatively drought proof water supply that is consistent regardless of seasonal or climatic variations.

8.5.1 Normal Water Year

During normal water years throughout the projection period between 2010 and 2005, RCWD's resource mix is 100 percent reliable (see Table 8-9). All forecasted demands throughout the projection period are expected to be met with the resource mix identified in RCWD's IRP.

Table 8-9
Service Area Reliability Assessment for Normal Water Year (AFY)

	2010	2015	2020	2025	2030
Total Demand [1]	100,700	108,000	124,400	132,900	140,400
Percent of Year 2005	108%	116%	134%	143%	151%
Total Supply	100,700	108,000	124,400	132,900	140,400
Percent of Year 2005	108%	116%	134%	143%	151%
Difference (Supply minus Demand)	0	0	0	0	0
Difference as a Percent of Supply	0%	0%	0%	0%	0%
Difference as a Percent of Demand	0%	0%	0%	0%	0%

[1] Includes consumptive demand, imported water for groundwater recharge, and unaccounted use

8.5.2 Single - Dry Water Year

Using the single-driest year of 1989, projections of water demands were compared to projected supplies for the period 2010 to 2030 (see Table 8-10). Throughout the projection period, RCWD's water resource mix remains reliable. During dry years, it is expected that demands would increase approximately 7 to 8 percent over the normal year period (Table 8-9 demands) due to hotter and drier weather. Supplies are also expected to increase by approximately 7 to 8 percent over the normal year period to meet demands.

Table 8-10
Service Area Reliability Assessment for Single Dry Year (AFY)

	2010	2015	2020	2025	2030
Total Demand	108,215	116,163	133,130	142,377	150,543
Percent of Projected Normal	107%	108%	107%	107%	107%
Total Supply	108,215	116,163	133,130	142,377	150,543
Percent of Projected Normal	107%	108%	107%	107%	107%
Difference (Supply minus Demand)	0	0	0	0	0
Difference as a Percent of Supply	0%	0%	0%	0%	0%
Difference as a Percent of Demand	0%	0%	0%	0%	0%

8.5.3 Multiple Dry Water Years

To determine the reliability of RCWD's water resource mix under a multi-year drought scenario the 1987-1991 drought period was used as a hydrologic base year to obtain supply and demand forecasts in five year intervals. Each five-year increment (e.g. 2006-2010) assumes the same multiple dry year period condition.

During the 1990 and 1991 drought years MWD curtailed imported water deliveries for agriculture. Therefore, if this hydrologic period was repeated in the future, RCWD could expect shortages for its agricultural customers. Reliability increases in the latter years of the projection period when planned improvements are constructed such as the MF/RO facility that would supply recycled water to agricultural users. Additionally, water transfers and potential agriculture conservation measures could reduce the potential agricultural water shortages.

Tables 8-11 through 8-15 summarize the reliability under multiple dry years.

Table 8-11
Service Area Reliability Assessment for Multiple Dry Years (AFY)

	2006	2007	2008	2009	2010
Total Demand	93,863	98,501	105,269	102,758	99,864
Percent of Projected Normal	99%	102%	108%	104%	99%
Total Supply	93,863	98,501	105,269	99,675	93,872
Percent of Projected Normal	99%	102%	108%	100%	93%
Difference (Supply minus Demand)	0	0	0	-3,083	-5,992
Difference as a Percent of Supply	0%	0%	0%	-3%	-6%
Difference as a Percent of Demand	0%	0%	0%	-3%	-6%

Note: Supply shortages in 2009 and 2010 are due to anticipated reductions in MWD's agricultural deliveries.

Table 8-12
Service Area Reliability Assessment for Multiple-Dry Years (AFY))

	2011	2012	2013	2014	2015
Total Demand	101,332	106,200	113,376	110,434	107,092
Percent of Projected Normal	99%	102%	108%	104%	99%
Total Supply	101,332	106,200	113,376	106,016	98,524
Percent of Projected Normal	99%	102%	108%	100%	91%
Difference (Supply minus Demand)	0	0	0	-4,417	-8,567
Difference as a Percent of Supply	0%	0%	0%	-4%	-9%
Difference as a Percent of Demand	0%	0%	0%	-4%	-8%

Note: Supply shortages in 2014 and 2015 are due to anticipated reductions in MWD's agricultural deliveries.

Table 8-13
Service Area Reliability Assessment for Multiple-Dry Years (AFY)

	2016	2017	2018	2019	2020
Total Demand	108,563	114,004	121,906	120,436	123,429
Percent of Projected Normal	99%	103%	108%	104%	99%
Total Supply	108,563	114,004	121,906	115,619	113,554
Percent of Projected Normal	99%	103%	108%	99%	91%
Difference (Supply minus Demand)	0	0	0	-4,817	-9,874
Difference as a Percent of Supply	0%	0%	0%	-4%	-9%
Difference as a Percent of Demand	0%	0%	0%	-4%	-8%

Note: Supply shortages in 2019 and 2020 are due to anticipated reductions in MWD's agricultural deliveries.

Table 8-14
Service Area Reliability Assessment for Multiple-Dry Years (AFY)

	2021	2022	2023	2024	2025
Total Demand	125,138	130,796	139,134	135,721	131,845
Percent of Projected Normal	99%	102%	107%	103%	99%
Total Supply	125,138	130,796	139,134	130,292	121,298
Percent of Projected Normal	99%	102%	107%	99%	91%
Difference (Supply minus Demand)	0	0	0	-5,429	-10,548
Difference as a Percent of Supply	0%	0%	0%	-4%	-9%
Difference as a Percent of Demand	0%	0%	0%	-4%	-8%

Note: Supply shortages in 2024 and 2025 are due to anticipated reductions in MWD's agricultural deliveries.

Table 8-15
Service Area Reliability Assessment for Multiple Dry Years (AFY)

	2026	2027	2028	2029	2030
Total Demand	133,359	139,133	147,767	143,752	139,271
Percent of Projected Normal	99%	102%	108%	103%	99%
Total Supply	133,359	139,133	147,767	140,877	133,701
Percent of Projected Normal	99%	102%	108%	101%	95%
Difference (Supply minus Demand)	0	0	0	-2,875	-5,571
Difference as a Percent of Supply	0%	0%	0%	-2%	-4%
Difference as a Percent of Demand	0%	0%	0%	-2%	-4%
Note: Supply shortages in 2029 and 2030 are due to anticipated reductions in MWD's agricultural deliveries.					

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Section 9
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Appendix A
Water Rate Schedules

RATES & FEE SCHEDULES

RANCHO DIVISION WATER & ENERGY RATES						
COMMODITY RATES	2004-2005 RATES		2005-2006 RATES		% OF CHANGE	
	M&I	AG	M&I	AG	M&I	AG
Commodity Rate Only	**$0.6107**	**$0.5482**	**$0.6287**	**$0.5587**	**2.9%**	**1.9%**
Projected Rate by Pump Zone in HCF (Includes Commodity+Energy Rates)						
1305	$0.6966	$0.6340	$0.7155	$0.6455	2.7%	1.8%
1380	$0.7286	$0.6660	$0.7485	$0.6785	2.7%	1.9%
1485	$0.7733	$0.7107	$0.7947	$0.7247	2.8%	2.0%
1550	$0.8010	$0.7384	$0.8233	$0.7533	2.8%	2.0%
1610	$0.8265	$0.7639	$0.8497	$0.7797	2.8%	2.1%
1790	$0.9032	$0.8406	$0.9289	$0.8589	2.8%	2.2%
1880	$1.0224	$0.9599	$1.0521	$0.9821	2.9%	2.3%
2070	$1.0224	$0.9599	$1.0521	$0.9821	2.9%	2.3%
2350	$1.1417	$1.0791	$1.1753	$1.1053	2.9%	2.4%
TOTAL WEIGHTED AVERAGE RATE IMPACT:					**2.8%**	**2.0%**

COMMODITY RATES	2004-2005 RATES		2005-2006 RATES		% OF CHANGE	
	M&I	AG	M&I	AG	M&I	AG
Commodity Rate Only	**$266.03**	**$238.78**	**$273.84**	**$243.35**	**2.9%**	**1.9%**
Projected Rate by Pump Zone Per Acre Foot (Includes Commodity+Energy Rates)						
1305	$303.45	$276.19	$311.68	$281.19	2.7%	1.8%
1380	$317.36	$290.10	$326.06	$295.57	2.7%	1.9%
1485	$336.84	$309.59	$346.18	$315.69	2.8%	2.0%
1550	$348.90	$321.64	$358.64	$328.15	2.8%	2.0%
1610	$360.03	$332.78	$370.14	$339.65	2.8%	2.1%
1790	$393.43	$366.17	$404.64	$374.15	2.8%	2.2%
1880	$445.38	$418.12	$458.31	$427.82	2.9%	2.3%
2070	$445.38	$418.12	$458.31	$427.82	2.9%	2.3%
2350	$497.32	$470.07	$511.97	$481.48	2.9%	2.4%
TOTAL WEIGHTED AVERAGE RATE IMPACT:					**2.8%**	**2.0%**

SANTA ROSA DIVISION WATER & ENERGY RATES						
COMMODITY RATES	2004-2005 RATES		2005-2006 RATES		% OF CHANGE	
	M&I	AG	M&I	AG	M&I	AG
Commodity Rate Only	**$1.0167**	**$0.7730**	**$1.02811**	**$0.7967**	**1.1%**	**3.1%**
Projected Rate by Pump Zone in HCF (Includes Commodity + Energy Rates)						
1305	$1.0754	$0.8316	$1.0870	$0.8556	1.1%	2.9%
1434	$1.1219	$0.8781	$1.1309	$0.8995	0.8%	2.4%
1440	$1.1241	$0.8803	$1.1329	$0.9015	0.8%	2.4%
1500	$1.1457	$0.9020	$1.1533	$0.9219	0.7%	2.2%
1670	$1.2071	$0.9633	$1.2111	$0.9797	0.3%	1.7%
1990	$1.3225	$1.0788	$1.3199	$1.0885	-0.2%	0.9%
2160	$1.3839	$1.1401	$1.3777	$1.1463	-0.4%	0.5%
2260	$1.4199	$1.1762	$1.4117	$1.1803	-0.6%	0.4%
2550	$1.5246	$1.2808	$1.5103	$1.2789	-0.9%	-0.1%
2850	$1.6328	$1.3890	$1.6123	$1.3809	-1.3%	-0.6%
TOTAL WEIGHTED AVERAGE RATE IMPACT					0.3%	1.7%

COMMODITY RATES	2004-2005 RATES		2005-2006 RATES		% OF CHANGE	
	M&I	AG	M&I	AG	M&I	AG
Commodity Rate Only	**$442.89**	**$336.70**	**$447.85**	**$347.05**	**1.1%**	**3.1%**
Projected Rate by Pump Zone Per Acre Foot (Includes Commodity+Energy Rates)						
1305	$468.43	$362.25	$473.51	$372.71	1.1%	2.9%
1434	$488.71	$382.52	$492.61	$391.82	0.8%	2.4%
1440	$489.65	$383.46	$493.50	$392.71	0.8%	2.4%
1500	$499.08	$392.89	$502.39	$401.59	0.7%	2.2%
1670	$525.80	$419.61	$527.56	$426.77	0.3%	1.7%
1990	$576.09	$469.90	$574.96	$474.16	-0.2%	0.9%
2160	$602.81	$496.62	$600.13	$499.34	-0.4%	0.5%
2260	$618.53	$512.34	$614.95	$514.15	-0.6%	0.4%
2550	$664.11	$557.92	$657.90	$557.10	-0.9%	-0.1%
2850	$711.26	$605.07	$702.33	$601.53	-1.3%	-0.6%

TOTAL WEIGHTED AVERAGE RATE IMPACT	0.3%	1.7%

MONTHLY CAPACITY FEES						
Meter Size	2004-2005 Rate		2005-2006 Rate		% of Increase	
	Rancho	Santa Rosa	Rancho	Santa Rosa	Rancho	Santa Rosa
3/4"	$12.10	$18.71	$12.71	$19.65	5%	5%
1"	$17.92	$33.59	$18.82	$35.27	5%	5%
1-1/2"	$30.56	$54.67	$32.09	$57.40	5%	5%
2"	$46.08	$86.15	$48.38	$90.46	5%	5%
2-1/2"	$68.96	$121.05	$72.41	$127.10	5%	5%
3"	$121.12	$189.92	$127.18	$199.42	5%	5%
4"	$273.03	$474.77	$286.68	$498.51	5%	5%
6"	$466.39	$780.17	$489.71	$819.18	5%	5%
8"	$715.92	$1,078.58	$751.52	$1,132.51	5%	5%

CONSTRUCTION & NON-POTABLE WATER RATES (Base Water Rates Per HCF)				
	RANCHO DIVISION		SANTA ROSA DIVISION	
Description	FY 2004-2005	FY 2005-2006	FY 2004-2005	FY 2005-2006
Construction Water	$2.019/HCF*	$2.019/HCF*	$2.019/HCF*	$2.019/HCF*
Tier 2 Annex Rate	$1.12/HCF	$1.2029/HCF	$1.12/HCF	$1.2029/HCF
Recycled Construction Water	$178.12/AF + $10 Monthly Service Charge	$192.50/AF + $10 Monthly Service Charge	$178.12/AF + $10 Monthly Service Charge	$192.50/AF + $10 Monthly Service Charge
Tertiary Treated	$178.12/AF + $10 Monthly Service Charge	$192.50/AF + $10 Monthly Service Charge	$178.12/AF + $10 Monthly Service Charge	$192.50/AF + $10 Monthly Service Charge
Agricultural	$69.42/AF + $10 Monthly Service Charge*	$71.50/AF + $10 Monthly Service Charge	$69.42/AF + $10 Monthly Service Charge*	$71.50/AF + $10 Monthly Service Charge

*Customers will be charged the appropriate pump zones' energy rates in addition to the base rate.

FEE FOR SERVICE SCHEDULE		
	DESCRIPTION OF SERVICE	FEE/DEPOSIT
1	**Will Serve Letters**	
	Single letter	$90.00
	Tract/Parcel map initiation	$150.00
	Fire Hydrant Location Fee	$150.00
2	Request for Secondary Line Extension (Cost Estimate New)	$1,370.00
3	CFD/Assessment District (Processing Fee) [Deposit]	$10,000.00
	Assessment District Pay-Off Administrative Fee	$25.00
4	Request for RCWD Participation in Joint Community Facilities Financing Agreement (JCFA) (Processing Fee) [Deposit]	$5,000.00
5	Annexation Processing Fee	$3,995.00
6	Annexation Acreage Fee	
	Rancho Division	$1,731.00
	Santa Rosa Division	$1,674.00
7	Temporary Remote Meter Request (Cost Estimate Update)	$264.00
8	Fire Hydrant Meter Deposit (4-inch)	$750.00
9	Construction Meter Deposit (4-inch)	$1,500.00
10	Construction Meter Deposit (6-inch)	$3,000.00
11	Construction Meter Relocation	$23.00
12	Meter Test Requests (3/4-inch to 2-inch)	$50.00
13	Meter Test Requests (3-inch and larger)	$100.00
14	Floating Meter "No Read" Penalty	$100.00
15	Construction Meter Location Penalty	$150.00
16	Unmetered Water Accounts	$52.00
17	Meter Obstruction Charge	$77.00
18	Meter Relocation Deposit (3/4-inch to 2-inch)	$2,000.00
19	Meter Downsize Deposit (3/4-inch to 2-inch MJ and Turbo)	$1,300.00
20	**Drop-In Meter Installations**	
	Meter w/Double Checks	
	¾-inch MJ-Single	$288.00
	¾-inch MJ-Multiple	$164.00
	1-inch MJ	$446.00
	1-1/2-inch MJ	$822.00
	2-inch MJ	$1,057.00
	2-inch Turbo	$1,150.00
	Meter w/Pressure Regulator and Double Checks	
	¾-inch MJ-Single	$411.00
	¾-inch MJ-Multiple	$288.00
	1-inch MJ	$592.00

	FEE FOR SERVICE SCHEDULE (cont) DESCRIPTION OF SERVICE	FEE/DEPOSIT
20	**Drop-In Meter Installations (cont)**	
	Meter w/Pressure Regulator and Double Checks (cont)	
	1-1/2-inch MJ	$1,385.00
	2-inch MJ	$1,661.00
	2-inch Turbo	$1,732.00
21	**Full Meter Installations**	
	Meter w/Double Checks	
	¾-inch MJ-Single	$3,890.00
	1-inch MJ	$3,963.00
	1-1/2-inch MJ	$4,378.00
	2-inch MJ	$4,727.00
	2-inch Turbo	$4,804.00
	Meter w/Pressure Regulator and Double Checks	
	¾-inch MJ-Single	$3,969.00
	1-inch MJ	$4,101.00
	1-1/2-inch MJ	$4,934.00
	2-inch MJ	$5,381.00
	2-inch Turbo	$5,404.00
22	Plans and Specifications	$50.00
23	Topos	$25.00
24	Topo Mylars	$50.00
25	Topo w/Aerial	$35.00
26	Blacklines (previously referred to as blueline copies)	$12.00
27	Facility Design Requirements	$25.00
28	Plan Checks (minimum 1,000 feet)	$1,000.00
	Per 100 feet thereafter	$50.00
29	Inspection Deposits (minimum 1,000 feet)	$3,630.00
	Per 1 foot thereafter	$3.63
30	As-Built Fee (per page) w/Inspection Deposit	$125.00
31	Miscellaneous Appurtenance, Plan Check & Inspections Deposit	
	(per 2 count)	$1,500.00
32	Inspection of Detector Checks	$2,500.00
	¾-inch Meter	$86.00
33	**RP Device**	
	Initial Certification Fee	$109.00
	Recertification Fee	$150.00
34	Potable Construction Water	$2.019/HCF
35	Application Processing Fee (non-refundable)	$50.00
36	Service Connection Fee Estimate	$167.00

FEE FOR SERVICE SCHEDULE (cont)		
	DESCRIPTION OF SERVICE	FEE/DEPOSIT
37	Bond Split Deposit	$1,500.00
	Per Parcel	$35.00
38	Sewer Lateral Sampling Wyes/Inspection, etc.	$155.00
39	Non-Compliance Sampling	$105.00
40	Non-Compliance Inspection	$130.00
41	Non-Compliance Inspection/Meeting	$210.00
42	Transfer Set-Up Charge	$23.00
43	Delinquent Accounts (% x Balance) 1st 30 days	Greater of $5 or 10%
	Each 30 Days Thereafter	$0.02
44	DTO's (Turn service back on after shut-off for non-payment)	
	M-F 8 a.m. to 5 p.m.	$46.00
	M-F after 5 p.m.; Weekends and Holidays	$109.00
45	Credit Card Convenience Fee	2.5% of transaction total
46	Non-Sufficient Funds/NSF Returned Check Fee	$25.00
47	Cutting District lock or straight-lining across meter (previously referred to as Lock Off Vandalism Penalty)	$125.00
48	Cutting Angle Meter (AM) Stop from Meter	$125.00
49	Replacement of pulled meter resulting from customer cutting lock a second time	$100.00
50	Illegal Hydrant Use	$600.00
51	Witness Fire Flow Test	$200.00
52	**Fire Service Charge for Industrial/Commercial w/Water Meter**	
	0-30,000 sq. ft. (charged on water bill)	$0.002/sq. ft.
	Over 30,000 sq. ft. (charged on water bill)	$0.001/sq. ft.
	Annual Fee Per Acre or Per Parcel if Less than 1 Acre	$40.00

Appendix B
RCWD Water Conservation Program, Shortage Plan and Waste of Water Prohibition

RESOLUTION NO. 91-5-8

RESOLUTION OF THE BOARD OF DIRECTORS OF RANCHO CALIFORNIA WATER DISTRICT, RIVERSIDE COUNTY, CALIFORNIA, ESTABLISHING A WATER CONSERVATION PROGRAM AND AMENDING RESOLUTION NO. 91-2-3

WHEREAS, the Board of Directors of Rancho California Water District is concerned about the possibility of a general water supply shortage, inadequate aqueduct capacity, and the prospect of a major disaster affecting distribution facilities;

WHEREAS, the Board of Directors of Rancho California Water District, in order to meet the demands of its customers in the event of a shortage, deem it necessary to establish water conservation guidelines.

NOW, THEREFORE, the Board of Directors of Rancho California Water District DOES HEREBY RESOLVE, DETERMINE AND ORDER as follows:

Section 1. Amend Resolution No. 91-2-3. This resolution hereby amends Resolution No. 91-2-3, adopted February 8, 1991.

Section 2. Stage I - Normal Condition. (The District is able to meet the water demands of its customers in the immediate future.)

1. When the General Manager has declared that the District's water supply is in a "Normal Condition," customers are requested to use water wisely and to practice water conservation measures so that water is not wasted.

2. Customers are to avoid use of water in a manner that creates runoff or drainage onto adjacent properties or onto public or private roadways.

3. Water waste is a violation of California Law and District Regulations at any time. Refer to Ordinance No. 88-8-1, as amended by Ordinance No. 91-1-2.

Section 3. Stage II - Water Alert. (There is a probability that the District will not be able to meet all of the water demands of its customers.)

1. Parks, school grounds, and golf courses are to be watered at night only.

2. Lawns and landscaping are to be watered after 6:00 p.m. and before 6:00 a.m.

3. Driveways, parking lots and other paved surfaces are not to be washed with water.

4. Private vehicles are to be washed with a bucket; hoses must have positive shut off nozzles.

5. Commercial car washes must recycle water.

6. Restaurant customers are to receive water only upon request.

7. A limited number of fire hydrant construction meters will be issued by the District. Applicant must present current, valid grading or building permit.

8. Livestock or animals may be watered at any time.

9. Decorative ponds, golf course water hazards which are not an integral part of the permanent irrigation or fire protection system, fountains and other waterscape features are not to be filled. Fountain pumps must remain off to minimize evaporation.

Section 4. Stage III - Water Warning. (The District is not able to meet all of the water demands of its customers).

1. Parks are to be watered at night no more than two times per week.

2. School grounds are to be watered at night no more than two times per week.

3. Golf courses, greens and tees only, are to be watered at night. Fairways may be watered on alternate days at night.

4. Lawns and landscaping are to be watered no more than two times per week after 6:00 p.m. and before 6:00 a.m.

5. Restaurant customers are to receive water only upon request using disposable cups.

6. Driveways, parking lots, or other paved surfaces are not to be washed with water.

7. Swimming pools are not to be filled.

8. Commercial car washes must recycle water.

9. New fire hydrant construction meters will not be issued by the District.

10. Water service through fire hydrant construction meters for grading or other construction is to be used after 5:00 p.m. and before 10:00 a.m.

11. Agricultural customers are to use water on alternate days only.

12. Commercial nurseries are to use water only on alternate days between 6:00 p.m. and 6:00 a.m.

13. Livestock or animals may be watered at any time.

Section 5. Stage IV - Water Emergency. (A major deficiency of any supply or failure of a distribution facility is declared.)

1. Lawns and landscaping are not to be watered.

2. Parks, school grounds and golf course fairways are to be watered with reclaimed water, if available, or not at all. Golf course greens and tees may be watered only on alternate nights.

3. Driveways, parking lots, or other paved surfaces are not to be washed.

4. Commercial car washes using recycled or reclaimed water are to be used for washing vehicles. Consumption of District water for this use must be reduced to 50% of average consumption during the prior year.

5. Restaurant customers are to receive water only upon request, using disposable cups.

6. Swimming pools are not to be filled.

7. New fire hydrant construction meters will not be issued by the District.

8. Water service through fire hydrant construction meters will not be available by the District.

9. Permanent orchard crop irrigation is to be limited to no more than two times per week. In the event of a temporary service outage, agricultural irrigation is to be discontinued.

10. Other agricultural and commercial nursery irrigation is to be discontinued.

11. Livestock or animals may be watered at any time.

ADOPTED, SIGNED AND APPROVED this 17th day of May.

Ralph H. Daily, President of the
Board of Directors of the
Rancho California Water District

ATTEST:

Linda M. Fregoso, Secretary of the
Board of Directors of the
Rancho California Water District

STATE OF CALIFORNIA)
)ss.
COUNTY OF RIVERSIDE)

I, LINDA M. FREGOSO, Secretary of the Board of Directors of Rancho California Water District, do hereby certify that the above and foregoing is a full, true and correct copy of Resolution No. 91-5-8 of said Board, and that the same has not been amended or repealed.

DATED: May 17, 1991

Linda M. Fregoso

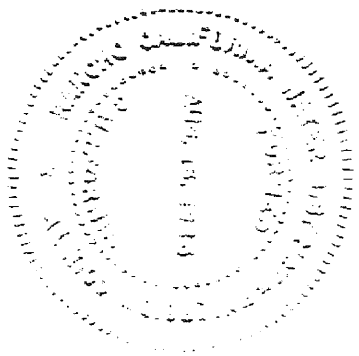
Linda M. Fregoso, Secretary of the
Board of Directors of the
Rancho California Water District

[SEAL]

STATE OF CALIFORNIA)
)ss.
COUNTY OF RIVERSIDE)

I, LINDA M. FREGOSO, Secretary of the Board of Directors of the Rancho California Water District, do hereby certify that the foregoing Resolution No. 91-5-8 was duly adopted by the Board of Directors of said District at an adjourned regular meeting thereof held on the 17th day of May, 1991, and that it was so adopted by the following vote:

AYES:	DIRECTORS:	Daily, Darby, Ko, Kulberg, Silla, Steffey
NOES:	DIRECTORS:	None
ABSENT:	DIRECTORS:	Minkler
ABSTAIN:	DIRECTORS:	None



Linda M. Fregoso

Linda M. Fregoso, Secretary of the
Board of Directors of the
Rancho California Water District

(SEAL)

RESOLUTION NO. 91-2-3

RESOLUTION OF THE BOARD OF DIRECTORS OF RANCHO CALIFORNIA WATER DISTRICT, RIVERSIDE COUNTY, CALIFORNIA, ESTABLISHING A WATER CONSERVATION PROGRAM AND AMENDING RESOLUTION NO. 91-1-3

WHEREAS, the Board of Directors of Rancho California Water District is concerned about the possibility of a general water supply shortage, inadequate aqueduct capacity, and the prospect of a major disaster affecting distribution facilities;

WHEREAS, the Board of Directors of Rancho California Water District, in order to meet the demands of its customers in the event of a shortage, deem it necessary to establish water conservation guidelines.

NOW, THEREFORE, the Board of Directors of Rancho California Water District DOES HEREBY RESOLVE, DETERMINE AND ORDER as follows:

Section 1. Amend Resolution No. 91-1-3. This resolution hereby amends Resolution No. 91-1-3, adopted January 11, 1991.

Section 2. Stage I - Normal Condition. (The District is able to meet the water demands of its customers in the immediate future.)

1. When the General Manager has declared that the District's water supply is in a "Normal Condition," customers are requested to use water wisely and to practice water conservation measures so that water is not wasted.

2. Customers are to avoid use of water in a manner that creates runoff or drainage onto adjacent properties or onto public or private roadways.

3. Water waste is a violation of California Law and District Regulations at any time. Refer to Ordinance No. 88-8-1, as amended by Ordinance No. 91-1-2.

Section 3. Stage II - Water Alert. (There is a probability that the District will not be able to meet all of the water demands of its customers.)

1. Parks, school grounds, and golf courses are to be watered at night only.

2. Lawns and landscaping are to be watered after 6:00 p.m. and before 6:00 a.m.

3. Driveways, parking lots and other paved surfaces are not to be washed with water.

4. Private vehicles are to be washed with a bucket; hoses must have positive shut off nozzles.

5. Commercial car washes must recycle water.

6. Restaurant customers are to receive water only upon request.

7. New fire hydrant construction meters will not be issued by the District.

8. Water service through fire hydrant construction meters for grading or other construction purposes is to be used after 5:00 p.m. and before 10:00 a.m.

9. Commercial nurseries are to use water between 6:00 p.m. and 6:00 a.m.

10. Livestock or animals may be watered at any time.

11. Decorative ponds, golf course water hazards which are not an integral part of the permanent irrigation or fire protection system, fountains and other waterscape features are not to be filled or replenished. Fountain pumps must remain off to minimize evaporation.

Section 4. Stage III - Water Warning. (The District is not able to meet all of the water demands of its customers).

1. Parks are to be watered at night no more than two times per week.

2. School grounds are to be watered at night no more than two times per week.

3. Golf courses, greens and tees only, are to be watered at night. Fairways may be watered on alternate days at night.

4. Lawns and landscaping are to be watered no more than two times per week after 6:00 p.m. and before 6:00 a.m.

5. Restaurant customers are to receive water only upon request using disposable cups.

6. Driveways, parking lots, or other paved surfaces are not to be washed with water.

7. Swimming pools are not to be filled.

8. Commercial car washes must recycle water.

9. New fire hydrant construction meters will not be issued by the District.

10. Water service through fire hydrant construction meters for grading or other construction is to be used after 5:00 p.m. and before 10:00 a.m.

11. Agricultural customers are to use water on alternate days only.

12. Commercial nurseries are to use water only on alternate days between 6:00 p.m. and 6:00 a.m.

13. Livestock or animals may be watered at any time.

Section 5. Stage IV - Water Emergency. (A major deficiency of any supply or failure of a distribution facility is declared.)

1. Lawns and landscaping are not to be watered.

2. Parks, school grounds and golf course fairways are to be watered with reclaimed water, if available, or not at all. Golf course greens and tees may be watered only on alternate nights.

3. Driveways, parking lots, or other paved surfaces are not to be washed.

4. Commercial car washes using recycled or reclaimed water are to be used for washing vehicles. Consumption of District water for this use must be reduced to 50% of average consumption during the prior year.

5. Restaurant customers are to receive water only upon request, using disposable cups.

6. Swimming pools are not to be filled.

7. New fire hydrant construction meters will not be issued by the District.

8. Water service through fire hydrant construction meters will not be available by the District.

9. Permanent orchard crop irrigation is to be limited to no more than two times per week. In the event of a temporary service outage, agricultural irrigation is to be discontinued.

10. Other agricultural and commercial nursery irrigation is to be discontinued.

11. Livestock or animals may be watered at any time.

ADOPTED, SIGNED AND APPROVED this 8th day of February.

Ralph H. Daily, President of the
Board of Directors of the
Rancho California Water District

ATTEST:

Linda M. Fregoso, Secretary of the
Board of Directors of the
Rancho California Water District

RESOLUTION NO. 91-1-3

RESOLUTION OF THE BOARD OF DIRECTORS OF RANCHO CALIFORNIA WATER DISTRICT, RIVERSIDE COUNTY, CALIFORNIA, ESTABLISHING A WATER CONSERVATION PROGRAM AND RESCINDING RESOLUTION NO. 88-4-4

WHEREAS, the Board of Directors of Rancho California Water District is concerned about the possibility of a general water supply shortage, inadequate aqueduct capacity, and the prospect of a major disaster affecting distribution facilities;

WHEREAS, the Board of Directors of Rancho California Water District, in order to meet the demands of its customers in the event of a shortage, deem it necessary to establish water conservation guidelines.

NOW, THEREFORE, the Board of Directors of Rancho California Water District DOES HEREBY RESOLVE, DETERMINE AND ORDER as follows:

Section 1. Rescind Resolution No. 88-4-4. This resolution hereby rescinds and supersedes Resolution No. 88-4-4, adopted April 8, 1988.

Section 2. Stage I - Normal Condition. (The District is able to meet the water demands of its customers in the immediate future.)

1. When the General Manager has declared that the District's water supply is in a "Normal Condition," customers are requested to use water wisely and to practice water conservation measures so that water is not wasted.

2. Customers are to avoid use of water in a manner that creates runoff or drainage onto adjacent properties or onto public or private roadways.

3. Water waste is a violation of California Law and District Regulations at any time. Refer to Ordinance No. 88-8-1, as amended by Ordinance No. 91-1-2.

Section 3. Stage II - Water Alert. (There is a probability that the District will not be able to meet all of the water demands of its customers.)

1. Parks, school grounds, and golf courses are to be watered at night only.

2. Lawns and landscaping are to be watered after 6:00 p.m. and before 6:00 a.m.

3. Driveways, parking lots and other paved surfaces are not to be washed with water.

4. Private vehicles are to be washed with a bucket; hoses must have positive shut off nozzles.

5. Commercial car washes must recycle water.

6. Restaurant customers are to receive water only upon request.

7. New construction meters will not be issued by the District.

8. Water service through construction meters for grading or other construction purposes is to be used after 5:00 p.m. and before 10:00 a.m.

9. Commercial nurseries are to use water between 6:00 p.m. and 6:00 a.m.

10. Livestock or animals may be watered at any time.

11. Decorative ponds, golf course water hazards which are not an integral part of the permanent irrigation or fire protection system, fountains and other waterscape features are not to be filled or replenished. Fountain pumps should remain off to minimize evaporation.

Section 4. Stage III - Water Warning. (The District is not able to meet all of the water demands of its customers).

1. Parks are to be watered at night no more than two times per week.

2. School grounds are to be watered at night no more than two times per week.

3. Golf courses, greens and tees only, are to be watered at night. Fairways may be watered on alternate days at night.

4. Lawns and landscaping are to be watered no more than two times per week after 6:00 p.m. and before 6:00 a.m.

5. Restaurant customers are to receive water only upon request using disposable cups.

6. Driveways, parking lots, or other paved surfaces are not to be washed with water.

7. Swimming pools are not to be filled.

8. Commercial car washes must recycle water.

9. New construction meters will not be issued by the District.

10. Water service through construction meters for grading or other construction is to be used after 5:00 p.m. and before 10:00 a.m.

11. Agricultural customers are to use water on alternate days only.

12. Commercial nurseries are to use water only on alternate days between 6:00 p.m. and 6:00 a.m.

13. Livestock or animals may be watered at any time.

Section 5. Stage IV - Water Emergency. (A major deficiency of any supply or failure of a distribution facility is declared.)

1. Lawns and landscaping are not to be watered.

2. Parks, school grounds and golf course fairways are to be watered with reclaimed water, if available, or not at all. Golf course greens and tees may be watered no more than two times per week.

3. Driveways, parking lots, or other paved surfaces are not to be washed.

4. Commercial car washes using recycled or reclaimed water are to be used for washing vehicles. Consumption of District water for this use must be reduced to 50% of average consumption during the prior year.

5. Restaurant customers are to receive water only upon request, using disposable cups.

6. Swimming pools are not to be filled.

7. New construction meters will not be issued by the District.

8. Water service through construction meters will not be available by the District.

9. Permanent orchard crop irrigation is to be limited to no more than two times per week. In the event of a temporary service outage, agricultural irrigation is to be discontinued.

10. Other agricultural and commercial nursery irrigation is to be discontinued.

11. Livestock or animals may be watered at any time.

ADOPTED, SIGNED AND APPROVED this 11th day of January, 1991.

Ralph H. Daily, President of the
Board of Directors of the
Rancho California Water District

ATTEST:

Linda M. Fregoso, Secretary of the
Board of Directors of the
Rancho California Water District

RESOLUTION NO. 90-10-3

RESOLUTION OF THE BOARD OF DIRECTORS OF RANCHO CALIFORNIA WATER DISTRICT, RIVERSIDE COUNTY, CALIFORNIA, AMENDING RESOLUTION NO. 88-4-4 ESTABLISHING A WATER CONSERVATION PROGRAM AND RESCINDING RESOLUTION NO. 88-8-5

WHEREAS, on April 8, 1988, the Board of Directors of Rancho California Water District adopted Resolution No. 88-4-4 establishing a water conservation program; and

WHEREAS, the District Staff has recommended changes in the Water Conservation Program; and

NOW, THEREFORE, the Board of Directors of Rancho California Water District DOES HEREBY RESOLVE, DETERMINE AND ORDER as follows:

Section 1. Resolution No. 88-8-5 is hereby rescinded.

Section 2. Resolution No. 88-4-4, as amended herein, shall remain in full force and effect.

Section 3. Paragraph No. 11 is added to Item 2 Stage II Water Alert to read as follows:

11. Decorative ponds, golf course water hazards which are not an integral part of the permanent irrigation or fire protection system, fountains and other waterscape features are not to be filled or replenished. Fountain pumps should remain off to minimize evaporation.

Section 4. Paragraphs Nos. 3, 4 and 11 of Item 3 Stage III Water Warning are amended to read as follows:

3. Golf courses, greens and tees only, are to be watered at night. Fairways may be watered on alternate days at night.

4. Lawns and landscaping are to be watered on alternate days after 5:00 p.m. and before 10:00 a.m. If address ends with an even number, water on even days; if address ends with an odd number, water on odd days.

11. Agricultural customers are to use water on alternate days between 12:00 midnight and noon of the following day. If address ends with an even number, water on even days; if address ends with an odd number, water on odd days.

Section 5. Paragraphs Nos. 2 and 9 of Item 4 Stage IV Water Emergency are amended to read as follows:

2. Parks, school grounds and golf course fairways are to be watered with reclaimed water, if available, or not at all. Golf course greens may be watered in accordance with Item No. 9.

9. Permanent orchard crop irrigation is to be limited to alternate days between 12:00 midnight and 6:00 a.m. of the following day. If address ends with an even number, water on even days; if address ends with an odd number, water on odd days. In the event of a temporary service outage, agricultural irrigation is to be discontinued.

Section 6. The General Manager is hereby authorized to prepare a revised version of Resolution No. 88-4-4, as amended, for use in District programs.

ADOPTED, SIGNED AND APPROVED this 12th day of October, 1990.

Jeffrey L. Minkler, President of the
Board of Directors of the
Rancho California Water District

ATTEST:

Linda M. Fregoso, Secretary of the
Board of Directors of the
Rancho California Water District

STATE OF CALIFORNIA)
)ss.
COUNTY OF RIVERSIDE)

I, LINDA M. FREGOSO, Secretary of the Board of Directors of the Rancho California Water District, do hereby certify that the foregoing Resolution No. 90-10-3 was duly adopted by the Board of Directors of said District at an adjourned meeting thereof held on the 12th day of October, 1990, and that it was so adopted by the following vote:

AYES:	DIRECTORS:	Daily, Darby, Ko, Minkler, Silla, Steffey
NOES:	DIRECTORS:	None
ABSENT:	DIRECTORS:	Kulberg
ABSTAIN:	DIRECTORS:	None

Linda M. Fregoso

Linda M. Fregoso, Secretary of the
Board of Directors of the
Rancho California Water District

(SEAL)

STATE OF CALIFORNIA)
)ss.
COUNTY OF RIVERSIDE)

I, LINDA M. FREGOSO, Secretary of the Board of Directors of Rancho California Water District, do hereby certify that the above and foregoing is a full, true and correct copy of Resolution No. 90-10-3 of said Board, and that the same has not been amended or repealed.

DATED: October 12, 1990

Linda M. Fregoso, Secretary of the
Board of Directors of the
Rancho California Water District

[SEAL]

STATE OF CALIFORNIA)
)ss.
COUNTY OF RIVERSIDE)

I, LINDA M. FREGOSO, Secretary of the Board of Directors of Rancho California Water District, do hereby certify that the above and foregoing is a full, true and correct copy of Resolution No. 90-10-3 of said Board, and that the same has not been amended or repealed.

DATED: October 12, 1990

Linda M Fregoso

Linda M. Fregoso, Secretary of the
Board of Directors of the
Rancho California Water District

[SEAL]

STATE OF CALIFORNIA)
)ss.
COUNTY OF RIVERSIDE)

I, LINDA M. FREGOSO, Secretary of the Board of Directors of Rancho California Water District, do hereby certify that the above and foregoing is a full, true and correct copy of Resolution No. 90-10-3 of said Board, and that the same has not been amended or repealed.

DATED: October 12, 1990

Linda M Fregoso

Linda M. Fregoso, Secretary of the
Board of Directors of the
Rancho California Water District

[SEAL]

RESOLUTION NO. 88-4-4

RESOLUTION OF THE BOARD OF DIRECTORS OF RANCHO CALIFORNIA WATER DISTRICT, RIVERSIDE COUNTY, CALIFORNIA, ESTABLISHING A WATER CONSERVATION PROGRAM

WHEREAS, the Board of Directors of Rancho California Water District is concerned about the possibility of a general water supply shortage, inadequate aqueduct capacity, and the prospect of a major disaster affecting distribution facilities;

WHEREAS, the Board of Directors of Rancho California Water District, in order to meet the demands of its customers in the event of a shortage, deem it necessary to establish water conservation guidelines.

NOW, THEREFORE, the Board of Directors of Rancho California Water District DOES HEREBY RESOLVE, DETERMINE AND ORDER as follows:

ITEM 1: STAGE I - NORMAL CONDITION. (The District is able to meet the water demands of its customers in the immediate future).

1. When the General Manager has declared that the District's water supply is in a "Normal Condition," customers are requested to use water wisely and to practice water conservation measures so that water is not wasted.

2. Customers are to avoid use of water in a manner that creates runoff or drainage onto adjacent properties or onto public or private roadways.

ITEM 2: STAGE II - WATER ALERT. (There is a probability that the District will not be able to meet all of the water demands of its customers).

1. Parks, school grounds and golf courses are to be watered at night only.

2. Lawns and landscaping are to be watered after 5:00 p.m. and before 10:00 a.m.

3. Driveways, parking lots and other paved surfaces are not to be washed with water.

4. Private vehicles are to be washed with a bucket only; hoses are not to be used.

5. Restaurant customers are to receive water only upon request, to be served in disposable cups or glasses.

6. Filling of swimming pools is to be limited to once every fifth day.

7. New construction meters will not be issued by the District.

8. Water service through construction meters for grading or other construction purposes is to be used after 5:00 p.m. and before 10:00 a.m.

9. Agricultural customers and commercial nurseries are to use water between 12:00 midnight and noon of the following day.

10. Livestock or animals may be watered at any time.

ITEM 3. STAGE III - WATER WARNING. (The District is not able to meet all of the water demands of its customers).

1. Parks are to be watered at night on even numbered days.

2. School grounds are to be watered at night on odd numbered days.

3. Golf courses, greens only, are to be watered at night.

4. Lawns and landscaping are to be watered on alternate days after 5:00 p.m. and before 10:00 a.m. If house number ends with an even number, water on even days; if house number ends with an odd number, water on odd days.

5. Restaurant customers are to receive water only upon request, using disposable cups.

6. Driveways, parking lots, or other paved surfaces are not to be watered.

7. Swimming pools are not to be filled.

8. Commercial car washes are to be used for washing private vehicles.

9. New construction meters will not be issued by the District.

10. Water service through construction meters for grading or other construction is to be used after 5:00 p.m. and before 10:00 a.m.

11. Agricultural customers are to use water on alternate days between 12:00 midnight and noon of the following day. If house number ends with an even number, water on even days; if house number ends with an odd number, water on odd days.

12. Commercial nurseries are to use water only between 6:00 a.m. and 6:00 p.m.

13. Livestock or animals may be watered at any time.

ITEM 4. STAGE IV - WATER EMERGENCY. (A major failure of any supply of distribution facility is declared).

1. Lawns and landscaping are not to be watered.

2. Parks, school grounds and golf courses are to be watered with reclaimed water.

3. Driveways, parking lots, or other paved surfaces are not to be washed.

4. Commercial car washes using recycled or reclaimed water are to be used for washing vehicles.

5. Restaurant customers are to receive water only upon request, using disposable cups.

6. Swimming pools are not to be filled.

7. New construction meters will not be issued by the District.

8. Water service through construction meters will not be available by the District.

9. Citrus and avocado trees and grapevine irrigation is to be limited to alternate days between 12:00 midnight and 6:00 a.m. of the following day. If house number ends with an even number, water on even days; if house number ends with an odd number, water on odd days. In the event of a temporary service outage, agricultural irrigation is to be discontinued.

10. Other agricultural and commercial nursery irrigation is to be discontinued.

11. Livestock or animals may be watered at any time.

ADOPTED, SIGNED AND APPROVED this 8th day of April, 1988.

Richard D. Steffey, President of the
Rancho California Water District
Board of Directors

ATTEST:

Stan T. Mills, Assistant Secretary
Rancho California Water District
Board of Directors

STATE OF CALIFORNIA)
)
COUNTY OF RIVERSIDE)

I, DORIS V. BAKER, Secretary of the Board of Directors of Rancho California Water District, do hereby certify that the above and foregoing is a full, true and correct copy of Resolution No. 88-4-4 of said Board, and that the same has not been amended or repealed.

DATED: January 24, 1989

Doris V. Baker

Doris V. Baker, Secretary of the Rancho California Water District and of the Board of Directors Thereof

[SEAL]

STATE OF CALIFORNIA)
)
COUNTY OF RIVERSIDE)

I, DORIS V. BAKER, Secretary of the Board of Directors of Rancho California Water District, do hereby certify that the foregoing resolution was duly adopted by the Board of Directors of said District at a duly called meeting thereof held on the 8th day of April, 1988, and that it was so adopted by the following vote:

AYES:	DIRECTORS:	Daily, Darby, Kulberg, Lundin, Minkler, Rowe, Steffey
NOES:	DIRECTORS:	None
ABSTAIN:	DIRECTORS:	None
ABSENT:	DIRECTORS:	None

Doris V. Baker

Doris V. Baker, Secretary of the Rancho California Water District and of the Board of Directors Thereof

[SEAL]

REVISED 10/12/90 BY RESOLUTION NO. 90-10-3

RESOLUTION NO. 88-4-4

RESOLUTION OF THE BOARD OF DIRECTORS OF RANCHO CALIFORNIA WATER DISTRICT, RIVERSIDE COUNTY, CALIFORNIA, ESTABLISHING A WATER CONSERVATION PROGRAM

WHEREAS, the Board of Directors of Rancho California Water District is concerned about the possibility of a general water supply shortage, inadequate aqueduct capacity, and the prospect of a major disaster affecting distribution facilities;

WHEREAS, the Board of Directors of Rancho California Water District, in order to meet the demands of its customers in the event of a shortage, deem it necessary to establish water conservation guidelines.

NOW, THEREFORE, the Board of Directors of Rancho California Water District DOES HEREBY RESOLVE, DETERMINE AND ORDER as follows:

Section 1. Stage I - Normal Condition. (The District is able to meet the water demands of its customers in the immediate future.)

1. When the General Manager has declared that the District's water supply is in a "Normal Condition," customers are requested to use water wisely and to practice water conservation measures so that water is not wasted.

2. Customers are to avoid use of water in a manner that creates runoff or drainage onto adjacent properties or onto public or private roadways.

Section 2. Stage II - Water Alert. (There is a probability that the District will not be able to meet all of the water demands of its customers.)

1. Parks, school grounds, and golf courses are to be watered at night only.

2. Lawns and landscaping are to be watered after 5:00 p.m. and before 10:00 a.m.

3. Driveways, parking lots and other paved surfaces are not to be washed with water.

4. Private vehicles are to washed with a bucket only; hoses are not to be used.

5. Restaurant customers are to receive water only upon request, to be served in disposable cups or glasses.

6. Filling of swimming pools is to be limited to once every fifth day.

7. New construction meters will not be issued by the District.

8. Water service through construction meters for grading or other construction purposes is to be used after 5:00 p.m. and before 10:00 a.m.

9. Agricultural customers and commercial nurseries are to use water between 12:00 midnight and noon of the following day.

10. Livestock or animals may be watered at any time.

11. Decorative ponds, golf course water hazards which are not an integral part of the permanent irrigation or fire protection system, fountains and other waterscape features are not to be filled or replenished. Fountain pumps should remain off to minimize evaporation.

Section 3. Stage III - Water Warning. (The District is not able to meet all of the water demands of its customers).

1. Parks are to watered at night on even numbered days.

2. School grounds are to be watered at night on odd numbered days.

3. Golf courses, greens and tees only, are to be watered at night. Fairways may be watered on alternate days at night.

4. Lawns and landscaping are to be watered on alternate days after 5:00 p.m. and before 10:00 a.m. If address ends with an even number, water on even days; if address ends with an odd number, water on odd days.

5. Restaurant customers are to receive water only upon request using disposable cups.

6. Driveways, parking lots, or other paved surfaces are not to be watered.

7. Swimming pools are not to be filled.

8. Commercial car washes are to be used for washing private vehicles.

9. New construction meters will not be issued by the District.

10. Water service through construction meters for grading or other construction is to be used after 5:00 p.m. and before 10:00 a.m.

11. Agricultural customers are to use water on alternate days between 12:00 midnight and noon of the following day. If address ends with an even number, water on even days; if address ends with an odd number, water on odd days.

12. Commercial nurseries are to use water only between 6:00 a.m. and 6:00 p.m.

13. Livestock or animals may be watered at any time.

Section 4. Stage IV - Water Emergency. (A major failure of any supply of distribution facility is declared.)

1. Lawns and landscaping are not to be watered.

2. Parks, school grounds and golf course fairways are to be watered with reclaimed water, if available, or not at all. Golf course greens may be watered in accordance with Item No. 9.

3. Driveways, parking lots, or other paved surfaces are not to be washed.

4. Commercial car washes using recycled or reclaimed water are to be used for washing vehicles.

5. Restaurant customers are to receive water only upon request, using disposable cups.

6. Swimming pools are not to be filled.

7. New construction meters will not be issued by the District.

8. Water service through construction meters will not be available by the District.

9. Permanent orchard crop irrigation is to be limited to alternate days between 12:00 midnight and 6:00 a.m. of the following day. If address ends with an even number, water on even days; if address ends with an odd number, water on odd days. In the event of a temporary service outage, agricultural irrigation is to be discontinued.

10. Other agricultural and commercial nursery irrigation is to be discontinued.

11. Livestock or animals may be watered at any time.

ADOPTED, SIGNED AND APPROVED this 12th day of October, 1990.

Jeffrey L. Minkler, President of the
Board of Directors of the
Rancho California Water District

ATTEST:

Linda M. Fregoso, Secretary of the
Board of Directors of the
Rancho California Water District

Appendix C
Public Hearing

Public Hearing

According to Section 10642 of the Urban Water Management Plan Act, each urban water supplier shall encourage the active involvement of diverse, social, cultural and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting the plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon.

In accordance with this provision of the Urban Water Management Plan Act, RCWD advertised the public hearing in two local newspapers:

- The Press-Enterprise – October 24th and 26th
- The Californian – October 24th and 31st

The RCWD Public Hearing was held on November 10th, 2005. In addition, copies of the draft plan were made available for public inspection at the RCWD headquarters for a period of one month prior to adoption.

The following page represents the draft minutes of the RCWD Public Hearing.

ITEM 6. PUBLIC HEARING TO REVIEW AND COMMENT ON THE DRAFT URBAN WATER MANAGEMENT PLAN

Director of Planning Perry Louck introduced Dan Rodrigo of Camp Dresser and McKee (CDM), to present the draft Urban Water Management Plan.

Mr. Rodrigo reported that pursuant to Water Code Section 10610, *et seq.*, *The California Urban Water Management Planning Act*, urban water suppliers providing water for municipal purposes are required to prepare an urban water management plan, update the plan every five (5) years, and file the plan with the California Department of Water Resources.

Mr. Rodrigo advised that the Urban Water Management Plan must address current and future water demands, current and future water supplies, wastewater management and recycled water, water conservation activities, drought planning and shortage contingency, as well as any possible water quality impacts that may affect the reliability of water supply.

Working with District staff, CDM prepared the public draft version of the plan and reported that public notice of the Board of Directors' intent to consider adoption of the Urban Water Management Plan was posted and published in accordance with law.

At this time, Mr. Rodrigo requested that the Board of Directors conduct the public hearing to review and comment on the draft Urban Water Management Plan. Mr. Rodrigo also noted that the final Urban Water Management Plan will be presented to the Board at their December 8, 2005 meeting.

President Ko declared the public hearing open and solicited questions and comments from the audience. There being no public present to comment on the subject, President Ko entertained a motion to close the public hearing.

MOTION: It was moved by Director Daily, seconded by Director Hoagland, to close the public hearing. The motion carried unanimously.

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Appendix D
Adoption of Plan

RESOLUTION NO. 2005-12-3

RESOLUTION OF THE BOARD OF DIRECTORS OF THE RANCHO CALIFORNIA WATER DISTRICT, RIVERSIDE COUNTY, CALIFORNIA, ADOPTING ITS URBAN WATER MANAGEMENT PLAN, DECEMBER 2005

WHEREAS, the California Legislature enacted Assembly Bill 797 during the 1983-1984 Regular Session of the California Legislature (Water Code Section 10610 et. seq.), known as the Urban Water Management Planning Act, which mandates that every urban supplier of water providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre feet of water annually, prepare an Urban Water Management Plan, the primary objective of which is to plan for the conservation and efficient use of water; and

WHEREAS, the proper and cost effective conservation of our water resources is essential to ensuring adequate water supplies now and in the future; and

WHEREAS, water conservation is recognized as an integral part of all water programs; and

WHEREAS, the Rancho California Water District has updated their Urban Water Management Plan (the "Plan") pursuant to the requirements of California Water Code Section 10610 et. seq.; and

WHEREAS, the Plan is the formal document to discuss past, current, and projected water demands; current and alternate water conservation measures; water supply deficiencies; and future water management practices.

NOW THEREFORE BE IT HEREBY RESOLVED, DETERMINED AND ORDERED by the Board of Directors of the Rancho California Water District that:

SECTION 1. The Board of Directors of the Rancho California Water District approves and adopts the updated "Urban Water Management Plan for the Rancho California Water District, December 2005."

SECTION 2. The General Manager is hereby authorized and directed to file the updated Plan with the California Department of Water Resources within 30 days after this date, pursuant to the requirements of California Water Code Section 10610, et. seq.

SECTION 3. The General Manager of the District is authorized and directed to implement the water conservation measures included in the updated Plan as the District's part in the local and regional water conservation effort.

ADOPTED, SIGNED AND APPROVED this 8th day of December 2005.

Ben R. Drake, President of the
Board of Directors of the
Rancho California Water District

ATTEST:

Kelli E. Garcia, Secretary of the
Board of Directors of the
Rancho California Water District

STATE OF CALIFORNIA)
)ss.
COUNTY OF RIVERSIDE)

I, KELLI E. GARCIA, Secretary of the Board of Directors of the Rancho California Water District, do hereby certify that the foregoing Resolution No. 2005-12-3 was duly adopted by the Board of Directors of said District at a regular meeting thereof held on the 8th day of December 2005, and that it was so adopted by the following vote:

AYES:	DIRECTORS:	Corona, Daily, Drake, Herman, McMillan, and Plummer
NOES:	DIRECTORS:	None
ABSENT:	DIRECTORS:	Hoagland
ABSTAIN:	DIRECTORS:	None

Kelli E. Garcia, Secretary of the Board of Directors of the Rancho California Water District

(SEAL)

STATE OF CALIFORNIA)
)ss.
COUNTY OF RIVERSIDE)

I, KELLI E. GARCIA, Secretary of the Board of Directors of the Rancho California Water District, do hereby certify that the above and foregoing is a full, true, and correct copy of Resolution No. 2005-12-3 of said Board, and that the same has not been amended or repealed.

DATED: December 8, 2005

Kelli E. Garcia, Secretary of the Board of Directors of the Rancho California Water District

(SEAL)

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Appendix N2:

Addendum to 2005 Urban Water Management Plan

Addendum to 2005 Update of the Urban Water Management Plan

RANCHO CALIFORNIA WATER DISTRICT

42135 WINCHESTER ROAD
TEMECULA, CA 92590
(951) 296-6900

MARCH 2007

Report Prepared by

Perry Louck
Director of Planning
Rancho California Water District

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SECTION 1

BACKGROUND

Rancho California Water District adopted and submitted its 2005 Urban Water Management Plan update to the California Department of Water Resources in December of 2005. As part of the normal review process, the California Department of Water Resources (DWR) performed a review of the 2005 plan. As a result of this review, DWR requested additional information in the form of a plan addendum.

As a result of this request, staff has worked closely with the DWR staff to ensure that the addendum meets all the requirements of the review process.

SECTION 2

REVIEW NOTES AND RESPONSES

The following items are provided in response to the request for additional information and clarification of data resulting from DWR's review of RCWD's 2005 Urban Water Management Plan.

2.1 Water Sources

Table 4 - Current and Planned Water Supplies – AFY

Review Note - Who are the wholesale agency or agencies?

See amended table 4 attached

2.1.2 Groundwater Sources

Does the District have a Groundwater Management plan ?

Need description of basin – ***See Basin description attached***

Provide a copy of the order or decree – ***See copy of the 1940 Stipulated Judgment attached***

Need GW amounts for 2000 – 2004 - ***See amended Table 6 attached***

2.1.3 Reliability of Supply

Need supply for Normal, single dry and multiple dry years – ***See amended Table 8 attached***

2.1.4 District is a CUWCC signatory

Provide copy of 2005 report- ***Copy of 2005 and 2006 reports are attached***

2.1.5 Wholesaler Supplies

Table 19 - Agency demand projections provided to wholesale suppliers – AFY – ***See amended Table attached***

Table 20- Wholesaler identified & quantified the existing and planned sources of water- AFY – ***See amended Table 20 attached***

Table 21 - Wholesale Supply Reliability - % of normal AFY – ***See amended Table 21 attached***

2.1.6 Supply Reliablity

Need 5th multiple dry year as per page 8-3 – ***See amended Table 21 attached***

Table 23 - Water Supply Shortage Stages and Conditions – ***See amended table 23 attached***

Table 27 - Consumption Reduction Methods – ***See copy of Water shortage Contingency Plan attached***

2.1.7 Review of Implementation of 2000 UWMP

Provide Review of implementation of 2000 UWMP

As a result of the Rancho California Water District completing and adopting its Regional Integrated Resources Plan (RIRP) in October 2005, the implementation plans identified in the 2000 UWMP have been put on hold. Resulting from the completion of the RIRP and the District becoming a CUWCC signatory after the 2000 UWMP plan was adopted, the District's resource supply and conservation plans changed dramatically as reflected in the 2005 UWMP. The District also adopted a Water Shortage contingency plan and a Tier 2 targeted water conservation program that superseded the conservation plans identified in the 2000 UWMP. In regards to the Resource plans identified in the RIRP and the 2005 UWMP, the District has funded and is performing a feasibility study to further the implementation of the resource projects identified in the RIRP.

SECTION 3

ADDENDUM RESOLUTION

RESOLUTION NO. 2007-4-draft

RESOLUTION OF THE BOARD OF DIRECTORS OF RANCHO CALIFORNIA WATER DISTRICT, RIVERSIDE COUNTY, CALIFORNIA, ADOPTING AN ADDENDUM TO ITS URBAN WATER MANAGEMENT PLAN, DECEMBER 2005

WHEREAS, the California Legislature enacted Assembly Bill 797 during the 1983-1984 Regular Session of the California Legislature (Water Code Section 10610 et. seq.), known as the Urban Water Management Planning Act, which mandates that every urban supplier of water providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre feet of water annually, prepare an Urban Water Management Plan, the primary objective of which is to plan for the conservation and efficient use of water; and

WHEREAS, the proper and cost effective conservation of our water resources is essential to ensuring adequate water supplies now and in the future; and

WHEREAS, water conservation is recognized as an integral part of all water programs; and

WHEREAS, The Rancho California Water District has updated their Urban Water Management Plan (the ”Plan”) pursuant to the requirements of California Water Code Section 10610 et. seq.; and

WHEREAS, the Plan is the formal document to discuss past, current, and projected water demands; current and alternate water conservation measures; water supply deficiencies; and future water management practices; and

WHEREAS, the Department of Water Resources has requested Rancho California Water District provide additional information to support the 2005 Urban Water Management Plan.

NOW, THEREFORE, BE IT HEREBY RESOLVED, DETERMINED, AND ORDERED by the Board of Directors of Rancho California Water District that:

SECTION 1. The Board of Directors of Rancho California Water District approves and adopts the addendum to the “Urban Water Management Plan for Rancho California Water District, December 2005.”

SECTION 2. The General Manager is hereby authorized and directed to file the Plan addendum with the California Department of Water Resources within 30 days after this date, pursuant to the requirements of California Water Code Section 10610, et. seq.

ADOPTED, SIGNED, AND APPROVED this 12th day of April 2007.

Stephen J. Corona, President of the
Board of Directors of the
Rancho California Water District

ATTEST:

Kelli E. Garcia, Secretary of the
Board of Directors of the
Rancho California Water District

STATE OF CALIFORNIA)
)ss.
COUNTY OF RIVERSIDE)

I, Kelli E. Garcia, Secretary of the Board of Directors of Rancho California Water District, do hereby certify that the foregoing Resolution No. 2007-__-__ was duly adopted by the Board of Directors of said District at a regular meeting thereof held on the 12th day of April, 2007, and that it was so adopted by the following vote:

AYES: DIRECTORS:

NOES: DIRECTORS:

ABSENT: DIRECTORS:

ABSTAIN: DIRECTORS:

Kelli E. Garcia, Secretary of the
Board of Directors of
Rancho California Water District

(SEAL)

APPENDICES

APPENDIX A

REVISED 2005 URBAN WATER MANAGEMENT PLAN "REVIEW FOR COMPLETENESS" FORM

2005 Urban Water Management Plan "Review for Completeness" Form

Rancho California Water District

(Water Code § 10620 (d)(1)(2))

Yes

[ ] Participated in area, regional, watershed or basin wide plan — Reference & Page Number

Name of plan _____ Lead Agency _____

[X] Describe the coordination of the plan preparation and anticipated benefits. — pg 1-6 — Reference & Page Number

Table 1
Coordination with Appropriate Agencies

Check at least one box on each row	Participated in developing the plan	Commented on the draft	Attended public meetings	Was contacted for assistance	Was sent a copy of the draft plan	Was sent a notice of intention to adopt	Not I
MWD	X		X	X			
Eastern MWD	X		X	X	X		
Western MWD	X		X	X	X		
Other							
Other							

(Water Code §10620 (f))

[X] Describe how water management tools / options maximize resources & minimize need to import water — pg 1-5 / 1-6 — Reference & Page Number

(Water Code § 10621(a))

[X] Date updated and adopted plan received 8-Dec-05 (enter date) — Appx D — Reference & Page Number

(Water Code § 10621(b))

[X] Notify any city or county within service area of UWMP of plan review & revision — Appx C — Reference & Page Number

[X] Consult and obtain comments from cities and counties within service area — Appx C — Reference & Page Number

Water Code § 10631 (a))

[X] Include current and projected population — pg 1-3 — Reference & Page Number

[X] Population projections were based on data from state, regional or local agency — pg 1-3 — Reference & Page Number

Table 2
Population - Current and Projected

	2005	2010	2015	2020	2025	2030 - opt
Service Area Population	109,123	121,324	134,184	145,631	155,772	165,151

[X] Describe climate characteristics that affect water management — pg 1-4 — Reference & Page Number

[X] Describe other demographic factors affecting water management — pg 1-4 — Reference & Page Number

Table 3
Climate

	January	February	March	April	May	June
Standard Average ETo	2.3	3.24	4.14	5.01	6.47	6.98
Average Rainfall	2.33	2.31	1.38	0.65	0.17	0.02
Average Temperature	65.4	67.9	71	76.5	82	90.6

Table 3 (continued)
Climate

	July	August	September	October	November	December
Average ETo	7.92	7.58	5.79	4.2	2.64	2.26

Average Rainfall	0.07	0.1	0.24	0.4	1.03	1.63	
Average Temperature	98.2	98.3	93.4	83.8	73.6	66.8	

(Water Code § 10631 (b))

X	Identify existing and planned water supply sources	pg 2-1	Reference & Page Number
X	Provide current water supply quantities	pg 2-1	Reference & Page Number
X	Provide planned water supply quantities	pg 2-12	Reference & Page Number

Table 4
Current and Planned Water Supplies - AFY

Water Supply Sources	2005	2010	2015	2020	2025	
Water purchased from:						
U.S. Bureau of Reclamation						
Department of Water Resources						
Arcade Water District						
Calleguas Municipal Water District						
Castaic Lake Water Agency						
Central Basin Municipal Water District						
Chino Basin Municipal Water District						
Coastal Municipal Water District						
Contra Costa Water District						
Eastern Municipal Water District	16,000	16,310	24,410	35,010	36,100	
Foothill Municipal Water District						
Humboldt Bay Municipal Water District						
Inland Empire Utilities Agency						
Joint Regional Water Supply System						
Kern County Water Agency						
Metropolitan Water District of Southern Cal						
Municipal Water District of Orange County						
North of The River Municipal Water District						
Placer County Water Agency						
Sacramento County Water Management Dist						
San Diego County Water Authority						
San Francisco City of						
San Juan Water District						
San Luis Obispo County						
Santa Clara Valley Water District						
Solano County Water Agency						
Sonoma County Water Agency						
Stockton East Water District						
Tehachapi-Cummings County Water District						
Three Valleys Municipal Utility District						
Upper San Gabriel Valley Municipal Water						
Water Facilities Authority						
West Basin Municipal Water District						
Western Municipal Water Dist of Riverside	35,000	38,500	36,500	23,500	16,500	

Zone 7						
Other Wholesaler 1 (enter agency name)						
Other Wholesaler 2 (enter agency name)						
Other Wholesaler 3 (enter agency name)						
Supplier produced groundwater	38,000	38,000	38,000	56,000	56,000	
Supplier surface diversions						
Transfers in or out						
Exchanges In or out						
Recycled Water (projected use)	6,700	7,890	9,090	9,890	24,300	
Desalination						
Other						
Other						
Total	**95,700**	**100,700**	**108,000**	**124,400**	**132,900**	

(Water Code §10631 (b)(1-4))

	Has management plan		Reference & Page Number
	Attached management plan (b)(1)		Reference & Page Number
	Description of basin(s) (b)(2)		Reference & Page Number
X	Basin is adjudicated	pg 2-2	Reference & Page Number
	If adjudicated, attached order or decree (b)(2)		Reference & Page Number
	Quantified amount of legal pumping right (b)(2)	N/A	Reference & Page Number

Table 5
Groundwater Pumping Rights - AF Year

Basin Name	Pumping Right - AFY
Total	0

	DWR identified, or projected to be, in overdraft (b)(2)	N/A	Reference & Page Number
	Plan to eliminate overdraft (b)(2)	N/A	Reference & Page Number
	Analysis of location, amount & sufficiency, last five years (b)(3)		Reference & Page Number
X	Analysis of location & amount projected, 20 years (b)(4)	pg 2-13	Reference & Page Number

Table 6
Amount of Groundwater pumped - AFY

Basin Name (s)	2000	2001	2002	2003	2004
Temecula/Pauba	39,096	41,706	41,348	37,188	37,832
% of Total Water Supply	38.82%	38.62%	33.24%	27.98%	28.47%

Table 7
Amount of Groundwater projected to be pumped - AFY

Basin Name(s)	2010	2015	2020	2025	2030 - opt
Pauba	27,766	27,766	45,766	45,766	45,766
South Murrieta	260	260	260	260	260
Lower Mesa	3,646	3,646	3,646	3,646	3,646
North Murrieta	404	404	404	404	404
Wolf Valley	1,566	1,566	1,566	1,566	1,566
San Gertrudis	4,056	4,056	4,056	4,056	4,056

Upper Mesa	76	76	76	76	76
Palomar	226	226	226	226	226
% of Total Water Supply	37.74%	35.19%	45.02%	42.14%	39.89%

(Water Code §10631 (c) (1-3)

	Describes the reliability of the water supply and vulnerability to seasonal or climatic shortage	Reference & Page Number

Table 8
Supply Reliability - AF Year

		Multiple Dry Water Years			
Average / Normal Water Year	**Single Dry Water Year**	**Year 1**	**Year 2**	**Year 3**	**Year 4**
95,700	95,700	95,700	95,700	95,700	95,700
% of Normal	100.0%	100.0%	100.0%	100.0%	100.0%

Table 9
Basis of Water Year Data

Water Year Type	Base Year(s)		
Average Water Year	1954	pg 8-3	Reference & Page Number
Single-Dry Water Year	1989	pg 8-3	Reference & Page Number
Multiple-Dry Water Years	1987 - 1991	pg 8-3	Reference & Page Number

(Water Code §10631 (c))

	Describe the reliability of the water supply due to seasonal or climatic shortages		Reference & Page Number
	Describe the vulnerability of the water supply to seasonal or climatic shortages		Reference & Page Number
X	No unreliable sources	pg 8-6	Reference & Page Number

Table 10
Factors resulting in inconsistency of supply

Name of supply	Legal	Environ-mental	Water Quality	Climatic
Groundwater	x	x	x	x
Imported	x	x	x	x

X	Describe plans to supplement or replace inconsistent sources with alternative sources or DMMs	pg 38	Reference & Page Number
	No inconsistent sources		Reference & Page Number

(Water Code §10631 (d))

	Describe short term and long term exchange or transfer opportunities		Reference & Page Number
X	No transfer opportunities	pg 2-13 / 2-14	Reference & Page Number

Table11
Transfer and Exchange Opportunities - AF Year

Transfer Agency	Transfer or Exchange	Short term	Proposed Quantities	Long term	Proposed Quantities

Total			0		0

(Water Code §10631 (e)(1)(2))

X	Quantify past water use by sector	pg 3-4	Reference & Page Number
X	Quantify current water use by sector	pg 3-4	Reference & Page Number
X	Project future water use by sector	pg 3-4	Reference & Page Number

TABLE 12 - Past, Current and Projected Water Deliveries

	2000				200		
	metered		unmetered		metered		
Water Use Sectors	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	#
Single family		21,700				25,500	
Multi-family		1,400				1,900	
Commercial/Institutional		3,500				4,100	
Industrial							
Government							
Landscape		8,300				8,700	
Agriculture		33,900				35,900	
other							
Total	0	68,800	0	0	0	76,100	

TABLE12 (continued) - Past

	2015				202		
	metered		unmetered		metered		
Water Use Sectors	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	# of accounts	Deliveries AFY	#
Single family		33,000				36,800	
Multi-family		2,800				3,200	
Commercial/Institutional		5,400				6,100	
Industrial							
Government							
Landscape		9,500				9,900	
Agriculture		40,000				41,000	
other							
Total	0	90,700	0	0	0	97,000	

	Identify and quantify sales to other agencies		Reference & Page Number
X	No sales to other agencies	pg 3-5	Reference & Page Number

Table 13
Sales to Other Agencies - AF Year

Water Distributed	2000	2005	2010	2015	2020	
name of agency		0	0	0	0	
name of agency						
name of agency						
Total	0	0	0	0	0	

X	Identify and quantify additional water uses	pg 3-5	Reference & Page Number

Any recycled water was included in table 12 should not be included in table 14.

Table 14
Additional Water Uses and Losses - AF Year

Water Use	2000	2005	2010	2015	2020	
Saline barriers						
Groundwater recharge		13,000	13,000	13,000	23,000	

Conjunctive use						
raw water						
recycled						
Gorge Discharge per water rights agreement		2,500	2,500	2,500	2,500	
Unaccounted-for system losses		1,500	1,700	1,800	1,900	
Total	0	17,000	17,200	17,300	27,400	

Table 15
Total Water Use - AF Year

Water Use	2000	2005	2010	2015	2020
Total of Tables 12, 13, 14	68,800	93,100	100,700	108,000	124,400

(Water Code §10631 (f)

(Water Code §10631 (f) & (g), the 2005 Urban Water Management Plan "Review of DMMs for Completeness" Form is found on Sheet 2

(Water Code §10631 (D359

X	No future water supply projects or programs and no non-implemented / not scheduled DMMs	pg 4-1	Reference & Page Number
	Cost-Benefit includes economic and non-economic factors (environmental, social, health, customer impact, and technological factors)		Reference & Page Number
	Cost-Benefit analysis includes total benefits and total costs		Reference & Page Number
	Identifies funding available for Projects with higher per-unit-cost than DMMs		Reference & Page Number
	Identifies Suppliers' legal authority to implement DMMs, efforts to implement the measures and efforts to identify cost share partners		Reference & Page Number

Table 16
Evaluation of unit cost of water resulting from non-implemented / non-scheduled DMMs and planned water supply project and programs

Non-implemented & Not Scheduled DMM / Planned Water Supply Projects (Name)	Per-AF Cost ($)

(Water Code §10631 (h))

	No future water supply projects or programs		
X	Detailed description of expected future supply projects & programs	pg 2-7 to 2-12	Reference & Page Number
X	Timeline for each proposed project	pg 2-12	Reference & Page Number
X	Quantification of each projects normal yield (AFY)	pg 2-12	Reference & Page Number
X	Quantification of each projects single dry-year yield (AFY)	pg 2-12	Reference & Page Number
X	Quantification of each projects multiple dry-year yield (AFY)	pg 2-12	Reference & Page Number

Table 17
Future Water Supply Projects

Project Name	Projected Start Date	Projected Completion Date	Normal-year AF to agency	Single-dry year yield AF	Multiple-Dry-Year 1 AF	Multiple-Dry-Year 2 AF	Mult
18 new wells	**2020**	**Ongoing**	**18,000**	16,700	16,700	15,900	
MF/RO Facilit for Recycle water	**2025**	**TBA**	13,600	13,600	13,600	13,600	
			31,600	30,300	30,300	29,500	

(Water Code §10631 (i))

X	Describes opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply

[X] No opportunities

Table 18 Opportunities for desalinated water	
Sources of Water	**Check if yes**
Ocean Water	X
Brackish ocean water	X
Brackish groundwater	X
other	
other	

pg 2-14 Reference & Page Number

(Water Code § 10631 (j))

Urban suppliers that are California Urban Water Conservation Council members may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g). The supplier's CUWCC Best Management Practices Report should be attached to the UWMP.

[X] Agency is a CUWCC member — pg 4-1 Reference & Page Number

[ ] 2005 annual updates are attached to plan — Reference & Page Number

[ ] Annual updates are considered completed by CUWCC website — Reference & Page Number

(Water Code §10631 (k))

Yes

[X] Agency receives, or projects receiving, wholesale water — pg 8-4 Reference & Page Number

[ ] Agency provided written demand projections to wholesaler, 20 years — pg 8-4 Reference & Page Number

Table 19 Agency demand projections provided to wholesale suppliers - AFY					
Wholesaler	**2010**	**2015**	**2020**	**2025**	**2030 - opt**
Eastern MWD	29,919	23,169	29,433	32,251	51,584
Western MWD	35,000	22,500	20,500	7,500	3,800

[ ] Wholesaler provided written water availability projections, by source, to agency, 20 years — Reference & Page Number

(if agency served by more than one wholesaler, duplicate this table and provide the source availability for each wholesaler)

Table 20 Wholesaler identified & quantified the existing and planned sources of water- AFY					
Wholesaler sources	**2010**	**2015**	**2020**	**2025**	**2030 - opt**
Eastern MWD	16,310	24,410	35,010	36,100	39,700
Western MWD	38,500	36,500	23,500	16,500	19,500
(source 3)					

[X] Reliability of wholesale supply provided in writing by wholesale agency — pg 8-5 Reference & Page Number

(if agency served by more than one wholesaler, duplicate this table and provide the source availability for each wholesaler)

Table 21 Wholesale Supply Reliability - % of normal AFY						
	Multiple Dry Water Years					
Wholesaler sources	**Single Dry**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
MWD	100	100	100	100	100	100
(source 2)						
(source 3)						

Table 22 Factors resulting in inconsistency of wholesaler's supply				
Name of supply	**Legal**	**Environment**	**Water Quality**	**Climatic**
MWD	X	X	X	X
(source 2)				

(Water Code § 10632)

(Water Code § 10632 (a))

X	Provide stages of action	pg 5-7 to 5-9	Reference & Page Number
X	Provide the water supply conditions for each stage	pg 5-7 to 5-9	Reference & Page Number
	Includes plan for 50 percent supply shortage		Reference & Page Number

Table 23
Water Supply Shortage Stages and Conditions
RATIONING STAGES

Stage No.	Water Supply Conditions	% Shortage
1	Normal condition	0
2	Water Alert	10
3	Water Warning	30
4	Water Emergency	50

(Water Code §10632 (b))

X	Identifies driest 3-year period	pg 5-10	Reference & Page Number
X	Minimum water supply available by source for the next three years	pg 5-10	Reference & Page Number

Table 24
Three-Year Estimated Minimum Water Supply - AF Year

source**	Normal	2006	2007	2008
Imported (MWD)	31,084	34,761	40,226	32,777
Groundwater	38,130	38,931	39,636	39,378
Reclaimed	6,044	6,093	6,161	6,068
Total	75,258	79,785	86,023	78,223

*Note: If reporting after 2005, please change the cc
(Year 1, 2, & 3) to the appropriate years

(Water Code §10632 (c))

X	Provided catastrophic supply interruption plan	pg 5-11/5-12	Reference & Page Number

Table 25
Preparation Actions for a Catastrophe

Possible Catastrophe	Check if Discussed
Regional power outage	X
Earthquake	X
Other (name action)	
Other (name action)	

(Water Code § 10632 (d))

X	List the mandatory prohibitions against specific water use practices during water shortages	pg 5-7 to 5-9	Reference & Page Number

Table 26
Mandatory Prohibitions

Examples of Prohibitions	Stage When Prohibition Becomes Mandatory

Using potable water for street washing	2
No runoff onto hardscape, driveways, streets, or gutters	1
Water at night only parks, school yards & golf courses	2
No fire hydrant meters to be issued	3
No watering lawns	4
Water will only be serve at restaurants when requested	4
Swimming pools are not to be filled	3

(Water Code § 10632 (e))

☐ List the consumption reduction methods the water supplier will use to reduce water use in the most restrictive stages with up to a 50% reduction. _____ Reference & Page Number

Table 27
Consumption Reduction Methods

Consumption Reduction Methods	Stage When Method Takes Effect	Projected Reduction (%)
*****See Water Shortage Contingency Plan attached*****		

(Water Code § 10632 (f))

☒ List excessive use penalties or charges for excessive use pg 5-12 Reference & Page Number

Table 28
Penalties and Charges

Penalties or Charges	Stage When Penalty Takes Effect
Penalty for excess use	1
Charge for excess use	1

(Water Code § 10632 (g))

☒ Describe how actions and conditions impact revenues pg 5-12/5-13 Reference & Page Number

☒ Describe how actions and conditions impact expenditures pg 5-13 Reference & Page Number

X Describe measures to overcome the revenue and expenditure impacts — pg 5-13 — Reference & Page Number

Table 29 Proposed measures to overcome revenue impacts	
Names of measures	**Check if Discussed**
Rate adjustment	X
Development of reserves	X
name of measure	
name of measure	

Table 30 Proposed measures to overcome expenditure impacts	
Names of measures	**Check if Discussed**
Drought Reserves	**X**

(Water Code § 10632 (h))

X Attach a copy of the draft water shortage contingency resolution or ordinance. — Appx B — Reference & Page Number

(Water Code § 10632 (i))

X Provided mechanisms for determining actual reductions — pg 5-13 — Reference & Page Number

Table 31 Water Use Monitoring Mechanisms	
Mechanisms for determining actual reductions	**Type data expected (pop-up?)**
Billing System on a monthly basis	**Actual water use**
Name mechanism	
Name mechanism	

Water Code § 10633

X Describe the coordination of the recycling plan preparation information to the extent available. — pg 6-1 — Reference & Page Number

Table 32 Participating agencies	
	participated
Water agencies	RCWD, MWD
Wastewater agencies	EMWD, WMWD
Groundwater agencies	
Planning Agencies	

(Water Code § 10633 (a))

X Describe the wastewater collection and treatment systems in the supplier's service area — pg 6-1 — Reference & Page Number

X Quantify the volume of wastewater collected and treated — pg 6-2 — Reference & Page Number

Table 33
Wastewater Collection and Treatment - AF Year

Type of Wastewater	2000	2005	2010	2015	2020	
Wastewater collected & treated in service area		18,594	22,655	26,715	29,404	
Volume that meets recycled water standard		18,594	22,655	26,715	29,404	

(Water Code § 10633 (a - d))

X Describes methods of wastewater disposal — pg 6-2 — Reference & Page Number

X Describe the current type, place and use of recycled water — pg 6-4 — Reference & Page Number

☐ None

X Describe and quantify potential uses of recycled water — pg 6-3/6-4 — Reference & Page Number

Table 34
Disposal of wastewater (non-recycled) AF Year

Method of disposal	Treatment Level	2005	2010	2015	2020	
Temascal Creek	Title 22	6,945	9,017	11,089	12,882	
Name of method						
Name of method						
Name of method						
	Total	6,945	9,017	11,089	12,882	

Table 35
Recycled Water Uses - Actual and Potential (AFY)

User type	Treatment Level	2005	2010	2015	2020	
Agriculture	Title 22	194	190	190	190	
Landscape	Title 22	6,497	4,481	5,699	6,917	
Wildlife Habitat						
Wetlands						
Industrial						
Groundwater Recharge	MF/RO	0	35,000	35,000	35,000	
Tolerant Agriculture	**MF/RO**	0	38,000	38,000	38,000	
Other (user type)						
	Total	6,691	77,671	78,889	80,107	

X Determination of technical and economic feasibility of serving the potential uses — pg 6-3 to 6-5 — Reference & Page Number

(Water Code § 10633 (e))

X Projected use of recycled water, 20 years — pg 6-4 — Reference & Page Number

Table 36
Projected Future Use of Recycled Water in Service Area - AF Year

	2010	2015	2020	2025	2030 - opt
Projected use of Recycled Water	7,890	9,090	9,890	24,300	25,200

X Compare UWMP 2000 projections with UWMP 2005 actual (§ 10633 (e)) — pg 6-5 — Reference & Page Number

☐ None

Table 37 Recycled Water Uses - 2000 Projection compared with 2005 actual - AFY		
User type	**2000 Projection for 2005**	**2005 actual use**
Agriculture		
Landscape	4,180	6,497
Wildlife Habitat		
Wetlands		
Industrial		
Groundwater Recharge		
Other (user type)		
Other (user type)		
Total	4,180	6,497

(Water Code § 10633 (f))

X	Describe actions that might be taken to encourage recycled water uses	pg 6-5/6-6	Reference & Page Number
X	Describe projected results of these actions in terms of acre-feet of recycled water used per year	pg 6-5/6-6	Reference & Page Number

Table 38 Methods to Encourage Recycled Water Use					
	AF of use projected to result from this action				
Actions	**2010**	**2015**	**2020**	**2025**	
Financial incentives	7,890	9,090	9,890	24,300	
name of action					
name of action					
name of action					
name of action					
name of action					
name of action					
name of action					
Total	7,890	9,090	9,890	24,300	

X	Provide a recycled water use optimization plan which includes actions to facilitate the use of recycled water (dual distribution systems, promote recirculating uses)	pg 6-7	Reference & Page Number

(Water Code §10634)

X	Discuss water quality impacts (by source) upon water management strategies and supply reliability	pg 7-1 to 7-8	Reference & Page Number
X	No water quality impacts projected	pg 7-1	Reference & Page Number

Table 39 Current & projected water supply changes due to water quality - percentage						
water source	**2005**	**2010**	**2015**	**2020**	**2025**	**2030 - opt**

(Water Code § 10635 (a))

X	Compare the projected normal water supply to projected normal water use over the next 20 years, in 5-year increments.	pg 8-6	Reference & Page Number

Table 40 Projected Normal Water Supply - AF Year					
(from table 4)	**2010**	**2015**	**2020**	**2025**	**2030 - opt**

Supply	100,700	108,000	124,400	132,900	140,400
% of year 2005	105.2%	112.9%	130.0%	138.9%	146.7%

Table 41
Projected Normal Water Demand - AF Year

(from table 15)	2010	2015	2020	2025	2030 - opt
Demand	100,700	108,000	124,400	132,900	140,400
% of year 2005	108.2%	116.0%	133.6%	142.7%	150.8%

Table 42
Projected Supply and Demand Comparison - AF Year

	2010	2015	2020	2025	2030 - opt
Supply totals	100,700	108,000	124,400	132,900	140400
Demand totals	100,700	108,000	124,400	132,900	140400
Difference	0	0	0	0	0
Difference as % of Supply	0.0%	0.0%	0.0%	0.0%	0.0%
Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	0.0%

(Water Code § 10635 (a))

X Compare the projected single-dry year water supply to projected single-dry year water use over the next 20 years, in 5-year increments. pg 8-7 Reference & Page Number

Table 43
Projected single dry year Water Supply - AF Year

	2010	2015	2020	2025	2030 - opt
Supply	108,215	116,163	133,130	142,377	150,543
% of projected normal	107.5%	107.6%	107.0%	107.1%	

Table 44
Projected single dry year Water Demand - AF Year

	2010	2015	2020	2025	2030 - opt
Demand	108,215	116,163	133,130	142,377	150,543
% of projected normal	107.5%	107.6%	107.0%	107.1%	

Table 45
Projected single dry year Supply and Demand Comparison - AF Year

	2010	2015	2020	2025	2030 - opt
Supply totals	108,215	116,163	133,130	142,377	150,543
Demand totals	108,215	116,163	133,130	142,377	150,543
Difference	0	0	0	0	0
Difference as % of Supply	0.0%	0.0%	0.0%	0.0%	0.0%
Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	0.0%

(Water Code § 10635 (a))

X Project a multiple-dry year period (as identified in Table 9) occurring between 2006-2010 and compare projected supply and demand during those years pg 8-7 Reference & Page Number

Table 46
Projected supply during multiple dry year period ending in 2010 - AF Year

	2006	2007	2008	2009	2010
Supply	93,863	98,501	105,269	99,675	93,872
% of projected normal	98.1%	102.9%	110.0%	104.2%	93.2%

Table 47
Projected demand multiple dry year period ending in 2010 - AFY

	2006	2007	2008	2009	2010
Demand	93,863	98,501	105,269	102,758	99,864
% of projected normal	100.8%	105.8%	113.1%	110.4%	99.2%

Table 48
Projected Supply and Demand Comparison during multiple dry year period ending in 2010- AF Year

	2006	2007	2008	2009	2010
Supply totals	93,863	98,501	105,269	99,675	93,872
Demand totals	93,863	98,501	105,269	102,758	99,864
Difference	0	0	0	(3,083)	(5,992)
Difference as % of Supply	0.0%	0.0%	0.0%	-3.1%	-6.4%
Difference as % of Demand	0.0%	0.0%	0.0%	-3.0%	-6.0%

X Project a multiple-dry year period (as identified in Table 9) occurring between 2011-2015 and compare projected supply and demand during those years — pg 8-8 — Reference & Page Number

Table 49
Projected supply during multiple dry year period ending in 2015 - AF Year

	2011	2012	2013	2014	2015
Supply	101,332	106,200	113,376	106,016	98,524
% of projected normal	100.6%	105.5%	112.6%	105.3%	91.2%

Table 50
Projected demand multiple dry year period ending in 2015 - AFY

	2011	2012	2013	2014	2015
Demand	101,332	106,200	113,376	110,434	107,092
% of projected normal	100.6%	105.5%	112.6%	109.7%	99.2%

Table 51
Projected Supply and Demand Comparison during multiple dry year period ending in 2015- AF Year

	2011	2012	2013	2014	2015
Supply totals	101,332	106,200	113,376	106,016	98,524
Demand totals	101,332	106,200	113,376	110,434	107,092
Difference	0	0	0	(4,418)	(8,568)
Difference as % of Supply	0.0%	0.0%	0.0%	-4.2%	-8.7%
Difference as % of Demand	0.0%	0.0%	0.0%	-4.0%	-8.0%

X Project a multiple-dry year period (as identified in Table 9) occurring between 2016-2020 and compare projected supply and demand during those years — pg 8-8 — Reference & Page Number

Table 52
Projected supply during multiple dry year period ending in 2020 - AF Year

	2016	2017	2018	2019	2020
Supply	108,563	114,004	121,906	115,619	113,554
% of projected normal	100.5%	105.6%	112.9%	107.1%	91.3%

Table 53

Projected demand multiple dry year period ending in 2020 - AFY					
	2016	2017	2018	2019	2020
Demand	108,563	114,004	121,906	120,436	123,429
% of projected normal	100.5%	105.6%	112.9%	111.5%	99.2%

Table 54 Projected Supply and Demand Comparison during multiple dry year period ending in 2020- AF Year					
	2016	2017	2018	2019	2020
Supply totals	108,563	114,004	121,906	115,619	113,554
Demand totals	108,563	114,004	121,906	120,436	123,429
Difference	0	0	0	(4,817)	(9,875)
Difference as % of Supply	0.0%	0.0%	0.0%	-4.2%	-8.7%
Difference as % of Demand	0.0%	0.0%	0.0%	-4.0%	-8.0%

[X] Project a multiple-dry year period (as identified in Table 9) occurring between 2021-2025 and compare projected supply and demand during those years — pg 8-8 — Reference & Page Number

Table 55 Projected supply during multiple dry year period ending in 2025 - AF Year					
	2021	2022	2023	2024	2025
Supply	125,138	130,796	139,134	130,292	121,298
% of projected normal	100.6%	105.1%	111.8%	104.7%	91.3%

Table 56 Projected demand multiple dry year period ending in 2025 - AFY					
	2021	2022	2023	2024	2025
Demand	125,138	130,796	139,134	135,721	131,845
% of projected normal	100.6%	105.1%	111.8%	109.1%	99.2%

Table 57 Projected Supply and Demand Comparison during multiple dry year period ending in 2025- AF Year					
	2021	2022	2023	2024	2025
Supply totals	125,138	130,796	139,134	130,292	121,298
Demand totals	125,138	130,796	139,134	135,721	131,845
Difference	0	0	0	(5,429)	(10,547)
Difference as % of Supply	0.0%	0.0%	0.0%	-4.2%	-8.7%
Difference as % of Demand	0.0%	0.0%	0.0%	-4.0%	-8.0%

Provision of Water Service Reliability section to cities/counties within service area — **(Water Code § 10635(b))**

[ ] Provided Water Service Reliability section of UWMP to cities and counties within which it provides water supplies within 60 days of UWMP submission to DWR — Reference & Page Number

(Water Code § 10642)

[X]	Attach a copy of adoption resolution	Appx D	Reference & Page Number
[X]	Encourage involvement of social, cultural & economic community groups	Appx C	Reference & Page Number
[X]	Plan available for public inspection	Appx C	Reference & Page Number
[X]	Provide proof of public hearing	Appx C	Reference & Page Number
[X]	Provided meeting notice to local governments	Appx C	Reference & Page Number

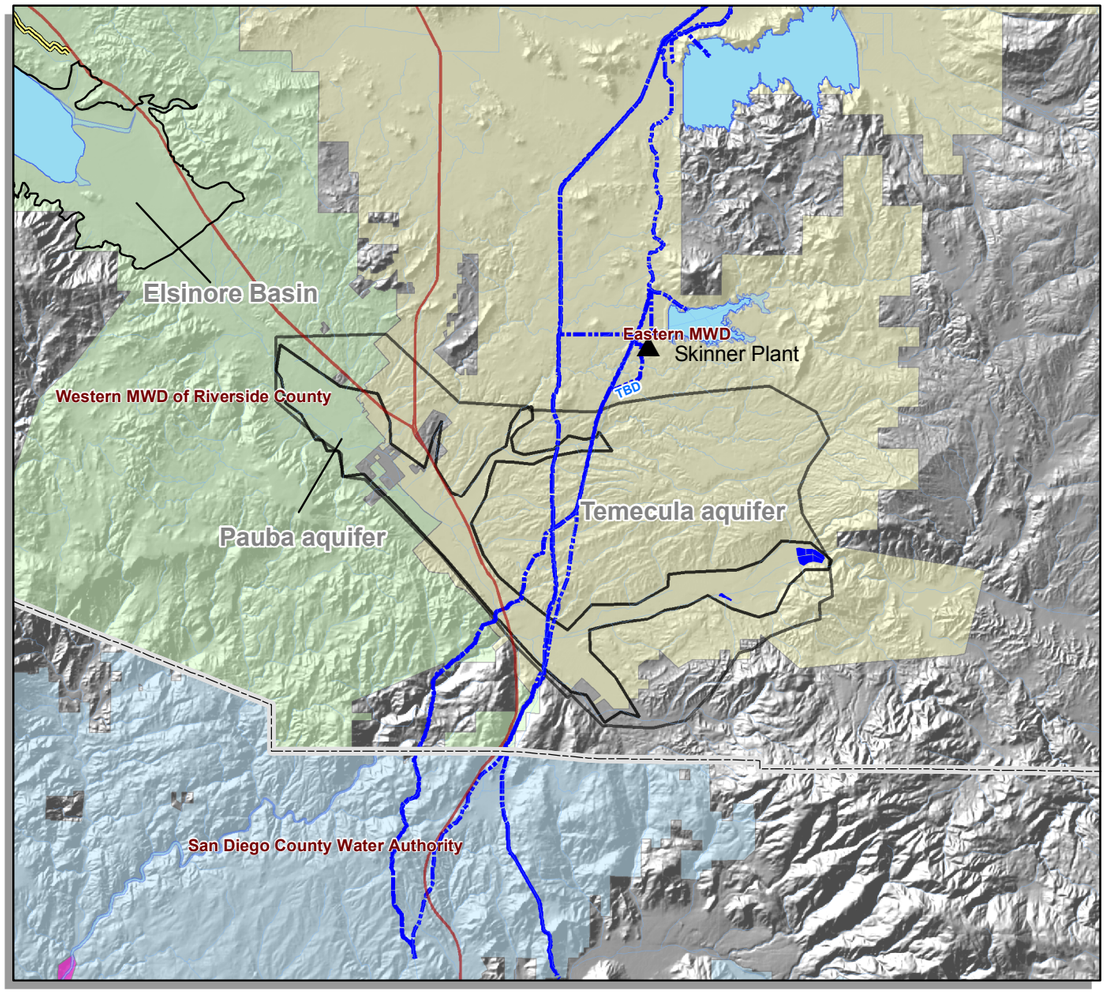
(Water Code § 10643)

[ ]	Reviewed implementation plan and schedule of 2000 UWMP		Reference & Page Number
[ ]	Implemented in accordance with the schedule set forth in plan		Reference & Page Number

☐	2000 UWMP not required		Reference & Page Number
		(Water Code § 10644 (a))	
X	Provide 2005 UWMP to DWR, and cities and counties within 30 days of adoption	Appx D	Reference & Page Number
		(Water Code § 10645)	
X	Does UWMP or correspondence accompanying it show where it is available for public review	Appx C	Reference & Page Number

APPENDIX B

BASIN DESCRIPTION

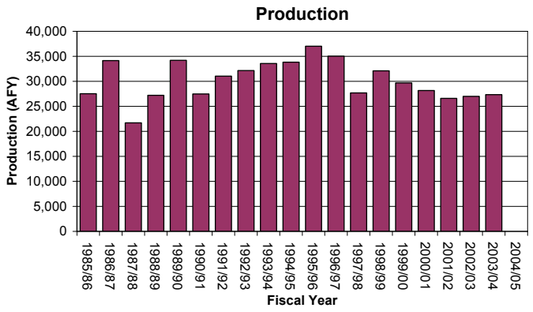


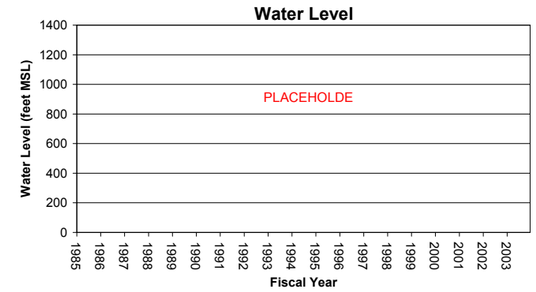
Temecula-Murrieta Basin

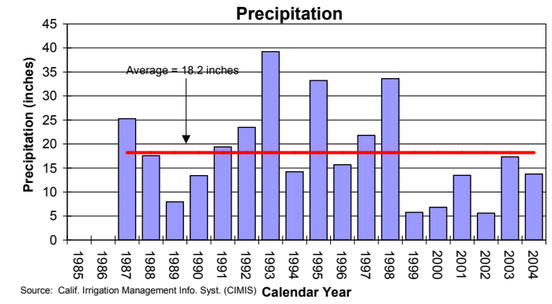
MWD Facility
Stream
Freeways
Santa Ana Regional Interceptor Line
MWD Pipeline
Water Body
County
Recharge Basins
Elsinore

N
W E
S

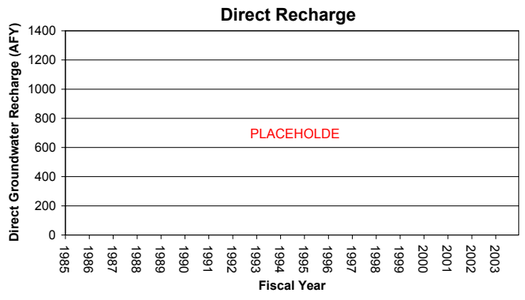
3 1.5 0 3 Miles







Source: Calif. Irrigation Management Info. Syst. (CIMIS)



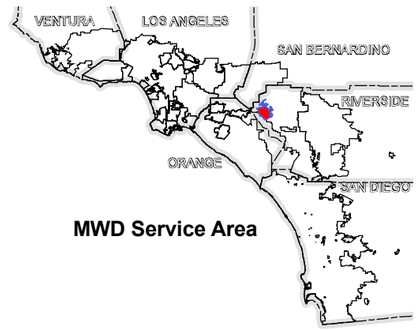
BASIN FACTS

Temecula-Murrieta Basin

Description
Location: Riverside and San Diego Counties
Watershed Surface Area: 137 square miles
MWD Member Agency(s):
Eastern Municipal Water District
Western Municipal Water District
Management: Adjudicated
Groundwater in connection with surface water is adjudicated under terms of Santa Margarita River Watermaster.
Safe/Operating Yield: 34,400 AFY
Total Storage: 1.3 to 2.0 MAF
Usable Storage: 250,000 to 500,000 AF
Storage Space Available: Data not available
Storage and Extraction Facilities
Production Wells
Production Capacity**:** 37,000 AFY
Average: ~31,700 AFY
Injection Wells
Injection Capacity: None
Average: None
Spreading Basins
Spreading Capacity: Data not available
Average: 16,000 AFY

Basin Constraints

- Diversion and pumping limitations of the Santa Margarita River Watermaster and other diversion/pumping rights



MWD Service Area

Note: This map was prepared by the Metropolitan Water District of Southern California for its own use. No warranty is expressed or implied as to the correctness, timeliness, or content of the information shown herein.

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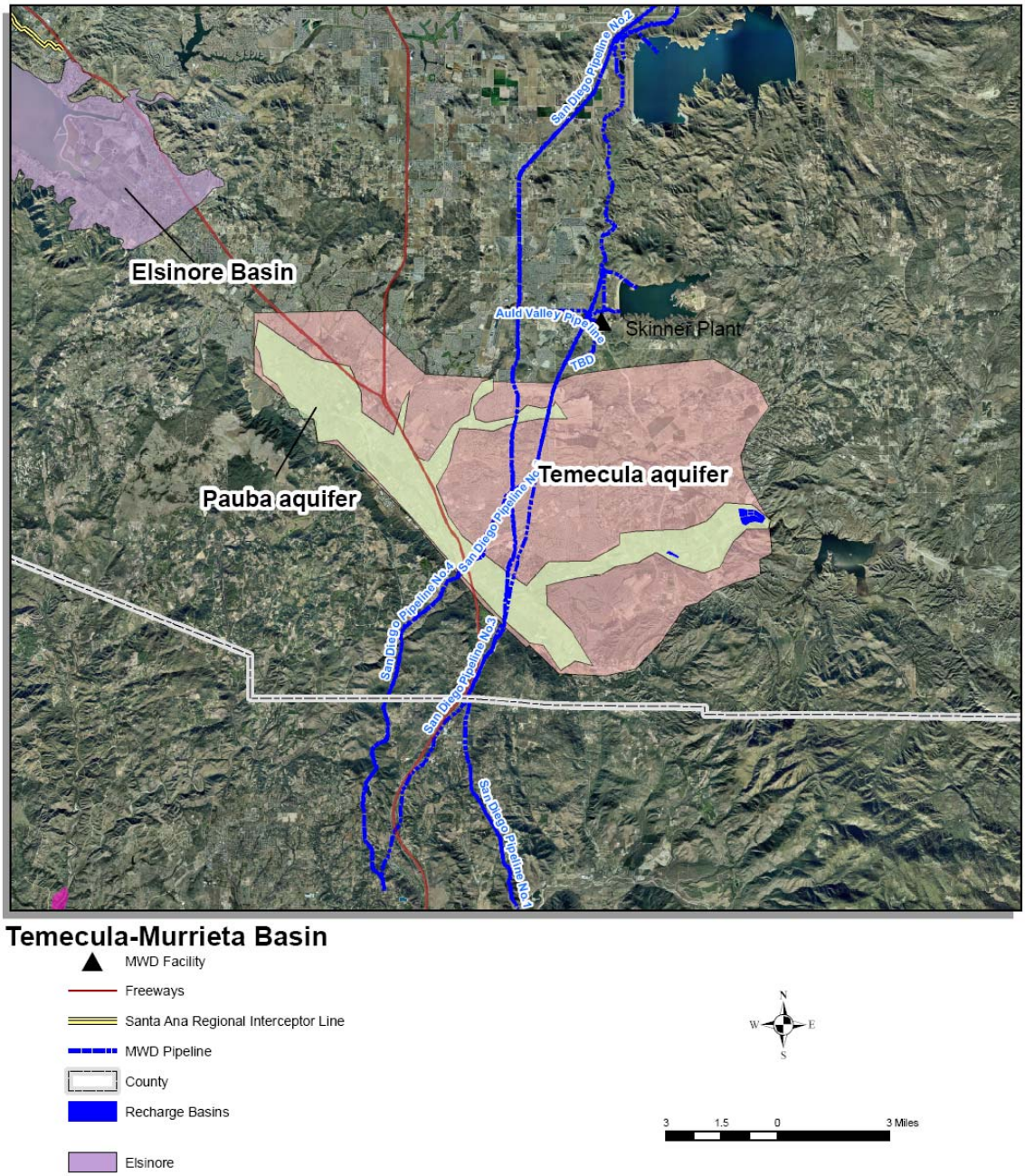
Additional Data Sourse(s): Santa Ana Watershed Project Authority (SAWPA); California Spatial Information Library (CaSIL).

Temecula-Murrieta Basin

The Temecula-Murrieta Basin underlies several valleys in southwestern Riverside County and a portion of northern San Diego County. Alluvial sediments extend through Pauba Valley, Temecula-Murrieta Valley, Santa Gertrudis Valley, and Wolf Valley. These basins underlie the Metropolitan member agency service areas of Eastern Municipal Water District (Eastern MWD) and Western Municipal Water District (Western MWD). A map of the Temecula-Murrieta Basin is provided in **Figure 1**.

Figure 1
Map of Temecula-Murrieta Basin



I. BASIN CHARACTERIZATION

The following section provides a physical description of the Temecula-Murrieta Basin, including its geographic location and hydrogeologic character.

A. Basin Producing Zones and Storage Capacity

There are two aquifers within the Temecula-Murrieta Basin: the Pauba aquifer and the Temecula aquifer. Within these two aquifers Rancho California Water District (RCWD) has identified eight underlying groundwater basins, which are based upon surface water hydrology subbasins: Pauba Valley Basin, Lower Mesa Basin, Upper Mesa Basin, North Murrieta Basin, South Murrieta Basin, San Gertrudis Basin, Wolf Valley Basin, and Palomar Basin. For purposes of this report, the extent of the groundwater basins are defined by the extent of the principal aquifers rather than surface water designations. The Pauba aquifer consists of younger, unconfined alluvium deposited within the Temecula-Murrieta Basin. The deeper Temecula aquifer is semi-confined and confined, and underlies and extends beyond the boundaries of the Pauba aquifer. A description of each aquifer follows.

The Lancaster, Aguanga, and Agua Caliente faults and several strands of the Elsinore fault zone cross the basin and may affect groundwater movement. The Wildomar fault is a groundwater barrier that produces differences in water level and pressure in the northwestern part of the basin. Murrieta Hot Springs lie along an unnamed fault indicating that the fault affects subsurface flow (DWR, 2004). Significant differences in water levels can occur across this fault and RCWD reports that pumping wells on one side of this fault do not discernibly affect the piezometric levels on the other side of the fault.

1. Pauba aquifer

The Pauba aquifer covers approximately 18 square miles. Alluvial sediments extend through Pauba Valley, Temecula-Murrieta Valley, Santa Gertrudis Valley, and Wolf Valley. The Pauba Valley occurs along Temecula Creek and extends approximately seven miles westward from Vail Lake. Well yields in the unconfined alluvial aquifer of the Pauba Valley are excellent, and typically range from 500 gpm to 2,000 gpm. The Pauba aquifer is underlain by the confined Temecula aquifer. The storage capacity of the Pauba aquifer has been estimated at 200,000 AF.

2. Temecula aquifer

The Temecula aquifer extends over an area of approximately 100 square miles and is comprised of consolidated sediments that underlie and extend beyond the boundaries of the Pauba aquifer. Sediment depths within the Temecula aquifer are typically 1,000 feet or more. Except for upstream forebay areas, confining layers separate the Pauba and Temecula aquifers, and groundwater is confined or semi-confined throughout the Temecula aquifer. RCWD reports well yields ranging from several hundred gpm to approximately 2,000 gpm.

Estimates for the amount of groundwater stored within the Temecula aquifer vary widely. The Santa Margarita River Watermaster estimated total groundwater storage in the uppermost 500 feet at 1,340,556 AF as of September 30, 2001. RCWD reports total groundwater storage with the Temecula aquifer at approximately 2 million AF. DWR reports groundwater storage

within the Pauba and Temecula aquifers at approximately 250,000 AF. Anchor Environmental estimated the Temecula aquifer storage capacity at approximately 300,000 AF, given the approximated 100 square mile areal extent of the 1,000-foot thick aquifer, a specific yield of 0.5 percent.

A summary of the hydrogeologic parameters of the Temecula-Murrieta Basin is presented in **Table 1**.

Table 1
Summary of Hydrogeologic Parameters of Temecula Valley Basin

Parameter	**Description**
Structure	
Aquifer(s)	Temecula Valley aquifer Pauba aquifer
Depth of groundwater basin	>2,500 feet
Thickness of water-bearing units	Temecula aquifer: 1,000 feet or more Pauba aquifer: 50 to 250 feet
Yield and storage	
Natural safe yield	34,400 AFY
Total Storage	1.34 to 2 million AF
Usable Storage	Temecula and Pauba aquifers: 250,000 to 500,000 AF
Available Storage	Data not available

Source: DWR, 2004; RCWD, 2005;Anchor Environmental, 2004; and Santa Margarita River Watermaster, 2005

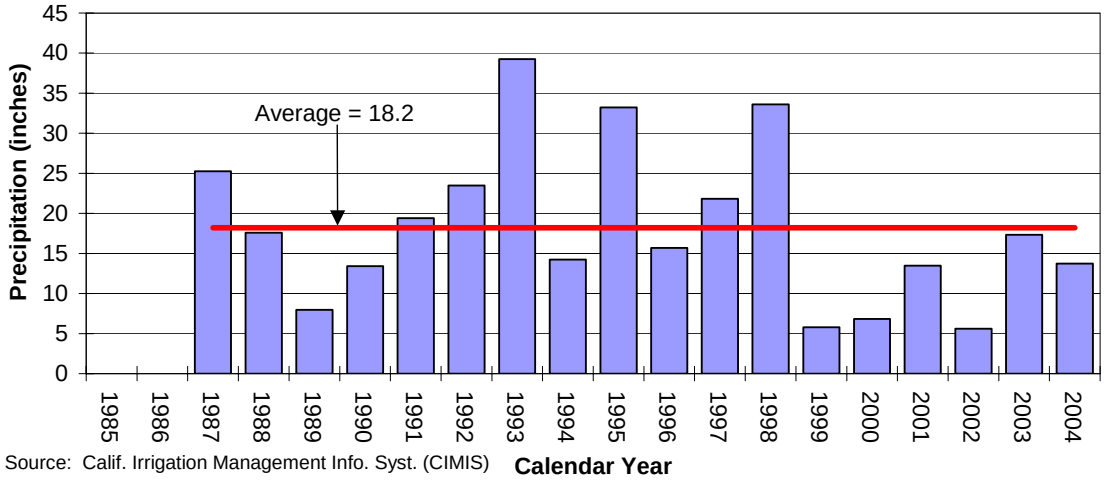
B. Safe Yield/Long-Term Balance of Recharge and Discharge

Average precipitation in the Temecula Valley is about 18.2 inches per year. **Figure 2** presents historical precipitation at the California Irrigation Management Information System (CIMIS) station Temecula #62.Extremely wet years occurred in 1993, 1995 and 1998. Very dry years occurred in 1989, 1999, 2000, 2001, and 2002.

According to RCWD's groundwater model, the average natural inflow (recharge, return flow, stream percolation and underflow) for all eight basins is 41,000 AFY when no artificial recharge is occurring (CDM, 2005). There are seven years in which the natural inflow has exceeded 70,000 AFY. The average natural basin outflow for all eight groundwater basins from 1935 to 1998 was 6,600 AFY. The natural yield of the eight basins equals the natural inflows less the

natural losses, which would be 34,400 AFY. Further descriptions on the recharge characteristics of the Pauba aquifer and the Temecula aquifer follow.

Figure 2
Historical Precipitation in the Temecula Valleys
(CIMIS Station #62)



Source: Calif. Irrigation Management Info. Syst. (CIMIS)

1. Pauba aquifer

As discussed above, the alluvial sediments of the Pauba aquifer extend through four valleys: Pauba Valley, Temecula-Murrieta Valley, Santa Gertrudis Valley, and Wolf Valley. The upstream portion of the Pauba Valley is a key forebay that recharges both the Pauba aquifer and the underlying Temecula aquifer. Pauba aquifer depths downstream from the forebay are typically in excess of 100 feet and extend to depths of more than 250 feet.

The Temecula-Murrieta Valley extends along Murrieta Creek northward from the Santa Margarita River confluence. The Murrieta forebay is located in the upstream portion of the Valley, and the forebay recharges both the alluvial sediments of the Temecula-Murrieta Valley and the underlying Temecula aquifer. Downstream from the forebay, confining layers separate overlying alluvial sediments from the underlying Temecula aquifer. Sediment depths in the unconfined portion of the Valley (Pauba aquifer) are typically in excess of 100 feet in depth, and extend to a maximum depth of approximately 200 feet.

The Santa Gertrudis Valley is a long and narrow valley that extends eastward from the Temecula-Murrieta Valley along Santa Gertrudis Creek. A forebay exists at the upstream end of the Valley that recharges both the unconfined alluvial sediments of the Valley (Pauba aquifer) and the underlying confined Temecula aquifer. The Pauba aquifer depths downstream from the forebay typically range from 50 to 100 feet.

Wolf Valley extends southward approximately three miles from the confluence of Pechanga Creek and Temecula Creek. A forebay exists at the upstream (south) end of Wolf Valley that recharges both the unconfined alluvial sediments of the Wolf Valley (Pauba aquifer) and the

underlying Temecula aquifer. Pauba aquifer depths downstream from the Wolf Valley forebay range from 50 to 80 feet.

2. Temecula aquifer

The Temecula aquifer is a deeper, confined or semi-confined aquifer below the Pauba aquifer. Streamflow infiltration in unconfined alluvial forebays represents the primary source of recharge to the Temecula aquifer. Such streamflow infiltration recharge occurs in upstream forebays within Pauba Valley, Wolf Valley, Temecula-Murrieta Valley, and Santa Gertrudis Valley. In addition, portions of the Temecula aquifer are exposed in the upland mesa portion of eastern Temecula, allowing for recharge through streamflow infiltration, applied water infiltration, and precipitation infiltration.

II. GROUNDWATER MANAGEMENT

The following section describes how the basins are currently managed.

A. Basin Governance

As part of the Santa Margarita River system, surface water and groundwater supporting surface water (defined as being in the older and younger alluvium) with the Temecula Valley have been under some form of court jurisdiction since 1928. Groundwater basins not contributing the Santa Margarita River system are not adjudicated. A summary of the governing agencies and their roles is presented in **Table 2**.

Rights to utilize the groundwater and the water stored in Vail Lake are defined in the 1940 Stipulated Judgment in the case of Santa Margarita versus Vail and Appropriations Permit 7032 issued by the State Water Resources Control Board. A Watermaster has been assigned by the court to oversee all uses within the Santa Margarita River Watershed. The Stipulated Judgment assigns two-thirds of all natural waters to Camp Pendleton and the remaining one third to RCWD. Inflow to Vail Lake is not stored, but rather is passed through to Temecula Creek from May through October (CDM, 2005)

In March 1989, the Court appointed a James S. Jenks as Watermaster (who has since been replaced by Chuck Binder) to administer and enforce the provisions of the Modified Final Judgment and Decree and subsequent orders of the Court. The Court also appointed a Steering Committee, that at the conclusion of 2003-04 was comprised of representatives from the United States, Eastern Municipal Water District, Fallbrook Public Utility District, Metropolitan, the Pechanga Tribe, and RCWD. The purposes of the Steering Committee are to assist the Court, to facilitate litigation, and to assist the Watermaster (Santa Margarita River Watershed Watermaster Report 2005.)

Table 2
Summary of Governing Agencies for Temecula-Murrieta Basin

Agency	Role
Santa Margarita River Watershed Steering Committee	Assist the Court, to facilitate litigation, and to assist the Watermaster
Chuck Binder	Court-appointed Santa Margarita River Watermaster
Rancho California Water District	Prepares Groundwater Audit and Recommend Groundwater Production Report

In addition, each year the RCWD prepares a Groundwater Audit and a Recommended Groundwater Production Report (RGPR). The amount of groundwater that can be produced varies due to such factors as rainfall, recharge area, and amount and location of well pumping capacity (RCWD, 1997).

B. Interactions with Adjoining Basins

The Temecula-Murrieta Basin is adjacent to the Elsinore Basin. When groundwater levels are above 1,100 feet MSL in the southeastern portion of the Elsinore Basin, small amounts (less than 100 AFY) of groundwater could spill into the adjacent Temecula-Murrieta Basin (MWH,2003a). Current water levels are substantially below this level so there are no agreements regarding this flow.

III. WATER SUPPLY FACILITIES AND OPERATIONS

The following section presents information on water supply facilities and operations. Facilities include more than 70 groundwater production wells, 4 groundwater recovery wells and spreading basins. Each of these facilities is discussed in more detail below.

A. Active Production Wells

A summary of production wells in the Temecula-Murrieta Basin is presented in **Table 3**.

Table 3
Summary of Production Wells in Temecula Valley Basin

Category	Number of Wells	Estimated Production Capacity (AFY)	Average Production (AFY)	Well Operation Cost ($/AF)
Pauba/Temecula aquifers				
Municipal	RCWD: 52 EMWD: 0 MCWD: 5 FPUD: 3 Subtotal: 60	Data not available	RCWD: 28,800 EMWD: 0 MCWD: 760 FPUD: 0 Subtotal:29,560	Data not available
Private "Substantial Users" (2003-04 Production)	Pechanga: 11 Others: Data not available		Pechanga: 721 Others: 1,377 Subtotal: 2,098	
Totals	**>71**		**31,658**	

Sources: Santa Margarita River Watermaster, 2004; Santa Margarita River Watershed Management Plan, Watershed Assessment Report Draft, 2004

The agencies that pump from the eight basins include RCWD, Eastern MWD, Western MWD (formerly Murrieta County Water District (MCWD)), the Pechanga Indian Reservation, and other private pumpers (RCWD, 2005). Well yields generally range to 300 gpm in the northwestern part of the basin, but reach 1,750 gpm for wells in Pauba Valley (DWR, 2004). RCWD, the largest of these agencies, encompasses almost 100,000 acres and provides retail water supply for a variety of agricultural and residential uses. Typical agricultural uses include avocados, citrus, and grapes while residential demands are for the rapidly growing cities of Temecula and Murrieta (RCWD, 1997).

RCWD maintains more than 100 production and monitoring wells within the Temecula Valley. RCWD currently has 52 production wells in the eight basins with a total instantaneous capacity of 46,400 gpm (104 cfs), not including four groundwater recovery wells in the Valle de los Caballos project. Total RCWD groundwater pumping is dependent on water demands and hydrologic conditions, but RCWD typically derives from 40 to 50 percent of its total water supply from local groundwaters of the Pauba and Temecula aquifers. From 1984/85 to 2003/04, RCWD groundwater production ranged from 21,400 AFY to 36,100 AFY, averaging 28,800 AFY (Santa Margarita River Watermaster, 2004).

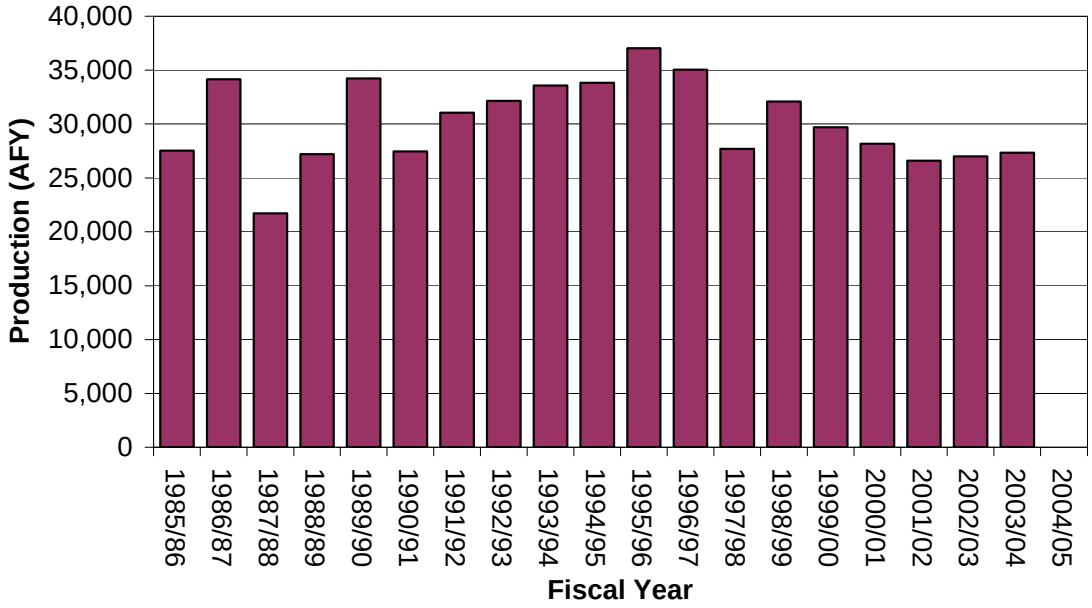
Eastern MWD has historically derived a small percentage of its domestic water supply from wells within the Temecula Valley. From 1984-85 to 2003-04, EMWD groundwater production from the Temecula Valley ranged from 0 AFY to 685 AFY, averaging 317 AFY (Santa Margarita River Watermaster, 2004). In 2004, Eastern MWD destroyed its one remaining well in the Temecula Valley.

Groundwater serves as the exclusive source of water supply for Western MWD, which acquired MCWD in 2005. Western MWD operates five water supply wells within the north end of the Temecula Valley. From 1984-85 to 2003-04, MCWD groundwater production from the Temecula Valley ranged from 286 AFY to 1979 AFY, averaging 760 AFY (Santa Margarita River Watermaster, 2004).

Fallbrook Public Utility District (FPUD) imports the majority of it water from SDCWA and Metropolitan, but it does have three wells in the Temecula Valley. From 1984-85 to 2003-04, FPUD groundwater production from the Valley ranged from 0 AFY to 94 AFY, averaging 20 AFY. There has been no production from these wells since 1994-95 (Santa Margarita River Watermaster, 2004).

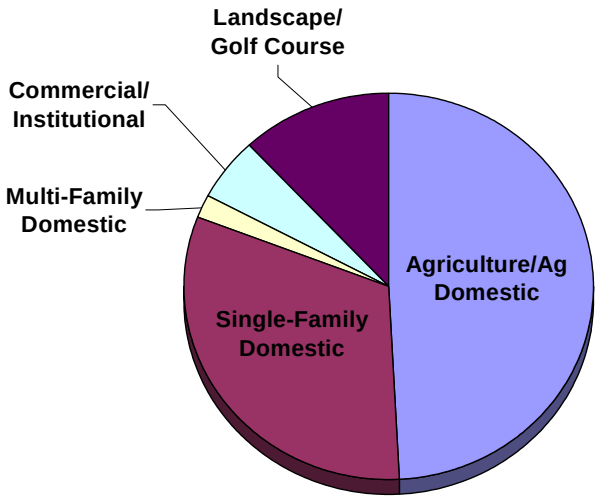
Historical municipal groundwater production for the Temecula Valley is presented in **Figure 3**. This figure does not include the production from substantial private users outside of these organized service areas.

Figure 3
Temecula Valley Historical Groundwater Production



Agricultural demands continue to be a significant part of the RCWD demands, as shown in **Figure 4**. However, increased residential and commercial development in the Temecula Valley will result in greater domestic/commercial demands over time.

Figure 4
Year 2000 Consumptive Water Demands in RCWD Service Area



Source: RCWD Urban Water Management Plan, 2005

B. Other Production

It is important to note that as a condition to receiving RCWD water service, RCWD requires local water users to convey overlying groundwater rights to RCWD. As a result, virtually no private groundwater wells exist within the RCWD service area. Outside of the RCWD service area, however, dozens of private well owners pump groundwater within the Temecula Valley. Most of the private wells are within the upstream portion of the Murrieta Valley, and are used for domestic or irrigation supply at private residences. In 2003-04, the Santa Margarita River Watermaster identified a total of nine private water users within the Temecula Valley as being "substantial users." During 2003-04, approximately 2,100 AF of groundwater was produced by these “substantial users” (Santa Margarita River Watermaster, 2004).

The Pechanga Indian Reservation is one of these “substantial users” and develops its potable and irrigation supplies from 11 onsite wells within the Temecula Valley. During 2003-04, the Pechanga Indian Reservation produced 721 AFY of groundwater from the Temecula-Murrieta Basin (Santa Margarita River Watermaster, 2004).

RCWD’s Vail Dam appropriative right provides that the District may store up to 40,000 AF in Vail Reservoir each year between November 1 and April 30, subject to limitations, and that the water so stored may be used for irrigation and domestic uses incidental to farming operations on 3,797 acres of land between May 1 and October 31. Such use may be by direct diversion from Vail Lake or by recovery with wells of water released from Vail and spread downstream in Pauba Valley. The amount of local runoff reaching the lake can vary widely depending on hydrological conditions. From 1962 to 2000, flows into Vail Lake ranged from 218 AFY to

29,570 AFY, with an average flow of 5,150 AFY. The storage capacity of the lake is approximately 40,000 AF, with a surface area of 1,000 acres. Currently, RCWD only uses Vail Lake to store local runoff. The historical available storage of the lake has varied widely as well, including two periods when the reservoir was full in March 1984 and February 1997. The average available storage is approximately 30,900 AF.

C. ASR Wells

RCWD operates four groundwater recovery wells – the Valle de los Caballos wells – at the Valle de los Caballos spreading basins discussed below.

D. Spreading Basins

In addition to the extraction of the natural yield of the basins, RCWD artificially recharges the Pauba Valley Basin with untreated imported water for enhanced groundwater production. RCWD purchases imported water from Metropolitan and delivers it from the San Diego aqueduct turnout EM-19 to the Valle de los Caballos (VDC) recharge basins. In the past, the VDC recharge basins have provided up to 16,000 AFY of artificial groundwater recharge. These data are summarized in **Figure 5**.

RCWD stores local runoff in Vail Lake, which was created in 1948 through construction of Vail Dam on Temecula Creek. RCWD has a surface water storage permit in Vail Lake for up to 40,000 AF from November 1 to April 30. During these months, RCWD releases available water from Vail Lake to the VDC spreading basins, about 1.5 miles downstream, for groundwater recharge. From May through October, existing State permits prohibit storage and require inflow to pass through Vail Lake to Temecula Creek.
(RCWD Urban Water Management Plan, 2005)

IV. GROUNDWATER LEVELS

Groundwater flows southeastward under Murrieta and Temecula Valleys and southwestward beneath Pauba Valley to the southwestern part of the basin. RCWD noted an extended drawdown in groundwater levels from 1945 to 1978, with major recoveries during the wet years in 1980 and 1993. Significant declines again occurred during the relatively dry years after 1980 and 1993. Water levels declined 1.3 feet in 2003-04. In the central part of the basin, the water level in one well rose about 12 feet during 1990 through 1993. In the southwestern part of the basin, the water level in one well declined about 60 feet during 1980 through 1993, recovered about 50 feet during 1993, then declined about 15 feet during 1994 through 2000. The hydrograph of another well in the southwestern part of the basin indicates large seasonal variations in water levels. Historical water levels are provided in **Figure 6**.

Figure 5
Historical Groundwater Recharge in Temecula-Murrieta Basin
PLACEHOLDER FOR GROUNDWATER RECHARGE

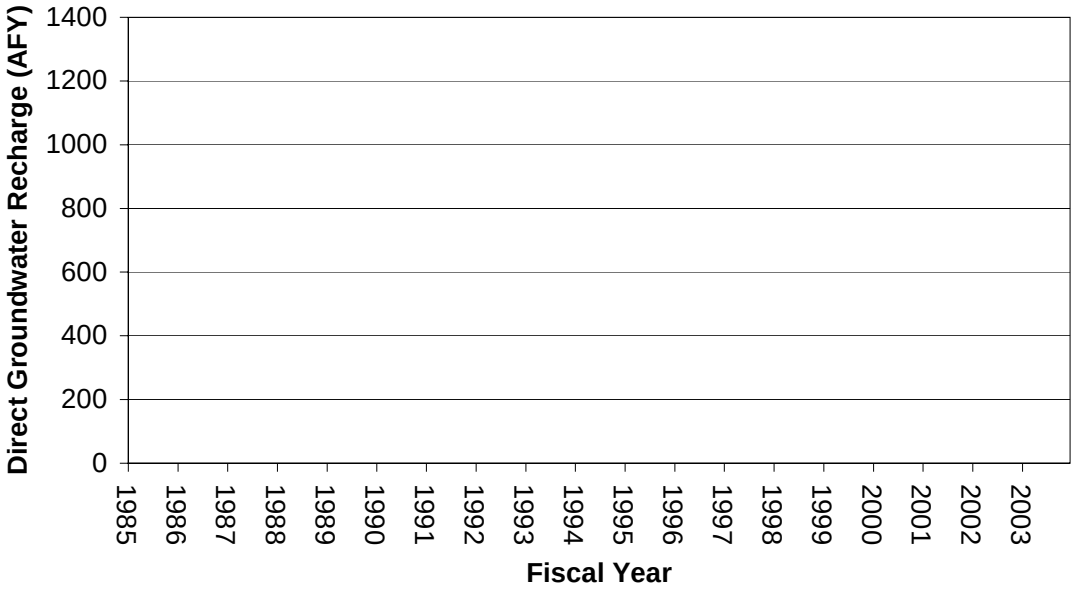
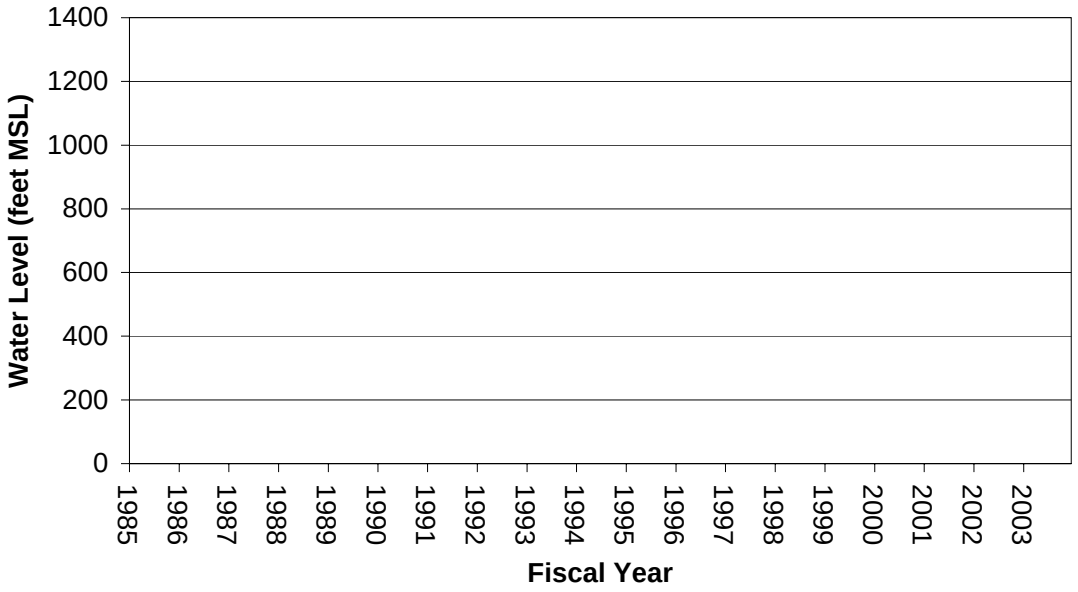


Figure 6
Historical Water Levels in Temecula-Murrieta Basin
PLACEHOLDER FOR REPRESENTATIVE HYDROGRAPH



V. GROUNDWATER QUALITY

This following section presents information on the groundwater quality of the Temecula-Murrieta Basin.

A. Groundwater Quality Monitoring

RCWD continually monitors the water quality of the eight groundwater basins and its 54 wells. Every year RCWD conducts over 2,000 tests for water quality on each of its wells and throughout the distribution system.

B. Groundwater Contaminants

Constituents of concern for the Temecula-Murrieta Basin are summarized in **Table 4**. These include: total dissolved solids (TDS), nitrate, volatile organic compounds (VOCs), perchlorate, fluoride and manganese. Groundwater in most of the Pauba aquifer and the Temecula aquifer is generally suitable for domestic and irrigation uses. TDS concentrations in the lower, confined and semi-confined Temecula aquifer tend to be lower than in the Pauba aquifer, though the percent sodium is higher in the Temecula aquifer. Nitrate levels are typically in compliance with drinking water MCLs, although nitrate levels have been found to be higher in the wells in the Santa Gertrudis Valley. Sampling at RCWD's wells between 2002 and 2004 has indicated that the primary MCL standard of 2 mg/L for fluoride has been exceeded. However, well water is blended with other well water and imported MWD water and the distribution system average level of fluoride was well below the MCL. Well sampling has also indicated high levels for manganese, but blending reduces the manganese concentration to the non-detect level. Groundwater is rated inferior for domestic use locally near Murrieta Hot Springs because of high nitrate and fluoride content.

C. Blending Needs

RCWD blends groundwater with imported water from Metropolitan to reduce fluoride concentrations and manganese concentrations.

D. Groundwater Treatment

Agencies chlorinate the groundwater. Data related to other treatment is currently not available.

VI. CURRENT GROUNDWATER STORAGE PROGRAMS

RCWD artificially recharges the Pauba Valley Basin with untreated imported water for enhanced groundwater production. RCWD purchases imported water from the Metropolitan and delivers it from the San Diego aqueduct turnout EM-19 to the Valle de los Caballos (VDC) recharge basins. In the past, the VDC recharge basins have provided up to 16,000 AFY of artificial groundwater recharge.

Table 4
Summary of Constituents of Concern in Temecula Basins

Constituent	Units	Range	Description
TDS Secondary MCL = 500	mg/L	200 to >1,000	In the unconfined Pauba aquifer, TDS ranges from 450 mg/L to greater than 1,000 mg/L. In the semi-confined and confined Temecula aquifer, TDS ranges from 200 mg/L to 600 mg/L. Percent sodium in the TDS for the Temecula aquifer can range from 55 to over 80 percent.
Nitrate (as N) Primary MCL = 10	mg/L	6.9 to 10	A sampling of 25 RCWD wells in 2003-04. High levels near Murrieta Hot Springs.
VOCs **(TCE and PCE)** Primary MCL TCE = 5 Primary MCL PCE = 5	µg/L	ND	No known detections of TCE or PCE.
Perchlorate Notification level = 6	µg/L	ND to 6.6	Detected in three RCWD wells since 2002. Only 1 well had a detection above notification level
Fluoride Primary MCL = 2	mg/L	0.2 to 7.6	A sampling of RCWD wells from 2002 to 2004. After blending with other well water and imported water, distribution system average was 0.4 mg/L. High levels near Murrieta Hot Springs.
Manganese Secondary MCL = 50	µg/L	50 to 250	RCWD wells. After blending with other well water and imported water, distribution system average was to non-detect level.

Sources: Santa Margarita River Watershed Annual Watermaster Report, 2005; RCWD Urban Water Management Plan, 2005; Santa Margarita River Watershed Management Plan, Watershed Assessment Report Draft, 2004

VII. BASIN CONSTRAINTS ON STORAGE AND EXTRACTION

The Temecula-Murrieta Basin is subject to the diversion and pumping limitations of the Santa Margarita River Watermaster, and to other local surface water diversion and groundwater pumping rights.

In addition, each year the RCWD prepares a Groundwater Audit and a Recommended Groundwater Production Report (RGPR). The amount of groundwater that can be produced varies due to such factors as rainfall, recharge area, and amount and location of well pumping capacity.

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APPENDIX C

WATER SHORTAGE CONTINGENCY PLAN

WATER SHORTAGE CONTINGENCY PLAN

Rancho California Water District

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Water Shortage Contingency Plan
Rancho California Water District

Section 1
Purpose and Principles of Plan

1.1 Water Code 10632

The Rancho California Water District (District) has developed a Water Shortage Contingency Plan (Plan) in accordance with California Water Code 10632. The Water Code 10632 states that water agencies must develop a supply shortage contingency plan in the event of drought, water supply reductions, failure of water distribution system, or other emergencies. The contingency plan must demonstrate the ability of an agency to meet demands under a supply shortage of up to 50 percent. Emphasis is placed on protection of public health, sanitation, fire protection, and general public welfare.

As such, this Plan adopts regulations and restrictions on outdoor water use only, including domestic, commercial/institutional, parks and golf courses, and agriculture. Recycled water users may be exempt from some restrictions in this Plan.

1.2 Metropolitan Water District of Southern California Water Surplus and Drought Management Plan

The District currently receives approximately 65 percent of its total water supply (treated and untreated) from the Metropolitan Water District of Southern California (MWD). This imported water is delivered through water connections of the Eastern Municipal Water District (EMWD) and Western Municipal Water District of Riverside County (WMWD). Both EMWD and WMWD are member agencies of MWD, and therefore the District is subject to MWD's plans and policies during a water shortage.

To deal with periods of water surplus and drought, MWD developed its Water Surplus and Drought Management Plan (WSDM Plan). MWD strategically manages water in times of surplus to ensure there is an adequate supply during a shortage. The WSDM Plan defines surplus and shortage conditions as follows:

> **Surplus**: Supplies are sufficient to allow MWD to meet full service demands, make deliveries to all interruptible programs (replenishment, long-term seasonal storage, and agricultural deliveries), and deliver water to regional and local facilities for storage.
>
> **Shortage**: Supplies are sufficient to allow MWD to meet full service demands and make partial or full deliveries to interruptible programs, sometimes using stored water and voluntary water transfers.
>
> **Severe Shortage**: Supplies are insufficient to meet full service demands and MWD is required to make withdrawals from storage, call on its water

transfers, and possibly call for extraordinary drought conservation and reduce deliveries under the Interim Agriculture Water Program (IAWP).

Extreme Shortage: Supplies are insufficient to meet full service demands and MWD is required to allocate its available imported supplies to its member agencies.

The following actions represent MWD's plan for dealing with supply shortages in the general order they would be implemented:

- Draw on stored water in the Diamond Valley Lake
- Draw on out-of-region groundwater storage in Semitropic and Arvin-Edison
- Reduce/suspend discounted long-term groundwater and surface storage replenishment deliveries
- Draw on contractual groundwater storage programs within the region
- Draw on State Water Project terminus reservoir storage
- Call for extraordinary drought conservation and public education
- Reduce agricultural deliveries in accordance with IAWP
- Call on water transfer options contracts and purchase transfers on the spot market
- Allocate MWD's firm imported supplies to its member agencies

1.3 Metropolitan Water District of Southern California Interim Agricultural Water Program

In 2005, the District served approximately 1,700 Agriculture and Agriculture/ Domestic accounts and delivered about 25,000 acre-feet (AF) of water to these customers (representing about 36 percent of total water deliveries). Most of these agriculture and agriculture/domestic deliveries are subject to MWD's IAWP.

The IAWP offers interruptible water to Southern California's agricultural industry at discounted water rates. These agricultural water supplies will be interrupted as part of MWD's shortage actions. MWD will work with IAWP participants to provide as much advance warning of interruption as possible. The IAWP reflects current policies toward agricultural water users. The policies underlying this program are due to be reviewed during the ten-year period of the WSDM Plan and the plan will be adjusted accordingly.

According to MWD's IAWP Reduction Guidelines, MWD has the right to discontinue surplus water service in whole or in part with one year's written notice. After a purchaser is given a notice of discontinuation, MWD's General Manager may reduce IAWP deliveries up to 30 percent prior to any urban water allocation action under the WSDM Plan.

The timing of potential IAWP reductions is important to note as Colorado River and State Water Project (SWP) supplies are determined annually. The initial supply allocation is estimated in December; however, the SWP supply is uncertain and not final until May 1. Typically May 1 is when a notification would be made by MWD regarding a reduction in IAWP water deliveries, with actual reductions occurring 60 days later on July 1.

If MWD requires a utility to reduce IAWP water usage, water usage targets for the upcoming year are established based on water use during the previous year. Once this baseline water use target is established it will remain in place as long as the reduction is in effect, even if it goes beyond the fiscal year. Actual IAWP water consumption will be measured every six months. If an agency used less water than it was allotted it receives a credit that carries over into the next six month period. If the agency used more water than it was allotted via the established baseline then it is assigned a debit. If an agency uses more water than it is allotted they have to pay MWD's penalty rate for the amount of water over the established baseline.

1.4 Principles of District's Water Shortage Contingency Plan

The overall principle of the District's Plan is to reliably meet water demands during shortages caused by droughts, supply reductions, and emergency conditions. The Plan recognizes the following priorities for potable water:

1. Public safety, health and welfare
2. Economic sustainability
3. Quality of life for the District's customers

The potable water use regulated and/or prohibited under this Plan is considered to be non-essential use. Continued use of such water during times of water shortage or other emergency supply conditions are deemed to constitute a waste of water and will be subject to appropriate penalties as described in Section 4 of this Plan.

In the event that the reduction in water sales as a result of implementation of the Plan negatively impacts the coverage of the District's fixed costs obligations, the District will utilize its cash reserves (see Section 5 of this Plan).

1.5 Public Notice and Coordination with Other Water Agencies

The District will periodically provide the public with information about the Plan, including its implementation. Such information will include, but not limited to, stages of action, restrictions on water use, water-saving tips, and potential penalties for non-compliance of Plan. In addition, the District will coordinate its implementation of its Plan with EMWD, WMWD and MWD. This will be necessary to ensure efficient regional water management during periods of water supply shortage.

Section 2
Authorization and Application of Plan

2.1 Authorization of Plan

The water shortage contingency measures of this Plan shall apply to all persons, customers, and property using water provided by the District. The terms "persons" and "customers" used in this Plan include individuals, home and property owners, corporations, businesses, agencies, associations, and all other legal entities.

A declaration by the Board or the General Manager of a water shortage condition as outlined below shall be made by public announcement and shall be published in a newspaper of general circulation. The declaration shall become effective immediately upon such publication.

There are two basic conditions which can trigger the declaration of the Plan:

Condition No. 1: Long and Short Term Water Supply Deficiencies

As outlined in Water Code 10632, the District's General Manager shall request the Board of Directors (Board) to authorize and implement provisions of the Plan, which declares that the demand for District water is anticipated to be in excess of water supply. The request shall be made at a regular or special meeting of the Board where findings will dictate the necessity, if any, to implement the measures of the Plan. The Board will have the authority to initiate or terminate any of the measures described in the Plan.

Condition No. 2: Emergency Water Shortage Response

Emergency water shortages are defined as an unexpected event that prevents adequate water to be delivered to customers due to a problem in the District's water distribution system. By adopting this Plan, the Board authorizes the General Manager to declare the extent of the water shortage emergency and to indicate which measures of the Plan are needed.

2.2 Criteria for Water Shortage Stages

The District will continue to monitor water demands and supplies on a regular basis and shall determine when conditions warrant initiation or termination of each stage of the Plan as follows:

Stage 1 – Normal Conditions: the District's General Manager has declared that the District's water supply is a "normal condition." Customers are requested to continue to use water efficiently, maximize recycled water use, practice sensible water conservation and take advantage of the District's indoor and outdoor water conservation incentive programs so water is not wasted. Water waste is in violation of California Law and District regulations at any Stage.

Stage 2 – Water Alert: there is a probability that the District may not be able to meet all of the water demands of its customers. This may correlate to MWD's WSDM Plan stage of "Shortage", or may mean groundwater levels and Vail Lake levels are lower

than normal. Expected water shortages are less than 10 percent. Additional voluntary conservation measures will be called upon during this stage. Some restrictions on certain non-essential outdoor water use may be implemented.

Stage 3 – Water Warning: water supplies are not sufficient to meet the District's demands by more than 10 percent, but less than 30 percent. This may correlate to MWD's WSDM Plan stage of "Severe Shortage". During this stage it is anticipated that the District's agricultural customers will be asked to comply with MWD's IAWP. Some restrictions on certain non-essential outdoor urban water use will be implemented. Penalties for non-compliance of such restrictions will be imposed.

Stage 4 – Extreme Water Warning: water supplies are not sufficient to meet the District's demands by more than 30 percent, but less than 50 percent. This may correlate to MWD's WSDM Plan stage of "Extreme Shortage". During this stage the District's agricultural customers will comply with MWD's IAWP and urban landscapes will greatly reduce water use. No new landscaping will be allowed. If this stage is the result of an extended drought and has been triggered by Condition No. 1 of Section 2 of this Plan, the District will explore increased conservation incentives for demand management measures that will have immediate and substantial impacts on water demands. More severe restrictions on non-essential outdoor water use will be implemented. Penalties for non-compliance of such restrictions will be imposed.

Stage 5 – Water Emergency: water supplies are not sufficient to meet the District's demands by more than 50 percent. This may correlate to MWD's WSDM Plan stage of "Extreme Shortage" or may be as a result of an emergency situation resulting in the inability of the District's water distribution system to deliver all of the District's supply. During this stage the District's agricultural customers will greatly reduce water consumption for permanent crops, or might even be discontinued. Restrictions on all non-essential outdoor water use will also be implemented. Severe penalties for non-compliance of such restrictions will be imposed.

Section 3
Supply Shortage Contingency Measures

The following represents the shortage contingency measures the District will impose for its domestic (household), commercial/institutional, and agricultural customers. Through timely communication, using various local outlets, the District will provide updates regarding supply conditions and Plan Stages. The District is not responsible for any customer issues that may arise from the implementation of the Plan or adjustment in timing of the Plan's Stages.

3.1 Domestic (Household) Customers

Stage 2 – Water Alert (shortages under 10 percent):

The following voluntary measures will be requested:

1. Do not hose down driveways or other hardscape surfaces.
2. Irrigate lawns and landscape only between 8:00 pm and 6:00 am (unless hand watering). Adjust automatic irrigation timers according to changing weather patterns and landscape requirements.
3. Refrain from using decorative fountains unless they are equipped with a recycling system.
4. Install pool and spa covers to minimize evaporative water loss.
5. Do not allow hoses to run while washing vehicles. Use a bucket or a hose with automatic shutoff valve.

No penalties or mandatory restrictions will be imposed during this stage.

Stage 3 – Water Warning (shortages more than 10 to 30 percent):

Same measures as in Stage 2, but now those measures are mandatory. In addition, the following mandatory measures will be imposed:

1. Irrigate lawns and landscape only between midnight and 6:00 am, and only every other day. Addresses with odd last digit (1, 3, 5, 7, 9) water on odd-numbered days of the month; while addresses with even last digit (0, 2, 4, 6, 8) water on even-numbered days.
2. If new landscaping must be installed, only landscaping meeting the specifications of "California-Friendly" landscaping as defined by the Metropolitan Water District of Southern California will be allowed.
3. No replacement water to be provided for ponds or lakes.
4. No water for decorative fountains to be used, even if it has a recycling system.

Penalties for non-compliance may be imposed for flagrant or repeat violations (see Section 4).

Stage 4 – Extreme Water Warning (shortages more than 30 to 50 percent):

Same mandatory measures as in Stages 2 and 3, with the following additional mandatory measures imposed:

1. Irrigate lawns and landscape only between midnight and 6:00 am, and only twice a week. Addresses with odd last digit (1, 3, 5, 7, 9) water on Sundays and Thursdays only; while addresses with even last digit (0, 2, 4, 6, 8) water Tuesdays and Saturdays only.

2. No planting of new landscaping (seed, sod, or other plant materials).

3. Washing of personal vehicles at home (including autos, trucks, trailers, motor homes, boats or others) is prohibited.

4. Water for refilling recreational swimming pools and spas is prohibited.

Penalties for non-compliance will be imposed (see Section 4).

Stage 5 – Water Emergency (shortages more than 50 percent):

Same mandatory measures as in Stages 2, 3 and 4, with the following additional mandatory measures imposed:

1. No irrigation of lawns, landscapes and/or gardens.

Penalties for non-compliance will be imposed (see Section 4).

3.2 Commercial/Institutional and Landscape Customers

Stage 2 – Water Alert (shortages under 10 percent):

The following voluntary measures will be requested:

1. A recommended base water allocation for outdoor use for Commercial/ Institutional Customers with no separate landscape meters will be calculated using the minimum month method outlined in Section 4 of this Plan. Outdoor water-use should not exceed 80-percent of the historical reference Evapotranspiration (ET) rate measured at CIMIS Station Number 62.

2. A recommended base water allocation for Commercial/Institutional Customers with a separate landscape meter will be calculated using the relevant landscape water meter. The base outdoor allocation will be established by calculating the maximum allowable project water demand as listed in Addendum Number 1 (the Water Budget Formula) to the County of Riverside Landscape and Irrigation Ordinance. The reference Evapotranspiration rate from CIMIS station 62 will be used.

3. All Commercial/Institutional and Landscape Customers, including but not limited to parks, school grounds, highway medians, commercial landscaping, and golf courses will be restricted to irrigation applications between 8:00 pm and 6:00 am only. These irrigators will be advised to adjust automatic irrigation timers according to changing weather patterns and landscape requirements. Recycled water customers will be exempt.

4. Refrain from using decorative fountains unless they are equipped with a recycling system.

5. Install pool and spa covers to minimize evaporative water loss.

No penalties or mandatory restrictions will be imposed during this stage.

Stage 3 – Water Warning (shortages more than 10 to 30 percent):

Same measures as in Stage 2, but now these measures are mandatory. In addition, the following mandatory measures will be imposed:

1. All Commercial/Institutional and Landscape Customers, including but not limited to parks, school grounds, highway medians, commercial landscaping, and golf courses will be restricted to irrigation applications between 10:00 pm and 6:00 am, and only twice a week. The District, at its discretion, may assign some or all commercial irrigators to watering groups and watering days. Outdoor water-use by Commercial, Institutional and Landscape customers will in no case exceed 60 percent of the historical reference Evapotranspiration (ET) rate as measured at CIMIS Station Number 62. Recycled water customers will be exempt provided signage on the site conforms to recycled water-use requirements and is clearly visible.

2. If new landscaping must be installed, only landscaping meeting the specifications of "California-Friendly" landscaping as defined by the Metropolitan Water District of Southern California will be allowed.

3. No replacement water to be provided for ponds or lakes. Recycled water customers, if applicable, will be exempted provided signage on the site conforms to recycled water-use requirements and is clearly visible.

4. No hosing down driveways, sidewalks or other hardscape except for California Department of Health Services prescribed health and sanitary reasons.

5. No washing of commercial or municipal vehicles unless necessary for public health and safety.

6. Commercial car wash consumption will be required to be reduced by 25 percent using on-site recycled water systems or other means.

7. No water for decorative fountains may be used, even if it has a recycling system.

Penalties for non-compliance will be imposed for flagrant or repeat violations (see Section 4).

Stage 4 – Extreme Water Warning (shortages more than 30 to 50 percent):

Same mandatory measures as in Stages 2 and 3, with the following additional mandatory measures imposed:

1. All Commercial/Institutional and Landscape Customers, including but not limited to parks, school grounds, highway medians, commercial landscaping, and golf courses will be restricted to irrigation applications between 10:00 pm and 6:00 am, and only once a week. The District, at its discretion, may assign some or all commercial irrigators to watering groups and watering days. Landscape meters will be restricted to a maximum of 25 percent of reference Evapotranspiration (ET) as measured at CIMIS Station Number 62. Recycled water customers will be exempt provided signage on the site conforms to recycled water-use requirements and is clearly visible.

2. No planting of new landscaping (seed, sod, or other plant materials).

3. Commercial car wash consumption will be required to be reduced by 50 percent using on-site recycled water systems or other means.

4. Water for refilling recreational swimming pools and spas is prohibited.

5. No new hydrant-construction or temporary construction meter permits will be issued by District.

Penalties for non-compliance will be imposed (see Section 4).

Stage 5 – Water Emergency (shortages more than 50 percent):

Same mandatory measures as in Stages 2, 3 and 4, with the following additional mandatory measures:

1. No irrigation of lawns and landscape. Recycled water customers will be exempted provided signage on the site conforms to recycled water-use requirements and is clearly visible.

2. No water for commercial car washes.

3. All hydrant-construction and/or temporary construction meter permits will be rescinded by the District.

Penalties for non-compliance will be imposed (see Section 4).

3.3 Agricultural Customers

Although the District retains the right to implement actions independent of Metropolitan Water District, each successive stage, with respect to Agricultural Customers, will be triggered by actions associated with Metropolitan Water District's Interim Agricultural Water Program (IAWP) unless the District's Plan or an individual Stage in the Plan is triggered by a local event leading to either a Condition 1 scenario or a Condition 2 scenario as outlined in Section 2 of this Plan.

Stage 2 – Water Alert (shortages under 10 percent):

The following voluntary measures will be requested:

1. A recommended base agricultural water-use allocation will be established using reference Evapotranspiration (ET) and the generally accepted crop-coefficient for each permanent and non-permanent crop grown.

2. A recommended commercial nursery base water-use allocation will be established at 80% of the Evapotranspiration (ET) rate using historical data from CIMIS Station Number 62.

No penalties or mandatory restrictions will be imposed during this stage.

Stage 3 – Water Warning (shortages more than 10 to 30 percent):

The following mandatory measures will be implemented:

1. Commercial nursery customers will be required to reduce the recommended base water-use allocation by 20 percent. Commercial nursery customer water-

use will be restricted to irrigation applications from midnight to 6:00 am, and only on alternate days. The District, at its discretion, may assign some or all commercial nursery irrigators to watering groups and watering days.

2. Agricultural customers will be required to reduce the recommended base water-use allocation by 20 percent.

Penalties for non-compliance will be imposed for flagrant or repeat violations (see Section 4).

Stage 4 – Extreme Water Warning (shortages more than 30 to 50 percent):

Same mandatory measures as those in Stage 3, with the following additional mandatory measures imposed:

1. Commercial nursery customers will be required to reduce the recommended base water-use allocation by 50 percent. Commercial nursery customer water-use will be restricted to irrigation applications from midnight to 6:00 am, and only twice weekly. The District, at its discretion, may assign some or all commercial nursery irrigators to watering groups and watering days.

2. Agricultural customers will be required to reduce recommended base water-use allocation by 50 percent. The District, at its discretion, may assign agricultural customers to watering groups and watering days. In the event of a temporary service outage, service to be restored when Stage 4 is terminated.

3. No planting of new agricultural trees, vines or row crops.

Penalties for non-compliance will be imposed (see Section 4).

Stage 5 – Water Emergency (shortages more than 50 percent):

Same mandatory measures as in Stages 2, 3 and 4, with the following additional mandatory measures imposed:

1. All agricultural and commercial nursery customers will be required to reduce recommended base water-use allocation by 75 to 100 percent, depending on severity of water emergency. Water service may be completely discontinued until Stage 5 is terminated.

Penalties for non-compliance will be imposed (see Section 4).

Section 4
Enforcement and Variances

Measures called for in the stages of the District's Plan will be primarily enforced through financial penalties. In extreme cases, certain types of outdoor water service may be discontinued until the emergency situation is over.

For most customers, financial penalties will be imposed using a base period water demand allocation.

4.1 Domestic and Commercial Customers with No Separate Irrigation Meters Present

For domestic and commercial customers without separate irrigation meters, the base period water demand allocation for outdoor water use will be calculated using a base year. The base year will represent the year prior to any stage of the Plan being implemented. For example, if Stage 2 of the Plan occurs in 2010, the base year would be 2009. If in 2011, Stage 3 of the Plan is implemented, the base year would still remain 2009. To estimate outdoor water use for this base year, the District will use the minimum month method. This method will use the lowest month for the base year and multiply that by 12 months. This will approximate indoor use. The actual water use above the minimum month will represent outdoor use. The calculated outdoor use for the base year will represent the base demand allocation for the purposes of imposing any financial penalties.

Because outdoor water use represents approximately 50 percent of the total non-agricultural water demand in the District, any target percent reduction in water use would represent double of what would be needed from outdoor water use. For example, if Stage 4 of the Plan calls for a 40 percent reduction in overall non-agricultural water use, then outdoor water use would have to be reduced by 80 percent. Therefore, if the domestic or commercial customer's demand for outdoor water use is greater than 20 percent of its base outdoor use, a penalty would be applied for each unit above the base.

For Stages 3 and 4 of the Plan, any penalty will represent any MWD penalties imposed (the total MWD penalty would be allocated to customers based on a pro-rata share), plus a 25 percent District increase in the customer's water bill for the base year. If MWD did not assess a penalty for a given stage of the District's Plan, the financial penalty imposed would just be a 25 percent District increase in the customer's water bill. For Stage 5, the District will impose a 50 percent increase in the customer's water a bill, in addition to any MWD penalty. All penalties collected would be used for additional administration of the Plan, to pay MWD for penalties assessed to the District, to implement additional demand management measures during an extended water shortage as well as to replenish the Drought Cash Reserve for the District (see Section 5).

4.2 Commercial Customers with Separate Irrigation Meters Present

For those commercial/institutional customers with a separate irrigation meter, the base demand allocation will be established at 100-percent of the Evapotranspiration (ET) rate using historical data from CIMIS Station Number 62. Different stages of the District's Plan would call for base water demand to be reduced and in some cases discontinued. Any water use above the specified reduction in base water allocations will be subject to a financial penalty.

Financial penalties for Commercial Customers with separate irrigation meters will be calculated in the same manner as calculated for domestic and commercial customers without separate landscape meters. For Stages 3 and 4 of the Plan, any penalty will represent any MWD penalties imposed (the total MWD penalty would be allocated to customers based on a pro-rata share), plus a 25 percent District increase in the customer's water bill for the base year. If MWD did not assess a penalty for a given stage of the District's Plan, the financial penalty imposed would just be a 25 percent District increase in the customer's water bill. For Stage 5, the District will impose a 50 percent increase in the customer's water a bill, in addition to any MWD penalty. All penalties collected would be used for additional administration of the Plan, to pay MWD for penalties assessed to the District, to implement additional demand management measures during an extended water shortage as well as to replenish the Drought Cash Reserve for the District (see Section 5).

4.3 Agricultural Customers

For permanent and non-permanent crops, each crop will be assigned a base water demand using reference Evapotranspiration (ET) and the generally accepted crop-coefficient for that crop. In no case will base water demand exceed 80-percent of the historical Evapotranspiration (ET) rate measured at CIMIS Station Number 62. Different stages of the District's Plan would call for the prescribed base water demand to be reduced and in some cases discontinued completely. Any water use above the specified reduction will be subject to a financial penalty.

Financial penalties for Agricultural Customers will be calculated in a similar manner as prescribed for domestic and commercial customers with or without separate landscape meters. However, all Agricultural Customer penalties will represent the MWD penalties imposed under the MWD Interim Agricultural Water Program and levied solely as a result of agricultural activities during any of the District's Plan stages (the total MWD penalty would be allocated to agricultural customers based on a pro-rata share), plus a 25 percent District increase in the customer's water bill for the base year for Stages 3 and 4 of the Plan. If MWD did not assess an IAWP penalty for a given stage of the District's Plan, the financial penalty imposed would just be a 25 percent District increase in the customer's water bill for Stages 3 and 4. For Stage 5, the District will impose a 50 percent increase in the customer's water a bill, in addition to any MWD penalty. All penalties collected would be used for additional administration of the Plan, to pay MWD for penalties assessed to the District, implement additional demand management measures during an extended water shortage as well as to replenish the Drought Cash Reserve for the District (see Section 5).

4.4 Variances

The District may, in writing, grant temporary variance for any penalties or restrictions imposed by the Plan. Variances may be granted due to health and safety reasons or because of special circumstances in how the base water demand was established and the actual use during a restrictive stage.

Any variance must be requested in writing within 15 days of the Plan's staged implementation. The following information must be provided:

1. Name, contact phone number , service address and customer account number of petitioner;

2. Purpose of water use (e.g., domestic, commercial, agriculture);

3. Specific provision (s) of the Plan from which the petitioner is requesting relief;

4. Detailed statement as to how the provision of the Plan adversely affects the petitioner or what damage or harm will occur;

5. Description of the relief requested;

6. Period of time for which the variance is sought; and

7. Any alternative water use restrictions (for example indoor use) that the petitioner is taking or proposes to take to meet the intent of the Plan.

Section 5
Revenue and Rate Impacts

Currently the District has a Cash Reserve Policy to deal with risk. One element of that reserve policy is a Drought Reserve. The Drought Reserve takes into account changes in the District's water supply operational costs and the reduced revenues from lower water sales. The target Drought Reserve level is $5.1 million. This reserve will be used to minimize any potential rate impacts caused by the implementation of the District's Plan.

Any penalties collected through non-compliance of the Plan would be partially used to replenish this Drought Reserve, implement additional demand management measures during an extended water shortage, contribute to increased administration costs, and pay for any MWD penalties imposed to the District.

Section 6
District's Emergency Actions

The Water Code 10632 requires actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

The District operates in an area where the probability of an earthquake is high. Depending on the severity, an earthquake may damage the water system. The District's Emergency Response Plan provides a framework for an organized response to an earthquake emergency. The primary objectives of the plan are to maintain the functionality of the water distribution system, assess the system and if necessary make rapid repair to any damage, and prevent any further damage. The District's response to an earthquake will be directed by the General Manager.

The District has Response Phases in the event of an Earthquake:

Phase I – Inspection: A rapid inspection to determine injuries and any damage which might affect the distribution system.

Phase II – Report Back: Emergency communications flow: additional inspection procedures.

Phase III – Repair: Coordination of maintenance forces.

Phase IV – Management Procedures: Key Management responsibilities for the emergency.

Phase V – Operating/Maintenance/Engineering: Outlines procedures for division staff.

Prior to Phase I inspections, system operators and inspectors report to the Emergency Operating Center to receive assigned inspection routes. The Emergency Operating Center creates a communications hub for the District to efficiently manage their available resources. For example, personnel inspecting Vail Dam, wastewater treatment facilities, and wells receive their assignments from and report their findings to the Emergency Operating Center. The Emergency Response Plan contains ten areas that are inspected with driving directions for specific inspections routes. If inspections reveal damage to any of the areas the necessary repairs are made. Communications are ongoing at all phases of the response to an earthquake. The District has a primary and secondary radio systems to insure communications will be available during an emergency.

The Emergency Response Plan also includes an analysis of the potential of an electrical power outage. The District depends on electricity to boost water to higher elevations via pumping stations, although some wells use natural gas as their energy source. In an emergency situation involving a power outage the District will utilize emergency generators to provide customers with a reliable source of water.

Section 7
Definitions for Plan

1. Acre-foot: a uniform volume of water that will cover one acre (43,560 square feet) to a depth of 1 foot (approximately 325,851 gallons).

2. Aesthetic water use: water use for ornamental or decorative purposes including, but not limited to, fountains, reflecting pools and water gardens.

3. Agricultural water use: water used for the irrigation and maintenance of both permanent and non-permanent agricultural crops including, but not limited to, avocado, citrus, winegrapes, corn and other products for human consumption or the generation of feed for livestock.

4. Beneficial water use: the efficient use of water resources for agriculture, commercial, domestic, habitat, industrial or recreation purposes.

5. Billing Unit: the unit amount of water used to apply water rates for the purposes of calculating commodity charges for the customer water usage; equal to 100 cubic feet or 748 gallons of water.

6. California-Friendly landscaping: defined by Metropolitan Water District as a landscape that features low-water using plants, state-of-the-art irrigation and controllers, sustainable landscaping techniques, and maintenance plan. Specific guidelines can be found at www.bewaterwise.com.

7. CIMIS: California Irrigation Management Information System; additional information at wwwcimis.water.ca.gov.

8. Commercial/Institutional water use: water used in businesses producing goods, providing services or in multiple family dwellings (apartments and condominiums), home owners' associations (HOA) property owners' associations (POA), schools, hospitals and correctional facilities.

9. Conservation: those practices, techniques, and technologies that reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water or increase the recycling and reuse of water so that a supply is conserved and made available for future or alternative uses.

10. Demand management: water-efficiency measures, practices or incentives implemented by the District to reduce or change the pattern of customer water demand.

11. District: Rancho California Water District.

12. Domestic (household) water use: water used for outdoor landscape irrigation or recreation and indoor personal needs such as drinking, bathing, heating, cooking, sanitation, or for general cleaning.

13. Drought: an extended period of below-normal precipitation that can result in water-supply shortages, increased water demand, or both.

14. EMWD: Eastern Municipal Water District.

15. Evapotranspiration (ET): water lost from the surface of soils and plants through evaporation and transpiration, respectively.

16. Evapotranspiration (ET) rate: the quantity of water transpired from plant tissues and evaporated from the surface of surrounding soil, expressed as a depth of water in inches or feet; where the ET rate is affected by temperature, solar radiation, humidity, wind and soil moisture.

17. Hardscape: asphalt, concrete, masonry or wood surfaced areas including streets, parking lots, sidewalks, driveways patios and decks.

18. Irrigation: the application of water to soil to meet the water needs of crops, turf, shrubbery, gardens, or wildlife food and habitat not satisfied by rainfall.

19. Landscape irrigation use: water used for the irrigation and maintenance of landscaped areas, whether publicly or privately owned, including residential and commercial lawns, gardens, golf courses, parks and rights-of-way and medians.

20. MWD: Metropolitan Water District of Southern California.

21. Non-permanent crop: agricultural commodity produced from plants that are removed following harvest and must be replanted to reproduce.

22. Non-essential water use: water uses that are not essential nor required for the protection of public, health, safety, and welfare, including:

    a. Irrigation of landscape areas, including parks, athletic fields, and golf courses, except otherwise provided under this plan;

    b. Use of water to wash any motor vehicle, motorbike, boat, trailer, airplane or other equipment or vehicle;

    c. Use of water to wash down any sidewalks, walkways, driveways, parking lots, tennis courts, or other hard-surfaced areas, unless required by the California Department of Health Services for health and sanitary reasons;

    d. Use of water to wash down buildings or structures for purposes other than immediate fire protection or hazardous substance remediation;

    e. Flushing gutters or permitting water to run or accumulate in any gutter, swale or street;

    f. Use of water to fill, refill, or add to any indoor or outdoor swimming pools or Jacuzzi-type pools used solely for recreational purposes;

g. Use of water in a fountain or pond for aesthetic or scenic purposes except where necessary to support aquatic life; and

h. Use of water from hydrants for construction purposes or any other purposes other than fire fighting.

23. Non-potable water: water not suitable for drinking; which may be recycled water or imported raw water, or a blend of the two.

24. Permanent crop: agricultural commodity produced from plants that remain following harvest.

25. Potable water: water suitable for drinking.

26. Raw water: untreated imported water.

27. Recycled water: municipal wastewater that has been treated to meet all applicable federal, state and local standards for use in approved applications, including but not limited to agricultural and landscape irrigation. Recycled water is not for human consumption.

28. Run-off: Irrigation water (agriculture and landscape) which is not absorbed by the soil to which it is applied and flows from the planted area.

29. Water waste: the use of water that results in water flowing into any gutter, street, sidewalk, swale, or storm drain in a steady stream of flow during the course of a period of five or more continuous minutes or the use of water that results in water pooling in a public street, sidewalk, right-of-way or easement, or water applied to a landscape or agricultural crop in excess of the commonly accepted ET adjustment factor or crop-coefficient.

30. WMWD: Western Municipal Water District of Riverside County.

APPENDIX D

2005 CUWCC REPORT

Reported as of 12/1/06

Water Supply & Reuse

Reporting Unit:
Rancho California Water District

Year:
2005

Water Supply Source Information

Supply Source Name	Quantity (AF) Supplied	Supply Type
MWD Treated	29921	Imported
RCWD	36459	Groundwater
SRWRF	3698	Recycled
TVRWRF	1322	Recycled
Vail Lake	71	Local Watershed

Total AF: 71471

Reported as of 12/1/06

Accounts & Water Use

Reporting Unit Name:
Rancho California Water District

Submitted to
CUWCC
11/30/2006

Year:
2005

A. Service Area Population Information:

1. Total service area population 109123

B. Number of Accounts and Water Deliveries (AF)

Type	Metered		Unmetered	
	No. of Accounts	Water Deliveries (AF)	No. of Accounts	Water Deliveries (AF)
1. Single-Family	33688	25442	0	0
2. Multi-Family	182	1750	0	0
3. Commercial	2324	4097	0	0
4. Industrial	0	0	0	0
5. Institutional	0	0	0	0
6. Dedicated Irrigation	1026	2468	0	0
7. Recycled Water	242	5020	0	0
8. Other	2872	31729	0	0
9. Unaccounted	NA	0	NA	0
Total	40334	70506	0	0
	Metered		**Unmetered**	

Reported as of 12/1/06

BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit:	BMP Form Status:	Year:
Rancho California Water District	**100% Complete**	**2005**

A. Implementation

1. Based on your signed MOU date, 03/09/2005, your Agency STRATEGY DUE DATE is:	03/09/2007
2. Has your agency developed and implemented a targeting/ marketing strategy for SINGLE-FAMILY residential water use surveys?	yes
a. If YES, when was it implemented?	07/28/2004
3. Has your agency developed and implemented a targeting/ marketing strategy for MULTI-FAMILY residential water use surveys?	yes
a. If YES, when was it implemented?	07/28/2004

B. Water Survey Data

Survey Counts:	**Single Family Accounts**	**Multi-Family Units**
1. Number of surveys offered:	120	5
2. Number of surveys completed:	74	1
Indoor Survey:		
3. Check for leaks, including toilets, faucets and meter checks	no	no
4. Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, if necessary	no	no
5. Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as neccesary; replace leaking toilet flapper, as necessary	no	no
Outdoor Survey:		
6. Check irrigation system and timers	yes	yes
7. Review or develop customer irrigation schedule	yes	yes
8. Measure landscaped area (Recommended but not required for surveys)	no	no
9. Measure total irrigable area (Recommended but not required for surveys)	no	no
10. Which measurement method is typically used (Recommended but not required for surveys)		None
11. Were customers provided with information packets that included evaluation results and water savings recommendations?	yes	yes
12. Have the number of surveys offered and completed, survey results, and survey costs been tracked?	yes	yes
a. If yes, in what form are surveys tracked?		manual activity

b. Describe how your agency tracks this information.

Contractor provides paper copies of completed evaluations. Indication of

completed evaluation is entered into customer billing system.

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

RCWD's Targeted Conservation Program focuses on the 500 highest water-use residential customers. Installed WBIC counted as evaluations.

BMP 02: Residential Plumbing Retrofit

Reporting Unit: **Rancho California Water District**

BMP Form Status: **100% Complete**

Year: **2005**

A. Implementation

1. Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts? — no

   a. If YES, list local jurisdictions in your service area and code or ordinance in each:

2. Has your agency satisfied the 75% saturation requirement for single-family housing units? — no

3. Estimated percent of single-family households with low-flow showerheads: — %

4. Has your agency satisfied the 75% saturation requirement for multi-family housing units? — no

5. Estimated percent of multi-family households with low-flow showerheads: — %

6. If YES to 2 OR 4 above, please describe how saturation was determined, including the dates and results of any survey research.

B. Low-Flow Device Distribution Information

1. Has your agency developed a targeting/ marketing strategy for distributing low-flow devices? — yes

   a. If YES, when did your agency begin implementing this strategy? — 04/01/2005

   b. Describe your targeting/ marketing strategy.

   One-time, trifold bill insert included in all customers bills. Follow up bill messages periodically to remind customers. Brochure listed program eligibility guidelines including single family home/condo owner or property manager of multifamily dwelling built prior to 1992.

Low-Flow Devices Distributed/ Installed	SF Accounts	MF Units
2. Number of low-flow showerheads distributed:	315	20
3. Number of toilet-displacement devices distributed:	0	0
4. Number of toilet flappers distributed:	0	0
5. Number of faucet aerators distributed:	185	10

6. Does your agency track the distribution and cost of low-flow devices? — yes

   a. If YES, in what format are low-flow devices tracked? — Spreadsheet

   b. If yes, describe your tracking and distribution system :

   MS Excel Spreadsheet

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? — No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 12/1/06

BMP 03: System Water Audits, Leak Detection and Repair

Reporting Unit:	BMP Form Status:	Year:
Rancho California Water District	**100% Complete**	**2005**

A. Implementation

1. Does your agency own or operate a water distribution system?	yes
2. Has your agency completed a pre-screening system audit for this reporting year?	no
3. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:	
a. Determine metered sales (AF)	66328.55
b. Determine other system verifiable uses (AF)	0
c. Determine total supply into the system (AF)	66451
d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required.	1.00
4. Does your agency keep necessary data on file to verify the values entered in question 3?	yes
5. Did your agency complete a full-scale audit during this report year?	no
6. Does your agency maintain in-house records of audit results or completed AWWA M36 audit worksheets for the completed audit which could be forwarded to CUWCC?	no
7. Does your agency operate a system leak detection program?	no
a. If yes, describe the leak detection program:	

B. Survey Data

1. Total number of miles of distribution system line.	842.05
2. Number of miles of distribution system line surveyed.	0

C. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP?	No
a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."	

D. Comments

FY 2006 supply into the system includes treated water purchased from MWD; locally produced groundwater and vail water.

Voluntary Questions (Not used to calculate compliance)

E. Volumes

	Estimated	Verified
1. Volume of raw water supplied to the system:		
2. Volume treated water supplied into the system:		
3. Volume of water exported from the system:		
4. Volume of billed authorized metered		

consumption:

5. Volume of billed authorized unmetered consumption:

6. Volume of unbilled authorized metered consumption:

7. Volume of unbilled authorized unmetered consumption:

F. Infrastructure and Hydraulics

1. System input (source or master meter) volumes metered at the entry to the:

2. How frequently are they tested and calibrated?

3. Length of mains:

4. What % of distribution mains are rigid pipes (metal, ac, concrete)?

5. Number of service connections:

6. What % of service connections are rigid pipes (metal)?

7. Are residential properties fully metered?

8. Are non-residential properties fully metered?

9. Provide an estimate of customer meter under-registration:

10. Average length of customer service line from the main to the point of the meter:

11. Average system pressure:

12. Range of system pressures: From to

13. What percentage of the system is fed from gravity feed?

14. What percentage of the system is fed by pumping and re-pumping?

G. Maintenance Questions

1. Who is responsible for providing, testing, repairing and replacing customer meters?

2. Does your agency test, repair and replace your meters on a regular timed schedule?

a. If yes, does your agency test by meter size or customer category?:

b. If yes to meter size, please provide the frequency of testing by meter size:

Less than or equal to 1"

1.5" to 2"

3" and Larger

c. If yes to customer category, provide the frequency of testing by customer category:

SF residential

MF residential

Commercial

Industrial & Institutional

3. Who is responsible for repairs to the customer lateral or customer service line?

4. Who is responsible for service line repairs downstream of the customer meter?

5. Does your agency proactively search for leaks using leak survey techniques or does your utility reactively repair leaks which are called in, or both?

6. What is the utility budget breakdown for:

Leak Detection	$
Leak Repair	$
Auditing and Water Loss Evaluation	$
Meter Testing	$

H. Comments

BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing

Reporting Unit:	BMP Form Status:	Year:
Rancho California Water District	**100% Complete**	**2005**

A. Implementation

1. Please fill out the following matrix:

Types of Billed Accounts	% Accounts Metered	% Accounts Measured (Not Metered)	% Accounts Volumetric Billing
Treated Water SF Residential Accounts	100		100
Treated Water MF Residential Accounts	100		100
Treated Water Commercial Accounts	100		100
Treated Water Industrial Accounts	100		100
Treated Water Institutional Accounts	100		100
Raw Water Residential Deliveries	0	0	0
Raw Water Non-Residential Deliveries	0	0	0

2. If your agency does not meter 100% of all treated water accounts:

   a. Does your agency have a plan or program for retrofitting existing unmetered treated water connections?

   b. By what date would 100% of all treated water accounts be metered?

   c. Number of previously unmetered accounts fitted with meters during report year:

3. If your agency does bill 100% of all treated water accounts by volume of use:

   a. By what date (Year must be four digit mm/dd/yyyy) will all customers with meters be billed by volume of use?

4. If your agency does not meter or measure 100% of all raw water delivery fields (as listed in quesiton 1f & 1g), does your agency intend to develop a program for measuring all raw water deliveries? — No

5. If your agency does not volumetrically bill 100% of all raw water delivery, does your agency intend to develop a program for billing all raw water deliveries by volume of use? — No

6. Does your agency meter by volume of use all municipal or governmental accounts?: — Yes

   a. If no, which types of accounts are not included:

7. Does your agency bill by volume of use all municipal or governmental accounts?	Yes
a. If no, which types of accounts are not included:	

B. Feasibility Study

1. Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?	no
a. If YES, when was the feasibility study conducted? (mm/dd/yy)	
b. Describe the feasibility study:	
2. Number of CII accounts with mixed-use meters:	0
3. Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period	0

D. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP?	No
a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."	

E. Comments

Report completed by Jason Martin and Sheri Todd.

Reported as of 12/1/06

BMP 05: Large Landscape Conservation Programs and Incentives

Reporting Unit:	BMP Form Status:	Year:
Rancho California Water District	**100% Complete**	**2005**

A. Water Use Budgets

1. Number of Dedicated Irrigation Meter Accounts:	1026
2. Number of Dedicated Irrigation Meter Accounts with Water Budgets:	1026
3. Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF) during reporting year:	5203
4. Actual Use for Irrigation Meter Accounts with Water Budgets (AF) during reporting year:	5358
5. Does your agency provide water use notices to accounts with budgets each billing cycle?	yes

B. Landscape Surveys

1. Has your agency developed a marketing / targeting strategy for landscape surveys?	yes
a. If YES, when did your agency begin implementing this strategy?	07/28/2004

b. Description of marketing / targeting strategy:

Rancho California Water District began implementing its Targeted Conservation Program (TCP) in July 2004. The program, provides water-use efficiency evaluations for the District's high water-use customers. If a customer's annual water-use is 200-percent higher than the average consumption in their customer class, they are "targeted" for program participation. 2,500 urban water users were initially identified for the program. The goal of the Targeted Conservation Program is to reduce the demand for more costly Tier 2 imported water.

2. Number of Surveys Offered during reporting year.	750
3. Number of Surveys Completed during reporting year.	380
4. Indicate which of the following Landscape Elements are part of your survey:	
a. Irrigation System Check	yes
b. Distribution Uniformity Analysis	no
c. Review / Develop Irrigation Schedules	yes
d. Measure Landscape Area	yes
e. Measure Total Irrigable Area	yes
f. Provide Customer Report / Information	yes
5. Do you track survey offers and results?	yes
6. Does your agency provide follow-up surveys for previously completed surveys?	yes

a. If YES, describe below:

C. Other BMP 5 Actions

1. An agency can provide mixed-use accounts with ETo-based landscape budgets in lieu of a large landscape survey program. Does your agency provide mixed-use accounts with	yes

landscape budgets?

2. Number of CII mixed-use accounts with landscape budgets. 0

Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period. (From BMP 4 report) 0

Total number of change-outs from mixed-use to dedicated irrigation meters since Base Year.

3. Do you offer landscape irrigation training? yes

4. Does your agency offer financial incentives to improve landscape water use efficiency? yes

Type of Financial Incentive:	Budget (Dollars/ Year)	Number Awarded to Customers	Total Amount Awarded
a. Rebates	0	0	0
b. Loans	0	0	0
c. Grants	0	0	0

5. Do you provide landscape water use efficiency information to new customers and customers changing services? No

a. If YES, describe below:

6. Do you have irrigated landscaping at your facilities? yes

a. If yes, is it water-efficient? yes

b. If yes, does it have dedicated irrigation metering? yes

7. Do you provide customer notices at the start of the irrigation season? no

8. Do you provide customer notices at the end of the irrigation season? no

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

BMP 06: High-Efficiency Washing Machine Rebate Programs

Reporting Unit:	BMP Form Status:	Year:
Rancho California Water District	**100% Complete**	**2005**

A. Coverage Goal

	Single Family	Multi-Family
1. Number of **residential** dwelling units in the agency service area.	27,518	6,336
2. Coverage Goal = Total Dwelling Units x 0.048	= 1,625 Points	

B. Implementation

1. Does your agency offer rebates for **residential** high-efficiency washers? yes

HEW Water Factor	Number of Financial Incentives Issued	Total Value of Financial Incentives: Retail Water Agency	Wholesaler/ Grants (if applicable)	Energy Utility (if applicable)	TOTAL	POINTS AWARDED
2. **Greater than 8.5 but not exceeding 9.5** (1 point)	26	$ 0	$ 0	$ 0	$ 0	0
3. **Greater than 6.0 but not exceeding 8.5** (2 points)	77	$ 0	$ 0	$ 0	$ 0	0
4. **Less than or equal to 6.0** (3 points)	230	$ 0	$ 0	$ 0	$ 0	0
TOTALS:	**333**	**$ 0**	**$ 0**	**$ 0**	**$ 0**	**0**

C. Past Credit Points

For HEW incentives issued before July 1, 2004, select ONE of the following TWO options:

- Method One: Points based on HEW Water Factor
- Method Two: Agency earns 1 point for each HEW.

NOTE: Agency shall not receive credit for any HEW incentives where the agency did not provide a financial incentive of $25 or more.

Method One: Points based on HEW Water Factor

HEW Water Factor	Number of Financial Incentives Issued	Total Value of Financial Incentives: Retail Water Agency	Wholesaler/ Grants (if applicable)	Energy Utility (if applicable)	TOTAL	POINTS AWARDED
1. **Greater than 8.5 but not exceeding 9.5** (1 point each)	7	$ 0	$ 0	$ 0	$ 0	0
2. **Greater than 6.0 but not exceeding 8.5**	150	$ 0	$ 0	$ 0	$ 0	0

(2 points each)						
3. **Less than or equal to 6.0** (3 points each)	171	$ 0	$ 0	$ 0	$ 0	0

Method Two: Agency earns 1 point for each HEW

	Number of Financial Incentives Issued		Total Value of Water Agency Financial Incentives			POINTS AWARDED
4. **Total HEWs installed**						
PAST CREDIT TOTALS:	**328**	**$ 0**	**$ 0**	**$ 0**	**$ 0**	**0**

D. Rebate Program Expenditures

1. Average or Estimated Administration and Overhead $ 8,000

2. Is the financial incentive offered per HEW at least equal to the marginal benefits of the water savings per HEW?

E. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

F. Comments

No comments

Reported as of 12/1/06

BMP 07: Public Information Programs

Reporting Unit: **Rancho California Water District**

BMP Form Status: **100% Complete**

Year: **2005**

A. Implementation

1. How is your public information program implemented?
Wholesaler and retailer both materially participate in program
Which wholesaler(s)?
Western Municipal Water District; Eastern Municipal Water District; and the Metropolitan Water District of Southern California

2. Describe the program and how it's organized:
Rancho California Water District's public information program consists of community and media outreach. The program was managed under the direction of the Director of Planning. The various public information outreach efforts focus on informing and educating the District's stakeholders on various topics relating to water and the organization itself. Included in these topics are: water conservation, water reliability, water quality and infrastructure planning. The District supports the local, regional and statewide community through its public information efforts. COMMUNITY Quarterly customer newsletter: includes annual water quality report, rate increase information and seasonal information. Bottled water program: reaching 49 organizations, including City of Temecula, American Red Cross and Susan G. Komen Race for the Cure. Community Water Festival: co-sponsored with other water agencies to educate the community on various topics relating to water. Landscape seminar: held in demonstration garden, open to the public. Three seminars held. City of Temecula 4th of July Parade: involvement included employee participation. MEDIA Press releases: used as a medium to relay messages about the District.

3. Indicate which and how many of the following activities are included in your public information program:

Public Information Program Activity in Retail Service Area	Yes/No	Number of Events
a. Paid Advertising	yes	1
b. Public Service Announcement	no	
c. Bill Inserts / Newsletters / Brochures	yes	12
d. Bill showing water usage in comparison to previous year's usage	yes	
e. Demonstration Gardens	yes	4
f. Special Events, Media Events	yes	5
g. Speaker's Bureau	no	
h. Program to coordinate with other government agencies, industry and public interest groups and media	yes	

B. Conservation Information Program Expenditures

1. Annual Expenditures (Excluding Staffing) 58491.36

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Report completed by Liselle DeGrave.

Reported as of 12/1/06

BMP 08: School Education Programs

Reporting Unit:
Rancho California Water District

BMP Form Status:
100% Complete

Year:
2005

A. Implementation

1. How is your public information program implemented?
Wholesaler and retailer both participate in program
Which wholesaler(s)?
Western Municipal Water District and Eastern Municipal Water District

2. Please provide information on your region-wide school programs (by grade level):

Grade	Are grade-appropriate materials distributed?	No. of class presentations	No. of students reached	No. of teachers' workshops
Grades K-3rd	yes	146	5900	0
Grades 4th-6th	yes	33	1000	0
Grades 7th-8th	yes	0	0	0
High School	yes	0	20	0

4. Did your Agency's materials meet state education framework requirements? yes

5. When did your Agency begin implementing this program? 01/01/1984

B. School Education Program Expenditures

1. Annual Expenditures (Excluding Staffing) 11057.58

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Report completed by Liselle DeGrave.

Reported as of 12/1/06

BMP 09: Conservation Programs for CII Accounts

Reporting Unit:	BMP Form Status:	Year:
Rancho California Water District	**100% Complete**	**2005**

A. Implementation

1. Has your agency identified and ranked COMMERCIAL customers according to use?	yes
2. Has your agency identified and ranked INDUSTRIAL customers according to use?	yes
3. Has your agency identified and ranked INSTITUTIONAL customers according to use?	yes

Option A: CII Water Use Survey and Customer Incentives Program

4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option? If so, please describe activity during reporting period: no

CII Surveys	Commercial Accounts	Industrial Accounts	Institutional Accounts
a. Number of New Surveys Offered	0	0	0
b. Number of New Surveys Completed	0	0	0
c. Number of Site Follow-ups of Previous Surveys (within 1 yr)	0	0	0
d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)	0	0	0
CII Survey Components	**Commercial Accounts**	**Industrial Accounts**	**Institutional Accounts**
e. Site Visit	yes	yes	yes
f. Evaluation of all water-using apparatus and processes	no	no	no
g. Customer report identifying recommended efficiency measures, paybacks and agency incentives	no	no	no

Agency CII Customer Incentives	Budget ($/Year)	# Awarded to Customers	Total $ Amount Awarded
h. Rebates	0	0	0
i. Loans	0	0	0
j. Grants	0	0	0
k. Others	0	0	0

Option B: CII Conservation Program Targets

5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this option? yes

6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings? yes

7. **System Calculated** annual savings (AF/yr):

CII Programs	# Device Installations
a. Ultra Low Flush Toilets	4
b. Dual Flush Toilets	0
c. High Efficiency Toilets	0
d. High Efficiency Urinals	0
e. Non-Water Urinals	0
f. Commercial Clothes Washers (coin-op only; not industrial)	2
g. Cooling Tower Controllers	0
h. Food Steamers	0
i. Ice Machines	0
j. Pre-Rinse Spray Valves	0
k. Steam Sterilizer Retrofits	0
l. X-ray Film Processors	0

8. **Estimated** annual savings (AF/yr) from agency programs not including the devices listed in Option B. 7., above:

CII Programs	Annual Savings (AF/yr)
a. Site-verified actions taken by agency:	0
b. Non-site-verified actions taken by agency:	0

B. Conservation Program Expenditures for CII Accounts

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

RCWD, as a water retailer in the Metropolitan Water District service area, participates in the Save Water-Save A Buck program for CII water customers.

Reported as of 12/1/06

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
Rancho California Water District	**100% Complete**	**2005**

A. Implementation

Water Service Rate Structure Data by Customer Class

Number of schedules: For the following accounts, how many rate schedules does agency offer/use?		**Use of classification:** This agency:
1. **Single-family residential**	2	Uses classification in its billing system
2. **Multi-family residential**	2	Uses classification in its billing system
3. **Commercial**	2	Uses classification in its billing system
4. **Industrial**	0	Includes customers in another class
5. **Institutional/ government**	0	Includes customers in another class
6. **Dedicated irrigation** (potable water)	2	Uses classification in its billing system
7. **Other**	0	Does not serve this type of customer
8. **Recycled-reclaimed water**	1	Uses classification in its billing system
9. **Raw water** (urban use)	0	Does not serve this type of customer
10. **Wholesale** (urban use)	0	Does not serve this type of customer

Sewer Service

11. Does your agency provide sewer service to your water customers?	yes
12. If yes, does sewer service use conservation rate structures?	no
13. Has your agency made the required efforts (as prescribed in BMP 11) to have sewer services billed on conservation rates?	no
14. What water agency activities have been undertaken during the reporting period to achieve waste water agency volumetric billing in your water agency service area?	None

B. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

C. Comments

RCWD rate structure is actually more detailed that this report form allows. RCWD has two divisions with two rate tiers each. The tiers are adjusted for both meter and property size. A different tiered allotment is calculated for meter size and a lot size variance is available at four progressively larger categories of lot size.

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
Rancho California Water District	**100% Complete**	**2005**

1.A. Single-Family Residential Rate Schedule A

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Non-volumetric Flat Rate
c. Total Revenue from only Volumetric Charges	6994909.49
d. Total Revenue from Non-Volumetric Charges (Includes fixed fees, surcharges, minimum usage charges, monthly service charges, meter charges etc.)	4073639.2
e. Total Revenue from this category	11068548.69

1.A. Rate Schedule - Volumetric

Title: Single Family Residential-Rancho Division

f. Billing Cycles/year	12
g. Service Charges/Cycle	12.1
h. Gallons/Bill Unit	748
i. Minimum Use/Cycle	0
j. Non-billed Units (included in monthly service charge)	0

	$/Bill Unit	Starting At (unit qty.)
k. Tier 1	.61073	0
l. Tier 2	.79668	525
m. Tier 3		
n. Tier 4		
o. Tier 5		
p. Tier 6		

q. Approximate quantity of meters/accounts on this rate schedule	27988
r. Are elevation charges included?	no
s. Approximate total annual water usage (AF) from customers on this rate schedule	20864

1.B. Single-Family Residential Rate Schedule B

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Non-volumetric Flat Rate
c. Total Revenue from only Volumetric Charges	2456999.04
d. Total Revenue from Non-Volumetric Charges (Includes fixed fees, surcharges, minimum usage charges, monthly service charges, meter charges etc.)	1403977.05

e. Total Revenue from this category	3860976.09

1.B. Rate Schedule - Volumetric

Title: Single Family Residential-Santa Rosa Division

f. Billing Cycles/year	12
g. Service Charges/Cycle	18.71
h. Gallons/Bill Unit	748
i. Minimum Use/Cycle	0
j. Non-billed Units (included in monthly service charge)	0

	$/Bill Unit	Starting At (unit qty.)
k. Tier 1	1.01674	0
l. Tier 2	1.20569	525
m. Tier 3		
n. Tier 4		
o. Tier 5		
p. Tier 6		

q. Approximate quantity of meters/accounts on this rate schedule	5700
r. Are elevation charges included?	no
s. Approximate total annual water usage (AF) from customers on this rate schedule	4578

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
Rancho California Water District	**100% Complete**	**2005**

2.A. Multi-Family Residential Rate Schedule A

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Non-volumetric Flat Rate
c. Total Revenue from only Volumetric Charges	774918.76
d. Total Revenue from Non-Volumetric Charges (Includes fixed fees, surcharges, minimum usage charges, monthly service charges, meter charges etc.)	319040.47
e. Total Revenue from this category	1093959.23

2.A. Rate Schedule - Volumetric

Title: Multi Family Residential - Rancho Division

f. Billing Cycles/year	12
g. Service Charges/Cycle	0
h. Gallons/Bill Unit	748
i. Minimum Use/Cycle	0
j. Non-billed Units (included in monthly service charge)	0

	$/Bill Unit	Starting At (unit qty.)
k. Tier 1	.61073	1
l. Tier 2	.79668	525
m. Tier 3		
n. Tier 4		
o. Tier 5		
p. Tier 6		

q. Approximate quantity of meters/accounts on this rate schedule	176
r. Are elevation charges included?	no
s. Approximate total annual water usage (AF) from customers on this rate schedule	1592

2.B. Multi-Family Residential Rate Schedule B

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Non-volumetric Flat Rate
c. Total Revenue from only Volumetric Charges	232127.27
d. Total Revenue from Non-Volumetric Charges (Includes fixed fees, surcharges, minimum usage charges, monthly service charges, meter charges etc.)	144076.03

e. Total Revenue from this category	376203.3

2.B. Rate Schedule - Volumetric

Title: Multi Family Residential - Santa Rosa Division

f. Billing Cycles/year	12
g. Service Charges/Cycle	0
h. Gallons/Bill Unit	748
i. Minimum Use/Cycle	0
j. Non-billed Units (included in monthly service charge)	0

	$/Bill Unit	Starting At (unit qty.)
k. Tier 1	1.01674	0
l. Tier 2	1.20269	525
m. Tier 3		
n. Tier 4		
o. Tier 5		
p. Tier 6		

q. Approximate quantity of meters/accounts on this rate schedule	6
r. Are elevation charges included?	no
s. Approximate total annual water usage (AF) from customers on this rate schedule	158

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
Rancho California Water District	**100% Complete**	**2005**

3.A. Commercial Rate Schedule A

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Non-volumetric Flat Rate
c. Total Revenue from only Volumetric Charges	1813556.75
d. Total Revenue from Non-Volumetric Charges (Includes fixed fees, surcharges, minimum usage charges, monthly service charges, meter charges etc.)	746751.74
e. Total Revenue from this category	2560308.49

3.A. Rate Schedule - Volumetric

Title: CII - Rancho Division

f. Billing Cycles/year	12
g. Service Charges/Cycle	0
h. Gallons/Bill Unit	748
i. Minimum Use/Cycle	0
j. Non-billed Units (included in monthly service charge)	0

	$/Bill Unit	Starting At (unit qty.)
k. Tier 1	.61073	0
l. Tier 2	.79668	525
m. Tier 3		
n. Tier 4		
o. Tier 5		
p. Tier 6		

q. Approximate quantity of meters/accounts on this rate schedule	1642
r. Are elevation charges included?	no
s. Approximate total annual water usage (AF) from customers on this rate schedule	3432

3.B. Commercial Rate Schedule B

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Non-volumetric Flat Rate
c. Total Revenue from only Volumetric Charges	543321.17
d. Total Revenue from Non-Volumetric Charges (Includes fixed fees, surcharges, minimum usage charges, monthly service charges, meter charges etc.)	337226.9

e. Total Revenue from this category	880548.07

3.B. Rate Schedule - Volumetric

Title: CII - Santa Rosa Division

f. Billing Cycles/year	12
g. Service Charges/Cycle	0
h. Gallons/Bill Unit	748
i. Minimum Use/Cycle	0
j. Non-billed Units (included in monthly service charge)	0

	$/Bill Unit	Starting At (unit qty.)
k. Tier 1	1.01674	0
l. Tier 2	1.20269	525
m. Tier 3		
n. Tier 4		
o. Tier 5		
p. Tier 6		

q. Approximate quantity of meters/accounts on this rate schedule	682
r. Are elevation charges included?	no
s. Approximate total annual water usage (AF) from customers on this rate schedule	665

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
Rancho California Water District	**100% Complete**	**2005**

6.A. Irrigation Rate Schedule A

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from only Volumetric Charges	1092477.46
d. Total Revenue from Non-Volumetric Charges (Includes fixed fees, surcharges, minimum usage charges, monthly service charges, meter charges etc.)	449839.49
e. Total Revenue from this category	1542316.95

6.A. Rate Schedule - Volumetric

Title: Domestic Landscape Irrigation - Rancho Division

f. Billing Cycles/year	12
g. Service Charges/Cycle	0
h. Gallons/Bill Unit	748
i. Minimum Use/Cycle	0
j. Non-billed Units (included in monthly service charge)	0

	$/Bill Unit	Starting At (unit qty.)
k. Tier 1	.61073	0
l. Tier 2	.79668	525
m. Tier 3		
n. Tier 4		
o. Tier 5		
p. Tier 6		

q. Approximate quantity of meters/accounts on this rate schedule	599
r. Are elevation charges included?	no
s. Approximate total annual water usage (AF) from customers on this rate schedule	1298

6.B. Irrigation Rate Schedule B

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from only Volumetric Charges	327293.94
d. Total Revenue from Non-Volumetric Charges (Includes fixed fees, surcharges, minimum usage charges, monthly service charges, meter charges etc.)	203143.79

e. Total Revenue from this category	530437.73

6.B. Rate Schedule - Volumetric

Title: Domestic Landscape Irrigation - Santa Rosa Division

f. Billing Cycles/year	12
g. Service Charges/Cycle	0
h. Gallons/Bill Unit	748
i. Minimum Use/Cycle	0
j. Non-billed Units (included in monthly service charge)	0

	$/Bill Unit	Starting At (unit qty.)
k. Tier 1	1.01674	0
l. Tier 2	1.20269	525
m. Tier 3		
n. Tier 4		
o. Tier 5		
p. Tier 6		

q. Approximate quantity of meters/accounts on this rate schedule	467
r. Are elevation charges included?	no
s. Approximate total annual water usage (AF) from customers on this rate schedule	1170

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
Rancho California Water District	**100% Complete**	**2005**

8.A. Recycled Rate Schedule A

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from only Volumetric Charges	754086.39
d. Total Revenue from Non-Volumetric Charges (Includes fixed fees, surcharges, minimum usage charges, monthly service charges, meter charges etc.)	20573.15
e. Total Revenue from this category	774659.54

8.A. Rate Schedule - Volumetric

Title: Tertiary Treated Recycled Water - Both Divisions

f. Billing Cycles/year	12
g. Service Charges/Cycle	10
h. Gallons/Bill Unit	325851
i. Minimum Use/Cycle	0
j. Non-billed Units (included in monthly service charge)	0

	$/Bill Unit	Starting At (unit qty.)
k. Tier 1	178.12	0
l. Tier 2		
m. Tier 3		
n. Tier 4		
o. Tier 5		
p. Tier 6		

q. Approximate quantity of meters/accounts on this rate schedule	242
r. Are elevation charges included?	no
s. Approximate total annual water usage (AF) from customers on this rate schedule	5020

Reported as of 12/1/06

BMP 12: Conservation Coordinator

Reporting Unit:	BMP Form Status:	Year:
Rancho California Water District	**100% Complete**	**2005**

A. Implementation

1. Does your Agency have a conservation coordinator?	yes
2. Is a coordinator position supplied by another agency with which you cooperate in a regional conservation program ?	no
a. Partner agency's name:	
3. If your agency supplies the conservation coordinator:	
a. What percent is this conservation coordinator's position?	25%
b. Coordinator's Name	Donna Powers
c. Coordinator's Title	Public Information Specialist
d. Coordinator's Experience in Number of Years	21 years
e. Date Coordinator's position was created (mm/dd/yyyy)	12/04/1985
4. Number of conservation staff (FTEs), including Conservation Coordinator.	1

B. Conservation Staff Program Expenditures

1. Staffing Expenditures (In-house Only)	7000
2. BMP Program Implementation Expenditures	25962

C. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP?	no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

None

Reported as of 12/1/06

BMP 13: Water Waste Prohibition

Reporting Unit:	BMP Form Status:	Year:
Rancho California Water District	**100% Complete**	**2005**

A. Requirements for Documenting BMP Implementation

1. Is a water waste prohibition ordinance in effect in your service area? yes

a. If YES, describe the ordinance:

Resolution 91-5-8 identifies five water supply stages during which certain potentially wasteful activities are prohibited. During Stage 1 - Normal Condition, specific language prevents run-off and customers are reminded that water waste is a violation of California Law and District regulations at all times. As the water supply decreases due to drought or temporary operations shortages the stage numbers increase and the water-use restrictions become increasingly strict.

2. Is a copy of the most current ordinance(s) on file with CUWCC? no

a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:

TEMECULA, MURRIETA AND THE COUNTY OF RIVERSIDE	City of Temecula Development Code Chapter 17.32; City of Murrieta Ordiance 182-2; County of Riverside Code Chapter 17.286

B. Implementation

1. Indicate which of the water uses listed below are prohibited by your agency or service area.

a. Gutter flooding	no
b. Single-pass cooling systems for new connections	no
c. Non-recirculating systems in all new conveyor or car wash systems	no
d. Non-recirculating systems in all new commercial laundry systems	no
e. Non-recirculating systems in all new decorative fountains	no
f. Other, please name	no

2. Describe measures that prohibit water uses listed above:

No ordinance specifically prohibited the above water uses during FY 2005. RCWD signed the MOU in March of 2005 and will soon work to address this requirement.

Water Softeners:

3. Indicate which of the following measures your agency has supported in developing state law:

a. Allow the sale of more efficient, demand-initiated regenerating DIR models.	yes
b. Develop minimum appliance efficiency standards that:	
i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used.	yes
ii.) Implement an identified maximum number of gallons discharged per gallon of soft water	yes

produced.

c. Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply. yes

4. Does your agency include water softener checks in home water audit programs? no

5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models? no

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

None

Reported as of 12/1/06

BMP 14: Residential ULFT Replacement Programs

Reporting Unit:	BMP Form Status:	Year:
Rancho California Water District	**100% Complete**	**2005**

A. Implementation

Number of 1.6 gpf Toilets Replaced by Agency Program During Report Year

	Single-Family Accounts	Multi-Family Units
1. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	yes
Replacement Method	**SF Accounts**	**MF Units**
2. Rebate	154	0
3. Direct Install	0	0
4. CBO Distribution	0	0
5. Other	0	0
Total	**154**	**0**

Number of 1.2 gpf High-Efficiency Toilets (HETs) Replaced by Agency Program During Report Year

	Single-Family Accounts	Multi-Family Units
6. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	no	no
Replacement Method	**SF Accounts**	**MF Units**
7. Rebate	0	0
8. Direct Install	0	0
9. CBO Distribution	0	0
10. Other	0	0
Total	**0**	**0**

Number of Dual-Flush Toilets Replaced by Agency Program During Report Year

	Single-Family Accounts	Multi-Family Units
11. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	no	no
Replacement Method	**SF Accounts**	**MF Units**
12. Rebate	0	0
13. Direct Install	0	0
14. CBO Distribution	0	0
15. Other	0	0
Total	**0**	**0**

16. Describe your agency's ULFT, HET, and/or Dual-Flush Toilet programs for

single-family residences.

IN FY 2005, RCWD'S TOILET REPLACEMENT PROGRAM WAS SOLELY A REBATE FOR THE REPLACEMENT OF NON-CONSERVING UNITS WITH ULFTS. SINGLE FAMILY AND MULTI FAMILY WERE PERMITTED TO PARTICIPATE.

17. Describe your agency's ULFT, HET, and/or Dual-Flush Toilet programs for multi-family residences.

IN FY 2005, RCWD'S TOILET REPLACEMENT PROGRAM WAS SOLELY A REBATE FOR THE REPLACEMENT OF NON-CONSERVING UNITS WITH ULFTS. SINGLE FAMILY AND MULTI FAMILY WERE PERMITTED TO PARTICIPATE.

18. Is a toilet retrofit on resale ordinance in effect for your service area? no

19. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

B. Residential ULFT Program Expenditures

1. Estimated cost per ULFT/HET replacement: 56

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Estimated Cost per ULFT does not include the $60 per unit rebate incentive that was passed to the customer.

APPENDIX E

2006 CUWCC REPORT

Reported as of 12/1/06

Water Supply & Reuse

Reporting Unit:
Rancho California Water District

Year:
2006

Water Supply Source Information

Supply Source Name	Quantity (AF) Supplied	Supply Type
MWD Treated	35969	Imported
SRWRF	4462	Recycled
TVRWRF	893	Recycled
RCWD	40700	Groundwater
Vail Lake	834	Local Watershed

Total AF: 82858

Reported as of 12/1/06

Accounts & Water Use

Reporting Unit Name:	Submitted to	Year:
Rancho California Water District	CUWCC **11/30/2006**	**2006**

A. Service Area Population Information:

1. Total service area population 111960

B. Number of Accounts and Water Deliveries (AF)

Type	Metered		Unmetered	
	No. of Accounts	Water Deliveries (AF)	No. of Accounts	Water Deliveries (AF)
1. Single-Family	34513	28200	0	0
2. Multi-Family	186	1758	0	0
3. Commercial	2425	4370	0	0
4. Industrial	0	0	0	0
5. Institutional	0	0	0	0
6. Dedicated Irrigation	1099	2120	0	0
7. Recycled Water	339	5355	0	0
8. Other	2936	38572	0	0
9. Unaccounted	NA	0	NA	0
Total	41498	80375	0	0
	Metered		**Unmetered**	

BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit:	BMP Form Status:	Year:
Rancho California Water District	**100% Complete**	**2006**

A. Implementation

1. Based on your signed MOU date, 03/09/2005, your Agency STRATEGY DUE DATE is:	03/09/2007
2. Has your agency developed and implemented a targeting/ marketing strategy for SINGLE-FAMILY residential water use surveys?	yes
a. If YES, when was it implemented?	07/28/2004
3. Has your agency developed and implemented a targeting/ marketing strategy for MULTI-FAMILY residential water use surveys?	yes
a. If YES, when was it implemented?	07/28/2004

B. Water Survey Data

Survey Counts:	Single Family Accounts	Multi-Family Units
1. Number of surveys offered:	170	6
2. Number of surveys completed:	138	6
Indoor Survey:		
3. Check for leaks, including toilets, faucets and meter checks	no	no
4. Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, if necessary	no	no
5. Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as neccesary; replace leaking toilet flapper, as necessary	no	no
Outdoor Survey:		
6. Check irrigation system and timers	yes	yes
7. Review or develop customer irrigation schedule	yes	yes
8. Measure landscaped area (Recommended but not required for surveys)	no	no
9. Measure total irrigable area (Recommended but not required for surveys)	no	no
10. Which measurement method is typically used (Recommended but not required for surveys)		None
11. Were customers provided with information packets that included evaluation results and water savings recommendations?	yes	yes
12. Have the number of surveys offered and completed, survey results, and survey costs been tracked?	yes	yes
a. If yes, in what form are surveys tracked?		manual activity

b. Describe how your agency tracks this information.

Contractor provides paper copies of completed evaluations. Indication of

completed evaluation is entered into customer billing system.

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

RCWD's Targeted Conservation Program focuses on the 500 highest water-use residential customers. Installed WBIC counted as evaluations.

BMP 02: Residential Plumbing Retrofit

Reporting Unit: **Rancho California Water District**

BMP Form Status: **100% Complete**

Year: **2006**

A. Implementation

1. Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts? — no

   a. If YES, list local jurisdictions in your service area and code or ordinance in each:

2. Has your agency satisfied the 75% saturation requirement for single-family housing units? — no

3. Estimated percent of single-family households with low-flow showerheads: — %

4. Has your agency satisfied the 75% saturation requirement for multi-family housing units? — no

5. Estimated percent of multi-family households with low-flow showerheads: — %

6. If YES to 2 OR 4 above, please describe how saturation was determined, including the dates and results of any survey research.

B. Low-Flow Device Distribution Information

1. Has your agency developed a targeting/ marketing strategy for distributing low-flow devices? — yes

   a. If YES, when did your agency begin implementing this strategy? — 04/01/2005

   b. Describe your targeting/ marketing strategy.

   In FY 2006, RCWD provided program messages in the customer newsletter and on monthly billing statements.

Low-Flow Devices Distributed/ Installed	SF Accounts	MF Units
2. Number of low-flow showerheads distributed:	58	0
3. Number of toilet-displacement devices distributed:	0	0
4. Number of toilet flappers distributed:	0	0
5. Number of faucet aerators distributed:	30	0

6. Does your agency track the distribution and cost of low-flow devices? — yes

   a. If YES, in what format are low-flow devices tracked? — Spreadsheet

   b. If yes, describe your tracking and distribution system :

   MS Excel Spreadsheet

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? — No

   a. If YES, please explain in detail how your implementation of this BMP

differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 12/1/06

BMP 03: System Water Audits, Leak Detection and Repair

Reporting Unit:	BMP Form Status:	Year:
Rancho California Water District	**100% Complete**	**2006**

A. Implementation

1. Does your agency own or operate a water distribution system?	yes
2. Has your agency completed a pre-screening system audit for this reporting year?	no
3. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:	
a. Determine metered sales (AF)	77493.77
b. Determine other system verifiable uses (AF)	0
c. Determine total supply into the system (AF)	77503
d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required.	1.00
4. Does your agency keep necessary data on file to verify the values entered in question 3?	yes
5. Did your agency complete a full-scale audit during this report year?	no
6. Does your agency maintain in-house records of audit results or completed AWWA M36 audit worksheets for the completed audit which could be forwarded to CUWCC?	no
7. Does your agency operate a system leak detection program?	no
a. If yes, describe the leak detection program:	

B. Survey Data

1. Total number of miles of distribution system line.	851.51
2. Number of miles of distribution system line surveyed.	0

C. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP?	No
a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."	

D. Comments

FY 2006 supply into the system includes treated water purchased from MWD; locally produced groundwater and vail water.

Voluntary Questions (Not used to calculate compliance)

E. Volumes

	Estimated	Verified
1. Volume of raw water supplied to the system:		
2. Volume treated water supplied into the system:		
3. Volume of water exported from the system:		
4. Volume of billed authorized metered		

consumption:

5. Volume of billed authorized unmetered consumption:

6. Volume of unbilled authorized metered consumption:

7. Volume of unbilled authorized unmetered consumption:

F. Infrastructure and Hydraulics

1. System input (source or master meter) volumes metered at the entry to the:

2. How frequently are they tested and calibrated?

3. Length of mains:

4. What % of distribution mains are rigid pipes (metal, ac, concrete)?

5. Number of service connections:

6. What % of service connections are rigid pipes (metal)?

7. Are residential properties fully metered?

8. Are non-residential properties fully metered?

9. Provide an estimate of customer meter under-registration:

10. Average length of customer service line from the main to the point of the meter:

11. Average system pressure:

12. Range of system pressures: From to

13. What percentage of the system is fed from gravity feed?

14. What percentage of the system is fed by pumping and re-pumping?

G. Maintenance Questions

1. Who is responsible for providing, testing, repairing and replacing customer meters?

2. Does your agency test, repair and replace your meters on a regular timed schedule?

a. If yes, does your agency test by meter size or customer category?:

b. If yes to meter size, please provide the frequency of testing by meter size:

Less than or equal to 1"

1.5" to 2"

3" and Larger

c. If yes to customer category, provide the frequency of testing by customer category:

SF residential

MF residential

Commercial

Industrial & Institutional

3. Who is responsible for repairs to the customer lateral or customer service line?

4. Who is responsible for service line repairs downstream of the customer meter?

5. Does your agency proactively search for leaks using leak survey techniques or does your utility reactively repair leaks which are called in, or both?

6. What is the utility budget breakdown for:

Leak Detection	$
Leak Repair	$
Auditing and Water Loss Evaluation	$
Meter Testing	$

H. Comments

BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing

Reporting Unit:	BMP Form Status:	Year:
Rancho California Water District	**100% Complete**	**2006**

A. Implementation

1. Please fill out the following matrix:

Types of Billed Accounts	% Accounts Metered	% Accounts Measured (Not Metered)	% Accounts Volumetric Billing
Treated Water SF Residential Accounts	100		100
Treated Water MF Residential Accounts	100		100
Treated Water Commercial Accounts	100		100
Treated Water Industrial Accounts	100		100
Treated Water Institutional Accounts	100		100
Raw Water Residential Deliveries	0	0	0
Raw Water Non-Residential Deliveries	0	0	0

2. If your agency does not meter 100% of all treated water accounts:

   a. Does your agency have a plan or program for retrofitting existing unmetered treated water connections? — No

   b. By what date would 100% of all treated water accounts be metered?

   c. Number of previously unmetered accounts fitted with meters during report year:

3. If your agency does bill 100% of all treated water accounts by volume of use:

   a. By what date (Year must be four digit mm/dd/yyyy) will all customers with meters be billed by volume of use?

4. If your agency does not meter or measure 100% of all raw water delivery fields (as listed in quesiton 1f & 1g), does your agency intend to develop a program for measuring all raw water deliveries? — No

5. If your agency does not volumetrically bill 100% of all raw water delivery, does your agency intend to develop a program for billing all raw water deliveries by volume of use? — No

6. Does your agency meter by volume of use all municipal or governmental accounts?: — Yes

   a. If no, which types of accounts are not included:

7. Does your agency bill by volume of use all municipal or governmental accounts?	Yes
a. If no, which types of accounts are not included:	

B. Feasibility Study

1. Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?	no
a. If YES, when was the feasibility study conducted? (mm/dd/yy)	
b. Describe the feasibility study:	
2. Number of CII accounts with mixed-use meters:	0
3. Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period	0

D. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP?	No
a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."	

E. Comments

Report completed by Jason Martin and Sheri Todd.

Reported as of 12/1/06

BMP 05: Large Landscape Conservation Programs and Incentives

Reporting Unit:	BMP Form Status:	Year:
Rancho California Water District	**100% Complete**	**2006**

A. Water Use Budgets

1. Number of Dedicated Irrigation Meter Accounts:	1099
2. Number of Dedicated Irrigation Meter Accounts with Water Budgets:	1099
3. Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF) during reporting year:	5617
4. Actual Use for Irrigation Meter Accounts with Water Budgets (AF) during reporting year:	6718
5. Does your agency provide water use notices to accounts with budgets each billing cycle?	yes

B. Landscape Surveys

1. Has your agency developed a marketing / targeting strategy for landscape surveys?	yes
a. If YES, when did your agency begin implementing this strategy?	07/28/2004

b. Description of marketing / targeting strategy:

Rancho California Water District began implementing its Targeted Conservation Program (TCP) in July 2004. The program, provides water-use efficiency evaluations for the District's high water-use customers. If a customer's annual water-use is 200-percent higher than the average consumption in their customer class, they are "targeted" for program participation. 2,500 urban water users were initially identified for the program. The goal of the Targeted Conservation Program is to reduce the demand for more costly Tier 2 imported water.

2. Number of Surveys Offered during reporting year.	1225
3. Number of Surveys Completed during reporting year.	724
4. Indicate which of the following Landscape Elements are part of your survey:	
a. Irrigation System Check	yes
b. Distribution Uniformity Analysis	no
c. Review / Develop Irrigation Schedules	yes
d. Measure Landscape Area	yes
e. Measure Total Irrigable Area	yes
f. Provide Customer Report / Information	yes
5. Do you track survey offers and results?	yes
6. Does your agency provide follow-up surveys for previously completed surveys?	yes

a. If YES, describe below:

RCWD's high water use list is generated each year. If a customer remains on the list from year to year and a follow up visit may yield aditional savings a follow up evaluation may be conducted.

C. Other BMP 5 Actions

1. An agency can provide mixed-use accounts with ETo-based landscape budgets in lieu of a large landscape survey	yes

program.

Does your agency provide mixed-use accounts with landscape budgets?

2. Number of CII mixed-use accounts with landscape budgets. 0

Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period. (From BMP 4 report) 0

Total number of change-outs from mixed-use to dedicated irrigation meters since Base Year.

3. Do you offer landscape irrigation training? yes

4. Does your agency offer financial incentives to improve landscape water use efficiency? yes

Type of Financial Incentive:	Budget (Dollars/ Year)	Number Awarded to Customers	Total Amount Awarded
a. Rebates	0	0	0
b. Loans	0	0	0
c. Grants	0	0	0

5. Do you provide landscape water use efficiency information to new customers and customers changing services? No

a. If YES, describe below:

6. Do you have irrigated landscaping at your facilities? yes

a. If yes, is it water-efficient? yes

b. If yes, does it have dedicated irrigation metering? yes

7. Do you provide customer notices at the start of the irrigation season? no

8. Do you provide customer notices at the end of the irrigation season? no

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

RCWD, through grant funding and financial incentives offered by Metropolitan Water District(MWD), directly installed more than 500 weather based irrigation controllers during FY 2006. These controllers are responsible for more than 750 acres of irrigated landscape. Most of the controllers were installed in HOA common area and commercial landscapes. In addition, RCWD passes all MWD landscape financial incentive programs on to its customers.

BMP 06: High-Efficiency Washing Machine Rebate Programs

Reporting Unit: **Rancho California Water District**

BMP Form Status: **100% Complete**

Year: **2006**

A. Coverage Goal

	Single Family	Multi-Family
1. Number of **residential** dwelling units in the agency service area.	27,518	6,336
2. Coverage Goal = Total Dwelling Units x 0.048	= 1,625 Points	

B. Implementation

1. Does your agency offer rebates for **residential** high-efficiency washers? yes

HEW Water Factor	Number of Financial Incentives Issued	Total Value of Financial Incentives: Retail Water Agency	Wholesaler/ Grants (if applicable)	Energy Utility (if applicable)	TOTAL	POINTS AWARDED
2. **Greater than 8.5 but not exceeding 9.5** (1 point)	0	$ 0	$ 0	$ 0	$ 0	0
3. **Greater than 6.0 but not exceeding 8.5** (2 points)	0	$ 0	$ 0	$ 0	$ 0	0
4. **Less than or equal to 6.0** (3 points)	311	$ 0	$ 0	$ 0	$ 0	0
TOTALS:	**311**	**$ 0**	**$ 0**	**$ 0**	**$ 0**	**0**

C. Past Credit Points

For HEW incentives issued before July 1, 2004, select ONE of the following TWO options:

- Method One: Points based on HEW Water Factor
- Method Two: Agency earns 1 point for each HEW.

NOTE: Agency shall not receive credit for any HEW incentives where the agency did not provide a financial incentive of $25 or more.

Method One: Points based on HEW Water Factor

HEW Water Factor	Number of Financial Incentives Issued	Total Value of Water Agency Financial Incentives	POINTS AWARDED
1. **Greater than 8.5 but not exceeding 9.5** (1 point each)	7	$ 0	0
2. **Greater than 6.0 but not exceeding 8.5** (2 points each)	150	$ 0	0

3. **Less than or equal to 6.0** (3 points each)	171	$ 0	0

Method Two: Agency earns 1 point for each HEW

	Number of Financial Incentives Issued	Total Value of Water Agency Financial Incentives	POINTS AWARDED
4. **Total HEWs installed**			
PAST CREDIT TOTALS:	**328**	**$ 0**	**0**

D. Rebate Program Expenditures

1. Average or Estimated Administration and Overhead $ 7,500

2. Is the financial incentive offered per HEW at least equal to the marginal benefits of the water savings per HEW?

E. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

F. Comments

Reported as of 12/1/06

BMP 07: Public Information Programs

Reporting Unit:	BMP Form Status:	Year:
Rancho California Water District	**100% Complete**	**2006**

A. Implementation

1. How is your public information program implemented?
Wholesaler and retailer both materially participate in program
Which wholesaler(s)?
Western Municipal Water District; Eastern Municipal Water District; and the Metropolitan Water District of Southern California

2. Describe the program and how it's organized:
Rancho California Water District's public information program consists of community, legislative and media outreach. The program is managed under the direction of the Director of planning. The various public information outreach efforts focus on informing and educating the District's stakeholders on various topics relating to water and the organization itself. Included in these topics are: water conservation, water reliability, water quality and infrastructure planning. The District supports the local, regional and statewide community through its public information efforts. COMMUNITY Quarterly customer newsletter: includes annual water quality report and seasonal information. Public outreach notices: includes time-sensitive information on rate increases and chloraminated water adjustments. Bottled water program: reaching 80 organizations, including Temecula Rotary, habitat for Humanity, Temecula Valley Public Library, American Cancer Society and Boys & Girls Club. Community Water Conservation Festival: co-sponsored with other local water agencies to educate the community on the importance of water conservation with live demos on various products that can be used to improve water efficiency. Enough H2O Campaign: combined effort between local water agencies to educate customers on how much water to use on their lawns, how often and for how many minutes over the summer months. Balloon & Wine Festival: booth with public information materials available to general public. Susan G. Komen: booth with public information materials available to general public. Sponsorships: ACWA spring and winter conferences, I-215 Corridor Economic Summit, California Urban Water Conservation Council and Riverside County Water Symposium. Website: updates and revisions made to improve public information. LEGISLATIVE Lobbyist efforts: educating local legislators on future projects that affect the Southern California region, to gain support. Support/ opposition letters: written in support or opposition for public policy concerning the water industry. MEDIA Press releases, public service announcements and media advisories: used as a medium to relay messages about the District.

3. Indicate which and how many of the following activities are included in your public information program:

Public Information Program Activity in Retail Service Area	Yes/No	Number of Events
a. Paid Advertising	yes	1
b. Public Service Announcement	yes	3
c. Bill Inserts / Newsletters / Brochures	yes	12
d. Bill showing water usage in comparison to previous year's usage	yes	
e. Demonstration Gardens	yes	0
f. Special Events, Media Events	yes	3
g. Speaker's Bureau	yes	1
h. Program to coordinate with other government agencies, industry and	yes	

public interest groups and media

B. Conservation Information Program Expenditures

1. Annual Expenditures (Excluding Staffing) 24546.82

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Report completed by Liselle DeGrave.

BMP 08: School Education Programs

Reporting Unit:
Rancho California Water District

BMP Form Status:
100% Complete

Year:
2006

A. Implementation

1. How is your public information program implemented?
Wholesaler and retailer both participate in program
Which wholesaler(s)?
Western Municipal Water District and Eastern Municipal Water District

2. Please provide information on your region-wide school programs (by grade level):

Grade	Are grade-appropriate materials distributed?	No. of class presentations	No. of students reached	No. of teachers' workshops
Grades K-3rd	yes	85	2888	0
Grades 4th-6th	yes	35	2397	0
Grades 7th-8th	yes	0	0	0
High School	yes	0	80	0

4. Did your Agency's materials meet state education framework requirements? yes

5. When did your Agency begin implementing this program? 01/01/1984

B. School Education Program Expenditures

1. Annual Expenditures (Excluding Staffing) 13147.55

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Report completed by Liselle DeGrave.

Reported as of 12/1/06

BMP 09: Conservation Programs for CII Accounts

Reporting Unit:	BMP Form Status:	Year:
Rancho California Water District	**100% Complete**	**2006**

A. Implementation

1. Has your agency identified and ranked COMMERCIAL customers according to use?	yes
2. Has your agency identified and ranked INDUSTRIAL customers according to use?	yes
3. Has your agency identified and ranked INSTITUTIONAL customers according to use?	yes

Option A: CII Water Use Survey and Customer Incentives Program

4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option? If so, please describe activity during reporting period: no

CII Surveys	Commercial Accounts	Industrial Accounts	Institutional Accounts
a. Number of New Surveys Offered	0	0	0
b. Number of New Surveys Completed	0	0	0
c. Number of Site Follow-ups of Previous Surveys (within 1 yr)	0	0	0
d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)	0	0	0

CII Survey Components	Commercial Accounts	Industrial Accounts	Institutional Accounts
e. Site Visit	yes	yes	yes
f. Evaluation of all water-using apparatus and processes	no	no	no
g. Customer report identifying recommended efficiency measures, paybacks and agency incentives	no	no	no

Agency CII Customer Incentives	Budget ($/Year)	# Awarded to Customers	Total $ Amount Awarded
h. Rebates	0	0	0
i. Loans	0	0	0
j. Grants	0	0	0
k. Others	0	0	0

Option B: CII Conservation Program Targets

5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this option? yes

6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings? yes

7. **System Calculated** annual savings (AF/yr):

CII Programs	# Device Installations
a. Ultra Low Flush Toilets	42
b. Dual Flush Toilets	0
c. High Efficiency Toilets	0
d. High Efficiency Urinals	0
e. Non-Water Urinals	0
f. Commercial Clothes Washers (coin-op only; not industrial)	0
g. Cooling Tower Controllers	2
h. Food Steamers	0
i. Ice Machines	0
j. Pre-Rinse Spray Valves	338
k. Steam Sterilizer Retrofits	0
l. X-ray Film Processors	0

8. **Estimated** annual savings (AF/yr) from agency programs not including the devices listed in Option B. 7., above:

CII Programs	Annual Savings (AF/yr)
a. Site-verified actions taken by agency:	0
b. Non-site-verified actions taken by agency:	0

B. Conservation Program Expenditures for CII Accounts

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

RCWD as a water retailer in the Metropolitan Water District service area participates in the Save Water-Save A Buck program for CII water customers.

Reported as of 12/1/06

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
Rancho California Water District	**100% Complete**	**2006**

A. Implementation

Water Service Rate Structure Data by Customer Class

Number of schedules: For the following accounts, how many rate schedules does agency offer/use?		**Use of classification:** This agency:
1. **Single-family residential**	2	Uses classification in its billing system
2. **Multi-family residential**	2	Uses classification in its billing system
3. **Commercial**	2	Uses classification in its billing system
4. **Industrial**	0	Includes customers in another class
5. **Institutional/ government**	0	Includes customers in another class
6. **Dedicated irrigation** (potable water)	2	Uses classification in its billing system
7. **Other**	0	Uses classification in its billing system
8. **Recycled-reclaimed water**	1	Uses classification in its billing system
9. **Raw water** (urban use)	0	Does not offer this type of water
10. **Wholesale** (urban use)	0	Does not offer this type of water

Sewer Service

11. Does your agency provide sewer service to your water customers?	yes
12. If yes, does sewer service use conservation rate structures?	no
13. Has your agency made the required efforts (as prescribed in BMP 11) to have sewer services billed on conservation rates?	no
14. What water agency activities have been undertaken during the reporting period to achieve waste water agency volumetric billing in your water agency service area?	None

B. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

C. Comments

RCWD rate structure is actually more detailed that this report form allows. RCWD has two divisions with two rate tiers each. The tiers are adjusted for both meter and property size. A different tiered allotment is calculated for meter size and a lot size variance is available at four progressively larger categories of lot size.

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
Rancho California Water District	**100% Complete**	**2006**

1.A. Single-Family Residential Rate Schedule A

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Non-volumetric Flat Rate
c. Total Revenue from only Volumetric Charges	7964550
d. Total Revenue from Non-Volumetric Charges (Includes fixed fees, surcharges, minimum usage charges, monthly service charges, meter charges etc.)	4428400
e. Total Revenue from this category	12392950

1.A. Rate Schedule - Volumetric

Title: Single Family 3/4 inch - Rancho Division

f. Billing Cycles/year	12
g. Service Charges/Cycle	12.71
h. Gallons/Bill Unit	748
i. Minimum Use/Cycle	0
j. Non-billed Units (included in monthly service charge)	0

	$/Bill Unit	Starting At (unit qty.)
k. Tier 1	.62865	1
l. Tier 2	.8146	525
m. Tier 3		
n. Tier 4		
o. Tier 5		
p. Tier 6		

q. Approximate quantity of meters/accounts on this rate schedule	28708
r. Are elevation charges included?	no
s. Approximate total annual water usage (AF) from customers on this rate schedule	22979

1.B. Single-Family Residential Rate Schedule B

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Non-volumetric Flat Rate
c. Total Revenue from only Volumetric Charges	2882159
d. Total Revenue from Non-Volumetric Charges (Includes fixed fees, surcharges, minimum usage charges, monthly service charges, meter charges etc.)	1561254

e. Total Revenue from this category	4443413

1.B. Rate Schedule - Volumetric

Title: SANTA ROSA DIVISION - 3/4 INCH DOMESTIC

f. Billing Cycles/year	12
g. Service Charges/Cycle	19.65
h. Gallons/Bill Unit	748
i. Minimum Use/Cycle	0
j. Non-billed Units (included in monthly service charge)	0

	$/Bill Unit	Starting At (unit qty.)
k. Tier 1	1.02811	0
l. Tier 2	1.21406	525
m. Tier 3		
n. Tier 4		
o. Tier 5		
p. Tier 6		

q. Approximate quantity of meters/accounts on this rate schedule	5805
r. Are elevation charges included?	no
s. Approximate total annual water usage (AF) from customers on this rate schedule	5221

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
Rancho California Water District	**100% Complete**	**2006**

2.A. Multi-Family Residential Rate Schedule A

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Non-volumetric Flat Rate
c. Total Revenue from only Volumetric Charges	847927.67
d. Total Revenue from Non-Volumetric Charges (Includes fixed fees, surcharges, minimum usage charges, monthly service charges, meter charges etc.)	361727.66
e. Total Revenue from this category	1209655.33

2.A. Rate Schedule - Volumetric

Title: Multi Family Residential - Rancho Division

f. Billing Cycles/year	12
g. Service Charges/Cycle	0
h. Gallons/Bill Unit	748
i. Minimum Use/Cycle	0
j. Non-billed Units (included in monthly service charge)	0

	$/Bill Unit	Starting At (unit qty.)
k. Tier 1	.62865	1
l. Tier 2	.8146	525
m. Tier 3		
n. Tier 4		
o. Tier 5		
p. Tier 6		

q. Approximate quantity of meters/accounts on this rate schedule	180
r. Are elevation charges included?	no
s. Approximate total annual water usage (AF) from customers on this rate schedule	1589

2.B. Multi-Family Residential Rate Schedule B

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Non-volumetric Flat Rate
c. Total Revenue from only Volumetric Charges	281198.66
d. Total Revenue from Non-Volumetric Charges (Includes fixed fees, surcharges, minimum usage charges, monthly service charges, meter charges etc.)	181034.83

e. Total Revenue from this category	462233.49

2.B. Rate Schedule - Volumetric

Title: Multi Family Residential - Santa Rosa Division

f. Billing Cycles/year	12
g. Service Charges/Cycle	0
h. Gallons/Bill Unit	748
i. Minimum Use/Cycle	0
j. Non-billed Units (included in monthly service charge)	0

	$/Bill Unit	Starting At (unit qty.)
k. Tier 1	1.02811	1
l. Tier 2	1.21406	525
m. Tier 3		
n. Tier 4		
o. Tier 5		
p. Tier 6		

q. Approximate quantity of meters/accounts on this rate schedule	6
r. Are elevation charges included?	no
s. Approximate total annual water usage (AF) from customers on this rate schedule	169

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
Rancho California Water District	**100% Complete**	**2006**

3.A. Commercial Rate Schedule A

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Non-volumetric Flat Rate
c. Total Revenue from only Volumetric Charges	2108081.09
d. Total Revenue from Non-Volumetric Charges (Includes fixed fees, surcharges, minimum usage charges, monthly service charges, meter charges etc.)	899311.66
e. Total Revenue from this category	3007392.75

3.A. Rate Schedule - Volumetric

Title: CII - Rancho Division

f. Billing Cycles/year	12
g. Service Charges/Cycle	0
h. Gallons/Bill Unit	748
i. Minimum Use/Cycle	0
j. Non-billed Units (included in monthly service charge)	0

	$/Bill Unit	Starting At (unit qty.)
k. Tier 1	.62865	0
l. Tier 2	.8146	525
m. Tier 3		
n. Tier 4		
o. Tier 5		
p. Tier 6		

q. Approximate quantity of meters/accounts on this rate schedule	1713
r. Are elevation charges included?	no
s. Approximate total annual water usage (AF) from customers on this rate schedule	3513

3.B. Commercial Rate Schedule B

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Non-volumetric Flat Rate
c. Total Revenue from only Volumetric Charges	699103.95
d. Total Revenue from Non-Volumetric Charges (Includes fixed fees, surcharges, minimum usage charges, monthly service charges, meter charges etc.)	450080.99

e. Total Revenue from this category	1149184.94

3.B. Rate Schedule - Volumetric

Title: CII - Santa Rosa Division

f. Billing Cycles/year	12
g. Service Charges/Cycle	0
h. Gallons/Bill Unit	748
i. Minimum Use/Cycle	0
j. Non-billed Units (included in monthly service charge)	0

	$/Bill Unit	Starting At (unit qty.)
k. Tier 1	1.02811	0
l. Tier 2	1.21406	525
m. Tier 3		
n. Tier 4		
o. Tier 5		
p. Tier 6		

q. Approximate quantity of meters/accounts on this rate schedule	712
r. Are elevation charges included?	no
s. Approximate total annual water usage (AF) from customers on this rate schedule	857

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
Rancho California Water District	**100% Complete**	**2006**

6.A. Irrigation Rate Schedule A

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from only Volumetric Charges	1022606.34
d. Total Revenue from Non-Volumetric Charges (Includes fixed fees, surcharges, minimum usage charges, monthly service charges, meter charges etc.)	436245.94
e. Total Revenue from this category	1458852.28

6.A. Rate Schedule - Volumetric

Title: Domestic Landscape Irrigation - Rancho Division

f. Billing Cycles/year	12
g. Service Charges/Cycle	0
h. Gallons/Bill Unit	748
i. Minimum Use/Cycle	0
j. Non-billed Units (included in monthly service charge)	0

	$/Bill Unit	Starting At (unit qty.)
k. Tier 1	.62865	0
l. Tier 2	.8146	525
m. Tier 3		
n. Tier 4		
o. Tier 5		
p. Tier 6		

q. Approximate quantity of meters/accounts on this rate schedule	599
r. Are elevation charges included?	no
s. Approximate total annual water usage (AF) from customers on this rate schedule	1056

6.B. Irrigation Rate Schedule B

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from only Volumetric Charges	436245.94
d. Total Revenue from Non-Volumetric Charges (Includes fixed fees, surcharges, minimum usage charges, monthly service charges, meter charges etc.)	218329.21

e. Total Revenue from this category	654575.15

6.B. Rate Schedule - Volumetric

Title: Domestic Landscape Irrigation - Santa Rosa Division

f. Billing Cycles/year	12
g. Service Charges/Cycle	0
h. Gallons/Bill Unit	748
i. Minimum Use/Cycle	0
j. Non-billed Units (included in monthly service charge)	0

	$/Bill Unit	Starting At (unit qty.)
k. Tier 1	1.02811	0
l. Tier 2	1.21406	525
m. Tier 3		
n. Tier 4		
o. Tier 5		
p. Tier 6		

q. Approximate quantity of meters/accounts on this rate schedule	500
r. Are elevation charges included?	no
s. Approximate total annual water usage (AF) from customers on this rate schedule	964

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
Rancho California Water District	**100% Complete**	**2006**

8.A. Recycled Rate Schedule A

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from only Volumetric Charges	777919
d. Total Revenue from Non-Volumetric Charges (Includes fixed fees, surcharges, minimum usage charges, monthly service charges, meter charges etc.)	32546
e. Total Revenue from this category	810465

8.A. Rate Schedule - Volumetric

Title: Recycled Water - Rancho & Santa Rosa Divisions

f. Billing Cycles/year	12
g. Service Charges/Cycle	10
h. Gallons/Bill Unit	325851
i. Minimum Use/Cycle	0
j. Non-billed Units (included in monthly service charge)	0

	$/Bill Unit	Starting At (unit qty.)
k. Tier 1	192.5	0
l. Tier 2		
m. Tier 3		
n. Tier 4		
o. Tier 5		
p. Tier 6		

q. Approximate quantity of meters/accounts on this rate schedule	339
r. Are elevation charges included?	no
s. Approximate total annual water usage (AF) from customers on this rate schedule	5355

Reported as of 12/1/06

BMP 12: Conservation Coordinator

Reporting Unit:	BMP Form Status:	Year:
Rancho California Water District	**100% Complete**	**2006**

A. Implementation

1. Does your Agency have a conservation coordinator?	yes
2. Is a coordinator position supplied by another agency with which you cooperate in a regional conservation program ?	no
a. Partner agency's name:	
3. If your agency supplies the conservation coordinator:	
a. What percent is this conservation coordinator's position?	40%
b. Coordinator's Name	Tim Barr
c. Coordinator's Title	Resource Planner
d. Coordinator's Experience in Number of Years	15 years
e. Date Coordinator's position was created (mm/dd/yyyy)	01/03/2006
4. Number of conservation staff (FTEs), including Conservation Coordinator.	3

B. Conservation Staff Program Expenditures

1. Staffing Expenditures (In-house Only)	98938
2. BMP Program Implementation Expenditures	117099

C. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP?	no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Staff included in staffing expenditures: Tim, Liselle and Donna

Reported as of 12/1/06

BMP 13: Water Waste Prohibition

Reporting Unit:	BMP Form Status:	Year:
Rancho California Water District	**100% Complete**	**2006**

A. Requirements for Documenting BMP Implementation

1. Is a water waste prohibition ordinance in effect in your service area? yes

a. If YES, describe the ordinance:

In June 2006, RCWD adopted a Water Shortage Contingency(WSC) Plan and recinded Resolution 91-5-8 mentioned in the report filed for FY2005. The WSC Plan identifies water supply stages and requires specific measures to prevent water waste.

2. Is a copy of the most current ordinance(s) on file with CUWCC? no

a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:

City of Temecula, City of Murrieta and the County of Riverside	City of Temecula Development Code Chapter 17.32; City of Murrieta Ordiance 182-2; County of Riverside Code Chapter 17.286

B. Implementation

1. Indicate which of the water uses listed below are prohibited by your agency or service area.

a. Gutter flooding	no
b. Single-pass cooling systems for new connections	no
c. Non-recirculating systems in all new conveyor or car wash systems	no
d. Non-recirculating systems in all new commercial laundry systems	no
e. Non-recirculating systems in all new decorative fountains	no
f. Other, please name	no

2. Describe measures that prohibit water uses listed above:

No ordinance specifically prohibits the above water uses at this time.

Water Softeners:

3. Indicate which of the following measures your agency has supported in developing state law:

a. Allow the sale of more efficient, demand-initiated regenerating DIR models.	yes
b. Develop minimum appliance efficiency standards that:	
i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used.	yes
ii.) Implement an identified maximum number of gallons discharged per gallon of soft water produced.	yes
c. Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater	yes

supply.

4. Does your agency include water softener checks in home water audit programs? no

5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models? no

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

None

BMP 14: Residential ULFT Replacement Programs

Reporting Unit:	BMP Form Status:	Year:
Rancho California Water District	**100% Complete**	**2006**

A. Implementation

Number of 1.6 gpf Toilets Replaced by Agency Program During Report Year

	Single-Family Accounts	Multi-Family Units
1. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	yes
Replacement Method	**SF Accounts**	**MF Units**
2. Rebate	64	0
3. Direct Install	0	0
4. CBO Distribution	0	0
5. Other	0	0
Total	**64**	**0**

Number of 1.2 gpf High-Efficiency Toilets (HETs) Replaced by Agency Program During Report Year

	Single-Family Accounts	Multi-Family Units
6. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	yes
Replacement Method	**SF Accounts**	**MF Units**
7. Rebate	0	0
8. Direct Install	0	0
9. CBO Distribution	0	0
10. Other	0	0
Total	**0**	**0**

Number of Dual-Flush Toilets Replaced by Agency Program During Report Year

	Single-Family Accounts	Multi-Family Units
11. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	yes
Replacement Method	**SF Accounts**	**MF Units**
12. Rebate	0	0
13. Direct Install	0	0
14. CBO Distribution	0	0
15. Other	0	0
Total	**0**	**0**

16. Describe your agency's ULFT, HET, and/or Dual-Flush Toilet programs for

single-family residences.

IN FY 2006 MWD PROVIDED INCREASED INCENTIVES FOR HE AND DF TOILETS. IN ADDITION TO THE STANDARD ULFT REBATE, RCWD OFFERS REBATES FOR SF AND MF WATER CUSTOMERS THAT ELECT TO REPLACE NON-CONSERVING UNITS.

17. Describe your agency's ULFT, HET, and/or Dual-Flush Toilet programs for multi-family residences.

IN FY 2006 MWD PROVIDED INCREASED INCENTIVES FOR HE AND DF TOILETS. IN ADDITION TO THE STANDARD ULFT REBATE, RCWD OFFERS REBATES FOR SF AND MF WATER CUSTOMERS THAT ELECT TO REPLACE NON-CONSERVING UNITS.

18. Is a toilet retrofit on resale ordinance in effect for your service area? no

19. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

B. Residential ULFT Program Expenditures

1. Estimated cost per ULFT/HET replacement: 56

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

ULFT REBATE PROGRAM WILL CONCLUDE DECEMBER 31, 2006. RCWD WILL FOCUS SOLELY ON HETS IN 2007.

APPENDIX F

1940 STIPULATED JUDGEMENT

Exhibit "A"

Cosgrove & O'Neil,
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Los Angeles, Calif.
Trinity 6656
Attorneys for Plaintiff

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IN THE SUPERIOR COURT OF THE STATE OF CALIFORNIA

In and For the County of San Diego

RANCHO SANTA MARGARITA
a corporation

Plaintiff

vs.

N. R. Vail, Mary Vail Wilkinson, Mahlon Vail, Edward N. Vail, Margaret Vail Bell, The Vail Company, an association of persons transacting business under that common name, N R. Vail, Mary Vail Wilkinson, Mahlon Vail, Edward N. Vail and Margaret Vail Bell, as Trustees of said Vail Company, Mahlon Vail, Executor of the Estate of Margaret R. Vail, deceased, and Laura Perry Vail, Executrix of the Estate of William Banning Vail, Deceased.

Defendants.

Guy Bogart, Lucy Parkman Bogart and Fred Reinhold, Executors of the will of Murray Schloss, deceased, and Philip Playtor,

Interveners.

No. 42850

STIPULATED JUDGMENT

This cause came on regularly for trial in the above entitled court and department thereof on Monday, October 18, 1926, at the hour of 10:00 o'clock A.M., before the court, Honorable L. D. Jennings, Judge, presiding; Messrs. Munsaker, Britt and Cosgrove appearing as attorneys for the plaintiff, Messrs. Haas & Dunnigan, Messrs. Ward, Ward & Ward, Messrs. Stephens & Stephens, and Messrs. O'Melveny, Milliken & Tuller, appearing as attorneys for defendants, and Walter Gould Lincoln, Esq., appearing as attorney for intervenors. The introduction of evidence, oral and documentary, being completed, arguments, oral and in writing, having been submitted, and court having considered the same and being fully advised in the premises, findings of fact and conclusions of law hav-

Exhibit "A"

been signed by the court and filed with the clerk thereof, and judgment on said findings and conclusions having been signed and entered; defendants and each of them thereon appealed from said judgment and from each part thereof, but said interveners did not appeal from said judgment; the Supreme Court of said State of California upon said appeal having reversed said judgment and directed a new trial upon certain issues designated in the opinion of said court reported Rancho Santa Margarita, a corporation, vs. Margaret R. Vail, et al., L. A. No. 15076, 11 Cal. (2nd) 501, and said plaintiff and defendants having stipulated to the entry of the following judgment,

Now, therefore, IT IS ORDERED, ADJUDGED AND DECREED that:

Section First: The plaintiff, Rancho Santa Margarita, a corporation, and defendants, N. R. Vail, Mary Vail Wilkinson, Mahlon Vail, Edward N. Vail, Margaret Vail Bell, the Vail Company, an association of persons transacting business under that common name, N. R. Vail, Mary Vail Wilkinson, Mahlon Vail, Edward N. Vail and Margaret Vail Bell, as Trustees of said Vail Company, Mahlon Vail, Executor of the estate of Margaret R. Vail, Deceased, and Laura Perry Vail, Executrix of the Estate of William Banning Vail, Deceased, and interveners, Guy Bogart, Lucy Parkman Bogart and Fred Reinhold, Executors of the Will of Murray Schloss, Deceased, and Philip Playtor, have and each has rights in and to the waters of the Temecula-Santa Margarita River and its tributaries, and in and to the use of said waters for all beneficial and useful purposes on their respective lands herein more specifically described.

Section Second: The plaintiff is entitled to take and use upon the whole or any part of its lands lying within the Rancho Santa Margarita y Las Flores, San Diego County, California, sixty-six and two-thirds per cent (66 2/3%) of the water of said Temecula-Santa Margarita River and all its tributaries which naturally, when not artificially diverted or abstracted, flows and descends in the channel thereof at that certain joint gaging station hereinafter in this judgment designated as Measuring Station No. Six (6).

Section Third: Defendants are entitled to take and use upon the whole or any part of their lands hereinafter mentioned, thirty-three and one-third per

cent (33 1/3%) of the water of said Temecula-Santa Margarita River and all its tributaries which naturally, when not artificially diverted or abstracted, flows and descends in the channel thereof at that certain joint gaging station hereinafter designated Measuring Station No. Six (6).

The lands of the defendants herein referred to consist of those certain lands in Riverside County, California, known as Pauba Grant, Lots A, B, C, and D of Little Temecula Grant, or Rancho as shown on the Wolf partition map of Little Temecula Grant as described in the final decree of paritition in the case of William Wold vs. Ramona Wolf, being Case No. 5756 of the Superior Court of San Diego County, State of California, said final decree of partition being recorded in Book 199 of Deeds, page 464, et seq., records of San Diego County, California, the southeasterly approximately one-half of Temecula Grant, excluding therefrom the town site of the unincorporated city or town of Temecula and the various parcels of land owned by persons other than the defendants herein, as shown by map entitled "Triangulation Map of Pauba Ranch and Vicinity, Riverside County" received in evidence in this case and marked "Plaintiff's Exhibit No. U-4", which exhibit has been incorporated into and constitutes a part of the Transcript on Appeal in this action (reference is hereby made to said Transcript and to said Exhibit No. U-4 and by such reference said exhibit is incorporated into and constitutes a part of this judgment), Santa Rosa Grant, and Vail government lands, which said Vail government lands, approximately four hundred sixty (460) acres in area, are more particularly described as: Those certain lands lying within sections twenty-one (21), twenty-seven (27), twenty-eight (28) and twenty-nine (29) of Township Eight (8) South, Range Two (2) West, S. B. B. M., Riverside County, California, and being more particularly identified as Lots Nineteen (19), Twenty (20), Twenty-one (21), Twenty-six (26), Twenty-seven (27), Thirty (30) and Thirty-one (31) of Block Fifteen (15), and those portions of Lots Seventeen (17) and Eighteen (18) of said Block Fifteen (15) lying without but contiguous to the southeasterly boundary of Lot D of said Little Temecula Grant.

Section Fourth: The intervener Philip Playtor is entitled to take and use upon the whole or any part of his lands riparian to said Temecula-Santa Margarita River, as hereinafter delineated and defined, one (1) miner's inch continuous flow of the waters of said Temecula-Santa Margarita River. The lands

of said Philip Playtor riparian to said river are described as follows: The northwest one-quarter ($NW\frac{1}{4}$) of the southeast one-quarter ($SE\frac{1}{4}$) and the south one-half ($S\frac{1}{2}$) of the south one-half ($S\frac{1}{2}$) of section thirty-three (33) and the southwest one-quarter ($SW\frac{1}{4}$) of the southwest one-quarter ($SW\frac{1}{4}$) of section thirty-four (34), Township Eight (8) South, Range Three (3) West, S. B. M., Riverside County, California.

Section Fifth: The interveners Guy Bogart, Lucy Parkman Bogart and Fred [illegible], as executors under the will of Murray Schloss, deceased, own certain real property in San Diego County, California, of which approximately twenty (20) acres are riparian to a certain tributary of said Temecula-Santa Margarita River by the name of Stone Creek and are susceptible of practical and profitable irrigation with the water of said creek, said approximately twenty (20) acres being described as follows: The south one-half ($S\frac{1}{2}$) of the northeast one-quarter ($NE\frac{1}{4}$) of the northeast one-quarter ($NE\frac{1}{4}$) of section four (4) Township Nine (9) South, Range Three (3) west, S. B. M., San Diego County, in said state. Said interveners are entitled to take from the surface and subsurface waters of said Stone Creek and use the same on said twenty (20) acres riparian to said Stone Creek, throughout said dry or irrigation season of each calendar year and from the 1st day of May of each year until the 31st day of October of the same calendar year, the entire flow of the waters of said Stone Creek and all its tributaries which naturally, when not artifically diverted or abstracted, flows or descends in the channel thereof to and upon said twenty (20) acresparcel; and are entitled to take from said Stone Creek, during the rainy or winter season of each year, for use upon said twenty (20) acres of riparian land for all beneficial purposes, five (5) miner's inches continuous flow.

Section Sixth: The waters of said stream and its tributaries herein apportioned to the interveners shall be deducted from the fractional part of the waters of said stream herein allotted to plaintiff.

Section Seventh: For the purpose of dividing among, and allocating to, the parties of this action, the waters of the Temecula-Santa Margarita River and its tributaries, at the places and in the amounts specified in this judgment, the plaintiff and the defendants immediately shall establish, and thereafter

maintain jointly (unless established and/or maintained by U. S. Geological Survey, Division of Water Resources State Department of Public Works, or other public body), stream-flow (automatically registering) gaging stations at the following three locations on the Temecula-Santa Margarita River:

Station No. One (1): The upper end of Nigger Canyon at or near the present location of the Nigger Canyon gaging station;

Station No. Three (3): The upper end of Temecula Gorge, immediately downstream from the confluence of Murrieta Creek, at or near the present location of the Temecula Gorge gaging station;

Station No. Six (6): The Narrows, at or near the present location of the Ysidora gaging station.

And plaintiff and defendants shall establish and maintain jointly (unless established and/or maintained by U. S. Geological Survey, Division of Water Resources State Department of Public Works, or other public body), gaging stations for measuring (and automatically registering) the surface flow of said stream, or any of its tributaries, at any point thereon where the plaintiff, the defendants, or the interveners, or any of them, hereafter may construct or maintain appliances for the diversions of the surface flow of said stream, or any of its tributaries. (The cost of establishing and maintaining joint gaging stations as are required hereunder, including the taking of measurements and observations thereof, shall be borne equally by the plaintiff and the defendants.)

Each party shall establish and maintain meters to determine and automatically register the amount of the underground waters abstracted or diverted by such party from the underground waters of Temecula-Santa Margarita River and/or its tributaries by means of wells, either artesian or pumped (except windmill wells and/or domestic use wells of the parties and/or their tenants); such meters shall be of a type which will meet the approval of both plaintiff and defendants or the approval of either party and the engineer in charge of the Los Angeles office of the U. S. Geological Survey, and shall be installed and maintained in such manner and place as to be available for inspection by either plaintiff or defendants at all times.

Section Eighth: Whenever the total normal flow of said Temecula-Santa

Margarita River (when not artificially diverted or abstracted) measured at gaging station No. Three (3) exceeds the total normal flow measured at Gaging Station No. Six (6), then and in that instance the flow of said stream at said Gaging Station No. Three (3) shall be considered as the total flow of said stream, and at such time the apportionments and allotments herein provided for shall be predicated upon the flow of said stream at said Gaging Station No. Three (3).

Section Ninth: For the purpose of apportioning to defendants thirty-three and one-third per cent (33-1/3%) of the waters of said stream as in Section Third provided, it shall be deemed that an amount of water equal to one-half (1/2) the surface flow at Station No. Six (6) or Station No. Three (3), wherever the flow is the greater (as provided in Section Eighth), pumped and/or diverted from the subsurface and/or surface waters of said river at points upstream from said Station No. Three (3), shall constitute thirty-three and one-third per cent (33-1/3%) of the waters of said stream.

It is recognized that the practical operation of the various pumping plants upon the defendants' lands for irrigation makes it difficult, if not impossible, for defendants to abstract and divert each day an amount of water the exact equivalent of the proportion of the stream flow measured at Station No. Six (6), or Station No. Three (3) to which defendants are entitled under this decree. Accordingly, whenever it is observed that defendants are abstracting and diverting, or have abstracted and diverted surface and/or underground waters in amounts in excess of that to which they are entitled hereunder, defendants, upon learning or being informed of such fact, thereupon shall reduce their diversions below the amount to which they are entitled under this decree, and shall continue such reduced diversions for the same period of time as near as is practicable and in an amount equivalent to the amount of water which defendants had diverted in excess of that to which they were entitled under this decree.

Section Tenth: In addition to the thirty-three and one-third per cent (33-1/3%) of the waters of said stream herein in Section Third allotted to defendants, they may also divert or abstract from the underground waters of said Temecula-Santa Margarita River, but not from the surface waters of said stream, at the places, during the times and upon the conditions hereinafter in this

Section specifically set forth, but not otherwise, a specified amount of subsurface water herein in this judgment referred to as "Storage Water". The amount of Storage Water which the defendants may divert or abstract during any irrigation season shall be determined by the elevation of water (when not artificially disturbed) on May 1st of each year in a certain well located on defendants' land known as Windmill Well, in accordance with the following table:

Depth of water below ground surface as shown in casing of Windmill Well on May 1st	Amount of Storage Water defendants may divert and apply to beneficial use during irrigation season
20 feet or less	1,500 acre feet
30 feet	1,125 acre feet
40 feet	750 acre feet
50 feet	375 acre feet
60 feet or more	No acre feet

At depths to water intermediate to those above stated proportionate quantities of water may be taken.

The spreading of flood water which does not involve surface impoundment (either temporary or otherwise) but which may raise the level of water in the underground basin in which said Windmill Well is drilled and upon which said well is located, shall not be considered as an artificial disturbance of the elevation of water in said Windmill Well. Storage water may be directed and used only upon said lands of defendants hereinbefore described and not elsewhere.

For the purpose of indicating the places at which said Storage Water may be pumped, reference is hereby made to "Plaintiff's Exhibit No. 265". Said Exhibit by reference has been incorporated into and constitutes a part of the Transcript on Appeal in this action. Reference is hereby made to said Transcript and to said Exhibit No. 265 and by such reference said Exhibit is incorporated into and constitutes a part of this judgment.

Shown upon said Exhibit No. 265, and extending in a generally northerly and southerly direction, is a certain line of wells (hereafter referred to as the E line of wells) designated on said Exhibit as E-3, E-2 North, E-1 North, E-1 South and E-2 South.

Easterly thereof, shown upon said Exhibit, and extending in a generally northwesterly and southeasterly direction, is a certain line of wells (hereafter referred to as the P.V. line of wells) designated on said Exhibit as P.V.9, P.V.6, and P.V.6X. Immediately adjacent to said P.V. line of wells and parallel thereto, is a certain highway commonly known as Old Warners Ranch Road (now not in common use).

(a) Not more than Thirty per cent (30%) of said Storage Water which defendants are entitled to pump during any irrigation season may be pumped from that portion of defendants' lands lying between a line drawn through said E line of wells and extended across said underground basin, and a line drawn through said P.V. line of wells and extended across said basin.

(b) At least seventy per cent (70%)of said Storage Water which defendants are entitled to pump during any irrigation season shall be pumped from that portion of defendants' lands lying easterly of a line drawn through said P.V. line of wells and extended across said underground basin.

The well hereinbefore described as Windmill Well is situated on Pauba Grant South sixty-seven degrees fifteen minutes (S 67 deg. 15 min) East of B. M. 11 a distance of approximately eleven hundred (1100) feet, and South fifty-seven degrees twenty minutes (S 57 deg. 20 min), West of B. M. 12 a distance of approximately fifteen hundred eighty (1580) feet said bench marks being designated as Nos. 11 and 12 on said Exhibit No. 265.

Should said Windmill Well collapse or otherwise cease to be available or useful for the purpose of determining ground water elevations in the vicinity thereof, then another well shall be drilled by the defendants in the same general location at approximately the same ground surface elevation above sea level, but not to exceed a distance of one hundred (100) feet from the location of said Windmill Well. Such new well shall be approximately the same depth and diameter of casing as said Windmill Well. In event the parties hereto are unable to agree upon location, depth and diameter of casing of such well, these matters, upon petition of the parties hereto or either of them, shall be determined by order of this court.

For the purpose of determining defendants' total diversions of the waters of the Temecula-Santa Margarita River and its tributaries (meaning thereby to include both the allotment of thirty-three and one third per cent (33 1/3%) of the waters of the river as defined in Section Third, and the additional Storage Water as defined in this Section Tenth hereof), any water abstracted or diverted by defendants from the underground waters of said river (including underground basins of percolating water within the watershed of said river and its tributaries) by use of wells or pumps or other means of diversion, whether now existing or hereafter established, except as hereinafter in this section provided, shall be added to any surface diversions by the defendants from the waters of said river. Such abstractions by the defendants of the underground waters of the Temecula-Santa Margarita River are, and for all purposes of this judgment shall be (except as hereinafter provided) considered as diversions of the waters of said river, and are and shall be chargeable against the fractional part of the surface flow of said stream and the additional amount of Storage Waters herein allotted to defendants.

—— Water abstracted or diverted from said underground water of said river which shall not be subject to the provisions of this section are as follows:

1. Windmill wells maintained by defendants for the purpose of supplying water for cattle;

2. Water used by defendants or their tenants for domestic use exclusively (but not including any irrigation use);

3. Waters which defendants may pump directly into the surface flow of said stream pursuant to the requirements of Section Eleventh hereof.

Section Eleventh:

Part I. During the irrigation season of each year, to wit, May 1 to October 31, inclusive, excepting as otherwise in Part I of this Section permitted, defendants shall cause to be maintained at Gaging Station No. Three (3) a constant flow of water of not less than three (3) cubic feet per second (one (1) cubic foot per second being the equivalent of fifty (50) miner's inches).

The surface flow at said Station No. Three (3) may be permitted to

fall below three (3) cubic feet per second during said irrigation season upon the following conditions and not otherwise:

1. Said surface flow shall not be permitted to fall below three (3) cubic feet per second for any continuous period of more than ten (10) days;

2. An interval of at least ten (10) days shall elapse between periods during which said surface flow falls below three (3) cubic feet per second;

3. Defendants shall contribute to the surface flow at Station No. Three (3), by means of pumping from Temecula Alluvial Basin, or otherwise, an amount of water equal to the amount that the actual flow during said period was less than the required flow of three (3) second feet;

4. Such contributions shall be made at the same rate and over the same period (as near as practicable) as the rate at which said surface flow was less than Three (3) second feet;

5. Such contributions shall be made immediately following the period in which said required flow of three (3) second feet was not maintained;

6. Defendants by means of pumping underground waters directly into the surface flow of the stream or otherwise during any period in which said required flow of three (3) second feet was not maintained, shall always maintain a constant surface flow at Station No. Three (3) of not less than two (2) second feet.

Part II. In the event that, during the irrigation season of any year, to wit, May 1 to October 31, inclusive, the irrigation of crops on said lands of defendants reasonably requires more water than they otherwise are entitled to take under this decree, defendants may abstract and divert underground waters only, in amounts in excess of that to which they are otherwise entitled hereunder. Such excessive diversions may be made upon the following conditions and not otherwise:

1. Excessive diversions shall not continue for a period to exceed eight (8) days consecutively;

2. Following any period of excessive diversion, an interval shall elapse before any further period of excessive diversion, which interval shall not be less than the number of days during the period of excessive diversions immediately preceding;

3. Defendants shall reduce their diversions below the amount to which they are otherwise entitled under this decree, such reductions to be in an amount not less than the amount of water which defendants have diverted in excess of that to which they are otherwise entitled under this decree;

4. Such reductions of their diversions shall be made by defendants immediately following the period during which such excessive diversions were made and shall be completed within ten (10) days thereafter;

5. Defendants, at least one (1) day in advance of the commencement of such diversions, shall advise plaintiff in writing of their requirements and of their intention to avail themselves of the privilege of excessive diversions afforded under part II of this section.

Parts I and II of this Section Eleventh are complementary one of the other and not inconsistent one with the other and hereafter shall be so construed. The purpose of Part I is to require defendants to maintain a constant flow at Station No. three (3) of not less than three (3) cubic feet per second excepting under the conditions stated when the flow may be permitted to fall below three (3) cubic feet per second but not below two (2) cubic feet per second, and when such diminution of the stream flow occurs the amount of such diminution shall be contributed by the defendants by pumping directly into the surface flow of the stream from the Temecula Alluvial Basin or otherwise. Part II permits defendants under the conditions stated to use for short periods amounts of water in excess of their allotment but requires them to contribute shortly thereafter the amount of such excessive diversions by reducing (in an amount not less than the amount of such excessive diversions) the amount of the diversions to which they are otherwise entitled. No part of such excessive diversions is required to be contributed by defendants through direct pumping from the subsurface waters of the Temecula Alluvial Basin into the surface flow of the stream if, during the period of such excessive diversions, the constant stream flow at Station No. Three (3) equals or exceeds three (3) second feet.

Section Twelfth: Defendants at all times shall be entitled to divert from the Temecula-Santa Margarita River and its tributaries, and to apply to beneficial use upon their said lands, an amount of water equal to one-half of

the amount which the plaintiff is entitled to divert from said river and its tributaries and apply to beneficial use upon its lands.

For the purpose of determining the amount of water which defendants are entitled to divert and apply to such beneficial use, computations of the amount of water diverted and applied to beneficial use by each of the parties hereto shall be made monthly, based on joint measurements maintained as herein required. In event said measurements disclose that the amount of water which defendants are entitled to divert and apply to beneficial use pursuant to the provisions of this judgment is less than one-half the amount being applied to beneficial use by plaintiff, thereupon defendants shall be entitled to increase their diversions and applications to beneficial use to an amount sufficient to make defendants' diversions and applications to beneficial use equal to one-half the amount diverted and applied by plaintiff; provided, however, that such additional diversions and applications, if and when made, shall be in addition to diversions made under Sections Third and Tenth hereof, and shall be made by defendants during the irrigation season in which such right accrues, or in the first subsequent season, or part in the same season and the remainder in the first subsequent season, and such diversion, if any, shall be made by pumping from the underground basin at points easterly from said P. V. line of wells.

Section Thirteenth: Each of the parties hereto shall have the right to construct dams or reservoirs on its or their respective lands or elsewhere, for the purpose of intercepting or impounding or conserving such party's share of the flood waters of said river and its tributaries; provided, however, in the event any such dam or reservoir is hereafter constructed by defendants for such purpose, the rights of defendants to abstract and divert Storage Water pursuant to Section Tenth hereof shall cease and terminate.

Defendants shall not make, during any irrigation season, any surface diversions of the waters of said river at the Bridge Pumping Plant, the Cantarini Pumping Plant or the Tule Pumping Plant referred to in the findings herein, or at any other point on said Temecula-Santa Margarita River below the point of Rising Water as shown on said Exhibit No. 265.

Section Fourteenth: The plaintiff, Rancho Santa Margarita, a corporation, shall have and recover of and from the defendants, its costs and disbursements

herein taxed at Six Thousand Thirty-Six and 62/100 Dollars ($6,036.62).

Dated at San Diego, California, this 26th day of December, 1940.

GORDON THOMPSON
Judge

Records indicate that this judgment was recorded in San Diego and Riverside Counties on 26 December 1940.

Appendix N3:

Water Facilities Master Plan Update_2005

RANCHO CALIFORNIA WATER DISTRICT

2005 WATER FACILITIES MASTER PLAN UPDATE

JULY 2005

RBF CONSULTING

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EXECUTIVE SUMMARY AND RECOMMENDATIONS

1.1 Introduction

The Rancho California Water District is located in southwestern Riverside County about 40 miles south of Riverside and 60 miles north of San Diego. The District encompasses approximately 100,000 acres and provides retail water supply for a variety of agricultural, residential and commercial uses.

The Rancho California Water District (RCWD) was formed in 1965 over the easterly 41,000 acres and the Santa Rosa Ranches Water District (SRRWD) was formed in 1968 over the westerly 46,000 acres. Each District was organized as a California Water District, which entitles property owners one vote per each $100 of assessed land valuation in electing a Board of Directors.

In 1977, the two Districts were consolidated as a single District known as the Rancho California Water District. The original RCWD and SRRWD had approved general obligation bond authorization of 55 million dollars and 63 million dollars respectively. Since these bond authorization's are still applicable over the original lands within each District, separate divisions known as the Rancho division and the Santa Rosa Division have been maintained for accounting purposes. Subsequent annexations have brought the RCWD from it's original 87,000 acres to the current 99,600 acres.

In 1997, RCWD completed a comprehensive update of the Water Master Plan covering water supply and water distribution. The plans were designed to determine a reasonable estimate of the facilities required and probable costs associated with projected development through ultimate buildout (estimated at year 2025).

The RCWD recognizes that master planning is an ongoing process. Numerous changes have occurred over the last five years both regionally and locally, which can impact facility planning. Major items include the following:

- RCIP Southwest Area Plan (2003)
- City of Temecula General Plan (2005)
- City of Murrieta General Plan (2002)
- Agricultural Demand Trends
- Land Preserves set Aide
- Contemplated Contract Service Areas
- Conservation

This Water Facilities Master Plan Update was authorized to investigate and reflect the revised land use, water demands, and corresponding facilities required to meet development currently anticipated within the District. The 1997 master plans also focused attention on the immediate (within a five year period) improvements, which were required to properly upgrade the systems. The RCWD has now completed the majority of the priority projects as a result of a comprehensive capital improvement program. The facilities identified in this update have also been phased and prioritized. This has been done in a manner which will support the District's sound fiscal policies of maintaining a balanced approach to facility financing and implementation

1.2 Land Use

The current population living within the RCWD is estimated at over 95,000 people. The population of Temecula alone is 77,460 (as of January, 2004) representing only the central portion of the District's service area. Development within the Rancho Division includes commercial and industrial, high-density residential, and low-density residential. In addition, the Rancho Division contains approximately 6,800 acres of citrus, avocado, and vineyard agricultural use.

Existing developments within the Santa Rosa Division are primarily avocado plantings. Recent developments within the Santa Rosa Division reflects a trend toward a diversification from a large agricultural base to a mix of estates, horse farms, specific plan developments (such as Bear Creek, California Oaks and the Cross Creek Golf Course) and open spaces of the nature conservancy property.

Proposed land use within RCWD is guided by the City of Temecula General Plan, City of Murrieta General Plan, and the Riverside County General Plan -- more specifically defined by the Southwest Area Plan (SWAP). These documents form the basis for RCWD's current planning updates.

Although the SWAP and general plans provides for a range of development densities, a mid-level of development was assumed for development projections. In addition, it is assumed that agricultural uses would not expand past their current levels. Based on these land use projections, it is anticipated that, at ultimate buildout, RCWD will include approximately 83,000 dwelling units, 5,900 acres of business park/commercial area, and approximately 12,737 acres of agricultural land.

1.3 Projected Ultimate Water Demands

The estimated ultimate water demands are based on land uses projected by the SWAP, City General Plans and specific plans, where applicable. Ongoing analysis of existing water duty factors, as well as comparisons to similar districts, have formed the basic water demand criteria utilized in the WFMP. The overall water consumption from 1997 to 2005 has increased from over 58,000 acre feet (AF) to 129,545 AF. In FY

1996-'97, approximately 44 percent of water sold by RCWD was to agricultural customers, which reflects a slight trend towards increased residential usage.

The projected ultimate water demand is estimated to be approximately 129,500 AF. This figure includes approximately 11,200 AF of potential non-domestic water use, which may be utilized on golf courses, parks, and major common areas. An ultimate average annual domestic water demand of 129,500 AF or 179 cubic feet per second (cfs) is projected, with a maximum day domestic demand of 393 cfs.

Should additional non-domestic water be made available to meet agricultural irrigation demands, an additional 4,700 AF/year could be reduced from domestic demands.

1.4 Water Supply

The RCWD is a constituent agency of Eastern Municipal Water District (EMWD) and Western Municipal Water District (WMWD). These agencies are member agencies of the Metropolitan Water District of Southern California (MWD); therefore, RCWD is entitled to receive water from available sources of MWD. EMWD provides wholesale water to the RCWD Rancho Division, while WMWD provides wholesale water to the RCWD Santa Rosa Division.

RCWD also relies on local groundwater sources to provide for a significant portion of the District's annual water demands. During wet years, the District has been able to utilize as much as 85 percent to 15 percent ratio of groundwater to imported water. During dry years, a 60 percent to 40 percent or 50 percent to 50 percent ratio has been used. The District has historically sought to minimize reliance on MWD imported water by optimizing the use of its groundwater.

Vail Lake, located within the southeastern portion of RCWD, provides the District with the opportunity to capture storm runoff for subsequent controlled releases for groundwater recharge. Vail Lake has the capacity of storing up to 49,000 AF.

Imported water is currently supplied via four aqueduct turnouts (WR-26, WR-28, EM-13, and EM-20).

Based on currently-available groundwater and imported water facilities, the District has an average annual supply capability of 100,000 AF to 150,000 AF, depending on duty time for each of the MWDSC turnouts. The District can currently meet maximum day flows in excess of 355 cfs.

A variety of supply projects are being implemented to meet projected long-term increases in demand. The major elements of water supply augmentation include artificial recharge of imported raw water into the groundwater basin to supplement naturally-occurring groundwater, the VDC Pump Station, water reclamation to meet potential non-domestic water demands, and additional MWD treated water turnouts.

It is anticipated that a combination of these supply alternatives will be implemented to meet future demands. If demands increase based on projected development rates, existing supply capabilities may be exceeded in approximately the year 2025. It should be noted that additional imported water supply connections will be required in any case to meet projected ultimate water demands and are currently being pursued jointly with MWD (EM-21 addition of over 100 cfs). Expansion of recycled water opportunities to minimize agricultural demands is also being pursued. The extent of agricultural conversions could vary significantly. Obviously, the large agricultural demands represent tremendous potential. Some of the factors that will require additional consideration and will influence these opportunities include the following:

- RWQCB Requirements
- Capital / O+M cost implications
- Phasing and Availability of recycled water
- Customer / Market Place variables
- Environmental process

1.5 Domestic Water Distribution System

The domestic distribution system is composed of two divisions: the Santa Rosa Division in the westerly half, and the Rancho Division in the easterly half. Each division provides water through a number of pressure zones ranging from 1,305 feet (above sea level) to 2,850. The 1,305 zone provides service to the I-15 corridor area and serves as the "forebay zone" for several pump stations which supply higher zones. Treated water from MWD turnouts and the majority of groundwater production enters the RCWD system in this zone. Some additional groundwater enters the system in the 1380, 1610, and the 1790 Zones of the Rancho Division, in the 1500 Zone of the Santa Rosa Division.

Current reservoir tank storage is 54.7 million gallons in the Santa Rosa Division and 83.4 million gallons in the Rancho Division. Based on a storage criterion of 16 hours to meet operational fire flow and emergency needs, an estimated 14.8 million gallons of new storage in the Santa Rosa Division and 37.8 million gallons in the Rancho division has been proposed to meet existing and future demands. It should be noted that the reservoir facilities can be phased to provide adequate storage capacity as development occurs. Should development not occur at the levels projected, a corresponding reduction in ultimate storage requirements would result.

Pumping requirements for each pressure zone were evaluated based on a combination of maximum day demand within a specific zone as well as any "pass through" demand required for higher zones. Recommended pump station capacities provide for the required capacity plus a "stand by" pump capacity equal to the largest pump for that station. Major pump station capacity expansion is anticipated for the majority of the District's service zones to meet future demands. As with storage facilities, pump stations can be phased to provide for construction to coincide with development on an "as need" basis. Energy officencies were also evaluated to support decision relative to pumping vs. storage and recovery opportunities at pressure reducing facilities.

Proposed domestic transmission mains were identified via computer hydraulic modeling. Backbone transmission mains are proposed to be located within known development areas to provide adequate distribution and fire flow delivery. In some cases, parallels of existing mains are required to meet transmission capacities under ultimate conditions or to rectify current system deficiencies. Sizing of proposed piping is based on the optimal combination of maximizing system efficiency, in the form of reduced energy costs, and minimizing capital costs. Unlike reservoirs and pump stations, transmission pipelines are difficult to phase. Therefore, constructing pipelines of a size and capacity to meet ultimate demands is considered to be prudent.

Facilities required to produce and convey source of supply water are identified as "common facilities." These facilities include the wells, aqueduct connections, groundwater recharge basins and corresponding conveyance pipelines. Expansion of all these facilities will be required to meet projected demands.

1.6 Non-Domestic Distribution System

The District is committed to maximizing the use of local water resources to meet ever-growing demands. The proposed non-domestic distribution system has been sized to provide conveyance of tertiary treated wastewater from each of the existing wastewater treatment plants (Rancho California, SBR and Joaquin Ranch) to the exiting and proposed golf courses and major park areas. RCWD is in the process of centering all wastewater treatment and reclaimed water source to its SRWTF. Water demands for these use areas are projected to be approximately 11,200 AF/Year. This system represents an initial implementation of permanent non-domestic use.

Significant additional potential non-domestic use areas exist within RCWD. These include the large agricultural demands and more remote central irrigation. These demands could represent an additional 4,700 AF/Year (or greater) reduction of domestic water demands at ultimate development.

The RCWD has implemented a comprehensive reclaimed storage pond system including the ability to reconvey water back to the treatment facility for supplemental treatment or pumping direct to the distribution system. Current storage capacity is in excess of 737 AF. Ultimate capacity requirements are approximately 2700 AF allowing for up to 10 mgd of system capacity.

1.7 Cost Estimates and Phasing

Cost estimates have been prepared for all of the facilities outlined in this WFMP. The estimated construction costs are based on recent experience with similar construction contracts awarded by RCWD and other local agencies. The required timing for each project has been determined, based on anticipated growth within the District. An allowance for escalation between 2005 and the anticipated phased construction period has been added based on 5 percent per year. The construction costs have been

increased 15 percent for engineering, legal, and administrative services, and 20 percent for contingency.

The total estimated capital costs for source of supply and domestic water distribution system are $172.3 million. With inflationary cost increases applied to future construction phases, the total estimated escalated capital cost is $229.6 million. The non-domestic system including, expanded pond storage is estimated to be $25.5 million.

1.8 Recommendation

It is recommended that the Water Facilities Master Plan be received by the Board of Directors of the Rancho California Water District and that upon completion of review and fulfillment of applicable CEQA requirements the plan be approved in final form.

Chapter 2

INTRODUCTION

2.1 Rancho California Water District

The Rancho California Water District is located in southwestern Riverside County, about 40 miles south of Riverside and 60 miles north of San Diego, as shown in Figure 2-1. The District encompasses almost 100,000 acres and provides retail water supply for a variety of agricultural, residential and commercial uses. Typical agricultural uses include avocados, citrus, and grapes. Most of the new commercial and residential land uses recently developed are within the incorporated areas of the Cities of Temecula and Murrieta.

The Temecula area was developed in the 1880's along the California Southern Railroad. Temecula served as an important shipping center for cut granite from nearby quarries. In the early 1900's 87,000 acres of land within the District were acquired by the Vail Company. These lands were developed by the Vail Company into a very successful cattle ranch. The Vail Ranch used the higher mesa lands for grazing and growing dry farm crops, while in the Pauba Valley irrigated crops such as alfalfa, melons and potatoes were grown. Initially, irrigation was achieved through direct diversion of water from Temecula Creek. Later, artesian and other wells were drilled in the valley. In 1948, Vail Dam was constructed on Temecula Creek in Butterfield Canyon. Vail Lake's storage capacity of 49,000 acre-feet and surface area of 1,000 acres provided additional irrigation water for the Pauba Valley.

In 1964, Rancho California was created when the Vail Ranch was purchased by the land development partnership of Kaiser Corporations and Macco Realty Company. The partnership implemented a master development plan with a goal to create a balanced residential, commercial and industrial community while maintaining its rural qualities of open spaces and agricultural production lands. The developers were instrumental in forming two water districts to provide a continued and reliable water supply. The Rancho California Water District (RCWD) was formed in 1965 over the easterly 41,000 acres, and the Santa Rosa Ranches Water District (SRRWD) was formed in 1968 over the westerly 46,000 acres. Each district was organized as a California Water District, which entitles property owners one vote for each $100 of assessed land valuation in electing a Board of Directors.

To provide a supplemental imported water supply, the Rancho California Water District was concurrently annexed to the Eastern Municipal Water District (EMWD) and the Metropolitan Water District of Southern California (MWD) in 1966. EMWD was also granted powers to collect, treat and dispose of wastewater within RCWD. Similarly, the Santa Rosa Ranches Water District was concurrently annexed into the Western Municipal Water District (WMWD) of Riverside County and MWD. SRRWD, however, reserved its wastewater service powers.

MWD serves as a regional wholesaler of imported water over a wide area of Southern California from Los Angeles to San Diego. EMWD and WMWD are member agencies of MWD and purchase imported water from MWD to retail to smaller local jurisdictions. Historically, RCWD has relied on local groundwater supplemented with MWD imported water to meet domestic and agricultural demands.

In 1977, the two districts, Rancho California Water District and Santa Rosa Ranches Water District were consolidated as a single district known as the Rancho California Water District. The original RCWD had approved a general obligation bond issue of 55 million dollars in 1966, and SRRWD had similarly approved 63 million dollars in bonds in 1968. Since these bond issues are still applicable over the original lands within each district, separate divisions known as the Rancho Division and the Santa Rosa Division have been maintained for accounting purposes.

Over the past decade, a number of areas have been annexed into RCWD within either division, bringing the total gross area of the District to approximately 99,600 acres. In addition, the 2005 Master Plan Update includes consideration of service to eight separate areas adjacent to District boundaries. These "contemplated contract service areas" (CCSA) total approximately 6,800 acres, all of which have been determined feasible service areas based on RCWD's current system configuration, and the lack of nearby facilities operated by neighboring agencies. Figure 2-2 illustrates the current RCWD service boundaries, the Rancho and Santa Rosa Divisions, and the CCSAs.

2.2 Authorization, Scope and Purpose

In 1996, RCWD authorized RBF Consulting (formerly Robert Bein, William Frost and Associates) to prepare the September 1997 *Water Facilities Master Plan Update*. The County of Riverside's Southwest Area Plan (SWAP) of the time was the basis for the projected ultimate land uses.

The 1997 Master Plan Update identified water facilities necessary to serve the ultimate buildout of development within RCWD. It also updated and reconfigured the District's capital improvement program (CIP) with a phasing component to assist the District project prioritization. The District continues to coordinate the efforts of the master plan updates to coincide with the preparation of their wastewater and reclaimed water master plans, which provides for a comprehensive approach to facility planning. In addition to these studies, RCWD commissioned a parallel study – the Integrated Water Resources Plan - to provide the District with a plan to utilize the various sources of water now at their disposal for optimized economy throughout the year.

Several factors can influence facility planning. For RCWD, the primary issues, which have lead to the preparation of an updated master plan, include the following:

- RCIP Southwest Area Plan (2003)
- City of Temecula General Plan (2005)
- City of Murrieta General Plan (2002)
- Agricultural Demand Trends
- Land Preserves Set Aside
- Contemplated Contract Service Areas
- Conservation

Due to several factors since the adoption of the 1997 Master Plan Update affecting the regional water supply for the area – namely, the completion of the EM-20 Turnout, the planned conversion of a major MWD aqueduct (Pipeline No. 3) from Lake Skinner to a treated water pipeline, the recently started construction of a major raw water aqueduct by MWD (Pipeline No. 6) for more feasible groundwater recharge and conjunctive use – this 2005 Master Plan Update also includes concept planning for development of alternative water source augmentation. The RCWD water source augmentation consists of three factors:

- Vail Lake Water Supply Integration
- Class II Recycled Water Conversion
- Conservation

Vail Lake water supply integration is a source that would maximize the benefits of the new MWDSC Pipeline No. 6 and relocation of RCWD's EM-21 (formerly EM-19) raw water turnout in proximity to the District's Valle de los Caballos spreading grounds. Currently used to spread planned release of Vail Lake water via the Butterfield Canyon, the VDC spreading grounds are envisioned as the central component of a seasonal storage system and expanded spreading operations; including EM-21 and additional raw water transmission piping, groundwater wells, a treatment facility, and additional pumping capacity.

The District authorized RBF Consulting to prepare an updated Water Facilities Master Plan with the following scope:

Task 1 **Review Existing Information**
(Land Use, Population, Water Use, Peaking Factors, development of Water Usage Factors)

Task 2 **Contemplated Contract Service Areas**
(Land Use, Water Use of surrounding areas)

Task 3 **Evaluate Water Supply Sources**
(MWD, Groundwater and Recycled Water, Vail Lake Integration and Recharge)

Task 4 **Domestic Water System Analysis**
(Computer Model using H2OMap software by MWH Soft, Inc.)

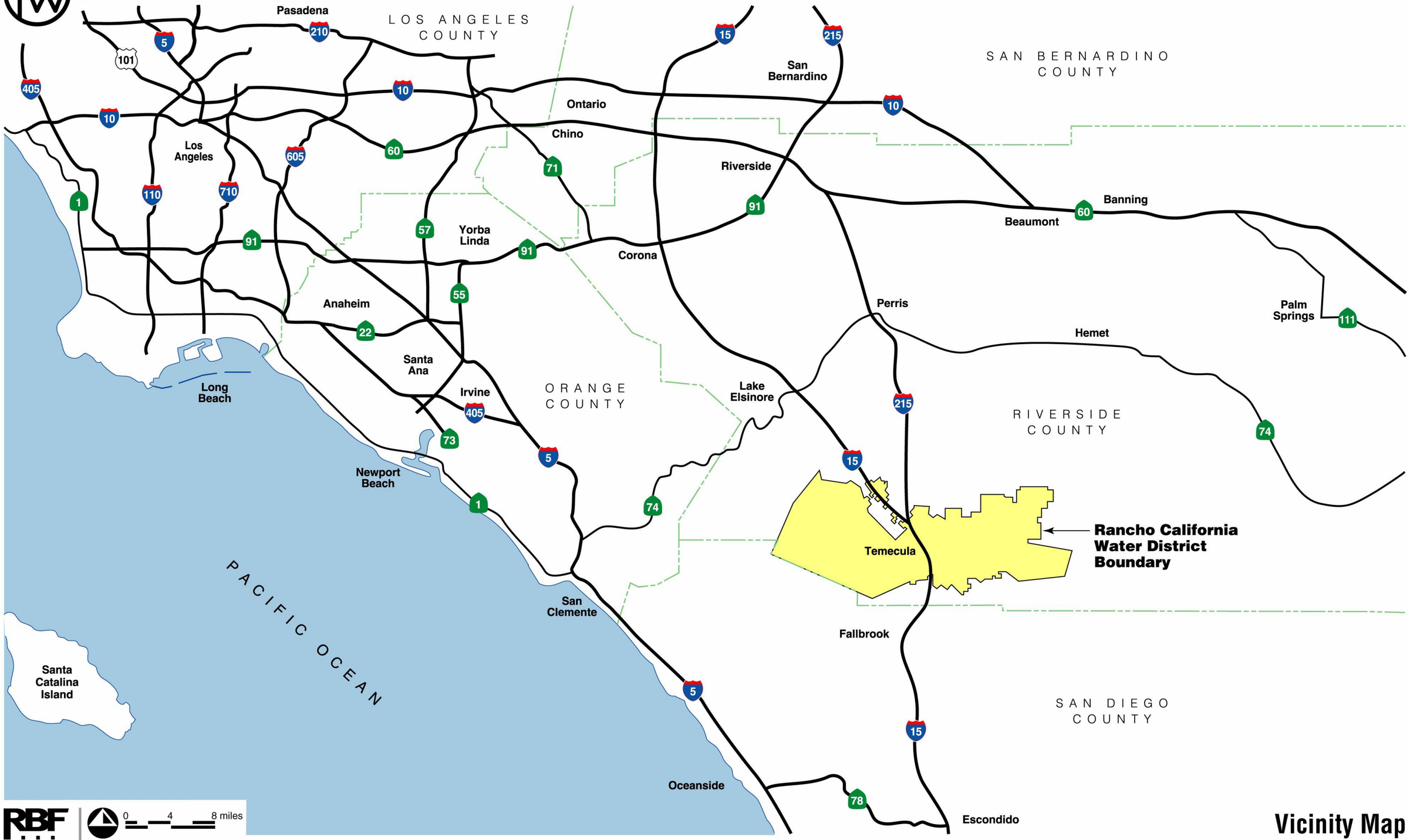
Task 5 **Recycled Water System Analysis**
(Computer Model using H2OMap software by MWH Soft, Inc.)

Task 6 **Recommended Improvements**
(Domestic, Reclaimed Water Facilities, Phasing)

Task 7 **Capital Improvement, Replacement Cost Analysis**
(Ultimate Buildout, Phasing, Capital Improvement and Capital Replacement Programs)

Task 8 **Final Report Preparation**

Rancho California Water District



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Vicinity Map

WATER FACILITIES MASTER PLAN UPDATE

Figure 2-1

Water District Divisions

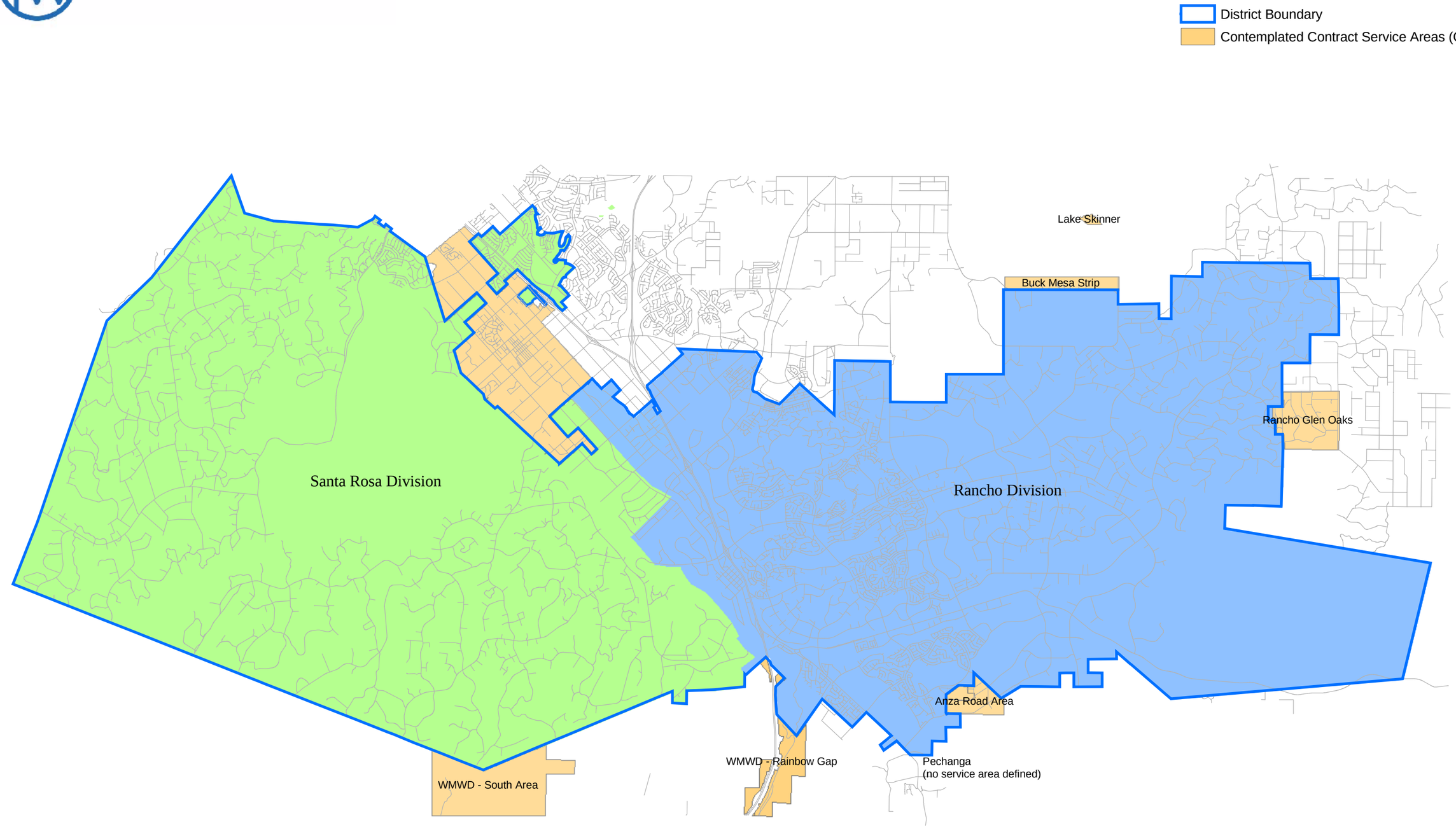

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Figure 2-2

Chapter 3

LAND USE

The Rancho California Water District service area overlies a very diverse geographic area. The terrain ranges from gentle rolling hills and valleys to very rugged mountainous areas. The valley floor is approximately 1,000 feet above sea level and the mountaintops reach a height of 2,800 feet. This diversity of terrain has a significant impact on the type and trends of development within the District.

3.1 Existing Land Use

Development within the Rancho Division of the District includes commercial, industrial, high density residential (including single family detached, condominiums and apartments) and low density residential as typified by the large estate type developments of Los Ranchitos and Meadowview. In addition, acres of citrus and vineyards comprise a well-established agricultural base as of 1984.

The Rancho Division also contains a very active horse community. Also, fishing and boating recreation continue to be popular activities at Vail Lake. The existing commercial development within the Rancho Division provides the shopping, entertainment, medical and dining facilities necessary to support the growing City of Temecula.

Existing development within the Santa Rosa Division is primarily the avocado plantings in the southern portion of the Division. Recent development within the Santa Rosa Division reflects a trend toward diversification from the agricultural base to a mix of estates, horse farms, specific plan development such as Bear Creek and California Oaks, the Cross Creek Golf Course, and the vast open spaces of the nature conservancy.

3.2 Current Land Planning

The land use information used to project ultimate land use consists of the County of Riverside's Southwest Area Plan (SWAP), the City of Temecula General Plan and the City of Murrieta General Plan (GP). The County has adopted the 2003 SWAP. The Cities of Temecula (2005) and Murrieta (2002) have also recently adopted revisions to their General Plans. These three planning documents combined provide the base land use data used in projecting ultimate buildout and corresponding water demands for the District. Figure 3-1 identifies the portion of the District covered by each Plan.

It's important to note that some unincorporated Riverside County areas within the District is identified as "policy area". Specific definitions of these policy areas reveal a range of alternative land use densities for given areas. In addition, it was further reasoned that current concept land use plans, or lack thereof, provides justification for 'reality' adjustments to the land use plan. Although regional general plans are

typically based on a 20-year planning horizon, planning studies such as water system master plans are necessarily updated much more frequently – every seven to ten years. Therefore, the land use plan dictated by general planning documents within the GP planning horizon cannot fully develop within the life of a water master planning document. These policy areas are discussed in more detail in the following subsection.

3.3 Projected Ultimate Land Use

The ultimate land use projections for Rancho California Water District are based on the SWAP, City of Temecula GP and the City of Murrieta GP. In order to establish a "common denominator" set of land use categories, each of the three planning documents, and their respective land use categories, were evaluated side by side to arrive at a master list of categories. This master list had to encompass all land uses proposed within each Plan without generating a lengthy cumbersome list that would not be feasible for a water facilities master plan.

As described above, land use planning adjustments were necessary to consider the specific definitions of the GP policy areas as well as foreseeable development trends within a shorter time frame than the 20-year planning horizon. The County policy areas that necessitated land use adjustments within the District service area are as follows:

- Santa Rosa Plateau Policy Area (SRPPA)
- Citrus Vineyard Rural Policy Area (CVRPA)
- Vail Lake Policy Area (VLPA)

The SRPPA includes the current agricultural and Ag/domestic land uses within the Santa Rosa Division. Although the SWAP provides for '5-acre minimum lot size', historically, this has not been demonstrated to be likely or even possible for the entire region. Therefore, the a delineation of areas that could be developed with this density remains consistent with those adopted agriculture-to-residential regions within the 1997 Master Plan Update.

The CVRPA includes the current vineyard and agricultural land uses within the Rancho Division. Although the SWAP provides for '5-acre minimum lot size', historically, this area has demonstrated that conversion of this policy area to residential should not be expected within the planning horizon, much less the seven-to-ten year useful life of the Water Facilities Master Plan Update. Therefore, it is more prudent from a master planning perspective to plan for the continued use of these areas as agricultural.

The VLPA is currently only used for recreational purposes within a small portion surrounding Vail Lake. However, recent concept land use provided by a master developer includes a proposal to construct a master planned community with medium- and high-density residential land use on approximately 500 acres making it more dense than the 20-acre minimum lot size stated in the SWAP.

Most notable of the adjustments regards the vineyard and agricultural uses. This master plan allows for much of these current uses to remain, thus it was deemed appropriate to include these traditional uses under the category of "Ag/Vineyard Planning Area". Table 3.1 includes the specific land use categories of each General Plan and those categories adopted for the 2005 RCWD Water Facilities Master Plan Update. District service area buildout within the 20-year planning horizon (ultimate) is projected to include approximately 83,000 dwelling units, 5,900 acres of business park/commercial area and 12,737 acres of agricultural land. The projected ultimate land uses for Rancho California Water District are shown on Figure 3-2 and summarized on Tables 3.2, 3.3 and 3.4.

3.3.1 Santa Rosa Division

The Santa Rosa Division comprises the western half of RCWD and includes approximately 49,000 acres. Projected land uses in the Santa Rosa Division consist of very low and medium density residential and agricultural uses. Approximately 9,000 acres are dedicated to open space to remain in their present natural condition. The only recent development that occurred within the Santa Rosa Plateau Policy Area is the Cross Creek Golf Course. Table 3.3 is a summary of the projected ultimate land use in the Santa Rosa Division. The land use is illustrated using individual pressure zone exhibits created from the District's GIS. (A tabulation summary by pressure zone is included in the water demand tables of Appendix C.)

3.3.2 Rancho Division

The Rancho Division of RCWD comprises the eastern 51,000 acres of the District and has considerably different projected land uses than the Santa Rosa Division. More urbanized commercial developments and the residential density has been, and will continue to be, constructed with much higher density within the urban core area. The Rancho Division will also include approximately 5,700 acres of business park/industrial and commercial development. The outlying areas have, and are proposed to remain, very low density estate residential development and agricultural/vineyard land uses. Ultimately, these low density uses will cover approximately 25,000 acres of the central and eastern portions of the Rancho Division. Other uses include approximately 10,000 acres of low-, medium-, and high-density residential tending toward the western portion of the division. Table 3.4 is a summary of the projected land uses within the Rancho Division. The land use is illustrated using individual pressure zone exhibits created from the District's GIS. (A tabulation summary by pressure zone is included in the water demand tables of Appendix C.)

Table 3.5 illustrates a comparison of the projected land use for Rancho California Water District as a whole as planned in the 1997 Master Plan Update and this 2005 update.

Table 3.1
Rancho California Water District
2005 Water Facilities Master Plan Update

SUMMARY OF LAND USE CATEGORIES

2005 RCWD Master Plan Update	Riverside County Southwest Area Plan (SWAP)	City of Temecula General Plan	City of Murrieta General Plan
RESIDENTIAL			
Ag/Vineyard Planning Area	Agricultural		
Estate 20 Residential (20 Ac min.)	Open Space - Rural		
Estate 10 Residential (10 Ac min.)	Rural Residential (10 Ac min.)	Hillside Residential (10 Ac min.)	
Estate 5 Residential (5 Ac min.)	Rural Residential (5 Ac min.)		
Estate 2 Residential (2 - 5 Ac lots)	Estate Residential (2 Ac min.)	Residential - Very Low density (0.2 - 0.4 DU/Ac)	Rural Residential (2.5 Ac min.)
Residential - Very Low density (1 - 2 acres)	Residential - Very Low density (1 - 2 acres)	Residential - Low density (0.5 - 2.0 DU/Ac)	Estate 1 Residential (0.5 - 1.0 DU/Ac)
Residential - Low density (1 - 2 DU/acre)	Residential - Low density (1 - 2 DU/Ac)		Estate 2 Residential (1.1 - 2.0 DU/Ac)
Residential - Medium density (2 - 5 DU/Ac)	Residential - Medium density (2 - 5 DU/Ac)	Residential - Low-Medium density (3 - 6 DU/Ac)	Estate 3 Residential (2.1 - 3.0 DU/Ac)
Residential - Medium-High density (5 - 8 DU/Ac)	Residential - Medium-High density (5 - 8 DU/Ac)		Single-Family 1 Res (2.1 - 5.0 DU/Ac)
Residential - High density (8 - 14 DUs/Acre)	Residential - High density (8 - 14 DU/Ac)	Residential - Medium density (7 - 12 DU/Ac)	Single-Family 2 Res (5.1 - 10.0 DU/Ac)
Multi-Family Residential (>14 DUs/Acre)	Residential - Very High density (14 - 20 DU/Ac) Residential - Highest density (20+ DU/Ac)	Residential - High density (13 - 20 DU/Ac)	Multi-Family 1 Res (10.1 - 15.0 DU/Ac) Multi-Family 2 Res (15.1 - 18.0 DU/Ac)
NON-RESIDENTIAL			
Commercial - Retail, Neighborhood Comm, Tourist, Schools	Commercial - Retail, Tourist, Office	Community Commercial Neighborhood Commercial Highway/Tourist Commercial	Neighborhood Commercial Community Commercial - Retail, Office Business Park
BP/Industrial - Office, Regional Comm, Industrial, Business Park, Institutional	Light Industrial Heavy Industrial	Business Park Professional Office Service Commercial Public/Institutional	Regional Commercial - Anchors, Restaurant, Hotel General Industrial Special Industrial Civic/Institutional
Public/Freeway		Public/Institutional	
Open Space - Recreational	Open Space	Open Space Recreational	Parks and Recreation
Open Space - Native	Open Space - Water		Open Space
	Cities		

TABLE 3.2
RANCHO CALIFORNIA WATER DISTRICT
WATER FACILITIES MASTER PLAN UPDATE

Projected Ultimate Land Use Summary

DISTRICT-WIDE SUMMARY				
Land Use	**Density Range (du/Ac)**	**Assumed Density (du/Ac)**	**Area (acre)**	**Estimated Dwelling Units**
Residential				
Ag/Vineyard Planning Area	0 - 0.05	0.05	12,737	637
Estate 20	0 - 0.05	0.05	243	12
Estate 10	0.05 - 0.10	0.075	3,749	281
Estate 5	0.10 - 0.20	0.15	40,957	6,144
Estate 2	0.20 - 0.50	0.35	3,483	1,219
Very Low Density	0.50 - 1	0.75	577	433
Low Density	1 - 2	1.5	153	230
Medium Density	2 - 5	3.5	4,438	15,830
Medium High Density	2 - 8	6.5	6,716	43,657
High Density	8 - 16	11	147	1,620
Multi-Family	-	20	667	13,331
Commercial	N/A	N/A	3,083	
Business Park / Industrial	N/A	N/A	2,842	
Public/Freeway			99	
Open Space - Native	N/A	N/A	16,370 [2]	
Open Space - Recreational	N/A	N/A	3,344	
CCSA [1]	N/A	N/A	6,782	492
TOTAL (excluding CCSA)			**99,606**	**83,393**
TOTAL (including CCSA)			**106,388**	**83,885**

[1] CCSA = Contemplated Contract Service Area, not within RCWD defined service area.

[2] Includes 6,854 acres of Vail Lake Policy Area assumed to remain native after the proposed development of medium density residential.

TABLE 3.3
RANCHO CALIFORNIA WATER DISTRICT
WATER FACILITIES MASTER PLAN UPDATE

Projected Ultimate Land Use Summary

SANTA ROSA DIVISION
SUMMARY

Land Use	Density Range (du/Ac)	Assumed Density (du/Ac)	Area (acre)	Estimated Dwelling Units
Residential				
Ag/Vineyard Planning Area	0 - 0.05	0.05	4,882	244
Estate 20	0 - 0.05	0.05	0	0
Estate 10	0.05 - 0.10	0.075	29	2
Estate 5	0.10 - 0.20	0.15	31,848	4,777
Estate 2	0.20 - 0.50	0.35	0	0
Very Low Density	0.50 - 1	0.75	169	127
Low Density	1 - 2	1.5	5	7
Medium Density	2 - 5	3.5	1,609	5,633
Medium High Density	2 - 8	6.5	268	1,744
High Density	8 - 16	11	0	0
Multi-Family	-	20	93	1,857
Commercial	N/A	N/A	221	
Business Park / Industrial	N/A	N/A	3	
Public/Freeway			35	
Open Space - Native	N/A	N/A	8,989	
Open Space - Recreational	N/A	N/A	576	
CCSA [1]	N/A	N/A	1,391	69
TOTAL (excluding CCSA)			**48,728**	**14,392**
TOTAL (including CCSA)			**50,119**	**14,461**

[1] CCSA = Contemplated Contract Service Area, not within RCWD defined service area.

TABLE 3.4
RANCHO CALIFORNIA WATER DISTRICT
WATER FACILITIES MASTER PLAN UPDATE

Projected Ultimate Land Use Summary

RANCHO DIVISION
SUMMARY

Land Use	Density Range (du/Ac)	Assumed Density (du/Ac)	Area (acre)	Estimated Dwelling Units
Residential				
Ag/Vineyard Planning Area	0 - 0.05	0.05	7,855	393
Estate 20	0 - 0.05	0.05	243	12
Estate 10	0.05 - 0.10	0.075	3,720	279
Estate 5	0.10 - 0.20	0.15	9,109	1,366
Estate 2	0.20 - 0.50	0.35	3,483	1,219
Very Low Density	0.50 - 1	0.75	408	306
Low Density	1 - 2	1.5	148	222
Medium Density	2 - 5	3.5	2,828	10,197
Medium High Density	2 - 8	6.5	6,448	41,912
High Density	8 - 16	11	147	1,620
Multi-Family	-	20	574	11,474
Commercial	N/A	N/A	2,862	
Business Park / Industrial	N/A	N/A	2,839	
Public/Freeway			64	
Open Space - Native	N/A	N/A	7,381 [2]	
Open Space - Recreational	N/A	N/A	2,768	
CCSA [1]	N/A	N/A	5,391	423
TOTAL (excluding CCSA)			**50,878**	**69,001**
TOTAL (including CCSA)			**56,269**	**69,424**

[1] CCSA = Contemplated Contract Service Area, not within RCWD defined service area.

[2] Includes 6,854 acres of Vail Lake Policy Area assumed to remain native after the proposed development of medium density residential.

TABLE 3.5
RANCHO CALIFORNIA WATER DISTRICT
WATER FACILITIES MASTER PLAN UPDATE

Comparison of Ultimate Projected Land Use

Land Use	1997 MASTER PLAN UPDATE	2005 WFMP UPDATE
Residential		
Ag/Vineyard Planning Area	17,586 Ac	637 DU
Estate 20	-- DU	12 DU
Estate 10	-- DU	281 DU
Estate 5	-- DU	6,144 DU
Estate 2	-- DU	1,219 DU
Very Low Density	9,094 DU	433 DU
Low Density	207 DU	230 DU
Medium Density	32,228 DU	15,830 DU
Medium High Density	1,215 DU	43,657 DU
High Density	21,048 DU	1,620 DU
Multi-Family	-- DU	13,331 DU
Commercial	1,392 Ac	3,083 Ac
Business Park / Industrial	3,692 Ac	2,842 Ac
Public/Freeway	-- Ac	99 Ac
Open Space - Native	10,527 Ac	16,370 Ac
Open Space - Recreational	1,329 Ac	3,344 Ac

Land Use Reference Map

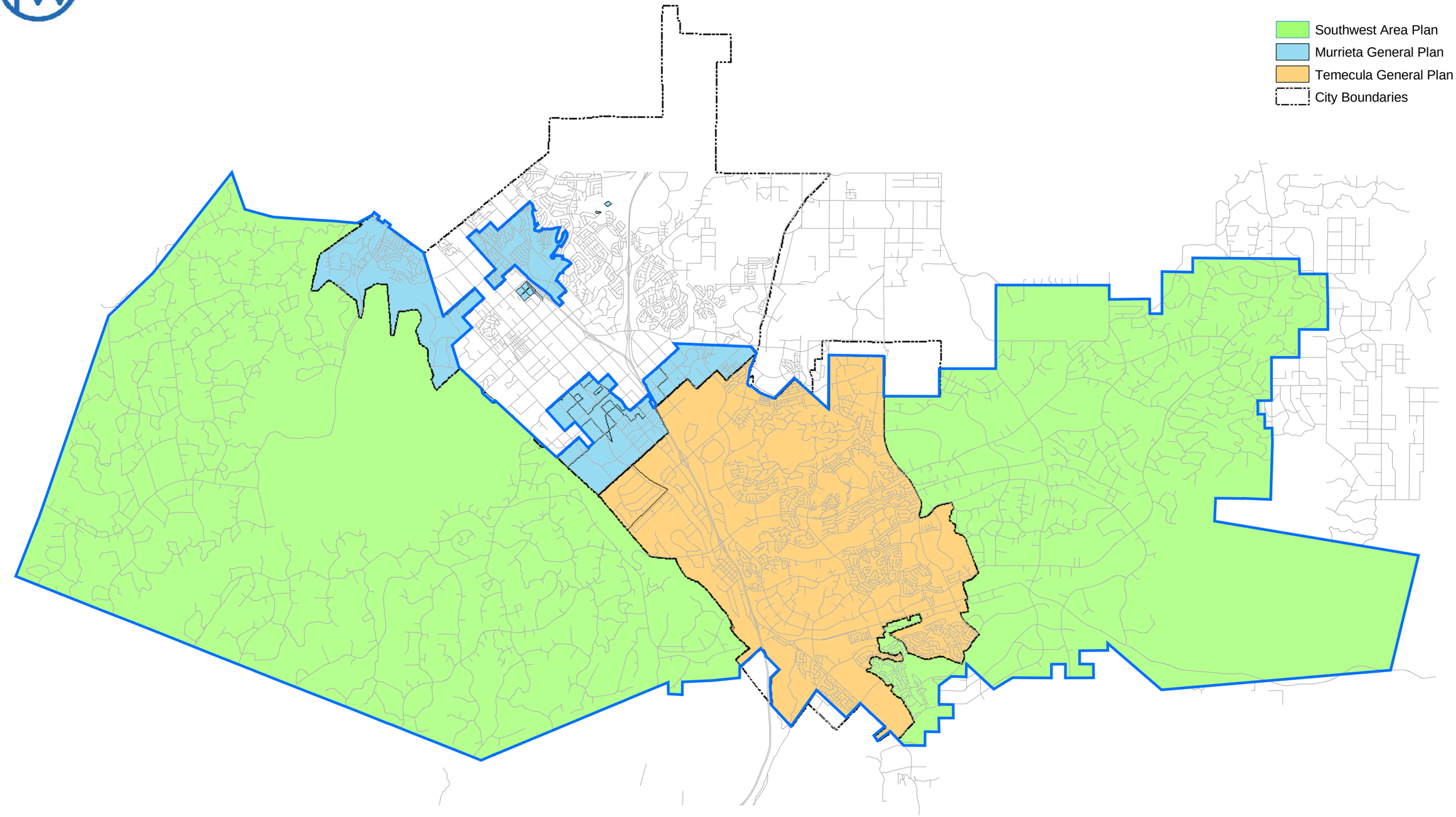

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Figure 3-1

Rancho California Water District

WATER FACILITIES MASTER PLAN

Projected Land Use Map

- Agriculture/Vineyard Planning Areas
- Estate 20 Acre Minimum
- Estate 10 Acre Minimum
- Estate 5 Acre Minimum
- Estate 2-5 Acre
- Very Low Density Residential
- Low Density Residential
- Medium Density Residential
- Medium High Density Residential
- High Density Residential
- Multi-Family Residential
- Commercial
- Business Park / Industrial
- Open Space - Native
- Open Space - Recreation
- Public / Freeway

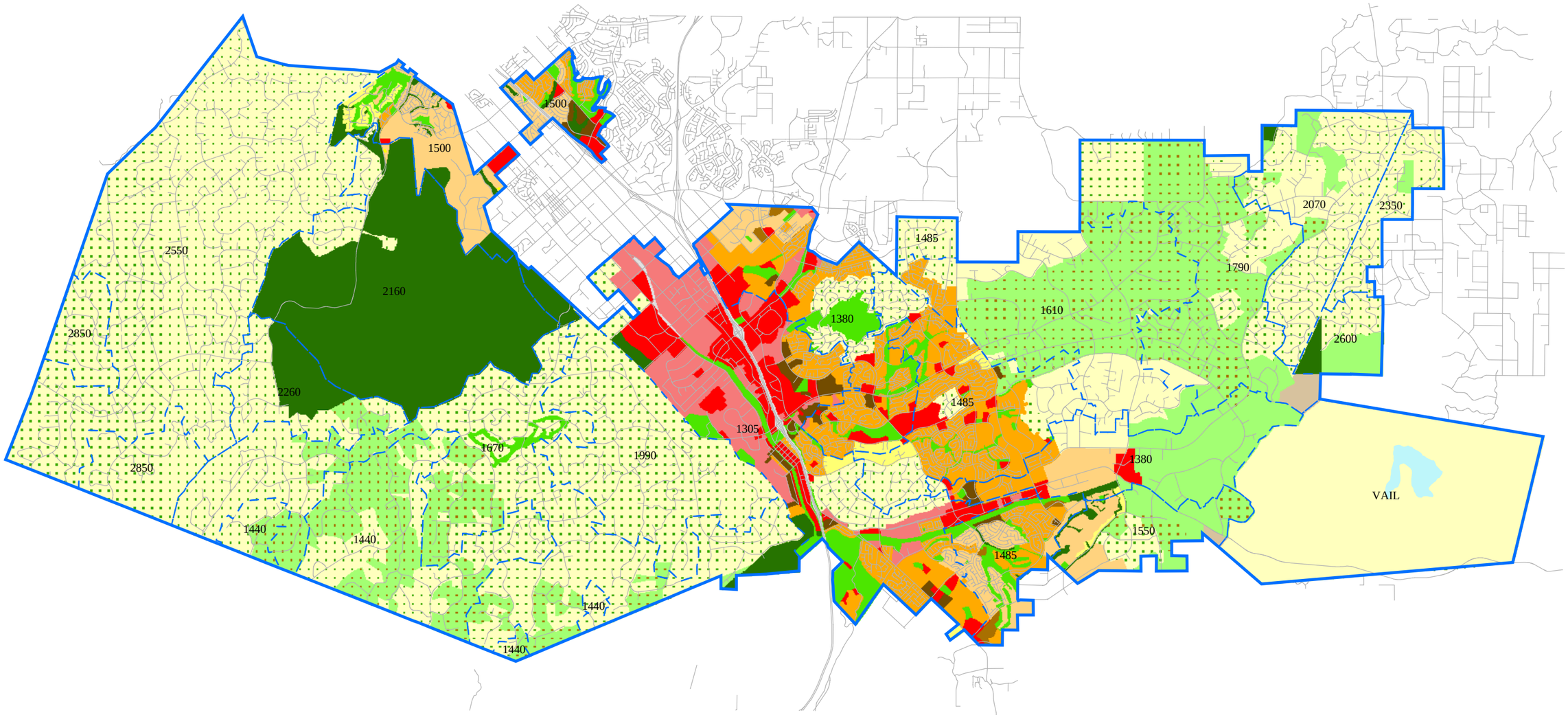

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Figure 3-2

Chapter 4

WATER DEMANDS

4.1 Historic Water Use

Figure 4-1 graphically illustrates the historic annual water production from FY 1993-'94 through FY 2003-'04 for the Rancho Division, Santa Rosa Division and RCWD as a whole. This time period reveals an increase in total District water production from 47,100 acre-feet (AF) to 83,400 AF, including recycled water production, for the eleven year span.

Water production in the Santa Rosa Division underwent rapid increase during the period from 1977 to 1985 as thousands of acres of avocado groves were cultivated. Water production increased from about 4,000 AF in 1977 to 22,000 AF in 1985. Since 1986 the demand within the Santa Rosa Division has leveled off considerably due to increased water rates and a decrease in agricultural use, and is currently at a total of 38,200 AF for FY 2003-'04. In the Rancho Division, water production increased steadily from about 9,000 AF in 1977 to 45,200 AF in FY 2003-'04.

Traditionally, water consumption within the District has been predominantly from agricultural uses. However, this trend has been declining in recent years. As an example, the 1997 WFMP Update projected the ultimate land use make-up of the District would include almost 17,500 acres of agriculture and vineyard uses, and this Update projects that figure at 12,700 acres. To further illustrate, the percent breakdown has been calculated for existing Agricultural (Ag), Ag/Domestic, Residential and Other water uses for the District as a whole and each division, as follows:

Land Use Category	RCWD		Santa Rosa		Rancho	
	1996	2003	1996	2003	1996	2003
Agricultural	44%	38%	73%	70%	19%	6%
Ag/Domestic	7%	8%	7%	10%	6%	6%
Residential	28%	47%	11%	17%	43%	78%
Other	21%	7%	9%	3%	32%	10%

Figure 4-2 is an illustration of the four land use categories for calendar year 2003 water consumption. As described in the following subsections, the trend towards residential development is indicated with an ultimate projected demand of approximately 66 percent of the total domestic water demand. This represents an increase from 54 percent projection in the 1997 WFMP Update.

Due to the high level of irrigation throughout the District, for both recreation and agriculture, rainfall has an affect on water demand and the corresponding

need for water production. Because of this, Figure 4-3 was developed to illustrate rainfall affects on required water production. As the figure shows, the side-by-side comparison of water production and rainfall for the Temecula area verifies a distinct inverse relationship, and also demonstrates the relatively low rainfall of recent years. Accordingly, Figure 4-4 illustrates the projected water production, which is largely influenced by the low rainfall totals for the last six years. Therefore, the possible range of future water production requirements should not be based on average rainfall. Since rainfall for the last six years has been *below* average, it can be reasoned that production has been *above* average with the projected production curve favoring the high end of the range. For the purposes of this master plan, production projection is taken as 25 percent above and 75 percent below.

It is anticipated that water production requirements in the year 2025 will be approximately 129,500 AF excluding CCSAs, and 140,100 AF including CCSAs.

4.2 Water Duty Factors

Water usage trends of the various land uses within the District were last studied for he 1990 WFMP. Several development projects have been completed and conservation habits encouraged since then. Therefore, a thorough water duty factor analysis was performed for the 2005 Master Plan Update. Billing data for the full 2002 and 2003 calendar year was provided by District customer service staff. The major land uses established for this Update were matched with the billing meter designations to calculate the current trend of water usage based on land use. The investigation determined the need to revise the District's water usage duty factors in order to more accurately estimate future water consumption.

With the adoption, for this master plan update, of the 'estate' residential land use densities to better define the imminent conversion of much of the agricultural land uses to large-lot residential (from 2-acre minimum up to 20-acre minimum, based on the 2003 Southwest Area Plan), a significantly reduced water demand can be expected. The water consumption habits of existing large-lot residential customers shows a much lower water usage can be expected when these historic agricultural uses are converted to estates. In addition, it is more appropriate in most areas to estimate these demands on a per-dwelling-unit basis rather than per acre. In addition, the analysis showed distinctly different usage trends among the higher density residential. These showed justification for modifying the duty factors from 400 gpd per dwelling unit 1,500 gpd per dwelling unit. Table 4.1 summarizes the resulting water duty factors for each land use category for the 2005 WFMP Update.

TABLE 4.1 WATER DUTY FACTORS	
Land Use	**Duty Factor**
Residential	
Ag/Vineyard Planning Areas	[1]
Estate 20	0.75 AF / ac / yr
Estate 10	0.75 AF / ac / yr
Estate 5	[2]
Estate 2	[2]
Very Low Density	3,000 gpd / du
Low Density	1,500 gpd / du
Medium Low Density	1,000 gpd / du
Medium Density	800 gpd / du
Medium High Density	400 gpd / du
High Density	400 gpd / du
Commercial	1,500 gpd / ac
Business Park / Industrial	1,500 gpd / ac
Public / Freeway	1.5 AF / ac / yr
Open Space - Native	0
Open Space – Recreational	4.0 AF / ac / yr
CCSA [3]	--

[1] Varied between the Santa Rosa Division (2.5 AF/Ac/Yr) and the Rancho Division (1.5 AF/Ac/Yr).
[2] Varied between District Divisions. Updated Duty Factor equals 3,000 gpd/du for all Santa Rosa zones except 1990, 1670, and 1440 where the factor equals 0.75 AF/Ac/Yr. All Rancho zones factor equal 2,000 gpd/du.
[3] CCSA = Contemplated Contract Service Areas, outside of District boundary and sphere.

4.3 System Peaking Factors

System peaking factors of the various pressure zones operated by the District were last studied for the 1990 WFMP. Several development projects have been completed and conservation habits encouraged since then, potentially affecting water demand peaking characteristics. The previous (1990) analysis concluded that the maximum day peaking factor tends to vary according to the proportion of agricultural and residential use within that zone as well as with the total demand within the zone, and that high agricultural water demands tended to show signs of higher peaking. This trend will be less significant with the conversion of more agricultural lands to residential. Therefore, a peaking analysis was performed for each pressure zone for the 2005 Master Plan Update.

Two types of maximum-day peaks should be considered – individual pressure zone peaks and overall District peaks. Individual pressure zone analysis should use the unique peaking factor determined for that particular pressure zone. This section provides a guideline for standard system analysis to determine the affects on a single pressure zone by independent peaking within each zone. As billing data for actual water consumption cannot record daily peaks to reveal maximum-day demands (meters typically read on a monthly basis), water production data was used to investigate maximum daily demands for each individual pressure zone.

Daily water production data for calendar years 2001, 2002 and 2003, are critical in determining pressure zone pumping requirements, pipeline sizes, and tank storage volume for each specific pressure zone. The data was presented by pressure zone and showed that maximum-day zone production typically occurred in August or September. These independent, or "cherry-picked", maximum water production values were deemed critical for establishing the maximum-day peaking factors for planning purposes for the distribution systems of the individual pressure zones. Extraordinarily high peaking factors were observed in a few of the pressure zones, and were reasoned to be due to high construction activity or a low-water demand zone (low water demand areas exhibit much higher demand fluctuations than high demand areas).

Since, for the purposes of hydraulic analysis for the 2005 Master Plan Update, the overall system was analyzed in a single model (as described in a later Section) and, thus, a single peaking value for the entire District was more appropriate. This inter-dependent, or "same-day", maximum water production value was determined by investigation of the overall system. The single maximum day for each calendar year was calculated as follows:

Year	District Maximum-day Peaking Factor
2001	2.27
2002	1.99
2003	2.33
Average	**2.2**

These years should be considered appropriate for calculation of a somewhat conservative maximum-day peaking factor, considering the high level of construction activity that could be expected to continue for several more years. Appendix B includes the tables detailing the calculations of the maximum-day ratios for individual pressure zone peak values ("cherry-picked") and overall District peak values ("same-day"). Table 4.2 is a summary of the recommended maximum day demand peaking factors to adopt for the 2005 WFMP Update.

Table 4.2
Peaking Factors

Pressure Zone	Maximum-day "Cherry-Picked"	Maximum-day "Same-Day"
Santa Rosa Division		
2850	3.0	2.2
2550	3.0	2.2
2260	2.75	2.2
2160	3.0	2.2
1990	2.75	2.2
1670	2.75	2.2
1500	2.0	2.2
1440	3.0	2.2
Rancho Division		
Vail Lake	3.0	2.2
2600	3.0	2.2
2350	3.0	2.2
2070	2.5	2.2
1790	2.5	2.2
1610	2.5	2.2
1550	3.0	2.2
1485	2.0	2.2
1380	2.0	2.2
1305	2.0	2.2

4.4 Projected Ultimate Water Demand

Based on the projected ultimate land use outlined in Chapter 3 and the duty factors discussed above, the projected ultimate water demands within Rancho California Water District are presented in Table 4.3. The estimated ultimate average annual and maximum-day District-wide domestic water demand is 129,500 acre-feet and 393 cfs. This is illustrated in the water production projection curve shown in Figure 4-4.

Table 4.4 summarizes the projected demands in the Santa Rosa Division. The estimated ultimate average annual and maximum-day Santa Rosa division domestic water demand is 42,300 acre-feet and 128 cfs. The detailed demand calculations for each pressure zone in the Santa Rosa Division are included in Appendix B. Figure 4-5 indicates the pressure zone locations.

Table 4.5 summarizes the projected demands in the Rancho Division. The estimated ultimate average annual and maximum-day Rancho division domestic water demand is 87,300 acre-feet and 265 cfs. The detailed demand calculations for each pressure zone in the Rancho Division are included in Appendix B. Figure 4-5 indicates the pressure zone locations.

It should be noted that these projections assume one hundred percent buildout based on the Southwest Area Plan, the City of Temecula General Plan and the City of Murrieta General Plan. As such, they should provide a conservative guideline for planning of future distribution facilities so long as projected land uses do not change significantly. Table 4.6 compares these new demand estimates to those prepared for the 1997 WFMP Update.

Table 4.8 summarizes the projected demands of the contemplated contract service areas. The CCSA areas have been shown previously in Figure 2-2 but are further explained in Table 4.8. The estimated maximum-day CCSA domestic water demand is 32 cfs.

TABLE 4.3
RANCHO CALIFORNIA WATER DISTRICT
WATER FACILITIES MASTER PLAN UPDATE

Summary of Projected Ultimate Domestic Water Demands

DISTRICT-WIDE SUMMARY						
	Domestic Water Use Area	Estimated Dwelling	Updated Duty	[1] Average Annual Water Demand		[1] Maximum Day Water Demand
Land Use	(acre)	Units	Factor	(ac-ft/yr)	(cfs)	(cfs)
Residential						
Ag/Vineyard Planning Area	12,737	637	-	23,987	33.13	72.89
Estate 20	243	12	0.75 af/ac/yr	183	0.25	0.55
Estate 10	3,749	281	0.75 af/ac/yr	2,812	3.88	8.54
Estate 5 [3]	40,957	6,144	-	22,780	31.46	69.22
Estate 2 [3]	3,483	1,219	-	2,732	3.77	8.30
Very Low Density	577	433	3,000 gpd/du	1,456	2.01	4.42
Low Density	153	230	1,500 gpd/du	386	0.53	1.17
Medium Density	4,438	15,830	1,000 gpd/du	17,734	24.49	53.89
Medium High Density	6,716	43,657	800 gpd/du	39,127	54.04	118.89
High Density	147	1,620	400 gpd/du	726	1.00	2.21
Multi-Family	667	13,331	400 gpd/du	5,974	8.25	18.15
Commercial	3,083		1,500 gpd/ac	5,180	7.16	15.74
Business Park / Industrial	2,842		1,500 gpd/ac	4,776	6.60	14.51
Public/Freeway	99		1.5 af/ac/yr	149	0.21	0.29
Open Space - Native	16,370		0	-	-	
Open Space - Recreational	386		4.0 af/ac/yr	1,545	2.13	4.69
CCSA [2]	6,782	492		10,534	14.55	32.01
TOTAL (excluding CCSA)	**96,648**	**83,393**		**129,545**	**178.93**	**393.48**
TOTAL (including CCSA)	**103,431**	**83,885**		**140,079**	**193.48**	**425.49**

[1] Excludes acres and estimated water demands for irrigation areas ultimately planned for recycled water service.

[2] CCSA = Contemplated Contract Service Area, outside of District boundary and sphere; demands calculated on separate table.

[3] Updated Duty Factor equals 3,000 gpd/du for all SR zones except 1990, 1670, and 1440 where the factor equals 0.75 af/ac/yr.

TABLE 4.4
RANCHO CALIFORNIA WATER DISTRICT
WATER FACILITIES MASTER PLAN UPDATE

Summary of Projected Ultimate Domestic Water Demands

SANTA ROSA DIVISION
SUMMARY

Land Use	Domestic Water Use Area (acre)	Estimated Dwelling Units	Updated Duty Factor	[1] Average Annual Water Demand (ac-ft/yr)	[1] Average Annual Water Demand (cfs)	[1] Maximum Day Water Demand (cfs)
Residential						
Ag/Vineyard Planning Area	4,882	244	2.5 af/ac/yr	12,206	16.86	37.09
Estate 20	0	0	0.75 af/ac/yr	0	0.00	0.00
Estate 10	29	2	0.75 af/ac/yr	22	0.03	0.07
Estate 5 [3]	31,848	4,777	-	19,719	27.24	59.92
Estate 2 [3]	0	0	-	0	0.00	0.00
Very Low Density	169	127	3,000 gpd/du	427	0.59	1.30
Low Density	5	7	1,500 gpd/du	12	0.02	0.04
Medium Density	1,609	5,633	1,000 gpd/du	6,310	8.72	19.18
Medium High Density	268	1,744	800 gpd/du	1,563	2.16	4.75
High Density	0	0	400 gpd/du	0	0.00	0.00
Multi-Family	93	1,857	400 gpd/du	832	1.15	2.53
Commercial	221		1,500 gpd/ac	371	0.51	1.13
Business Park / Industrial	3		1,500 gpd/ac	5	0.01	0.01
Public/Freeway	35		1.5 af/ac/yr	53	0.07	0.00
Open Space - Native	8,989		0	-	-	-
Open Space - Recreational	184		4.0 af/ac/yr	736	1.02	2.24
CCSA [2]	1,391	69		3,468	4.79	10.54
TOTAL (excluding CCSA)	**48,336**	**14,392**		**42,256**	**58.36**	**128.24**
TOTAL (including CCSA)	**49,727**	**14,461**		**45,724**	**63.15**	**138.78**

[1] Excludes acres and estimated water demands for irrigation areas ultimately planned for recycled water service.

[2] CCSA = Contemplated Contract Service Area, outside of District boundary and sphere; demands calculated on separate table.

[3] Updated Duty Factor equals 3,000 gpd/du for all SR zones except 1990, 1670, and 1440 where the factor equals 0.75 af/ac/yr.

TABLE 4.5
RANCHO CALIFORNIA WATER DISTRICT
WATER FACILITIES MASTER PLAN UPDATE

Summary of Projected Ultimate Domestic Water Demands

RANCHO DIVISION
SUMMARY

Land Use	Domestic Water Use Area (acre)	Estimated Dwelling Units	Updated Duty Factor	[1] Average Annual Water Demand (ac-ft/yr)	(cfs)	[1] Maximum Day Water Demand (cfs)
Residential						
Ag/Vineyard Planning Area	7,855	393	1.5 af/ac/yr	11,782	16.27	35.80
Estate 20	243	12	0.75 af/ac/yr	183	0.25	0.55
Estate 10	3,720	279	0.75 af/ac/yr	2,790	3.85	8.48
Estate 5	9,109	1,366	2,000 gpd/du	3,061	4.23	9.30
Estate 2	3,483	1,219	2,000 gpd/du	2,732	3.77	8.30
Very Low Density	408	306	3,000 gpd/du	1,028	1.42	3.13
Low Density	148	222	1,500 gpd/du	374	0.52	1.14
Medium Density	2,828	10,197	1,000 gpd/du	11,423	15.78	34.71
Medium High Density	6,448	41,912	800 gpd/du	37,563	51.88	114.14
High Density	147	1,620	400 gpd/du	726	1.00	2.21
Multi-Family	574	11,474	400 gpd/du	5,142	7.10	15.62
Commercial	2,862		1,500 gpd/ac	4,809	6.64	14.61
Business Park / Industrial	2,839		1,500 gpd/ac	4,771	6.59	14.50
Public/Freeway	64		1.5 af/ac/yr	96	0.13	0.29
Open Space - Native	7,381		0	-	-	
Open Space - Recreational	202		4.0 af/ac/yr	809	1.12	2.46
CCSA [2]	5,391	423		7,066	9.76	21.47
TOTAL (excluding CCSA)	**48,312**	**69,001**		**87,289**	**120.56**	**265.24**
TOTAL (including CCSA)	**53,703**	**69,424**		**94,355**	**130.32**	**286.71**

[1] Excludes acres and estimated water demands for irrigation areas ultimately planned for recycled water service.

[2] CCSA = Contemplated Contract Service Area, outside of District boundary and sphere; demands calculated on separate table.

TABLE 4.6
RANCHO CALIFORNIA WATER DISTRICT
WATER FACILITIES MASTER PLAN UPDATE

Comparison of Ultimate Domestic Water Demand Projections
(Average Annual Demand)

Pressure Zone	1997 Master Plan Update		2005 WFMP Update [1]		Change Quantity	Change %	
Santa Rosa Division							
2850	927	AF	1,214	AF	287	31	%
1550	3,992	AF	6,412	AF	2,420	61	%
2260	831	AF	1,111	AF	280	34	%
2160	642	AF	371	AF	-271	-42	%
1990	4,511	AF	3,771	AF	-740	-16	%
1670	13,441	AF	11,873	AF	-1,568	-12	%
1500	5,166	AF	9,469	AF	4,303	83	%
1440	5,939	AF	7,982	AF	2,043	34	%
Santa Rosa Subtotal	35,449	AF	42,256	AF	6,807	19	%
Rancho Division							
Vail	3,971	AF	3,546	AF	-425	-11	%
2600	274	AF	432	AF	158	58	%
2350	403	AF	444	AF	41	10	%
2070	1,158	AF	1,754	AF	596	51	%
1790	4,928	AF	6,363	AF	1,435	29	%
1610	6,929	AF	8,839	AF	1,910	28	%
1550	1,479	AF	3,159	AF	1,680	114	%
1485	14,238	AF	21,567	AF	7,329	51	%
1380	10,463	AF	20,836	AF	10,373	99	%
1305	22,843	AF	20,349	AF	-2,494	-11	%
(1540)	1,554	AF	-	[2]	-	-	
Rancho Subtotal	68,240	AF	87,289	AF	19,049	28	%
DISTRICT TOTAL	**103,689**	**AF**	**129,545**		**25,856**	**25**	**%**

[1] Does not include CCSA demands.

4.5 Non-Domestic Water

The 2005 WFMP Update includes an update to the non-domestic water system master plan and revisions to the land uses anticipated to include major irrigation demands, as provided from the recent city and county general plans. The potential service areas include various types of open space recreational uses such as golf courses and sports parks, as well as community parks, schools and freeway landscaping.

The District began construction of a regional recycled water transmission and distribution system in the early 1990s. The regional system is complete, and is capable of serving the major irrigation uses within the 1305, 1380, 1485 and 1500 Zone service areas. These Class I demands are the areas deemed most feasible to serve, and either recently retrofitted for non-domestic water service, or slated to be retrofitted. Class II demands have been identified as potentially feasible depending on future water supply scenarios and the cost to distribute recycles water.

Table 4.7 summarizes the land uses and projected recycled water demands. As shown, the potential average annual non-domestic water demand is approximately 11,200 AF based on the demands identified as Class I. Figure 4-6 illustrates the total potential non-domestic water use areas.

Table 4.7
RANCHO CALIFORNIA WATER DISTRICT
WATER FACILITIES MASTER PLAN UPDATE

Estimated Ultimate Non-domestic Water Demands

Domestic Water Zone Service area	Land Use Type	Acres	Average (Ac-ft/yr)	Average (cfs)	Max Day (cfs)
Class I					
1500	OS - Recreational	**392**	**1,568**	**2.17**	**4.76**
1485	OS - Recreational	**566**	**2,264**	**3.13**	**6.88**
1380	OS - Recreational	**753**	**3,012**	**4.16**	**9.15**
1305	OS - Recreational	**1,005**	**4,020**	**5.55**	**12.22**
1305	Public/Freeway	**242**	**363**	**0.50**	**1.10**
Subtotal Class I		**2,958**	**11,227**	**15.51**	**34.12**
Class II					
1670	OS - Recreational	184	736	1.02	2.24
1610	Ag/Vineyard PA	2,300	3,450	4.77	10.48
Subtotal Class II		**2,484**	**4,186**	**5.78**	**12.72**

Class I = landscape irrigation areas in proximity to the the District's existing non-domestic water distribution system.
Class II = more remote irrigation areas, including Agriculture/Vineyard and Walker Basin Golf Course, which were determined potentially feasible to be served from the existing non-domestic water distribution system.

TABLE 4.8
RANCHO CALIFORNIA WATER DISTRICT
WATER FACILITIES MASTER PLAN UPDATE

Water Demand Summary Based on 2004 Master Plan Update Land Use Designations
Contemplated Contract Service Areas

CCSA	Description	Proposed RCWD Pressure Zone	General Plan Land Use	Acres	Duty Factor [1]	Assumed Density (du/acre)	Average (gpd)	Average (cfs)	Max Day (cfs) [2]	Peak Hour (cfs) [2]
1	South of Santa Rosa	1440	OS - Native	3.4	0.0	-	-	-	-	-
	(WMWD-South Area)		Ag/Vineyard PA	1,387.9	2.5 AF/Ac/Yr	0.05	3,097,824	4.79	10.54	
	CCSA 1 Sub Total:			**1,391.2**			**3,097,824**	**4.79**	**10.54**	**15.81**
2	I.D. "A" (Rainbow)	1305	Public/Fwy	178.2	0.0	-	-	-	-	-
	(WMWD-Rainbow Gap)		BP/Industrial	53.8	1,500.0 gpd/Ac	-	80,700	0.12	0.27	
			Res - Med high	40.0	800.0 gpd/du	6.50	208,208	0.32	0.71	
			OS - Native	2.6	0.0	-	-	-	-	-
			OS - Rec.	46.5	4.0 AF/Ac/Yr	-	165,889	0.26	0.56	
			Estate 20	18.0	0.75 AF/Ac/Yr	0.05	12,026	0.02	0.04	
			Commercial	24.9	1,500.0 gpd/Ac	-	37,335	0.06	0.13	
			Estate 10	384.4	0.75 AF/Ac/Yr	0.075	257,398	0.40	0.88	
			Estate 5	16.4	0.75 AF/Ac/Yr	0.15	10,989	0.02	0.04	
	CCSA 2 Sub Total:			**764.7**			**772,544**	**1.20**	**2.63**	**3.94**
3	Pechanga	1305	Commercial/Golf				2,000,000 [3]	3.09 [3]	6.81	10.21
	CCSA 3 Sub Total:			**275.0**			**2,000,000**	**3.09**	**6.81**	**10.21**
4	Monte Verde/	1485	Commercial	0.3						
	Anza Annex		Res - Low	148.3						
	(Anza Road Area)		Res - Med	160.6			[4]			
			OS - Native	0.4						
	CCSA 4 Sub Total:			**-**			**0**	**0.00**	**0.00**	**0.00**
5	Grey Squirrel	2600	Estate 10	297.2	0.75 AF/Ac/Yr	0.075	199,006	0.31	0.68	
	(Rancho Glen Oaks)		Estate 5	409.8	0.75 AF/Ac/Yr	0.15	274,419	0.42	0.93	
	CCSA 5 Sub Total:			**707.0**			**473,426**	**0.73**	**1.61**	**2.42**
6	Buck Mesa strip	1790	Estate 5	315.8	0.75 AF/Ac/Yr	0.15	211,441	0.33	0.72	
	(EMWD)									
	CCSA 6 Sub Total:			**315.8**			**211,441**	**0.33**	**0.72**	**1.08**
7	Lake Skinner	1790	OS - Rec.	**28.3**	4.0 AF/Ac/Yr	-	100,890	0.16	0.34	
	CCSA 7 Sub Total:			**28.3**			**100,890**	**0.16**	**0.34**	**0.52**
8	WMWD/MCWD	1305	-	3,300.0	-	-	-	4.25	9.36	9.36
	CCSA 8 Sub Total:			**3,300.0** [6]			**2,748,595**	**4.25**	**9.36** [5]	**9.36** [5]
	Total:			**6,782.0**			**9,404,721**	**14.55**	**32.01**	**43.34**

[1] Duty factors based on 2004 RCWD Master Plan Update (draft).
[2] Peaking factors based on 2004 RCWD Master Plan Update draft (average x 2.2 = Max Day, Max Day x 1.5 = Peak Hour.
[3] Represents approximate difference between existing (2004) Pechanga demands and estimated ultimate Pechanga demands based on ultimate land use plan provided by Pechanga Development Corporation. Includes 1.1 MGD average irrigation demand estimate for proposed golf course.
[4] CCSA No. 4 to be annexed into RCWD service area, and included in 1485 Zone domestic water demand estimate.
[5] Based on May 4, 2004 letter from Western Municipal Water District outlined ultimate water supply needs: Annual Demand = 4,400 AFY, Flow Rate = 4,200 gpm.
[6] Based on area provided by RCWD April 7, 2005.

Rancho California Water District

Historic Water Production

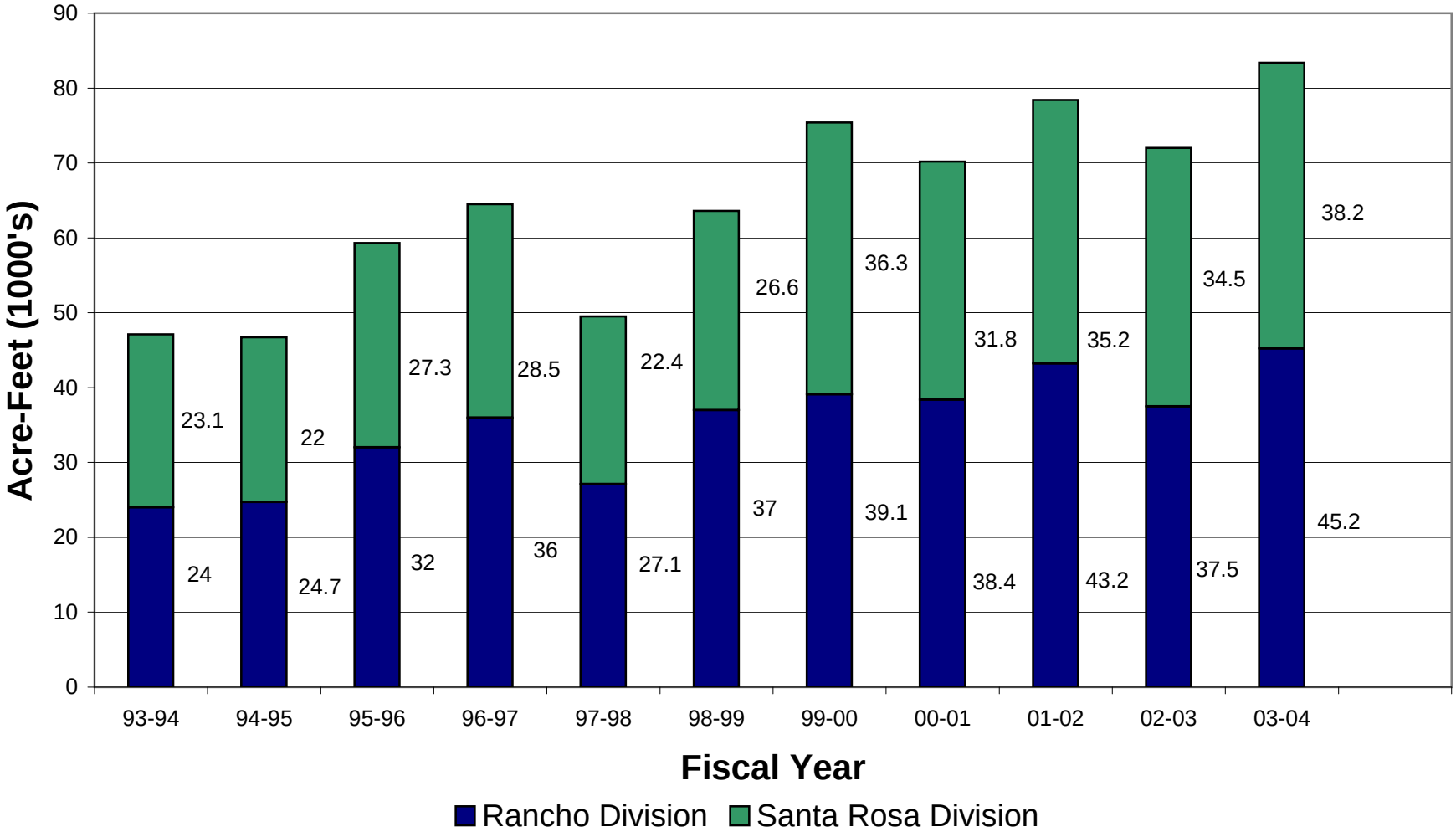


FIGURE 4-1

Rancho California Water District

2003 WATER USAGE BY SERVICE TYPE

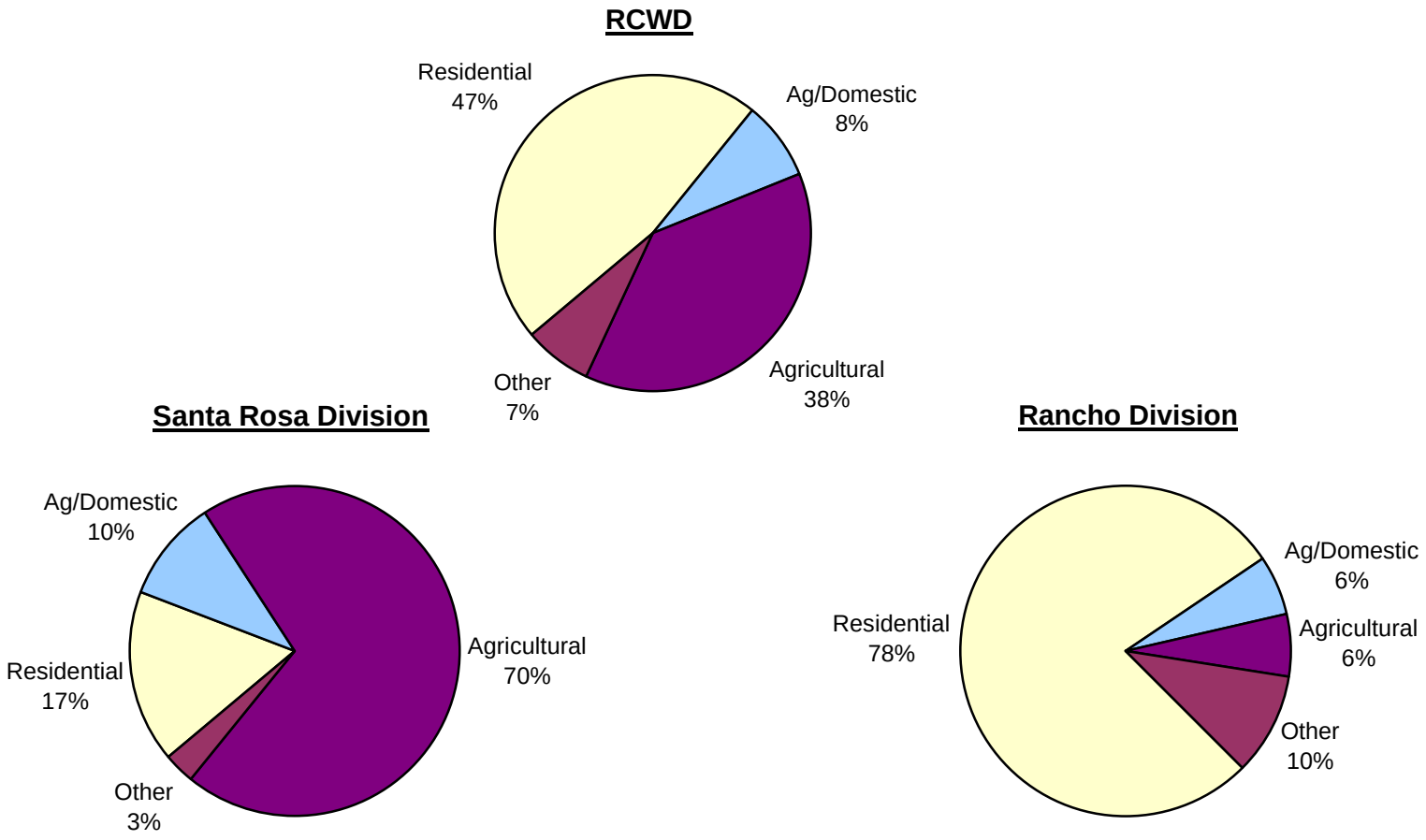


FIGURE 4-2

Rancho California Water District

Historic Water Production vs Rainfall

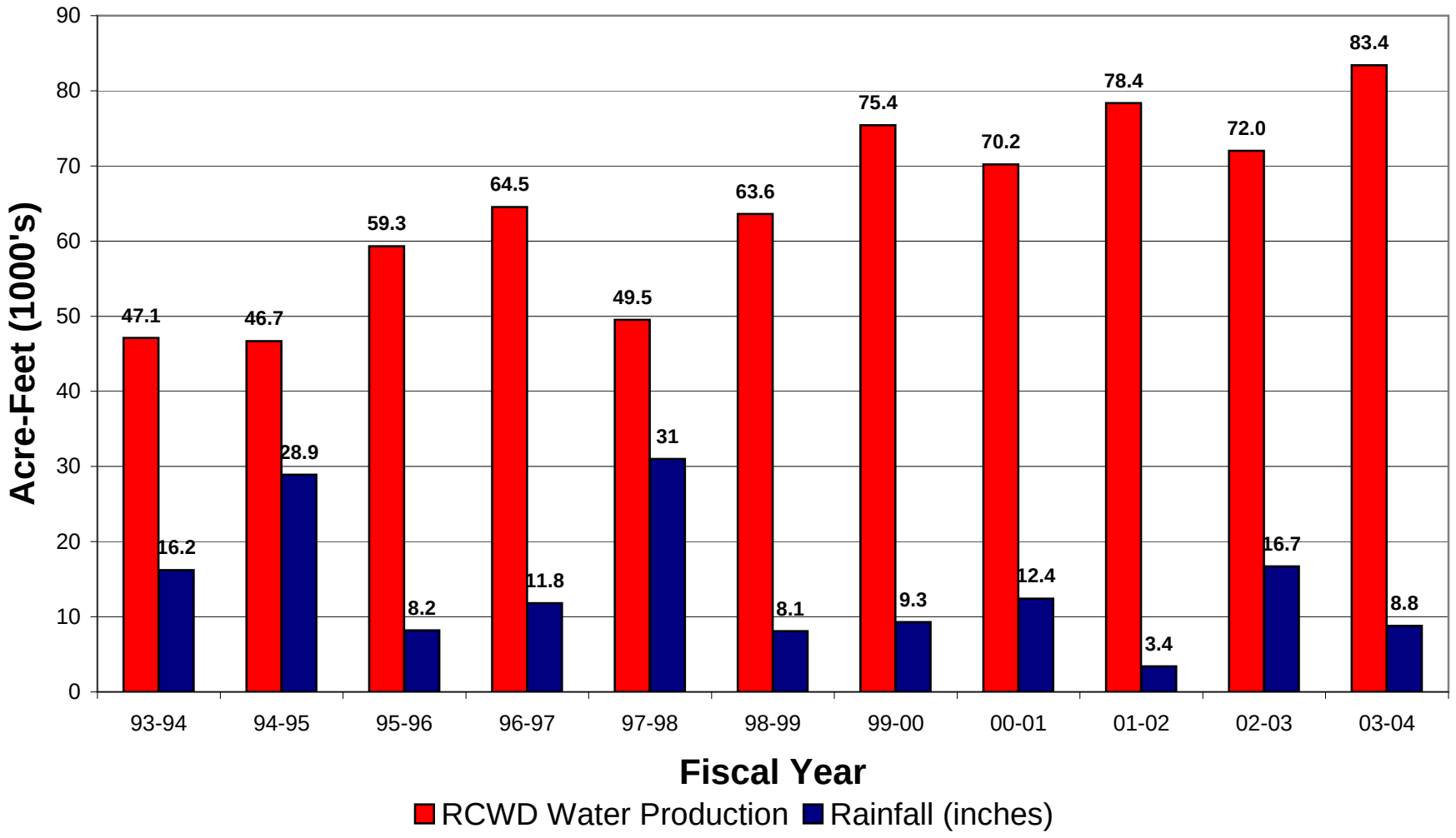
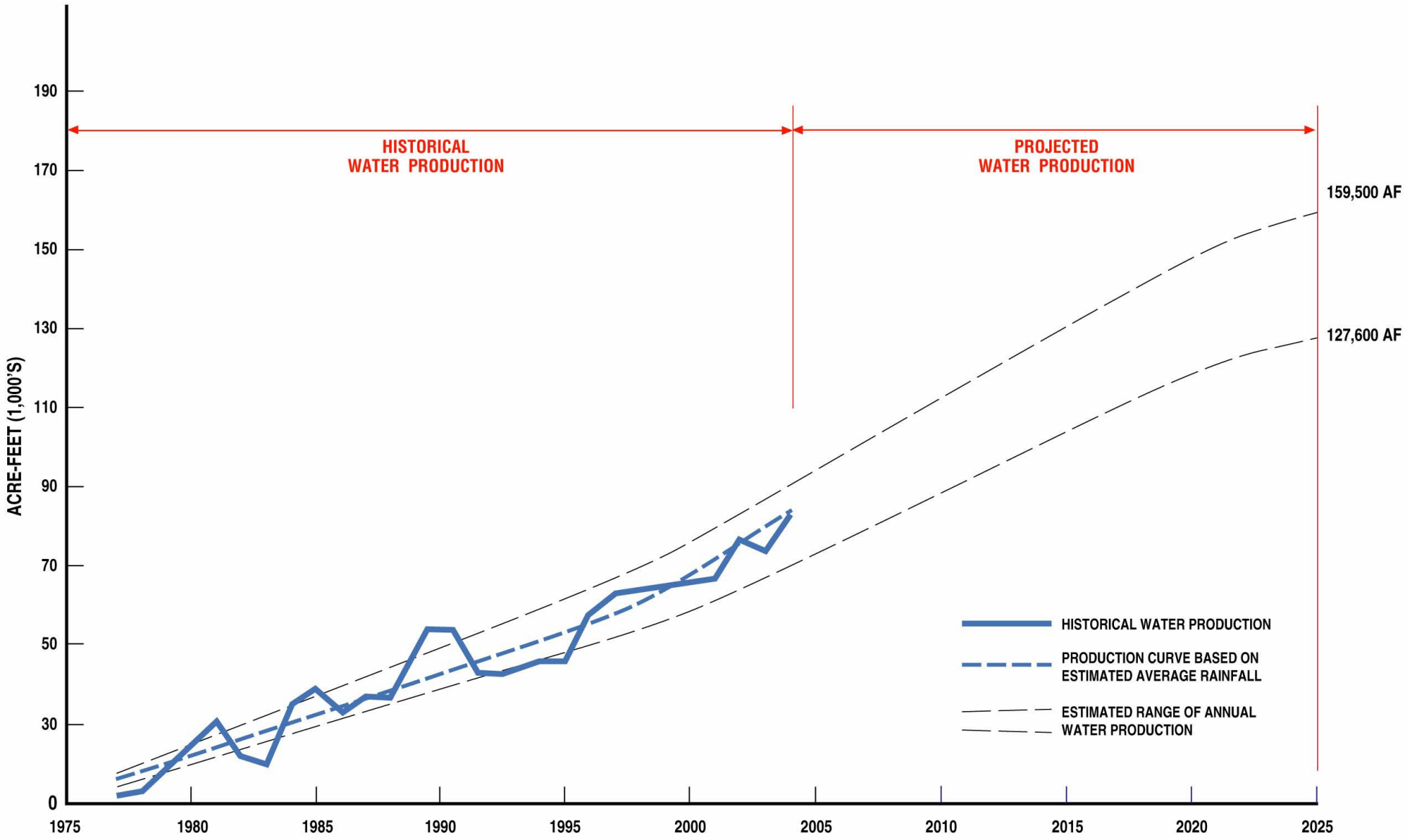


FIGURE 4-3



RANCHO CALIFORNIA WATER DISTRICT

2005 Master Plan Update
Projections Through Buildout

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WATER FACILITIES MASTER PLAN UPDATE

Figure 4-4

Pressure Zones

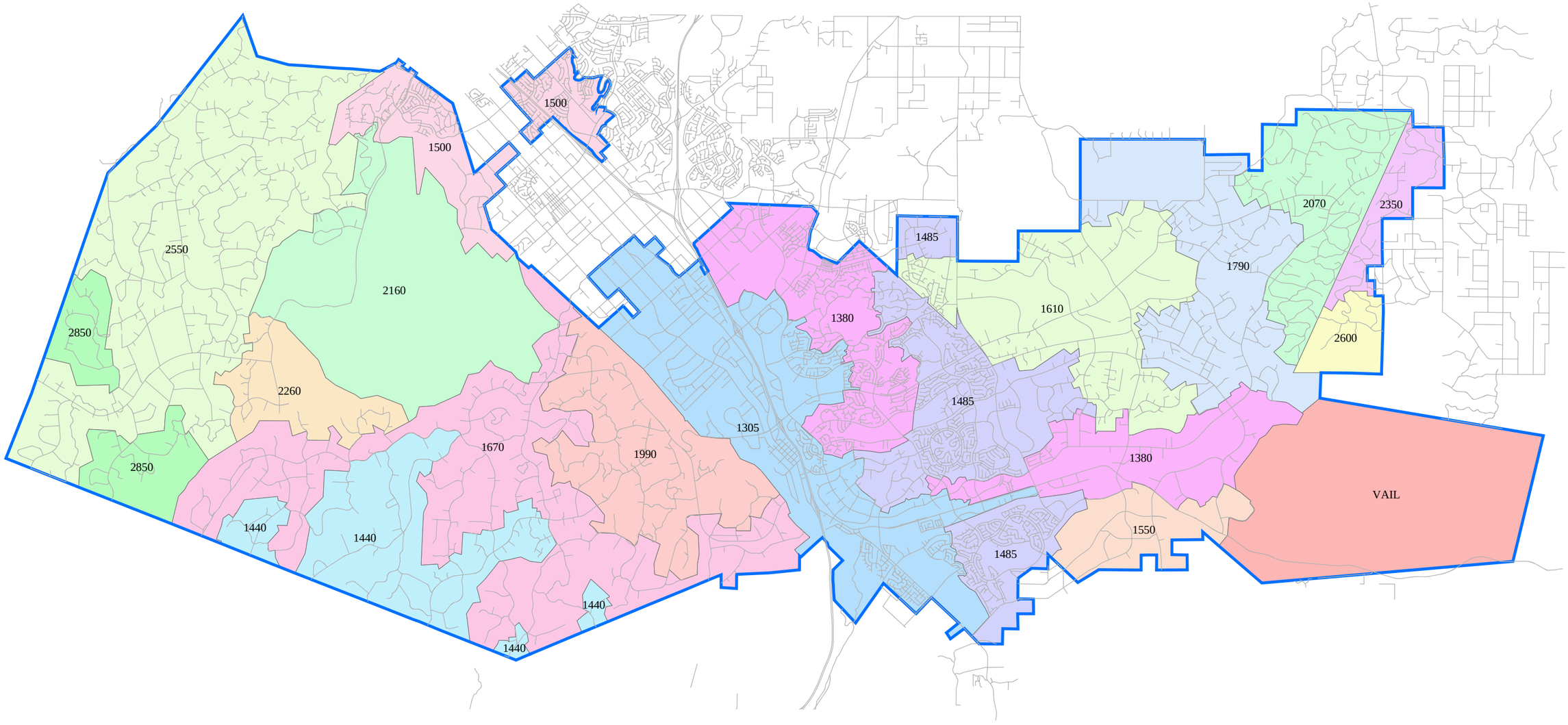

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Figure 4-5

Rancho California Water District

WATER FACILITIES MASTER PLAN

Potential Nondomestic Water Use Map

Class 1 Nondomestic Irrigation Area

Class 2 Nondomestic Irrigation Area

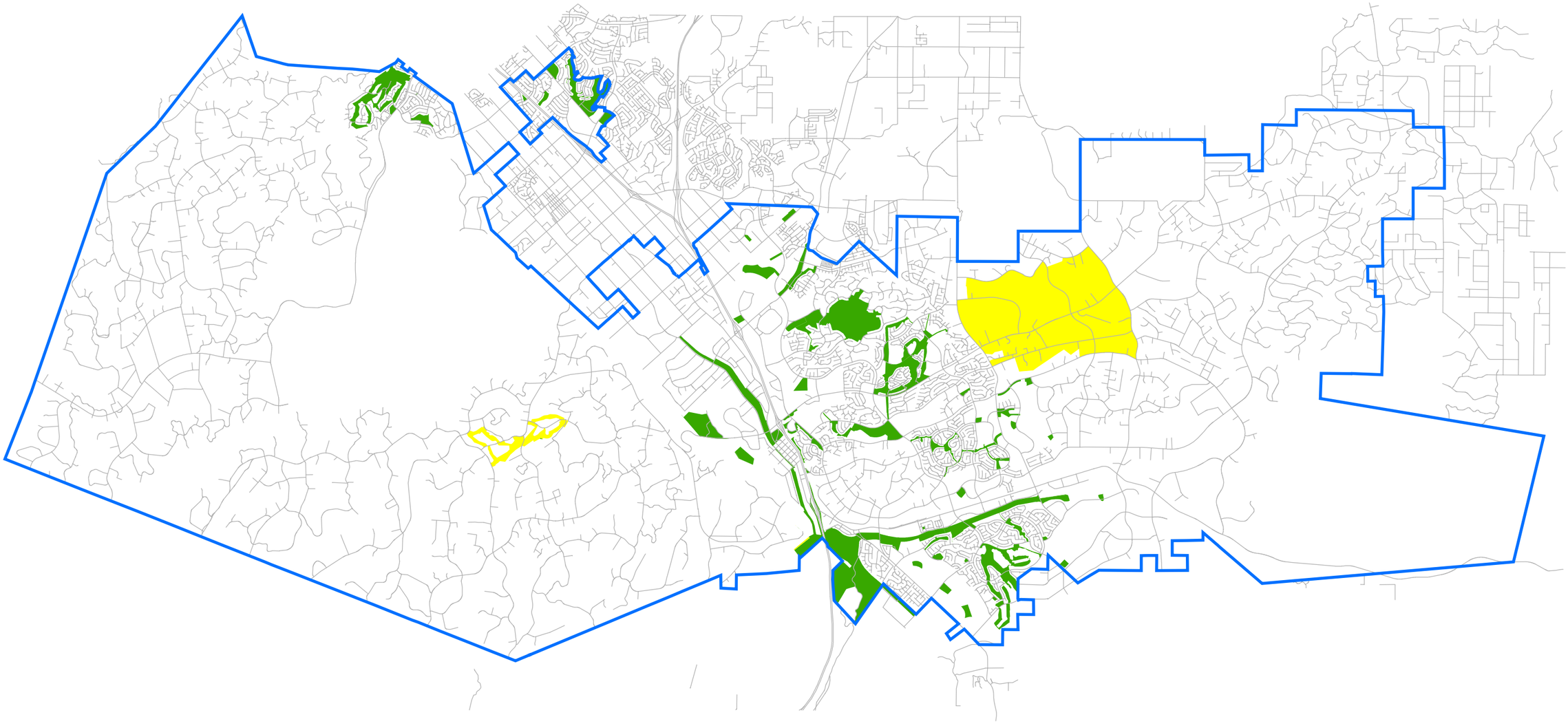

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Figure 4-6

Chapter 5

WATER SUPPLY

5.1 Existing Water Supply Sources

The District currently receives water from local groundwater sources and imported water from the Metropolitan Water District of Southern California (MWD). The previously constructed Pauba Valley Transmission Main in De Portola Road conveys imported MWD raw water to the Valle De Los Caballos (VDC) spreading basin for enhancing groundwater supplies within their conjunctive use program. Treated imported water from MWD has historically been used to supplement the local groundwater sources. In addition, RCWD has been serving major irrigation customers with recycled water. Table 5.1 summarizes the District's historic uses of groundwater, imported water and reclaimed water. Figure 5-1 shows a graphic representation of the historic water usage.

5.1.1 Existing Groundwater Sources

Since its inception, the District has sought to develop its groundwater supply sources to the greatest extent feasible. The District overlies two major aquifers, the Temecula and the Pauba. These aquifers have been the subject of a number of studies over the years. The District regularly updates their Water Facilities Master Plan Update, and is currently preparing a comprehensive integrated water resources plan. In addition, each year the District has prepared a Groundwater Audit and a Recommended Groundwater Production Report (RGPR). The amount of groundwater which can be produced varies due to such factors as rainfall, recharge area and amount and location of well pumping capacity.

The District's rights to use much of its groundwater and the water captured in Vail Lake are defined in a 1940 Stipulated Judgment in the case of Santa Margarita versus Vail and Appropriations Permit 7032 issued by the State Water Resources Control Board. The provisions of those documents have been the subject of dispute between the District and Camp Pendleton.

The District currently operates approximately 60 active groundwater production wells. The total sum design flow delivery from these wells is approximately 210 cfs – 170 cfs from wells producing native groundwater and 40 cfs from groundwater recharge and recovery wells. For master planning purposes, an allowance of 100 cfs capacity for native water is assumed.

5.1.2 Existing Metropolitan Treated Water Turnouts

The Metropolitan Water District of Southern California provides wholesale imported water to the majority of the urban coastal plain of Southern

California. Metropolitan member agencies such as the Eastern Municipal Water District (EMWD) and the Western Municipal Water District (WMWD) purchase water from Metropolitan on behalf of their member agencies. Metropolitan operates a storage and filtration facility at Lake Skinner, just north of RCWD. Three aqueducts, including one raw water (Pipeline No. 5) and two treated water (Nos. 3 and 4), emanate from the Skinner facilities and cross the District en route to San Diego County area users. These importation aqueducts are shown on Figure 5-2.

With the recent completion of the new EM-20 MWDSC Turnout by EMWD and the RCWD, the District currently has capacity for up to 200 cfs (peak flow) of treated water from Pipeline Nos. 3 and 4. WR-26 and WR-28 are each designed to deliver 40 cfs via WMWD, and EM-13 is designed to deliver another 40 cfs via EMWD. Assuming seasonal aqueduct peaking proportional to demand, this is equivalent to an average annual volume of 104,000 AF or 11,000 AF from each of WR-26, WR-28 and EM-13, and 71,000 AF from EM-20. Due to MWDSC System constraints, WR-26 and WR-28 have a reduced summer peak capacity of 65 cfs.

5.1.3 Recycled Water

The RCWD operates a non-domestic water system, which includes pipelines, pumping capacity, distribution storage and seasonal storage facilities. During fiscal 2003-04, the District recycled a total of approximately 4,200 AF for irrigation demands. The District delivers recycled water for irrigation through their recently completed water supply system and multi-zone transmission piping network. The recycled water supply is from tertiary facilities at the Santa Rosa Water Reclamation Facility and the seasonal storage ponds constructed adjacent to the reclamation plant. The recycled water system is discussed in more detail in Chapter 8.

5.2 Projected Ultimate Water Supply Requirements

The projected ultimate average annual potable water demand, as outlined in Chapter 4, is 129,500 acre-feet (179 cfs), and the ultimate average annual Class I non-potable water demand is 11,200 AF (15.5 cfs). The District's fiscal year 2003-04 total water demand was 83,400 AF (115 cfs), with a maximum-day demand estimated at 253 cfs.

Based on currently available groundwater and imported water facilities, the District has an average annual supply capability of 100,000 AF to 150,000 AF, depending on duty time for each of the MWDSC turnouts. In addition, the District can currently meet maximum day flows in excess of 355 cfs. Figures 5-3 and 5-4 illustrate the projected demand and the current supply for average annual and maximum day conditions, respectively. This is expected to be sufficient through the 20-year planning horizon of this Update based on the land use projections of the city and county general plans. However, opportunities exist for the District to develop more

economical water sources by expanding their conjunctive-use program and minimize imported water dependency. Augmenting the existing water supply sources are investigated as part of the WFMP Update and include Vail Lake integration facilities for seasonal storage benefit, expanded water conservation, and Class II irrigation water service in an expanded recycled water system operation.

5.3 Augmented Water Supply Sources

As the District has essentially completed construction of the final water supply source to meet ultimate projected demands, the focus should be on methods to enhance existing source reliability; to, maximize production of local water; and study treatment methods of lower cost untreated (raw) water. The 2005 WFMP Update includes evaluation of the District's conjunctive use program and techniques for expanding the program to include enhancements to the Valle de Los Caballos (VDC) spreading grounds, new treatment facilities, and Vail Lake.

5.3.1 Turnout EM-21

RCWD is currently overseeing the design and construction of a new turnout that will furnish raw water from the proposed MWD Pipeline No. 6. Pipeline No. 6 will be supplied from Lake Skinner that receives a blend of State Project Water and feed from the Colorado River. Turnout EM-21 is currently under design. Construction completion is anticipated in 2006. Pipeline No. 6 is also expected to be on line in 2006.

Turnout EM-21 is sized to accommodate flows from 8 to 80 cubic feet per second (cfs). Hydraulic gradeline at the turnout will range from 1483 feet to 1760 feet. Ground elevation at Turnout EM-21 is approximately 1170 feet, yielding pressures of 135 pounds per square inch (psi) to 255 psi.

5.3.2 Existing Raw Water Supply System

RCWD currently purchases raw water from MWD via Turnout EM-19. Raw water from EM-19 is piped east via De Portola Road to the RCWD Recharge and Recovery System. This system consists of 26 wells and the Upper VDC and Lower VDC Percolation Ponds. The Upper VDC Ponds have an effective recharge area of 113 acres and an estimated maximum recharge capacity of 37,000 acre-feet per year (af/yr). The Lower VDC Ponds have an effective recharge area of 18 acres and a recharge capacity of approximately 6,000 af/yr. Recharge capacities are assumed over an eight-month period to allow four months for basin cleaning and maintenance. RCWD currently takes one pond out of service every three months to disc and scarify (an operation which has a duration of approximately two days).

RCWD designed the system to provide up to 30,000 af/yr of artificial recharge and is currently recharging and recovering raw water at a rate of approximately 17,000 af/yr, or 23.5 cfs. Extracted water is supplied to the

RCWD 1305 Zone. The Upper VDC recovery wells (RCWD Well Nos. 152, 153, 157 and 158) are located in the berms adjacent to the percolation ponds. Figure 5-7 is a schematic diagram showing the Upper Ponds and wells in an expanded recharge and recovery concept.

The DOHS has given RCWD credit for a 2.5 log removal for Giardia and a 2.0 log removal for virus based upon the natural filtration capacity of the surrounding aquifer. The remaining required 2.0 log reduction of virus and 0.5 log reduction of Giardia is achieved by RCWD through chlorine disinfection. The DOHS also requires that a minimum 40 feet depth-to-groundwater be maintained at all times.

RCWD completed a Monitoring Program for the Upper Ponds in 1996 to demonstrate compliance with the 40 feet DOHS rule. In 1999, the RCWD issued its Disinfection Operations Plan for the Upper Ponds. This plan describes the staffing, facilities operating procedures, performance monitoring, reporting procedures and reliability features required for the chlorine disinfection systems utilized at each extraction well.

In 2001, the Initial 12 Months Performance Report was submitted to the DOHS for Wells 153, 157 and 158. It was determined that turbidity and bacteriological raw water requirements were continuously met. The RCWD added Well No. 152 to increase overall extraction capacity and provide additional flexibility to meet the depth to groundwater requirement.

5.3.3 Raw Water Options

Several options were evaluated for accommodating raw water from EM-21. These options are summarized in Figure 5-8 and include:

- Utilize the existing treatment/storage process of percolation followed by extraction and chlorination.
- Route raw water to and from Vail Lake.
- Construct a raw water treatment system to accommodate raw water directly and deliver treated water to the 1305 Zone.
- Make provisions for treatment of well water and Vail Lake discharge at the new treatment facility.

Any option would change the capacity of the existing VDC Recovery Well Project.

5.3.4 Existing Storage and Treatment Systems

The existing percolation, extraction and treatment systems are operating under a plan approved by the DOHS. The approved system requires that well

capacity be sufficient to maintain groundwater level at no less than 40 feet below ground surface and disinfection levels be maintained. Additional raw water discharge to the percolation ponds would necessitate construction of equipment that maintains compliance with the RCWD Operating Plan. The percolation capacity of the existing ponds must not be exceeded.

In 1993, RCWD's hydrogeologist estimated that the Upper Ponds are capable of recharging at a maximum rate of 37,000 af/yr, or 51.1 cfs. The proposed turnout is designed to supply up to 80 cfs. One of the existing ponds (U6) is currently leased to a private company and is not utilized for percolation. This pond is approximately 7 acres with a commensurate spreading capacity of approximately 2,300 af/yr or 3.2 cfs. The lower ponds can accommodate 6,000 af/yr; yielding a net raw water capacity of approximately 62 cfs. The additional 18 cfs would require approximately eight additional acres of percolation ponds to satisfy the maximum application rate established in 1993. Experience since that date has indicated that a higher percolation rate can be achieved in the Upper Ponds. A rate of 2 feet per day (common for soils similar to those of the Upper Ponds) would yield a maximum instantaneous application rate of 114 cfs, well above the EM-21 maximum capacity.

Six to ten additional wells will be necessary to accommodate the additional raw water flow in order to satisfy the 40 feet rule from DOHS. A hydrogeologic model should be performed to more accurately define this number. In addition, each well must be equipped with chloramination facilities to match the existing wells.

5.3.5 Route Flow to Vail Lake

Two options were evaluated for routing flow to Vail Lake – 1) up the existing drainage creek to the lake (northerly route), and 2) within existing public rights-of-way to the lake (southerly route). The existing drainage creek option has the advantage of the shortest length, an estimated 18,750 lineal feet. The option could suffer from environmental restrictions. Erosion potential will necessitate encasement in concrete. The public right-of-way option is over twice as long, at approximately 38,600 lineal feet. Traffic control issues must be resolved, and the end of the route at Vail Lake would require easement acquisition. A 36 inch-diameter pipe is required for the 80 cfs. Figure 5-9 shows the two alternatives.

The minimum design hydraulic gradient at Turnout EM-21 is 1483 feet. Vail Lake has a high water level of 1470 feet. Therefore, a water booster station would be required to lift raw water to Vail Lake when the hydraulic gradient at EM-21 falls below the level required to deliver water by gravity to the lake

Raw water stored in Vail Lake would drain in the creek to the Upper Ponds.

This system would have the added advantage of recharging the groundwater basin between Vail Lake and the Upper Ponds. Several piping options are available at the existing lake discharge system to convey water to and from the lake.

5.3.6 Treatment System

Raw water could be treated to potable water standards and discharged directly to the 1305 Zone. A treatment facility suitable for MWD Water would be required. Two basic options are available for treatment:

- Conventional treatment utilizing flash mix followed by flocculation, sedimentation, filtration and chlorination
- Flash mixing followed by a membrane treatment process, such as the Zenon Z500 heavy duty membrane.

Both processes could be accommodated on RCWD property. Approximately one acre would be required for the new plant. Provisions must be made to raise treatment facilities above the 100-year flood plain.

5.3.7 Future Potable Water Regulations

Future potable water regulations may require additional treatment to meet more rigorous standards. It may be advantageous to make provisions for treating well and Vail Lake discharge water at the proposed raw water treatment facility. This could be fairly easily achieved through valving and pipe extensions to the site for the proposed treatment plant. It may be possible to generate electricity by installing a turbine in the pipeline that flows from Vail Lake to the new treatment facility.

5.3.8 Recommendations

The following is recommended to accommodate raw water from EM-21 and integrate Vail Lake into the supply system:

- Construct a new 36-inch pipeline from the termination of the existing pipeline to Vail Lake via the existing drainage channel. Encase the pipe in concrete. Connect to the existing lake discharge system and directly to the lake. Install valves to permit flow in either direction.
- Reevaluate the percolation ponds to confirm that they can accommodate the increased raw water flow.
- Update the hydrogeologic model for the increased flow to determine the required additional well capacity. Construct new wells. Equip the existing well that is drilled.
- Construct a new membrane treatment facility capable of accommodating MWD Project Water. Size the new facility at 14 cfs (Master Plan capacity goal of 40 cfs minus existing well capacity, including well that is drilled but not yet equipped.

TABLE 5.1
RANCHO CALIFORNIA WATER DISTRICT
WATER FACILITIES MASTER PLAN UPDATE

Historic Water Production by Type

Fiscal Year	Total Production (AF)	Groundwater*		Imported Water		Recycled Water	
		(AF)	(%)	(AF)	(%)	(AF)	(%)
95-96	59,330	34,918	58.85%	22,358	37.68%	2,054	3.46%
96-97	64,524	38,267	59.31%	23,690	36.72%	2,567	3.98%
97-98	49,515	28,167	56.89%	19,206	38.79%	2,142	4.33%
98-99	63,606	38,027	59.79%	22,843	35.91%	2,736	4.30%
99-00	75,436	39,096	51.83%	33,621	44.57%	2,719	3.60%
00-01	70,222	41,706	59.39%	26,070	37.13%	2,446	3.48%
01-02	78,368	41,348	52.76%	33,765	43.09%	3,255	4.15%
02-03	71,988	37,188	51.66%	32,190	44.72%	2,610	3.63%
03-04	83,413	37,832	45.36%	41,312	49.53%	4,269	5.12%

*Groundwater is defined as the total Native Groundwater plus the Groundwater Recharge

Rancho California Water District

Historic Water Production by Type

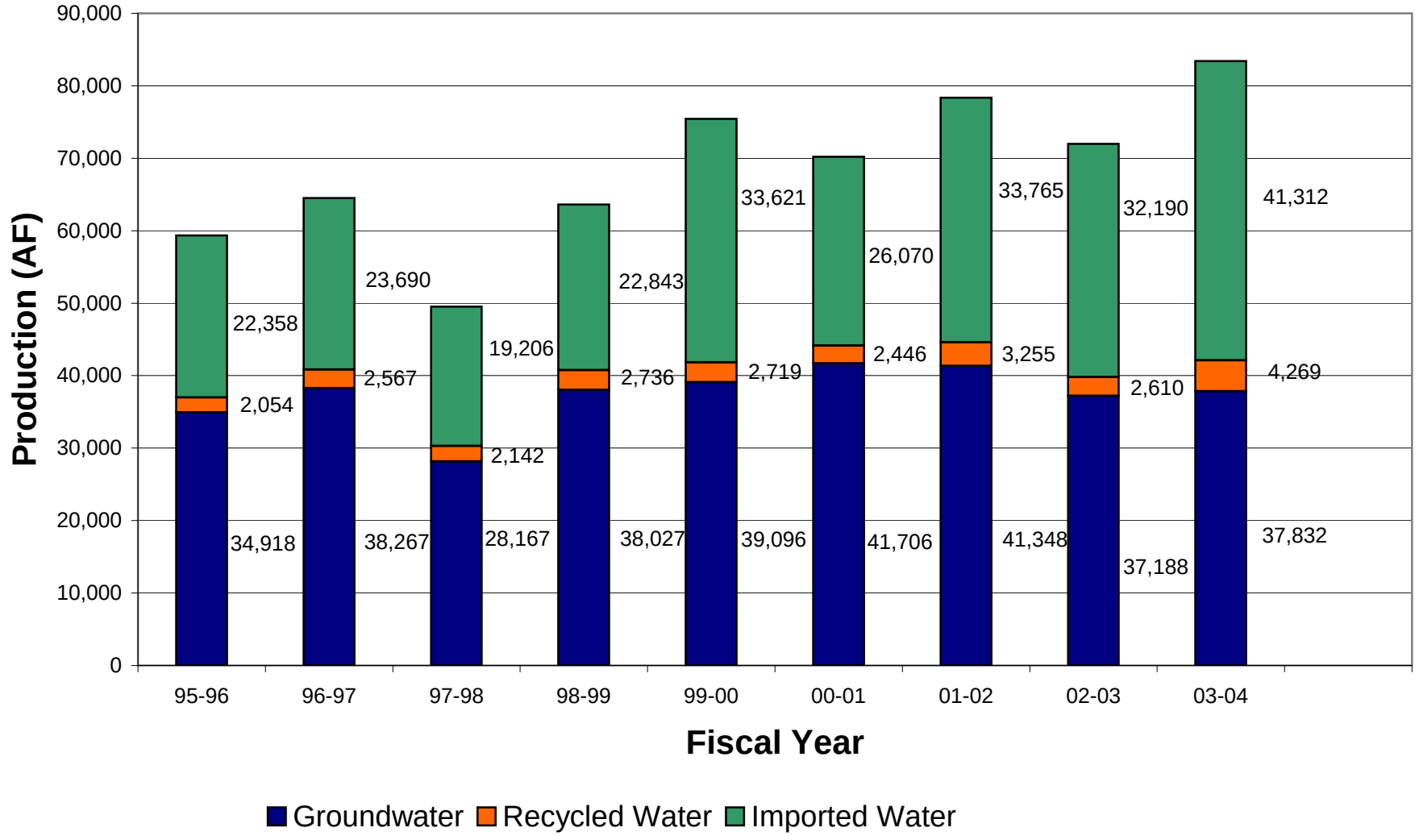

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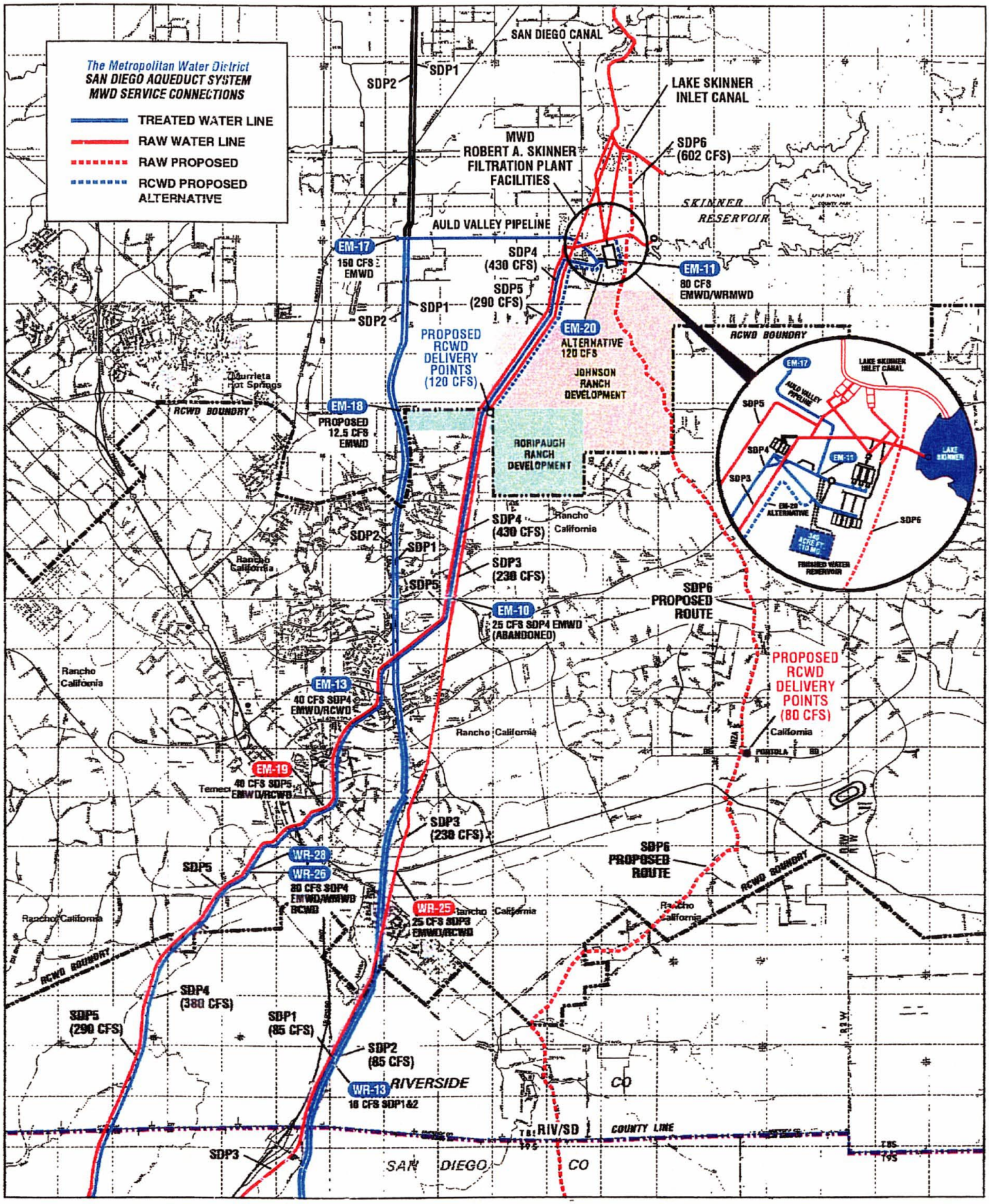
FIGURE 5-1



RANCHO CALIFORNIA WATER DISTRICT

Metropolitan Water District Service Connections

WATER FACILITIES MASTER PLAN UPDATE

Figure 5-2

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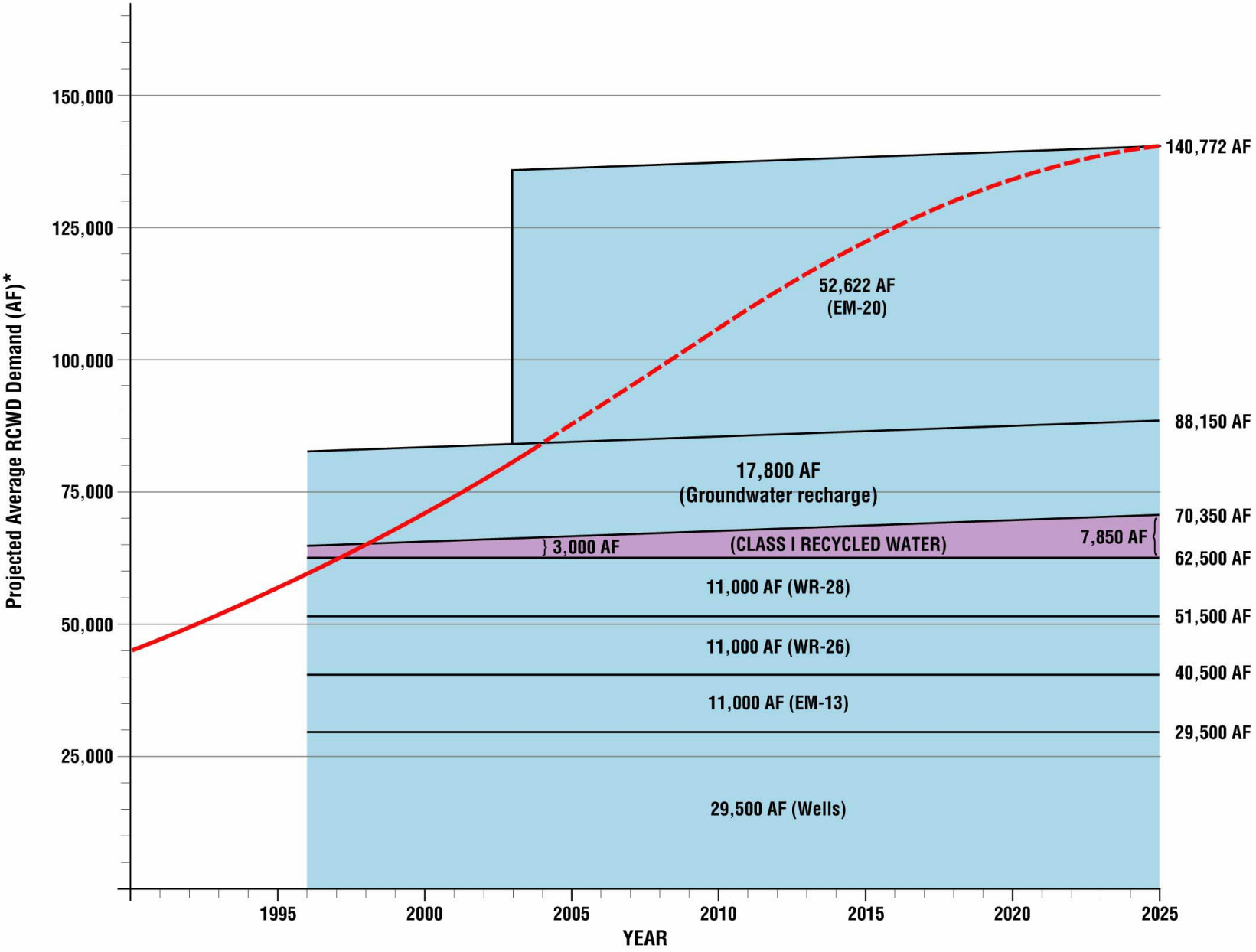

* Excludes Demands for Contemplated Contract Service Areas.

Recycled Water Source
Domestic Water Source
Historical Water Production
Projected Water Production

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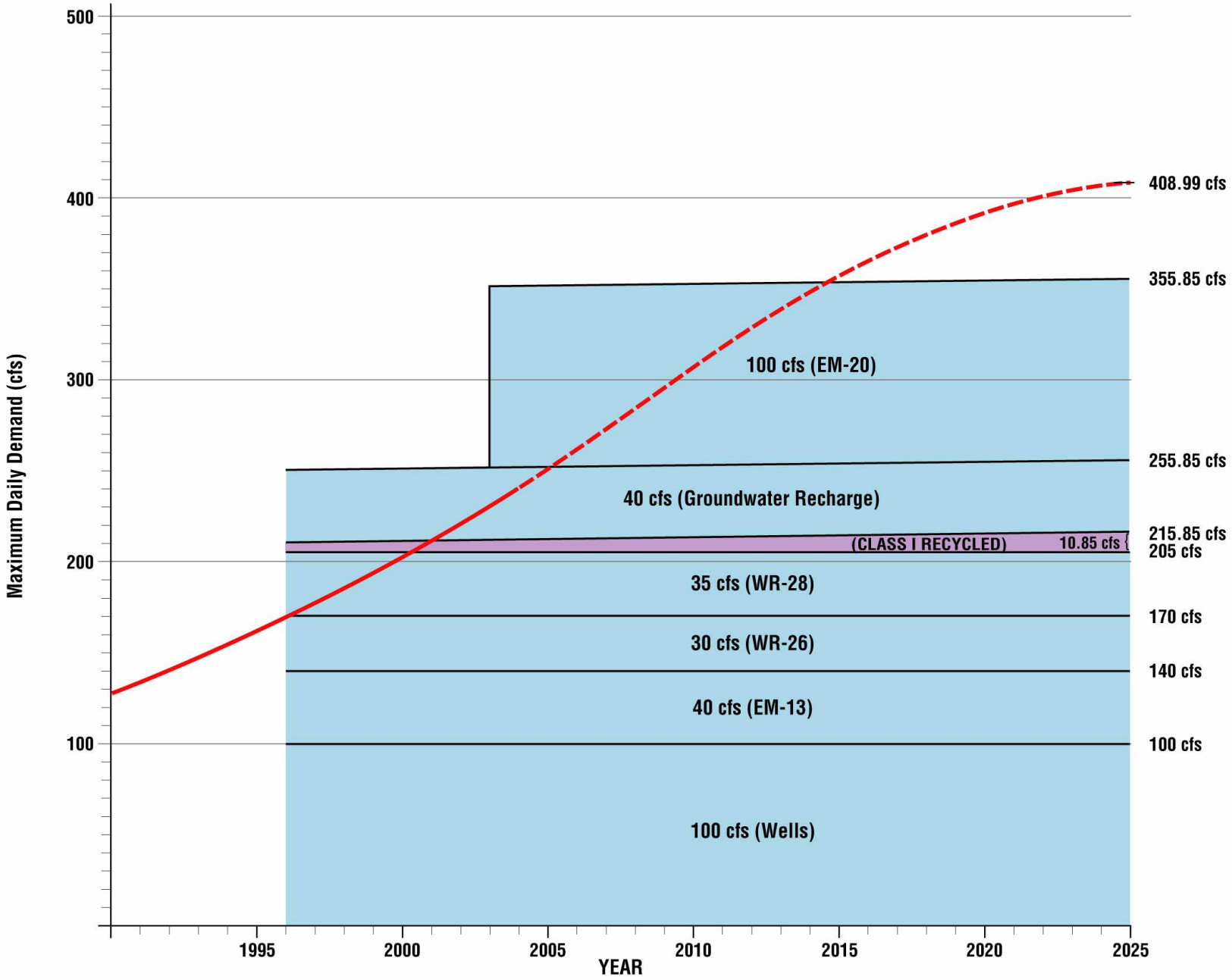
RANCHO CALIFORNIA WATER DISTRICT

Ultimate Water Sources

WATER FACILITIES MASTER PLAN UPDATE

Figure 5-3



* Excludes Demands for Contemplated Contract Service Areas.

Recycled Water Source

Domestic Water Source

Historical Water Production

Projected Water Production

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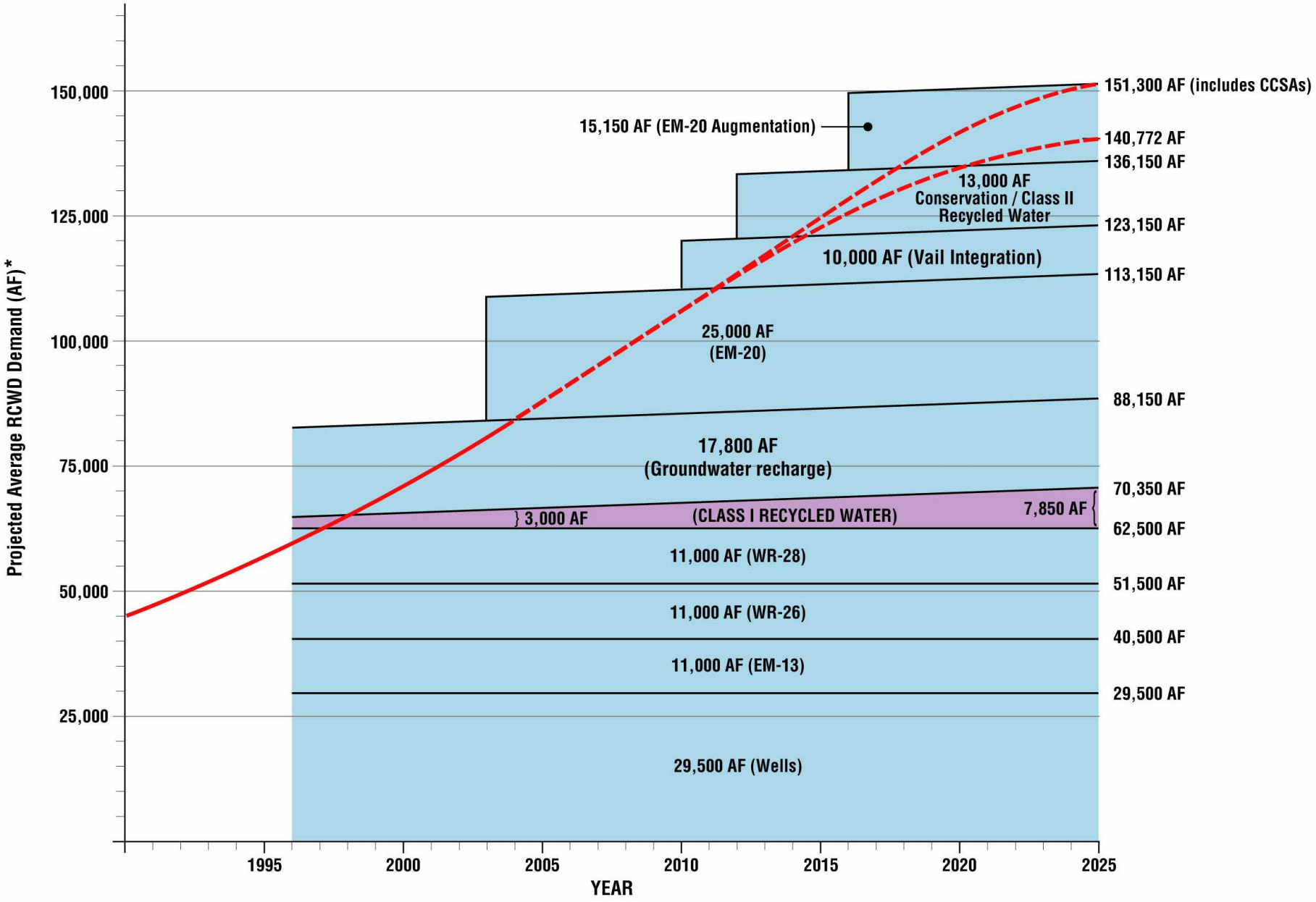
RANCHO CALIFORNIA WATER DISTRICT

Existing Water Sources - Max Day

WATER FACILITIES MASTER PLAN UPDATE

Figure 5-4



Recycled Water Source
Domestic Water Source
Historical Water Production
Projected Water Production

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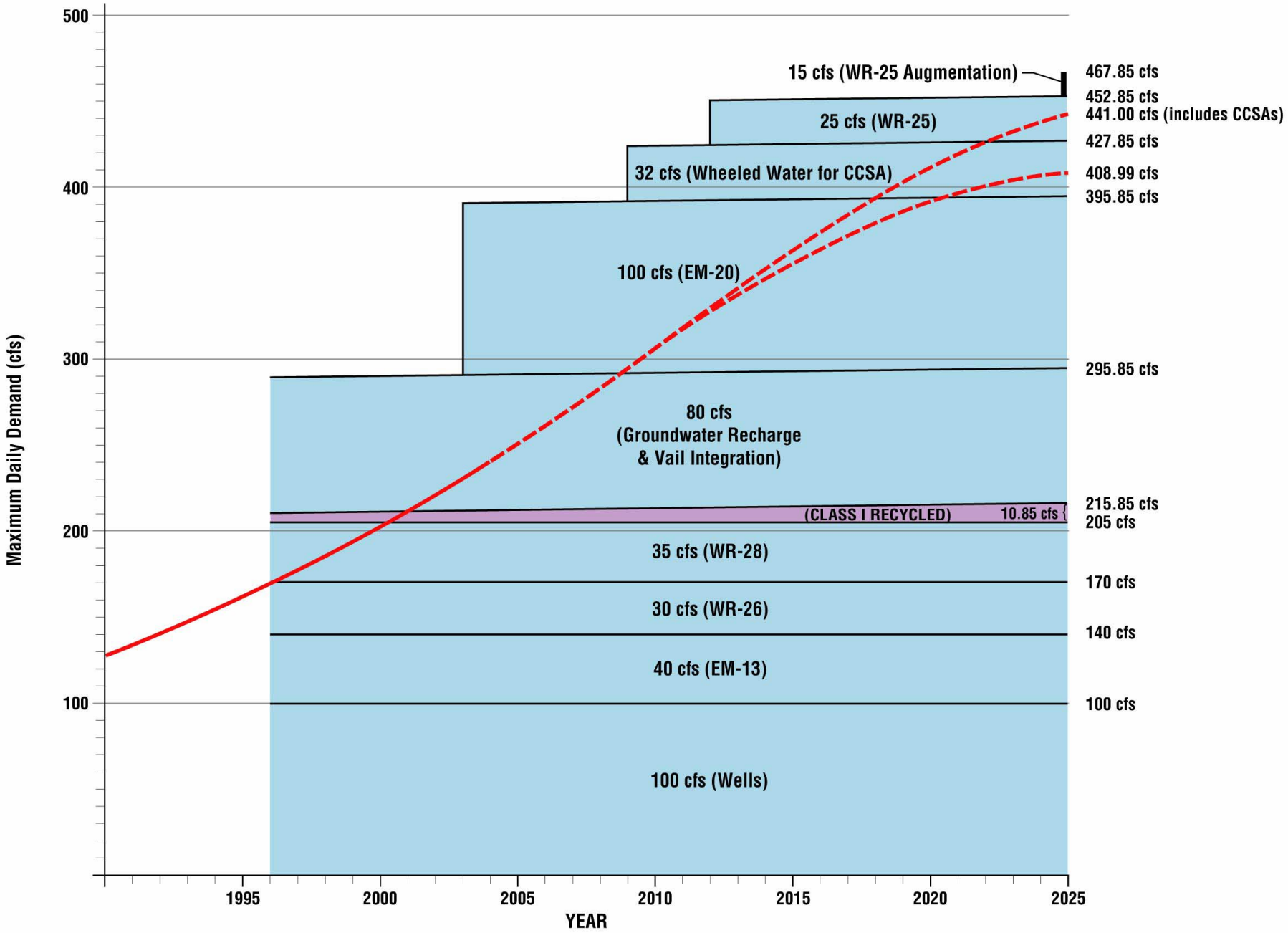
RANCHO CALIFORNIA WATER DISTRICT

Augmented Ultimate Water Sources

WATER FACILITIES MASTER PLAN UPDATE

Figure 5-5



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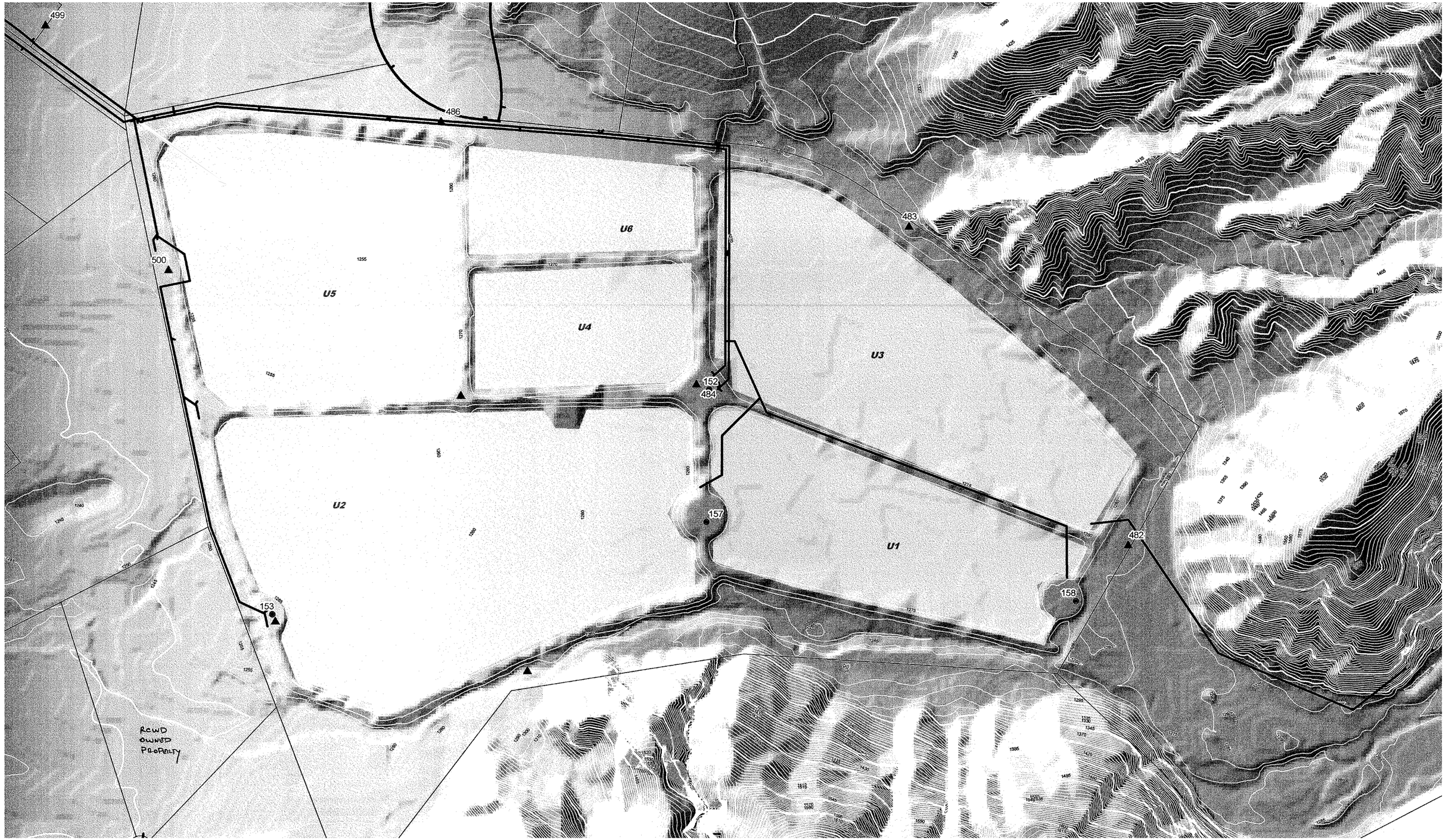
RANCHO CALIFORNIA WATER DISTRICT

Augmented Ultimate Water Sources - Max Day

WATER FACILITIES MASTER PLAN UPDATE

Figure 5-6



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RANCHO CALIFORNIA WATER DISTRICT

RCWD RECHARGE
AND RECOVERY SYSTEM

FIGURE
5-7

H:\PDATA\65100064\CADD\WATER\EXHIBITS\FIG5-7.DWG CHESS 6/17/05 9:13 am

LAKE SKINNER
(MWD)

EM21

PARALLEL PW PIPELINE (WRMP-13 CONNECTING PIPELINE)

POTABLE WATER SYSTEM

TREAT
SYSTEM

TEMPORARY
PUMP STATION

VAIL LAKE

ADDITIONAL
PUMPS

VFD

WELL PUMPS

PERCOLATION PONDS

ADDITIONAL
PERCOLATION
PONDS

LEGEND

- EM21 TO PERCOLATION PONDS TO PW SYSTEM
- EM21 TO VAIL LAKE (OPTIONAL)
- EM21 TO PERCOLATION PONDS TO TREAT SYSTEM (OPTIONAL)
- EM21 TO TREAT SYSTEM (OPTIONAL)
- VAIL LAKE TO PERCOLATION PONDS
- VAIL LAKE TO TREAT SYSTEM (OPTIONAL)

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RANCHO CALIFORNIA WATER DISTRICT

RAW WATER OPTIONS

FIGURE
5-8

H:\PDATA\65100064\CADD\WATER\EXHIBITS\FIG5-8.DWG BYOUNG 7/1/05 12:01 pm

LAKE SKINNER
(MWD)

EM21

PARALLEL PW PIPELINE (WRMP-13 CONNECTING PIPELINE)

POTABLE WATER SYSTEM

TREAT
SYSTEM

TEMPORARY
PUMP STATION

VAIL LAKE

ADDITIONAL
PUMPS

VFD

WELL PUMPS

PERCOLATION PONDS

ADDITIONAL
PERCOLATION
PONDS

LEGEND

- EM21 TO PERCOLATION PONDS TO PW SYSTEM
- EM21 TO VAIL LAKE (OPTIONAL)
- EM21 TO PERCOLATION PONDS TO TREAT SYSTEM (OPTIONAL)
- EM21 TO TREAT SYSTEM (OPTIONAL)
- VAIL LAKE TO PERCOLATION PONDS
- VAIL LAKE TO TREAT SYSTEM (OPTIONAL)

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RANCHO CALIFORNIA WATER DISTRICT

RAW WATER OPTIONS

FIGURE
5-8

H:\PDATA\65100064\CADD\WATER\EXHIBITS\FIG5-8.DWG BYOUNG 7/1/05 12:01 pm

Chapter 6

DOMESTIC WATER DISTRIBUTION SYSTEM

6.1 System Overview

The RCWD domestic water distribution system distinctly operates within the two divisions, the Santa Rosa Division in the westerly half, and the Rancho Division in the easterly half. Each division provides water through a number of pressure zones ranging from 1305 to 2850 feet in the Santa Rosa Division, and 1305 to 2600 feet in the Rancho Division. The 1305 Zone provides service to the I-15 corridor area and serves as the forebay zone for several pump stations, which deliver water to higher zones within both Divisions. Treated water from Metropolitan turnouts and the majority of groundwater production enters the RCWD system in this zone. Some additional groundwater enters the system in the 1380, 1610, and 1790 Zones of the Rancho Division, in the 1500 Zone of the Santa Rosa Division.

The Santa Rosa Division is generally divided into three areas: the Upper Santa Rosa, Lower Santa Rosa, and Murrieta Valley. The Lower Santa Rosa area includes the 1440 (1160, 1060), 1670, and 1990 Zones. With the exception of the new Cross Creek Golf Course (formerly the Walker Basin Specific Plan), this area is mostly agricultural with some rural and estate type residential land use. Water is delivered from the 1305 Zone to this area via the Ace Bowen Nos. 1 and 2 (1670) and Ace Bowen Nos. 3 and 4 (1440) Pump Stations, the East Bluff (1670) Pump Station, and the recently completed Senga Doherty (1670) Pump Station.

The Upper Santa Rosa area includes the 2160, 2260, 2550 and 2850 pressure zones. The majority of the 2160 Zone has recently been dedicated as nature-conservancy property. The 2260, 2550 and 2850 Zones include rural residential and agricultural uses. Water is delivered to this area through the Carancho Pump Station (1670 to 2260), De Luz Pump Station (1670 to 2160), Bear Creek Pump Station (1500 to 2160), Baldaray Pump Station (2160 to 2550), and the 2850 Zone Redondo Mesa and Avenida Escala Pump Stations.

The Murrieta Valley area comprises the northerly 1305 Zone and the 1500 Zone. The 1500 Zone includes the Bear Creek, Joaquin Ranch, and the Cal Oaks development regions. The northerly 1305 Zone includes a large business park development. Joaquin Ranch No. 1 Pump Station supplies the westerly portion of the 1500 Zone, and the Cal Oaks Pump Station supplies the easterly portion of the 1500 Zone.

The Rancho Division can also be categorized into three areas - the Core Area, comprised of the more urban and suburban 1305, 1380 and 1485 Zones; the Mesa Grande region consisting of the rural residential and vineyard/citrus agricultural lands of the 1610, 1790, 2070 (1880), 2350, and 2600 Zones; and the remaining area south and east of Highway 79 in the Pauba Valley includes the portions of the 1380 Zone, the 1550 Zone, and the future Vail Lake Specific Plan service area.

Water is delivered to the Rancho Division in a stair-step manner with the Meadowview and Norma Marshall Pump Stations feeding the 1380 Zone, which in turn supplies the Rancho California No. 1 (1380 to 1610) and Rancho California No. 2 (1380 to 1485) Pump Stations and the Anza Pump Station (1380 to 1610). Buck Mesa Pump Station (1610 to 1790) and Los Caballos Pump Station (1305 to 1790) provide flows to the 1790 Zone, which in turn supplies the 2070 Zone via De Portola Pump Station. The 1550 Zone is supplied from the Alvarez Pump Station out of the 1380 Zone. Vail Lake development may require service within two separate pressure zones, either from the 1305 or 1550 Zones. This stair-step manner of domestic water distribution is illustrated in Figures 6-1 and 6-2, for the existing and ultimate domestic water transmission, respectively.

6.2 Reservoir Storage

The criterion of 16 hours of maximum-day demand was determined to be an adequate volume of storage in each pressure zone. Table 6.1 is a summary of an analysis of the existing and proposed reservoir storage volume.

It should be noted that the 1485 Zone System Storage combination results in a volume equal to 12.2 hours. Although this is slightly below the 16 hour criteria, it is considered adequate due to the nature of max day demands being primarily residential (as opposed to the large peaks of agriculture).

Should the nature of demands evolve to higher peaking characteristics, the District can consider expanded pressure reduction capability from the 1550 or 1610 Zone Systems to provide additional redundancy. Reservoir site availability for the 1485 Zone is considered extremely limited.

Within each pressure zone a number of potential tank sites were identified based on topographic elevation and their proximity to the pressure zone service area. Of these sites, those with the best access and location relative to other existing or planned facilities within the zone were selected. The sizes of individual tanks were managed to provide the best balance of storage volume within the zone. The location and name of each proposed reservoir are shown in the Proposed Facility Map (see pocket).

6.3 Pump Station

Table 6.2 summarizes the existing and proposed pump station capacity within the Santa Rosa and Rancho Divisions. The pumping requirements for each pressure zone were evaluated based on the combined maximum day demand within a specific zone plus flow-through demand required to supply higher zones. The proposed pumping facilities are shown in the Proposed Facility Map (see pocket).

6.4 Transmission Facilities

Proposed transmission mains were identified with the help of computer modeling. Backbone mains were located within known future development areas to provide adequate water distributions. In some instances, parallels of existing mains were required to meet transmission capacities under ultimate conditions, or to rectify current system deficiencies. Sizing of proposed piping was based on the optimal combination of maximizing system efficiency, and minimizing capital cost. The proposed transmission pipelines are shown on the Proposed Facility Map (see pocket), and are summarized within the cost estimates in Chapter 9.

6.5 Common Facilities

A number of major transmission lines were identified which will convey increasing amounts of source water from wells and turnouts to the various pump stations in each Division. Since these pipelines are closely linked to water supply, which directly benefit all service areas within the RCWD, they have been identified as common facilities.

Table 6.1 (cont.)
Rancho California Water District
Water Facilities Master Plan Update

Summary of Existing & Proposed Domestic Reservoir Storage

RCWD Division	Pressure Zone	Ultimate Demands Max Day (cfs)	Ultimate Demands 16 Hrs of Max Day (MG)	Existing or Under Construction Reservoirs	Capacity (MG)	Hours of Max Day Flow	Proposed Reservoirs	Ultimate Capacity (MG)	Hours of Max Day Flow
RANCHO	1305	61.84	26.65	Ace Bowen No. 1 Ace Bowen No. 2 Norma Marshall Senga Doherty	3.0 5.0 5.0 10.0		Murrieta Rainbow No. 1 Rainbow No. 2	5.0 3.0 3.0	
	Subtotal for Zone 1305				23.0	13.8 hrs		34.0	20.4 hrs
	1380	63.31	27.28	Anza General Kearny Winchester No. 1	2.2 7.7 4.6		Winchester No. 2 Anza No. 2	5.0 7.0	
	Subtotal for Zone 1380				14.5	8.5 hrs		26.5	15.5 hrs
	1485	65.54	28.24	Calle Contento No. 1 Calle Contento No. 2 El Chimisal No. 1 Stan Kemp El Chimisal No. 2	2.2 3.5 6.2 3.5 6.2				
	Subtotal for Zone 1485				21.6	12.2 hrs		21.6	12.2 hrs
	1550	9.60	4.14	Alvarez No. 1 El Chimisal No. 3	1.5 2.2		El Chimisal No. 4	1.0	
	Subtotal for Zone 1550				3.7	14.3 hrs		4.7	18.2 hrs
	1610	26.86	11.57	Buck Mesa No. 1 Buck Mesa No. 2	1.5 5.0		Buck Mesa No. 3	6.0	
	Subtotal for Zone 1610				6.5	9.0 hrs		12.5	17.3 hrs
	1790	19.33	8.33	De Portola No. 1 De Portola No. 2 Tucalota	2.2 3.5 3.5				
	Subtotal for Zone 1790				9.2	17.7 hrs		9.2	17.7 hrs
	2070	5.33	2.30	Glen Oaks No. 1 Glen Oaks No. 2	2.2 2.2				
	Subtotal for Zone 2070				4.4	30.7 hrs		4.4	30.7 hrs
	2350	1.35	0.58	Calaveras No. 1	0.5		Calaveras No. 2	0.5	
	Subtotal for Zone 2350				0.5	13.8 hrs		1.0	27.5 hrs
	2600 [1]	1.31	0.56				Zone 2600	1.0	
	Subtotal for Zone 2600					--		1.0	28.3 hrs
	Vail [1]	10.78	4.64				Vail No. 1 (1675) Vail No. 2 (1850	1.0 4.3	
	Subtotal for Vail					--		5.3	18.3 hrs

[1] Future zone.

Table 6.1
Rancho California Water District
Water Facilities Master Plan Update

Summary of Existing & Proposed Domestic Reservoir Storage

RCWD Division	Pressure Zone	Ultimate Demands Max Day (cfs)	Ultimate Demands 16 Hrs of Max Day (MG)	Existing or Under Construction Reservoirs	Capacity (MG)	Hours of Max Day Flow	Proposed Reservoirs	Ultimate Capacity (MG)	Hours of Max Day Flow
SANTA ROSA	1440 [1]	24.25	10.45	Prado No. 1 Prado No. 2	5.0 6.0		Los Gatos [3]	2.0	
	Subtotal for Zone 1440 [1]				11.0	16.8 hrs		13.0	19.9 hrs
	1500	28.77	12.40	Bear Creek No. 1 Antelope	2.2 5.2		Vineyard No. 1 Bear Creek No. 2	3.5 1.5	
	Subtotal for Zone 1500				7.4	9.6 hrs		12.4	16.0 hrs
	1670	38.72 [2]	16.68	De Luz No. 1 De Luz No. 2 Carancho No. 3 Via Vaquero No. 1	3.0 3.0 5.0 5.0		Via Vaquero No. 2 (or Carancho No. 4)	5.0	
	Subtotal for Zone 1670				16.0	15.3 hrs		21.0	20.1 hrs
	1990	11.46	4.94	Freeman No. 1 Freeman No. 2	3.3 5.0				
	Subtotal for Zone 1990				8.3	26.9 hrs		8.3	26.9 hrs
	2160	1.13	0.49	Baldaray No. 1	2.2				
	Subtotal for Zone 2160				2.2	72.3 hrs		2.2	72.3 hrs
	2260	3.38	1.46	Tenaja	2.2				
	Subtotal for Zone 2260				2.2	24.2 hrs		2.2	24.2 hrs
	2550	19.48	8.39	La Cresta Avocado Mesa No. 1	1.1 5.0		Avocado Mesa No. 2	2.3	
	Subtotal for Zone 2550				6.1	11.6 hrs		8.4	16.0 hrs
	2850	3.69	1.59	Redondo Mesa Calle Parama	0.5 1.0		Redondo Mesa No. 2	0.5	
	Subtotal for Zone 2850				1.5	15.1 hrs		2.0	20.1 hrs

[1] Zone 1440 includes 1060 and 1160 Zones.

[2] Demand for 1670 Zone includes 36.08 cfs maximum-day plus 2.64 cfs supplemental flow for 1440 via PRVs at west end.

[3] For fixed grade head source at west end of pressure zone and reduced dependency on pressure-reduced flows from 1670 Zone.

Table 6.2 (cont.)
Rancho California Water District
Water Facilities Master Plan Update

Summary of Existing & Proposed Pumps and Projected Ultimate Water Demands by Pressure Zone

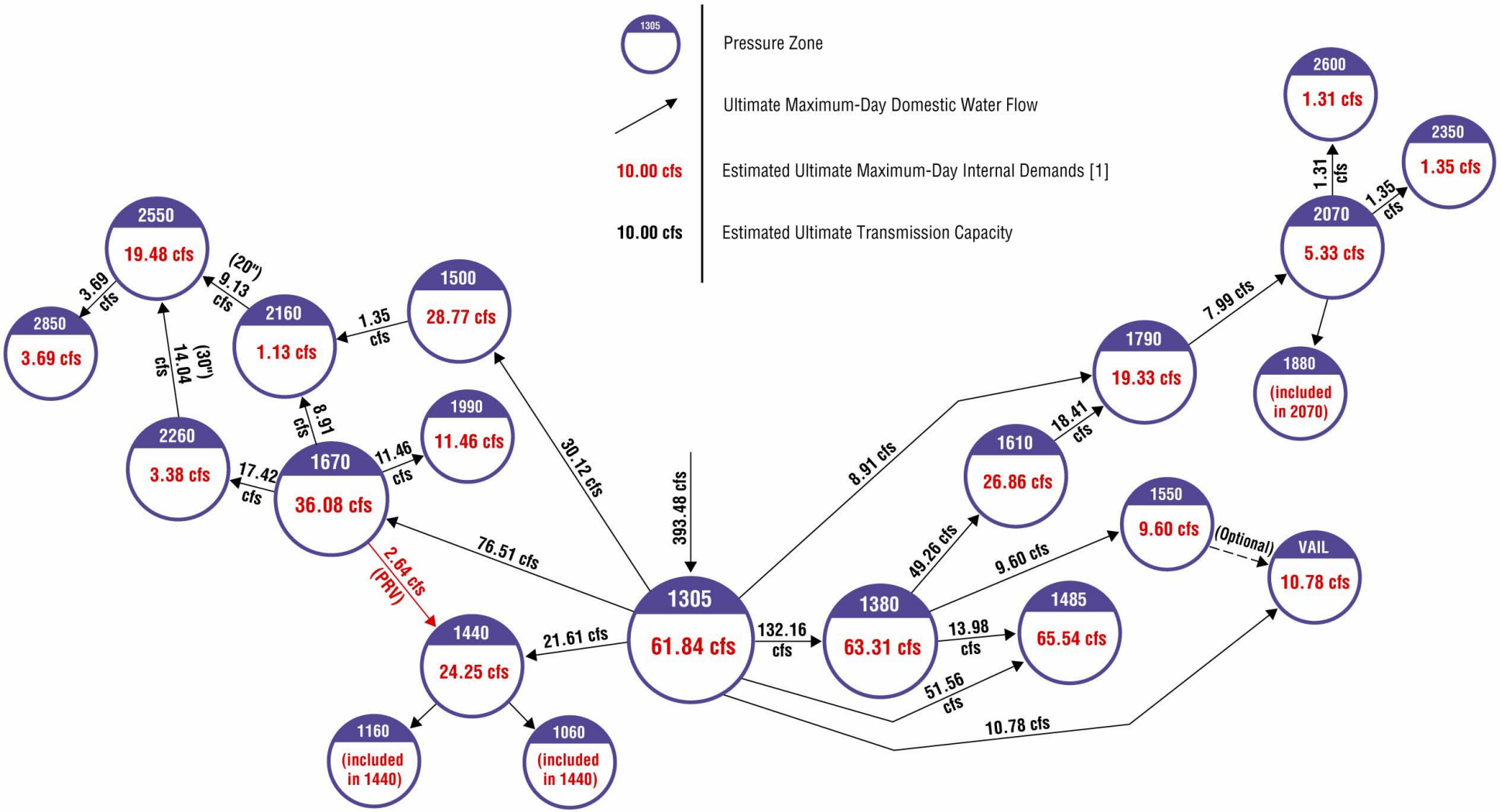
RCWD Division	Pressure Zone (Ultimate Max Day Demand)	Pump Station	Status [1]	Supply (from Zone)	(gpm) Existing Firm Capacity (no. of pump units) [2]	(gpm) Proposed Firm Capacity [3]	Projected Ultimate Max. Day Water Demands and Flow-Through Capacity (gpm)	Surplus/ Deficit (gpm)
RANCHO	1305 (61.84 cfs)	VDC (recharge)	E	groundwtr	17,953	35,904		
		Wells (native) [5]	E	groundwtr	50,856	50,856		
		EM-13	E		17,953	17,953		
		EM-20	E		44,880	44,880		
		WR-25	P		0	11,200		
		WR-26	E		13,464	13,464		
		WR-28	E		15,708	15,708		
	Subtotal for Zone 1305				160,814	189,965	178,809	11,156
	1380 (63.31 cfs)	Winchester	E	1305	11,100 (6)	11,100		
		Norma Marshall	E	1305	14,300 (6)	14,300		
		Meadowview	E	1305	6,900 (6)	15,000		
		Los Caballos No. 2	P	1305	0	2,000		
		Wells (native) [5]		groundwtr	17,440	17,440		
	Subtotal for Zone 1380				49,740	59,840	59,317	523
	1485 (65.54 cfs)	Rancho California #2	E	1380	2,600 (3)	6,300		
		Butterfield Stage	E	1305	24,600 (6)	24,600		
	Subtotal for Zone 1485				27,200	30,900	29,416	1,484
	1550 (9.60 cfs)	Alvarez (Booster 40)	E	1380	1,300 (2)	9,200		
	Subtotal for Zone 1550				1,300	9,200	9,147	53
	1610 (27.58 cfs)	Anza	E	1380	4,000	11,000 [7]		
		Rancho California #1	E	1380	6,600	10,000 [7]		
		Wells (native) [5]	E	groundwtr	5,100	5,100		
	Subtotal for Zone 1610				10,600 [6]	21,000	20,314	686
	1790 (23.52 cfs)	Buck Mesa	E	1610	8,400	8,400		
		Los Caballos No. 1	E	1305	4,000	5,700		
		Wells (native) [5]	E	groundwtr	1,500	1,500		
	Subtotal for Zone 1790				12,400 [6]	14,100	12,262	1,838
	2070 (5.33 cfs)	De Portola	E	1790	5,700	5,700		
	Subtotal for Zone 2070				5,700	5,700	3,586	2,114
	2350 (1.35 cfs)	Calle Breve	E	2070	1,200	1,200		
	Subtotal for Zone 2350				1,200	1,200	606	594
	2600 (1.31 cfs)	Zone 2600	P	2070	0	600		
	Subtotal for Zone 2600				0	600	588	12
	Vail (10.78 cfs)	Vail No. 1 (1675)	P	1305	0	4,900		
		Vail No. 2 (1850)	P	1305				
	Subtotal for Zone 2850				0	4,900	4,838	62

[1] "E" = existing; "P" = proposed; "UC" = under construction.
[2] Based on 2004 Pump testing (less largest unit).
[3] Based on 2004 Pump testing (less largest unit) or proposed firm capacity from 1997 Master Plan Update, except as otherwise noted.
[4] Includes demands for Zone 1060 and Zone 1160.
[5] Wells (native) total 'maximum capacity' based on "Existing Water Supply Sources" provided by RCWD 6/30/04, which equals 170 cfs, or 76,300 gpm.
[6] Subtotal excludes well pumping capacity.
[7] Suction side of RC #1 (1380 Zone) may limit its expansion potential to 10,000 gpm. Expansion of Anza PS and Anza Road TMs would depend on reliability of 1610 Zone well capacity.

Table 6.2
Rancho California Water District
Water Facilities Master Plan Update

Summary of Existing & Proposed Pumps and Projected Ultimate Water Demands by Pressure Zone

RCWD Division	Pressure Zone (Ultimate Max Day Demand)	Pump Station	Status [1]	Supply (from Zone)	(gpm) Existing Firm Capacity (no. of pump units) [2]	Proposed Firm Capacity [3]	Projected Ultimate Max. Day Water Demands and Flow-Through Capacity (gpm)	Surplus/ Deficit (gpm)
SANTA ROSA	1440 [4] (24.25 cfs)	Ace Bowen #3	E	1305	2,900 (2)	3,500		
		Ace Bowen #4	E	1305	6,800 (2)	7,400		
	Subtotal for Zone 1440 [4]				9,700	10,900	10,884	16
	1500 (28.77 cfs)	California Oaks	E	1305	7,600 (6)	7,600		
		Joaquin Ranch No. 1	E	1305	5,300 (3)	6,300		
		Wells (native) [5]	E	groundwater	1,400	1,400		
	Subtotal for Zone 1500				12,900 [6]	13,900	13,519	381
	1670 (36.08 cfs)	Ace Bowen #1	E	1305	7,600 (5)	7,600		
		Ace Bowen #2	E	1305	12,600 (4)	12,600		
		East Bluff	E	1305	6,000 (6)	6,000		
		Senga Doherty	E	1305	20,000 (7)	20,000		
	Subtotal for Zone 1670				46,200	46,200	34,340	11,860
	1990 (11.46 cfs)	Santa Rosa	E	1670	2,300 (3)	2,300		
		Vaquero	E	1670	2,100 (3)	2,100		
		Del Oro	E	1670	3,600 (4)	3,600		
	Subtotal for Zone 1990				8,000	8,000	5,144	2,856
	2160 (1.13 cfs)	Bear Creek	E	1500	1,300 (3)	1,300		
		De Luz	E	1670	4,000 (4)	4,000		
	Subtotal for Zone 2160				5,300	5,300	4,605	695
	2260 (3.38 cfs)	Carancho	E	1670	1,500 (2)	7,800		
	Subtotal for Zone 2260				1,500	7,800	7,819	(19)
	2550 (19.48 cfs)	Baldaray	E	2160	4,100 (4)	4,100		
		Tenaja	P	2260	0	6,300		
	Subtotal for Zone 2550				4,100	10,400	10,404	(4)
	2850S	Redondo Mesa	E	2550	800	1,050		
	2850N (3.69 cfs)	Avenida Escala	E	2550	1,100	1,100		
	Subtotal for Zone 2850				1,900	2,150	1,656	494



[1] Based on "Summary of Projected Ultimate Domestic Water Demands" excluding Contemplated Contract Service Areas (CCSA).

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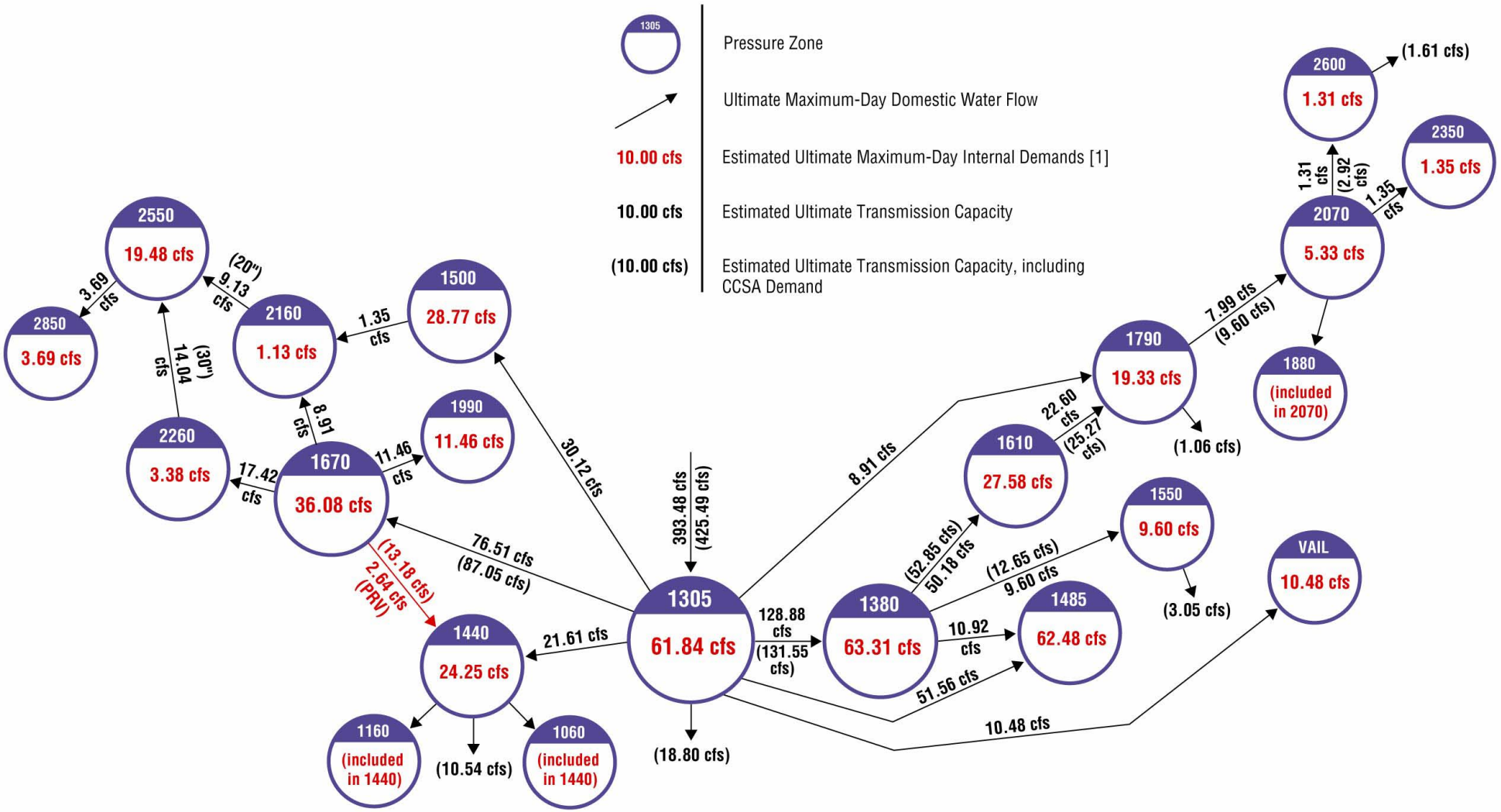
RANCHO CALIFORNIA WATER DISTRICT

Ultimate Domestic Water Transmission

WATER FACILITIES MASTER PLAN UPDATE

Figure 6-1



[1] Based on "Summary of Projected Ultimate Domestic Water Demands".

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RANCHO CALIFORNIA WATER DISTRICT

Ultimate Domestic Water Transmission

WATER FACILITIES MASTER PLAN UPDATE

Figure 6-2

Chapter 7

HYDRAULIC ANALYSIS

7.1 System Overview

The existing computer model of the domestic water distribution system was converted to the H2OMap hydraulic analysis software (MWH Soft, Inc.). The model is actually a series of individual computer models set up to independently analyze the separate 'backbone' distribution systems of each pressure zone, i.e. looping pipelines 16-inch in diameter and larger. Due to the nature of RCWD system operation, the stair-step distribution system, as described in Chapter 6, requires 'flow-through' capacities of lower pressure zones for supply to higher zones. Maximum flow-through during summer months represents the most critical operating scenario for the major zones serving the lower elevations of the District service area.

The 1305 Zone, often referred to as the fore-bay zone, is responsible for delivery of all imported water supplies to the Santa Rosa and Rancho divisions. The zones required for the majority of the imported water delivery to each division from the 1305 Zone is the 1670 Zone (for Santa Rosa) and the 1380 Zone (for Rancho). The previous demand estimates were removed from the existing model. Upon model conversion, the revised demands were applied to the model to reflect RCWD's ultimate land uses based on the new general plans within the service area. This was done using the state-of-the-art features developed by MWH Soft within the H2OMap software. One feature, labeled 'demand-allocator', enables computer models to more accurately simulate changes to demand estimates and their locations. These changes, although not major in the case of RCWD, proved to be significant enough to warrant capital improvement program modifications (Chapter 9). This 're-loading' of a computer model to update a master plan can cause subtle shifting of demand-center locations, which is also important to simulate for master planning analysis.

The basic criteria used to evaluate the computer analysis results were headloss per unit length of pipe, velocity of water within the pipeline and resulting pressures at hydraulically-remote locations. For the purposes of analyzing the overall system within a master planning format, the critical operating scenario was based on maximum-day demand of a summer day, plus all pump stations and turnouts operating at their rated capacities. The majority of the pipelines in the model are 16-inch or larger due to the flow-through capacities. Localized fireflow simulations, although foreseeable, are not considered critical at the District-wide master-planning level. These local emergency conditions can be critical in smaller zones, and therefore, should be evaluated for specific development projects.

As part of the hydraulic analysis, the WFMP Update also investigated current pumping and storage efficiency of each pressure zone. The methodology used for this evaluation incorporated four basic characteristics of each pressure Zone:

- Internal maximum-day demand

- Total summer pumping hours
- Available storage capacity
- Pump station utilization

Pumping hours were obtained from RCWD operations staff for the summer months of 2004. The District's pump stations use two separate power sources – electrical power and gasoline power. The majority of the pump stations operate on electrical power with on-site backup power generation. Therefore, time-of-use and total pumping hours were an important consideration. The electrical power rates governing the power cost to the District employ a tiered rate structure, which is defined as follows:

Table 7.1

Tier	Time of day	Hours/day	Rate
Off-peak	11pm – 8am	9 hrs	$0.0886/kwh
Mid-peak	8am – 12noon, 6pm – 11pm	9 hrs	$0.1104/kwh
On-peak	12noon – 6pm	6 hrs	$0.2021/kwh

Table 7.2 was developed to detail the individual pumping units and their hours of operation through the month of August 2004. Based on this data, a pump utilization factor was developed comparing total hours of operation with available hours of off- and mid-peak operation for the entire month. Such a factor can indicate which pump stations are necessarily operating during on-peak power cost times-of-use (TOU) and reveal alternative system operating techniques that could be more efficient. As a further indication to the potential cause of inefficient system operation, storage capacity, and its ability to provide the majority of supply during a maximum summer day, was considered. The old adage always applies when operational storage volume is less than the volume of water demanded: "the lower the storage capacity, the more pumping required".

Upon observation of Table 7.2, five zones showed indicators where operational efficiency could be improved: the 1670 and 1440 Zones of the Santa Rosa division, and 1610, 1485 and 1380 Zones of the Rancho division.

7.2 1670/1440 Zones

The pump utilization factor calculated collectively for all pump stations serving the 1670 Zone is within the system's ability to operate efficiently, i.e. not require pumping during on-peak power cost time of the day. Table 7.2 shows the gas engine-driven units of the Ace Bowen No. 2 and East Bluff pump stations were used

predominantly. RCWD Operations staff has indicated that, traditionally, gas-powered pumps have been much less expensive to operate and maintain than electric-powered pump stations *and* the fuel costs are constant for all hours of the day. However, staff also indicated that the recent rise in fuel costs have significantly reduced the cost gap making electric-powered pumps more feasible. This should have the affect of equalizing the usage of each pump station serving the 1670 Zone.

An additional operational consideration involves pressure-reduced flow to the 1440 Zone, and minimizing the dependency on flow from pressure-reducing stations. Operations staff has indicated as much as 500 gpm, on average during the summer months, flows through pressure-reduction from the 1670 Zone to the 1440 Zone. This represents a significant operational cost that could be minimized by replacing the head source benefits of the PRV station with the proposed 1440 Los Gatos Reservoir (CIP 1440-1).

7.3 1610 Zone

Pumps serving the 1610 Zone are within the Anza and Rancho California No. 1 (RC-1) Pump Stations. Both of these stations incorporate electric-powered pumps with backup power generator on-site. Their unbalanced use is attributed to the hydraulics of the distribution grid. Table 7.2 shows that RC-1 is over-utilized when comparing the utilization factors of the two pump stations. Hydraulic analysis confirms that the discharge piping of the RC-1 allows for more effective conveyance to the 1610 Zone reservoirs than from the Anza pumps. However, consideration should be given to the fact that RC-1 draws its supply from the same suction piping as RC-2 (1485 Zone), which could limit the expandability of the RC Pump Stations. Capital improvement projects will improve the suction piping capacity of RC-1 and the discharge piping capacity of Anza, thereby providing future flexibility to safely expand either pump station first (or both at the same time) when additional 1610 Zone storage capacity is required.

7.4 1485 Zone

The 1485 Zone is served by three reservoir sites and two pump station sites. This provides multiple outlets for the discharge of each pump station. Both pump stations incorporate electric-powered pumps with backup power generator on-site. As with the 1610 Zone hydraulic characteristics, the 1485 Zone pump stations are not sharing the supply burden equally. RC-2 is over-utilized when comparing the utilization factors of the two pump stations. Upon conversion of the 48-inch raw water transmission main in Pauba Road to the domestic water transmission system and 1305 Zone, a greater transmission capacity will be afforded to the Butterfield Stage Pump Station. This will, in turn, allow increased pumping time for Butterfield Stage pumping units and increased volume to the 1485 Zone via the south end where the majority of the storage capacity also exists (El Chimisal site). This will increase the Butterfield Stage Pump Station utilization as demands increase within the zone.

7.5 1380 Zone

The 1380 Zone is served by three reservoir sites, three pump station sites and several direct-supply wells. The wells provide the zone the flexibility to optimize the utilization balance between the Norma Marshal, Meadowview and Winchester Pump Stations. Although the utilization between the Norma Marshall and Meadowview Pump Stations does not appear to be balanced, RCWD Operations staff has indicated that supply burden can be readily shifted between the two pump stations due to their existing capacities and proximity to each other within the distribution grid. As with the wells and their effectiveness to directly supply demands at the southeast end of this expansive zone, Winchester can only be expected to perform effectively for demands at the north end of the zone. Hydraulic analysis was performed to provide an indication of the effect on discharge pressures at Winchester if significant supply burden was shifted from the Norma Marshal and Meadowview Pump Stations to the Winchester Pump Station. Required discharge pressure at Winchester increases under this scenario indicating a definite limitation of Winchester to supply demands to the central and southern portions of the service area.

Appendix D includes printouts of the general computer hydraulic analysis results of each pressure zone and the schematic diagrams representing each pressure zone model.

Table 7.2
Rancho California Water District
Water Facilities Master Plan Update

Pumping Efficiency Evaluation

Discharge Pressure Zone	Pump Name	Booster No.	Fuel/ Power Supply	Total Hours of Operation [1] (Monthly)	Off/Mid-Peak Hours Per Day [2] [3]	Required Hours to Operate during Peak Power Costs	Pump Station Utilization Ratio [4]	Estimated hours of Max Day storage (adjusted for 2003 demands)	Estimated 2003 Maximum-day Production, "Same-day" (cfs)
2850S	Avocado Mesa	1	Electric	0	540	0			
		2	Electric	5	540	0			
	Total Pumping Hours			*5*	*1080*		*0.00*		
2850N	Avenida Escala	1	Electric	33	540	0		n/a	n/a
		2	Electric	0	540	0			
		3	Electric	0	540	0			
	Total Pumping Hours			*33*	*1620*		*0.02*		
2550	Baldaray	1	Electric	140	540	0			
		2	Electric	78	540	0			
		3	Electric	559	540	19		41.3	5.47
		4	Electric	447	540	0			
	Total Pumping Hours			*1224*	*2160*		*0.57*		
2260	Carancho	1	Electric	8	540	0			
		2	Electric	203	540	0		25.2	3.25
	Total Pumping Hours			*211*	*1080*		*0.20*		
2160	Bear Creek	1	Electric	174	540	0			
		2	Electric	65	540	0			
		3	Electric	352	540	0			
	Total Pumping Hours			*591*	*1620*		*0.36*		
	De Luz	1	Electric	530	540	0		75.6	1.08
		2	Electric	20	540	0			
		3	Electric	273	540	0			
		4	Electric	2	540	0			
	Total Pumping Hours			*825*	*2160*		*0.38*		

RCWD Recommended Facilities - Table 2
RCWD 2005 Water Master Plan Update

Pump Name	Service Pressure Zone	Supply Pressure Zone	Description of Facilities to Enhance Pumping Efficiency	Notes
Ace Bowen No. 1	1670	1305	No planned upgrade.	Check for better utilization.
Ace Bowen No. 2	1670	1305	Gas driven engine, but possibility of better utilization of Ace Bowen No. 1 or Senga Doherty	With price of petroleum based products rising, might not be as cost effective to run gas fueled motors.
East Bluff	1670	1305	No planned upgrade.	
Senga Doherty	1670	1305	No planned upgrade.	Check for better utilization.
Ace Bowen No. 3 (and No. 4 - parallel unit)	1440	1305	Los Gatos Reservoir to replace fixed gradient supplied by 1670 pressure reducing valves (PRV), therefore reducing PRV flows and reducing wasted pumping from 1670 to 1440.	
Anza	1610	1380	Upgrade might not be required if RC No. 1 can take greater load of the system, but RC No. 1 can only take greater load if 1380-100 is constructed.	Therefore, parallel piping not might be required.
Rancho California No. 1	1610	1380	If CIP project 1380-100 is constructed, suction side to RC No. 1 and 2 will have greater flow, along with a greater capacity, could elimate CIP 1610-5.	Regardless, need more pump units to alleviate utilization of current pumps and motors.
Butterfield Stage	1485	1305	No change	
Rancho California No. 2	1485	1380	Can simply shift load from RC No. 2 to Butterfield PS. No change.	Or Butterfield Stage pump station could be utilized more.
Meadowview	1380	1305	Upgrade due to upgrades in Alvarez, Anza, and possibly a new Los Caballos pump station. Check for ability to distribute pumping needs among Winchester and Norma Marshall PS.	
Norma Marshall	1380	1305	Can simply shift load from Meadowview to Norma Marshall PS and stay within off-peak power costs.	
Winchester	1380	1305	No change	

Chapter 8

NON-DOMESTIC WATER DISTRIBUTION SYSTEM

8.1 Introduction

The District is pursuing maximum use of a non-domestic water distribution system supplied with recycled water for the following reasons:

- Historically, the District has been required to supplement its groundwater supply sources with expensive imported water, the cost of which is expected to double within the next several years. Costly imported water use could be reduced by using recycled water.

- Water agencies that import Metropolitan water can benefit from financial incentives by Metropolitan for developing local water supply sources.

- Recycled water use reduces dependency on treated water sources and increases the District's tolerance to extended low-rainfall periods, such as in recent years within the Rancho California area. Drought conditions would raise the likelihood of water officials mandating large water users to use recycled water.

- The District would realize a direct reduction in future required water allocations.

The Rancho California Water District has been operating their non-domestic water distribution system since the early 1990s, which is supplied primarily by reclaimed water produced from the Santa Rosa Water Reclamation Facility. The District has steadily increased the capacity of the system, which supplied a total of 4,200 acre-feet during fiscal year 2003-04. Figure 8-1 shows the system layout and use areas.

8.2 Non-Domestic Water Supply

The District currently has a non-domestic water delivery capability of approximately 3.75 mgd, or 4,200 acre-feet per year. The majority of this supply originates from the tertiary treatment facilities at the Santa Rosa Water Reclamation Plant. Future supply, therefore, somewhat depends on population growth within the District.

The RCWD has discussed the possibility of increasing the wastewater generation to the Santa Rosa Water Reclamation Facility by accepting flows from the Eastern Municipal Water District. The increase in non-domestic system water supply due to these potential sources combined with an assumed increase in RCWD wastewater service area flows (600 DU's / year at 300 GPD / DU = 180,000 GPD increase / year) will form the foundation for recycled water supply.

8.3 Non-Domestic Water Demands

The total estimated ultimate annual demand that could potentially be supplied by the basic non-domestic system, as identified in Chapter 4, is summarized as follows:

Type	Demand (AF)
Class I	11,227
Class II	4,186
Total	15,413

This Master Plan provides for supplying only Class I demands due to proximity to the ultimate proposed system. Class II demands were identified to illustrate the potential increase in irrigation demands to remote areas, which would require additional non-domestic system facilities. The extent of agricultural conversions could vary significantly. Obviously, the large agricultural demands represent tremendous potential. Some of the factors that will require additional consideration and will influence these opportunities include the following:

- RWQCB Requirements
- Capital / O+M cost implications
- Phasing and Availability of recycled water
- Customer / Market Place variables
- Environmental process

The following is a discussion of the District's non-domestic water distribution system and expanded service capabilities to supply future irrigation demands.

8.4 Non-Domestic Water System

The District has proceeded with the implementation of a comprehensive non-domestic system expansion program. The system currently in place or under construction includes the majority of the distribution system pipelines, pump stations, and storage tanks ultimately planned. In addition, the system includes reclaimed water storage ponds with a total existing capacity of 1,252 AF, and total planned capacity of 1,900 AF. The capacity allows for reclaimed water system service to existing and future customers with total annual demands projected to be 11,200 acre-feet (AF). The system allows for pumping of tertiary treated water from the Santa Rosa Wastewater Reclamation Plant to users within the 1500 Zone in the northern Santa Rosa Division, and to users within the 1305, 1380 and 1485 Zones of the Rancho Division. In addition, water can be pumped to the recycled water storage ponds for extended storage. The existing system is shown on Figure 8-1.

The Class I demands include landscape irrigation areas in proximity to the distribution system, such as golf courses, schools and open space areas, which are described as follows:

Santa Rosa Division

- Bear Creek Golf Course
- Colony Golf Course
- Open Space/Schools (1500 Zone Domestic Water Service Area)

Rancho Division

- Temeku Golf Course
- Redhawk Golf Course
- Temecula Creek Golf Course
- Open space along Interstate 15 and Highway 79
- Open space/schools (1380 Zone Domestic Water Service Area)

Additional non-domestic water use areas, which are somewhat geographically removed from the proposed system and would require additional facilities, have been identified as Class II use areas. Irrigation of these areas with non-domestic water may or may not be deemed economically feasible. The Class II use areas include the existing Cross Creek Golf Course in the Santa Rosa Division and a portion of the vineyard and the agricultural land within the Rancho Division and west of Anza Road.

8.5 Hydraulic Analysis

The model of the recycled water (non-domestic) distribution system was updated for the 2005 WFMP Update, and analyzed to verify the proposed sizing of pump stations and pipelines. The system necessarily incorporates four separate distribution pressure zones, which are described as follows:

1. Cole Creek Zone - supplied by effluent pumps at the Santa Rosa Water Reclamation Facility (separate from Rancho system)

2. Rancho Zone - supplied by effluent pumps at the Santa Rosa Water Reclamation Facility (separate from Cole Creek system)

3. Bear Creek Zone - supplied by pumps at the Cole Creek reservoir site

4. Redhawk Zone - supplied by pumps at the Redhawk Golf Course site

The demands applied to each Zone of the model were determined using the tributary area duty method similar to the domestic system analysis. The following is a summary of the demands applied to each model component:

Cole Creek	(1181 HGL)	402 AF/YR	(548 GPM)
General Kearney	(1381 HGL)	7,646 AF/YR	(10,427 GPM)
Bear Creek	(1491 HGL)	1,757 AF/YR	(2,396 GPM)
El Chimisal	(1441 HGL)	1,436 AF/YR	(1,959 GPM)
TOTAL		11,240 AF/YR	(15,330 GPM)

RCWD's GIS department provided billing account records for existing reclaimed water users. Ultimate demands were created based on the updated (2005) land use map, which depicted Class I irrigation areas as described previously in this section. Class II demands are being excluded to stay consistent with the 1997 Master Plan.

Each Zone was analyzed under a critical operating scenario to test for adequacy. With the above stated ultimate demands (representing maximum day demands) and no pump station flow (supply coming only from the reservoirs), the four Zones were checked for pressures and velocities. Reservoir levels were set at mid water level in the tank, or 16 feet below the HGL, to simulate a realistic condition not requiring pumping. During peak demands of summer months, it is assumed that the reservoirs and pump stations will supply each Zone simultaneously, therefore no peak summer scenario was analyzed. The H2O Map Water computer diagrams and results are located in Appendix E.
However, the Non-Domestic System operation will continue to rely heavily on the storage ponds for meeting peak summer demands. A typical Non-Domestic System demand hydrograph for RCWD is shown on Figure 8-2.

8.6 Non-Domestic System Capital Costs

The Non-Domestic System Capital Projects and corresponding estimated capital costs are shown on Table 8.1. The total estimated costs are $25.5 million.

TABLE 8.1
RANCHO CALIFORNIA WATER DISTRICT
Recommended Recycled Water System
Capital Improvements Projects

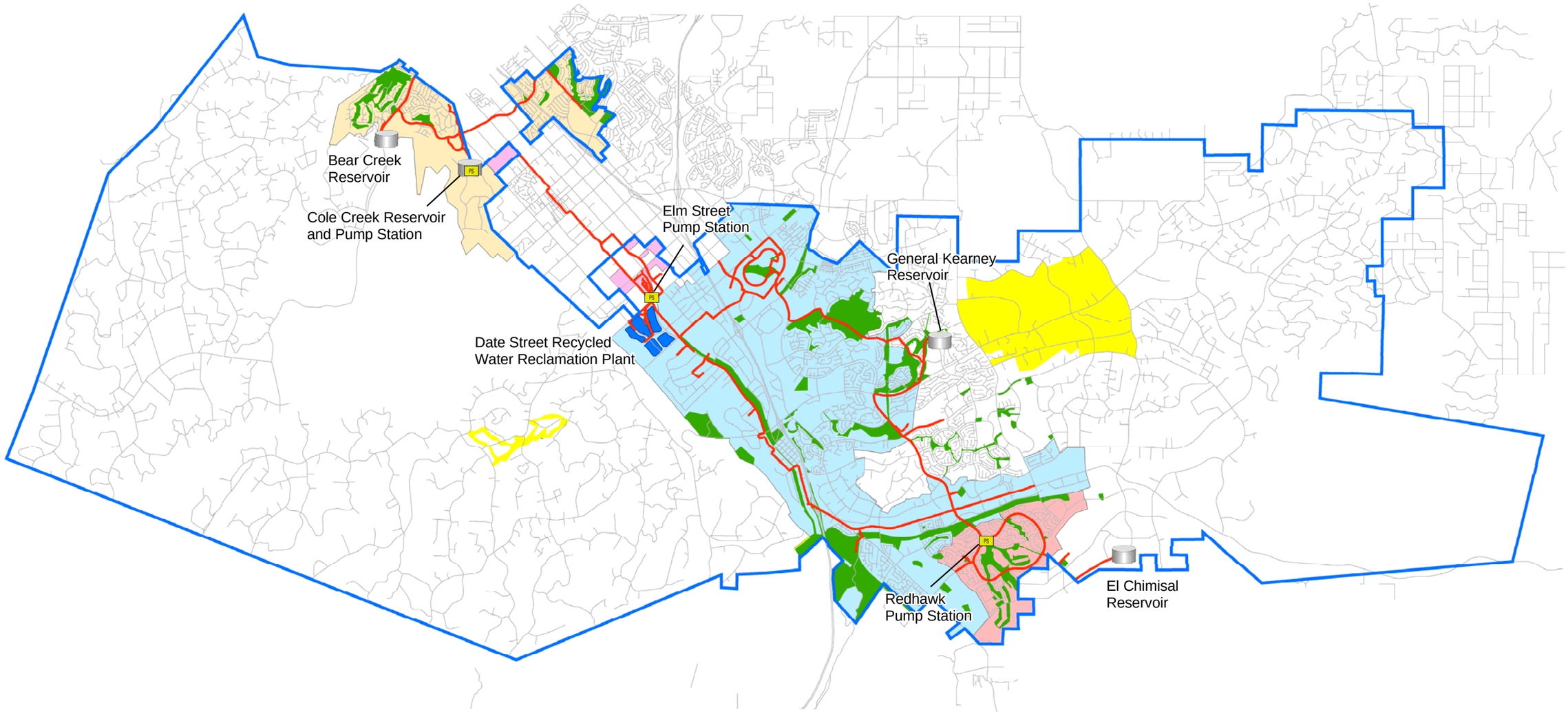
Item No.	Description of Recommended Improvements	Status	size/ Capacity	Quantity	Unit Cost	Estimated Construction Cost (2005 $) ENR=8200	Estimated Capital Cost (2005 $) ENR=8200 [1]
BASIC SYSTEM IMPROVEMENTS							
1	Pond No. 5					$2,400,000	$3,240,000
2	Pond No. 6					$2,400,000	$3,240,000
3	Pond No. 4 Expansion					$1,000,000	$1,350,000
Total Basic Improvements						$5,800,000	$7,830,000
FUTURE SANTA ROSA SYSTEM EXPANSION							
4	SBR West Pump Station		650 hp	3,000 gpm	$3,000 /HP	$1,950,000	$2,632,500
5	Walker Basin Golf Course TM		20 in	20,000 LF	$200 /LF	$4,000,000	$5,400,000
6	Reservoir Inlet/Outlet		16 in	500 LF	$150 /LF	$75,000	$101,250
7	Storage/Equalization Reservoir (Tank)		1.5 MG	1.5 MG	$0.70 /GAL	$1,050,000	$1,417,500
8	Secondary Pipelines					$2,000,000	$2,700,000
9	Conversion of Existing Users					$1,000,000	$1,350,000
Total Estimated Santa Rosa System Expansion						$10,075,000	$13,601,250
FUTURE RANCHO SYSTEM EXPANSION							
10	Secondary Pipelines					$2,000,000	$2,700,000
11	Conversion of Existing Users					$1,000,000	$1,350,000
Total Estimated Rancho System Expansion						$3,000,000	$4,050,000
TOTAL RECYCLED WATER SYSTEM EXPANSION PROGRAM						**$18,875,000**	**$25,481,250**

[1] Estimated capital cost based on an additional 35% of the estimated construction cost.

Nondomestic Water System and Use Areas

Cole Creek Service Area
El Chimisal Service Area
Class 1 Nondomestic Irrigation Area
General Kearny Service Area
Bear Creek Service Area
Class 2 Nondomestic Irrigation Area

Existing RCWD Non-Domestic Water Transmission Main



RBF CONSULTING

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Figure 8-1

RANCHO CALIFORNIA WATER DISTRICT
RECLAIMED WATER SYSTEM
CONSUMPTION HYDROGRAPH

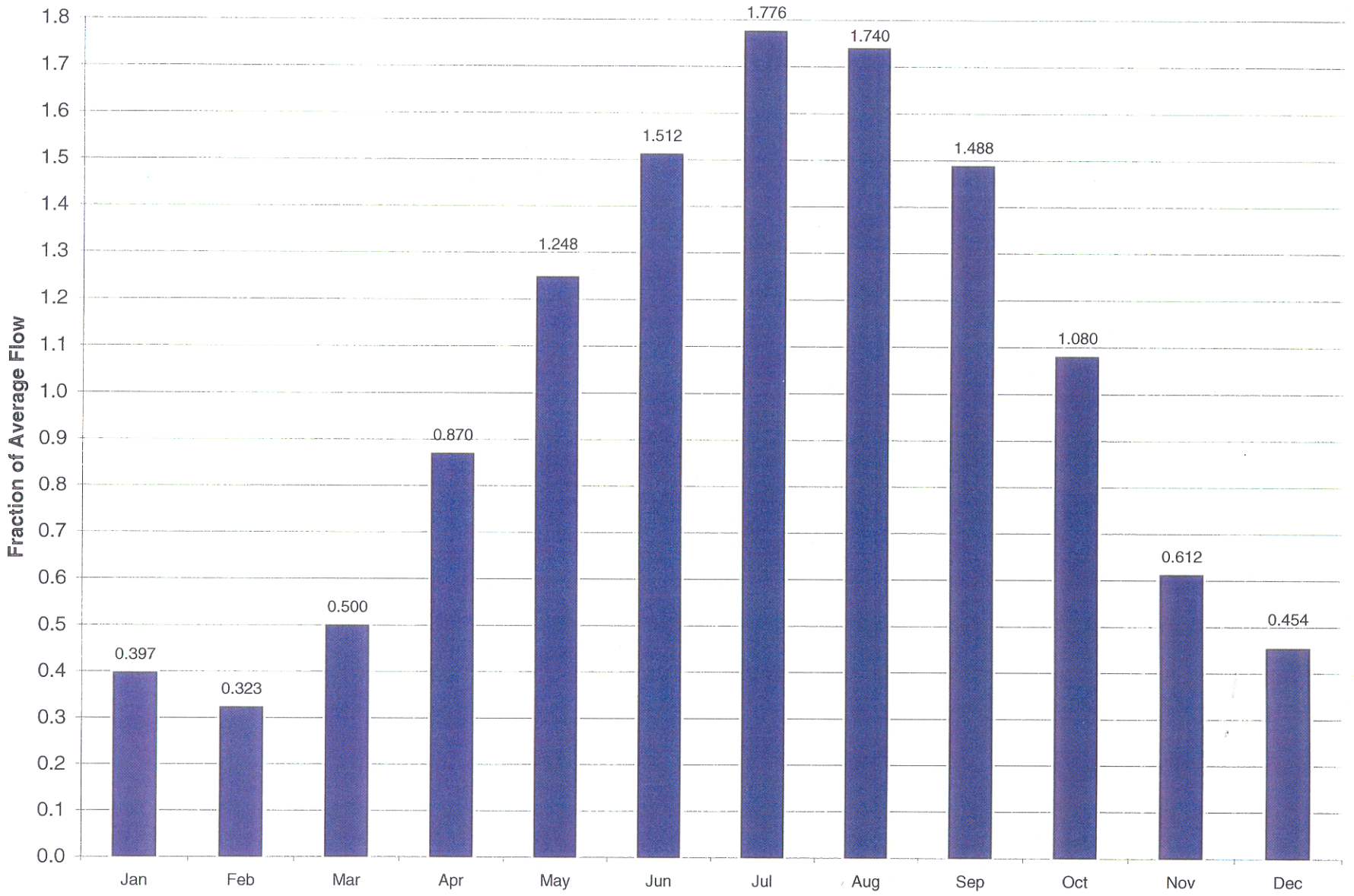

Figure 8-2

Chapter 9

CAPITAL IMPROVEMENT PROJECTS AND COSTS

The revised Master Plan of water facilities outlined in this report was the basis for revisions made to the current list of capital improvements projects. The capital improvement project's list identified in the RCWD Capital Improvement Program, dated June 2005 as analyzed against this RCWD Water Facilities Master Plan Update to identify the status of each facility as one of the following: 1) Completed 2) Canceled 3) Modified.

The revised Capital Improvement Program (CIP) includes all "modified" projects as well as additional projects necessary to provide adequate backbone water supply for the ultimate land use plan identified in Chapter 3.

The proposed CIP projects were categorized as either being of benefit to all pressure zones within the District equally (Category 1), being of benefit to only a few zones (Category 2), or being of benefit to a particular zone only (Category 3). This is to ensure that project costs are allocated to only those users within zones that receive a direct or indirect benefit from the facility. Those facilities needed exclusively for Santa Rosa Division pressure zones are included in Table 9.1 (pages 1 through 8), those facilities needed exclusively for Rancho division Pressure Zones are included in Table 9.2 (pages 1 through 8), and all "common" facilities are included in Table 9.3 (pages 1 and 2).

A phasing study was also performed to estimate the year required to initiate the construction of each CIP project. An escalated cost was then determined for each project at an estimated average interest rate of 5 percent. The phases are as follows:

	Year
Phase One	2005-2009
Phase Two	2010
Phase Three	2015
Phase Four	2020
Phase Five	2025

Tables 9.1 (pages 9 through 16), 9.2 (pages 9 through 16) and 9.3 (pages 3 and 4) show when each CIP project is needed and their escalated cost for Santa Rosa Division projects, Rancho Division projects, and Common Facilities, respectively. A summary of total escalated capital costs for each is as follows:

Santa Rosa	$ 71,550,900
Rancho	$ 140,487,000
Common	$ 17,531,100
Total	$ 229,569,000

Additionally, a schedule for Capital Replacement facilities has been prepared (Table numbers 9.4, 9.5 and 9.6). This represents an update to the previous (1993) analysis. The update includes reflection of subsequently constructed facilities, modified C.I.P. information, and project cost experiences.

Table 9.1
Rancho California Water District
Water Facilities Master Plan Update
Status of 1997 Capital Improvement Projects &
Recommended Capital Improvement Projects
Santa Rosa Division

			Recommended Facilities Improvements					Preliminary Cost Estimate: Recommended Facilities			
Item No.	**Cate-gory No.**	**Facility Name**	**Description of Recommended Improvements Per the 1997 Master Plan**	**Changes to Recommended Improvements**	**Status**	**Size/ Capacity**	**Quantity**	**Unit Cost**	**Estimated Construction Cost (2005 $) ENR=8200**	**Estimated Capital Cost (2005 $) ENR=8200**	**Escalated Cost ($)**
2850 ZONE:											
2850-1	3	Calle Parama Reservoir Nos. 1 and 2	Construct 2-0.5 MG steel tanks near Calle Parama.	Constructed as single 1.0 MG Tank	Completed				$0	$0	$0
2850-2	3	Bosque Pump Station	Construct 750 gpm (500 firm) pump station @ Ave Bosque & Calle Corriente. 150 HP.	Renamed Escala P.S. @ 1,100 gpm	Completed				$0	$0	$0
2850-3	3	Huerto/Parama Trans Main	Construct 12,000 ft of 12-inch pipeline between North P.S. and North Resvr in Huerto & Parama.		Completed				$0	$0	$0
2850-100 (south)	3	Redondo Mesa P.S. expansion		Increase Redondo Mesa pumping capacity by 250 gpm		250 gpm	50 HP	$2,500.00 /HP	$125,000	$168,750	$288,600
2850-101 (south)	3	Redondo Mesa Reservoir No. 2		Construct 0.5 MG steel tank at Redondo Mesa site, existing stor-age capacity provides ~8 hrs at maximum-day demand			0.5 MG	$0.70 /gal	$350,000	$472,500	$808,100
		Subtotal Category 3:							**$475,000**	**$641,250**	**$1,096,700**
		Subtotal 2850 Zone:							**$475,000**	**$641,300**	**$1,096,700**

Table 9.1
Rancho California Water District
Water Facilities Master Plan Update
Status of 1997 Capital Improvement Projects &
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Santa Rosa Division

			Recommended Facilities Improvements					Preliminary Cost Estimate: Recommended Facilities			
Item No.	Cate-gory No.	Facility Name	Description of Recommended Improvements Per the 1997 Master Plan	Changes to Recommended Improvements	Status	Size/ Capacity	Quantity	Unit Cost	Estimated Construction Cost (2005 $) ENR=8200	Estimated Capital Cost (2005 $) ENR=8200	Escalated Cost ($)
2550 ZONE:											
2550-1	2	Tenaja Pump Station	Completion of Tenaja Pump Station Facility to be 4500 gpm (3100 firm), 1800 HP. Suction from ex 2260 Tenaja Resvr.	Increase proposed firm capacity to 6,300 gpm		6300 gpm	1200 HP	$3,500.00 /HP	$4,200,000	$5,670,000	$9,697,600
2550-6	2	Baldary P.S. Relocation/Expansion	Relocate Pump Station below Baldaray Reservoir and match required 4500gpm capacity. Requres Tenaja Pump station in place	Completed, but tested at 4,100 gpm	Completed					$0	$0
2550-100	2	La Cresta Reservoir No. 2		Increase storage capacity at La Cresta site to achieve 16 hrs max day volume			2.3 MG	$0.70 /gal	$1,610,000	$2,173,500	$3,717,400
		Subtotal Category 2:							**$5,810,000**	**$7,843,500**	**$13,415,000**
		Subtotal 2550 Zone							**$4,200,000**	**$5,670,000**	**$9,697,600**
		Subtotal Above Zones							**$4,675,000**	**$6,311,300**	**$10,794,300**

Table 9.1
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Santa Rosa Division

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Item No.	**Cate-gory No.**	**Facility Name**	**Description of Recommended Improvements Per the 1997 Master Plan**	**Changes to Recommended Improvements**	**Status**	**Size/ Capacity**	**Quantity**	**Unit Cost**	**Estimated Construction Cost (2005 $) ENR=8200**	**Estimated Capital Cost (2005 $) ENR=8200**	**Escalated Cost ($)**
2260 ZONE:											
2260-1	2	Carancho Pump Station Expansion	Add pump units 3 and 4.	Increase P.S. capacity to 7,800 gpm 2 Units at 3,200 gpm each, or 4 Units at 1,600 gpm each.		6300 gpm	1600 HP	$3,000.00 /HP	$4,800,000	$6,480,000	$8,683,800
2260-2	2	El Calamar Parallel	Construct 6,500 ft of 16-inch pipeline in El Calamar between Carancho P.S. and Via Escalon; and in Via Escalon from El Calamar to existing 24"	Increase pipe size to 24-inch		24 in	6500 LF	$225.00 /LF	$1,462,500	$1,974,375	$2,645,900
		Subtotal Category 2:							**$6,262,500**	**$8,454,375**	**$11,329,700**
		Subtotal 2260 Zone							**$6,262,500**	**$8,454,400**	**$11,329,700**
		Subtotal Above Zones							**$10,937,500**	**$14,765,700**	**$22,124,000**

Table 9.1
Rancho California Water District
Water Facilities Master Plan Update
Status of 1997 Capital Improvement Projects &
Recommended Capital Improvement Projects
Santa Rosa Division

Item No.	Cate-gory No.	Facility Name	Recommended Facilities Improvements: Description of Recommended Improvements Per the 1997 Master Plan	Changes to Recommended Improvements	Status	Size/ Capacity	Quantity	Preliminary Cost Estimate: Recommended Facilities: Unit Cost	Estimated Construction Cost (2005 $) ENR=8200	Estimated Capital Cost (2005 $) ENR=8200	Escalated Cost ($)
2160 ZONE:											
2160-3	2	Baldaray Resvr #2	Construct 1.0 MG steel tank in vicinity of exist Baldaray Resvr.	Not needed	Cancelled				$0	$0	$0
2160-10	2	La Cresta Road Parallel	Construct 6,300 ft of 24-inch pipeline in La Cresta Rd btw Clinton Keith Rd and proposed New Baldaray Reservoirs.	Not needed	Cancelled				$0	$0	$0
2160-11	2	Clinton Keith Parallel	Construct 8,300 ft of 24-inch parallel in Clinton Keith Rd. north of La Cresta Rd	Not needed	Cancelled				$0	$0	$0
2160-12	2	Bear Cr. P.S. Expansion	Exist P.S. has three units: two @ 150HP 600 gpm one @ 250HP 1000 gpm Add: one @ 225HP 800 gpm Total = 4200gpm, Firm = 3200gpm	No expansion needed	Cancelled				$0	$0	$0
		Subtotal Category 2:							**$0**	**$0**	**$0**
		Subtotal 2160 Zone:							**$0**	**$0**	**$0**
		Subtotal Above Zones:							**$10,937,500**	**$14,765,700**	**$22,124,000**

Table 9.1
Rancho California Water District
Water Facilities Master Plan Update
Status of 1997 Capital Improvement Projects &
Recommended Capital Improvement Projects
Santa Rosa Division

Item No.	Cate-gory No.	Facility Name	Recommended Facilities Improvements: Description of Recommended Improvements Per the 1997 Master Plan	Changes to Recommended Improvements	Status	Size/ Capacity	Quantity	Preliminary Cost Estimate: Recommended Facilities: Unit Cost	Estimated Construction Cost (2005 $) ENR=8200	Estimated Capital Cost (2005 $) ENR=8200	Escalated Cost ($)
1990 ZONE:											
1990-7	3	Del Oro/La Cruz Loop Main	Construct 3,800 ft of 12-inch pipeline in easements from Avenida Del Oro to La Cruz Rd.	Revise alignment: Del Oro from PS to Creek Hollow, Cr Hollow from Del Oro to La Cruz		12 in	3800 LF	$100.00 /LF	$380,000	$513,000	$687,500
		Subtotal Category 3:							**$380,000**	**$513,000**	**$687,500**
		Subtotal 1990 Zone							**$380,000**	**$513,000**	**$687,500**
		Subtotal Above Zones:							**$11,317,500**	**$15,278,700**	**$22,811,500**

Table 9.1
Rancho California Water District
Water Facilities Master Plan Update
Status of 1997 Capital Improvement Projects &
Recommended Capital Improvement Projects
Santa Rosa Division

			Recommended Facilities Improvements					Preliminary Cost Estimate: Recommended Facilities			
Item No.	Cate-gory No.	Facility Name	Description of Recommended Improvements Per the 1997 Master Plan	Changes to Recommended Improvements	Status	Size/ Capacity	Quantity	Unit Cost	Estimated Construction Cost (2005 $) ENR=8200	Estimated Capital Cost (2005 $) ENR=8200	Escalated Cost ($)
1670 ZONE:											
1670-3a	2	Carancho Reservoir #4	Construct 4.0-MG tank	Revise size based on make-up for 1440 Zone, current demands may require as interim facility			4.0 MG	$0.70 /gal	$2,800,000	$3,780,000	$5,065,600
1670-4	2	Via Del Verano Resvr	Construct 4.0 MG steel tank in vicinity of Via Del Verano, off Vaquero. With HWL = 1670 ft.	Replaced with new Via Vaquero Tank No. 1	Completed				$0	$0	$0
1670-5	2	Del Verano Resvr Inlet	Construct 1,500 ft of 24-inch pipeline in easements from Vaquero to Del Verano Resvr.	Replaced with new 36-inch Via Vaquero Inlet/ Outlet	Completed				$0	$0	$0
1670-6	2	Via Pino Reservoir (Renamed Via Vaquero No. 2)	Construct 4.0 MG steel tank in vicinity of Via Pino, off Vaquero. With HWL = 1670 ft.	Renamed Via Vaquero Tank No. 2			5.0 MG	$0.70 /gal	$3,500,000	$4,725,000	$6,030,400
1670-7	2	Pino Resvr Inlet	Construct 1,800 ft of 24-inch pipeline in easements from Vaquero to Pino Resvr.	Replaced with new 36-inch Via Vaquero Inlet/ Outlet	Completed				$0	$0	$0
1670-10	2	De Luz Reservoir No. 3	Construct 7.0 MG steel tank in vicinity of existing De Luz, Remove ex Tanks Resvr's. With HWL = 1670 ft.		Cancel				$0	$0	$0
1670-11	2	De Luz Reservoir No. 3 Inlet	Construct 400 ft of 36-inch, and 800 ft of 24-inch main from R.C. Rd to De Luz Resvr #3.		Cancel				$0 $0	$0 $0	$0 $0
1670-14	2	Rancho Road Trans Main	Construct 7,800 ft of 42-inch pipeline in Rancho Calif Rd from Camino Sec Resvrs to De Luz Rd.		Completed				$0	$0	$0
1670-15	2	Vaquero/De Luz Parallel Transmission Main	Construct 5,800 ft of 36-inch pipeline parallel in Vaquero fr 2000 ft S of A. Del Oro to Rancho California Rd.	De Luz tank cancelled, therefore existing transmission facilities are adequate (Note existing demand INCREASE at west end due to Carancho PS)	Cancel				$0	$0	$0
1670-16	2	Sandia Creek Loop Transmission Main	Construct 6400 ft of 16-inch pipeline in Sandia Crk Dr from Carancho to Vaquero.			16 in	6400 LF	$150.00 /LF	$960,000	$1,296,000	$1,500,300
1670-17	2	C. Roca/Cresta Parallel Transmission Main	Construct 4900 ft of 16-inch pipeline parallel to exist 8-inch in Calle Roca/Cresta btw Vaquero and Tierra.			16 in	4900 LF	$150.00 /LF	$735,000	$992,250	$1,148,700
1670-18	2	C. Uva/Cresta Loop Transmission Main	Construct 6100 ft of 12-inch loop completion in easements from C. Cresta to C. Uva.			12 in	6100 LF	$100.00 /LF	$610,000	$823,500	$907,900
1670-100	2	Existing Carancho tanks demolition		Existing tanks taken out of service due to incompatible elevation			1 LS	$100,000.00 /ea	$100,000	$135,000	$230,900
		Subtotal Category 2:							**$8,705,000**	**$11,751,750**	**$14,883,800**
		Subtotal 1670 Zone:							**$8,705,000**	**$11,751,800**	**$14,883,800**
		Subtotal Above Zones:							**$20,022,500**	**$27,030,500**	**$37,695,300**

Table 9.1
Rancho California Water District
Water Facilities Master Plan Update
Status of 1997 Capital Improvement Projects &
Recommended Capital Improvement Projects
Santa Rosa Division

			Recommended Facilities Improvements					Preliminary Cost Estimate: Recommended Facilities			
Item No.	Cate-gory No.	Facility Name	Description of Recommended Improvements Per the 1997 Master Plan	Changes to Recommended Improvements	Status	Size/ Capacity	Quantity	Unit Cost	Estimated Construction Cost (2005 $) ENR=8200	Estimated Capital Cost (2005 $) ENR=8200	Escalated Cost ($)
1440 ZONE:											
1440-1	3	Los Gatos Resvr	Construct 5.6 MG steel tank in vicinity of Los Gatos Rd, off Carancho Road. With HWL = 1440 ft.	Revise size based on potential need as interim facility for existing high demands, assume 2.0 MG adequate			2.0 MG	$0.70 /gal	$1,400,000	$1,890,000	$2,083,700
1440-3	3	L. Gatos Rsvr Inlet	Construct 6200 ft of 24-inch pipeline in Carancho Rd and Los Gatos Rd from Calamar to Los Gatos Reservoirs.			24 in	6200 LF	$225.00 /LF	$1,395,000	$1,883,250	$2,076,300
1440-101	3	Carancho Road Parallel Transmission Main	Construct 6,000 ft of 24-inch pipeline parallel to exist 20-inch in Carancho btw El Calamar and Vista Del Mar.	Although lower zone demands, stay in CIP due to increased need to support 1440 Zone thru PRVs	formerly CIP No. 1670-19	24 in	5700 LF	$225.00 /LF	$1,282,500	$1,731,375	$4,324,500
1440-102	3	Los Gatos Parallel Transmission Main	Construct 4500 ft of 16-inch pipeline parallel to exist 12-inch in Los Gatos btw Carancho and Buena Vista	Although lower zone demands, stay in CIP due to increased need to support 1440 Zone thru PRVs	formerly CIP No. 1670-20	16 in	4500 LF	$150.00 /LF	$675,000	$911,250	$956,800
1440-103	3	Buena Vista/Los Vientos Zone Conversion	Convert existing 1440 Zone 12-inch mains in B. Vista btw L. Gatos and Del Mar, and in Los Vientos btw B. Vista and Vista Del Mar. to 1670 Zone trans. Mains.		formerly CIP No. 1670-21		1 EA	$150,000.00 /ea	$150,000	$202,500	$212,600
1440-104	3	Los Gatos Loop Transmission Main	Construct 2800 ft of 12-inch to complete loop in Los Gatos fr V. Del Mar to ex 12-inch.	Although lower zone demands, stay in CIP due to increased need to support 1440 Zone thru PRVs	formerly CIP No. 1670-22	12 in	2800 LF	$100.00 /LF	$280,000	$378,000	$396,900
1440-105	3	Ace Bowen PS expansion		Expand Ace Bowen Pumps #3 and #4 to 10,900 gpm	Pumps tested in 2004 show reduced flows	1200 gpm	150 HP	$2,500.00 /HP	$375,000	$506,250	$586,000
		Subtotal Category 3:							**$5,557,500**	**$7,502,625**	**$10,636,800**
		Subtotal 1440 Zone:							**$5,557,500**	**$7,502,600**	**$10,636,800**
		Subtotal Above Zones:							**$25,580,000**	**$34,533,100**	**$48,332,100**

Table 9.1
Rancho California Water District
Water Facilities Master Plan Update
Status of 1997 Capital Improvement Projects &
Recommended Capital Improvement Projects
Santa Rosa Division

Item No.	Category No.	Facility Name	Recommended Facilities Improvements: Description of Recommended Improvements Per the 1997 Master Plan	Changes to Recommended Improvements	Status	Size/ Capacity	Quantity	Preliminary Cost Estimate: Recommended Facilities: Unit Cost	Estimated Construction Cost (2005 $) ENR=8200	Estimated Capital Cost (2005 $) ENR=8200	Escalated Cost ($)
1500 ZONE (West):											
1500W-1	2	Vineyard Reservoir#1	Construct 1.0 MG steel tank in vicinity of Fut Tenaja Rd, with HWL = 1500 ft.	Currently under design as 3.5 MG	Under Design		3.5 MG	$0.70 /gal	$2,450,000	$3,307,500	$3,472,900
1500W-3	2	Joaquin Ranch No. 1 P.S. Expansion	Exist P.S. has two firm units: two @ 250HP 2600 gpm Add one addtl firm unit: one @ 260HP 2400 gpm Total = 7600 gpm, Firm = 5000 gpm		Completed				$0	$0	$0
1500W-5	2	Tenaja/Vineyard TM	Construct 6300 ft of 36-inch pipeline in Tenaja Rd to the proposed Vineyard Reservoir	Change diameter to 24-inch	Under Design	24 in	6300 LF	$225.00 /LF	$1,417,500	$1,913,625	$2,009,300
1500W-6	2	Vineyard S.P. TM	Construct 9800 ft of 24-inch pipeline from Tenaja Rd to the ex 30-inch main in Oso Del Oro/ Nutmeg St. Align Per S.P.		Under Design	24 in	9800 LF	$225.00 /LF	$2,205,000	$2,976,750	$3,125,600
1500W-7	2	Bear Creek Resvr Parallel TM	Construct 4200 ft of 16-inch pipeline parallel to exist 16-inch in Clinton Keith betw Oso Del Oro and Bear Creek Resvr.	Change diameter to 24-inch, abandon existing 16-inch		24 in	4200 LF	$225.00 /LF	$945,000	$1,275,750	$1,628,200
1500W-100	2	Bear Creek Resvr No. 2		Required for increased estimated demands and 16 hrs of max day			1.5 MG	$0.70 /gal	$1,050,000	$1,417,500	$1,809,100
1500W-101	2	Joaquin Ranch No. 1 P.S. further expansion		Add 1 - 1,000 gpm unit in separate building		1000 gpm	125 HP	$2,500.00 /HP	$312,500	$421,875	$538,400
		Subtotal Category 2:							**$8,380,000**	**$11,313,000**	**$12,583,500**
		Subtotal 1500W Zone:							**$8,380,000**	**$11,313,000**	**$12,583,500**
		Subtotal Above Zones:							**$33,960,000**	**$45,846,100**	**$60,915,600**

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Item No.	Cate-gory No.	Facility Name	Recommended Facilities Improvements: Description of Recommended Improvements Per the 1997 Master Plan	Changes to Recommended Improvements	Status	Size/ Capacity	Quantity	Preliminary Cost Estimate: Recommended Facilities: Unit Cost	Estimated Construction Cost (2005 $) ENR=8200	Estimated Capital Cost (2005 $) ENR=8200	Escalated Cost ($)
1500 ZONE (East, Formerly 1432 Zone):											
1500E-10	3	Cross Zone Transmission Main	Construct 24-inch pipe in Cal Oaks Road between Cal Oaks Pump Station & Joaquin Ranch Pump Station		Complete				$0	$0	$0
		Subtotal Category 3:							**$0**	**$0**	**$0**
		Subtotal 1550E Zone:							**$0**	**$0**	**$0**
		Subtotal Above Zones:							**$33,960,000**	**$45,846,100**	**$60,915,600**

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Item No.	Cate-gory No.	Facility Name	Recommended Facilities Improvements: Description of Recommended Improvements Per the 1997 Master Plan	Changes to Recommended Improvements	Status	Size/ Capacity	Quantity	Preliminary Cost Estimate: Recommended Facilities: Unit Cost	Estimated Construction Cost (2005 $) ENR=8200	Estimated Capital Cost (2005 $) ENR=8200	Escalated Cost ($)
1305 ZONE: (Santa Rosa)											
1305-17	2	Lemon St Trans Main	Construct 3000 ft of 30-inch pipeline in Lemon from Hayes to proposed Murrieta Resvr.		Under design	30 in	3000 LF	$250.00 /LF	$750,000	$1,012,500	$1,063,100
1305-18	2	Murrieta Reservoir	Construct 3.0 MG steel tank.	Change to 5.0 MG	Under design		5.0 MG	$0.70 /gal	$3,500,000	$4,725,000	$4,961,300
		Subtotal Cateogry 2:							**$4,250,000**	**$5,737,500**	**$6,024,400**
		Subtotal 1305 Zone (Santa Rosa):							**$4,250,000**	**$5,737,500**	**$6,024,400**
		Subtotal Above Zones:							**$38,210,000**	**$51,583,600**	**$66,940,000**
GENERAL ITEMS (Santa Rosa)											
SR-1		Reservoir Site Acquisition				N/A	6	$150,000 /EA	$900,000	$1,215,000	$1,781,900
SR-2		Pump Station Site Acquisition				N/A	3	$50,000 /EA	$150,000	$202,500	$292,000
SR-3		City of Murrieta Road Imp. Allow.							$1,000,000	$1,350,000	$2,537,000
		Subtotal General Items (Santa Rosa):							**$2,050,000**	**$2,767,500**	**$4,610,900**
		SUBTOTAL SANTA ROSA DIVISION							**$40,260,000**	**$54,351,100**	**$71,550,900**

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Item No.	Cate-gory No.	Facility Name	PHASE ONE					PHASE TWO	PHASE THREE	PHASE FOUR	PHASE FIVE
			2005	2006	2007	2008	2009	2010	2015	2020	2025
2850 ZONE:											
2850-1	3	Calle Parama Reservoir Nos. 1 and 2									
2850-2	3	Bosque Pump Station									
2850-3	3	Huerto/Parama Trans Main									
2850-100 (south)	3	Redondo Mesa P.S. expansion							$288,600		
2850-101 (south)	3	Redondo Mesa Reservoir No. 2							$808,100		
		Subtotal Category 3:	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$1,096,700**	**$0**	**$0**
		Subtotal 2850 Zone:	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$1,096,700**	**$0**	**$0**

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Item No.	Cate-gory No.	Facility Name	PHASE ONE					PHASE TWO	PHASE THREE	PHASE FOUR	PHASE FIVE
			2005	2006	2007	2008	2009	2010	2015	2020	2025
2550 ZONE:											
2550-1	2	Tenaja Pump Station							$9,697,600		
2550-6	2	Baldaray P.S. Relocation/Expansion									
2550-100	2	La Cresta Reservoir							$3,717,400		
		Subtotal Category 2:	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$13,415,000**	**$0**	**$0**
		Subtotal 2550 Zone	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$9,697,600**	**$0**	**$0**
		Subtotal Above Zones	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$10,794,300**	**$0**	**$0**

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Item No.	Cate-gory No.	Facility Name	PHASE ONE					PHASE TWO	PHASE THREE	PHASE FOUR	PHASE FIVE
			2005	2006	2007	2008	2009	2010	2015	2020	2025
2260 ZONE:											
2260-1	2	Carancho Pump Station Expansion						$8,683,800			
2260-2	2	El Calamar Parallel						$2,645,900			
		Subtotal Category 2:	**$0**	**$0**	**$0**	**$0**	**$0**	**$11,329,700**	**$0**	**$0**	**$0**
		Subtotal 2260 Zone	**$0**	**$0**	**$0**	**$0**	**$0**	**$11,329,700**	**$0**	**$0**	**$0**
		Subtotal Above Zones	**$0**	**$0**	**$0**	**$0**	**$0**	**$11,329,700**	**$10,794,300**	**$0**	**$0**

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Item No.	Cate-gory No.	Facility Name	PHASE ONE					PHASE TWO	PHASE THREE	PHASE FOUR	PHASE FIVE
			2005	2006	2007	2008	2009	2010	2015	2020	2025
2160 ZONE:											
2160-3	2	Baldaray Resvr #2									
2160-10	2	La Cresta Road Parallel									
2160-11	2	Clinton Keith Parallel									
2160-12	2	Bear Cr. P.S. Expansion									
		Subtotal Category 2:	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
		Subtotal 2160 Zone:	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
		Subtotal Above Zones:	**$0**	**$0**	**$0**	**$0**	**$0**	**$11,329,700**	**$10,794,300**	**$0**	**$0**

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Item No.	Cate-gory No.	Facility Name	PHASE ONE					PHASE TWO	PHASE THREE	PHASE FOUR	PHASE FIVE
			2005	2006	2007	2008	2009	2010	2015	2020	2025
1990 ZONE:											
1990-7	3	Del Oro/La Cruz Loop Main						$687,500			
		Subtotal Category 3:	**$0**	**$0**	**$0**	**$0**	**$0**	**$687,500**	**$0**	**$0**	**$0**
		Subtotal 1990 Zone	**$0**	**$0**	**$0**	**$0**	**$0**	**$687,500**	**$0**	**$0**	**$0**
		Subtotal Above Zones:	**$0**	**$0**	**$0**	**$0**	**$0**	**$12,017,200**	**$10,794,300**	**$0**	**$0**

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Item No.	Cate-gory No.	Facility Name	PHASE ONE					PHASE TWO	PHASE THREE	PHASE FOUR	PHASE FIVE
			2005	2006	2007	2008	2009	2010	2015	2020	2025
1670 ZONE:											
1670-3a	2	Carancho Reservoir #4						$5,065,600			
1670-4	2	Via Del Verano Resvr									
1670-5	2	Del Verano Resvr Inlet									
1670-6	2	Via Pino Reservoir (Renamed Via Vaquero No. 2)					$6,030,400				
1670-7	2	Pino Resvr Inlet									
1670-10	2	De Luz Reservoir No. 3									
1670-11	2	De Luz ReservoirNo. 3 Inlet									
1670-14	2	Rancho Road Trans Main									
1670-15	2	Vaquero/De Luz Parallel Transmission Main									
1670-16	2	Sandia Creek Loop Transmission Main			$1,500,300						
1670-17	2	C. Roca/Cresta Parallel Transmission Main			$1,148,700						
1670-18	2	C. Uva/Cresta Loop Transmission Main			$907,900						
1670-100	2	Existing Carancho tanks demolition							$230,900		
		Subtotal Category 2:	**$0**	**$0**	**$3,556,900**	**$0**	**$6,030,400**	**$5,065,600**	**$230,900**	**$0**	**$0**
		Subtotal 1670 Zone:	**$0**	**$0**	**$3,556,900**	**$0**	**$6,030,400**	**$5,065,600**	**$230,900**	**$0**	**$0**
		Subtotal Above Zones:	**$0**	**$0**	**$3,556,900**	**$0**	**$6,030,400**	**$17,082,800**	**$11,025,200**	**$0**	**$0**

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Item No.	Cate-gory No.	Facility Name	PHASE ONE					PHASE TWO	PHASE THREE	PHASE FOUR	PHASE FIVE
			2005	2006	2007	2008	2009	2010	2015	2020	2025
1440 ZONE:											
1440-1	3	Los Gatos Resvr		$2,083,700							
1440-3	3	L. Gatos Rsvr Inlet		$2,076,300							
1440-101	3	Carancho Road Parallel Transmission Main			$2,004,300			$2,320,200			
1440-102	3	Los Gatos Parallel Transmission Main	$956,800								
1440-103	3	Buena Vista/Los Vientos Zone Conversion	$212,600								
1440-104	3	Los Gatos Loop Transmission Main	$396,900								
1440-105	3	Ace Bowen PS expansion			$586,000						
		Subtotal Category 3:	**$1,566,300**	**$4,160,000**	**$2,590,300**	**$0**	**$0**	**$2,320,200**	**$0**	**$0**	**$0**
		Subtotal 1440 Zone:	**$1,566,300**	**$4,160,000**	**$2,590,300**	**$0**	**$0**	**$2,320,200**	**$0**	**$0**	**$0**
		Subtotal Above Zones:	**$1,566,300**	**$4,160,000**	**$6,147,200**	**$0**	**$6,030,400**	**$19,403,000**	**$11,025,200**	**$0**	**$0**

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Item No.	Cate-gory No.	Facility Name	PHASE ONE					PHASE TWO	PHASE THREE	PHASE FOUR	PHASE FIVE
			2005	2006	2007	2008	2009	2010	2015	2020	2025
1500 ZONE (West):											
1500W-1	2	Vineyard Reservoir#1	$3,472,900								
1500W-3	2	Joaquin Ranch No. 1 P.S. Expansion									
1500W-5	2	Tenaja/Vineyard TM	$2,009,300								
1500W-6	2	Vineyard S.P. TM	$3,125,600								
1500W-7	2	Bear Creek Resvr Parallel TM					$1,628,200				
1500W-100	2	Bear Creek Resvr No. 2					$1,809,100				
1500W-101	2	Joaquin Ranch No. 1 P.S. further expansion					$538,400				
		Subtotal Category 2:	**$8,607,800**	**$0**	**$0**	**$0**	**$3,975,700**	**$0**	**$0**	**$0**	**$0**
		Subtotal 1500W Zone:	**$8,607,800**	**$0**	**$0**	**$0**	**$3,975,700**	**$0**	**$0**	**$0**	**$0**
		Subtotal Above Zones:	**$10,174,100**	**$4,160,000**	**$6,147,200**	**$0**	**$10,006,100**	**$19,403,000**	**$11,025,200**	**$0**	**$0**

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Santa Rosa Division

Item No.	Cate-gory No.	Facility Name	PHASE ONE					PHASE TWO	PHASE THREE	PHASE FOUR	PHASE FIVE
			2005	2006	2007	2008	2009	2010	2015	2020	2025
1500 ZONE (East, Formerly 1432 Zone):											
1500E-10	2	Cross Zone Transmission Main		$0							
		Subtotal Category 2:	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
		Subtotal 1550E Zone:	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
		Subtotal Above Zones:	**$10,174,100**	**$4,160,000**	**$6,147,200**	**$0**	**$10,006,100**	**$19,403,000**	**$11,025,200**	**$0**	**$0**

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Santa Rosa Division

Item No.	Cate-gory No.	Facility Name	PHASE ONE 2005	2006	2007	2008	2009	PHASE TWO 2010	PHASE THREE 2015	PHASE FOUR 2020	PHASE FIVE 2025
1305 ZONE: (Santa Rosa)											
1305-17	2	Lemon St Trans Main	$1,063,100								
1305-18	2	Murrieta Reservoir	$4,961,300								
		Subtotal Cateogry 2:	**$6,024,400**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
		Subtotal 1305 Zone (Santa Rosa):	**$6,024,400**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
		Subtotal Above Zones:	**$16,198,500**	**$4,160,000**	**$6,147,200**	**$0**	**$10,006,100**	**$19,403,000**	**$11,025,200**	**$0**	**$0**
GENERAL ITEMS (Santa Rosa)											
SR-1		Reservoir Site Acquisition	$425,300		$234,400	$246,100	$258,400	$271,400	$346,300		
SR-2		Pump Station Site Acquisition					$86,100	$90,500	$115,400		
SR-3		City of Murrieta Road Imp. Allow.	$61,600	$64,700	$68,000	$71,400	$74,900	$236,000	$502,000	$640,700	$817,700
		Subtotal General Items (Santa Rosa):	**$486,900**	**$64,700**	**$302,400**	**$317,500**	**$419,400**	**$597,900**	**$963,700**	**$640,700**	**$817,700**
		SUBTOTAL SANTA ROSA DIVISION	**$16,685,400**	**$4,224,700**	**$6,449,600**	**$317,500**	**$10,425,500**	**$20,000,900**	**$11,988,900**	**$640,700**	**$817,700**

Table 9.2
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Recommended Capital Improvement Projects
Rancho Division

Item No.	Cate-gory No.	Facility Name	Description of Recommended Improvements Per the 1997 Master Plan	Changes to Recommended Improvements	Status	Size/ Capacity	Quantity	Preliminary Cost Estimate: Recommended Facilities			
								Unit Cost	Estimated Construction Cost (2005 $) ENR=8200	Estimated Capital Cost (2005 $) ENR=8200	Escalated Cost ($)
2600 ZONE:											
2600-1	3	2600 Reservoir	Construct 1.0 MG steel tank.				1.0 MG	$0.70 /gal	$700,000	$945,000	$1,266,400
2600-2	3	2600 Pump Station	Construct 750 gpm (500 firm) pump station @ Ladera Vista Glen Oaks Resvr. 150 HP.	Increase to 600 firm		600 gpm	200 HP	$3,000.00 /HP	$600,000	$810,000	$1,085,500
2600-3	3	2600 Trans Main	Construct 10,600 ft of 12-inch pipeline between 2600 P.S. and 2600 Resvr.			12 in	10600 LF	$100.00 /LF	$1,060,000	$1,431,000	$1,917,700
		Subtotal Category 3:							**$2,360,000**	**$3,186,000**	**$4,269,600**
		Subtotal 2600 Zone							**$2,360,000**	**$3,186,000**	**$4,269,600**

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Status of 1997 Capital Improvement Projects &
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Item No.	Category No.	Facility Name	Description of Recommended Improvements Per the 1997 Master Plan	Changes to Recommended Improvements	Status	Size/ Capacity	Quantity	Preliminary Cost Estimate: Recommended Facilities			Escalated Cost ($)
								Unit Cost	Estimated Construction Cost (2005 $) ENR=8200	Estimated Capital Cost (2005 $) ENR=8200	
2350 ZONE:											
2350-1	3	Calle Breve Pump Station Expansion	Exist P.S. has two units: two @ 125HP 500 gpm Add one addtl unit: one @ 125HP 500 gpm Total = 1500gpm, Firm = 1000 gpm		Completed, tested in 2004 at 1,200 gpm firm				$0	$0	$0
2350-2	3	Calaveras Reservoir #2	Construct 0.5 MG steel tank adjacent to exist reservoir.[1]				0.5 MG	$0.70 /gal	$350,000	$472,500	$808,100
2350-3	3	2070 to 2350 Zone Conversion I	Construct 6500 ft of 12-inch pipeline fr C. Breve P.S. discharge in De Portola and Camino Sierra.		Cancel				$0	$0	$0
		Subtotal Category 3:							**$350,000**	**$472,500**	**$808,100**
		Subtotal 2350 Zone							**$350,000**	**$472,500**	**$808,100**
		Subtotal Above Zones							**$2,710,000**	**$3,658,500**	**$5,077,700**

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Status of 1997 Capital Improvement Projects &
Recommended Capital Improvement Projects
Rancho Division

Item No.	Cate-gory No.	Facility Name	Description of Recommended Improvements Per the 1997 Master Plan	Changes to Recommended Improvements	Status	Size/ Capacity	Quantity	Preliminary Cost Estimate: Recommended Facilities			Escalated Cost ($)
								Unit Cost	Estimated Construction Cost (2005 $) ENR=8200	Estimated Capital Cost (2005 $) ENR=8200	
2070 ZONE: 2070-100	2	Portola Dr/ Cordova Dr Parallel		Construct approx. 5,000 ft of 16-inch pipeline between Portola P.S. and Glenoaks/ Portola Dr intersection	ONLY NEED IF DE PORTOLA PS OPERATES AT FULL CAP; HOWEVER, FULL CAPACITY NOT NEEDED BASED ON ULTIMATE DEMANDS	16 in	5000 LF	150 /LF	$750,000	$1,012,500	$1,230,700
		Subtotal Category 2:							**$750,000**	**$1,012,500**	**$1,230,700**
		Subtotal 2070 Zone							**$750,000**	**$1,012,500**	**$1,230,700**
		Subtotal Above Zones							**$3,460,000**	**$4,671,000**	**$6,308,400**

Table 9.2
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Status of 1997 Capital Improvement Projects &
Recommended Capital Improvement Projects
Rancho Division

Item No.	Cate-gory No.	Facility Name	Description of Recommended Improvements Per the 1997 Master Plan	Changes to Recommended Improvements	Status	Size/ Capacity	Quantity	Preliminary Cost Estimate: Recommended Facilities			Escalated Cost ($)
								Unit Cost	Estimated Construction Cost (2005 $) ENR=8200	Estimated Capital Cost (2005 $) ENR=8200	
1790 ZONE:											
1790-2	2	Mesa Dr Resvr	Construct 3.3 MG steel tank near Mesa Dr. HWL = 1790 ft.	Renamed "Tucalota" and currently under design at 3.5 MG.	Under Design		3.5 MG	$0.70 /gal	$2,450,000	$3,307,500	$3,472,900
1790-7	2	Buck Road Parallel Trans Main	Construct 3,000 ft of 24-inch pipeline in Buck Rd btw Buck Mesa P.S. and Rancho Cal Rd.	Due to proposed expansion of Los Caballos instead of Buck Mesa PS, parallel not needed	Cancel				$0	$0	$0
1790-8	2	Mesa Resvr Trans Main (Tucalota TM)	Construct 5,400 ft of 24-inch pipeline in Glenoaks Rd. and Mesa Rd to proposed Mesa Resvrs.	Renamed "Tucalota" TM - relocate to E. Benton and Calle Jojoba	Under Design	24 in	5400 LF	$225.00 /LF	$1,215,000	$1,640,250	$1,722,300
1790-100	2	Los Caballos PS expansion		Expand Pumping Cap from 4,000 GPM (2004 Test) to 5,700 GPM		1,700 gpm	400 HP	$2,500.00 /HP	$1,000,000	$1,350,000	$1,809,100
1790-101	2	Demolition of De Portola Res. No. 1; replace with new tank		Remove old tank (2.2 MG) Construct new tank at 3.5 MG			3.5 MG	$1.00 /gal	$3,500,000	$4,725,000	$6,332,000
		Subtotal Category 2:							**$8,165,000**	**$11,022,750**	**$13,336,300**
		Subtotal 1790 Zone							**$8,165,000**	**$11,022,750**	**$13,336,300**
		Subtotal Above Zones							**$11,625,000**	**$15,693,750**	**$19,644,700**

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Rancho Division

Item No.	Cate-gory No.	Facility Name	Description of Recommended Improvements Per the 1997 Master Plan	Changes to Recommended Improvements	Status	Size/ Capacity	Quantity	Preliminary Cost Estimate: Recommended Facilities			Escalated Cost ($)
								Unit Cost	Estimated Construction Cost (2005 $) ENR=8200	Estimated Capital Cost (2005 $) ENR=8200	
1610 ZONE:											
1610-4	2	Buck Mesa Resvr #3	Construct 6.0 MG steel tank near existing Buck Mesa Resvrs.			6.0 MG	6.0 MG	$0.70 /gal	$4,200,000	$5,670,000	$7,598,300
1610-5	2	Anza Rd Parallel Trans Main	Construct 10,800 ft of 24-inch pipeline in Anza Rd from Anza Pump Station to R.C. Rd.	Reduce length to 5400 ft: from Anza P.S. to Madera De Playa	Not needed if RC PS and 1380 Zone upgrades (1610-101 and 1380-100) are constructed	24 in	5400 LF	$225.00 /LF	$1,215,000	$1,640,250	$2,198,100
1610-6	2	Anza Pump Station Expansion	Add pump units 5, 6 and 7. 250 HP and 2300 gpm each.	Revise capacity of each proposed pump unit to 2350 gpm, total firm cap = 11,000 gp	Station tested (2004) at 4,000 gpm firm Expansion depends on RC #1 expansion	7000 gpm	900 HP	$3,000.00 /HP	$2,700,000	$3,645,000	$4,884,600
1610-7	2	Vista Del Monte Loop Trans Main	Construct 1,900 ft of 30-inch pipeline in Butterfield Stage Rd. between La Serena and Vista Del Monte.		Completed as 16"						
1610-100	2	Buck Mesa Reservoir #3 Inlet/Outlet		Construct 6,000 ft of 24-inch within El Sol Road north from Buck Mesa to potential Tank #3 site		24 in	6000 LF	$225.00 /LF	$1,350,000	$1,822,500	$2,215,300
1610-101	2	Rancho California P.S. #1 expansion		Increase station firm cap to 10,000 gpm	Station tested (2004) at 6,600 gpm firm Expansion depends on Anza expansion	3400 gpm	450 HP	$2,500.00 /HP	$1,125,000	$1,518,750	$2,035,300
		Subtotal Category 2:							**$10,590,000**	**$14,296,500**	**$18,931,600**
		Subtotal 1610 Zone							**$10,590,000**	**$14,296,500**	**$18,931,600**
		Subtotal Above Zones							**$22,215,000**	**$29,990,250**	**$38,576,300**

Table 9.2
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Status of 1997 Capital Improvement Projects &
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Item No.	Cate-gory No.	Facility Name	Description of Recommended Improvements Per the 1997 Master Plan	Changes to Recommended Improvements	Status	Size/ Capacity	Quantity	Preliminary Cost Estimate: Recommended Facilities			Escalated Cost ($)
								Unit Cost	Estimated Construction Cost (2005 $) ENR=8200	Estimated Capital Cost (2005 $) ENR=8200	
1550 ZONE:											
1550-2	3	Monte Verde Trans Main/Parallel	Construct 6,500 ft of 12-inch in Anza Monte Verde, and Los Caballas Rd.		Upsize to 24", depends if 1550 is supply zone to Vail	24 in	6500 LF	$225.00 /LF	$1,462,500	$1,974,375	$2,519,900
1550-3	3	Los Caballos Trans Main	Construct 3,600 ft of 16-inch in Los Caballos		Completed				$0	$0	$0
1550-4	3	Highway 79 Trans Main	Construct 2,600 ft. of 16-inch in Highway 79	Increase length to 5400LF and upsize to 24 for potential supply to Vail	Upsize to 24", depends if 1550 is supply zone to Vail	24 in	2600 LF	$225.00 /LF	$585,000	$789,750	$1,007,900
1550-5	3	Future Transmission Main (name not determined)	Construct 1,400 ft. of 16-inch in easements from Hwy 79 to Los Corralitos		Upsize to 24", depends if 1550 is supply zone to Vail	24 in	1400 LF	$225.00 /LF	$315,000	$425,250	$569,900
1550-6	3	Los Corralitos Trans Main	Construct 2,300 ft. of 16-inch in Los Corralitos		Upsize to 24", depends if 1550 is supply zone to Vail	24 in	2300 LF	$225.00 /LF	$517,500	$698,625	$936,200
1550-7	3	Pauba Trans Main	Construct 3,300 ft. of 16-inch in Pauba		Upsize to 24", depends if 1550 is supply zone to Vail	24 in	3300 LF	$225.00 /LF	$742,500	$1,002,375	$1,343,300
1550-8	3	1640 (1675 Zone) to 1550 Pressure Reducing Station	Construct Pressure Reducing Station between 1640 (1675) and 1550 Zones				1	Lump Sum	$100,000	$135,000	$180,900
1550-9	3	Alvarez Reservoir No. 2	Construct 2.2 MG tank		Completed as El Chimisal #3				$0	$0	$0
1550-100	3	Highway 79 Trans Main Parallel/ Upsize		Extend length to Alverez P.S. with parallel existing 24" pipeline in Highway 79S (to include future Vail demands)		24 in	4500 LF	$225.00 /LF	$1,012,500	$1,366,875	$1,744,500
1550-101	3	Alvarez PS expansion		Expand from 1,300 gpm (2004 test) to 9,200 gpm (to incl. future Vail demands)	Expansion cap depends if 1550 is supply zone to Vail	7900 gpm	800 HP	$3,000.00 /HP	$2,400,000	$3,240,000	$3,572,100
1550-102	3	El Chimisal Reservoir No. 4		Construct a new 1.0 MG tank		1.0 MG	1.0 MG	$0.70 /gal	$700,000	$945,000	$1,266,400
1550-103	3	Anza Road Transmission Main		Construct 4,000 LF of 16-inch in Anza Road from El Mirador Corte and continue west.		16 in	4000 LF	$150.00 /LF	$600,000	$810,000	$1,085,500
		Subtotal Category 3:							**$8,435,000**	**$11,387,250**	**$14,226,600**
		Subtotal 1550 Zone							**$8,435,000**	**$11,387,250**	**$14,226,600**
		Subtotal Above Zones							**$30,650,000**	**$41,377,500**	**$52,802,900**

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								Unit Cost	Estimated Construction Cost (2005 $) ENR=8200	Estimated Capital Cost (2005 $) ENR=8200	
1485 ZONE:											
1485-2	3	El Chimisal Resvr #2	Construct 6.2 MG steel tank near El Chimisal Rd.		Completed				$0	$0	$0
1485-4	3	Nicolas Resvr	Construct 7.0 MG steel tank north of Nicolas Road.		Completed as 3.5 MG tank				$0	$0	$0
1485-8	3	Meadows Parkway Trans Main	Construct 6,700 ft of 16-inch pipeline in Meadows Pkwy from De Portola to Pauba.	Revise length to 3,500 LF	3,200 LF constructed	16 in	3500 LF	$150.00 /LF	$525,000	$708,750	$820,500
1485-13	3	Meadows Parkway Trans Main	Construct 5,100 ft of 24-inch pipeline in Meadows Pkwy from Rancho CA to LaSerena		Completed				$0	$0	$0
1485-14	3	Rancho Cal Rd. Trans Main	Construct 2,000 ft of 16-inch pipeline in Rancho Cal Rd from BS Rd to Margarita Rd.		Cancelled				$0	$0	$0
1485-19	3	Unnamed Trans Main	Construct 2,000 ft of 16-inch pipeline.		Completed as 12"				$0	$0	$0
1485-21	3	Fairview Ave. Trans Main	Construct 3,000 ft of 16-inch pipeline in Fairview Avenue.		Completed				$0	$0	$0
1485-24	3	Butterfield Stage Rd Trans Main	Construct 4,700 ft of 30-inch pipeline in B.St. Rd from R.C. Road to La Serena.		Completed				$0	$0	$0
1485-26	3	La Serena Parallel Trans Main	Construct 400 ft of 30-inch pipeline in La Serena from B.St. Rd to Walcott Ln.		Completed				$0	$0	$0
1485-27	3	Walcott/Nicolas Trans Main	Construct 3,100 ft of 30-inch pipeline in Walcott Ln and Nicolas Rd		Completed						
1485-28	3	Nicolas Resvr Inlet Trans Main	Construct 5,000 ft of 30-inch pipeline to Nicolas Resvrs.		Completed as a 24"				$0	$0	$0
1485-100	3	Rancho Ca No. 2 P.S. Expansion		Expand from 2,600 gpm firm (2004 test) to 6,300 gpm	Help to relieve burden on Butterfield Stage PS and discharge system	3700 gpm	300 HP	$2,500.00 /HP	$750,000	$1,012,500	$1,731,700
		Subtotal Category 3:							**$1,275,000**	**$1,721,250**	**$2,552,200**
		Subtotal 1485 Zone							**$1,275,000**	**$1,721,250**	**$2,552,200**
		Subtotal Above Zones							**$31,925,000**	**$43,098,750**	**$55,355,100**

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Item No.	Cate-gory No.	Facility Name	Description of Recommended Improvements Per the 1997 Master Plan	Changes to Recommended Improvements	Status	Size/ Capacity	Quantity	Preliminary Cost Estimate: Recommended Facilities			Escalated Cost ($)
								Unit Cost	Estimated Construction Cost (2005 $) ENR=8200	Estimated Capital Cost (2005 $) ENR=8200	
1380 ZONE:											
1380-1	2	Meadowview PS Upgrade	Expand to 15,000 gpm firm		NOT complete, based on 2004 pump test, tested at 6900 gpm firm	8100 gpm	550 HP	$3,000.00 /HP	$1,650,000	$2,227,500	$2,455,800
1380-7	2	La Serena/Meadows Loop Completion	Construct 5,400 ft of 24-inch pipeline between exist La Serena Main and G. Kearny Rsvr Inlet.		Completed				$0	$0	$0
1380-12	2	Meadowview Loop Compl Trans Main	Construct 2,800 ft of 12-inch in Del Rey and Buene Suerte.			12 in	2800 LF	$100.00 /LF	$280,000	$378,000	$416,700
1380-17	3	Winchester Resvr #2	Construct 2.0 MG steel tank.	Revise to 5.0 MG			5.0 MG	$0.70 /gal	$3,500,000	$4,725,000	$8,081,400
1380-19	3	Winchester Rd Parallel/Ynez Rd. Connection Trans Mains	Convert existing 16-inch to 1380, construct 3,800 ft of 16-inch pipeline between Winchester Rd and Ynez		Cancel. Harveston development projects provide the looping that was intended.				$0	$0	$0
1380-100	2	Rancho Cal Rd 24-inch parallel		Construct 5,500 ft of 24-inch in RC Rd from Yukon to Margarita for increased suction-side capacity for RC Pump Stations, caused by increased 1485 projected demand and may replace the need for CIP 1610-5		24 in	5500 LF	$225.00 /LF	$1,237,500	$1,670,625	$2,238,800
1380-101	2	Anza I/O 24-inch parallel		Construct ~1,000 ft of 24" parallel to existing I/O pipe for Anza Res		24 in	1000 LF	$225.00 /LF	$225,000	$303,750	$369,200
1380-102	2	Anza/Hwy 79S 20-inch parallel		Construct 3,000 ft of 20" in Anza Rd and Hwy 79S for suction to Alvarez PS		20 in	3000 LF	$200.00 /LF	$600,000	$810,000	$984,600
1380-103	2	Hwy 79S 12-inch parallel		Contruct 4,000 ft of 12-inch parallel to ex. 12" west from Alvarez PS (local area demand increase)		12 in	4000 LF	$100.00 /LF	$400,000	$540,000	$656,400
1380-104	2	Anza Resvr #2		Construct 6.0 MG steel tank for 15 hrs of storage, or as site constraints allow			6.0 MG	$0.70 /gal	$4,200,000	$5,670,000	$6,891,900
1380-105	2	Los Caballos PS (1305 to 1380)		Construct Los Caballos PS - 2000 gpm firm; expand existing or construct in new bldg)		2000 gpm	150 HP	$3,000.00 /HP	$450,000	$607,500	$738,400
		Subtotal Category 2:							**$9,042,500**	**$12,207,375**	**$14,751,800**
		Subtotal Category 3:							**$3,500,000**	**$4,725,000**	**$8,081,400**
		Subtotal 1380 Zone							**$12,542,500**	**$16,932,375**	**$22,833,200**
		Subtotal Above Zones							**$44,467,500**	**$60,031,125**	**$78,188,300**

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								Unit Cost	Estimated Construction Cost (2005 $) ENR=8200	Estimated Capital Cost (2005 $) ENR=8200	Escalated Cost ($)
1305 ZONE (Rancho):											
1305-19	2	Rainbow Canyon Trans Main	Construct 7900 ft of 30-inch pipeline in Rainbow Cyn from Hwy 79 to prop Rainbow Resvrs.			30 in	7900 LF	$250.00 /LF	$1,975,000	$2,666,250	$4,560,200
1305-20	2	Rainbow Resvr #1	Construct 3.0 MG steel tank.				3.0 MG	$0.70 /gal	$2,100,000	$2,835,000	$4,848,800
1305-21	2	Rainbow Resvr #2	Construct 3.0 MG steel tank.				3.0 MG	$0.70 /gal	$2,100,000	$2,835,000	$4,848,800
1305-22	2	Rainbow Canyon TM Bridge Crossing	Construct 400 feet of 30-inch pipeline		Complete				$0	$0	$0
1305-23	2	Front St. Waterline Replacement	Construct 3700 ft of 24-inch pipeline		Complete				$0	$0	$0
1305-100	2	Diaz Road "water quality" 12-inch pipeline		Construct 4,000 lf of 12-inch in Diaz Road from Winchester Rd to Cherry Street	Completed as 16-inch						
1305-101	2	Winchester Road Parallel		Construct parallel 3,200 LF of 24-inch in Winchester Road easterly from Ynez to ex. 36-inch TM	Based on increased Winchest. PS capacity to operate safely with 1305 wells off	24 in	3200 LF	$225.00 /LF	$720,000	$972,000	$1,662,400
1305-102	2	Margarita Road Parallel		Construct 2,000 lf of 24-inch suction TM in Margarita Road for Winch. PS	Based on increased Winchest. PS capacity to operate safely with 1305 wells off	24 in	2000 LF	$225.00 /LF	$450,000	$607,500	$1,039,000
		Subtotal Category 2:							**$7,345,000**	**$9,915,750**	**$16,959,200**
		Subtotal 1305 Zone							**$7,345,000**	**$9,915,750**	**$16,959,200**
		Subtotal Above Zones							**$51,812,500**	**$69,946,875**	**$95,147,500**

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								Unit Cost	Estimated Construction Cost (2005 $) ENR=8200	Estimated Capital Cost (2005 $) ENR=8200	
RAINBOW GAP AREA											
1540 ZONE (Proposed)											
1540-1	3	1540 Zone Pump Station	Construct 3600 gpm PS near 1305 Zone Vinyard Reservoir			1000 gpm	150 HP	$3,000.00 /HP	$450,000	$607,500	$1,039,000
1540-2	3	1540 Zone Reservoir	Construct 2.3 MG Reservoir	Reduce to 1.0 MG for RCWD Service Area only.			1.0 MG	$0.70 /gal	$700,000	$945,000	$1,616,300
1540-3	3	1540 Zone Trans Main	Construct 4500 feet of 20-inch trans main	Reduce to 12 inch for RCWD Service Area only.		12 in	4500 LF	$100.00 /LF	$450,000	$607,500	$1,039,000
1540-4	3	1540 Zone Trans Main	Construct 7000 feet of 16-inch trans main from the 1540 Zone Reservoir South, portion to be jack and bored Includes 500 foot jack casing cost.		Cancel				$0	$0	$0
		Subtotal Category 3:							**$1,600,000**	**$2,160,000**	**$3,694,300**
		Subtotal 1540 Zone							**$1,600,000**	**$2,160,000**	**$3,694,300**
		Subtotal Above Zones							**$53,412,500**	**$72,106,875**	**$98,841,800**

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								Unit Cost	Estimated Construction Cost (2005 $) ENR=8200	Estimated Capital Cost (2005 $) ENR=8200	
VAIL LAKE											
1675 ZONE:											
1675-1	2	1675 Reservoir					1.0 MG	$0.70 /gal	$700,000	$945,000	$1,266,400
1675-2	2	1675 Trans Main				24 in	12650 LF	$225.00 /LF	$2,846,250	$3,842,438	$5,149,200
1675-3	2	1305 to 1675 Pump Station		Revised to 4900 gpm firm capacity		4900 gpm	1100 HP	$3,500.00 /HP	$3,850,000	$5,197,500	$6,965,100
		Subtotal Category 2:							**$7,396,250**	**$9,984,938**	**$13,380,700**
		Subtotal Vail Lake 1675 Zone							**$7,396,250**	**$9,984,938**	**$13,380,700**
		Subtotal Above Zones							**$60,808,750**	**$82,091,813**	**$112,222,500**

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								Unit Cost	Estimated Construction Cost (2005 $) ENR=8200	Estimated Capital Cost (2005 $) ENR=8200	
1850 ZONE											
1850-1	3	1850 Reservoir					4.3 MG	$0.70 /gal	$3,010,000	$4,063,500	$5,445,500
1850-2	3	1850 Pump Station				2500 gpm	350 HP	$3,000.00 /HP	$1,050,000	$1,417,500	$1,899,600
1850-3	3	1850 Trans Main				24 in	5100 LF	$225.00 /LF	$1,147,500	$1,549,125	$2,076,000
1850-4	3	1850 Trans Main				30 in	1800 LF	$250.00 /LF	$450,000	$607,500	$814,100
1850-5	3	1850 Trans Main				24 in	2600 LF	$225.00 /LF	$585,000	$789,750	$1,058,300
1850-6	3	1850 Trans Main				16 in	9900 LF	$150.00 /LF	$1,485,000	$2,004,750	$2,686,600
1850-7	3	1850 Trans Main				20 in	14900 LF	$200.00 /LF	$2,980,000	$4,023,000	$5,391,200
1850-8	3	1850 Trans Main				20 in	5800 LF	$200.00 /LF	$1,160,000	$1,566,000	$2,098,600
		Subtotal Category 3:							**$11,867,500**	**$16,021,125**	**$21,469,900**
		Subtotal Vail Lake 1850 Zone							**$11,867,500**	**$16,021,125**	**$21,469,900**
		Subtotal Above Zones							**$72,676,250**	**$98,112,938**	**$133,692,400**
GENERAL ITEMS (Rancho)											
R-1		Reservoir Site Acquisition				N/A	9	$150,000 /EA	$1,350,000	$1,822,500	$1,781,900
R-2		Pump Station Site Acquisition				N/A	6	$50,000 /EA	$300,000	$405,000	$636,800
R-3		City of Temecula Road Imp. Allowance							$1,000,000	$1,350,000	$4,375,900
		Subtotal General Items (Rancho):							**$2,650,000**	**$3,577,500**	**$6,794,600**
		SUBTOTAL RANCHO DIVISION							**$75,326,250**	**$101,690,438**	**$140,487,000**

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			2005	2006	2007	2008	2009	2010	2015	2020	2025
2600 ZONE:											
2600-1	3	2600 Reservoir						$1,266,400			
2600-2	3	2600 Pump Station						$1,085,500			
2600-3	3	2600 Trans Main						$1,917,700			
		Subtotal Category 3:	**$0**	**$0**	**$0**	**$0**	**$0**	**$4,269,600**	**$0**	**$0**	**$0**
		Subtotal 2600 Zone	**$0**	**$0**	**$0**	**$0**	**$0**	**$4,269,600**	**$0**	**$0**	**$0**

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			2005	2006	2007	2008	2009	2010	2015	2020	2025
2350 ZONE:											
2350-1	3	Calle Breve Pump Station Expansion						$0			
2350-2	3	Calaveras Reservoir #2							$808,100		
2350-3	3	2070 to 2350 Zone Conversion I									
		Subtotal Category 3:	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$808,100**	**$0**	**$0**
		Subtotal 2350 Zone	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$808,100**	**$0**	**$0**
		Subtotal Above Zones	**$0**	**$0**	**$0**	**$0**	**$0**	**$4,269,600**	**$808,100**	**$0**	**$0**

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			2005	2006	2007	2008	2009	2010	2015	2020	2025
2070 ZONE:											
2070-100	2	Portola Dr/ Cordova Dr Parallel				$1,230,700					
		Subtotal Category 2:	**$0**	**$0**	**$0**	**$1,230,700**	**$0**	**$0**	**$0**	**$0**	**$0**
		Subtotal 2070 Zone	**$0**	**$0**	**$0**	**$1,230,700**	**$0**	**$0**	**$0**	**$0**	**$0**
		Subtotal Above Zones	**$0**	**$0**	**$0**	**$1,230,700**	**$0**	**$4,269,600**	**$808,100**	**$0**	**$0**

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			2005	2006	2007	2008	2009	2010	2015	2020	2025
1790 ZONE:											
1790-2	2	Mesa Dr Resvr	$3,472,900								
1790-7	2	Buck Road Parallel Trans Main									
1790-8	2	Mesa Resvr TM (Tucalota TM)	$1,722,300								
1790-100	2	Los Caballos PS expansion						$1,809,100			
1790-101	2	Demolition of De Portola Res. No. 1; replace with new tank						$6,332,000			
		Subtotal Category 2:	**$5,195,200**	**$0**	**$0**	**$0**	**$0**	**$8,141,100**	**$0**	**$0**	**$0**
		Subtotal 1790 Zone	**$5,195,200**	**$0**	**$0**	**$0**	**$0**	**$8,141,100**	**$0**	**$0**	**$0**
		Subtotal Above Zones	**$5,195,200**	**$0**	**$0**	**$1,230,700**	**$0**	**$12,410,700**	**$808,100**	**$0**	**$0**

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1610 ZONE:											
1610-4	2	Buck Mesa Resvr #3						$7,598,300			
1610-5	2	Anza Rd Parallel Trans Main						$2,198,100			
1610-6	2	Anza Pump Station Expansion						$4,884,600			
1610-7	2	Vista Del Monte Loop Trans Main									
1610-100	2	Buck Mesa Reservoir #3 Inlet/Outlet				$2,215,300					
1610-101	2	Rancho California P.S. #1 expansion						$2,035,300			
		Subtotal Category 2:	**$0**	**$0**	**$0**	**$2,215,300**	**$0**	**$16,716,300**	**$0**	**$0**	**$0**
		Subtotal 1610 Zone	**$0**	**$0**	**$0**	**$2,215,300**	**$0**	**$16,716,300**	**$0**	**$0**	**$0**
		Subtotal Above Zones	**$5,195,200**	**$0**	**$0**	**$3,446,000**	**$0**	**$29,127,000**	**$808,100**	**$0**	**$0**

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			2005	2006	2007	2008	2009	2010	2015	2020	2025
1550 ZONE:											
1550-2	3	Monte Verde Trans Main					$2,519,900				
1550-3	3	Los Caballos Trans Main									
1550-4	3	Highway 79 Trans Main					$1,007,900				
1550-5	3	Future Transmission Main (name not determined)						$569,900			
1550-6	3	Los Corralitos Trans Main						$936,200			
1550-7	3	Pauba Trans Main						$1,343,300			
1550-8	3	1640 (1675 Zone) to 1550 Pressure Reducing Station						$180,900			
1550-9	3	Alvarez Reservoir No. 2									
1550-100	3	Highway 79 TM Parallel/ Upsize					$1,744,500				
1550-101	3	Alvarez PS expansion		$3,572,100							
1550-102	3	El Chimisal Reservoir No. 4							$1,266,400		
1550-103	3	Anza Road Transmission Main							$1,085,500		
		Subtotal Category 3:	**$0**	**$3,572,100**	**$0**	**$0**	**$5,272,300**	**$3,030,300**	**$2,351,900**	**$0**	**$0**
		Subtotal 1550 Zone	**$0**	**$3,572,100**	**$0**	**$0**	**$5,272,300**	**$3,030,300**	**$2,351,900**	**$0**	**$0**
		Subtotal Above Zones	**$5,195,200**	**$3,572,100**	**$0**	**$3,446,000**	**$5,272,300**	**$32,157,300**	**$3,160,000**	**$0**	**$0**

Table 9.2
Rancho California Water District
Water Facilities Master Plan Update
Status of 1997 Capital Improvement Projects &
Recommended Capital Improvement Projects
Rancho Division

Item No.	Cate-gory No.	Facility Name	PHASE ONE 2005	2006	2007	2008	2009	PHASE TWO 2010	PHASE THREE 2015	PHASE FOUR 2020	PHASE FIVE 2025
1485 ZONE:											
1485-2	3	El Chimisal Resvr #2									
1485-4	3	Nicolas Resvr									
1485-8	2	Meadows Parkway Trans Main			$820,500						
1485-13	3	Meadows Parkway Trans Main									
1485-14	3	Rancho Cal Rd. Trans Main									
1485-19	2	Unnamed Trans Main									
1485-21	3	Fairview Ave. Trans Main									
1485-24	3	Butterfield Stage Rd Trans Main									
1485-26	3	La Serena Parallel Trans Main									
1485-27	3	Walcott/Nicolas Trans Main									
1485-28	3	Nicolas Resvr Inlet Trans Main									
1485-100	3	Rancho Ca No. 2 P.S. Expansion							$1,731,700		
		Subtotal Category 3:	**$0**	**$0**	**$820,500**	**$0**	**$0**	**$0**	**$1,731,700**	**$0**	**$0**
		Subtotal 1485 Zone	**$0**	**$0**	**$820,500**	**$0**	**$0**	**$0**	**$1,731,700**	**$0**	**$0**
		Subtotal Above Zones	**$5,195,200**	**$3,572,100**	**$820,500**	**$3,446,000**	**$5,272,300**	**$32,157,300**	**$4,891,700**	**$0**	**$0**

Table 9.2
Rancho California Water District
Water Facilities Master Plan Update
Status of 1997 Capital Improvement Projects &
Recommended Capital Improvement Projects
Rancho Division

Item No.	Cate-gory No.	Facility Name	PHASE ONE					PHASE TWO	PHASE THREE	PHASE FOUR	PHASE FIVE
			2005	2006	2007	2008	2009	2010	2015	2020	2025
1380 ZONE:											
1380-1	2	Meadowview PS Upgrade		$2,455,800							
1380-7	2	La Serena/Meadows Loop Completion		$0							
1380-12	2	Meadowview Loop Compl Trans Main		$416,700							
1380-17	3	Winchester Resvr #2							$8,081,400		
1380-19	3	Winchester Rd Parallel/Ynez Rd. Connection Trans Mains									
1380-100	2	Rancho Cal Rd 24-inch parallel						$2,238,800			
1380-101	2	Anza I/O 24-inch parallel				$369,200					
1380-102	2	Anza/Hwy 79S 20-inch parallel				$984,600					
1380-103	3	Hwy 79S 12-inch parallel				$656,400					
1380-104	3	Anza Resvr #2				$6,891,900					
1380-105	3	Los Caballos PS (1305 to 1380)				$738,400					
		Subtotal Category 2:	**$0**	**$2,872,500**	**$0**	**$9,640,500**	**$0**	**$2,238,800**	**$0**	**$0**	**$0**
		Subtotal Category 3:	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$8,081,400**	**$0**	**$0**
		Subtotal 1380 Zone	**$0**	**$2,872,500**	**$0**	**$9,640,500**	**$0**	**$2,238,800**	**$8,081,400**	**$0**	**$0**
		Subtotal Above Zones	**$5,195,200**	**$6,444,600**	**$820,500**	**$13,086,500**	**$5,272,300**	**$34,396,100**	**$12,973,100**	**$0**	**$0**

Table 9.2
Rancho California Water District
Water Facilities Master Plan Update
Status of 1997 Capital Improvement Projects &
Recommended Capital Improvement Projects
Rancho Division

Item No.	Cate-gory No.	Facility Name	PHASE ONE					PHASE TWO	PHASE THREE	PHASE FOUR	PHASE FIVE
			2005	2006	2007	2008	2009	2010	2015	2020	2025
1305 ZONE (Rancho):											
1305-19	2	Rainbow Canyon Trans Main							$4,560,200		
1305-20	2	Rainbow Resvr #1							$4,848,800		
1305-21	2	Rainbow Resvr #2							$4,848,800		
1305-22	2	Rainbow Canyon TM Bridge xing									
1305-23	2	Front St. Waterline Replacement									
1305-100	2	Diaz Road "water quality" 12-inch TM									
1305-101	2	Winchester Road Parallel							$1,662,400		
1305-102	2	Margarita Road Parallel							$1,039,000		
		Subtotal Category 2:	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$16,959,200**	**$0**	**$0**
		Subtotal 1305 Zone	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$16,959,200**	**$0**	**$0**
		Subtotal Above Zones	**$5,195,200**	**$6,444,600**	**$820,500**	**$13,086,500**	**$5,272,300**	**$34,396,100**	**$29,932,300**	**$0**	**$0**

Table 9.2
Rancho California Water District
Water Facilities Master Plan Update
Status of 1997 Capital Improvement Projects &
Recommended Capital Improvement Projects
Rancho Division

Item No.	Cate-gory No.	Facility Name	PHASE ONE					PHASE TWO	PHASE THREE	PHASE FOUR	PHASE FIVE
			2005	2006	2007	2008	2009	2010	2015	2020	2025
RAINBOW GAP AREA											
1540 ZONE (Proposed)											
1540-1	3	1540 Zone Pump Station							$1,039,000		
1540-2	3	1540 Zone Reservoir							$1,616,300		
1540-3	3	1540 Zone Trans Main							$1,039,000		
1540-4	3	1540 Zone Trans Main									
		Subtotal Category 3:	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$3,694,300**	**$0**	**$0**
		Subtotal 1540 Zone	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$3,694,300**	**$0**	**$0**
		Subtotal Above Zones	**$5,195,200**	**$6,444,600**	**$820,500**	**$13,086,500**	**$5,272,300**	**$34,396,100**	**$33,626,600**	**$0**	**$0**

Table 9.2
Rancho California Water District
Water Facilities Master Plan Update
Status of 1997 Capital Improvement Projects &
Recommended Capital Improvement Projects
Rancho Division

Item No.	Cate-gory No.	Facility Name	PHASE ONE					PHASE TWO	PHASE THREE	PHASE FOUR	PHASE FIVE
			2005	2006	2007	2008	2009	2010	2015	2020	2025
VAIL LAKE											
1675 ZONE:											
1675-1	2	1675 Reservoir						$1,266,400			
1675-2	2	1675 Trans Main						$5,149,200			
1675-3	2	1305 to 1675 Pump Station						$6,965,100			
		Subtotal Category 2:	**$0**	**$0**	**$0**	**$0**	**$0**	**$13,380,700**	**$0**	**$0**	**$0**
		Subtotal Vail Lake 1675 Zone	**$0**	**$0**	**$0**	**$0**	**$0**	**$13,380,700**	**$0**	**$0**	**$0**
		Subtotal Above Zones	**$5,195,200**	**$6,444,600**	**$820,500**	**$13,086,500**	**$5,272,300**	**$47,776,800**	**$33,626,600**	**$0**	**$0**

Table 9.2
Rancho California Water District
Water Facilities Master Plan Update
Status of 1997 Capital Improvement Projects &
Recommended Capital Improvement Projects
Rancho Division

Item No.	Cate-gory No.	Facility Name	PHASE ONE 2005	2006	2007	2008	2009	PHASE TWO 2010	PHASE THREE 2015	PHASE FOUR 2020	PHASE FIVE 2025
1850 ZONE											
1850-1	2	1850 Reservoir						$5,445,500			
1850-2	2	1850 Pump Station						$1,899,600			
1850-3	2	1850 Trans Main						$2,076,000			
1850-4	2	1850 Trans Main						$814,100			
1850-5	3	1850 Trans Main						$1,058,300			
1850-6	3	1850 Trans Main						$2,686,600			
1850-7	3	1850 Trans Main						$5,391,200			
1850-8	3	1850 Trans Main						$2,098,600			
		Subtotal Category 3:	**$0**	**$0**	**$0**	**$0**	**$0**	**$21,469,900**	**$0**	**$0**	**$0**
		Subtotal Vail Lake 1850 Zone	**$0**	**$0**	**$0**	**$0**	**$0**	**$21,469,900**	**$0**	**$0**	**$0**
		Subtotal Above Zones	**$5,195,200**	**$6,444,600**	**$820,500**	**$13,086,500**	**$5,272,300**	**$69,246,700**	**$33,626,600**	**$0**	**$0**
GENERAL ITEMS (Rancho)											
R-1		Reservoir Site Acquisition	$425,300		$234,400	$246,100	$258,400	$271,400	$346,300		
R-2		Pump Station Site Acquisition				$82,000	$86,100	$90,500	$230,900	$147,300	
R-3		City of Temecula Road Imp. Allow.	$106,300	$111,600	$117,200	$123,100	$129,200	$407,100	$865,900	$1,105,100	$1,410,400
		Subtotal General Items (Rancho):	**$531,600**	**$111,600**	**$351,600**	**$451,200**	**$473,700**	**$769,000**	**$1,443,100**	**$1,252,400**	**$1,410,400**
		SUBTOTAL RANCHO DIVISION	**$5,726,800**	**$6,556,200**	**$1,172,100**	**$13,537,700**	**$5,746,000**	**$70,015,700**	**$35,069,700**	**$1,252,400**	**$1,410,400**

Table 9.3
Rancho California Water District
Water Facilities Master Plan Update
Status of 1997 Capital Improvement Projects and
Recommended Capital Improvement Projects
Common Facilities

Item No.	Category No.	Facility Name	Description of Recommended Improvements Per the 1997 Master Plan	Changes to Recommended Improvements	Status	Size/ Capacity	Quantity	Preliminary Cost Estimate: Recommended Facilities			Escalated Cost ($)
								Unit Cost	Estimated Construction Cost (2005 $) ENR=8200	Estimated Capital Cost (2005 $) ENR=8200	
1305 ZONE (Common Facilities):											
1305-2	1	Butterfield Tie-in	Construct 1,600 ft of 30-inch pipeline in Butterfield from De Portola to Hwy 79.		Under Design as 36-inch	36 in	1600 LF	$250.00 /LF	$400,000	$540,000	$567,000
1305-3	1	Margarita Tie-in	Construct 1,400 ft of 24-inch pipeline in Margarita from De Portola to Hwy 79.		Under Design	24 in	1400 LF	$225.00 /LF	$315,000	$425,250	$446,500
1305-4	1	La Paz Tie-in	Construct 1,500 ft of 24-inch pipeline in La Paz from Ynez to Hwy 79.		Under Design	24 in	1500 LF	$225.00 /LF	$337,500	$455,625	$478,400
1305-5	1	Ynez Road Trans Main	Construct 12,800 ft of 48-inch pipeline in Ynez from Jededia Smith to R.C. Road.		Under Design	48 in	12800 LF	$350 /LF	$4,480,000	$6,048,000	$6,350,400
1305-7	1	Nicolas Road Feeder Trans Main	Construct 13,000 ft of 34-inch pipeline in Nicolas Rd from prop MWD TO's to Winchester.		Complete				$0	$0	$0
Subtotal Category 1:									**$5,532,500**	**$7,468,875**	**$7,842,300**
Subtotal General Items (Common Facilities):									**$5,532,500**	**$7,468,875**	**$7,842,300**

Table 9.3
Rancho California Water District
Water Facilities Master Plan Update
Status of 1997 Capital Improvement Projects and
Recommended Capital Improvement Projects
Common Facilities

Item No.	Cate-gory No.	Facility Name	Description of Recommended Improvements Per the 1997 Master Plan	Changes to Recommended Improvements	Status	Size/ Capacity	Quantity	Preliminary Cost Estimate: Recommended Facilities			Escalated Cost ($)
								Unit Cost	Estimated Construction Cost (2005 $) ENR=8200	Estimated Capital Cost (2005 $) ENR=8200	
COMMON - WRMP											
WRMP-10	1	EM20A	Construct treated MWD turnout connection		Completed				$0	$0	$0
WRMP-11	1	EM20B	Construct treated MWD turnout connection		Completed				$0	$0	$0
WRMP-12		Misc. Well Improvements	Construct necessary improvements and/or modifications to wells						$570,000	$769,500	$1,031,200
WRMP-13a	1	Future Raw Water T.O. Conversion	Relocate EM-19 to future aqueduct No. 6 near VDC recharge facilities	Renamed EM-21 (80 cfs)	Under Design		1 EA	$400,000.00 /EA	$400,000	$540,000	$567,000
WRMP-13b	1	VDC Recharge Pipeline		EM-21 Discharge Pipeline to VDC	Under Design	48 in	13000 LF	$350 /LF	$4,550,000	$6,142,500	$6,449,600
WRMP-15	1	Joint RCWD/MWDSC Pipeline	Approximately 2.5 miles of 60-inch pipeline to Lake Skinner		Completed						
WRMP-16	1	WR26/WR28 Discharge Pipeline	Construct 1100 LF of 42" pipeline		Cancel				$0	$0	$0
WRMP-100	1	WR-25 activation					1 Ea	$500,000.00 /EA	$500,000	$675,000	$820,500
WRMP-101	1	WR-25 Augmentation					1 Ea	$500,000.00 /EA	$500,000	$675,000	$820,500
Subtotal Category 1:									**$6,520,000**	**$8,802,000**	**$9,688,800**
Subtotal General Items (WRMP-Common Fac.):									**$6,520,000**	**$8,802,000**	**$9,688,800**
Total Common Facilities									**$12,052,500**	**$16,270,875**	**$17,531,100**
TOTAL SANTA ROSA, RANCHO and COMMON:									**$127,638,750**	**$172,312,413**	**$229,569,000**

Alternative Water Source Augmentation											
WRMP-101	1	New VDC Extraction Wells		Construct additional well pump capacity at VDC			5 EA	$900,000.00 /EA	$4,500,000	$6,075,000	$7,384,200
WRMP-102	1	New VDC Extraction Wells		Construct additional well pump capacity at VDC			5 EA	$900,000.00 /EA	$4,500,000	$6,075,000	$10,390,300
WRMP-103	1	Raw Water Pipeline to Vail Lake		Construct 16000 LF of 36" pipe from VDC to Vail Lake		36 in	16000 LF	$275.00 /LF	$4,400,000	$5,940,000	n/a
WRMP-104	1	Raw Water Booster Station		Construct Pump Station for raw water conveyance from VDC to Vail Lake and through treatment plant			55 MGD	$20,000.00 /MGD	$1,100,000	$1,485,000	n/a
WRMP-105	1	Raw Water Treatment Plant		Construct raw water treatment plant at VDC for EM-21 and/of for extractin wells			9 MGD	$1,500,000.00 /MGD	$13,500,000	$18,225,000	n/a
WRMP-106	1	Conservation Facilities					1 LS	$10,000,000 /LS	$10,000,000	$13,500,000	n/a

Table 9.3
Rancho California Water District
Water Facilities Master Plan Update
Status of 1997 Capital Improvement Projects and
Recommended Capital Improvement Projects
Common Facilities

Item No.	Cate-gory No.	Facility Name	PHASE ONE 2005	2006	2007	2008	2009	PHASE TWO 2010	PHASE THREE 2015	PHASE FOUR 2020	PHASE FIVE 2025
1305 ZONE (Common Facilities):											
1305-2	1	Butterfield Tie-in	$567,000								
1305-3	1	Margarita Tie-in	$446,500								
1305-4	1	La Paz Tie-in	$478,400								
1305-5		Ynez Road Trans Main	$6,350,400								
1305-7	1	Nicolas Road Feeder Trans Main									
Subtotal Category 1:			**$7,842,300**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Subtotal General Items (Common Facilities):			**$7,842,300**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Table 9.3
Rancho California Water District
Water Facilities Master Plan Update
Status of 1997 Capital Improvement Projects and
Recommended Capital Improvement Projects
Common Facilities

Item No.	Cate-gory No.	Facility Name	PHASE ONE 2005	2006	2007	2008	2009	PHASE TWO 2010	PHASE THREE 2015	PHASE FOUR 2020	PHASE FIVE 2025
COMMON - WRMP											
WRMP-10	1	EM20A									
WRMP-11	1	EM20B									
WRMP-12		Misc. Well Improvements						$1,031,200			
WRMP-13	1	Future Raw Water T.O. Conversion	$567,000								
WRMP-13b	1	VDC Recharge Pipeline	$6,449,600								
WRMP-15	1	Joint RCWD/MWDSC Pipeline									
WRMP-16	1	WR26/WR28 Discharge Pipeline									
WRMP-100	1	WR-25 activation				$820,500					
WRMP-101	1	WR-25 Augmentation				$820,500					
Subtotal Category 1:			**$7,016,600**	**$0**	**$0**	**$1,641,000**	**$0**	**$1,031,200**	**$0**	**$0**	**$0**
Subtotal General Items (WRMP-Common Fac.):			**$7,016,600**	**$0**	**$0**	**$1,641,000**	**$0**	**$1,031,200**	**$0**	**$0**	**$0**
Total Common Facilities			**$14,858,900**	**$0**	**$0**	**$1,641,000**	**$0**	**$1,031,200**	**$0**	**$0**	**$0**
TOTAL SANTA ROSA, RANCHO and COMMON:			**$37,271,100**	**$10,780,900**	**$7,621,700**	**$15,496,200**	**$16,171,500**	**$91,047,800**	**$47,058,600**	**$1,893,100**	**$2,228,100**

Alternative Augmentation											
WRMP-101	1	New VDC Extraction Wells				$7,384,200					
WRMP-102	1	New VDC Extraction Wells							$10,390,300		
WRMP-103	1	Raw Water Pipeline to Vail Lake	n/a								
WRMP-104	1	Raw Water Booster Station	n/a								
WRMP-105	1	Raw Water Treatment Plant	n/a								
WRMP-106	1	Conservation Facilities	n/a								

TABLE 9.4
RANCHO CALIFORNIA WATER DISTRICT
CAPITAL REPLACEMENT PROGRAM
ESTIMATED CAPITAL COST
Santa Rosa Division

Item No.	Facility Name	Description of Facilities	Size/ Capacity	Quantity	Unit Cost	Estimated Capital Cost 2004 ($)	Estimated Replacement Items %	Estimated Replacement Items Cost	Life Cycle In Years	Construction Date	Repl. Date	Estimated Future Replacement Cost ($)
		RESERVOIRS										
1670E-6	Carancho Reservoir #1	3.0 MG tank at Carancho Site (abandoned)										
1305E-1	Ace Bowen Reservoir #1	3.0 MG tank at Ace Bowen Site		3 MG	$0.70 /gal	$2,100,000	10%	$210,000	60	1978	2038	$1,103,203
1990E-1	Freeman Reservoir	3.0 MG tank at Calle Escadera		3 MG	$0.70 /gal	$2,100,000	10%	$210,000	60	1978	2038	$1,103,203
1670E-1	De Luz Reservoir #1	3.0 MG tank at De Luz Site		3 MG	$0.70 /gal	$2,100,000	10%	$210,000	60	1978	2038	$1,103,203
1670E-2	De Luz Reservoir #2	3.0 MG tank at De Luz Site		3 MG	$0.70 /gal	$2,100,000	10%	$210,000	60	1978	2038	$1,103,203
1670E-7	Carancho Reservoir #2	2.2 MG tank at Carancho Site (abandoned)										
1305E-2	Ace Bowen Reservoir #2	5.0 MG tank at Ace Bowen Site		5 MG	$0.70 /gal	$3,500,000	10%	$350,000	60	1980	2040	$2,027,136
2160E-3	Baldaray Reservoir	2.2 MG tank at Baldaray Site		2.2 MG	$0.70 /gal	$1,540,000	10%	$154,000	60	1981	2041	$936,537
2550E-1	La Cresta Reservoir	1.1 MG tank at La Cresta Site		1.1 MG	$0.70 /gal	$770,000	10%	$77,000	60	1981	2041	$468,268
1440E-1	Prado Reservoir	5.0 MG tank at Prado Site		5 MG	$0.70 /gal	$3,500,000	10%	$350,000	60	1985	2045	$2,587,196
2260E-1	Tenaja Reservoir	2.2 MG tank at Tenaja Site		2.2 MG	$0.70 /gal	$1,540,000	10%	$154,000	60	1987	2047	$1,255,049
1500E-1	Bear Creek Reservoir	2.2 MG tank at Bear Creek Site on Clinton Keith		2.2 MG	$0.70 /gal	$1,540,000	10%	$154,000	60	1987	2047	$1,255,049
1432E-1	Antelope Reservoir	2.2 MG tank at Antelope Site		2.2 MG	$0.70 /gal	$1,540,000	10%	$154,000	60	1988	2048	$1,317,801
2550E-35	Avocado Mesa Reservoir	5.8 MG tank at Avocado Mesa Site		5.8 MG	$0.70 /gal	$4,060,000	10%	$406,000	60	1988	2048	$3,474,203
1440	Prado Reservoir #2			6.0 MG		$3,958,400	10%	$395,840	60	2000	2060	$6,083,037
1670	Carancho Reservoir #3			5.0 MG		$3,200,000	10%	$320,000	60	2000	2060	$4,917,572
1670	Vaquero Reservoir #1			5.0 MG		$3,692,000	10%	$369,200	60	2000	2060	$5,673,649
1990	Freeman Reservoir #2			5.0 MG		$3,200,000	10%	$320,000	60	2000	2060	$4,917,572
2850	Redondo Mesa Reservoir			0.5 MG		$320,000	10%	$32,000	60	2000	2060	$491,757
2850	Calle Parama Reservoir			1.0 MG		$1,096,600	10%	$109,660	60	2000	2060	$1,685,190
		Subtotal				$41,857,000		$4,185,700				$41,502,827
		PUMP STATIONS										
1990E-3	Del Oro Pump Station	4900 gpm pump station (4 units at 150 HP each) at Avd. Del Oro & C. Capistrano	4900 gpm	600 HP	$2,745 /HP	$1,646,754	40%	$658,702	35	1974	2009	$840,689
1670E-3	East Bluff Pump Station	7500 gpm pump station (2 units at 150 HP, 4 units at 200 HP) at East Bluff	7500 gpm	1100 HP	$4,548 /HP	$5,002,995	40%	$2,001,198	35	1975	2010	$2,681,797
2550E-2	Baldaray Pump Station	4500 gpm pump station (4 units, 200 HP each) at Baldaray site.	4500 gpm	800 HP	$2,588 /HP	$2,070,205	40%	$828,082	35	1975	2010	$1,109,709
1670E-4	Ace Bowen #1 Pump Station	11800 gpm pump station (3 units at 350 HP, 2 units at 250 HP) at Ace Bowen	11800 gpm	1550 HP	$2,196 /HP	$3,403,291	40%	$1,361,316	35	1977	2012	$2,011,284
2160E-10	De Luz Pump Station	5300 gpm pump station (2 units at 350 HP, 2 units at 200 HP) at De Luz Site	5300 gpm	1100 HP	$2,274 /HP	$2,501,497	40%	$1,000,599	35	1977	2012	$1,478,340
1440E-2	Ace Bowen #3 Pump Station	6000 gpm pump station (2 units at 250 HP each) at Ace Bowen Site	6000 gpm	500 HP	$2,980 /HP	$1,489,920	40%	$595,968	35	1980	2015	$1,019,308
1990E-2	Santa Rosa Pump Station	3200 gpm pump station (3 units at 150 HP each) at Via Santa Rosa & Vaqu	3200 gpm	450 HP	$2,980 /HP	$1,340,928	40%	$536,371	35	1981	2016	$963,246
1670E-5	Ace Bowen #2 Pump Station	18000 gpm pump station at Ace Bowen Site	18000 gpm	2500 HP	$3,764 /HP	$9,410,022	40%	$3,764,009	35	1983	2018	$7,452,480
1440E-3	Ace Bowen #4 Pump Station	14500 gpm pump station (2 units at 650 HP each) at Ace Bowen Site	14500 gpm	1300 HP	$4,548 /HP	$5,912,630	40%	$2,365,052	35	1984	2019	$4,916,774
2160E-4	Bear Creek Pump Station	2500 gpm pump station (2 units at 150 HP, 1 unit at 250 HP) at Bear Creek Site	2500 gpm	550 HP	$2,823 /HP	$1,552,654	40%	$621,061	35	1984	2019	$1,291,142
1500E-2	Joaquin Ranch Pump Station	5400 gpm pump station (2 units at 250 HP each) at Tenaja & Hayes Rd.	5400 gpm	500 HP	$2,980 /HP	$1,489,920	40%	$595,968	35	1984	2019	$1,238,975
2260E-6	Carancho Pump Station	1700 gpm pump station (1 unit at 350 HP) at Carancho Site	1700 gpm	350 HP	$3,137 /HP	$1,097,836	40%	$439,134	35	1987	2022	$1,056,829
1432E-2	Cal Oaks Pump Station	3000 gpm pump station (2 units at 125 HP each) at Cal Oaks Site	3000 gpm	250 HP	$3,137 /HP	$784,168	40%	$313,667	35	1987	2022	$754,878
1670	Senga Doherty P.S.		20000 gpm			$5,015,000	40%	$2,006,000	35	2000	2035	$9,103,307
1990	Vaquero P.S.		2100 gpm			$1,700,000	40%	$680,000	35	2000	2035	$3,085,867
2850S	Redondo Mesa P.S.		800 gpm			$600,000	40%	$240,000	35	2000	2035	$1,089,129
2850N	Avenida Escala P.S.		1100 gpm			$691,000	40%	$276,400	35	2000	2035	$1,254,314
		Subtotal				$45,708,821		$18,283,528				$41,348,068

TABLE 9.4
RANCHO CALIFORNIA WATER DISTRICT
CAPITAL REPLACEMENT PROGRAM
ESTIMATED CAPITAL COST
Santa Rosa Division

Item No.	Facility Name	Description of Facilities	Size/ Capacity	Quantity	Unit Cost	Estimated Capital Cost 2004 ($)	Estimated Replacement Items %	Estimated Replacement Items Cost	Life Cycle In Years	Construction Date	Repl. Date	Estimated Future Replacement Cost ($)
		TRANSMISSION MAINS										
1440E-17	Upper Sandia Creek T.M. #3	12-inch pipeline between De Lorme Dr. & Via De Los Fideos in Sandia Creek	12 in	2250 /LF	$100 /LF	$225,000	100%	$225,000	50	1978	2028	$725,647
1440E-24	Upper Carancho T.M. #2	20-inch pipeline between Carancho Reservoirs & Camaron Road	20 in	9000 /LF	$200 /LF	$1,800,000	100%	$1,800,000	50	1978	2028	$5,805,180
1670E-27	El Prado trans Main	12-inch pipeline between Sandia Creek & Carancho in El Prado	12 in	12250 /LF	$100 /LF	$1,225,000	100%	$1,225,000	50	1978	2028	$3,950,747
1305E-5	Upper Jefferson Ave. T.M.	36-inch pipeline in Jefferson Ave. between Lemon R. & Winchester Rd.	36 in	23200 /LF	$275 /LF	$6,380,000	100%	$6,380,000	50	1978	2028	$20,576,138
1670E-28	Upper El Prado Trans Main	8-inch pipeline between Carancho & La Vella Rd. in El Prado	8 in	3000 /LF	$75 /LF	$225,000	100%	$225,000	50	1978	2028	$725,647
1440E-25	Upper Carancho T.M. #3	24-inch pipeline extends 3500 ft. from Camaron Rd. towards De Luz in Carancho	24 in	3500 /LF	$225 /LF	$787,500	100%	$787,500	50	1978	2028	$2,539,766
1670E-29	Lower Carancho Trans Main	8-inch pipeline between Sandia Creek & Calle Jardin in Carancho	8 in	8250 /LF	$75 /LF	$618,750	100%	$618,750	50	1978	2028	$1,995,531
2550E-36	Avenida La Cresta T.M. #4	20-inch pipeline in Avd. La Cresta between Calle Bandido and Gallop Lane	20 in	6700 /LF	$200 /LF	$1,340,000	100%	$1,340,000	50	1978	2028	$4,321,634
2550E-27	Calle Pino Trans Main	16-inch pipeline between Rancho Calif. Rd. & Avd. La Cresta in Calle Pino	16 in	7500 /LF	$150 /LF	$1,125,000	100%	$1,125,000	50	1978	2028	$3,628,237
1440E-26	Upper Carancho T.M. #4	16-inch pipeline extends toward Camaron Rd. from De Luz in Carancho	16 in	4000 /LF	$150 /LF	$600,000	100%	$600,000	50	1978	2028	$1,935,060
2550E-33	Avocado Mesa Inlet T.M.	36-inch pipeline in Avocado Mesa & Corona Cala Camino between Avocado	36 in	7000 /LF	$275 /LF	$1,925,000	100%	$1,925,000	50	1978	2028	$6,208,317
2260E-3	Via Escalon Trans Main	12-inch pipeline between Calamar Rd. & 24" Trans Main in Via Escalon	12 in	3700 /LF	$100 /LF	$370,000	100%	$370,000	50	1978	2028	$1,193,287
2550E-25	Avenida Bosque T.M.	24-inch pipeline from Calle Bandido to Calle Corriente in Avd. Bosque	24 in	2250 /LF	$225 /LF	$506,250	100%	$506,250	50	1978	2028	$1,632,707
1440E-27	Prado Trans Main	42-inch pipeline between Prado Reservoir & Carancho	42 in	1000 /LF	$300 /LF	$300,000	100%	$300,000	50	1978	2028	$967,530
2550E-37	Calle de Companero T.M. #2	12-inch pipeline in C. de Companero between Avd. La Cresta and Vista	12 in	1000 /LF	$100 /LF	$100,000	100%	$100,000	50	1978	2028	$322,510
2160E-1	Paseo Chaparro T.M. #1	12-inch pipeline in Paseo Chaparro extending 6000 ft. from Via Ent	12 in	4500 /LF	$100 /LF	$450,000	100%	$450,000	50	1978	2028	$1,451,295
2260E-2	Calle de Mucho Trans Main	24-inch pipeline between Tenaja Reservoir & Via Escalon in Via Volcano	24 in	18600 /LF	$225 /LF	$4,185,000	100%	$4,185,000	50	1978	2028	$13,497,043
1440E-28	Via Vaquero T.M. #7	39-inch pipeline between Ace Bowen #3 & 4 P.S. & Calle Roca in Via Vaquero	36 in	15000 /LF	$275 /LF	$4,125,000	100%	$4,125,000	50	1978	2028	$13,303,537
2260E-4	Upper El Calamar Rd. T.M.	8-inch pipeline extending north along El Calamar Rd. from Via Escalon	8 in	5000 /LF	$75 /LF	$375,000	100%	$375,000	50	1978	2028	$1,209,412
2160E-5	Upper Clinton Keith T.M. #1	16-inch pipeline between Bear Creek P.S. & Via Entrada	16 in	7750 /LF	$150 /LF	$1,162,500	100%	$1,162,500	50	1978	2028	$3,749,179
2550E-23	La Cresta Res. Inlet T.M.	24-inch pipeline from Vista de Montanas to La Cresta Reservoir	24 in	2000 /LF	$225 /LF	$450,000	100%	$450,000	50	1978	2028	$1,451,295
1440E-29	Calle Uva Trans Main #1	36-inch pipeline between Via Vaquero & Sandia Creek in Calle Rosa	36 in	20500 /LF	$275 /LF	$5,637,500	100%	$5,637,500	50	1978	2028	$18,181,501
2160E-2	Via Entrada Trans Main	8-inch pipeline between Clingo Keith & Avd. La Cresta in Via Ent	8 in	3000 /LF	$75 /LF	$225,000	100%	$225,000	50	1978	2028	$725,647
2160E-9	Santa Rosa Plateau T.M. #3	36-inch pipeline between De Luz P.S. & S.R. Sprs. Rd	39 in	7000 /LF	$288 /LF	$2,016,000	100%	$2,016,000	50	1978	2028	$6,501,801
2550E-21	Vista de Montanas T.M. #1	24-inch pipeline between Calle de Companero & nod to La Cresta Res.	24 in	2500 /LF	$225 /LF	$562,500	100%	$562,500	50	1978	2028	$1,814,119
1305E-104	Kalima St. Trans Main	24-inch pipeline in Kalima and I-inch pipline between15 between Cal Oaks P.S. and Jefferson	24 in	3750 /LF	225 /LF	$843,750	100%	$843,750	50	1978	2028	$2,721,178
2160E-6	Upper Clinton Keith T.M. #2	20-inch pipeline between Via Entrada & S.R. Springs Road in Cilinton Keith	20 in	2500 /LF	$200 /LF	$500,000	100%	$500,000	50	1978	2028	$1,612,550
2550E-18	Camino Noroeste T.M.	8-inch pipeline between Calle de Suenos & Sierra Sota Rd. in Valle Vista	8 in	5500 /LF	$75 /LF	$412,500	100%	$412,500	50	1978	2028	$1,330,354
2160E-8	Santa Rosa Plateau T.M. #2	33-inch pipeline between Tenaja Rd. & the end of S.R. Springs Rd. in S.R.	30 in	5500 /LF	$250 /LF	$1,375,000	100%	$1,375,000	50	1978	2028	$4,434,512
1440E-31	Lower De Luz T.M. #2	12-inch pipeline in De Luz, extending south from De Luz PRS	12 in	5000 /LF	$100 /LF	$500,000	100%	$500,000	50	1978	2028	$1,612,550
2550E-20	Via Caballos Trans Main	12-inch pipeline between Avd. Castilla & Avd. La Cresta in Via Caballos	12 in	9000 /LF	$100 /LF	$900,000	100%	$900,000	50	1978	2028	$2,902,590
1990E-6	Sycamore Mesa Trans Main	16-inch pipeline between Via Baranca & Via Santa Rosa in Sycamore Mesa	16 in	5500 /LF	$150 /LF	$825,000	100%	$825,000	50	1978	2028	$2,660,707
2550E-19	Sierra Soto Rd. T.M.	12-inch pipeline between Camino Noroesta & Sierra Maria in Sierra Soto	12 in	1500 /LF	$100 /LF	$150,000	100%	$150,000	50	1978	2028	$483,765
1305E-33	Blackdeer Loop Trans Main	16-inch pipeline in Blackdeer Loop between Diaz & Rancho Calif. Airport	16 in	2850 /LF	$150 /LF	$427,500	100%	$427,500	50	1978	2028	$1,378,730
2550E-17	Valle Vista Trans Main	12-inch pipeline between Avd. Cresta & C. de Suenos in Valle Vista	12 in	6000 /LF	$100 /LF	$600,000	100%	$600,000	50	1978	2028	$1,935,060
1990E-10	Upper Sandia Creek T.M.	20-inch pipeline between Via Barranca & Del Oro P.S. in Sando Creek	20 in	7300 /LF	$200 /LF	$1,460,000	100%	$1,460,000	50	1978	2028	$4,708,646
1990E-5	Upper Santa Rosa T.M. #1	16-inch pipeline between Santa Rosa P.S. & Sycamore Mesa in Via Santa	16 in	4000 /LF	$150 /LF	$600,000	100%	$600,000	50	1978	2028	$1,935,060
1440E-33	Lower Sandia Creek T.M. #3	8-inch pipeline in Sandia Creek between De Anza & El Prado	8 in	1750 /LF	$75 /LF	$131,250	100%	$131,250	50	1978	2028	$423,294
1990E-7	Via Peregrino Trans Main	12-inch pipeline from Via Santa Rosa in Via Peregrino	12 in	3500 /LF	$100 /LF	$350,000	100%	$350,000	50	1978	2028	$1,128,785
1990E-14	Calle Capistrano Loop T.M.	12-inch pipeline in Calle Capistrano, Rancho Calif. & Calle Monticello	12 in	13000 /LF	$100 /LF	$1,300,000	100%	$1,300,000	50	1978	2028	$4,192,630
1990E-9	Via Barranca Trans Main	20-inch pipeline between Freeman Res. & Sandia Creek Dr. in Calle	20 in	5000 /LF	$200 /LF	$1,000,000	100%	$1,000,000	50	1978	2028	$3,225,100
2550E-6	Calle De Lobo Trans Main	12-inch pipeline between Paseo Montana & C. de Componero in C.D. Lobo	12 in	7250 /LF	$100 /LF	$725,000	100%	$725,000	50	1978	2028	$2,338,197
1990E-11	Lower Sandia Creek T.M.	16-inch pipeline between Via Barranco & La Cruz in Sandia Creek	16 in	5000 /LF	$150 /LF	$750,000	100%	$750,000	50	1978	2028	$2,418,825
2550E-15	Avenida Castilla T.M.	12-inch pipeline between Avd. La Cresta & Avd. La Cresta & Avd. La Cresta in Avd. Castilla	12 in	8300 /LF	$100 /LF	$830,000	100%	$830,000	50	1978	2028	$2,676,833
1990E-13	Upper La Cruz Dr. T.M. #2	8-inch pipeline extends 2350 ft. below Via Vega in La Cruz Dr.	8 in	2350 /LF	$75 /LF	$176,250	100%	$176,250	50	1978	2028	$568,424
2550E-5	Paseo Montana Trans Main	8-inch pipeline between Majorica & Calle De Lobo in P. Montana	8 in	6750 /LF	$75 /LF	$506,250	100%	$506,250	50	1978	2028	$1,632,707
1990E-15	Upper Calle Capistrano T.M.	10-inch pipeline in Calle Capistrano between Rancho Calif Rd. & Prader	10 in	1250 /LF	$88 /LF	$110,000	100%	$110,000	50	1978	2028	$354,761
2550E-11	Avenida Bonita T.M. #2	8-inch pipeline between Avd. La Cresta & Avd. Castilla in Ave. Bonita	8 in	2500 /LF	$75 /LF	$187,500	100%	$187,500	50	1978	2028	$604,706
2550E-16	Calle de Suenos T.M.	12-inch pipeline between Avd. Castilla & Valle Vista in Calle de Suenos	12 in	10750 /LF	$100 /LF	$1,075,000	100%	$1,075,000	50	1978	2028	$3,466,982
1500E-3	Lower Clinton Keith T.M. #1	16-inch pipeline in Clinton Keith between Calle Del Oso & Ransho Santa	16 in	3500 /LF	$150 /LF	$525,000	100%	$525,000	50	1978	2028	$1,693,177
2550E-14	Avenida La Cresta T.M. #2	16-inch pipeline between Gallop Ln. & Sierra Maria Rd. in Avd. La Cresta	16 in	3300 /LF	$150 /LF	$495,000	100%	$495,000	50	1978	2028	$1,596,424
1670E-10	Calle Nuevo Trans Main	39-inch pipeline between V. Vaquero & Carancho in Calle Nuevo & Cara	39 in	6000 /LF	$288 /LF	$1,728,000	100%	$1,728,000	50	1978	2028	$5,572,973

TABLE 9.4
RANCHO CALIFORNIA WATER DISTRICT
CAPITAL REPLACEMENT PROGRAM
ESTIMATED CAPITAL COST
Santa Rosa Division

Item No.	Facility Name	Description of Facilities	Size/ Capacity	Quantity	Unit Cost	Estimated Capital Cost 2004 ($)	Estimated Replacement Items %	Estimated Replacement Items Cost	Life Cycle In Years	Construction Date	Repl. Date	Estimated Future Replacement Cost ($)
2550E-12	Calle de Companero T.M. #1	12-inch pipeline between C. de Lobo & Vista de Montanas in Calle de Companero	12 in	5700 /LF	$100 /LF	$570,000	100%	$570,000	50	1978	2028	$1,838,307
1500E-4	Upper Bear Creek T.M.	12-inch pipeline in Bear Creek Drive between Clinton Keith & Creek Vie	12 in	4000 /LF	$100 /LF	$400,000	100%	$400,000	50	1978	2028	$1,290,040
2550E-10	Avenida Bonita T.M. #1	12-inch pipeline between Avd. De Arboles & Avd. La Cresta in Ave. Bonita	12 in	5000 /LF	$100 /LF	$500,000	100%	$500,000	50	1978	2028	$1,612,550
1670E-14	Upper De Luz Trans Main	12-inch pipeline between Via Nortada & De Luz Reservoir in De Luz	12 in	1500 /LF	$100 /LF	$150,000	100%	$150,000	50	1978	2028	$483,765
1670E-9	Upper Carancho T.M. #1	36-inch pipeline between De Luz Rd & Carancho P.S. in Carancho Rd.	36 in	16000 /LF	$275 /LF	$4,400,000	100%	$4,400,000	50	1978	2028	$14,190,440
1500E-5	Lower Bear Creek T.M.	12-inch pipeline in Bear Creek Drive between Clinton Keith & Twin Oaks	12 in	4000 /LF	$100 /LF	$400,000	100%	$400,000	50	1978	2028	$1,290,040
1670E-11	Mid De Luz Trans Main	16-inch pipeline between V. Vaquero & El Prado in De Luz Rd & Carancha	16 in	1125 /LF	$150 /LF	$168,750	100%	$168,750	50	1978	2028	$544,236
1670E-18	Lower La Cruz Trans Main	12-inch pipeline between Sandia Creek & El Perro Dr. in La Cruz Dr.	12 in	3000 /LF	$100 /LF	$300,000	100%	$300,000	50	1978	2028	$967,530
2850E-1	Avocado Mesa T.M. #1	12-inch pipeline between Calle Viento and 16-inch main in Avocado Mesa	12 in	5750 /LF	$100 /LF	$575,000	100%	$575,000	50	1978	2028	$1,854,432
1500E-6	Calle Del Oso Oro T.M.	30-inch pipeline between Clinton Keith & Joaquin Ranch Pump Station in	30 in	14000 /LF	$250 /LF	$3,500,000	100%	$3,500,000	50	1978	2028	$11,287,850
1670E-15	Via Vaquero Trans Main #1	20-inch pipeline between Avd. Del Oro & Calle Cuero in Via Vaquero &	20 in	9600 /LF	$200 /LF	$1,920,000	100%	$1,920,000	50	1978	2028	$6,192,192
1670E-22	Calle Roca Trans Main	8-inch pipeline between Via Vaquero & Avd. Tierra in Calle Roca	8 in	4750 /LF	$75 /LF	$356,250	100%	$356,250	50	1978	2028	$1,148,942
1670E-17	Via Vaquero Trans Main #3	39-inch pipeline between Calle Nuevo & Calle Roca in Via Vaquero	39 in	19500 /LF	$288 /LF	$5,616,000	100%	$5,616,000	50	1978	2028	$18,112,161
1500E-7	Magnolia Trans Main	16-inch pipeline Hayes and Douglas in Magnolia	16 in	2000 /LF	$150 /LF	$300,000	100%	$300,000	50	1978	2028	$967,530
1670E-19	Via Vaquero Trans Main #5	24-inch pipeline between Calle Cuero & Via Santa Rosa in Via Vaquero	24 in	24000 /LF	$225 /LF	$5,400,000	100%	$5,400,000	50	1978	2028	$17,415,540
1670E-26	Calle Cuero Trans Main	12-inch pipeline extending from Via Vaquero in Calle Cuervo	12 in	4500 /LF	$100 /LF	$450,000	100%	$450,000	50	1978	2028	$1,451,295
1670E-21	Lower Santa Rosa T.M.	24-inch pipeline between Ace Bowen #1 & 2 P.S. & Santa Rosa P.S. in Santa Rosa	24 in	8000 /LF	$225 /LF	$1,800,000	100%	$1,800,000	50	1978	2028	$5,805,180
1500E-8	Lower Clinton Keith T.M. #2	16-inch pipeline between Calle Del Oso Oro and Bear Creek Reservoir in	16 in	3500 /LF	$150 /LF	$525,000	100%	$525,000	50	1978	2028	$1,693,177
1670E-23	Calle Uva Trans Main #2	12-inch pipeline in Calle Uva extending from Calle Jardin	12 in	3500 /LF	$100 /LF	$350,000	100%	$350,000	50	1978	2028	$1,128,785
2550E-24	Calle Bandido Trans Main	24-inch pipeline from Avd. La Cresta to Avd. Bosque in Calle Bandido	24 in	12000 /LF	$225 /LF	$2,700,000	100%	$2,700,000	50	1978	2028	$8,707,770
1670E-25	Avenida Tierra Trans Main	16-inch pipeline in Ave Tierra between Calle Jardin & Calle Roca	16 in	6000 /LF	$150 /LF	$900,000	100%	$900,000	50	1978	2028	$2,902,590
1305E-12	Camino Estribo T.M. #2	30-inch pipeline in C. Estribo between Ace Bowen P.S. #3 & 4 & 2nd San	30 in	11250 /LF	$250 /LF	$2,812,500	100%	$2,812,500	50	1978	2028	$9,070,594
2550E-28	Tenaja Rd. Trans Main #1	24-inch pipeline in Tenaja Rd. between 2260 Tenaja Reservoir & 30-inch	24 in	1100 /LF	$225 /LF	$247,500	100%	$247,500	50	1978	2028	$798,212
2550E-22	Vista de Montanas T.M. #2	16-inch pipeline between node to La Cresta Res. & Hombre Ln. in Vista	16 in	3500 /LF	$150 /LF	$525,000	100%	$525,000	50	1978	2028	$1,693,177
2550E-29	Tenaja Rd. Trans Main #2	30-inch pipeline from 24" trans main to Rancho Calif. Rd. in Tenaja Rd.	30 in	6300 /LF	$250 /LF	$1,575,000	100%	$1,575,000	50	1978	2028	$5,079,532
1305E-8	Diaz Rd. Trans Main #2	12-inch pipeline in Diaz Rd. between Cherry St. & Rancho Calif. Rd.	12 in	11750 /LF	$100 /LF	$1,175,000	100%	$1,175,000	50	1978	2028	$3,789,492
2550E-32	Viejo Road Trans Main	16-inch pipeline in the Viejo Road loop	16 in	3750 /LF	$150 /LF	$562,500	100%	$562,500	50	1978	2028	$1,814,119
2160E-11	Lower Avenida La Cresta T.M.	20-inch pipeline in Avd. La Cresta between Clinton Keith and Baldaray Road	20 in	6000 /LF	$200 /LF	$1,200,000	100%	$1,200,000	50	1978	2028	$3,870,120
1670E-32	Calle Colina Trans Main	8-inch pipeline extending from Carancho in Calle Colina	8 in	2000 /LF	$75 /LF	$150,000	100%	$150,000	50	1978	2028	$483,765
2550E-4	Via Majorica Trans Main	12-inch pipeline between Avd. De Arboles & Avia Vista Grande in V. Majorica	12 in	7250 /LF	$100 /LF	$725,000	100%	$725,000	50	1978	2028	$2,338,197
1670E-34	Los Gatos T.M. #1	12-inch pipeline extends from Carancho 9500 ft. in Via Los Gatos	12 in	9500 /LF	$100 /LF	$950,000	100%	$950,000	50	1978	2028	$3,063,845
1990E-8	Via Horca Trans Main	12-inch pipeline between Camino Gatillo & Santa Rosa in Via Horca	12 in	5000 /LF	$100 /LF	$500,000	100%	$500,000	50	1978	2028	$1,612,550
1670E-36	Via Vaquero T.M. #4	20-inch pipeline between De Luz Reservoir and Avd. Del Oro in Via Vaquero	20 in	5000 /LF	$200 /LF	$1,000,000	100%	$1,000,000	50	1978	2028	$3,225,100
2550E-3	Via Vista Grande T.M.	12-inch pipeline between Avd. De Arboles & Via Majorica in V.V. Grande	12 in	5250 /LF	$100 /LF	$525,000	100%	$525,000	50	1978	2028	$1,693,177
2550E-8	Avenida De Arboles T.M. #2	16-inch pipeline between Via Huerta & ViaVista Grande in Avd. De Arboles	16 in	6500 /LF	$150 /LF	$975,000	100%	$975,000	50	1978	2028	$3,144,472
1990E-16	Upper Santa Rosa T.M. #2	12-inch pipeline between Santa Rosa P.S. & Via Horca	12 in	5500 /LF	$100 /LF	$550,000	100%	$550,000	50	1978	2028	$1,773,805
1440E-4	Vuelta Grande Trans Main	12-inch pipeline in Carancho & Vuelta Grande	12 in	8000 /LF	$100 /LF	$800,000	100%	$800,000	50	1978	2028	$2,580,080
1432E-3	Antelope Rd. Trans Main	24-inch pipeline between Antelope Reservoir & Cal Oaks P.S. in Antelope Rd.	24 in	8750 /LF	$225 /LF	$1,968,750	100%	$1,968,750	50	1978	2028	$6,349,416
1440E-6	Lower De Luz T.M. #1	16-inch pipeline between Carancho & De Luz PRS in De Luz	16 in	13000 /LF	$150 /LF	$1,950,000	100%	$1,950,000	50	1978	2028	$6,288,945
1670E-8	Del Oro Trans Main	20-inch pipeline between East Bluff P.S. & Via Vaquero in Avd. Del Oro	20 in	19000 /LF	$225 /LF	$4,275,000	100%	$4,275,000	50	1978	2028	$13,787,302
1440E-8	Lower Camaron R. T.M. #1	12-inch pipeline between De Luz & De Anza in Camaron Rd.	12 in	3250 /LF	$100 /LF	$325,000	100%	$325,000	50	1978	2028	$1,048,157
1432E-4	Jackson Ave. Trans Main	16-inch pipeline between Antelope Rd. & Nutmeg Rd. in Jackson Ave.	16 in	6500 /LF	$150 /LF	$975,000	100%	$975,000	50	1978	2028	$3,144,472
1440E-10	De Anza Rd. Trans Main #1	24-inch pipeline between Camaron & Sandi Creek in De Anza Rd.	24 in	4000 /LF	$225 /LF	$900,000	100%	$900,000	50	1978	2028	$2,902,590
1670E-16	Via Vaquero Trans Main #2	24-inch pipeline between De Luz Reservoir & Calle Nuevo in Via Vaquero	24 in	7250 /LF	$225 /LF	$1,631,250	100%	$1,631,250	50	1978	2028	$5,260,944
1440E-12	De Anza Rd Trans Main #3	10-inch pipeline in De Anza from Sandia Creek	10 in	2500 /LF	$88 /LF	$220,000	100%	$220,000	50	1978	2028	$709,522
1432E-5	Upper Nutmeg Loop T.M.	12-inch pipeline between Nutmeg & 16" node in Unnamed Road	12 in	2000 /LF	$100 /LF	$200,000	100%	$200,000	50	1978	2028	$645,020
1440E-14	Lower Sandia Creek T.M. #2	8-inch pipeline in Sandia Creek between De Anza & Carancho	8 in	7000 /LF	$75 /LF	$525,000	100%	$525,000	50	1978	2028	$1,693,177
1670E-24	Calle Jardin Trans Main	16-inch pipeline in Calle Jardin between Calle Cuero & Carancho	16 in	10000 /LF	$150 /LF	$1,500,000	100%	$1,500,000	50	1978	2028	$4,837,650
1440E-16	Upper Sandia Creek T.M. #2	8-inch pipeline between Sandia Creek between Carancho Rd. & DeLorme Dr.	8 in	2750 /LF	$75 /LF	$206,250	100%	$206,250	50	1978	2028	$665,177
1432E-6	Lower Nutmeg Loop T.M.	16-inch pipeline between Jackson Ave. & 12-inch node in Unnamed Road	16 in	2500 /LF	$150 /LF	$375,000	100%	$375,000	50	1978	2028	$1,209,412
1440E-18	Mid El Calamar Trans Main	16-inch pipeline in El Calamar between carancho & Lillian Lane	16 in	2000 /LF	$150 /LF	$300,000	100%	$300,000	50	1978	2028	$967,530
2260E-5	Carancho Pump Trans Main	12-inch pipeline from Carancho Pump Station to Via Escalon	12 in	4000 /LF	$100 /LF	$400,000	100%	$400,000	50	1978	2028	$1,290,040
1440E-20	Lillian Lane Trans Main	16-inch pipeline in Lillian Lane between El Calamar & Camaron Rd.	16 in	4000 /LF	$150 /LF	$600,000	100%	$600,000	50	1978	2028	$1,935,060
1432E-7	Nutmeg Trans Main	12-inch pipeline in Nutmeg between Lincoln Ave. & Jefferson Ave.	12 in	6000 /LF	$100 /LF	$600,000	100%	$600,000	50	1978	2028	$1,935,060

TABLE 9.4
RANCHO CALIFORNIA WATER DISTRICT
CAPITAL REPLACEMENT PROGRAM
ESTIMATED CAPITAL COST
Santa Rosa Division

Item No.	Facility Name	Description of Facilities	Size/ Capacity	Quantity	Unit Cost	Estimated Capital Cost 2004 ($)	Estimated Replacement Items %	Estimated Replacement Items Cost	Life Cycle In Years	Construction Date	Repl. Date	Estimated Future Replacement Cost ($)
1440E-22	Mid-Carancho T.M. #1	24-inch pipeline between De Luz Rd. & El Prado Rd. in Carancho Rd.	24 in	2500 /LF	$225 /LF	$562,500	100%	$562,500	50	1978	2028	$1,814,119
1990E-4	Via Vaquero Trans Main #1	12-inch pipeline in Vaquero Rd. from Via Santa Rosa	12 in	5500 /LF	$100 /LF	$550,000	100%	$550,000	50	1978	2028	$1,773,805
2550E-26	Calle Corriente T.M.	24-inch pipeline between Avd. Bosque & Rancho Calif. In Calle Corriente	24 in	3600 /LF	$225 /LF	$810,000	100%	$810,000	50	1978	2028	$2,612,331
1432E-8	I-15 Trans Main	12-inch pipeline in I-15 between Nutmeg & Cal Oaks P.S.	12 in	5000 /LF	$100 /LF	$500,000	100%	$500,000	50	1978	2028	$1,612,550
2550E-31	Rancho Calif Rd. T.M. #2	16-inch pipeline between Corona Cala Camino & Viejo Rd. in Rancho Calif Rd.	16 in	3000 /LF	$150 /LF	$450,000	100%	$450,000	50	1978	2028	$1,451,295
2550E-13	Avenida La Cresta T.M. #1	20-inch pipeline between Baldaray P.S. & Calle Bandido in Avd. La Cresta	20 in	16800 /LF	$200 /LF	$3,360,000	100%	$3,360,000	50	1978	2028	$10,836,336
1670E-33	Upper Vista Del Mar T.M.	16-inch pipeline between Buena Vista & Carancho in Vista Del Mar	16 in	4250 /LF	$150 /LF	$637,500	100%	$637,500	50	1978	2028	$2,056,001
1432E-6	Upper Jefferson Ave. T.M.	12-inch pipeline in Jefferson between Nutmeg & Arikara St.	12 in	3000 /LF	$100 /LF	$300,000	100%	$300,000	50	1978	2028	$967,530
2550E-9	Calle Centro Trans Main	16-inch pipeline between Avd. De Arboles & Avd. La Cresta in Calle Centro	16 in	1000 /LF	$150 /LF	$150,000	100%	$150,000	50	1978	2028	$483,765
1670E-20	Via Vaquero Trans Main #6	36-inch pipeline between Ace Bowen #1 & 2 P.S. & Calle Roca in Via Vaquero	36 in	15000 /LF	$275 /LF	$4,125,000	100%	$4,125,000	50	1978	2028	$13,303,537
1440E-5	Via Los Gatos T.M. #2	12-inch pipeline between Buena Vista & Vista Del Mar in Via los Gatos	12 in	6000 /LF	$100 /LF	$600,000	100%	$600,000	50	1978	2028	$1,935,060
2850E-4	Corona Cala Camino T.M. #2	12-inch pipeline extends 3000 ft. from Redondo Mesa in Corona Cala Camino	12 in	3000 /LF	$100 /LF	$300,000	100%	$300,000	50	1978	2028	$967,530
1440E-9	Lower Camaron R. T.M. #2	20-inch pipeline between De Luz & De Anza in Camaron Rd.	20 in	3250 /LF	$200 /LF	$650,000	100%	$650,000	50	1978	2028	$2,096,315
2160E-7	Santa Rosa Plateau T.M. #1	24-inch pipeline between Clinton Keith Rd. & Tenaja Rd. in S.R. Sprs. Rd.	24 in	7750 /LF	$225 /LF	$1,743,750	100%	$1,743,750	50	1978	2028	$5,623,768
1440E-13	Lower Sandia Creek T.M. #1	24-inch pipeline in Sandia Creek between De Anza & Carancho	24 in	7000 /LF	$225 /LF	$1,575,000	100%	$1,575,000	50	1978	2028	$5,079,532
2850E-3	Corona Cala Camino T.M. #1	16-inch pipeline between Avocado Mesa & Redondo Mesa in Corona Cala Camino	16 in	2000 /LF	$150 /LF	$300,000	100%	$300,000	50	1978	2028	$967,530
1670E-13	De Luz Pump Trans Main	36-inch pipeline between De Luz P.S. & De Luz Reservoir	36 in	3000 /LF	$275 /LF	$825,000	100%	$825,000	50	1978	2028	$2,660,707
1670E-12	Mid-inch pipline betweenCaran	12-inch pipeline between El Prado Rd. & Sadi in Carancho	12 in	9000 /LF	$100 /LF	$900,000	100%	$900,000	50	1978	2028	$2,902,590
1440E-21	Buena Vista Trans Main	12-inch pipeline in Buena Vista Road between El Calamar & Via Los Gatos	12 in	9000 /LF	$100 /LF	$900,000	100%	$900,000	50	1978	2028	$2,902,590
1990E-12	Upper La Cruz Dr. T.M. #1	12-inch pipeline extends 6750 ft. above Via Vega in La Cruz Dr.	12 in	6750 /LF	$100 /LF	$675,000	100%	$675,000	50	1978	2028	$2,176,942
2550E-30	Rancho Calif Rd. T.M. #1	24-inch pipeline between Calle Pino & Corona Cala Camino in Rahcno Calif Rd.	24 in	7500 /LF	$225 /LF	$1,687,500	100%	$1,687,500	50	1978	2028	$5,442,356
2550E-34	Avenida La Cresta T.M. #3	20-inch pipeline in Avd. La Cresta between Sierra Maria Rd. & Tenaja	20 in	5100 /LF	$200 /LF	$1,020,000	100%	$1,020,000	50	1978	2028	$3,289,602
1670E-35	Upper Carancho T.M. #6	20-inch pipeline between Via Los Gatos & El Calamar in Carancho	20 in	4000 /LF	$200 /LF	$800,000	100%	$800,000	50	1978	2028	$2,580,080
1305E-4	Lemon Road Trans Main	36-inch pipeline in Lemon Rd. between Jefferson Ave. & Joaquin Ranch Rd.	36 in	6400 /LF	$275 /LF	$1,760,000	100%	$1,760,000	50	1978	2028	$5,676,176
1440E-7	Upper Camaron Rd. T.M.	16-inch pipeline between Carancho Rd. & De Luz Rd. in Cameron Rd.	16 in	7750 /LF	$150 /LF	$1,162,500	100%	$1,162,500	50	1978	2028	$3,749,179
1670E-31	Upper Carancho T.M. #5	16-inch pipeline between Los Gatos & Carancho PRS in Carancho	16 in	9000 /LF	$150 /LF	$1,350,000	100%	$1,350,000	50	1978	2028	$4,353,885
2550E-7	Avenida De Arboles T.M. #1	12-inch pipeline between Calle de Lobo & Via Herta in Avd. De Arbole	12 in	4000 /LF	$100 /LF	$400,000	100%	$400,000	50	1978	2028	$1,290,040
1440E-19	Lower El Calamar T.M.	12-inch pipeline in El Calamar between Lillian Lane & Buena Vista Rd.	12 in	2000 /LF	$100 /LF	$200,000	100%	$200,000	50	1978	2028	$645,020
1440E-15	Upper Sandia Creek T.M. #1	12-inch pipeline in Sandia Creek between Carancho & Via Vaquero	12 in	6250 /LF	$100 /LF	$625,000	100%	$625,000	50	1978	2028	$2,015,687
1440E-23	Mid-Carancho T.M. #2	30-inch pipeline between El Prado Road & Sandia Creek in Carancho	30 in	9000 /LF	$250 /LF	$2,250,000	100%	$2,250,000	50	1978	2028	$7,256,475
1440E-11	De Anza Rd. Trans Main #2	12-inch pipeline in De Anza from Camaron	12 in	1500 /LF	$100 /LF	$150,000	100%	$150,000	50	1978	2028	$483,765
1305E	Meriedes St. T.M.	24-inch pipeline beginning at Rancho CA Rd. to Mercedes St. and ending at 1st. St.	24 in	4098 /LF	$225 /LF	$922,050	100%	$922,050	50	2000	2050	$8,698,858
1990E	Freeman Res. T.M.	30-inch pipeline at Freeman Res. Outlet pipe	30 in	237 /LF	$250 /LF	$59,250	100%	$59,250	50	2000	2050	$558,980
1670E	Carancho Res. T.M.	30-inch pipeline from El Calamar to Carancho Rd.	30 in	6199 /LF	$250 /LF	$1,549,750	100%	$1,549,750	50	2000	2050	$14,620,742
1305E	Rorck Dr. T.M.	x-inch pipeline between Via Industria and Dendy Pkwy.	20 in	600 /LF	$200 /LF	$120,000	100%	$120,000	50	2000	2050	$1,132,111
1790E	Los Caballos P.S. T.M.	16-inch pipeline between Pauba Road & De Portola Rd.	16 in	3435 /LF	$150 /LF	$515,250	100%	$515,250	50	2000	2050	$4,861,002
1305E	RWBP T.M.	48-inch pipeline located around Temecula Creek Rd.	48 in	1571 /LF	$350 /LF	$549,850	100%	$549,850	50	2000	2050	$5,187,427
2160E	Vineyard Pkwy T.M.	x-inch pipeline between Del Oro and Silverwood St.	24 in	818 /LF	$225 /LF	$184,050	100%	$184,050	50	2000	2050	$1,736,375
2850	Redonda Mesa T.M.	x-inch pipelline beginning at Redonda Mesa Res. No. 2 heading east	20 in	1600 /LF	$200 /LF	$320,000	100%	$320,000	50	2000	2050	$3,018,963
		Subtotal				$153,242,700		$153,242,700				$520,426,913
		PRESSURE REDUCING STATIONS										
1670E-30	Carancho P.R.S.	Pressure Reducing Station at Carancho & Barona		1 LS		$158,830	30%	$47,649	30	1978	2008	$57,918
1440E-32	Sandia Creek P.R.S.	Pressure Reducing Station at Sandia Creek & De Anza		1 LS		$158,830	30%	$47,649	30	1978	2008	$57,918
1440E-30	De Luz P.R.S.	Pressure Reducing Station at De Luz & Cameron		1 LS		$158,830	30%	$47,649	30	1978	2008	$57,918
		Subtotal				$476,489		$142,947				$173,753
		WELLS										
1500E-9	Well No. 302	Well at Hayes Rd.	0 gpm	1 LS		$635,176	100%	$635,176	30	1979	2009	$810,664
1500E-10	Well No. 301	Well at Tenaja and Hayes	0 gpm	1 LS		$635,176	100%	$635,176	30	1979	2009	$810,664
1305E-58	Well No. 309	Well below Elm & Jefferson	3200 gpm	1 LS		$741,111	100%	$741,111	30	1987	2017	$1,397,474
		Subtotal				$2,011,463		$2,011,463				$3,018,802
TOTAL SANTA ROSA DIVISION						$243,296,474		$177,866,339				$606,470,363

TABLE 9.4
RANCHO CALIFORNIA WATER DISTRICT
CAPITAL REPLACEMENT PROGRAM
ESTIMATED CAPITAL COST
Santa Rosa Division

Item No.	Facility Name	Description of Facilities	2005-2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2040	2041-2050	2051-2060
		RESERVOIRS								
1670E-6	Carancho Reservoir #1	3.0 MG tank at Carancho Site (abandoned)								
1305E-1	Ace Bowen Reservoir #1	3.0 MG tank at Ace Bowen Site						$1,103,203		
1990E-1	Freeman Reservoir	3.0 MG tank at Calle Escadera						$1,103,203		
1670E-1	De Luz Reservoir #1	3.0 MG tank at De Luz Site						$1,103,203		
1670E-2	De Luz Reservoir #2	3.0 MG tank at De Luz Site						$1,103,203		
1670E-7	Carancho Reservoir #2	2.2 MG tank at Carancho Site (abandoned)								
1305E-2	Ace Bowen Reservoir #2	5.0 MG tank at Ace Bowen Site						$2,027,136		
2160E-3	Baldaray Reservoir	2.2 MG tank at Baldaray Site							$936,537	
2550E-1	La Cresta Reservoir	1.1 MG tank at La Cresta Site							$468,268	
1440E-1	Prado Reservoir	5.0 MG tank at Prado Site							$2,587,196	
2260E-1	Tenaja Reservoir	2.2 MG tank at Tenaja Site							$1,255,049	
1500E-1	Bear Creek Reservoir	2.2 MG tank at Bear Creek Site on Clinton Keith							$1,255,049	
1432E-1	Antelope Reservoir	2.2 MG tank at Antelope Site							$1,317,801	
2550E-35	Avocado Mesa Reservoir	5.8 MG tank at Avocado Mesa Site							$3,474,203	
1440	Prado Reservoir #2									$6,083,037
1670	Carancho Reservoir #3									$4,917,572
1670	Vaquero Reservoir #1									$5,673,649
1990	Freeman Reservoir #2									$4,917,572
2850	Redondo Mesa Reservoir									$491,757
2850	Calle Parama Reservoir									$1,685,190
		Subtotal	$0	$0	$0	$0	$0	$6,439,948	$11,294,102	$23,768,777
		PUMP STATIONS								
1990E-3	Del Oro Pump Station	4900 gpm pump station (4 units at 150 HP each) at Avd. Del Oro & C. Capistrano	$840,689							
1670E-3	East Bluff Pump Station	7500 gpm pump station (2 units at 150 HP, 4 units at 200 HP) at East Bluff	$2,681,797							
2550E-2	Baldaray Pump Station	4500 gpm pump station (4 units, 200 HP each) at Baldaray site.	$1,109,709							
1670E-4	Ace Bowen #1 Pump Station	11800 gpm pump station (3 units at 350 HP, 2 units at 250 HP) at Ace Bowen		$2,011,284						
2160E-10	De Luz Pump Station	5300 gpm pump station (2 units at 350 HP, 2 units at 200 HP) at De Luz Site		$1,478,340						
1440E-2	Ace Bowen #3 Pump Station	6000 gpm pump station (2 units at 250 HP each) at Ace Bowen Site		$1,019,308						
1990E-2	Santa Rosa Pump Station	3200 gpm pump station (3 units at 150 HP each) at Via Santa Rosa & Vaqu			$963,246					
1670E-5	Ace Bowen #2 Pump Station	18000 gpm pump station at Ace Bowen Site			$7,452,480					
1440E-3	Ace Bowen #4 Pump Station	14500 gpm pump station (2 units at 650 HP each) at Ace Bowen Site			$4,916,774					
2160E-4	Bear Creek Pump Station	2500 gpm pump station (2 units at 150 HP, 1 unit at 250 HP) at Bear Creek Site			$1,291,142					
1500E-2	Joaquin Ranch Pump Station	5400 gpm pump station (2 units at 250 HP each) at Tenaja & Hayes Rd.			$1,238,975					
2260E-6	Caranco Pump Station	1700 gpm pump station (1 unit at 350 HP) at Carancho Site				$1,056,829				
1432E-2	Cal Oaks Pump Station	3000 gpm pump station (2 units at 125 HP each) at Cal Oaks Site				$754,878				
1670	Senga Doherty P.S.							$9,103,307		
1990	Vaquero P.S.							$3,085,867		
2850S	Redondo Mesa P.S.							$1,089,129		
2850N	Avenida Escala P.S.							$1,254,314		
		Subtotal	$4,632,194	$4,508,933	$15,862,616	$1,811,707	$0	$14,532,618	$0	$0

TABLE 9.4
RANCHO CALIFORNIA WATER DISTRICT
CAPITAL REPLACEMENT PROGRAM
ESTIMATED CAPITAL COST
Santa Rosa Division

Item No.	Facility Name	Description of Facilities	2005-2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2040	2041-2050	2051-2060
		TRANSMISSION MAINS								
1440E-17	Upper Sandia Creek T.M. #3	12-inch pipeline between De Lorme Dr. & Via De Los Fideos in Sandia Creek					$725,647			
1440E-24	Upper Carancho T.M. #2	20-inch pipeline between Carancho Reservoirs & Camaron Road					$5,805,180			
1670E-27	El Prado trans Main	12-inch pipeline between Sandia Creek & Carancho in El Prado					$3,950,747			
1305E-5	Upper Jefferson Ave. T.M.	36-inch pipeline in Jefferson Ave. between Lemon R. & Winchester Rd.					$20,576,138			
1670E-28	Upper El Prado Trans Main	8-inch pipeline between Carancho & La Vella Rd. in El Prado					$725,647			
1440E-25	Upper Carancho T.M. #3	24-inch pipeline extends 3500 ft. from Camaron Rd. towards De Luz in Carancho					$2,539,766			
1670E-29	Lower Carancho Trans Main	8-inch pipeline between Sandia Creek & Calle Jardin in Carancho					$1,995,531			
2550E-36	Avenida La Cresta T.M. #4	20-inch pipeline in Avd. La Cresta between Calle Bandido and Gallop Lane					$4,321,634			
2550E-27	Calle Pino Trans Main	16-inch pipeline between Rancho Calif. Rd. & Avd. La Cresta in Calle Pino					$3,628,237			
1440E-26	Upper Carancho T.M. #4	16-inch pipeline extends toward Camaron Rd. from De Luz in Carancho					$1,935,060			
2550E-33	Avocado Mesa Inlet T.M.	36-inch pipeline in Avocado Mesa & Corona Cala Camino between Avocado					$6,208,317			
2260E-3	Via Escalon Trans Main	12-inch pipeline between Calamar Rd. & 24" Trans Main in Via Escalon					$1,193,287			
2550E-25	Avenida Bosque T.M.	24-inch pipeline from Calle Bandido to Calle Corriente in Avd. Bosque					$1,632,707			
1440E-27	Prado Trans Main	42-inch pipeline between Prado Reservoir & Carancho					$967,530			
2550E-37	Calle de Companero T.M. #2	12-inch pipeline in C. de Companero between Avd. La Cresta and Vista					$322,510			
2160E-1	Paseo Chaparro T.M. #1	12-inch pipeline in Paseo Chaparro extending 6000 ft. from Via Ent					$1,451,295			
2260E-2	Calle de Mucho Trans Main	24-inch pipeline between Tenaja Reservoir & Via Escalon in Via Volcano					$13,497,043			
1440E-28	Via Vaquero T.M. #7	39-inch pipeline between Ace Bowen #3 & 4 P.S. & Calle Roca in Via Vaquero					$13,303,537			
2260E-4	Upper El Calamar Rd. T.M.	8-inch pipeline extending north along El Calamar Rd. from Via Escalon					$1,209,412			
2160E-5	Upper Clinton Keith T.M. #1	16-inch pipeline between Bear Creek P.S. & Via Entrada					$3,749,179			
2550E-23	La Cresta Res. Inlet T.M.	24-inch pipeline from Vista de Montanas to La Cresta Reservoir					$1,451,295			
1440E-29	Calle Uva Trans Main #1	36-inch pipeline between Via Vaquero & Sandia Creek in Calle Rosa					$18,181,501			
2160E-2	Via Entrada Trans Main	8-inch pipeline between Clingo Keith & Avd. La Cresta in Via Ent					$725,647			
2160E-9	Santa Rosa Plateau T.M. #3	36-inch pipeline between De Luz P.S. & S.R. Sprs. Rd					$6,501,801			
2550E-21	Vista de Montanas T.M. #1	24-inch pipeline between Calle de Companero & nod to La Cresta Res.					$1,814,119			
1305E-104	Kalima St. Trans Main	24-inch pipeline in Kalima and l-inch pipline between15 between Cal Oaks P.S. and Jefferson					$2,721,178			
2160E-6	Upper Clinton Keith T.M. #2	20-inch pipeline between Via Entrada & S.R. Springs Road in Cilinton Keith					$1,612,550			
2550E-18	Camino Noroeste T.M.	8-inch pipeline between Calle de Suenos & Sierra Sota Rd. in Valle Vista					$1,330,354			
2160E-8	Santa Rosa Plateau T.M. #2	33-inch pipeline between Tenaja Rd. & the end of S.R. Springs Rd. in S.R.					$4,434,512			
1440E-31	Lower De Luz T.M. #2	12-inch pipeline in De Luz, extending south from De Luz PRS					$1,612,550			
2550E-20	Via Caballos Trans Main	12-inch pipeline between Avd. Castilla & Avd. La Cresta in Via Caballos					$2,902,590			
1990E-6	Sycamore Mesa Trans Main	16-inch pipeline between Via Baranca & Via Santa Rosa in Sycamore Mesa					$2,660,707			
2550E-19	Sierra Soto Rd. T.M.	12-inch pipeline between Camino Noroesta & Sierra Maria in Sierra Soto					$483,765			
1305E-33	Blackdeer Loop Trans Main	16-inch pipeline in Blackdeer Loop between Diaz & Rancho Calif. Airport					$1,378,730			
2550E-17	Valle Vista Trans Main	12-inch pipeline between Avd. Cresta & C. de Suenos in Valle Vista					$1,935,060			
1990E-10	Upper Sandia Creek T.M.	20-inch pipeline between Via Barranca & Del Oro P.S. in Sando Creek					$4,708,646			
1990E-5	Upper Santa Rosa T.M. #1	16-inch pipeline between Santa Rosa P.S. & Sycamore Mesa in Via Santa					$1,935,060			
1440E-33	Lower Sandia Creek T.M. #3	8-inch pipeline in Sandia Creek between De Anza & El Prado					$423,294			
1990E-7	Via Peregrino Trans Main	12-inch pipeline from Via Santa Rosa in Via Peregrino					$1,128,785			
1990E-14	Calle Capistrano Loop T.M.	12-inch pipeline in Calle Capistrano, Rancho Calif. & Calle Monticello					$4,192,630			
1990E-9	Via Barranca Trans Main	20-inch pipeline between Freeman Res. & Sandia Creek Dr. in Calle					$3,225,100			
2550E-6	Calle De Lobo Trans Main	12-inch pipeline between Paseo Montana & C. de Componero in C.D. Lobo					$2,338,197			
1990E-11	Lower Sandia Creek T.M.	16-inch pipeline between Via Barranco & La Cruz in Sandia Creek					$2,418,825			
2550E-15	Avenida Castilla T.M.	12-inch pipeline between Avd. La Cresta & Avd. La Cresta & Avd. La Cresta in Avd. Castilla					$2,676,833			
1990E-13	Upper La Cruz Dr. T.M. #2	8-inch pipeline extends 2350 ft. below Via Vega in La Cruz Dr.					$568,424			
2550E-5	Paseo Montana Trans Main	8-inch pipeline between Majorica & Calle De Lobo in P. Montana					$1,632,707			
1990E-15	Upper Calle Capistrano T.M.	10-inch pipeline in Calle Capistrano between Rancho Calif Rd. & Prader					$354,761			
2550E-11	Avenida Bonita T.M. #2	8-inch pipeline between Avd. La Cresta & Avd. Castilla in Ave. Bonita					$604,706			
2550E-16	Calle de Suenos T.M.	12-inch pipeline between Avd. Castilla & Valle Vista in Calle de Suenos					$3,466,982			
1500E-3	Lower Clinton Keith T.M. #1	16-inch pipeline in Clinton Keith between Calle Del Oso & Ransho Santa					$1,693,177			
2550E-14	Avenida La Cresta T.M. #2	16-inch pipeline between Gallop Ln. & Sierra Maria Rd. in Avd. La Cresta					$1,596,424			
1670E-10	Calle Nuevo Trans Main	39-inch pipeline between V. Vaquero & Carancho in Calle Nuevo & Cara					$5,572,973			

TABLE 9.4
RANCHO CALIFORNIA WATER DISTRICT
CAPITAL REPLACEMENT PROGRAM
ESTIMATED CAPITAL COST
Santa Rosa Division

Item No.	Facility Name	Description of Facilities	2005-2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2040	2041-2050	2051-2060
2550E-12	Calle de Companero T.M. #1	12-inch pipeline between C. de Lobo & Vista de Montanas in Calle de Companero					$1,838,307			
1500E-4	Upper Bear Creek T.M.	12-inch pipeline in Bear Creek Drive between Clinton Keith & Creek Vie					$1,290,040			
2550E-10	Avenida Bonita T.M. #1	12-inch pipeline between Avd. De Arboles & Avd. La Cresta in Ave. Bonita					$1,612,550			
1670E-14	Upper De Luz Trans Main	12-inch pipeline between Via Nortada & De Luz Reservoir in De Luz					$483,765			
1670E-9	Upper Carancho T.M. #1	36-inch pipeline between De Luz Rd & Carancho P.S. in Carancho Rd.					$14,190,440			
1500E-5	Lower Bear Creek T.M.	12-inch pipeline in Bear Creek Drive between Clinton Keith & Twin Oaks					$1,290,040			
1670E-11	Mid De Luz Trans Main	16-inch pipeline between V. Vaquero & El Prado in De Luz Rd & Carancha					$544,236			
1670E-18	Lower La Cruz Trans Main	12-inch pipeline between Sandia Creek & El Perro Dr. in La Cruz Dr.					$967,530			
2850E-1	Avocado Mesa T.M. #1	12-inch pipeline between Calle Viento and 16-inch main in Avocado Mesa					$1,854,432			
1500E-6	Calle Del Oso Oro T.M.	30-inch pipeline between Clinton Keith & Joaquin Ranch Pump Station in					$11,287,850			
1670E-15	Via Vaquero Trans Main #1	20-inch pipeline between Avd. Del Oro & Calle Cuero in Via Vaquero &					$6,192,192			
1670E-22	Calle Roca Trans Main	8-inch pipeline between Via Vaquero & Avd. Tierra in Calle Roca					$1,148,942			
1670E-17	Via Vaquero Trans Main #3	39-inch pipeline between Calle Nuevo & Calle Roca in Via Vaquero					$18,112,161			
1500E-7	Magnolia Trans Main	16-inch pipeline Hayes and Douglas in Magnolia					$967,530			
1670E-19	Via Vaquero Trans Main #5	24-inch pipeline between Calle Cuero & Via Santa Rosa in Via Vaquero					$17,415,540			
1670E-26	Calle Cuero Trans Main	12-inch pipeline extending from Via Vaquero in Calle Cuervo					$1,451,295			
1670E-21	Lower Santa Rosa T.M.	24-inch pipeline between Ace Bowen #1 & 2 P.S. & Santa Rosa P.S. in Santa Rosa					$5,805,180			
1500E-8	Lower Clinton Keith T.M. #2	16-inch pipeline between Calle Del Oso Oro and Bear Creek Reservoir in					$1,693,177			
1670E-23	Calle Uva Trans Main #2	12-inch pipeline in Calle Uva extending from Calle Jardin					$1,128,785			
2550E-24	Calle Bandido Trans Main	24-inch pipeline from Avd. La Cresta to Avd. Bosque in Calle Bandido					$8,707,770			
1670E-25	Avenida Tierra Trans Main	16-inch pipeline in Ave Tierra between Calle Jardin & Calle Roca					$2,902,590			
1305E-12	Camino Estribo T.M. #2	30-inch pipeline in C. Estribo between Ace Bowen P.S. #3 & 4 & 2nd San					$9,070,594			
2550E-28	Tenaja Rd. Trans Main #1	24-inch pipeline in Tenaja Rd. between 2260 Tenaja Reservoir & 30-inch					$798,212			
2550E-22	Vista de Montanas T.M. #2	16-inch pipeline between node to La Cresta Res. & Hombre Ln. in Vista					$1,693,177			
2550E-29	Tenaja Rd. Trans Main #2	30-inch pipeline from 24" trans main to Rancho Calif. Rd. in Tenaja Rd.					$5,079,532			
1305E-8	Diaz Rd. Trans Main #2	12-inch pipeline in Diaz Rd. between Cherry St. & Rancho Calif. Rd.					$3,789,492			
2550E-32	Viejo Road Trans Main	16-inch pipeline in the Viejo Road loop					$1,814,119			
2160E-11	Lower Avenida La Cresta T.M.	20-inch pipeline in Avd. La Cresta between Clinton Keith and Baldaray Road					$3,870,120			
1670E-32	Calle Colina Trans Main	8-inch pipeline extending from Carancho in Calle Colina					$483,765			
2550E-4	Via Majorica Trans Main	12-inch pipeline between Avd. De Arboles & Avia Vista Grande in V. Majorica					$2,338,197			
1670E-34	Los Gatos T.M. #1	12-inch pipeline extends from Carancho 9500 ft. in Via Los Gatos					$3,063,845			
1990E-8	Via Horca Trans Main	12-inch pipeline between Camino Gatillo & Santa Rosa in Via Horca					$1,612,550			
1670E-36	Via Vaquero T.M. #4	20-inch pipeline between De Luz Reservoir and Avd. Del Oro in Via Vaquero					$3,225,100			
2550E-3	Via Vista Grande T.M.	12-inch pipeline between Avd. De Arboles & Via Majorica in V.V. Grande					$1,693,177			
2550E-8	Avenida De Arboles T.M. #2	16-inch pipeline between Via Huerta & ViaVista Grande in Avd. De Arboles					$3,144,472			
1990E-16	Upper Santa Rosa T.M. #2	12-inch pipeline between Santa Rosa P.S. & Via Horca					$1,773,805			
1440E-4	Vuelta Grande Trans Main	12-inch pipeline in Carancho & Vuelta Grande					$2,580,080			
1432E-3	Antelope Rd. Trans Main	24-inch pipeline between Antelope Reservoir & Cal Oaks P.S. in Antelope Rd.					$6,349,416			
1440E-6	Lower De Luz T.M. #1	16-inch pipeline between Carancho & De Luz PRS in De Luz					$6,288,945			
1670E-8	Del Oro Trans Main	20-inch pipeline between East Bluff P.S. & Via Vaquero in Avd. Del Oro					$13,787,302			
1440E-8	Lower Camaron R. T.M. #1	12-inch pipeline between De Luz & De Anza in Camaron Rd.					$1,048,157			
1432E-4	Jackson Ave. Trans Main	16-inch pipeline between Antelope Rd. & Nutmeg Rd. in Jackson Ave.					$3,144,472			
1440E-10	De Anza Rd. Trans Main #1	24-inch pipeline between Camaron & Sandi Creek in De Anza Rd.					$2,902,590			
1670E-16	Via Vaquero Trans Main #2	24-inch pipeline between De Luz Reservoir & Calle Nuevo in Via Vaquero					$5,260,944			
1440E-12	De Anza Rd Trans Main #3	10-inch pipeline in De Anza from Sandia Creek					$709,522			
1432E-5	Upper Nutmeg Loop T.M.	12-inch pipeline between Nutmeg & 16" node in Unnamed Road					$645,020			
1440E-14	Lower Sandia Creek T.M. #2	8-inch pipeline in Sandia Creek between De Anza & Carancho					$1,693,177			
1670E-24	Calle Jardin Trans Main	16-inch pipeline in Calle Jardin between Calle Cuero & Carancho					$4,837,650			
1440E-16	Upper Sandia Creek T.M. #2	8-inch pipeline between Sandia Creek between Carancho Rd. & DeLorme Dr.					$665,177			
1432E-6	Lower Nutmeg Loop T.M.	16-inch pipeline between Jackson Ave. & 12-inch node in Unnamed Road					$1,209,412			
1440E-18	Mid El Calamar Trans Main	16-inch pipeline in El Calamar between carancho & Lillian Lane					$967,530			
2260E-5	Carancho Pump Trans Main	12-inch pipeline from Carancho Pump Station to Via Escalon					$1,290,040			
1440E-20	Lillian Lane Trans Main	16-inch pipeline in Lillian Lane between El Calamar & Camaron Rd.					$1,935,060			
1432E-7	Nutmeg Trans Main	12-inch pipeline in Nutmeg between Lincoln Ave. & Jefferson Ave.					$1,935,060			

TABLE 9.4
RANCHO CALIFORNIA WATER DISTRICT
CAPITAL REPLACEMENT PROGRAM
ESTIMATED CAPITAL COST
Santa Rosa Division

Item No.	Facility Name	Description of Facilities	2005-2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2040	2041-2050	2051-2060
1440E-22	Mid-Carancho T.M. #1	24-inch pipeline between De Luz Rd. & El Prado Rd. in Carancho Rd.					$1,814,119			
1990E-4	Via Vaquero Trans Main #1	12-inch pipeline in Vaquero Rd. from Via Santa Rosa					$1,773,805			
2550E-26	Calle Corriente T.M.	24-inch pipeline between Avd. Bosque & Rancho Calif. In Calle Corriente					$2,612,331			
1432E-8	I-15 Trans Main	12-inch pipeline in I-15 between Nutmeg & Cal Oaks P.S.					$1,612,550			
2550E-31	Rancho Calif Rd. T.M. #2	16-inch pipeline between Corona Cala Camino & Viejo Rd. in Rancho Calif Rd.					$1,451,295			
2550E-13	Avenida La Cresta T.M. #1	20-inch pipeline between Baldaray P.S. & Calle Bandido in Avd. La Cresta					$10,836,336			
1670E-33	Upper Vista Del Mar T.M.	16-inch pipeline between Buena Vista & Carancho in Vista Del Mar					$2,056,001			
1432E-6	Upper Jefferson Ave. T.M.	12-inch pipeline in Jefferson between Nutmeg & Arikara St.					$967,530			
2550E-9	Calle Centro Trans Main	16-inch pipeline between Avd. De Arboles & Avd. La Cresta in Calle Centro					$483,765			
1670E-20	Via Vaquero Trans Main #6	36-inch pipeline between Ace Bowen #1 & 2 P.S. & Calle Roca in Via Vaquero					$13,303,537			
1440E-5	Via Los Gatos T.M. #2	12-inch pipeline between Buena Vista & Vista Del Mar in Via los Gatos					$1,935,060			
2850E-4	Corona Cala Camino T.M. #2	12-inch pipeline extends 3000 ft. from Redondo Mesa in Corona Cala Camino					$967,530			
1440E-9	Lower Camaron R. T.M. #2	20-inch pipeline between De Luz & De Anza in Camaron Rd.					$2,096,315			
2160E-7	Santa Rosa Plateau T.M. #1	24-inch pipeline between Clinton Keith Rd. & Tenaja Rd. in S.R. Sprs. Rd.					$5,623,768			
1440E-13	Lower Sandia Creek T.M. #1	24-inch pipeline in Sandia Creek between De Anza & Carancho					$5,079,532			
2850E-3	Corona Cala Camino T.M. #1	16-inch pipeline between Avocado Mesa & Redondo Mesa in Corona Cala Camino					$967,530			
1670E-13	De Luz Pump Trans Main	36-inch pipeline between De Luz P.S. & De Luz Reservoir					$2,660,707			
1670E-12	Mid-inch pipline betweenCaran	12-inch pipeline between El Prado Rd. & Sadi in Carancho					$2,902,590			
1440E-21	Buena Vista Trans Main	12-inch pipeline in Buena Vista Road between El Calamar & Via Los Gatos					$2,902,590			
1990E-12	Upper La Cruz Dr. T.M. #1	12-inch pipeline extends 6750 ft. above Via Vega in La Cruz Dr.					$2,176,942			
2550E-30	Rancho Calif Rd. T.M. #1	24-inch pipeline between Calle Pino & Corona Cala Camino in Rahcno Calif Rd.					$5,442,356			
2550E-34	Avenida La Cresta T.M. #3	20-inch pipeline in Avd. La Cresta between Sierra Maria Rd. & Tenaja					$3,289,602			
1670E-35	Upper Carancho T.M. #6	20-inch pipeline between Via Los Gatos & El Calamar in Carancho					$2,580,080			
1305E-4	Lemon Road Trans Main	36-inch pipeline in Lemon Rd. between Jefferson Ave. & Joaquin Ranch Rd.					$5,676,176			
1440E-7	Upper Camaron Rd. T.M.	16-inch pipeline between Carancho Rd. & De Luz Rd. in Cameron Rd.					$3,749,179			
1670E-31	Upper Carancho T.M. #5	16-inch pipeline between Los Gatos & Carancho PRS in Carancho					$4,353,885			
2550E-7	Avenida De Arboles T.M. #1	12-inch pipeline between Calle de Lobo & Via Herta in Avd. De Arbole					$1,290,040			
1440E-19	Lower El Calamar T.M.	12-inch pipeline in El Calamar between Lillian Lane & Buena Vista Rd.					$645,020			
1440E-15	Upper Sandia Creek T.M. #1	12-inch pipeline in Sandia Creek between Carancho & Via Vaquero					$2,015,687			
1440E-23	Mid-Carancho T.M. #2	30-inch pipeline between El Prado Road & Sandia Creek in Carancho					$7,256,475			
1440E-11	De Anza Rd. Trans Main #2	12-inch pipeline in De Anza from Camaron					$483,765			
1305E	Meriedes St. T.M.	24-inch pipeline beginning at Rancho CA Rd. to Mercedes St. and ending at 1st. St.							$8,698,858	
1990E	Freeman Res. T.M.	30-inch pipeline at Freeman Res. Outlet pipe							$558,980	
1670E	Carancho Res. T.M.	30-inch pipeline from El Calamar to Carancho Rd.							$14,620,742	
1305E	Rorck Dr. T.M.	x-inch pipeline between Via Industria and Dendy Pkwy.							$1,132,111	
1790E	Los Caballos P.S. T.M.	16-inch pipeline between Pauba Road & De Portola Rd.							$4,861,002	
1305E	RWBP T.M.	48-inch pipeline located around Temecula Creek Rd.							$5,187,427	
2160E	Vineyard Pkwy T.M.	x-inch pipeline between Del Oro and Silverwood St.							$1,736,375	
2850	Redonda Mesa T.M.	x-inch pipelline beginning at Redonda Mesa Res. No. 2 heading east							$3,018,963	
		Subtotal	$0	$0	$0	$0	$480,612,456	$0	$39,814,456	$0
		PRESSURE REDUCING STATIONS								
1670E-30	Carancho P.R.S.	Pressure Reducing Station at Carancho & Barona	$57,918							
1440E-32	Sandia Creek P.R.S.	Pressure Reducing Station at Sandia Creek & De Anza	$57,918							
1440E-30	De Luz P.R.S.	Pressure Reducing Station at De Luz & Cameron	$57,918							
		Subtotal	$173,753	$0	$0	$0	$0	$0	$0	$0
		WELLS								
1500E-9	Well No. 302	Well at Hayes Rd.	$810,664							
1500E-10	Well No. 301	Well at Tenaja and Hayes	$810,664							
1305E-58	Well No. 309	Well below Elm & Jefferson			$1,397,474					
		Subtotal	$1,621,328	$0	$1,397,474	$0	$0	$0	$0	$0
TOTAL SANTA ROSA DIVISION			$6,427,275	$4,508,933	$17,260,090	$1,811,707	$480,612,456	$20,972,566	$51,108,559	$23,768,777

TABLE 9.5
RANCHO CALIFORNIA WATER DISTRICT
CAPITAL REPLACEMENT PROGRAM
ESTIMATED CAPITAL COST
Rancho Division

Item No.	Facility Name	Description of Facilities	Size/ Capacity	Quantity	Unit Cost	Estimated Capital Cost 2004 ($)	Estimated Replacement Items %	Estimated Replacement Items Cost	Life Cycle In Years	Construction Date	Repl. Date	Estimated Future Replacement Cost ($)
		RESERVOIRS										
1610E-1	Buck Mesa Reservoir #1	1.5 MG tank at Brenda Rd. and Buck Rd.		1.5 MG	$0.70 /gal	$1,050,000	10%	$105,000	60	1967	2027	$322,510
1550E-1	Alvarez Reservoir	1.5 MG tank at Los Panteras Rd. Site		1.5 MG	$0.70 /gal	$1,050,000	10%	$105,000	60	1968	2028	$338,635
1380E-8	Anza Reservoir #1	2.2 MG tank at Anza Rd. and Linda Rosea Road		2.2 MG	$0.70 /gal	$1,540,000	10%	$154,000	60	1969	2029	$521,499
1380E-1	General Kearny Reservoir	2.2 MG tank at Kaiser Pkwy site		2.2 MG	$0.70 /gal	$1,540,000	10%	$154,000	60	1969	2029	$521,499
2070E-1	Glen Oaks Reservoir #1	2.2 MG tank at Camino Sierra		2.2 MG	$0.70 /gal	$1,540,000	10%	$154,000	60	1970	2030	$547,574
1790E-1	De Portola Reservoir #1	2.2 MG tank at De Portola Site		2.2 MG	$0.70 /gal	$1,540,000	10%	$154,000	60	1970	2030	$547,574
1485E-1	Calle Contento Reservoir	2.2 MG tank at Calle Contento and Pauba Rd.		2.2 MG	$0.70 /gal	$1,540,000	10%	$154,000	60	1982	2042	$983,364
2070E-2	Glen Oaks Reservoir #2	2.2 MG tank at Ladera Vista		2.2 MG	$0.70 /gal	$1,540,000	10%	$154,000	60	1982	2042	$983,364
1610E-2	Buck Mesa Reservoir #2	5.0 MG tank at Brenda Rd. and Buck Rd.		5 MG	$0.70 /gal	$3,500,000	10%	$350,000	60	1982	2042	$2,234,917
1305E-3	Norma Marshall Res.	5.0 MG tank at Rancho Calif. Rd. and Margarita		5 MG	$0.70 /gal	$3,500,000	10%	$350,000	60	1982	2042	$2,234,917
1790E-2	De Portola Reservoir #2	3.5 MG tank at De Portola Site		3.5 MG	$0.70 /gal	$2,450,000	10%	$245,000	60	1984	2044	$1,724,797
2350E-1	Calaveras Reservoir #1	0.5 MG tank at Esplendida and Avd. Alturas		0.5 MG	$0.70 /gal	$350,000	10%	$35,000	60	1987	2047	$285,238
1305	Senga Doherty Reservoir			10.0 MG		$6,400,000	10%	$640,000	60	2000	2060	$9,835,144
1380	Winchester Reservoir #1			4.6 MG		$2,900,000	10%	$290,000	60	2000	2060	$4,456,550
1485	El Chimisal Reservoir #1			6.2 MG		$3,900,000	10%	$390,000	60	2000	2060	$5,993,291
1485	Nicolas Reservoir			3.5 MG		$2,200,000	10%	$220,000	60	2000	2060	$3,380,831
1485	El Chimisal Reservoir #2			6.2 MG		$3,900,000	10%	$390,000	60	2000	2060	$5,993,291
1550	El Chimisal Reservoir #3			2.2 MG		$2,400,000	10%	$240,000	60	2000	2060	$3,688,179
1790	Tucalota Reservoir			3.5 MG		$2,500,000	10%	$250,000	60	2000	2060	$3,841,853
		Subtotal				$45,340,000		$4,534,000				$48,435,025
		PUMP STATIONS										
1550E-5	Booster 40 Pump Station	1100 gpm pump station (1 unit at 125 HP) at Hwy 79 Site	1100 gpm	125 HP	$2,509 /HP	$313,667	40%	$125,467	35	1966	2001	$108,383
1790E-3	Buck Mesa Pump Station	12900 gpm pump station (3 units at 100 HP, 4 units at 150 HP)	12900 gpm	900 HP	$2,438 /HP	$2,194,246	40%	$877,698	35	1967	2002	$796,098
1380E-20	Meadowview Pump Station	9300 gpm pump station (6 units at 75 HP each) at Rancho Calif. Rd. and Margarite	9300 gpm	450 HP	$2,980 /HP	$1,340,928	40%	$536,371	35	1970	2005	$563,190
2070E-3	De Portola Pump Station	5000 gpm pump station (1 unit at 75 HP, 3 units at 150 HP) at De Portola Site	5000 gpm	525 HP	$2,980 /HP	$1,564,416	40%	$625,766	35	1972	2007	$724,403
1485E-2	Rancho Calif. Pump Station #2	4600 gpm pump station (3 units at 75 HP each) at Rancho Calif. And Butterfield Stage Rd.	4600 gpm	225 HP	$2,823 /HP	$635,176	40%	$254,071	35	1974	2009	$324,266
1610E-9	Anza Pump Station	6900 gpm pump station (4 units at 150 HP each) at Anza rd. Site	6900 gpm	600 HP	$2,752 /HP	$1,651,031	40%	$660,412	35	1976	2011	$929,267
1610E-18	Rancho Calif. Pump Station #1	9700 gpm pump station (6 units at 200 HP each) at Rancho Calif. And Butterfield Stage Rd.	9700 gpm	1200 HP	$2,281 /HP	$2,737,461	40%	$1,094,984	35	1982	2017	$2,064,756
1790E-30	Los Caballos Pump Station	7300 gpm pump station (3 units at 350 HP each) at Los Caballos Site in De Portola	7300 gpm	1050 HP	$2,353 /HP	$2,470,131	40%	$988,052	35	1984	2019	$2,054,090
2350E-2	Calle Breve Pump Station	1000 gpm pump station (2 units at 125 HP each) at Calle Breve Site	1000 gpm	250 HP	$2,823 /HP	$705,752	40%	$282,301	35	1987	2022	$679,390
1380	Winchester P.S.		11100 gpm			$1,600,000	40%	$640,000	35	2000	2035	$2,904,345
1380	Norma Marshal P.S.		14300 gpm			$2,700,000	40%	$1,080,000	35	2000	2035	$4,901,083
1485	Butterfield Stage P.S.		24600 gpm			$4,400,000	40%	$1,760,000	35	2000	2035	$7,986,950
		Subtotal				$22,312,809		$8,925,123				$24,036,220

TABLE 9.5
RANCHO CALIFORNIA WATER DISTRICT
CAPITAL REPLACEMENT PROGRAM
ESTIMATED CAPITAL COST
Rancho Division

Item No.	Facility Name	Description of Facilities	Size/ Capacity	Quantity	Unit Cost	Estimated Capital Cost 2004 ($)	Estimated Replacement Items %	Estimated Replacement Items Cost	Life Cycle In Years	Construction Date	Repl. Date	Estimated Future Replacement Cost ($)
		TRANSMISSION MAINS										
2350E-6	Esplendida Trans Main	16-inch pipeline in Esplendida between Via De Oro and Calaveras Res	16 in	3000 /LF	$150 /LF	$450,000	100%	$450,000	50	1978	2028	$1,451,295
2350E-5	Via De Oro Trans Main	23-inch pipeline in Via De Oro below Esplandida	12 in	2000 /LF	$100 /LF	$200,000	100%	$200,000	50	1978	2028	$645,020
2350E-4	Calaveras Trans Main	12-inch pipeline in Calaveras Rd. between Parado del Sol Dr. and Via Del Oro	12 in	2500 /LF	$100 /LF	$250,000	100%	$250,000	50	1978	2028	$806,275
2350E-3	Calle Breve Trans Main	16-inch pipeline in Calle Breve and Via De Oro between Calle Breve P.S. & Esplendida	16 in	16000 /LF	$150 /LF	$2,400,000	100%	$2,400,000	50	1978	2028	$7,740,240
2070E-9	Upper Glen Oaks Trans Main #1	12-inch pipeline between De Portola and Mesa Drive in Glen Oaks	12 in	3500 /LF	$100 /LF	$350,000	100%	$350,000	50	1978	2028	$1,128,785
2070E-8	East Sierra Rd. Trans Main	16-inch pipeline between Glen Oaks Res. #1 and De Portola in Sierra Road	16 in	1000 /LF	$150 /LF	$150,000	100%	$150,000	50	1978	2028	$483,765
2070E-7	West Sierra Rd. Trans Main	14-inch pipeline between Mesa Dr. and Glen Oaks Reservoir #1 in Camino Sierra	14 in	6250 /LF	$125 /LF	$781,250	100%	$781,250	50	1978	2028	$2,519,609
2070E-6	Lower Mesa Drive Trans Main	14-inch pipeline between Via Lobato and Glen Oaks Rd. in Mesa Dr.	14 in	7250 /LF	$125 /LF	$906,250	100%	$906,250	50	1978	2028	$2,922,747
2070E-5	Upper Mesa Drive Trans Main	16-inch pipeline between De Portola and Via Lobato in Mesa Dr.	16 in	5700 /LF	$150 /LF	$855,000	100%	$855,000	50	1978	2028	$2,757,460
2070E-4	Upper De Portola Trans Main	16-inch pipeline between Mesa Dr. and Parado Del Sol in De Portola, Via De Oro, Cordova, & Cha	16 in	14500 /LF	$150 /LF	$2,175,000	100%	$2,175,000	50	1978	2028	$7,014,592
2070E-16	Mid Prado Del Sol Trans Main	8-inch pipeline in Prado Del Sol between Chapparal & Caparral	8 in	2750 /LF	$75 /LF	$206,250	100%	$206,250	50	1978	2028	$665,177
2070E-15	Avenida Bravura Trans Main	8-inch pipeline Avd. Bravura between Chaparral and Prado Del Sol	8 in	2900 /LF	$75 /LF	$217,500	100%	$217,500	50	1978	2028	$701,459
2070E-14	Chaparral Loop Trans Main	8-inch pipeline in Chaparral between Prado Del Sol and Prado Del Sol	8 in	7500 /LF	$75 /LF	$562,500	100%	$562,500	50	1978	2028	$1,814,119
2070E-13	Lower Prado Del Sol Trans Main	12-inch pipeline in Chaparral and Prado Del Sol	12 in	5700 /LF	$100 /LF	$570,000	100%	$570,000	50	1978	2028	$1,838,307
2070E-12	Ladera Vista Trans Main	14-inch pipeline between Glen Oaks Res. And Chaparral Dr. in Ladera Vista	14 in	1250 /LF	$125 /LF	$156,250	100%	$156,250	50	1978	2028	$503,922
2070E-11	Lower Chaparral Trans Main	12-inch pipeline between Parado Del Sol and Parado Del Sol in Chaparral	12 in	4800 /LF	$100 /LF	$480,000	100%	$480,000	50	1978	2028	$1,548,048
2070E-10	Prado Del Sol Drive Trans Main	14-inch pipeline between Chaparral and Chaparral in Parado Del Sol	14 in	7750 /LF	$125 /LF	$968,750	100%	$968,750	50	1978	2028	$3,124,316
1790E-9	Buck Rd. Trans Main #2	12-inch pipeline between Buck Mesa P.S. and Glen Oaks in Buck and Rancho Calif. Rd.	24 in	4300 /LF	$225 /LF	$967,500	100%	$967,500	50	1978	2028	$3,120,284
1790E-8	Buck Rd. Trans Main #1	24-inch pipeline between Buck Mesa P.S. and Rancho Calif Rd. in Buck Rd.	24 in	3500 /LF	$225 /LF	$787,500	100%	$787,500	50	1978	2028	$2,539,766
1790E-7	Warren Road Trans Main	20-inch pipeline in Warren and Buck Rd. between Rancho Calif. Rd. and Benton	20 in	2750 /LF	$200 /LF	$550,000	100%	$550,000	50	1978	2028	$1,773,805
1790E-6	Upper Camino del Vino Trans Main	8-inch pipeline in Camino del Vino between Warren and Glen Oaks	8 in	4000 /LF	$75 /LF	$300,000	100%	$300,000	50	1978	2028	$967,530
1790E-5	East Benton Rd. Trans Main	20-inch pipeline in E. Benton Rd. between Camino del Vino and Bella Vista	20 in	3700 /LF	$200 /LF	$740,000	100%	$740,000	50	1978	2028	$2,386,574
1790E-4	Upper Bella Vista Trans Main	8-inch pipeline in Bella Vista between Avd. Brista and E. Benton Rd.	20 in	4900 /LF	$200 /LF	$980,000	100%	$980,000	50	1978	2028	$3,160,598
1790E-31	Upper Glen Oaks Trans Main #2	12-inch pipeline in Glen Oaks between Mesa Drive and Bella Vista	12 in	2600 /LF	$100 /LF	$260,000	100%	$260,000	50	1978	2028	$838,526
1790E-29	Mid De Portola Trans Main #3	30-inch pipeline between Camino Del Vino and Los Caballos P.S. in De Portola	30 in	4600 /LF	$250 /LF	$1,150,000	100%	$1,150,000	50	1978	2028	$3,708,865
1790E-28	Mid De Portola Trans Main #2	16-inch pipeline between Monte De Oro and Camino Del Vino in De Portola	16 in	6500 /LF	$150 /LF	$975,000	100%	$975,000	50	1978	2028	$3,144,472
1790E-27	Mid De Portola Trans Main #1	20-inch pipeline between Camino Arroyo Seco and Monte de Oro in de Portola	20 in	3750 /LF	$200 /LF	$750,000	100%	$750,000	50	1978	2028	$2,418,825
1790E-26	De Portola Reservoir T.M. #1	20-inch pipeline between De Portola Res. #2 and Chaparral	20 in	500 /LF	$200 /LF	$100,000	100%	$100,000	50	1978	2028	$322,510
1790E-25	Cordova Dr. Trans Main #2	30-inch pipeline between De Portola and De Portola Reservoir in Cordova	30 in	5000 /LF	$250 /LF	$1,250,000	100%	$1,250,000	50	1978	2028	$4,031,375
1790E-24	Luna Drive Trans Main	24-inch pipeline between De Portola and De P{ortola P.S. in Luna Drive	24 in	3750 /LF	$225 /LF	$843,750	100%	$843,750	50	1978	2028	$2,721,178
1790E-23	Avenida Brisa Trans Main	18-inch pipeline in Avd. Brisa and C. Arroyo Seco between Bella Vista and De Portola	18 in	3600 /LF	$175 /LF	$630,000	100%	$630,000	50	1978	2028	$2,031,813
1790E-22	Cruz Way Trans Main	8-inch pipeline in Cruz Way between Calle Napal and Meadow Ridge	8 in	2000 /LF	$75 /LF	$150,000	100%	$150,000	50	1978	2028	$483,765
1790E-21	Meadow Ridge Trans Main	12-inch pipeline in Meadow Ridge Rd. between Valencia and Meadow Ridge cul-de-sac	12 in	3500 /LF	$100 /LF	$350,000	100%	$350,000	50	1978	2028	$1,128,785
1790E-20	Via Anita Trans Main	8-inch pipeline in Via Anita between Calle Nopal and Meadow Ridge	8 in	2750 /LF	$75 /LF	$206,250	100%	$206,250	50	1978	2028	$665,177
1790E-19	Calle Nopal Trans Main	12-inch pipeline in Calle Nopal between Valencia Way and Calle Cancion	12 in	4900 /LF	$100 /LF	$490,000	100%	$490,000	50	1978	2028	$1,580,299
1790E-18	Upper Pauba Trans Main	12-inch pipeline in Pauba Rd. from Linda Rosea toward De Anza	12 in	3850 /LF	$100 /LF	$385,000	100%	$385,000	50	1978	2028	$1,241,663
1790E-17	Valencia Way Trans Main	14-inch pipeline in Valencia Way between Camino del Vino and Pauba Rd.	14 in	4350 /LF	$125 /LF	$543,750	100%	$543,750	50	1978	2028	$1,753,648
1790E-16	Lower Camino Del Vino T.M.	16-inch pipeline in Camino Del Vino between Monte de Oro and De Portola	16 in	10250 /LF	$150 /LF	$1,537,500	100%	$1,537,500	50	1978	2028	$4,958,591
1790E-15	Monte De Oro Trans Main	18-inch pipeline in Monte de Oro between Camino Del Vino and De Portola	18 in	6250 /LF	$175 /LF	$1,093,750	100%	$1,093,750	50	1978	2028	$3,527,453
1790E-14	Upper Camino Del Vino T.M. #3	20-inch pipeline in Camino Del Vino between Glen Oaks and Monte de Oro	20 in	2900 /LF	$200 /LF	$580,000	100%	$580,000	50	1978	2028	$1,870,558
1790E-13	Upper Camino Del Vino T.M. #2	20-inch pipeline in Camino Del Vino between Glen Oaks and Monte de Oro	20 in	2900 /LF	$200 /LF	$580,000	100%	$580,000	50	1978	2028	$1,870,558
1790E-12	Lower Bella Vista Trans Main	12-inch pipeline in Belle Vista between Glen Oaks and Monte de Oro Rd.	12 in	5600 /LF	$100 /LF	$560,000	100%	$560,000	50	1978	2028	$1,806,056
1790E-11	Mid Glenoaks Trans Main	18-inch pipeline between Camino Del Vino and Bella Vista in Glen Oaks	18 in	4500 /LF	$175 /LF	$787,500	100%	$787,500	50	1978	2028	$2,539,766
1790E-10	Lower Glenoaks Trans Main	24-inch pipeline between Rancho Calif. Rd. and Camino Del Vino in Glen Oaks	24 in	4200 /LF	$225 /LF	$945,000	100%	$945,000	50	1978	2028	$3,047,719
1610E-8	Mid Anza Trans Main #2	24-inch pipeline in Anza Rd. between Rancho Calif. Rd. and Anza P.S.	24 in	10300 /LF	$225 /LF	$2,317,500	100%	$2,317,500	50	1978	2028	$7,474,169
1610E-7	Upper Anza Rd. Trans Main #2	18-inch pipeline in Anza Rd. between Brenda Rd. and Rancho Calif. Rd.	18 in	2750 /LF	$175 /LF	$481,250	100%	$481,250	50	1978	2028	$1,552,079
1610E-6	Upper Anza Rd. Trans Main #1	16-inch pipeline in Anza Rd. between Vino Way and Brenda Rd.	16 in	1700 /LF	$150 /LF	$255,000	100%	$255,000	50	1978	2028	$822,400
1610E-5	Los Nogales Trans Main	12-inch pipeline in Los Nogales extending from Anza Rd.	12 in	4350 /LF	$100 /LF	$435,000	100%	$435,000	50	1978	2028	$1,402,918
1610E-4	Brenda Rd. Trans Main	20-inch pipeline between Buck Mesa P.S. and Anza in Brenda Rd.	20 in	8000 /LF	$200 /LF	$1,600,000	100%	$1,600,000	50	1978	2028	$5,160,160
1610E-3	Upper Rancho Calif. Rd. T.M. #1	24-inch pipeline between Buck Mesa P.S. and Anza in Rancho Calif Rd.	24 in	10000 /LF	$225 /LF	$2,250,000	100%	$2,250,000	50	1978	2028	$7,256,475
1610E-25	Lower Calle Contento T.M.	16-inch pipeline in C. Contento between Madera de Playa and Linda Rosea	16 in	5500 /LF	$150 /LF	$825,000	100%	$825,000	50	1978	2028	$2,660,707
1610E-24	Mid Calle Contento Trans Main	18-inch pipeline in C. Contento between Rancho Calif. Rd. and Madera de Playa	18 in	3050 /LF	$175 /LF	$533,750	100%	$533,750	50	1978	2028	$1,721,397

TABLE 9.5
RANCHO CALIFORNIA WATER DISTRICT
CAPITAL REPLACEMENT PROGRAM
ESTIMATED CAPITAL COST
Rancho Division

Item No.	Facility Name	Description of Facilities	Size/ Capacity	Quantity	Unit Cost	Estimated Capital Cost 2004 ($)	Estimated Replacement Items %	Estimated Replacement Items Cost	Life Cycle In Years	Construction Date	Repl. Date	Estimated Future Replacement Cost ($)
1610E-23	Upper Calle Contento T.M. #2	16-inch pipeline in C. Contento between Vista Del Monte and Rancho Calif Rd.	16 in	5700 /LF	$150 /LF	$855,000	100%	$855,000	50	1978	2028	$2,757,460
1610E-22	Upper Calle Contento T.M. #1	12-inch pipeline in C. Contento between Vista Del Monte Dr. and Pauba Rancho boundary	12 in	2450 /LF	$100 /LF	$245,000	100%	$245,000	50	1978	2028	$790,149
1610E-21	Vino Way Trans Main	16-inch pipeline in Vino Way between Anza Rd. and C. Contento	16 in	4400 /LF	$150 /LF	$660,000	100%	$660,000	50	1978	2028	$2,128,566
1610E-20	Vista Del Monte Drive T.M.	12-inch pipeline in Vista Del Monte Dr. between C. Contento and Butterfield Stage Rd.	12 in	8350 /LF	$100 /LF	$835,000	100%	$835,000	50	1978	2028	$2,692,958
1610E-19	Upper La Serena Way Trans Main	14-inch pipeline in La Serena Way between Madera de Playa and Butterfield Stage	14 in	9850 /LF	$175 /LF	$1,723,750	100%	$1,723,750	50	1978	2028	$5,559,266
1610E-17	Upper Rancho Calif. T.M. #4	24-inch pipeline in Rancho Calif. Rd. between La Serena and Rancho Calif. P.S. #1	24 in	5000 /LF	$225 /LF	$1,125,000	100%	$1,125,000	50	1978	2028	$3,628,237
1610E-16	Upper Rancho Calif. T.M. #3	20-inch pipeline in Rancho Calif. Rd. between C. Contento and La Serena Way	20 in	5100 /LF	$200 /LF	$1,020,000	100%	$1,020,000	50	1978	2028	$3,289,602
1610E-15	Upper Rancho Calif. T.M. #2	18-inch pipeline in Rancho Calif. Rd. between Anza and Calle Contento	18 in	4650 /LF	$175 /LF	$813,750	100%	$813,750	50	1978	2028	$2,624,425
1610E-14	Modera De Playa Dr. Trans Main	18-inch pipeline in Madera De Playa Dr. between Anza and C. Cabrillo	18 in	10400 /LF	$175 /LF	$1,820,000	100%	$1,820,000	50	1978	2028	$5,869,682
1610E-13	Upper Pauba Rd. Trans Main	16-inch pipeline in Pauba Rd. between Anza Rd. and Calle Contento	16 in	3850 /LF	$150 /LF	$577,500	100%	$577,500	50	1978	2028	$1,862,495
1610E-12	Upper Linda Rosea Trans Main #3	16-inch pipeline in Linda Rosea between Sea Wind Circle and Calle Contento	16 in	2750 /LF	$150 /LF	$412,500	100%	$412,500	50	1978	2028	$1,330,354
1610E-11	Upper Linda Rosea Trans Main #2	24-inch pipeline in Linda Rosea between Anza Rd. and 10" pipe node	24 in	4350 /LF	$225 /LF	$978,750	100%	$978,750	50	1978	2028	$3,156,567
1610E-10	Upper Linda Rosea Trans Main #1	10-inch pipeline in Linda Rosea extending south from Pauba Rd.	10 in	4250 /LF	$88 /LF	$374,000	100%	$374,000	50	1978	2028	$1,206,187
1550E-4	Lower Anza Rd. Trans Main #1	14-inch pipeline in Anza Rd. between Booster 40 P.S. and Santa Rita Rd.	14 in	8500 /LF	$125 /LF	$1,062,500	100%	$1,062,500	50	1978	2028	$3,426,669
1550E-3	Santa Rita Rd. Trans Main	14-inch pipeline in Santa Rita Rd. between L. Panteras and Monte Verde	14 in	5150 /LF	$125 /LF	$643,750	100%	$643,750	50	1978	2028	$2,076,158
1550E-2	Los Panteras Trans Main	24-inch pipeline in Los Panteras between Alvares Reservoir and St. Rita Rd.	24 in	2500 /LF	$225 /LF	$562,500	100%	$562,500	50	1978	2028	$1,814,119
1485E-9	Chenin Blanc Trans Main	12-inch pipeline in Chenin Blanc off of Rancho Calif. Rd.	12 in	1800 /LF	$100 /LF	$180,000	100%	$180,000	50	1978	2028	$580,518
1485E-8	Mid Rancho Calif. Trans Main #1	24-inch pipeline in Rancho Calif. Rd. between Riesling Ct. and Rancho Calif. P.S. #2	24 in	3250 /LF	$225 /LF	$731,250	100%	$731,250	50	1978	2028	$2,358,354
1485E-7	Linda Rosea Loop Trans Main	12-inch pipeline looped in Linda Rosea and C. Contento	12 in	8750 /LF	$100 /LF	$875,000	100%	$875,000	50	1978	2028	$2,821,962
1485E-6	Cee Cee Rd. Trans Main	8-inch pipeline in Cee Cee Road between Lisa Rd. and Orlinda Dr.	8 in	2125 /LF	$75 /LF	$159,375	100%	$159,375	50	1978	2028	$514,000
1485E-5	Lisa Rd. Trans Main	16-inch pipeline in Lisa Rd. between Vista Del Monte and Cee Cee Rd.	16 in	850 /LF	$150 /LF	$127,500	100%	$127,500	50	1978	2028	$411,200
1485E-4	Via Del Monte Trans Main	16-inch pipeline in Vista Del Monte between Pauba and Linda Rosea	16 in	5500 /LF	$150 /LF	$825,000	100%	$825,000	50	1978	2028	$2,660,707
1485E-3	Mid Pauba Rd. Trans Main	24-inch pipeline in Pauba Rd. between R.C.P.S. #2 and Calle Contento Reservoir	24 in	15000 /LF	$225 /LF	$3,375,000	100%	$3,375,000	50	1978	2028	$10,884,712
1485E-16	Del Rey Rd. Trans Main	12-inch pipeline in Del Ray Road from Avd. Del Reposo	12 in	4000 /LF	$100 /LF	$400,000	100%	$400,000	50	1978	2028	$1,290,040
1485E-15	Loop Line #1	14-inch pipeline between Del Ray and La Serena; not in a street	14 in	1000 /LF	$125 /LF	$125,000	100%	$125,000	50	1978	2028	$403,137
1485E-14	Upper Via Norte Trans Main	12-inch pipeline in Via Norte between Avd. Centenario and Avd. De Reposo	12 in	4500 /LF	$100 /LF	$450,000	100%	$450,000	50	1978	2028	$1,451,295
1485E-13	Calle Girasol Trans Main	8-inch pipeline in Calle Girasol between Niccolas Road and 2nd S.D. Aqueduct	8 in	2700 /LF	$75 /LF	$202,500	100%	$202,500	50	1978	2028	$653,083
1485E-12	Leifer Rd. Trans Main	8-inch pipeline in Liefer Road between Nicolas Road	8 in	4650 /LF	$75 /LF	$348,750	100%	$348,750	50	1978	2028	$1,124,754
1485E-11	Calle Medusa Trans Main	12-inch pipeline in C. Medusa between Liefer Road and La Serena Way	12 in	6650 /LF	$100 /LF	$665,000	100%	$665,000	50	1978	2028	$2,144,691
1485E-10	Lower La Serena Trans Main #2	16-inch pipeline in La Serena Way between Kaiser and Butterfield Stage	16 in	4200 /LF	$150 /LF	$630,000	100%	$630,000	50	1978	2028	$2,031,813
1380E-9	Lower Anza Rd. Trans Main #2	24-inch pipeline in Anza Rd. between Anza Res. And De Portola Rd.	24 in	6200 /LF	$225 /LF	$1,395,000	100%	$1,395,000	50	1978	2028	$4,499,014
1380E-7	Lower Pauba Trans Main #1	12-inch pipeline between Calle Cedral and Ynez in Pauba Road	12 in	12200 /LF	$100 /LF	$1,220,000	100%	$1,220,000	50	1978	2028	$3,934,622
1380E-6	Rancho Vista Trans Main	12-inch pipeline between Ynez and Margarita in Rancho Vista	12 in	7400 /LF	$100 /LF	$740,000	100%	$740,000	50	1978	2028	$2,386,574
1380E-5	Camino Pina Colada Trans Main	20-inch pipeline between Del Rey Rd. and La Serena Way in C. Pina Colada	20 in	2200 /LF	$200 /LF	$440,000	100%	$440,000	50	1978	2028	$1,419,044
1380E-4	Del Rey Road Trans Main	16-inch pipeline between Via Norte and Calle Pina Colada in Del Rey Rd.	16 in	4500 /LF	$150 /LF	$675,000	100%	$675,000	50	1978	2028	$2,176,942
1380E-32	Orlinda Drive Trans Main	12-inch pipeline in Orlinda Dr. and Linda Rosea between Cee Cee Road and De Portola Rd.	12 in	2150 /LF	$100 /LF	$215,000	100%	$215,000	50	1978	2028	$693,396
1380E-3	Lower Via Norte Trans Main	16-inch pipeline between Del Rey Rd. & Avd. Centenario in Via Norte	16 in	7400 /LF	$150 /LF	$1,110,000	100%	$1,110,000	50	1978	2028	$3,579,861
1380E-21	Lower La Serena Trans Main #1	24-inch pipeline in La Sierra Way between Margarita & Calle Pina Colada	24 in	2850 /LF	$225 /LF	$641,250	100%	$641,250	50	1978	2028	$2,068,095
1380E-2	General Kearney Trans Main	24-inch pipeline in General Kearny between General Kearny Res. and Rancho Calif. Rd.	24 in	4900 /LF	$225 /LF	$1,102,500	100%	$1,102,500	50	1978	2028	$3,555,673
1380E-19	Los Corralitos Rd. Trans Main	14-inch pipeline in Los Corralitos Rd. & Los Caballos between Pauba Rd. and De Portola Rd.	14 in	8350 /LF	$125 /LF	$1,043,750	100%	$1,043,750	50	1978	2028	$3,366,198
1380E-18	Lower Pauba Rd. Trans Main #3	14-inch pipeline in Pauba Rd. between De Portola and Los Corralitos Rd.	14 in	8600 /LF	$125 /LF	$1,075,000	100%	$1,075,000	50	1978	2028	$3,466,982
1380E-17	Lower Pauba Rd. Trans Main #2	16-inch pipeline in Pauba Rd. between De Portola Rd. and Winners Circle	16 in	2750 /LF	$150 /LF	$412,500	100%	$412,500	50	1978	2028	$1,330,354
1380E-16	Upper Hwy 79 Trans Main #2	12-inch pipeline in Hwy 79 extending West from Booster 40 P.S.	12 in	4350 /LF	$100 /LF	$435,000	100%	$435,000	50	1978	2028	$1,402,918
1380E-15	Lower Anza Rd. Trans Main #4	14-inch pipeline in Anza Rd. between Booster 40 P.S. and De Portola	14 in	3900 /LF	$125 /LF	$487,500	100%	$487,500	50	1978	2028	$1,572,236
1380E-14	Lower De Portola Rd T.M. #3	24-inch pipeline in De Portola Road between C. contento and Margarite	24 in	14000 /LF	$225 /LF	$3,150,000	100%	$3,150,000	50	1978	2028	$10,159,065
1380E-13	Margarita Rd. Trans Main #1	24-inch pipeline Margarite Pkwy between De Portola and La Sierra Way	24 in	13500 /LF	$225 /LF	$3,037,500	100%	$3,037,500	50	1978	2028	$9,796,241
1380E-12	Mid Rancho Calif. Trans Main #4	30-inch pipeline extending East of Margarita Pkwy in Rancho Calif. Rd.	30 in	4500 /LF	$250 /LF	$1,125,000	100%	$1,125,000	50	1978	2028	$3,628,237
1380E-11	Mid Rancho Calif. Trans Main #3	36-inch pipeline extending West of Kaiser Pkwy in Rancho Calif. Rd.	36 in	2450 /LF	$275 /LF	$673,750	100%	$673,750	50	1978	2028	$2,172,911
1380E-10	Mid Rancho Calif. Trans Main #2	24-inch pipeline between Riesling Ct. and Rancho Calif. P.S. #2 in Rancho Calif. Rd.	24 in	3150 /LF	$225 /LF	$708,750	100%	$708,750	50	1978	2028	$2,285,790
1305E-9	Valdez Road Trans Main	24-inch pipeline in Valdez, Felix, Vincent & Rancho Calif. Road between Diaz and 6th	24 in	2700 /LF	$225 /LF	$607,500	100%	$607,500	50	1978	2028	$1,959,248
1305E-53	Lower De Portola Rd. T.M. #2	20-inch pipeline in De Portola between Los Caballos P.S. & Calle Contento	20 in	15100 /LF	$200 /LF	$3,020,000	100%	$3,020,000	50	1978	2028	$9,739,802
1305E-51	Loop Trans Main #4	36-inch pipeline between Front Street & Diaz, not in existing road	36 in	650 /LF	$275 /LF	$178,750	100%	$178,750	50	1978	2028	$576,487
1305E-50	Moraga Rd. Trans Main	16-inch pipeline in Moraga Road between Margarita & Rancho Calif.	16 in	1350 /LF	$150 /LF	$202,500	100%	$202,500	50	1978	2028	$653,083

TABLE 9.5
RANCHO CALIFORNIA WATER DISTRICT
CAPITAL REPLACEMENT PROGRAM
ESTIMATED CAPITAL COST
Rancho Division

Item No.	Facility Name	Description of Facilities	Size/ Capacity	Quantity	Unit Cost	Estimated Capital Cost 2004 ($)	Estimated Replacement Items %	Estimated Replacement Items Cost	Life Cycle In Years	Construction Date	Repl. Date	Estimated Future Replacement Cost ($)
1305E-49	Ynez Rd. Loop Trans Main	20-inch pipeline in Ynez, Equity, & County Center Drive	20 in	6300 /LF	$200 /LF	$1,260,000	100%	$1,260,000	50	1978	2028	$4,063,626
1305E-48	Avenida Sonoma Trans Main	12-inch pipeline in Avd. Sonoma between Solana Wy. & Margarita Rd.	12 in	1800 /LF	$100 /LF	$180,000	100%	$180,000	50	1978	2028	$580,518
1305E-47	Solana Way Trans Main #2	10-inch pipeline in Solana Way between Margarita & Avd. Sonoma	10 in	4500 /LF	$88 /LF	$396,000	100%	$396,000	50	1978	2028	$1,277,140
1305E-46	Solana Way Trans Main #1	10-inch pipeline in Solana Way between Margarita & Ynez	12 in	1650 /LF	$100 /LF	$165,000	100%	$165,000	50	1978	2028	$532,141
1305E-45	Lower Margarita Rd. Trans Main #2	16-inch pipeline in Margarita Rd. between Avd. Sonoma & C. Pina Colada	16 in	12200 /LF	$150 /LF	$1,830,000	100%	$1,830,000	50	1978	2028	$5,901,933
1305E-44	Lower Rancho Calif Rd. T.M. #3	20-inch pipeline in Rancho Calif. Rd. between Norma Marshall Res. & Asteroid Rd.	20 in	2500 /LF	$200 /LF	$500,000	100%	$500,000	50	1978	2028	$1,612,550
1305E-43	Lower Rancho Calif Rd. T.M. #2	24-inch pipeline in Rancho California Rd. between Ynez Rd. & Asteroid Rd.	24 in	6700 /LF	$225 /LF	$1,507,500	100%	$1,507,500	50	1978	2028	$4,861,838
1305E-42	Lower Rancho Calif Rd. T.M. #1	20-inch pipeline between Ynez Rd. & Front St. in Rancho Calif. Rd.	20 in	2150 /LF	$200 /LF	$430,000	100%	$430,000	50	1978	2028	$1,386,793
1305E-41	Rainbow Canyon Trans Main	14-inch pipeline in Rainbow Canyon between Pala Road & Rainbow Canyon Golf Course	14 in	2400 /LF	$125 /LF	$300,000	100%	$300,000	50	1978	2028	$967,530
1305E-40	Loop Trans Main #3	16-inch pipeline between Loma Linda & Hwy 79, not in existing street	16 in	2400 /LF	$150 /LF	$360,000	100%	$360,000	50	1978	2028	$1,161,036
1305E-39	Loma Linda Trans Main	12-inch pipeline in Loma Linda between Cal Turf & Pala Rd.	12 in	8300 /LF	$100 /LF	$830,000	100%	$830,000	50	1978	2028	$2,676,833
1305E-38	Cal Turf Trans Main	16-inch pipeline in Cal Turf Road between Pala Rd. & Loma Linda Rd.	16 in	5000 /LF	$150 /LF	$750,000	100%	$750,000	50	1978	2028	$2,418,825
1305E-37	Pala Rd. Trans Main #2	24-inch pipeline in Pala Road between Rainbow Cyn. & Cal Turf	24 in	9300 /LF	$225 /LF	$2,092,500	100%	$2,092,500	50	1978	2028	$6,748,522
1305E-36	Pala Rd. Trans Main #1	18-inch pipeline in Pala Rd. between Hwy 79 & Rainbow Canyon Rd.	18 in	1500 /LF	$175 /LF	$262,500	100%	$262,500	50	1978	2028	$846,589
1305E-35	Business Park Drive Trans Main	24-inch pipeline in Business Pk. Drive & Single Oak Dr. off of Rancho Calif. Rd.	24 in	4500 /LF	$225 /LF	$1,012,500	100%	$1,012,500	50	1978	2028	$3,265,414
1305E-34	Airport Trans Main	20-inch ippeline between Airport & Business Park Dr. - not in existing rd.	20 in	1000 /LF	$200 /LF	$200,000	100%	$200,000	50	1978	2028	$645,020
1305E-32	Rio Nedo Loop Trans Main	12-inch pipeline in Diaz, Rio Nedo, Tierro Alta & Avd. Alvarado	12 in	7700 /LF	$100 /LF	$770,000	100%	$770,000	50	1978	2028	$2,483,327
1305E-31	Loop Trans Main #2	24-inch pipeline between V. Montezuma & Diaz - not in roadway	24 in	500 /LF	$225 /LF	$112,500	100%	$112,500	50	1978	2028	$362,824
1305E-30	Via Montezuma Trans Main	12-inch pipeline in V. Montezuma between Front St. & Del Rio	12 in	1000 /LF	$100 /LF	$100,000	100%	$100,000	50	1978	2028	$322,510
1305E-29	Del Rio Rd. Trans Main	14-inch pipeline in Del Rio Rd. between Via Montezuma & Front St.	14 in	2850 /LF	$125 /LF	$356,250	100%	$356,250	50	1978	2028	$1,148,942
1305E-28	Front Street Trans Main #4	12-inch pipeline in Front St. between Del Rio & Via Montezuma	12 in	3400 /LF	$100 /LF	$340,000	100%	$340,000	50	1978	2028	$1,096,534
1305E-27	Front Street Trans Main #3	16-inch pipeline in Front Street between Rancho Calif. & Del Rio Rd.	16 in	1700 /LF	$150 /LF	$255,000	100%	$255,000	50	1978	2028	$822,400
1305E-26	Front Street Trans Main #2	24-inch pipeline in Santiage, Front, & Jefferson between Ynez & Winchester	24 in	16000 /LF	$225 /LF	$3,600,000	100%	$3,600,000	50	1978	2028	$11,610,360
1305E-25	Front Street Trans Main #1	20-inch pipeline in Front St. between Hwy 79 & Santiago Rd.	20 in	3900 /LF	$200 /LF	$780,000	100%	$780,000	50	1978	2028	$2,515,578
1305E-24	La Paz Rd. Trans Main	16-inch pipeline in La Paz Rd. between Ynez Rd. & Constance St.	16 in	1350 /LF	$150 /LF	$202,500	100%	$202,500	50	1978	2028	$653,083
1305E-22	Lower Highway 79 Trans Main #1	30-inch pipeline between Margarita Rd. & 2nd Sand Diego Aqueduct in Hwy 79	30 in	7100 /LF	$250 /LF	$1,775,000	100%	$1,775,000	50	1978	2028	$5,724,552
1305E-21	Lower Margarita Trans Main #1	12-inch pipeline between De Portola Rd. & Hwy 79 in Margarita Rd.	12 in	1500 /LF	$100 /LF	$150,000	100%	$150,000	50	1978	2028	$483,765
1305E-20	Lower Ynez Rd. Trans Main #2	20-inch pipeline in Ynez Road & De Portola between La Paz St. & Margarita	20 in	9500 /LF	$200 /LF	$1,900,000	100%	$1,900,000	50	1978	2028	$6,127,690
1305E-19	Lower Ynez Rd. Trans Main #1	18-inch pipeline in Ynez Rd. between Santiago Rd. & La Paz St.	18 in	3300 /LF	$175 /LF	$577,500	100%	$577,500	50	1978	2028	$1,862,495
1305E-18	Mid Ynez Rd. Trans Main	16-inch pipeline in Ynez Road between Solana Way & Santiago Rd.	16 in	11200 /LF	$150 /LF	$1,680,000	100%	$1,680,000	50	1978	2028	$5,418,168
1305E-17	Upper Ynez Rd. Trans Main	12-inch pipeline in Ynez Road between Winchester & Solana Way	12 in	4200 /LF	$100 /LF	$420,000	100%	$420,000	50	1978	2028	$1,354,542
1305E-16	Winchester Trans Main #4	24-inch pipeline in Winchester Rd. between Jefferson and Margarita	24 in	6000 /LF	$225 /LF	$1,350,000	100%	$1,350,000	50	1978	2028	$4,353,885
1305E-15	Winchester Trans Main #3	20-inch pipeline in Winchester Rd. between Nicolas Rd. & Margarita	20 in	3300 /LF	$200 /LF	$660,000	100%	$660,000	50	1978	2028	$2,128,566
1305E-14	Winchester Trans Main #2	16-inch pipeline in Winchester Rd. between Nicolas Rd. & Winchestrick Ave.	16 in	2500 /LF	$165 /LF	$412,500	100%	$412,500	50	1978	2028	$1,330,354
1305E-13	Main Street Trans Main	6-inch pipeline in Main Street between Front St. and Pujol St.	6 in	750 /LF	$50 /LF	$37,500	100%	$37,500	50	1978	2028	$120,941
1305E-10	Pujol Street Trans Main	24-inch pipeline in Pujol Street & 6th between Valdez and C. Estribo	24 in	6000 /LF	$225 /LF	$1,350,000	100%	$1,350,000	50	1978	2028	$4,353,885
1380E	Winchester P.S. T.M.	24-inch pipeline from Winchester Rd. to General Kearny Rd. ending at Via Norte	24 in	6021 /LF	$225 /LF	$1,354,725	100%	$1,354,725	50	2000	2050	$12,780,825
1380E	Long Canyon T.M.	24-inch pipeline between Via Norte & Del Rey Rd.	24 in	3861 /LF	$225 /LF	$868,725	100%	$868,725	50	2000	2050	$8,195,776
1305E	Overland Dr. T.M.	16-inch pipeline between Ynez Rd. & Margarita Rd.	16 in	1689 /LF	$150 /LF	$253,350	100%	$253,350	50	2000	2050	$2,390,169
1305E	Promenade Wey T.M.	16-inch pipeline Overland Dr. & Loop Rd.	16 in	782 /LF	$150 /LF	$117,300	100%	$117,300	50	2000	2050	$1,106,638
1305E	Solana Way T.M.	16-inch pipeline between Ynez Rd. & Margarita Rd.	16 in	1819 /LF	$150 /LF	$272,850	100%	$272,850	50	2000	2050	$2,574,137
1485E	La Serena Way T.M.	24-inch pipeline from Via Aguila to Meadows Pkwy ending at Spyglass Hill Lane	24 in	4381 /LF	$225 /LF	$985,725	100%	$985,725	50	2000	2050	$9,299,584
1485E	Meadows Pkwy T.M. #1	24-inch pipeline between Spyglass Hill Lane & Parducci Lane	24 in	1000 /LF	$225 /LF	$225,000	100%	$225,000	50	2000	2050	$2,122,708
1485E	Meadows Pkwy T.M. #2	24-inch pipeline between Parducci Lane & Royal Birkdale Dr.	24 in	2382 /LF	$225 /LF	$535,950	100%	$535,950	50	2000	2050	$5,056,291
1610E	La Serena Way T.M. #1	24-inch pipeline between Calle Medusa & Walcott Ln.	24 in	1260 /LF	$225 /LF	$283,500	100%	$283,500	50	2000	2050	$2,674,612
1610E	La Serena Way T.M. #2	16-inch pipeline between Calle Elenita & Butterfield Stage Rd.	16 in	1145 /LF	$150 /LF	$171,750	100%	$171,750	50	2000	2050	$1,620,334
1610E	La Serena Way T.M. #3	30-inch pipeline between Walcott Ln. & Butterfield Stage Rd.	30 in	882 /LF	$250 /LF	$220,500	100%	$220,500	50	2000	2050	$2,080,254
1610E	Walcott Lane T.M. #1	30-inch pipeline between La Serena & Valone Ct.	30 in	755 /LF	$250 /LF	$188,750	100%	$188,750	50	2000	2050	$1,780,716
1610E	Walcott Lane T.M. #2	30-inch pipeline between Klare Ln. & Calle Chapos	30 in	2734 /LF	$250 /LF	$683,500	100%	$683,500	50	2000	2050	$6,448,315
1380E	Winchester Rd. T.M. #1	20-inch pipeline between Northeast of Roripaugh & Southwest of Nicolas Rd.	20 in	1328 /LF	$200 /LF	$265,600	100%	$265,600	50	2000	2050	$2,505,739
1380E	Winchester Rd. T.M. #2	16-inch pipeline North of Murrieta Hot Springs Rd. to Glen Dr.	16 in	480 /LF	$150 /LF	$72,000	100%	$72,000	50	2000	2050	$679,267
1305E	Store Rd. T.M.	16-inch pipeline between Redhaw Pkwy and Apis Rd.	16 in	965 /LF	$150 /LF	$144,750	100%	$144,750	50	2000	2050	$1,365,609
1380E	Pine Road T.M.	16-inch pipeline between Manzanita Dr. & Margarita Rd.	16 in	4219 /LF	$150 /LF	$632,850	100%	$632,850	50	2000	2050	$5,970,470

TABLE 9.5
RANCHO CALIFORNIA WATER DISTRICT
CAPITAL REPLACEMENT PROGRAM
ESTIMATED CAPITAL COST
Rancho Division

Item No.	Facility Name	Description of Facilities	Size/ Capacity	Quantity	Unit Cost	Estimated Capital Cost 2004 ($)	Estimated Replacement Items %	Estimated Replacement Items Cost	Life Cycle In Years	Construction Date	Repl. Date	Estimated Future Replacement Cost ($)
1380E	Lakeview Rd. T.M.	16-inch pipeline from Halleston Dr. to Paddington Ct.	16 in	902 /LF	$150 /LF	$135,300	100%	$135,300	50	2000	2050	$1,276,455
1380E	Date St. T.M. #1	16-inch pipeline between Paddington Ct. & Margarita Rd.	16 in	2005 /LF	$150 /LF	$300,750	100%	$300,750	50	2000	2050	$2,837,353
1380E	Date St. T.M. #2	30-inch pipeline from Margarita Rd. to Murrieta Hot Springs Rd.	30 in	4295 /LF	$250 /LF	$1,073,750	100%	$1,073,750	50	2000	2050	$10,130,035
1380E	Date St. Ext. T.M.	16-inch pipeline ~700 lf west from Date Street	16 in	732 /LF	$150 /LF	$109,800	100%	$109,800	50	2000	2050	$1,035,882
1380E	Murrieta Hot Springs T.M.	30-inch pipeline from Date St. Ext. T.M. to Sky Larron Dr.	30 in	1116 /LF	$250 /LF	$279,000	100%	$279,000	50	2000	2050	$2,632,158
1380E	Winchester Rd. T.M. #3	16-inch pipeline from Murietta Hot Springs Rd. to ??????	16 in	973 /LF	$150 /LF	$145,950	100%	$145,950	50	2000	2050	$1,376,930
1305E	Murrieta Creek T.M.	??	20 in	2000 /LF	$200 /LF	$400,000	100%	$400,000	50	2000	2050	$3,773,703
1305E	Townfront St. T.M. #1	??	20 in	2711 /LF	$200 /LF	$542,200	100%	$542,200	50	2000	2050	$5,115,255
1305E	Townfront St. T.M. #2	??	16 in	402 /LF	$150 /LF	$60,300	100%	$60,300	50	2000	2050	$568,886
1305E	Townfront St. T.M. #3	20-inch pipeline parallel to Town Front St.	20 in	958 /LF	$200 /LF	$191,600	100%	$191,600	50	2000	2050	$1,807,604
1305E	Townfront St. T.M. #4	42-inch pipeline perpendicular to Town Front St.	42 in	933 /LF	$300 /LF	$279,900	100%	$279,900	50	2000	2050	$2,640,649
1305E	SR79 T.M. #1	30-inch pipeline between Murrieta Creek & Bedford Ct	30 in	3499 /LF	$250 /LF	$874,750	100%	$874,750	50	2000	2050	$8,252,617
1305E	SR79 T.M. #2	36-inch pipeline parallel to SR79 T.M. #1	36 in	895 /LF	$275 /LF	$246,125	100%	$246,125	50	2000	2050	$2,322,007
1305E	SR79 T.M. #3	36-inch pipeline parallel to SR79	36 in	307 /LF	$275 /LF	$84,425	100%	$84,425	50	2000	2050	$796,487
1305E	SR79 T.M. #4	30-inch pipeline parallel to SR79	30 in	534 /LF	$250 /LF	$133,500	100%	$133,500	50	2000	2050	$1,259,473
1305E	SR79 T.M. #5	36-inch pipeline parallel to SR79 T.M. #4	36 in	916 /LF	$275 /LF	$251,900	100%	$251,900	50	2000	2050	$2,376,490
1305E	Pechanga Pkwy T.M. #1	16-inch pipeline parallel to Pechanga Pkwy.	16 in	2085 /LF	$160 /LF	$333,600	100%	$333,600	50	2000	2050	$3,147,269
1305E	Pechanga Pkwy T.M. #2	30-inch pipeline parallel to Pechanga Pkwy.	30 in	660 /LF	$250 /LF	$165,000	100%	$165,000	50	2000	2050	$1,556,653
1550E	Los Caballos Rd. T.M.	24-inch pipeline between SR 79 and Rita Rd.	24 in	3900 /LF	$225 /LF	$877,500	100%	$877,500	50	2000	2050	$8,278,562
1550E	Anza Rd. T.M	16-inch pipeline from Rita Rd. to Linda Rd.	16 in	3596 /LF	$150 /LF	$539,400	100%	$539,400	50	2000	2050	$5,088,839
1610E	Playa Dr. T.M.	20-inch pipeline easterly from Brickswell lane	20 in	2800 /LF	$200 /LF	$560,000	100%	$560,000	50	2000	2050	$5,283,185
1305E	Adam Ave. T.M	30-inch pipeline between Lemon and Larchmont Ln.	30 in	15800 /LF	$250 /LF	$3,950,000	100%	$3,950,000	50	2000	2050	$37,265,320
1305E	Vineyard pkwy T.M	20-inch pipeline between Hayes and Monroe Ave.	20 in	11100 /LF	$200 /LF	$2,220,000	100%	$2,220,000	50	2000	2050	$20,944,053
1305E	Monroe Ave. T.M.	20-inch pipeline between Troyes Ln and California Oak Rd.	20 in	2000 /LF	$200 /LF	$400,000	100%	$400,000	50	2000	2050	$3,773,703
1305E	Nighthawk Wy T.M.	20-inch pipeline between Hayes St. and Santa Fe Tr	20 in	1300 /LF	$200 /LF	$260,000	100%	$260,000	50	2000	2050	$2,452,907
		Subtotal				$135,964,700		$135,964,700				$573,186,168
		PRESSURE REDUCING STATIONS										
2070E-19	Pressure Reducing Station	PRS from 2070 to 1880		1 /EA		$158,794	30%	$47,638	30	1992	2022	$114,647
2070E-18	Pressure Reducing Station	PRS from 2070 to 1880		1 /EA		$158,794	30%	$47,638	30	1992	2022	$114,647
2070E-17	Pressure Reducing Station	PRS from 2070 to 1880		1 /EA		$158,794	30%	$47,638	30	1992	2022	$114,647
1485E-17	Pressure Reducing Station	PRS at La Serena and Calle Medusa. Pressure reducing from 1610 to 1485		1 /LS		$158,794	30%	$47,638	30	1976	2006	$52,521
		Subtotal				$635,176		$190,553				$396,462
		WELLS										
1305E-92	Well No. 224	Well at Butterfield & De Portola	gpm	1 LS		$423,451	100%	$423,451	30	1953	1983	$151,994
1380E-28	Well No. 210	Well at De Portola	1400 gpm	1 LS		$529,314	100%	$529,314	30	1957	1987	$230,938
1790E-33	Well No. 202	Well at Calle Nupal and Cruz Way		1 LS		$317,588	100%	$317,588	30	1965	1995	$204,720
1380E-27	Well No. 203	Well at De Portola and Pauba	gpm	1 LS		$635,176	100%	$635,176	30	1965	1995	$409,440
1610E-28	Well No. 204	Well at Rancho Calif. Rd. and Anza		1 LS		$648,457	100%	$648,457	30	1965	1995	$418,001
1305E-94	Well No. 205	Well at General Kearny	gpm	1 LS		$741,039	100%	$741,039	30	1965	1995	$477,680
1610E-27	Well No. 201	Well at Calle Contento and R.C. Rd.		1 LS		$741,039	100%	$741,039	30	1965	1995	$477,680
1550E-6	Well No. 207	Well at Hwy 79 and Anza Rd.	gpm	1 LS		$635,176	100%	$635,176	30	1966	1996	$429,912
1610E-30	Well No. 209	Well at La Serana Way		1 LS		$648,457	100%	$648,457	30	1966	1996	$438,902
1610E-29	Well No. 208	Well at Pauba and Calle Contento		1 LS		$698,694	100%	$698,694	30	1966	1996	$472,904
1380E-29	Well No. 212	Well at Hwy 79 and Booster 40 P.S.	1000 gpm	1 LS		$635,176	100%	$635,176	30	1967	1997	$451,408
1305E-88	Well No. 211	Well at Pala Rd.	gpm	1 LS		$762,212	100%	$762,212	30	1967	1997	$541,690
1380E-30	Well No. 214	Well at Butterfield Stage	gpm	1 LS		$317,588	100%	$317,588	30	1970	2000	$261,281
1610E-31	Well No. 215	Well at Madera de Playa		1 LS		$741,039	100%	$741,039	30	1970	2000	$609,655
1305E-90	Well No. 217	Well at Pauba & Verde Dr.	900	1 LS		$635,176	100%	$635,176	30	1972	2002	$576,124
1380E-31	Well No. 216	Well at Margarita and Rancho Vista	1800 gpm	1 LS		$1,588,134	100%	$1,588,134	30	1972	2002	$1,440,484
1305E-91	Well No. 223	Well at Hwy 79	gpm	1 LS		$423,451	100%	$423,451	30	1974	2004	$423,451
1380E-23	Well No. 233	Well at De Portola	2500 gpm	1 LS		$635,176	100%	$635,176	30	1980	2010	$851,197
1305E-66	Well No. 231	Well at Hwy 79 & Valdez Rd.	2300 gpm	1 LS		$656,349	100%	$656,349	30	1980	2010	$879,570
1380E-22	Well No. 232	Well at De Portola and Anza	2300 gpm	1 LS		$741,039	100%	$741,039	30	1981	2011	$1,042,717
1380E-24	Well No. 234	Well at Hwy 79 and Anza	gpm	1 LS		$698,694	100%	$698,694	30	1982	2012	$1,032,289
1305E-89	Well No. 235	Well at Rancho Calif. & Lynde	2500 gpm	1 LS		$762,212	100%	$762,212	30	1987	2017	$1,437,264
		Subtotal				$14,614,641		$14,614,641				$13,259,303
TOTAL RANCHO DIVISION						$218,867,326		$164,229,017				$659,313,178

TABLE 9.5
RANCHO CALIFORNIA WATER DISTRICT
CAPITAL REPLACEMENT PROGRAM
ESTIMATED CAPITAL COST
Rancho Division

Item No.	Facility Name	Description of Facilities	2005-2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2040	2041-2050	2051-2060
		RESERVOIRS								
1610E-1	Buck Mesa Reservoir #1	1.5 MG tank at Brenda Rd. and Buck Rd.					$322,510			
1550E-1	Alvarez Reservoir	1.5 MG tank at Los Panteras Rd. Site					$338,635			
1380E-8	Anza Reservoir #1	2.2 MG tank at Anza Rd. and Linda Rosea Road					$521,499			
1380E-1	General Kearny Reservoir	2.2 MG tank at Kaiser Pkwy site					$521,499			
2070E-1	Glen Oaks Reservoir #1	2.2 MG tank at Camino Sierra					$547,574			
1790E-1	De Portola Reservoir #1	2.2 MG tank at De Portola Site					$547,574			
1485E-1	Calle Contento Reservoir	2.2 MG tank at Calle Contento and Pauba Rd.							$983,364	
2070E-2	Glen Oaks Reservoir #2	2.2 MG tank at Ladera Vista							$983,364	
1610E-2	Buck Mesa Reservoir #2	5.0 MG tank at Brenda Rd. and Buck Rd.							$2,234,917	
1305E-3	Norma Marshall Res.	5.0 MG tank at Rancho Calif. Rd. and Margarita							$2,234,917	
1790E-2	De Portola Reservoir #2	3.5 MG tank at De Portola Site							$1,724,797	
2350E-1	Calaveras Reservoir #1	0.5 MG tank at Esplendida and Avd. Alturas							$285,238	
1305	Senga Doherty Reservoir									$9,835,144
1380	Winchester Reservoir #1									$4,456,550
1485	El Chimisal Reservoir #1									$5,993,291
1485	Nicolas Reservoir									$3,380,831
1485	El Chimisal Reservoir #2									$5,993,291
1550	El Chimisal Reservoir #3									$3,688,179
1790	Tucalota Reservoir									$3,841,853
		Subtotal	$0	$0	$0	$0	$2,799,290	$0	$8,446,597	$37,189,138
		PUMP STATIONS								
1550E-5	Booster 40 Pump Station	1100 gpm pump station (1 unit at 125 HP) at Hwy 79 Site								
1790E-3	Buck Mesa Pump Station	12900 gpm pump station (3 units at 100 HP, 4 units at 150 HP)								
1380E-20	Meadowview Pump Station	9300 gpm pump station (6 units at 75 HP each) at Rancho Calif. Rd. and Margarite	$563,190							
2070E-3	De Portola Pump Station	5000 gpm pump station (1 unit at 75 HP, 3 units at 150 HP) at De Portola Site	$724,403							
1485E-2	Rancho Calif. Pump Station #2	4600 gpm pump station (3 units at 75 HP each) at Rancho Calif. And Butterfield Stage Rd.	$324,266							
1610E-9	Anza Pump Station	6900 gpm pump station (4 units at 150 HP each) at Anza rd. Site		$929,267						
1610E-18	Rancho Calif. Pump Station #1	9700 gpm pump station (6 units at 200 HP each) at Rancho Calif. And Butterfield Stage Rd.			$2,064,756					
1790E-30	Los Caballos Pump Station	7300 gpm pump station (3 units at 350 HP each) at Los Caballos Site in De Portola			$2,054,090					
2350E-2	Calle Breve Pump Station	1000 gpm pump station (2 units at 125 HP each) at Calle Breve Site				$679,390				
1380	Winchester P.S.							$2,904,345		
1380	Norma Marshal P.S.							$4,901,083		
1485	Butterfield Stage P.S.							$7,986,950		
		Subtotal	$1,611,858	$929,267	$4,118,846	$679,390	$0	$15,792,377	$0	$0

TABLE 9.5
RANCHO CALIFORNIA WATER DISTRICT
CAPITAL REPLACEMENT PROGRAM
ESTIMATED CAPITAL COST
Rancho Division

Item No.	Facility Name	Description of Facilities	2005-2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2040	2041-2050	2051-2060
		TRANSMISSION MAINS								
2350E-6	Esplendida Trans Main	16-inch pipeline in Esplendida between Via De Oro and Calaveras Res					$1,451,295			
2350E-5	Via De Oro Trans Main	23-inch pipeline in Via De Oro below Esplandida					$645,020			
2350E-4	Calaveras Trans Main	12-inch pipeline in Calaveras Rd. between Parado del Sol Dr. and Via Del Oro					$806,275			
2350E-3	Calle Breve Trans Main	16-inch pipeline in Calle Breve and Via De Oro between Calle Breve P.S. & Esplendida					$7,740,240			
2070E-9	Upper Glen Oaks Trans Main #1	12-inch pipeline between De Portola and Mesa Drive in Glen Oaks					$1,128,785			
2070E-8	East Sierra Rd. Trans Main	16-inch pipeline between Glen Oaks Res. #1 and De Portola in Sierra Road					$483,765			
2070E-7	West Sierra Rd. Trans Main	14-inch pipeline between Mesa Dr. and Glen Oaks Reservoir #1 in Camino Sierra					$2,519,609			
2070E-6	Lower Mesa Drive Trans Main	14-inch pipeline between Via Lobato and Glen Oaks Rd. in Mesa Dr.					$2,922,747			
2070E-5	Upper Mesa Drive Trans Main	16-inch pipeline between De Portola and Via Lobato in Mesa Dr.					$2,757,460			
2070E-4	Upper De Portola Trans Main	16-inch pipeline between Mesa Dr. and Parado Del Sol in De Portola, Via De Oro, Cordova, & Ch.					$7,014,592			
2070E-16	Mid Prado Del Sol Trans Main	8-inch pipeline in Prado Del Sol between Chapparal & Caparral					$665,177			
2070E-15	Avenida Bravura Trans Main	8-inch pipeline Avd. Bravura between Chaparral and Prado Del Sol					$701,459			
2070E-14	Chaparral Loop Trans Main	8-inch pipeline in Chaparral between Prado Del Sol and Prado Del Sol					$1,814,119			
2070E-13	Lower Prado Del Sol Trans Main	12-inch pipeline in Chaparral and Prado Del Sol					$1,838,307			
2070E-12	Ladera Vista Trans Main	14-inch pipeline between Glen Oaks Res. And Chaparral Dr. in Ladera Vista					$503,922			
2070E-11	Lower Chaparral Trans Main	12-inch pipeline between Parado Del Sol and Parado Del Sol in Chaparral					$1,548,048			
2070E-10	Prado Del Sol Drive Trans Main	14-inch pipeline between Chaparral and Chaparral in Parado Del Sol					$3,124,316			
1790E-9	Buck Rd. Trans Main #2	12-inch pipeline between Buck Mesa P.S. and Glen Oaks in Buck and Rancho Calif. Rd.					$3,120,284			
1790E-8	Buck Rd. Trans Main #1	24-inch pipeline between Buck Mesa P.S. and Rancho Calif Rd. in Buck Rd.					$2,539,766			
1790E-7	Warren Road Trans Main	20-inch pipeline in Warren and Buck Rd. between Rancho Calif. Rd. and Benton					$1,773,805			
1790E-6	Upper Camino del Vino Trans Main	8-inch pipeline in Camino del Vino between Warren and Glen Oaks					$967,530			
1790E-5	East Benton Rd. Trans Main	20-inch pipeline in E. Benton Rd. between Camino del Vino and Bella Vista					$2,386,574			
1790E-4	Upper Bella Vista Trans Main	8-inch pipeline in Bella Vista between Avd. Brista and E. Benton Rd.					$3,160,598			
1790E-31	Upper Glen Oaks Trans Main #2	12-inch pipeline in Glen Oaks between Mesa Drive and Bella Vista					$838,526			
1790E-29	Mid De Portola Trans Main #3	30-inch pipeline between Camino Del Vino and Los Caballos P.S. in De Portola					$3,708,865			
1790E-28	Mid De Portola Trans Main #2	16-inch pipeline between Monte De Oro and Camino Del Vino in De Portola					$3,144,472			
1790E-27	Mid De Portola Trans Main #1	20-inch pipeline between Camino Arroyo Seco and Monte de Oro in de Portola					$2,418,825			
1790E-26	De Portola Reservoir T.M. #1	20-inch pipeline between De Portola Res. #2 and Chaparral					$322,510			
1790E-25	Cordova Dr. Trans Main #2	30-inch pipeline between De Portola and De Portola Reservoir in Cordova					$4,031,375			
1790E-24	Luna Drive Trans Main	24-inch pipeline between De Portola and De P{ortola P.S. in Luna Drive					$2,721,178			
1790E-23	Avenida Brisa Trans Main	18-inch pipeline in Avd. Brisa and C. Arroyo Seco between Bella Vista and De Portola					$2,031,813			
1790E-22	Cruz Way Trans Main	8-inch pipeline in Cruz Way between Calle Napal and Meadow Ridge					$483,765			
1790E-21	Meadow Ridge Trans Main	12-inch pipeline in Meadow Ridge Rd. between Valencia and Meadow Ridge cul-de-sac					$1,128,785			
1790E-20	Via Anita Trans Main	8-inch pipeline in Via Anita between Calle Nopal and Meadow Ridge					$665,177			
1790E-19	Calle Nopal Trans Main	12-inch pipeline in Calle Nopal between Valencia Way and Calle Cancion					$1,580,299			
1790E-18	Upper Pauba Trans Main	12-inch pipeline in Pauba Rd. from Linda Rosea toward De Anza					$1,241,663			
1790E-17	Valencia Way Trans Main	14-inch pipeline in Valencia Way between Camino del Vino and Pauba Rd.					$1,753,648			
1790E-16	Lower Camino Del Vino T.M.	16-inch pipeline in Camino Del Vino between Monte de Oro and De Portola					$4,958,591			
1790E-15	Monte De Oro Trans Main	18-inch pipeline in Monte de Oro between Camino Del Vino and De Portola					$3,527,453			
1790E-14	Upper Camino Del Vino T.M. #3	20-inch pipeline in Camino Del Vino between Glen Oaks and Monte de Oro					$1,870,558			
1790E-13	Upper Camino Del Vino T.M. #2	20-inch pipeline in Camino Del Vino between Glen Oaks and Monte de Oro					$1,870,558			
1790E-12	Lower Bella Vista Trans Main	12-inch pipeline in Belle Vista between Glen Oaks and Monte de Oro Rd.					$1,806,056			
1790E-11	Mid Glenoaks Trans Main	18-inch pipeline between Camino Del Vino and Bella Vista in Glen Oaks					$2,539,766			
1790E-10	Lower Glenoaks Trans Main	24-inch pipeline between Rancho Calif. Rd. and Camino Del Vino in Glen Oaks					$3,047,719			
1610E-8	Mid Anza Trans Main #2	24-inch pipeline in Anza Rd. between Rancho Calif. Rd. and Anza P.S.					$7,474,169			
1610E-7	Upper Anza Rd. Trans Main #2	18-inch pipeline in Anza Rd. between Brenda Rd. and Rancho Calif. Rd.					$1,552,079			
1610E-6	Upper Anza Rd. Trans Main #1	16-inch pipeline in Anza Rd. between Vino Way and Brenda Rd.					$822,400			
1610E-5	Los Nogales Trans Main	12-inch pipeline in Los Nogales extending from Anza Rd.					$1,402,918			
1610E-4	Brenda Rd. Trans Main	20-inch pipeline between Buck Mesa P.S. and Anza in Brenda Rd.					$5,160,160			
1610E-3	Upper Rancho Calif. Rd. T.M. #1	24-inch pipeline between Buck Mesa P.S. and Anza in Rancho Calif Rd.					$7,256,475			
1610E-25	Lower Calle Contento T.M.	16-inch pipeline in C. Contento between Madera de Playa and Linda Rosea					$2,660,707			
1610E-24	Mid Calle Contento Trans Main	18-inch pipeline in C. Contento between Rancho Calif. Rd. and Madera de Playa					$1,721,397			

TABLE 9.5
RANCHO CALIFORNIA WATER DISTRICT
CAPITAL REPLACEMENT PROGRAM
ESTIMATED CAPITAL COST
Rancho Division

Item No.	Facility Name	Description of Facilities	2005-2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2040	2041-2050	2051-2060
1610E-23	Upper Calle Contento T.M. #2	16-inch pipeline in C. Contento between Vista Del Monte and Rancho Calif Rd.					$2,757,460			
1610E-22	Upper Calle Contento T.M. #1	12-inch pipeline in C. Contento between Vista Del Monte Dr. and Pauba Rancho boundary					$790,149			
1610E-21	Vino Way Trans Main	16-inch pipeline in Vino Way between Anza Rd. and C. Contento					$2,128,566			
1610E-20	Vista Del Monte Drive T.M.	12-inch pipeline in Vista Del Monte Dr. between C. Contento and Butterfield Stage Rd.					$2,692,958			
1610E-19	Upper La Serena Way Trans Main	14-inch pipeline in La Serena Way between Madera de Playa and Butterfield Stage					$5,559,266			
1610E-17	Upper Rancho Calif. T.M. #4	24-inch pipeline in Rancho Calif. Rd. between La Serena and Rancho Calif. P.S. #1					$3,628,237			
1610E-16	Upper Rancho Calif. T.M. #3	20-inch pipeline in Rancho Calif. Rd. between C. Contento and La Serena Way					$3,289,602			
1610E-15	Upper Rancho Calif. T.M. #2	18-inch pipeline in Rancho Calif. Rd. between Anza and Calle Contento					$2,624,425			
1610E-14	Modera De Playa Dr. Trans Main	18-inch pipeline in Madera De Playa Dr. between Anza and C. Cabrillo					$5,869,682			
1610E-13	Upper Pauba Rd. Trans Main	16-inch pipeline in Pauba Rd. between Anza Rd. and Calle Contento					$1,862,495			
1610E-12	Upper Linda Rosea Trans Main #3	16-inch pipeline in Linda Rosea between Sea Wind Circle and Calle Contento					$1,330,354			
1610E-11	Upper Linda Rosea Trans Main #2	24-inch pipeline in Linda Rosea between Anza Rd. and 10" pipe node					$3,156,567			
1610E-10	Upper Linda Rosea Trans Main #1	10-inch pipeline in Linda Rosea extending south from Pauba Rd.					$1,206,187			
1550E-4	Lower Anza Rd. Trans Main #1	14-inch pipeline in Anza Rd. between Booster 40 P.S. and Santa Rita Rd.					$3,426,669			
1550E-3	Santa Rita Rd. Trans Main	14-inch pipeline in Santa Rita Rd. between L. Panteras and Monte Verde					$2,076,158			
1550E-2	Los Panteras Trans Main	24-inch pipeline in Los Panteras between Alvares Reservoir and St. Rita Rd.					$1,814,119			
1485E-9	Chenin Blanc Trans Main	12-inch pipeline in Chenin Blanc off of Rancho Calif. Rd.					$580,518			
1485E-8	Mid Rancho Calif. Trans Main #1	24-inch pipeline in Rancho Calif. Rd. between Riesling Ct. and Rancho Calif. P.S. #2					$2,358,354			
1485E-7	Linda Rosea Loop Trans Main	12-inch pipeline looped in Linda Rosea and C. Contento					$2,821,962			
1485E-6	Cee Cee Rd. Trans Main	8-inch pipeline in Cee Cee Road between Lisa Rd. and Orlinda Dr.					$514,000			
1485E-5	Lisa Rd. Trans Main	16-inch pipeline in Lisa Rd. between Vista Del Monte and Cee Cee Rd.					$411,200			
1485E-4	Via Del Monte Trans Main	16-inch pipeline in Vista Del Monte between Pauba and Linda Rosea					$2,660,707			
1485E-3	Mid Pauba Rd. Trans Main	24-inch pipeline in Pauba Rd. between R.C.P.S. #2 and Calle Contento Reservoir					$10,884,712			
1485E-16	Del Rey Rd. Trans Main	12-inch pipeline in Del Ray Road from Avd. Del Reposo					$1,290,040			
1485E-15	Loop Line #1	14-inch pipeline between Del Ray and La Serena; not in a street					$403,137			
1485E-14	Upper Via Norte Trans Main	12-inch pipeline in Via Norte between Avd. Centenario and Avd. De Reposo					$1,451,295			
1485E-13	Calle Girasol Trans Main	8-inch pipeline in Calle Girasol between Niccolas Road and 2nd S.D. Aqueduct					$653,083			
1485E-12	Leifer Rd. Trans Main	8-inch pipeline in Liefer Road between Nicolas Road					$1,124,754			
1485E-11	Calle Medusa Trans Main	12-inch pipeline in C. Medusa between Liefer Road and La Serena Way					$2,144,691			
1485E-10	Lower La Serena Trans Main #2	16-inch pipeline in La Serena Way between Kaiser and Butterfield Stage					$2,031,813			
1380E-9	Lower Anza Rd. Trans Main #2	24-inch pipeline in Anza Rd. between Anza Res. And De Portola Rd.					$4,499,014			
1380E-7	Lower Pauba Trans Main #1	12-inch pipeline between Calle Cedral and Ynez in Pauba Road					$3,934,622			
1380E-6	Rancho Vista Trans Main	12-inch pipeline between Ynez and Margarita in Rancho Vista					$2,386,574			
1380E-5	Camino Pina Colada Trans Main	20-inch pipeline between Del Rey Rd. and La Serena Way in C. Pina Colada					$1,419,044			
1380E-4	Del Rey Road Trans Main	16-inch pipeline between Via Norte and Calle Pina Colada in Del Rey Rd.					$2,176,942			
1380E-32	Orlinda Drive Trans Main	12-inch pipeline in Orlinda Dr. and Linda Rosea between Cee Cee Road and De Portola Rd.					$693,396			
1380E-3	Lower Via Norte Trans Main	16-inch pipeline between Del Rey Rd. & Avd. Centenario in Via Norte					$3,579,861			
1380E-21	Lower La Serena Trans Main #1	24-inch pipeline in La Sierra Way between Margarita & Calle Pina Colada					$2,068,095			
1380E-2	General Kearney Trans Main	24-inch pipeline in General Kearny between General Kearny Res. and Rancho Calif. Rd.					$3,555,673			
1380E-19	Los Corralitos Rd. Trans Main	14-inch pipeline in Los Corralitos Rd. & Los Caballos between Pauba Rd. and De Portola Rd.					$3,366,198			
1380E-18	Lower Pauba Rd. Trans Main #3	14-inch pipeline in Pauba Rd. between De Portola and Los Corralitos Rd.					$3,466,982			
1380E-17	Lower Pauba Rd. Trans Main #2	16-inch pipeline in Pauba Rd. between De Portola Rd. and Winners Circle					$1,330,354			
1380E-16	Upper Hwy 79 Trans Main #2	12-inch pipeline in Hwy 79 extending West from Booster 40 P.S.					$1,402,918			
1380E-15	Lower Anza Rd. Trans Main #4	14-inch pipeline in Anza Rd. between Booster 40 P.S. and De Portola					$1,572,236			
1380E-14	Lower De Portola Rd T.M. #3	24-inch pipeline in De Portola Road between C. contento and Margarite					$10,159,065			
1380E-13	Margarita Rd. Trans Main #1	24-inch pipeline Margarite Pkwy between De Portola and La Sierra Way					$9,796,241			
1380E-12	Mid Rancho Calif. Trans Main #4	30-inch pipeline extending East of Margarita Pkwy in Rancho Calif. Rd.					$3,628,237			
1380E-11	Mid Rancho Calif. Trans Main #3	36-inch pipeline extending West of Kaiser Pkwy in Rancho Calif. Rd.					$2,172,911			
1380E-10	Mid Rancho Calif. Trans Main #2	24-inch pipeline between Riesling Ct. and Rancho Calif. P.S. #2 in Rancho Calif. Rd.					$2,285,790			
1305E-9	Valdez Road Trans Main	24-inch pipeline in Valdez, Felix, Vincent & Rancho Calif. Road between Diaz and 6th					$1,959,248			
1305E-53	Lower De Portola Rd. T.M. #2	20-inch pipeline in De Portola between Los Caballos P.S. & Calle Contento					$9,739,802			
1305E-51	Loop Trans Main #4	36-inch pipeline between Front Street & Diaz, not in existing road					$576,487			
1305E-50	Moraga Rd. Trans Main	16-inch pipeline in Moraga Road between Margarita & Rancho Calif.					$653,083			

TABLE 9.5
RANCHO CALIFORNIA WATER DISTRICT
CAPITAL REPLACEMENT PROGRAM
ESTIMATED CAPITAL COST
Rancho Division

Item No.	Facility Name	Description of Facilities	2005-2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2040	2041-2050	2051-2060
1305E-49	Ynez Rd. Loop Trans Main	20-inch pipeline in Ynez, Equity, & County Center Drive					$4,063,626			
1305E-48	Avenida Sonoma Trans Main	12-inch pipeline in Avd. Sonoma between Solana Wy. & Margarita Rd.					$580,518			
1305E-47	Solana Way Trans Main #2	10-inch pipeline in Solana Way between Margarita & Avd. Sonoma					$1,277,140			
1305E-46	Solana Way Trans Main #1	10-inch pipeline in Solana Way between Margarita & Ynez					$532,141			
1305E-45	Lower Margarita Rd. Trans Main #2	16-inch pipeline in Margarita Rd. between Avd. Sonoma & C. Pina Colada					$5,901,933			
1305E-44	Lower Rancho Calif Rd. T.M. #3	20-inch pipeline in Rancho Calif. Rd. between Norma Marshall Res. & Asteroid Rd.					$1,612,550			
1305E-43	Lower Rancho Calif Rd. T.M. #2	24-inch pipeline in Rancho California Rd. between Ynez Rd. & Asteroid Rd.					$4,861,838			
1305E-42	Lower Rancho Calif Rd. T.M. #1	20-inch pipeline between Ynez Rd. & Front St. in Rancho Calif. Rd.					$1,386,793			
1305E-41	Rainbow Canyon Trans Main	14-inch pipeline in Rainbow Canyon between Pala Road & Rainbow Canyon Golf Course					$967,530			
1305E-40	Loop Trans Main #3	16-inch pipeline between Loma Linda & Hwy 79, not in existing street					$1,161,036			
1305E-39	Loma Linda Trans Main	12-inch pipeline in Loma Linda between Cal Turf & Pala Rd.					$2,676,833			
1305E-38	Cal Turf Trans Main	16-inch pipeline in Cal Turf Road between Pala Rd. & Loma Linda Rd.					$2,418,825			
1305E-37	Pala Rd. Trans Main #2	24-inch pipeline in Pala Road between Rainbow Cyn. & Cal Turf					$6,748,522			
1305E-36	Pala Rd. Trans Main #1	18-inch pipeline in Pala Rd. between Hwy 79 & Rainbow Canyon Rd.					$846,589			
1305E-35	Business Park Drive Trans Main	24-inch pipeline in Business Pk. Drive & Single Oak Dr. off of Rancho Calif. Rd.					$3,265,414			
1305E-34	Airport Trans Main	20-inch ippeline between Airport & Business Park Dr. - not in existing rd.					$645,020			
1305E-32	Rio Nedo Loop Trans Main	12-inch pipeline in Diaz, Rio Nedo, Tierro Alta & Avd. Alvarado					$2,483,327			
1305E-31	Loop Trans Main #2	24-inch pipeline between V. Montezuma & Diaz - not in roadway					$362,824			
1305E-30	Via Montezuma Trans Main	12-inch pipeline in V. Montezuma between Front St. & Del Rio					$322,510			
1305E-29	Del Rio Rd. Trans Main	14-inch pipeline in Del Rio Rd. between Via Montezuma & Front St.					$1,148,942			
1305E-28	Front Street Trans Main #4	12-inch pipeline in Front St. between Del Rio & Via Montezuma					$1,096,534			
1305E-27	Front Street Trans Main #3	16-inch pipeline in Front Street between Rancho Calif. & Del Rio Rd.					$822,400			
1305E-26	Front Street Trans Main #2	24-inch pipeline in Santiage, Front, & Jefferson between Ynez & Winchester					$11,610,360			
1305E-25	Front Street Trans Main #1	20-inch pipeline in Front St. between Hwy 79 & Santiago Rd.					$2,515,578			
1305E-24	La Paz Rd. Trans Main	16-inch pipeline in La Paz Rd. between Ynez Rd. & Constance St.					$653,083			
1305E-22	Lower Highway 79 Trans Main #1	30-inch pipeline between Margarita Rd. & 2nd Sand Diego Aqueduct in Hwy 79					$5,724,552			
1305E-21	Lower Margarita Trans Main #1	12-inch pipeline between De Portola Rd. & Hwy 79 in Margarita Rd.					$483,765			
1305E-20	Lower Ynez Rd. Trans Main #2	20-inch pipeline in Ynez Road & De Portola between La Paz St. & Margarita					$6,127,690			
1305E-19	Lower Ynez Rd. Trans Main #1	18-inch pipeline in Ynez Rd. between Santiago Rd. & La Paz St.					$1,862,495			
1305E-18	Mid Ynez Rd. Trans Main	16-inch pipeline in Ynez Road between Solana Way & Santiago Rd.					$5,418,168			
1305E-17	Upper Ynez Rd. Trans Main	12-inch pipeline in Ynez Road between Winchester & Solana Way					$1,354,542			
1305E-16	Winchester Trans Main #4	24-inch pipeline in Winchester Rd. between Jefferson and Margarita					$4,353,885			
1305E-15	Winchester Trans Main #3	20-inch pipeline in Winchester Rd. between Nicolas Rd. & Margarita					$2,128,566			
1305E-14	Winchester Trans Main #2	16-inch pipeline in Winchester Rd. between Nicolas Rd. & Winchestrick Ave.					$1,330,354			
1305E-13	Main Street Trans Main	6-inch pipeline in Main Street between Front St. and Pujol St.					$120,941			
1305E-10	Pujol Street Trans Main	24-inch pipeline in Pujol Street & 6th between Valdez and C. Estribo					$4,353,885			
1380E	Winchester P.S. T.M.	24-inch pipeline from Winchester Rd. to General Kearny Rd. ending at Via Norte							$12,780,825	
1380E	Long Canyon T.M.	24-inch pipeline between Via Norte & Del Rey Rd.							$8,195,776	
1305E	Overland Dr. T.M.	16-inch pipeline between Ynez Rd. & Margarita Rd.							$2,390,169	
1305E	Promenade Wey T.M.	16-inch pipeline Overland Dr. & Loop Rd.							$1,106,638	
1305E	Solana Way T.M.	16-inch pipeline between Ynez Rd. & Margarita Rd.							$2,574,137	
1485E	La Serena Way T.M.	24-inch pipeline from Via Aguila to Meadows Pkwy ending at Spyglass Hill Lane							$9,299,584	
1485E	Meadows Pkwy T.M. #1	24-inch pipeline between Spyglass Hill Lane & Parducci Lane							$2,122,708	
1485E	Meadows Pkwy T.M. #2	24-inch pipeline between Parducci Lane & Royal Birkdale Dr.							$5,056,291	
1610E	La Serena Way T.M. #1	24-inch pipeline between Calle Medusa & Walcott Ln.							$2,674,612	
1610E	La Serena Way T.M. #2	16-inch pipeline between Calle Elenita & Butterfield Stage Rd.							$1,620,334	
1610E	La Serena Way T.M. #3	30-inch pipeline between Walcott Ln. & Butterfield Stage Rd.							$2,080,254	
1610E	Walcott Lane T.M. #1	30-inch pipeline between La Serena & Valone Ct.							$1,780,716	
1610E	Walcott Lane T.M. #2	30-inch pipeline between Klare Ln. & Calle Chapos							$6,448,315	
1380E	Winchester Rd. T.M. #1	20-inch pipeline between Northeast of Roripaugh & Southwest of Nicolas Rd.							$2,505,739	
1380E	Winchester Rd. T.M. #2	16-inch pipeline North of Murrieta Hot Springs Rd. to Glen Dr.							$679,267	
1305E	Store Rd. T.M.	16-inch pipeline between Redhaw Pkwy and Apis Rd.							$1,365,609	
1380E	Pine Road T.M.	16-inch pipeline between Manzanita Dr. & Margarita Rd.							$5,970,470	

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Rancho Division

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1380E	Lakeview Rd. T.M.	16-inch pipeline from Halleston Dr. to Paddington Ct.							$1,276,455	
1380E	Date St. T.M. #1	16-inch pipeline between Paddington Ct. & Margarita Rd.							$2,837,353	
1380E	Date St. T.M. #2	30-inch pipeline from Margarita Rd. to Murrieta Hot Springs Rd.							$10,130,035	
1380E	Date St. Ext. T.M.	16-inch pipeline ~700 lf west from Date Street							$1,035,882	
1380E	Murrieta Hot Springs T.M.	30-inch pipeline from Date St. Ext. T.M. to Sky Larron Dr.							$2,632,158	
1380E	Winchester Rd. T.M. #3	16-inch pipeline from Murietta Hot Springs Rd. to ??????							$1,376,930	
1305E	Murrieta Creek T.M.	??							$3,773,703	
1305E	Townfront St. T.M. #1	??							$5,115,255	
1305E	Townfront St. T.M. #2	??							$568,886	
1305E	Townfront St. T.M. #3	20-inch pipeline parallel to Town Front St.							$1,807,604	
1305E	Townfront St. T.M. #4	42-inch pipeline perpendicular to Town Front St.							$2,640,649	
1305E	SR79 T.M. #1	30-inch pipeline between Murrieta Creek & Bedford Ct							$8,252,617	
1305E	SR79 T.M. #2	36-inch pipeline parallel to SR79 T.M. #1							$2,322,007	
1305E	SR79 T.M. #3	36-inch pipeline parallel to SR79							$796,487	
1305E	SR79 T.M. #4	30-inch pipeline parallel to SR79							$1,259,473	
1305E	SR79 T.M. #5	36-inch pipeline parallel to SR79 T.M. #4							$2,376,490	
1305E	Pechanga Pkwy T.M. #1	16-inch pipeline parallel to Pechanga Pkwy.							$3,147,269	
1305E	Pechanga Pkwy T.M. #2	30-inch pipeline parallel to Pechanga Pkwy.							$1,556,653	
1550E	Los Caballos Rd. T.M.	24-inch pipeline between SR 79 and Rita Rd.							$8,278,562	
1550E	Anza Rd. T.M	16-inch pipeline from Rita Rd. to Linda Rd.							$5,088,839	
1610E	Playa Dr. T.M.	20-inch pipeline easterly from Brickswell lane							$5,283,185	
1305E	Adam Ave. T.M	30-inch pipeline between Lemon and Larchmont Ln.							$37,265,320	
1305E	Vineyard pkwy T.M	20-inch pipeline between Hayes and Monroe Ave.							$20,944,053	
1305E	Monroe Ave. T.M.	20-inch pipeline between Troyes Ln and California Oak Rd.							$3,773,703	
1305E	Nighthawk Wy T.M.	20-inch pipeline between Hayes St. and Santa Fe Tr							$2,452,907	
		Subtotal	$0	$0	$0	$0	$368,542,249	$0	$204,643,919	$0
		PRESSURE REDUCING STATIONS								
2070E-19	Pressure Reducing Station	PRS from 2070 to 1880				$114,647				
2070E-18	Pressure Reducing Station	PRS from 2070 to 1880				$114,647				
2070E-17	Pressure Reducing Station	PRS from 2070 to 1880				$114,647				
1485E-17	Pressure Reducing Station	PRS at La Serena and Calle Medusa. Pressure reducing from 1610 to 1485				$52,521				
		Subtotal	$0	$0	$0	$396,462	$0	$0	$0	$0
		WELLS								
1305E-92	Well No. 224	Well at Butterfield & De Portola								
1380E-28	Well No. 210	Well at De Portola								
1790E-33	Well No. 202	Well at Calle Nupal and Cruz Way								
1380E-27	Well No. 203	Well at De Portola and Pauba								
1610E-28	Well No. 204	Well at Rancho Calif. Rd. and Anza								
1305E-94	Well No. 205	Well at General Kearny								
1610E-27	Well No. 201	Well at Calle Contento and R.C. Rd.								
1550E-6	Well No. 207	Well at Hwy 79 and Anza Rd.								
1610E-30	Well No. 209	Well at La Serana Way								
1610E-29	Well No. 208	Well at Pauba and Calle Contento								
1380E-29	Well No. 212	Well at Hwy 79 and Booster 40 P.S.								
1305E-88	Well No. 211	Well at Pala Rd.								
1380E-30	Well No. 214	Well at Butterfield Stage								
1610E-31	Well No. 215	Well at Madera de Playa								
1305E-90	Well No. 217	Well at Pauba & Verde Dr.								
1380E-31	Well No. 216	Well at Margarita and Rancho Vista								
1305E-91	Well No. 223	Well at Hwy 79								
1380E-23	Well No. 233	Well at De Portola	$851,197							
1305E-66	Well No. 231	Well at Hwy 79 & Valdez Rd.	$879,570							
1380E-22	Well No. 232	Well at De Portola and Anza		$1,042,717						
1380E-24	Well No. 234	Well at Hwy 79 and Anza		$1,032,289						
1305E-89	Well No. 235	Well at Rancho Calif. & Lynde			$1,437,264					
		Subtotal	$1,730,768	$2,075,006	$1,437,264	$0	$0	$0	$0	$0
TOTAL RANCHO DIVISION			$3,342,626	$3,004,273	$5,556,110	$1,075,853	$371,341,539	$15,792,377	$213,090,516	$37,189,138

TABLE 9.6
RANCHO CALIFORNIA WATER DISTRICT
CAPITAL REPLACEMENT PROGRAM
ESTIMATED CAPITAL COST
Common Facilities

Item No.	Facility Name	Description of Facilities	Size/ Capacity	Quantity	Unit Cost	Estimated Capital Cost 2004 ($)	Estimated Replacement Items %	Estimated Replacement Items Cost	Life Cycle In Years	Construction Date	Repl. Date	Estimated Future Replacement Cost ($)
		TRANSMISSION MAINS										
1305E-11	Camino Estribo Trans Main #1	42-inch pipeline in C. Estribo between Ace Bowen P.S. #1 & 2 and I-15	42 in	6700 LF	$300.00 /LF	$2,010,000	100%	$2,010,000	50	1967	2017	$3,790,155
1305E-7	Diaz Rd. Trans Main #1	36-inch pipeline in Diaz, Felix, Valdez, 6th, & Pujol Roads between Winchester and C. Escribo	36 in	16650 LF	$275.00 /LF	$4,578,750	100%	$4,578,750	50	1968	2018	$9,065,612
1305E-54	Lower Anza Rd. Trans Main #3	36-inch pipeline in Anza Rd. between De Portola Rd. and Hwy 79	36 in	2500 LF	$275.00 /LF	$687,500	100%	$687,500	50	1969	2019	$1,429,263
1305E-52	Lower De Portola Rd. T.M. #1	36-inch pipeline in De Portola Road between Los Caballos P.S. & Anza Rd.	36 in	12500 LF	$275.00 /LF	$3,437,500	100%	$3,437,500	50	1969	2019	$7,146,316
1305E-23	Lower Highway 79 Trans Main #2	30-inch pipeline between Margarita Rd. and I-15 in Hwy 79	30 in	13000 LF	$250.00 /LF	$3,250,000	100%	$3,250,000	50	1970	2020	$7,094,342
1305E-6	Winchester Rd. Trans Main #1	36-inch pipeline in Winchester Rd. between Jefferson and Diaz Road	36 in	2700 LF	$275.00 /LF	$742,500	100%	$742,500	50	1970	2020	$1,620,784
1305E-55	Upper Hwy 79 Trans Main #1	36-inch pipeline in Hwy 79 between Anza Rd. and Margarita Rd.	36 in	15000 LF	$275.00 /LF	$4,125,000	100%	$4,125,000	50	1970	2020	$9,004,358
1990E	Rancho CA, T.M.	42-inch pipeline between De Luz Rd. & Eagle Nest Rd.	42 in	5860 LF	$300.00 /LF	$1,758,000	100%	$1,758,000	50	2000	2050	$16,585,426
1990E	Eagle Nest Rd. T.M.	42-inch pipeline from Rancho CA Rd. to before Hayes Ave.	42 in	2718 LF	$300.00 /LF	$815,400	100%	$815,400	50	2000	2050	$7,692,694
1305E	Diaz Rd. T.M. #1	10-inch pipeline parallel with Date St. & ending at Cherry St.	10 in	2742 LF	$88.00 /LF	$241,296	100%	$241,296	50	2000	2050	$2,276,449
1305E	Diaz Rd. T.M. #2	24-inch pipeline continues from T.M. #1 ending 290 feet southerly	24 in	290 LF	$225.00 /LF	$65,250	100%	$65,250	50	200	2050	$615,585
1305E	Diaz Rd. T.M. #3	20-inch pipeline continues from T.M. #2 ending 713 feet southerly	20 in	713 LF	$200.00 /LF	$142,600	100%	$142,600	50	2000	2050	$1,345,325
1305E	Date St. T.M.	42-inch pipeline between Hayes Ave. & Madison Ave.	42 in	4881 LF	$300.00 /LF	$1,464,300	100%	$1,464,300	50	2000	2050	$13,814,584
1305E	Winchester P.S. T.M.	54-inch pipeline begins at Temecula Valley Rd and ends at Cantrell Rd.	54 in	27181 LF	$400.00 /LF	$10,872,400	100%	$10,872,400	50	2000	2050	$102,573,029
1305E	Ynez Rd. T.M.	48-inch pipeline between County Center & Winchester Rd.	48 in	1518 LF	$350.00 /LF	$531,300	100%	$531,300	50	2000	2050	$5,012,421
		Subtotal				$34,721,796		$34,721,796				$189,066,343
		TURNOUTS										
1305E-97	MWD Turnout EM-13	MWD turnout at Norma Marshall site	15 cfs	1 LS		$1,058,627	30%	$317,588	30	1966	1996	$214,956
1305E-95	MWD Turnout WR-26	MWD turnout at Ace Bowen site	40 cfs	1 LS		$1,058,627	30%	$317,588	30	1967	1997	$225,704
1305E-96	MWD Turnout WR-28	MWD turnout at Ace Bowen site	40 cfs	1 LS		$1,058,627	30%	$317,588	30	1970	2000	$261,281
1305	MWD Turnout EM-20		100 cfs			$2,400,000	30%	$720,000	30	2000	2030	$2,560,084
		Subtotal				$5,575,882		$1,672,765				$3,262,025
		WELLS										
1305E-65	Well No. 101	Well at Cherry & Diaz	1460 gpm	1 LS		$741,039	100%	$741,039	30	1978	2008	$900,738
1305E-60	Well No. 102	Well at Rancho California Airport	1500 gpm	1 LS		$741,039	100%	$741,039	30	1978	2008	$900,738
1305E-64	Well No. 105	Well at Winchester	2000 gpm	1 LS		$741,039	100%	$741,039	30	1978	2008	$900,738
1305E-62	Well No. 106	Well at Winchester & Ynez	gpm	1 LS		$1,693,996	100%	$1,693,996	30	1978	2008	$2,059,063
1305E-63	Well No. 107	Well at Winchester	gpm	1 LS		$1,482,078	100%	$1,482,078	30	1978	2008	$1,801,476
1305E-93	Well No. 108	Well at Winchester	2300 gpm	1 LS		$741,039	100%	$741,039	30	1978	2008	$900,738
1305E-67	Well No. 109	Well at Hwy. 79 & Margarita	1600 gpm	1 LS		$656,349	100%	$656,349	30	1978	2008	$797,796
1305E-68	Well No. 110	Well at Pauba & De Portola	gpm	1 LS		$656,349	100%	$656,349	30	1978	2008	$797,796
1790E-32	Well No. 113	Well at Camino Del Vino and Los Nocalas	500 gpm	1 LS		$648,457	100%	$648,457	30	1978	2008	$788,204
1305E-69	Well No. 115	Well at De Portola & Los Caballos P.S.	gpm	1 LS		$635,176	100%	$635,176	30	1978	2008	$772,061
1305E-70	Well No. 116	Well at De Portola & Los Caballos	gpm	1 LS		$529,314	100%	$529,314	30	1978	2008	$643,384
1305E-71	Well No. 117	Well at Loma Linda & Pala	gpm	1 LS		$741,039	100%	$741,039	30	1978	2008	$900,738
1305E-61	Well No. 118	Well at Del Rio & Front	1900 gpm	1 LS		$762,212	100%	$762,212	30	1978	2008	$926,473
1305E-72	Well No. 119	Well at Loma Linda & Pala	gpm	1 LS		$741,039	100%	$741,039	30	1978	2008	$900,738
1305E-72	Well No. 120	Well at Ynez & Margarita	2500 gpm	1 LS		$762,212	100%	$762,212	30	1978	2008	$926,473
1305E-74	Well No. 121	Well at Diaz & Winchester	gpm	1 LS		$741,039	100%	$741,039	30	1978	2008	$900,738
1305E-75	Well No. 122	Well at Pala & Gilberto	gpm	1 LS		$762,212	100%	$762,212	30	1978	2008	$926,473
1305E-76	Well No. 123	Well at Pauba & De Portola	gpm	1 LS		$762,212	100%	$762,212	30	1978	2008	$926,473
1305E-77	Well No. 124	Well at Anza & Hwy 79	1500 gpm	1 LS		$698,694	100%	$698,694	30	1978	2008	$849,267
1305E-78	Well No. 125	Well at De Portola	gpm	1 LS		$741,039	100%	$741,039	30	1978	2008	$900,738
1305E-79	Well No. 126	Well at Butterfield Stage & Hwy 79	2200 gpm	1 LS		$762,212	100%	$762,212	30	1978	2008	$926,473
1305E-80	Well No. 128	Well at Solana & Margarita	2000 gpm	1 LS		$762,212	100%	$762,212	30	1978	2008	$926,473
1305E-81	Well No. 130	Well at Los Caballos	3000 gpm	1 LS		$762,212	100%	$762,212	30	1978	2008	$926,473
1305E-82	Well No. 131	Well at Los Caballos	1600 gpm	1 LS		$698,694	100%	$698,694	30	1978	2008	$849,267
1305E-83	Well No. 132	Well at De Portola	2000 gpm	1 LS		$741,039	100%	$741,039	30	1978	2008	$900,738
1305E-84	Well No. 133	Well at Los Caballos	2000 gpm	1 LS		$698,694	100%	$698,694	30	1978	2008	$849,267
1305E-59	Well No. 135	Well at Washington & Elm	gpm	1 LS		$741,039	100%	$741,039	30	1978	2008	$900,738
1305E-85	Well No. 138	Well at Rancho Calif. & Humber	gpm	1 LS		$317,588	100%	$317,588	30	1978	2008	$386,030
1380E-25	Well No. 139	Well at General Kearny Res.	gpm	1 LS		$317,588	100%	$317,588	30	1978	2008	$386,030
1380E-26	Well No. 140	Well at Rancho Calif. And Butterfield Stage Rd.	gpm	1 LS		$317,588	100%	$317,588	30	1978	2008	$386,030
1380E-86	Well No. 141	Well at Hwy. 79	gpm	1 LS		$211,725	100%	$211,725	30	1978	2008	$257,354
1305E-87	Well No. 143	Well at Hwy. 79 & Margarita	gpm	1 LS		$211,725	100%	$211,725	30	1978	2008	$257,354
1305E-56	Well No. 144	Well at Fig & Jefferson	gpm	1 LS		$317,588	100%	$317,588	30	1978	2008	$386,030
1305E-57	Well No. 145	Well at Guava & Washington	gpm	1 LS		$317,588	100%	$317,588	30	1978	2008	$386,030
		Subtotal				$23,155,070		$23,155,070				$28,145,132
TOTAL COMMON FACILITIES						$63,452,748		$59,549,630				$220,473,501

TABLE 9.6
RANCHO CALIFORNIA WATER DISTRICT
CAPITAL REPLACEMENT PROGRAM
ESTIMATED CAPITAL COST
Common Facilities

Item No.	Facility Name	Description of Facilities	2005-2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2040	2041-2050	2051-2060
		TRANSMISSION MAINS								
1305E-11	Camino Estribo Trans Main #1	42-inch pipeline in C. Estribo between Ace Bowen P.S. #1 & 2 and I-15			$3,790,155					
1305E-7	Diaz Rd. Trans Main #1	36-inch pipeline in Diaz, Felix, Valdez, 6th, & Pujol Roads between Winchester and C. Escribo			$9,065,612					
1305E-54	Lower Anza Rd. Trans Main #3	36-inch pipeline in Anza Rd. between De Portola Rd. and Hwy 79			$1,429,263					
1305E-52	Lower De Portola Rd. T.M. #1	36-inch pipeline in De Portola Road between Los Caballos P.S. & Anza Rd.			$7,146,316					
1305E-23	Lower Highway 79 Trans Main #2	30-inch pipeline between Margarita Rd. and I-15 in Hwy 79			$7,094,342					
1305E-6	Winchester Rd. Trans Main #1	36-inch pipeline in Winchester Rd. between Jefferson and Diaz Road			$1,620,784					
1305E-55	Upper Hwy 79 Trans Main #1	36-inch pipeline in Hwy 79 between Anza Rd. and Margarita Rd.			$9,004,358					
1990E	Rancho CA, T.M.	42-inch pipeline between De Luz Rd. & Eagle Nest Rd.							$16,585,426	
1990E	Eagle Nest Rd. T.M.	42-inch pipeline from Rancho CA Rd. to before Hayes Ave.							$7,692,694	
1305E	Diaz Rd. T.M. #1	10-inch pipeline parallel with Date St. & ending at Cherry St.							$2,276,449	
1305E	Diaz Rd. T.M. #2	24-inch pipeline continues from T.M. #1 ending 290 feet southerly							$615,585	
1305E	Diaz Rd. T.M. #3	20-inch pipeline continues from T.M. #2 ending 713 feet southerly							$1,345,325	
1305E	Date St. T.M.	42-inch pipeline between Hayes Ave. & Madison Ave.							$13,814,584	
1305E	Winchester P.S. T.M.	54-inch pipeline begins at Temecula Valley Rd and ends at Cantrell Rd.							$102,573,029	
1305E	Ynez Rd. T.M.	48-inch pipeline between County Center & Winchester Rd.							$5,012,421	
		Subtotal	$0	$0	$39,150,830	$0	$0	$0	$149,915,514	$0
		TURNOUTS								
1305E-97	MWD Turnout EM-13	MWD turnout at Norma Marshall site								
1305E-95	MWD Turnout WR-26	MWD turnout at Ace Bowen site								
1305E-96	MWD Turnout WR-28	MWD turnout at Ace Bowen site								
1305	MWD Turnout EM-20						$2,560,084			
		Subtotal	$0	$0	$0	$0	$2,560,084	$0	$0	$0
		WELLS								
1305E-65	Well No. 101	Well at Cherry & Diaz	$900,738							
1305E-60	Well No. 102	Well at Rancho California Airport	$900,738							
1305E-64	Well No. 105	Well at Winchester	$900,738							
1305E-62	Well No. 106	Well at Winchester & Ynez	$2,059,063							
1305E-63	Well No. 107	Well at Winchester	$1,801,476							
1305E-93	Well No. 108	Well at Winchester	$900,738							
1305E-67	Well No. 109	Well at Hwy. 79 & Margarita	$797,796							
1305E-68	Well No. 110	Well at Pauba & De Portola	$797,796							
1790E-32	Well No. 113	Well at Camino Del Vino and Los Nocalas	$788,204							
1305E-69	Well No. 115	Well at De Portola & Los Caballos P.S.	$772,061							
1305E-70	Well No. 116	Well at De Portola & Los Caballos	$643,384							
1305E-71	Well No. 117	Well at Loma Linda & Pala	$900,738							
1305E-61	Well No. 118	Well at Del Rio & Front	$926,473							
1305E-72	Well No. 119	Well at Loma Linda & Pala	$900,738							
1305E-72	Well No. 120	Well at Ynez & Margarita	$926,473							
1305E-74	Well No. 121	Well at Diaz & Winchester	$900,738							
1305E-75	Well No. 122	Well at Pala & Gilberto	$926,473							
1305E-76	Well No. 123	Well at Pauba & De Portola	$926,473							
1305E-77	Well No. 124	Well at Anza & Hwy 79	$849,267							
1305E-78	Well No. 125	Well at De Portola	$900,738							
1305E-79	Well No. 126	Well at Butterfield Stage & Hwy 79	$926,473							
1305E-80	Well No. 128	Well at Solana & Margarita	$926,473							
1305E-81	Well No. 130	Well at Los Caballos	$926,473							
1305E-82	Well No. 131	Well at Los Caballos	$849,267							
1305E-83	Well No. 132	Well at De Portola	$900,738							
1305E-84	Well No. 133	Well at Los Caballos	$849,267							
1305E-59	Well No. 135	Well at Washington & Elm	$900,738							
1305E-85	Well No. 138	Well at Rancho Calif. & Humber	$386,030							
1380E-25	Well No. 139	Well at General Kearny Res.	$386,030							
1380E-26	Well No. 140	Well at Rancho Calif. And Butterfield Stage Rd.	$386,030							
1380E-86	Well No. 141	Well at Hwy. 79	$257,354							
1305E-87	Well No. 143	Well at Hwy. 79 & Margarita	$257,354							
1305E-56	Well No. 144	Well at Fig & Jefferson	$386,030							
1305E-57	Well No. 145	Well at Guava & Washington	$386,030							
		Subtotal	$28,145,132	$0	$0	$0	$0	$0	$0	$0
TOTAL COMMON FACILITIES			$28,145,132	$0	$39,150,830	$0	$2,560,084	$0	$149,915,514	$0

Appendix N4:

Sewer System Management Plan_2008

Rancho California Water District
Sewer System Management Plan
Volume I

FINAL REPORT

Prepared for:

Rancho California Water District
42135 Winchester Road
Temecula, CA 92589-9017

March 2008

Prepared by:
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5242 Katella Ave, Suite 205
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ABBREVIATIONS / ACRONYMS

BMP	Best Management Practice
CMMS	Computerized Maintenance Management System
CMOM	Capacity, Management, Operations and Maintenance
CPI	Capital Improvement Program
CWEA	California Water Environment Association
ECS	Environmental Compliance Services
EDU	Equivalent Dwelling Unit
EVMWD	Elsinore Valley Municipal Water District
FOG	Fats, Oils, Grease
GIS	Geographical Information System
IEC	Infrastructure Engineering Corporation
I/I	Inflow / Infiltration
MRP	Monitoring and Reporting Plan
NPDES	National Pollution Discharge Elimination System
OERP	Overflow Emergency Response Plan
O&M	Operation and Maintenance
PM	Preventative Program
PVC	Polyvinyl Chloride
RA&S	Regional Assets and Services Department
RCWD	Rancho California Water District
SSMP	Sewer System Management Plan
SSO	Sanitary Sewer Overflows
SRWRF	Santa Rosa Water Reclamation Facility
SWRCB	State of California Water Resources Control Board
WDR	Waste Discharge Requirements
WMWD	Western Municipal Water District

EXECUTIVE SUMMARY

On May 2, 2006, after several years of public discussion and planning, the State Water Resources Control Board (SWRCB) adopted Order No. 2006-0003, a General Waste Discharge Requirement (WDR) for all publicly owned sanitary sewer collection systems in California with more than one (1) mile of sewer pipe. The goal of Order No. 2006-0003 is to provide a consistent statewide approach for reducing Sanitary Sewer Overflows (SSOs) by requiring that:

1. In the event of an SSO, all feasible steps be taken to control the released volume and prevent untreated wastewater from entering storm drains, creeks, etc.

2. If an SSO occurs, it must be reported to the SWRCB using an online reporting system developed by the SWRCB.

3. All publicly owned collection system agencies with more than 1 mile of sewer pipe in the State must develop a Sewer System Management Plan (SSMP).

This critical component of Order No. 2006-0003 is the development of a Sewer System Management Plan (SSMP). There are eleven specific "milestones" identified in the schedule that relate to the elements required in the WDR. The eleven milestones, and the applicable schedule for the RCWD, include:

1. SSMP Development Plan and Schedule (November 2, 2007)

2. Goals and Organization Structure (November 2, 2007)

3. Legal Authority (May 2, 2009)

4. Operation and Maintenance Program (May 2, 2009)

5. Design and Performance Standards (August 2, 2009)

6. Overflow Emergency Response Program (May 2, 2009)

7. Fats, Oils and Grease Control Program (May 2, 2009)

8. System Evaluation and Capacity Assurance Plan (August 2, 2009)

9. Monitoring, Measurement, and Program Modifications (August 2, 2009)

10. SSMP Program Audits (August 2, 2009)

11. Communication Program (August 2, 2009)

12. Final SSMP, incorporating all the SSMP elements. (August 2, 2009)

Although it is the SWRCB's intent that Order No. 2006-0003 be the primary regulatory mechanism for sanitary sewer systems statewide, the Order allows each regional board to issue more stringent or more prescriptive WDRs for sanitary sewer systems within their respective jurisdiction. RCWD is within Region 9, the San Diego Region, which adopted Order R9-2007-0005 on February 14, 2007 that contains additional provisions that all sewage collection agencies within Region 9 must adhere to, specifically relating to private lateral sewage discharges reporting.

CHAPTER 1. PROHIBITIONS AND PROVISIONS

Both State Water Resources Control Board (SWRCB) Order No. 2006-0003, as well as San Diego Regional Water Quality Control Board Order R9-2007-0005, mandate that Rancho California Water District (RCWD) comply with the following discharge prohibitions and provisions.

1.1 PROHIBITIONS

To meet the provisions contained in Division 7 of the California Water Code and regulations adopted there under, RCWD is required to comply with the following prohibitions:

- Any SSO that results in a discharge of untreated or partially treated wastewater to waters of the United States is prohibited; and,

- Any SSO that results in a discharge of untreated or partially treated wastewater that creates a nuisance as defined in California Water Code Section 13050(m) is prohibited.

Order R9-2007-0005, adopted by the San Diego Regional Water Quality Control Board, expands these prohibitions to include:

- The discharge of sewage from a sanitary sewer system any point upstream of a sewage treatment plant is prohibited.

In any enforcement action, the Regional Board will consider the efforts of RCWD to contain, control, and clean up sewage spills from its collection system in accordance with Section 13327 of the California Water Code. RCWD will make every effort to contain sewage spilled from its collection systems and to prevent the sewage from entering storm drains and surface water bodies. RCWD will also make every effort to prevent sewage from discharging from storm drains into flood control channels and open ditches by blocking the storm drainage system and by removing the sewage from the storm drains. The use of the storm drain pipe system to contain the sewage by blocking the drain pipes, and recovering and cleaning up the spilled sewage, in order to prevent the sewage from being discharged to a surface water body is not a violation of the prohibitions listed above.

1.2 PROVISIONS

As stated in Order No. 2006-0003, RCWD must meet the following fifteen (15) provisions:

1. RCWD must comply with all conditions of Order No. 2006-0003. Any noncompliance with Order No. 2006-0003 constitutes a violation of the California Water Code and is grounds for enforcement action.

2. It is the intent of the State Water Board that sanitary sewer systems be regulated in a manner consistent with the general WDRs. Nothing in the general WDRs shall be:

a. Interpreted or applied in a manner inconsistent with the Federal Clean Water Act, or supersede a more specific or more stringent state or federal requirement in an existing permit, regulation, or administrative/judicial order or Consent Decree;

b. Interpreted or applied to authorize an SSO that is illegal under either the Clean Water Act, an applicable Basin Plan prohibition or water quality standard, or the California Water Code;

c. Interpreted or applied to prohibit a Regional Water Board from issuing an individual NPDES permit or WDR, superseding this general WDR, for a sanitary sewer system, authorized under the Clean Water Act or California Water Code; or

d. Interpreted or applied to supersede any more specific or more stringent WDRs or enforcement order issues by a Regional Water Board.

3. RCWD shall take all feasible steps to eliminate SSOs. In the event that an SSO does occur, RCWD shall take all feasible steps to contain and mitigate the impacts of an SSO.

4. In the event of an SSO, RCWD shall take all feasible steps to prevent untreated or partially treated wastewater from discharging from storm drains into flood control channels or waters of the United States by blocking the storm drainage system and by removing the wastewater from the storm drains.

5. All SSOs must be reported in accordance with Section G of the general WDRs.

6. In any enforcement action, the State and/or Regional Water Boards will consider the appropriate factors under the duly adopted State Water Board Enforcement Policy. And, consistent with the Enforcement Policy, the State and/or Regional Water Boards must consider RCWDs efforts to contain, control, and mitigate SSOs when considering the California Water Code Section 13327 factors. In assessing these factors, the State and/or Regional Water Boards will also consider whether:

   a. RCWD has complied with the requirements of Order No. 2006-0003, including requirements for reporting, developing and implementing a SSMP;

   b. RCWD can identify the cause or likely cause of the discharge event;

   c. There were no feasible alternatives to the discharge, such as temporary storage or retention of untreated wastewater, reduction of inflow and infiltration, use of adequate backup equipment, collecting and hauling of untreated wastewater to a treatment facility, or an increase in the capacity of the system as necessary to contain the design storm event identified in the SSMP. It is inappropriate to consider the lack of feasible alternatives if RCWD does not implement a periodic or continuing process to identify and correct problems.

d. The discharge was exceptional, unintentional, temporary, and caused by factors beyond the reasonable control of RCWD;

e. The discharge could have been prevented by the exercise of reasonable control described in a certified SSMP for:

i. Proper management, operation and maintenance;

ii. Adequate treatment facilities, sanitary sewer system facilities, and/or components with an appropriate design capacity, to reasonably prevent SSOs (e.g., adequately enlarging treatment or collection facilities to accommodate growth, infiltration and inflow (I/I), etc.);

iii. Preventative maintenance (including cleaning and fats, oils, and grease (FOG) control);

iv. Installation of adequate backup equipment; and

v. Inflow and infiltration prevention and control to the extent practicable.

f. The sanitary sewer system design capacity is appropriate to reasonably prevent SSOs.

g. RCWD took all reasonable steps to stop and mitigate the impact of the discharge as soon as possible.

7. When a sanitary sewer overflow occurs, RCWD shall take all feasible steps and necessary remedial actions to 1) control or limit the volume of untreated or partially treated wastewater discharged, 2) terminate the discharge, and 3) recover as much of the wastewater discharged as possible for proper disposal, including any wash down water.

RCWD shall implement all remedial actions to the extent they may be applicable to the discharge and not inconsistent with an emergency response plan, including the following:

a. Interception and rerouting of untreated or partially treated wastewater flows around the wastewater line failure;

b. Vacuum truck recovery of sanitary sewer overflows and wash down water;

c. Cleanup of debris at the overflow site;

d. System modifications to prevent another SSO at the same location;

e. Adequate sampling to determine the nature and impact of the release; and

f. Adequate public notification to protect the public from exposure to the SSO.

8. RCWD shall properly manage, operate, and maintain all parts of the sanitary sewer system owned or operated by RCWD, and shall ensure that the system operators (including employees, contractors, or other agents) are adequately trained and possess adequate knowledge, skills, and abilities.

9. RCWD shall allocate adequate resources for the operation, maintenance, and repair of its sanitary sewer system, by establishing a proper rate structure, accounting mechanisms, and auditing procedures to ensure an adequate measure of revenues and expenditures. These procedures must be in compliance with applicable laws and regulations and comply with generally acceptable accounting practices.

10. RCWD shall provide adequate capacity to convey base flows and peak flows, including flows related to wet weather events. Capacity shall meet or exceed the design criteria as defined in RCWD's System Evaluation and Capacity Assurance Plan for all parts of the sanitary sewer system owned or operated by RCWD.

11. RCWD shall develop and implement a written Sewer System Management Plan (SSMP) and make it available to the State and/or Regional Water Board upon request. A copy of this document must be publicly available at RCWD's office and/or available on the internet. This SSMP must be approved by RCWD's Board of Directors at a public meeting.

12. In accordance with the California Business and Professions Code sections 6735, 7835, and 7835.1, all engineering and geologic evaluations and judgments shall be performed by or under the direction of registered professionals competent and proficient in the fields pertinent to the required activities. Specific elements of the SSMP that require professional evaluation and judgments shall be prepared by or under the direction of appropriately qualified professionals, and shall bear the professional(s)' signature and stamp.

13. The mandatory elements of the SSMP are specified below. However, if RCWD believes that any element of this section is not appropriate or applicable to RCWD's sanitary sewer system, the SSMP must be approved by the deadlines listed in Order No. 2006-0003.

    Sewer System Management Plan (SSMP)

    a. Goal

    b. Organization

    c. Legal Authority

    d. Operation and Maintenance Program

    e. Design and Performance Provisions

f. Overflow Emergency Response Plan

g. FOG Control Program

h. System Evaluation and Capacity Assurance Plan

i. Monitoring, Measurement, and Program Modifications

j. SSMP Program Audits

k. Communication Program

14. Both the SSMP and RCWD's program to implement the SSMP must be certified by RCWD to be in compliance with the requirements set forth above and must be presented to RCWD's Board of Directors for approval at a public meeting. RCWD shall certify that the SSMP, and subparts thereof, are in compliance with the general WDRs within the time frames identified in the time schedule provided in subsection D.15, below.

    In order to complete this certification, RCWD's authorized representative must complete the certification portion in the Online SSO Database Questionnaire by checking the appropriate milestone box, printing and signing the automated form, and sending the form to:

    State Water Resources Control Board
    Division of Water Quality
    Attn: SSO Program Manager
    P.O. Box 100
    Sacramento, CA 95812

    The SSMP must be updated every five (5) years, and must include any significant program changes. Re-certification by the Board of Directors of RCWD is required in accordance with D.14 when significant updates to the SSMP are made. To complete the re-certification process, RCWD shall enter the data in the Online SSO Database and mail the form to the State Water Board, as described above.

15. RCWD shall comply with these requirements according to the legislated schedule. This time schedule does not supersede existing requirements or time schedules associated with other permits or regulatory requirements.

The SSMP will also comply with the additional monitoring and reporting requirements outlined in Order No. R9-2007-0005. As advised by the SWRCB, content and format for portions of the SSMP were obtained from the California Water Environment Association, and the Orange County Sanitation District SSMP.

CHAPTER 2: GOALS AND ORGANIZATIONAL STRUCTURE

The District's Goals and Organization Structure addresses those mandatory SSMP provisions outlined in Section D, 13 (i) Goals and (ii) Organization of SWRCB Order No. 2006-0003.

2.1 GOALS

The goal of this SSMP is to provide a plan and schedule to properly manage, operate, and maintain all parts of the District's sanitary sewer collection system, in order to reduce and prevent Sanitary Sewer Overflows (SSOs), as well as mitigate any SSOs that do occur. Accordingly, the SSMP will satisfy the requirements of both SWRCB Order No. 2006-0003, as well as Order R9-2007-0005, subsequently adopted by Regional Board 9, San Diego Region. These Orders are attached as Appendices A and B, respectively.

The following specific performance indicator goals have also been identified:

- Conduct a system-wide video inspection of all manholes and gravity mains every five years;
- Inspect 100% of all Interceptors annually;
- Clean 33% of all gravity mains annually;
- Clean 100% of all wet wells annually.

2.2 ORGANIZATIONAL STRUCTURE

The organization structure identifies the name of the responsible or authorized representative of the District, as described in Section J of SWRCB Order No. 2006-0003. It identifies the administrative and maintenance positions responsible for implementing specific measures in the SSMP with up-to-date descriptions, responsibilities of personnel, and authority for each position. The organization structure includes a chain of communication for reporting SSOs and lines of authority with contact information.

RCWD's Organizational Structure encompasses the following components:

(1) The name of the responsible or authorized representative as described in Section J of SWRCB Order No. 2006-0003.

(2) The names and telephone numbers for management, administrative, and maintenance positions responsible for implementing specific measures in the SSMP program. The SSMP must identify lines of authority through an organization chart or similar document with a narrative explanation; and

(3) The chain of communication for reporting SSOs, from receipt of a complaint or other information, including the person responsible for reporting SSOs to the State and Regional Water Board and other agencies if applicable (such as County Health Officer, County Environmental Health Agency, Regional Water Board, and/or State Office of Emergency Services)

2.2.1 Compliance Summary

As shown in Appendix C, RCWD maintains organizational charts which illustrate lines of authority, employee names, and employee titles. Additionally, RCWD provides sufficient staffing information to properly manage, operate, and maintain all parts of the RCWD sanitary sewer system. Appendix D includes RCWD's Sanitary Sewer Overflow Response Standard Operating Procedures which describes the chain of communication for reporting and responding to SSOs, as well as names and contact information for positions charged with implementing specific portions of the SSMP.

In summary, the District maintains an Organizational Structure which meets the requirements of Section D, 13 (ii) Organization of SWRCB Order No. 2006-0003.

(1) Section 6 of the Sanitary Sewer Overflow Response Standard Operating Procedures identifies the Santa Rosa Water Reclamation Manager as the responsible or authorized representative of the District, as described in Section J of SWRCB Order No. 2006-0003, and lists his name and contact information.

(2) RCWD maintains organizational charts with the names and telephone numbers for all management, administrative, and maintenance positions. These charts clearly identify the lines of authority for these positions, while RCWD's Sanitary Sewer Overflow Response Standard Operating Procedures contains the names and contact information for all positions charged with implementing specific portions of the SSMP.

(3) RCWD's Sanitary Sewer Overflow Response Standard Operating Procedures describes the chain of communication for reporting and responding to SSOs, with Section 6 identifying the person responsible for reporting SSOs to the State and Regional Water Board, as well as other applicable agencies.

2.2.2 Compliance Documents

The following documents allow the District to comply with the goals and organizational structure requirements of the WDR, and are attached as appendices.

- Organizational Charts, Rancho California Water District, Human Resources, Last Updated March 2008, Appendix C.

- Sanitary Sewer Overflow Response Standard Procedures, Rancho California Water District, Last Updated July 2007, Appendix D.

2.2.3 Document Descriptions

A description for each compliance document listed above is described below:

2.2.3.1 Organizational Charts (Appendix C)

RCWD maintains organizational charts which illustrate lines of authority, employee names, and titles for the following departments:

- Board of Directors and District Officers
- Rancho California Water District Board of Directors
- District Management
- District Administrative Officers
- Human Resources
- Engineering Division
- Field Services Division
- Finances and Administration Division
- Systems Operations Division
- Planning Division

Each year, Human Resources compiles updated information provided by each department and updates the organizational charts.

2.2.3.2 Sanitary Sewer Overflow Response Standard Procedures (Appendix D)

RCWD maintains a chain of communication in their Sanitary Sewer Overflow Response Standard Operating Procedures for reporting and responding to SSOs. For those management, maintenance and administrative positions charged with implementing specific portions of the SSMP, names and telephone numbers are listed. The plan includes the following contents:

- Purpose of Plan
- Spill Response
- Emergency Traffic Control
- Bypass

- Containment
- Reporting and Notification
- Sign Posting
- Restoration
- Documentation

Specifically, Section 6 of the Sanitary Sewer Overflow Response Standard Operating Procedures identifies the Santa Rosa Water Reclamation Manager as the responsible or authorized representative of the District, as described in Section J of SWRCB Order No. 2006-0003, and lists his name and contact information.

Descriptions, responsibilities and authorities for each management, administrative and maintenance position responsible for implementing specific portions of the SSMP are available from Human Resources. A summary for key positions, including the personnel responsible for responding to and reporting SSOs, is presented below:

- General Manager– Establishes policy, plans strategy, leads staff, allocates resources, delegates responsibility, authorizes outside contractors to perform services, and may serve as public information officer.
- Assistant General Manager – Engineering and Operations – Oversees preparation of wastewater collection system planning documents; manages capital improvement delivery system; oversees documentation of new and rehabilitated assets; oversees development and implementation of SSMP; provides information updates to Board; and arranges for emergency meetings if necessary.
- Santa Rosa Water Reclamation Manager – Notifies the Collection Duty Operator when alerted to a potential SSO; during working hours, oversees reporting and notification of SSOs, as well the posting of any necessary public health warnings; manages field operations and maintenance activities, provides relevant information to agency management, prepares and implements contingency plans, leads emergency response, investigates and reports SSOs, and trains field crews.
- Lead Collections Operator – If the Water Reclamation Manager is unable to do so, notifies the Collection Duty Operator when alerted to a potential SSO.
- First Response Wastewater Duty Operator – If after hours notifies the Collection Duty Operator when alerted to a potential SSO.

- Collections Duty Operator - Notifies all other staff members from the Collections and Maintenance Department to assist in the SSO response; assesses the SSO and assigns the response crew job duties in order to eliminate the overflow.

- Planning and Capital Projects Manager– Prepares wastewater collection system planning documents; documents new and rehabilitated assets; and coordinates development and implementation of SSMP.

- Operations and Maintenance Technician - Notifies the Water Reclamation Manager or Lead Collections Operator when alerted to a potential SSO.

- Collections Crew – Staff preventive maintenance activities; mobilizes and responds to notification of stoppages and SSOs (mobilize sewer cleaning equipment, by-pass pumping equipment, and portable generators).

- Collections Crew Leader - If SSO enters a storm drain or catch basin, appoints someone to retrieve a sample or samples from the spill area, whether it is from a creek, catch basin, detention basin, tributary, or street; verifies that the sample is taken to the Santa Rosa Water Reclamation Facility for analysis by outside vendor.

RCWD's chain of communication for reporting SSOs is described in detail in the District's Sanitary Sewer Overflow Response Standard Operating Procedures, prepared by the Collections Department. The purpose of the Sanitary Sewer Overflow Response Standard Operating Procedures is to minimize the impact of SSO's to the public and the environment. All sanitary sewer overflows are responded to in a timely manner to expedite the necessary steps to relieve the overflow. Relieving the sewage blockage and spill containment is the District's highest priority, taking into consideration public health concerns. This response plan is the guideline for the standard operating procedures in the event of a SSO. The response plan is reviewed periodically to ensure that all corrective measures are being taken.

All SSO's are reported as soon as: (1) the District has knowledge of the discharge, (2) reporting is possible, and (3) reporting can be provided without substantially impeding cleanup or other emergency measures. For any discharges of sewage that result in a discharge to a drainage channel or a surface water, the spill shall, as soon as possible but not later than two (2) hours after becoming aware of the discharge, notify the State Office of Emergency Services, the local health officer or directors of environmental health with jurisdiction over affected water bodies, and the San Diego Regional Water Quality Control Board.

As soon as possible, but not later than twenty-four (24) hours after becoming aware of a discharge to a drainage channel or surface water, a certification stating that the State Office of emergency Services and the local health officer or directors of environmental health with jurisdiction over the affected water bodies have been notified shall be submitted to the San Diego Regional Water Quality Control Board.

Initial reporting of SSOs must be reported to the Online SSO System as soon as possible but no later than 3 business days after we are aware of the SSO. Minimum information that must be contained in the 3-day report must include all information identified in *section 9, Monitoring and Reporting Program No. 2006-0003*. A final certified report must be completed through the Online SSO System, within 15 calendar days of the conclusion of SSO response and remediation.

Initial reporting of SSOs that do not discharge to a drainage channel or surface water must be reported to the San Diego Water Quality Control Board within 24 hours after the City becomes aware of the SSO, notification is possible, and notification can be provided without substantially impeding cleanup or other emergency measures. Minimum information that must be contained in the 24-hour report must include all information identified in *section C.2 of R9-2007-0005*.

Section 6 of the Sanitary Sewer Overflow Response Standard Operating Procedures identifies the Santa Rosa Water Reclamation Manager as the responsible or authorized representative of the District, as described in Section J of SWRCB Order No. 2006-0003, and lists his/her name and contact information.

In addition to the District's response plan, the *Sanitary Sewer Overflow Response Standard Operating Procedures*, attached as Appendix D, also addresses the following procedures:

- Procedures for reporting SSOs and notifying the proper authorities, with appropriate contact information.
- A list of agencies, with their appropriate contact information, to be notified in the event of any SSO.
- Procedures to post the proper signs to warn the public of potential contamination hazards.
- Procedures to restore the environment to the condition that existed before the SSO occurred.
- Procedures to document all reported SSOs.

CHAPTER 3. LEGAL AUTHORITY

The District's Legal Authority addresses those mandatory SSMP provisions outlined in Section D, 13 (iii) Legal Authority of SWRCB Order No. 2006-0003.

RCWD will demonstrate, through sanitary sewer system use ordinances, service agreements, or other legally binding procedures, that is possesses the necessary legal authority to:

(1) Prevent illicit discharges into its sanitary sewer system (examples may include I/I, stormwater, chemical dumping, unauthorized debris and cut roots, etc.).

(2) Require that sewers and connections be properly designed and constructed.

(3) Ensure access for maintenance, inspection, or repairs for portions of the lateral owned or maintained by the District.

(4) Limit the discharge of Fats, Oils, and Grease (FOG) and other debris that may cause blockages.

(5) Enforce any violation of its sewer ordinances.

3.1 COMPLIANCE SUMMARY

The District is regulated by several agencies of the United States Government and the State of California, pursuant to the provisions of Federal and State Law. Federal and State Laws (including, but not limited to: 1) Federal Water Pollution Control Act, commonly known as the Clean Water Act (33 U.S.C. Section 1251 et seq); 2) California Porter Cologne Water Quality Act (California Water Code section 13000 et seq.); 3) California Health & Safety Code sections 25100 to 25250; 4) Resource Conservation and Recovery Act of 1976 (42 U.S.C. Section 6901 et seq.); and 5) California Government Code, Sections 54739-54740) grant the District the authority to regulate and/or prohibit, by the adoption of an ordinance, and by issuance of control mechanisms, the discharge of any waste, directly or indirectly, to the District sewerage facilities. Said authority includes the right to establish limits, conditions, and prohibitions; to establish flow rates or prohibit flows discharged to the District sewerage facilities; to require the development of compliance schedules for the installation of equipment systems and materials by all users; and to take all actions necessary to enforce its authority, whether within or outside the District boundaries, including those users that are tributary to the District or within areas for which the District has contracted to provide sewerage services.

Through a series of Ordinances and Resolutions adopted by the Board of Directors, Satellite Community Sewer Use Agreements and internally developed Plans and Requirements, the District possesses the necessary legal authority required by Section D, 13 (iii) Legal Authority of SWRCB Order No. 2006-0003:

(1) The District prevents illicit discharges into its sanitary sewer system (including, but not limited to, I/I, stormwater, chemical dumping, and unauthorized debris) through *Ordinance No. 2002-5-1, Resolution No. 2002-5-1*, their Satellite Community Sewer Use Agreements and their *Enforcement Response Plan*.

(2) The District requires that sewers and connections be properly designed and constructed in their *Rules and Regulations Sewer System Facilities and Service,* their *Sewer System Facility Requirements and Design Guidelines* and their Satellite Community Sewer Use Agreements.

(3) The District ensures access for maintenance, inspection, or repairs for portions of the lateral owned or maintained by the District in their *Rules and Regulations Sewer System Facilities and Service,* their *Sewer System Facility Requirements and Design Guidelines* and their Satellite Community Sewer Use Agreements.

(4) The District limits the discharge of Fats, Oils, and Grease (FOG) and other debris that may cause blockages through *Ordinance No. 2002-5-1, Resolution No. 2002-5-1*, and their Satellite Community Sewer Use Agreements.

(5) The District enforces any violation of its sewer ordinances in accordance with their *Enforcement Response Plan.*

3.2 COMPLIANCE DOCUMENTS

The following documents allow the District to comply with the Legal Authority requirements of the WDR, and are attached as appendices:

- *Ordinance No. 2002-5-1, Regulations for Water Discharge and Sewer Use*, Adopted by the Board of Directors of Rancho California Water District, July 1 2002, Appendix E.
- *Resolution No. 2002-5-1, Local Limit Tables*, Adopted by the Board of Directors of Rancho California Water District, May 16 2002, Appendix F.
- *Rules and Regulations Sewer System Facilities and Service*, Part III, Chapter 1, Section2 of the *Amended Rules and Regulations*, adopted by the Board of Directors of Rancho California Water District, September 14 2006, Appendix G.
- *Sewer System Facility Requirements and Design Guidelines*, Rancho California Water District, Last revised on December 1 2007, Appendix H.
- *Enforcement Response Plan*, Rancho California Water District, Source Control Division, Appendix I.
- Existing Satellite Community Sewer Use Agreements with either the Elsinore Valley Municipal Water District (EVMWD) or the Western Municipal Water District (WMWD), Appendix J:

- Palomar Area Agreement, March 2 2004, EVMWD.
- Palomar Area Agreement Addendum No. 1, July 5 2006, EVMWD.
- Northern California Oaks Area Agreement, March 2 2004, EVMWD.
- California Oaks Agreement, June 22 1988, EVMWD.
- California Oaks Agreement, Addendum No. 1, March 2 2004, EVMWD.
- Murrieta Sewer Service Area Agreement, March 1 1989, WMWD.
- Western Wastewater Service Agreement, Proposed, WMWD.

3.3 DOCUMENT DESCRIPTIONS

Each of the following documents provides a portion of the District's Legal Authority, as required in Section D, 13 (iii) Legal Authority of SWRCB Order No. 2006-0003.

3.3.1 Ord. No 2002-5-1, Regulations for Water Discharge and Sewer Use (Appendix E)

This ordinance, adopted by the Board of Directors on July 1 2002, sets conditions and limitations on the use of the Districts sewer system and sets specific enforcement provisions to resolve noncompliance with the District's ordinance. The provisions of this Ordinance apply to sewer construction, use, maintenance, discharge, deposit, or disposal of wastewater, both directly and indirectly, into and through all District collection systems and to the issuance of control mechanisms and assessment/imposition of fees, fines and penalties thereof. This Ordinance applies to all users of the District's sewer system and specifies herein that all users of the District's sewer system are subject to regulation and enforcement.

Article 3 prevents illicit discharges into the District's sanitary sewer system and limits the discharge of Fats, Oils, and Grease (FOG). Articles 4 and 5 outline the specific control and enforcement mechanisms available to the District.

3.3.2 Resolution No. 2002-5-1, Local Limit Table (Appendix F)

Adopted by the Board of Directors on May 16 2002, this resolution establishes maximum concentration levels of industrial wastewater pollutants, domestic liquid waste, and conventional pollutants and applicable surcharge rates, in accordance with sections 3.300(a) and 3.700(b) of *Ordinance No. 2002-5-1*.

3.3.3 Rules and Regulations Sewer System Facilities and Service (Appendix G)

Part III, Chapter 1, Section 2 of the *Amended Rules and Regulations*, adopted by the Board of Directors on September 14, 2006, describes the following rules and regulations governing the

District's sewer service:

- Arrangement for Sewer Service Connections
- Rules and Regulations Applicable for all Sewer Service Connections
- Arrangements for Public Sewer Connections to the District's Sewer System by Other Public Agencies with which the District has entered into an Interagency Agreement
- Arrangements for District Sewer System Facilities other than Service Connections
- Rules and Regulations Applicable for all Types of District Sewer System Facilities, other than Sewer Service Connections
- Rules and Regulations Applicable for Sewer Service
- Calculations of EDU's for Residential and Commercial/Industrial Developments

Section 3.01 requires that all sewer service connections be installed in accordance with the design criteria presented in the *Sewer System Facility Requirements and Design Guidelines*. Section 6.05 prohibits any tampering, disturbing or interfering with any District sewer facility, creating a violation and fee associated with illegal sewer connections.

3.3.4 Sewer System Facility Requirements and Design Guidelines (Appendix H)

The District's *Sewer System Facility Requirements and Design Guidelines*, last revised December 1 2007, details:

- Procedures for Construction Drawing Approval
- Design Criteria
- Construction Drawing Preparation
- Procedures for Sewer System Facility Construction

Section III and Section V require that sewers and connections be properly designed and constructed, respectively. Section I (C) requires that all sewer facilities must be in either dedicated road right-of-way or in easements granted to the District, thereby ensuring access for maintenance, inspection, or repairs for portions of the lateral owned or maintained by the District.

3.3.5 Enforcement Response Plan (Appendix I)

In the event of non-compliance with *Ordinance No. 2002-5-1*, the *Enforcement Response Plan*, as developed by the Source Control Division, aims to deal with noncompliance in a just, efficient and effective manner. The Source Control Division has outlined the necessary steps to:

- Identify and respond to noncompliance as quickly as possible, in order to minimize impact on the District's collection system
- Document all noncompliance; to include the Source Control Entry Log
- Investigate noncompliance thoroughly and expeditiously
- Ensure that enforcement actions are dictated by the severity of the violation
- Take enforcement action in a timely manner
- Respond to noncompliance in a consistent and objective manner

The *Enforcement Response Plan* addresses the different types of noncompliance and the nature of the violation, as well as the enforcement response tasks for each noncompliance matter. It also includes an Enforcement Matrix which shows the title and action allowed per source control personnel.

3.3.6 Existing Satellite Community Sewer Use Agreements (Appendix J)

Each of the District's Satellite Community Sewer Use Agreements, or successive Addendums, contains detailed obligations for the appropriate satellite community. The sections identified in each Agreement or Addendum pertain to the respective satellite community's obligations, and may include: minimizing I/I and stormwater; delivering Domestic Quality Wastewater to the SRWRF; and/or enforcing all industrial discharge rules related thereto including the requirements of Order No. 2002-5-1:

- Palomar Area Agreement, March 2 2004, EVMWD. (Section 1.8)
- Palomar Area Agreement Addendum No. 1, July 5 2006, EVMWD.
- Northern California Oaks Area Agreement, March 2 2004, EVMWD. (Section 1.10)
- California Oaks Area Agreement, June 22 1988, EVMWD.
- California Oaks Agreement Addendum No. 1, March 2 2004, EVMWD. (Section 1(a) and (b)).
- Murrieta Sewer Service Area Agreement, March 1 1989, WMWD.(Section 1.5)
- Western Wastewater Service Area Agreement, Proposed, WMWD.(Section 2.3)

Currently, the District and the Western Municipal Water District are in the process of drafting the Western Wastewater Service Area Agreement, which specifically acknowledges the wastewater management practices required by State Water Resources Control Board Order No. 2006-0003 and California Regional Water Quality Control Board, Region 9, Order No. R9-2007-0005, including

but not limited to, an appropriate Fats, Oils and Grease Control Program and Overflow Emergency Response Plan, as well as the monitoring, reporting and measurement components required to support these Orders.

CHAPTER 4. OPERATION AND MAINTENANCE PROGRAM

The District's Operating and Maintenance Program addresses those mandatory SSMP provisions outlined in Section D, 13 (iv) Operation and Maintenance Program of SWRCB Order No. 2006-0003.

RCWD's Operation and Maintenance Program encompasses the following components:

(1) An up-to-date map of the sanitary sewer system, showing all gravity line segments and manholes, pumping facilities, pressure pipes and valves, and applicable stormwater conveyance facilities.

(2) Routine preventive operation and maintenance activities by staff, including a system for scheduling regular maintenance and cleaning of the sanitary sewer system with more frequent cleaning and maintenance targeted at known problem areas. The Preventative Maintenance (PM) program includes a system to document scheduled and conducted activities, such as work orders.

(3) A rehabilitation and replacement plan to identify and prioritize system deficiencies and implement short-term and long-term rehabilitation actions to address each deficiency. The program should include regular visual and TV inspections of manholes and sewer pipes, and a system for ranking the condition of sewer pipes and scheduling rehabilitation. Rehabilitation and replacement focuses on sewer pipes that are at risk of collapse or prone to more frequent blockages due to pipe defects. Finally, the rehabilitation and replacement plan includes a capital improvement plan that addresses proper management and protection of the infrastructure assets. The plan includes a time schedule for implementing the short- and long-term plans plus a schedule for developing the funds needed for the capital improvement plan.

(4) Training on a regular basis for staff in sanitary sewer system operations and maintenance.

(5) Equipment and replacement part inventories, including identification of critical replacement parts.

4.1 COMPLIANCE SUMMARY

The District routinely cleans two (2) miles of gravity mains every month, thereby cleaning all gravity mains, at a minimum, of every 3 years. The District cleans problem area gravity mains, as well as all wet wells, quarterly. RCWD's Operation and Maintenance (O&M) Program includes an up-to-date map of the sanitary sewer system, showing all gravity line segments and manholes, pumping facilities, pressure pipes and valves, as well as a map of all gravity main problem areas. The District can obtain pertinent storm system information, including up-to-date maps, via emergency contacts at each applicable City.

The District maintains a log of all cleaning activity by development tract, which details the size, material and location of each pipe cleaned, as well as the equipment utilized, and any relevant remarks observed during the cleaning. The District's also maintains a Computerized Maintenance Management System (CMMS), which utilizes Orion software for preventative maintenance and work orders.

The District completed a system-wide video inspection of the trunk sewer system in 2002, and intends to conduct a system-wide video inspection of all manholes and gravity mains in 2008. Additionally, District Field Staff observe all gravity mains and manholes during routine cleaning, and conduct localized video inspections when their observations warrant such further investigation. The District maintains a log of this continued video inspection in their *Video Inspection Report Log*. During both the system-wide and localized video inspections, each pipe is given a ranking based on the observed overall condition. These rankings, as well as the observed condition of each pipeline, allow the District to identify gravity mains that are at risk of collapse or prone to more frequent blockages due to pipe defects. Such lines are then either monitored, as was done in the recently completed *Fiscal Year 2006/2007 Sewer Flow Monitoring Report*, or placed on the District's *Annual Capital Replacement Program*. The District's *Long-Range Capital Financing Plan*, utilized to fund Capital Improvement and Replacement Programs, describes how the District proposes to continue to pay for these improvements by noting fund balances, funding sources and fund uses, and encompasses both collection and treatment system costs.

District Staff currently participate in the CWEA certification program for collection workers. The District provides on-going in house technical, job skills and safety training for its Staff. The District has been and continues to conduct training of Waste Discharge Requirements (WDR) awareness. The District has also developed an SSO Response Training, and conducts other internal training programs on line cleaning, vactor truck operation, sewer grit removal and dumping, valve repair and replacement pump station operations and maintenance, and other related tasks.

The District maintains a Sewer Response Trailer with all necessary, back-up inventory, including plugs. Furthermore, the District has a back-up pump in its inventory for each lift station.

In summary, the District maintains a Operation and Maintenance Program which meets the requirements of Section D, 13 (iv) Operation and Maintenance Program of SWRCB Order No. 2006-0003:

(1) The District maintains an up-to-date Geographic Information System (GIS) database of their sanitary sewer system, including all gravity line segments and manholes, pumping facilities, pressure pipes and valves. This database was utilized to create a map of the District's wastewater facilities, as presented in Figure 1 of Appendix K, Existing Wastewater Facilities. The District has access to up-to-date storm system maps via each applicable City's emergency contact information as detailed in Section 3 of *Sanitary Sewer Overflow Response Standard Operating Procedures,* attached as Appendix D.

(2) The District routinely cleans two (2) miles of gravity mains every month, thereby cleaning all gravity mains, at a minimum, of every 3 years. The District cleans problem area gravity mains, as well as all wet wells, quarterly. A map of these problem area gravity mains is

presented as Figure 1 of *Appendix L*. The District maintains a log of this cleaning activity by development tract, which details the size, material and location of each pipe cleaned, as well as the equipment utilized. A sample of the District's cleaning activity log is presented in Appendix M. The District's also maintains a Computerized Maintenance Management System (CMMS), which utilizes Orion software for preventative maintenance and work orders.

(3) RCWD completed a system-wide video inspection of the trunk sewer system in 2002, and intends to conduct a system-wide video inspection of all manholes and gravity mains in 2008. A copy of the *2002 Video Inspection and Flow Monitoring Report* is available from the District's Engineering Division. Additionally, District Field Staff observe all gravity mains and manholes during routine cleaning, and conduct localized video inspections when their observations warrant such further investigation. The District maintains a log of this continued video inspection in their *Video Inspection Report Log*, attached as Appendix N. During both the system-wide and localized video inspections, each pipe is given a ranking based on the observed overall condition. These rankings, as well as the observed condition of each pipeline, allow the District to identify gravity mains that are at risk of collapse or prone to more frequent blockages due to pipe defects. Such lines are then either monitored, as was done in the recently completed *Fiscal Year 2006/2007 Sewer Flow Monitoring Report*, or placed on the District's *Annual Capital Replacement Program*, a sample portion of which is attached as Appendix O. In addition to these rehabilitation and replacement projects, identified with a "1" in Appendix O, the *Annual Capital Replacement Program* includes additional repair projects developed by consensus of the collection system operators and other District staff, in order to maintain a high degree of system integrity, as identified with a "2" in Appendix O. Finally, attached as Appendix P, is the District's *Long-Range Capital Financing Plan*, utilized to fund Capital Improvement and Replacement Programs. As shown, the *Long-Range Capital Financing Plan* describes how the District proposes to continue to pay for these improvements by noting fund balances, funding sources and fund uses, and encompasses both collection and treatment system costs.

(4) District Staff currently participates in the CWEA certification program for collection workers. The District provides on-going in house technical, job skills and safety training for its Staff. The District has been and continues to conduct training of Waste Discharge Requirements (WDR) awareness. The District has also developed an SSO Response Training, and conducts other internal training programs on line cleaning, vactor truck operation, sewer grit removal and dumping, valve repair and replacement pump station operations and maintenance, and other related tasks. The District has not encountered a situation or non-compliance event that would cause it to believe that O&M Staff is not appropriately trained.

(5) The District maintains a Sewer Response Trailer with all necessary, back-up parts as inventory, including plugs. Furthermore, the District has a back-up pump in its inventory for each lift station.

4.2 COMPLIANCE DOCUMENTS

The following documents, attached as appendices, support the District's Operation and Maintenance Program, thereby allowing the District to comply with the Operation and Maintenance Program requirements of the WDR:

- A Map of the District's sanitary sewer system, including all gravity line segments and manholes, pumping facilities, pressure pipes and valves, Appendix K.
- Sanitary Sewer Overflow Response Standard Procedures, Rancho California Water District, Last Updated July 2007, Appendix D.
- A Map of the District's problem area gravity mains, Appendix L.
- A sample of the District's *Sewer Cleaning Report*, Rancho California Water District, Source Control Division, Appendix M.
- A sample of the District's *Video Inspection Log*, Rancho California Water District, Source Control Division, Appendix N.
- A sample of the District's *Annual Capital Replacement Program*, Rancho California Water District, Source Control Division, Appendix O.
- The District's *Long-Range Capital Financing Plan,* Rancho California Water District, Source Control Division, Appendix P.

Additionally, the following documents also support the District's Operation and Maintenance Program, and are available from the District's Engineering Division. Due to the size of these documents, they have not been attached as appendices.

- *2002 Video Inspection and Flow Monitoring Report*, prepared for the District by Kennedy/Jenks Consultants and submitted on February 13, 2002.
- *Fiscal Year 2006/2007 Sewer Flow Monitoring*, prepared for the District by ADS Environmental Services.

4.3 *DOCUMENT DESCRIPTIONS*

A description for each compliance document listed above is described below:

4.3.1 Map of Existing Wastewater Facilities, (Appendix K)

The District maintains an up-to-date Geographic Information System (GIS) database of their sanitary sewer system, including all gravity line segments and manholes, pumping facilities, pressure pipes and valves. This database was utilized to create this map of the District's wastewater facilities.

4.3.2 Sanitary Sewer Overflow Response Standard Procedures (Appendix D)

RCWD can obtain up-to-date storm system maps from each applicable City's emergency contact, with names, titles and phone numbers presented in Section 3.

4.3.3 Map of Sewer System Problem Areas (Appendix L)

A Map illustrating the location of the District's sewer system problem areas for Fats, Oils and Grease and/or Heavy Grit.

4.3.4 Sewer Cleaning Report- Sample (Appendix M)

The District maintains a log of all cleaning activity by development tract, which details the size, material and location of each pipe cleaned, as well as the equipment utilized, and any relevant remarks observed during the cleaning. The District routinely cleans two (2) miles of gravity mains every month, thereby cleaning all gravity mains, at a minimum, of every 3 years. The District cleans problem area gravity mains, as well as all wet wells, quarterly.

4.3.5 Video Inspection Report Log-Sample, (Appendix N)

District Field Staff observe all gravity mains and pipes during routine cleaning, and conduct localized video inspections when their observations warrant such further investigation. The results of these video inspections are recorded in the *Video Inspection Report Log*.

4.3.6 Annual Capital Replacement Program (Appendix O)

Developed annually by the District, the program includes rehabilitation and replacement projects, as wells as repair projects developed by a consciences of the collection system operators and other District staff, in order to maintain a high degree of system integrity.

4.3.7 Long-Range Capital Financing (Appendix P)

Developed by the District, this document describes how the District proposes to continue to pay for the Capital Replacement and Improvement Programs, by noting fund balances, funding sources and fund uses, and encompasses both collection and treatment system costs.

4.3.8 2002 Video Inspection and Flow Monitoring Report, (Engineering Division)

Prepared for the District by Kennedy/Jenks Consultants and submitted on February 13, 2002, this system-wide video inspection of all gravity mains and manholes, identified gravity mains at risk of

collapse or prone to more frequent blockages due to pipe defects. The results of these video inspections were utilized in determining the locations of the sewer flow monitors, also included in the report.

4.3.9 Fiscal Year 2006/2007 Sewer Flow Monitoring, (Engineering Division)

The District recently completed a flow monitoring study of all gravity mains suspected of hydraulic limitations.

CHAPTER 5. DESIGN AND PERFORMANCE PROVISIONS

The District's Design and Performance Provisions addresses those mandatory SSMP provisions outlined in Section D, 13 (v) Design and Performance Provisions of SWRCB Order No. 2006-0003.

RCWD's Design and Performance Provisions encompass the following components:

(1) Design and construction standards and specifications for the installation of new sanitary sewer systems, pump stations and other appurtenances; and for the rehabilitation and repair of existing sanitary sewer systems.

(2) Procedures and standards for inspecting and testing the installation of new sewers, pumps and other appurtenances and for rehabilitation and repair projects.

5.1 COMPLIANCE SUMMARY

The District requires that all new sanitary sewer systems, pump stations and other appurtenances, as well as the rehabilitation and repair of existing sewer facilities, be designed and constructed in accordance with the District's *Sewer System Standard Drawings*, *Division 15 of Technical Provisions of the District's Standard Specifications and Standard Drawings for Water and Sanitary Sewer Facilities* and their *Sewer System Facility Requirements and Design Guidelines*. The *Sewer System Facility Requirements and Design Guidelines* also clearly outline the procedures for construction drawing preparation and approval. Procedures and standards for inspecting and testing the installation of new sewers, pumps and other appurtenances and for rehabilitation and repair projects are outlined in the District's *Division 15 of Technical Provisions of the District's Standard Specifications and Standard Drawings for Water and Sanitary Sewer Facilities.*

The District maintains Design and Performance Provisions which meet the requirements of Section D, 13 (v) Design and Performance Provisions of SWRCB Order No. 2006-0003:

(1) The District's *Sewer System Facility Requirements and Design Guidelines*, *Sewer System Standard Drawings* and *Division 15 of Technical Provisions of the District's Standard Specifications and Standard Drawings for Water and Sanitary Sewer Facilities* contain design and construction standards and specifications for the installation of new sanitary sewer systems, pump stations and other appurtenances, and for the rehabilitation and repair of existing sanitary sewer infrastructure. The *Sewer System Facility Requirements and Design Guidelines* also outline the procedures for construction drawing preparation and approval. As per Section I.C.5. of these requirements, the District will review all drawings, and may revise, modify, or require redesign of any concepts, drawings, or details submitted. All concepts and drawings must be approved by the District's Development Engineering Manager and Assistant General Manager of Engineering and Operations.

(2) The District's *Division 15 of Technical Provisions of the District's Standard Specifications and Standard Drawings for Water and Sanitary Sewer Facilities* contains procedures and standards

for inspecting and testing the installation of new sewers, pumps and other appurtenances and for rehabilitation and repair projects.

5.2 COMPLIANCE DOCUMENTS

The following documents, attached as appendices, support the District's Design and Performance Provisions, thereby allowing the District to comply with the Design and Performance Provisions requirements of the WDR:

- *Sewer System Facility Requirements and Design Guidelines*, Rancho California Water District, Last revised on December 1 2007, Appendix H.
- *Sewer System Standard Drawings*, Rancho California Water District, Appendix Q.
- *Division 15 of Technical Provisions of the District's Standard Specifications and Standard Drawings for Water and Sanitary Sewer Facilities*, Rancho California Water District, Appendix A.

5.3 DOCUMENT DESCRIPTIONS

A description for each compliance document listed above is described below:

5.3.1 Sewer System Facility Requirements and Design Guidelines (Appendix H)

The District's *Sewer System Facility Requirements and Design Guidelines*, last revised December 1 2007, detail:

- Procedures for Construction Drawing Approval
- Design Criteria
- Construction Drawing Preparation
- Procedures for Sewer System Facility Construction

Section III and Section V require that sewers and connections be properly designed and constructed, respectively. Per Section I.C.5, the District will review all drawings, and may revise, modify, or require redesign of any concepts, drawings, or details submitted. All concepts and drawings must be approved by the District's Development Engineering Manager and Director of Engineering.

5.3.2 Sewer System Standard Drawings (Appendix Q)

These drawings include the District's *Sewer System Standard Drawings* for:

- Pipe Zone Bedding and Trench Backfill

- Concrete Caps and Encasement
- Sewer Connection at Concrete Encasement
- Sewer Lateral Normal Cut
- Sewer Lateral Deep Cut
- Sewer Lateral V.C.P. Saddle Connection
- Sewer Lateral Plastic Pipe Saddle Connection
- Connecting Dissimilar Sewer Pipes
- Residential Cleanout
- Sewer Chimney Lateral
- Sewer Tree Laterals & Cleanouts
- Pre-Case Reinforced Eccentric Concrete Manhole
- Terminus Manhole with House Laterals
- Manhole Cover & Frame
- 36" – 2 Piece Manhole Cover & Frame Standard & Watertight
- Paving Detail Around Manholes
- Manhole Cover and Frame – Locking Type –
- Sewer Clean-Out
- 36" LD. Sampling Manhole
- Drop Manhole
- Typical Metering Manhole
- Metering M.H. Telemetry
- Pipe Casing Sewer Main
- Sewer Main Crossing Existing Water

- Sand/Oil Separator
- Sample Box #1 (Industrial)
- Sample Box #2 (Commercial)
- Grease Interceptor
- Sampling Wye
- Sewage Backflow Assembly

5.3.3 Division 15 of Technical Provisions of the District's Standard Specifications and Standard Drawings for Water and Sanitary Sewer Facilities (Appendix R)

The District's *Division 15 of Technical Provisions of the District's Standard Specifications and Standard Drawings for Water and Sanitary Sewer Facilities* requires contractors to perform all operations necessary to construct sewer mains and appurtenances as specified within the provisions, and as shown on the District's *Sewer System Standard Drawings*. Specific sewer specifications are outlined in the following sections:

- Scope
- Excavation
- Bedding
- Bedding and Backfill
- Vitrified Clay Pipe (V.C.P) Sewer Pipe
- Installation
- Manholes and Appurtenances
- Laterals
- Force Mains
- Testing Sewer for Leakage and Visual Inspection
- Inspection and Pipeline Interior
- Pipe Repair and Replacement
- Conductor Casings and Carrier Pipes

- Polyvinyl Chloride (PVC) Sewer Pipe

- Special Rules and Regulations Applicable for Certain Sewer Connections

Section 15.10 (Testing Sewer for Leakage and Visual Inspection) includes general testing procedures, as well as specific guidance in performing leakage, water exfiltration and air pressure tests. Section 15.11 (Inspection of Pipeline Interior) details specific inspection procedures for sewer lines 24-inch and larger, while Section 15.14 (Polyvinyl Chloride (PVC) Sewer Pipe) includes specific testing requirement for PVC sewer line, including air and deflection (Mandrel) tests.

CHAPTER 6. OVERFLOW EMERGENCY RESPONSE PLAN

The District's Overflow Emergency Response Plan addresses those mandatory SSMP provisions outlined in Section D, 13 (vi) Overflow Emergency Response Plan of SWRCB Order No. 2006-0003.

The District has developed and implemented an overflow emergency response plan that identifies measures to protect public health and the environment, thereby satisfying Section D, 13 (vi) Overflow Emergency Response Plan of SWRCB Order No. 2006-0003 by including:

(1) Proper notification procedures so that primary responders and regulatory agencies are informed of all SSOs in a timely manner;

(2) A program to ensure an appropriate response to all overflows;

(3) Procedures which ensure prompt notification to appropriate regulatory agencies and other potentially affected entities (e.g. health agencies, Regional Water Boards, water suppliers, etc.) of all SSOs that potentially affect public health or reach the waters of the State in accordance with the Monitoring and Reporting Program (MRP). All SSOs shall be reported in accordance with this MRP, the California Water Code, other State Law, and other applicable Regional Water Boards WDR's or National Pollution Discharge Elimination System (NPDES) permit requirements. The SSMP should identify the officials who will receive immediate notification;

(4) Procedures to ensure that appropriate staff and contractor personnel are aware of and follow the Emergency Response Plan and are appropriately trained;

(5) Procedures to address emergency operations, such as traffic and crowd control and other necessary response activities; and

(6) A program to ensure that all reasonable steps are taken to contain and prevent the discharge of untreated and partially treated wastewater to waters of the United States and to minimize or correct any adverse impact on the environment resulting from the SSOs, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the discharge.

The District's Overflow Emergency Response Plan complies with the additional notification requirements outlined in SWRCB Order No. WQ-2008-0002-EXEC:

(1) For any discharges of sewage that results in a discharge to a drainage channel or a surface water, the District shall, as soon as possible, but not later then two (2) hours after becoming aware of the discharge, notify the State Office of Emergency Services, the local health officer or directors of environmental health with jurisdiction over affected water bodies, and the San Diego Regional Water Quality Control Board.

(2) As soon as possible, but no later then twenty-four (24) hours after becoming aware of a discharge to a drainage channel or a surface water, the District shall submit to the San Diego Regional Water Quality Control Board a certification that the State Office of Emergency Services and the local health officer or directors of environmental health with jurisdiction over the affected water bodies have been notified of the discharge.

The District's Overflow Emergency Response Plan also complies with the additional monitoring and reporting requirements outlined in Order No. R9-2007-0005, as adopted by the San Diego Regional Water Quality Control Board:

(1) RCWD shall report all SSOs in accordance with the Monitoring and Reporting Program No. 96-04 until RCWD notifies the Regional Board that they can successfully report the SSOs to the State Board Online SSO System. The notification shall be a letter signed and certified by a person designated, for a municipality, state, federal or other public agency, as either a principle executive officer of ranking elected official.

(2) For Category 1 (as defined in State Board Monitoring and Reporting Program No. 2006-0003-DWQ) SSOs, RCWD shall provide notification of the SSO to the Regional Board by phone, email, or fax within 24 hours after the District becomes aware of the SSO, notification is possible, and notification can be provided without substantially impeding cleanup or other emergency measures. The information reported to the Regional Board shall include the name and phone number of the person reporting the SSO, the responsible sewage collection agency, the estimated total sewer overflow volume, the location of the SSO, the receiving water (if any), the start date/time of the SSO (or whether or not the sewer overflow is still occurring at the time of the report), and confirmation that the local health services agency was or will be notified as required under the reporting requirements of the local health services agency.

(3) The District shall provide notification of all Private Lateral Sewage Discharges (as defined in the State Board Order), for which they become aware of, that equal or exceed 1,000 gallons; result in a discharge to a drainage channel and/or surface water; and/or discharge to a storm drainpipe that was not fully captured and returned to the sanitary sewer system, to the Regional Board by phone or fax within 24 hours after RCWD becomes aware of the Private Lateral Sewage Discharge, notification is possible, and notification can be provided without substantially impeding cleanup or other emergency measures. The information reported to the Regional Board shall include the following information, if known: the name and phone number of the person reporting the Private Lateral Sewage Discharge, the service area where the Private Lateral Sewage Discharge occurred, the responsible party (other than RCWD, if known), the estimated Private Lateral Sewage Discharge volume, the location of the Private Lateral Sewage Discharge, the receiving water (if any), the start date/time of the Private Lateral Sewage Discharge (or whether or not the sewer overflow is still occurring at the time of the report), and confirmation that the local health services agency was or will be notified as required under the reporting requirements of the local health services agency.

(4) The following requirement supersedes the Private Lateral Sewage Discharge Reporting Timeframe for Private Lateral Sewage Discharge in the State Board Monitoring and Reporting Program No. 2006-0003-DWQ: For Private Lateral Sewage Discharges that occur within RCWD's service area and that the District becomes aware of, RCWD shall report the Private Lateral Sewage Discharge to the State Board Online SSO Database within 30 days after the end of the calendar month in which the Lateral Sewage Discharge occurs. The District must identify the sewage discharge as occurring and caused by a private lateral, and responsible party (other than RCWD) should be identified, if known. RCWD will not be responsible for the cause, cleanup, or repair of Private Lateral Sewage Discharges, but only the reporting of those within their jurisdiction and for which they become aware of.

6.1 COMPLIANCE SUMMARY

RCWD has outlined specific measures to protect public health and the environment in their *Sanitary Sewer Overflow Response Standard Operating Procedures* (Appendix D). These procedures contain a plan for responding and reporting to SSOs which includes, but is not limited to, the following:

- Descriptions, responsibilities and authorities for each management, administrative and maintenance position responsible for responding to and reporting an SSO.
- Procedures for receiving SSO notification and immediately notifying first responders of the SSO.
- Procedures to rapidly mobilize, diagnose, contain, report on, and relieve the cause of SSOs.
- Procedures to provide emergency operations, such as traffic control, in the event of an SSO.
- Procedures for reporting all SSOs, including those originating from private laterals, and notifying the proper authorities, with appropriate contact information.
- A list of agencies, with their appropriate contact information, to be notified in the event of any SSO.
- Procedures to post the proper signs to warn the public of potential contamination hazards.
- Procedures to restore the environment to the condition that existed before the SSO occurred.

The District conducts internal training sessions to ensure familiarity with these procedures and prepare staff for an SSO event, from initial notification to SSO report documentation, including any necessary emergency activities, such as traffic control.

Through these documents and programs, the District has developed and implemented an overflow emergency response plan that identifies measures to protect public health and the environment, thereby satisfying Section D, 13 (vi) Overflow Emergency Response Plan of SWRCB Order No. 2006-0003:

(1) Section 6 of the District's *Sanitary Sewer Overflow Response Standard Operating Procedures* outlines the proper SSO notification procedures, thereby ensuring that primary responders and regulatory agencies are informed of all SSOs in a timely manner;

(2) Section 2 of the District's *Sanitary Sewer Overflow Response Standard Operating Procedures* contains a program to ensure an appropriate response to all overflows;

(3) Section 6 of the District's *Sanitary Sewer Overflow Response Standard Operating Procedures* outlines the procedures which ensure prompt notification to appropriate regulatory agencies and other potentially affected entities of all SSOs that potentially affect public health or reach the waters of the State in accordance with the Monitoring and Reporting Program (MRP). In addition to the SWRCB Online reporting system, agencies to be notified include the Office of Emergency Service, San Diego Regional Water Quality Board, City of Murrieta, City of Temecula, San Diego State Health Department, and the Riverside County Health Department. Section 6 also identifies the officials who will receive immediate notification;

(4) The District conducts internal training sessions to ensure familiarity with these procedures and prepare staff and contractor personnel for an SSO event, from initial notification to SSO report documentation, including any necessary emergency activities, such as traffic control;

(5) Procedures to address emergency operations, such as traffic and crowd control and other necessary response activities, are addressed in Sections 3 and 7 of the District's *Sanitary Sewer Overflow Response Standard Operating Procedures* ; and

(6) Sections 5 and 8 of the District's *Sanitary Sewer Overflow Response Standard Operating Procedures* ensure that all reasonable steps are taken to contain and prevent the discharge of untreated and partially treated wastewater to waters of the United States and to minimize or correct any adverse impact on the environment resulting from the SSOs.

Provisions of the District's Overflow Emergency Response Plan, that comply with SWRCB Order No. WQ 2008-0002-EXEC, are contained in Section 6 of the District's *Sanitary Sewer Overflow Response Standard Operating Procedures*:

(1) In the event of a sewage discharge that results in a discharge to a drainage channel or a surface water, the Ditrict shall, as soon as possible, but not later then two (2) hours after becoming aware of the discharge, notify the State Office of Emergency Services, the local health officer or directors of environmental health with jurisdiction over affected water bodies, and the San Diego Regional Water Quality Control Board.

(2) As soon as possible, but no later then twenty-four (24) hours after becoming aware of a discharge to a drainage channel or a surface water, the District shall submit to the San Diego Regional Water Quality Control Board a certification that the State Office of Emergency Services and the local health officer or directors of environmental health with jurisdiction over the affected water bodies have been notified of the discharge.

Provisions of the District's Overflow Emergency Response Plan also comply with San Diego Regional Water Quality Control Board Order No. R9-2007-0005:

(1) RCWD has notified the San Diego Regional Water Quality Control Board that they can successfully report SSOs to the State Board Online SSO System. The notification was in the form of a letter signed and certified by the Santa Rosa Water Reclamation Manager. Accordingly, RCWD will report future SSOs in accordance with R9-2007-0005, and not under the Monitoring and Reporting Program No. 96-04.

(2) In the event of a SSO, RCWD provides notification of the SSO to the Regional Board by phone, email, or fax within 24 hours after the District becomes aware of the SSO, notification is possible, and notification can be provided without substantially impeding cleanup or other emergency measures.

(3) In the event of a private lateral sewer discharge, RCWD provides notification of the discharge to the Regional Board by phone, email, or fax within 24 hours after the District becomes aware of the SSO, notification is possible, and notification can be provided without substantially impeding cleanup or other emergency measures.

(4) In the event of a private lateral sewer discharge, RCWD reports the discharge to the State Board Online SSO Database within 30 days after the end of the calendar month in which the Lateral Sewage Discharge occurs. The District identifies the sewage discharge as occurring and caused by a private lateral, and the responsible party (other than the District) is identified, if known.

6.2 COMPLIANCE DOCUMENTS

The following documents allow the District to comply with the overflow and emergency response plan requirements of the WDR, and are attached as appendices.

- Sanitary Sewer Overflow Response Standard Procedures, Rancho California Water District, Last Updated July 2007, Appendix D.

6.3 DOCUMENT DESCRIPTIONS

A description for each compliance document listed above is described below:

6.3.1 Sanitary Sewer Overflow Response Standard Procedures (Appendix D)

RCWD maintains a plan for responding and reporting to SSOs in their *Sanitary Sewer Overflow Response Standard Operating Procedures.* The purpose of these procedures is to minimize the impact of SSO's to the public and the environment. This response plan is a guideline for the standard operating procedures in the event of a SSO, and is reviewed periodically by the Santa Rosa Water Reclamation Manager. The plan includes the following contents:

- Purpose of Plan
- Spill Response
- Emergency Traffic Control
- Bypass
- Containment
- Reporting and Notification
- Sign Posting
- Restoration
- Documentation

Specifically, the *Sanitary Sewer Overflow Response Standard Operating Procedures* addresses the following:

6.3.1.1 Spill Response

Includes the procedures for receiving SSO notification and immediately notifying first responders of the SSO. For a potential Sanitary Sewer Overflow during working hours, the Operations and Maintenance Technician is notified. Additionally, the Operations and Maintenance Technician will notify the Water Reclamation Manager or Lead Collections Operator. During after hours, the First Response Duty Operator will notify the Collections Duty Operator of a potential sanitary sewer overflow. Also, the Collections Duty Operator will notify all other staff members from the Collections and Maintenance Department to assist in the spill response.

6.3.1.2 Emergency Traffic Control

Includes the procedures to provide emergency traffic control activities in the event of an SSO. The Lead Collections Operator will utilize assistance from the Districts' Construction Crew in the event that the spill is located in a high traffic area. Additionally, if the construction crew is being utilized at that particular time, then the City of Temecula and Murrieta Maintenance Superintendent will be notified for assistance.

6.3.1.3 Bypass

Includes the procedures to rapidly contain a SSO in the event of a potential blockage that is not relieved within the first 20 minutes. In such an instance, the nearest manhole will be located that can accept the additional flow. Additionally, either a 3-in or 6-in pump will be used for the collection lines. All discharge pump hoses will be secured or placed far enough into the manhole to avoid the hose from coming out and protected from traffic by barricades.

6.3.1.4 Containment

Includes the procedures to rapidly mobilize, diagnose, contain, and relieve the cause of SSO's. The Collection Crew will make every effort to keep the SSO in as small an area as possible, and in the streets away from storm drains.

6.3.1.5 Reporting and Notification

Includes the procedures for reporting SSOs and notifying the proper authorities, with appropriate contact information, as well as the list of agencies, with their appropriate contact information, to be notified in the event of any SSO. All SSOs will be reported as soon as the District has knowledge of the discharge and as soon as reporting is possible. Additionally, reporting can be provided without substantially impeding cleanup or other emergency measures. During working hours, reporting will be made by contacting the Santa Rosa Water Reclamation Manager or by any of the personnel from the Collections and Maintenance Department, as listed in Section 6.1 of this document.

6.3.1.6 Sign Posting

Includes the procedures to post proper signs to warn the public of potential contamination hazards. Posting of contamination signs will be done in all cases whether there is standing water or the ground is saturated. Signs will be placed in locations with high visibility so they can be seen from all routes that the public might take to enter an area.

6.3.1.7 Restoration

Emphasizes that every effort will be made to restore the environment to the condition that existed before the SSO occurred, and outlines corresponding procedures.

6.3.1.8 Documentation

Includes the District's documentation requirements in the event of an SSO, including: the beginning and ending time of the SSO spill, location, and cause; did the SSO reach surface waters or a storm drain; the total gallons of SSO spilled and recovered; any damage that was caused and any repairs that were made because of the SSO; and photos of the affected area.

6.3.1.9 Training

The District has been and continues to conduct training on WDR awareness, in order to prepare staff for an SSO event, from initial notification to SSO report documentation, including any necessary emergency activities, such as traffic control. This internal training is managed and documented by the Collections Division.

CHAPTER 7. FATS, OILS AND GREASE (FOG) CONTROL PROGRAM

The District's Fats, Oils and Grease Control Program addresses those mandatory SSMP provisions outlined in Section D, 13 (vii) FOG Control Program of SWRCB Order No. 2006-0003.

RCWD's FOG Control Program helps reduce the amount of Fats, Oils and Grease discharged to the sanitary sewer system, by including:

(1) A plan and schedule for the disposal of FOG generated within the sanitary sewer system service area, and a list of acceptable disposal facilities.

(2) Legal authority to prohibit discharges to the system and identify measures to prevent SSOs and blockages caused by FOG.

(3) Requirements to install grease removal devices, design standards for the removal devices, maintenance requirements, BMP requirements, record keeping and reporting requirements.

(4) Authority to inspect grease producing facilities, enforcement authorities, and sufficient staff to inspect and enforce the FOG ordinance.

(5) Identification of sanitary sewer system sections subject to FOG blockages and establishment of a cleaning maintenance schedule for each section.

(6) Development and implementation of source control measures for all sources of FOG discharged to the sanitary sewer system for each section identified.

(7) Implementation of a plan and schedule for a public education outreach program that promotes proper disposal of FOG.

7.1 COMPLIANCE SUMMARY

To reduce the amount of Fats, Oils and Grease discharged to RCWD's sanitary sewer system, the District has developed a FOG Control Program. The District identifies all food preparation and service locations within their service area as part of their monitoring and surveillance program, as per *Ordinance No. 2002-5-1*. Accordingly, these customers must complete a Waste Discharge Application in order to receive sewer service, as do all potential Categorical Industrial Users and Significant Industrial Users. This application includes an interceptor sizing component and an Interceptor Maintenance Plan, which includes the District's maintenance requirements, BMP requirements, record keeping and reporting requirements. A list of all such customers is maintained by the District in their Interceptor Equipment Listing. Currently there are no Significant Industrial Users, and only 3 Permitted Non-Discharging Categorical Industrial Users.

All interceptors on the Interceptor Equipment Listing are inspected between two to four times a year by the District's Source Control Division, with quarterly inspections for those interceptors tributary to sections of the sanitary sewer system subject to high levels of FOG. Each inspection is logged in the District's Source Control Entry Log, with the results of each inspection recorded in

the District's Interceptor Maintenance Plan Log Sheet. The District maintains standard drawings for both a sand/oil separator and a grease interceptor, and there are several independent vendors which will collect and dispose of accumulated FOG.

The District has identified the sections of their sanitary sewer system subject to high levels of FOG, and has developed an Operation and Maintenance Program which includes a quarterly cleaning schedule for each of these sections, which has prevented any SSOs due to FOG from previously occurring. In summary, the District maintains a FOG Control which meets the requirements of Section D, 13 (vii) FOG Control Program of SWRCB Order No. 2006-0003:

(1) The District maintains a plan and schedule for the disposal of FOG generated within their sanitary sewer system service area in the District's *Interceptor Maintenance Plan* and *Source Control Log.* The District has provided a list of independent vendors which can provide collection and disposal services within their service area.

(2) The District possesses the legal authority to prohibit discharges to the system and identify measures to prevent SSOs and blockages caused by FOG through *Ordinance No. 2002-5-1, Resolution No. 2002-5-1*, and their Satellite Community Sewer Use Agreements.

(3) The District's requirements to install grease removal devices are discussed in *Ordinance No. 2002-5-1,* their *Rules and Regulations Sewer System Facilities and Service,* their *Sewer System Facility Requirements and Design Guidelines,* their *Waste Discharge Permit Application* and their *Interceptor Sizing* criteria. The District has standard drawings for both sand/oil separators and grease interceptors, as well as the appropriate, accompanying sample boxes. The District's maintenance requirements, BMP requirements, record keeping and reporting requirements for each of these removal devices is contained in their *Interceptor Maintenance Plan.*

(4) The District has authority to inspect grease producing facilities through *Ordinance No. 2002-5-1* and their *Rules and Regulations Sewer System Facilities and Service*, and enforces any violation of its sewer ordinances in accordance with their *Enforcement Response Plan.* The District has sufficient staff to provide inspections of each removal device in their service area between two to four times a year.

(5) The District has identified sections of their sanitary sewer system subject to high levels of FOG in their Sewer Line Problem Areas. Accordingly, the District's Operation and Maintenance Program includes a quarterly cleaning schedule for each of these sections, which has prevented any SSOs due to FOG from previously occurring.

(6) The District has developed and implemented source control measures for all sources of FOG discharged to the sanitary sewer system for each section identified in their Sewer Line Problem Areas by adopting *Ordinance No. 2002-5-1.*

(7) District Staff from the Source Control Division meet with each interceptor owner as required, as listed and documented in the *Source Control Log,* to allow for discussion regarding the District's FOG Control Program. The District has developed formal

literature to be disseminated during these meetings. Additional, the District has developed a FOG Mailer, to be included annually in all customer's monthly bills, and has posted this Mailer on their web site, www.ranchowater.com.

7.2 COMPLIANCE DOCUMENTS

The following documents, attached as appendices, support the District's FOG Control Program, thereby allowing the District to comply with the FOG Control Program requirements of the Statewide General Waste Discharge Requirements (WDR):

- *Ordinance No. 2002-5-1, Regulations for Water Discharge and Sewer Use*, Adopted by the Board of Directors of Rancho California Water District, July 1 2002, Appendix E.
- *Resolution No. 2002-5-1, Local Limit Tables*, Adopted by the Board of Directors of Rancho California Water District, May 16 2002, Appendix F.
- *Rules and Regulations Sewer System Facilities and Service*, Part III, Chapter 1, Section2 of the *Amended Rules and Regulations*, adopted by the Board of Directors of Rancho California Water District, September 14 2006, Appendix G.
- *Sewer System Facility Requirements and Design Guidelines*, Rancho California Water District, Last revised on December 1 2007, Appendix H.
- *Enforcement Response Plan*, Rancho California Water District, Source Control Division, Appendix I.
- Existing Satellite Community Sewer Use Agreements with either the Elsinore Valley Municipal Water District (EVMWD) or the Western Municipal Water District (WMWD), Appendix J:
  - Palomar Area Agreement, March 2 2004, EVMWD.
  - Palomar Area Agreement, Addendum No. 1, July 5 2006, EVMWD.
  - Northern California Oaks Area Agreement, March 2 2004, EVMWD.
  - California Oaks Agreement, June 22 1988, EVMWD.
  - California Oaks Agreement, Addendum No. 1, March 2 2004, EVMWD.
  - Murrieta Sewer Service Area Agreement, March 1 1989, WMWD.
  - Western Wastewater Service Area Agreement, Proposed, WMWD.
- *Sewer System Standard Drawings*, Rancho California Water District, Appendix Q.

- A Collection of Applications, Plans, Logs and Lists, developed by the District's Source Control Division, which support the FOG Control Program, Appendix S:
    - Waste Discharge Application
    - Interceptor Sizing Form
    - Interceptor Maintenance Plan
    - Source Control Entry Log
    - Interceptor Equipment Listing
    - Sewer Line Problem Areas
    - Partial List of Independent vendors which can provide collection and disposal services within the District's service area
- *Fat-Free Sewers (A Public Outreach Program for FOG Control Program),* Appendix T

7.3 DOCUMENT DESCRIPTION

A description for each compliance document listed above is described below:

7.3.1 Ord. No. 2002-5-1, Regulations for Water Discharge and Sewer Use (Appendix E)

This ordinance, adopted by the Board of Directors on May 16 2002 and effective July 1 2002, sets conditions and limitations on the use of the Districts sewer system and sets specific enforcement provisions to resolve noncompliance with the District's ordinance. The provisions of this Ordinance apply to sewer construction, use, maintenance, discharge, deposit, or disposal of wastewater, both directly and indirectly, into and through all District collection systems. Furthermore, these provisions apply to the issuance of control mechanisms and assessment/imposition of fees, fines and penalties thereof. This Ordinance applies to all users of the District's sewer system and specifies herein that all users of the District's sewer system are subject to regulation and enforcement.

As adopted by the Board of Directors, Article 3 prohibits discharges to the system in accordance with the local limits set in *Resolution No. 2002-5-1*. Article 4 outlines the specific control mechanisms utilized by the District, including Waste Discharge Permit Application requirements for potential Categorical Industrial Users or Significant Industrial Users.

7.3.2 Resolution No. 2002-5-1, Local Limit Tables (Appendix F)

Adopted by the Board of Directors on May 16 2002 and effective July 1 2002, this resolution establishes maximum concentration levels of industrial wastewater pollutants, domestic liquid

waste, and conventional pollutants and applicable surcharge rates, in accordance with sections 3.300(a) and 3.700(b) of *Ordinance No. 2002-5-1*. Table 1 includes local limits for Oil and Grease at all District Facilities.

7.3.3 Rules and Regulations Sewer System Facilities and Service (Appendix G)

Part III, Chapter 1, Section 2 of the *Amended Rules and Regulations*, adopted by the Board of Directors on September 14 2006, describes the following rules and regulations governing the District's sewer service:

- Arrangement for Sewer Service Connections
- Rules and Regulations Applicable for all Sewer Service Connections
- Arrangements for Public Sewer Connections to the District's Sewer System by Other Public Agencies with which the District has entered into an Interagency Agreement
- Arrangements for District Sewer System Facilities other than Service Connections
- Rules and Regulations Applicable for all Types of District Sewer System Facilities, other than Sewer Service Connections
- Rules and Regulations Applicable for Sewer Service
- Calculations of EDU's for Residential and Commercial/Industrial Developments

Section 3.01 requires that all sewer service connections be installed in accordance with the design criteria and specifications, including the District's *Standard Drawings*. This section also articulates the District's rights of inspection, approval and acceptance of all new sewer service connections.

7.3.4 Sewer System Facility Requirements and Design Guidelines (Appendix H)

The District's *Sewer System Facility Requirements and Design Guidelines*, last revised December 1 2007, details:

- Procedures for Construction Drawing Approval
- Design Criteria
- Construction Drawing Preparation
- Procedures for Sewer System Facility Construction

Section III and Section V require that sewers and connections be properly designed and constructed, respectively. Section I (C) specifies that the District will review all drawings, and that all drawings must be approved by the District's Development Engineering Manager and Assistant

General Manager of Engineering and Operations.

7.3.5 Enforcement Response Plan (Appendix I)

In the event of non-compliance with *Ordinance No. 2002-5-1*, the *Enforcement Response Plan*, as developed by the Source Control Division, aims to deal with noncompliance in a just, efficient and effective manner. The Source Control Division has outlined the necessary steps to:

- Identify and respond to noncompliance as quickly as possible, in order to minimize impact on the District's collection system
- Document all noncompliance; to include the Source Control Entry Log
- Investigate noncompliance thoroughly and expeditiously
- Ensure that enforcement actions are dictated by the severity of the violation
- Take enforcement action in a timely manner
- Respond to noncompliance in a consistent and objective manner

The *Enforcement Response Plan* addresses the different types of noncompliance and the nature of the violation, as well as the enforcement response tasks for each noncompliance matter. It also includes an Enforcement Matrix which shows the title and action allowed per source control personnel.

7.3.6 Existing Satellite Community Sewer Use Agreements (Appendix J)

Each of the District's Satellite Community Sewer Use Agreements, or successive Addendums, contains detailed obligations for the appropriate satellite community. The sections identified in each Agreement or Addendum pertain to the respective satellite community's obligations, and may include: delivering Domestic Quality Wastewater to the SRWRF; and/or enforcing all industrial discharge rules related thereto including the requirements of Order No. 2002-5-1:

- Palomar Area Agreement, March 2 2004, EVMWD. (Section 1.8)
- Palomar Area Agreement, Addendum No. 1, July 5 2006, EVMWD.
- Northern California Oaks Area Agreement, March 2 2004, EVMWD. (Section 1.10)
- California Oaks Agreement, June 22 1988, EVMWD.
- California Oaks Agreement, Addendum No. 1, March 2 2004, EVMWD. (Section 1(a) and (b)).
- Murrieta Sewer Service Area Agreement, March 1 1989, WMWD.(Section 1.5)

- Western Wastewater Service Area Agreement, Proposed, WMWD.(Section 2.3)

Currently, the District is in the process of drafting the Western Wastewater Service Area Agreement, which specifically acknowledges the wastewater management practices required by State Water Resources Control Board Order No. 2006-0003 and California Regional Water Quality Control Board, Region 9, Order No. R9-2007-0005, including but not limited to, an appropriate Fats, Oils and Grease Control Program and Overflow Emergency Response Plan, as well as the monitoring, reporting and measurement components required to support these Orders.

7.3.7 Sewer System Standard Drawings (Appendix Q)

These drawings include the standard drawings for devices used to intercept and separate FOG, including:

- Sand / Oil Separator (S-24)
- Sample Box # 1 (Industrial) (S-25)
- Sample Box # 2 (Commercial) (S-26)
- Grease Interceptor (S-27)

7.3.8 A Collection of Applications, Plans, Logs and Lists, developed by the District's Source Control Division, which support the FOG Control Program (Appendix S)

- Waste Discharge Application – Application that must be completed by all Significant Industrial Users and potential Categorical Industrial Users when applying for service, and every five (5) years thereafter. Identifies customer as a preparer and/or server of food, thereby requiring the completion of the Interceptor Sizing Form.
- Interceptor Sizing Form – Calculates the size of the required grease interceptor, with minimum size of 750 gal.
- Interceptor Maintenance Plan – Identifies location, maintenance practices and schedule, responsible party for monitoring, independent vendor servicing the receptacle and any previous problems for each grease interceptor in the District's service area.
- Source Control Entry Log (3/06 – 6/07) – Provides a record of the District's actions taken, correspondence, discussions and inspections of each interceptor.
- Interceptor Maintenance Plan Log Sheet - Provides a record of the result of each interceptor inspection.
- Interceptor Equipment Listing – A list of all sand/oil separators and grease interceptors in the District's service area.

- Sewer Line Problem Areas – Sewer segments prone to FOG deposits, as identified by the District, and cleaned quarterly. This has prevented the District from previously experiencing an SSO due to FOG.

- A Map of the Sewer Line Problem Areas – A Map of the sewer segments prone to FOG deposits, as identified by the District, and cleaned quarterly.

- Partial List of Independent vendors which can provide collection and disposal services within their service area – There are several independent vendors which can provide grease interceptor service. This list represents a random selection of a portion of these vendors, and does not imply District endorsement of any specific vendor.

7.3.9 Fat-Free Sewers (Public Outreach for the FOG Control Program) (Appendix T)

The District has developed this document to be supplied to all customers on an annual basis, as well as posted on their website, www.ranchowater.com. This mailer further defines FOG and its importance of being properly managed. It includes general prevention tips such as technology and cleaning methods. In order to accommodate each of the following FOG producers, cleaning methods and technology target the general public, as well as restaurants and the automotive sector.

CHAPTER 8. SYSTEM EVALUATION AND CAPACITY ASSURANCE PLAN

The District's System Evaluation and Capacity Assurance Plan addresses those mandatory SSMP provisions outlined in Section D, 13 (viii) System Evaluation and Capacity Assurance Plan of SWRCB Order No. 2006-0003.

RCWD has prepared and implemented a Capital Improvement Program (CIP) that will provide hydraulic capacity of key sanitary sewer system elements for dry weather peak flow conditions, as well as the appropriate design storm or wet weather event. RCWD's System Evaluation and Capacity Assurance Plan encompasses the following components:

(1) Evaluation - Actions needed to evaluate those portions of the sanitary sewer system that are experiencing or contributing to an SSO discharge caused by hydraulic deficiency. The evaluation provides estimates of peak flows (including flows from SSOs that escape from the system) associated with conditions similar to those causing overflow events, estimates of the capacity of key system components, hydraulic deficiencies (including components of the system with limiting capacity) and the major sources that contribute to the peak flows associated with overflow events.

(2) Design Criteria - Where design criteria do not exist or are deficient, undertake the evaluation identified in (1) above to establish appropriate design criteria.

(3) Capacity Enhancement Measures - The steps needed to establish a short- and long-term CIP to address identified hydraulic deficiencies, including prioritization, alternatives analysis, and schedules. The CIP may include increases in pipe size, I/I reduction programs, increases and redundancy in pumping capacity, and storage facilities. The CIP shall include an implementation schedule and shall identify sources of funding.

(4) Schedule – RCWD has developed a schedule of completion dates for all portions of the CIP developed in (1)-(3) above. This schedule shall be reviewed and updated consistent with the SSMP review and update requirements as described in Section D. 14.

8.1 COMPLIANCE SUMMARY

The District maintains a System Evaluation and Capacity Assurance Plan which meet the requirements of Section D, 13 (viii) System Evaluation and Capacity Assurance Plan of SWRCB Order No. 2006-0003:

(1) The District's *2005 Wastewater Facilities Master Plan* includes wastewater flow projections and a hydraulic analysis of all District-owned gravity mains, lift station and force mains. The analysis includes estimates of peak dry and wet weather flows, and outlines a Capital Improvement and Replacement Program. The District recently reviewed these wastewater flow projections and hydraulic analysis in the *2007 Wastewater Flow Projections and Monitoring Update*. Currently, all District-owned sewer facilities have sufficient capacity to accommodate peak flows. As such, no SSOs caused by hydraulic deficiencies are projected to escape from the system.

(2) The District's *Sewer System Facility Requirements and Design Guidelines* outlines the appropriate design criteria necessary to ensure sufficient capacity, as well as preserve the estimated life-cycle of wastewater infrastructure.

(3) The District has established a short- and long-term Capital Improvement Program (CIP) to address projected hydraulic deficiencies. The CIP is included in the *2005 Wastewater Facilities Master Plan,* and includes projected cost estimates, alternatives analysis and project prioritization by 5-Year time increment. The District's *Long-Range Capital Financing* describes how the District proposes to continue to pay for the CIP, by noting fund balances, funding sources and fund uses.

(4) The District has developed their CIP, as presented above, and plans to review and update it accordingly during their next *Wastewater Facilities Master Plan Update.*

8.2 COMPLIANCE DOCUMENTS

The following documents, attached as appendices, support the District's System Evaluation and Capacity Assurance Plan, thereby allowing the District to comply with the System Evaluation and Capacity Assurance Plan requirements of the WDR:

- *2007 Wastewater Flow Projections and Monitoring Update,* Infrastructure Engineering Corporation, October 2007, Appendix U.
- *Sewer System Facility Requirements and Design Guidelines*, Rancho California Water District, Last revised on December 1 2007, Appendix H.
- The District's *Long-Range Capital Financing Plan,* Rancho California Water District, Source Control Division, Appendix P.

Additionally, the following documents also support the District's System Evaluation and Capacity Assurance Plan, and are available from the District's Engineering Division. Due to the size of these documents, they have not been attached as appendices.

- *2005 Wastewater Facilities Master Plan,* Kennedy/Jenks Consultants, June 2005.

8.3 DOCUMENT DESCRIPTIONS

A description for each compliance document listed above is described below:

8.3.1 2007 Wastewater Flow Projection and Monitoring Update (Appendix U)

Infrastructure Engineering Corporation completed this October 2007 review and updated analysis of the wastewater flow projections and hydraulic analysis developed in the *2005 Wastewater Facilities Master Plan*. This also accounted for all District-owned wastewater facilities constructed since the completion of the *2005 Wastewater Facilities Master Pla*n, and the District's *Fiscal Year 2006-7 Sewer Flow Monitoring Study*. IEC recommended continuing with the District's

previously developed wastewater CIP.

8.3.2 Sewer System Facility Requirements and Design Guidelines (Appendix H)

The District's *Sewer System Facility Requirements and Design Guidelines*, last revised December 1 2007, details:

- Procedures for Construction Drawing Approval
- Design Criteria
- Construction Drawing Preparation
- Procedures for Sewer System Facility Construction

Section III contains the necessary design criteria to ensure sufficient capacity, as well as preserve the estimated life-cycle of wastewater infrastructure.

8.3.3 Long-Range Capital Financing (Appendix P)

Developed by the District, this document describes how the District proposes to continue to pay for the Capital Replacement and Improvement Programs, by noting fund balances, funding sources and fund uses, and encompasses both collection and treatment system costs.

8.3.4 2005 Wastewater Facilities Master Plan

The District's *2005 Wastewater Facilities Master Plan* analyzed current and projected flows, and recommend system capital improvements and proposed facility cost estimates, based on the District's established design criteria. The development of an accurate wastewater hydraulic model, land use database and accurate wastewater projections were critical components of this Master Plan. Specific sections in the Master Plan include:

- Introduction
- Study Area Characteristics
- Wastewater System Design Criteria
- Wastewater Flows and Projections
- Santa Rosa Water Reclamation Facility Evaluation
- Existing Wastewater Facilities and Wastewater System Analysis
- Sewer System Model Development

- Capital Improvement Program
- Capital Replacement Program
- CMOM Compliance Summary

CHAPTER 9. MONITORING, MEASUREMENT, AND PROGRAM MODIFICATIONS

The District's Monitoring, Measurement, and Program Modifications addresses those mandatory SSMP provisions outlined in Section D, 13 (ix) Monitoring, Measurement, and Program Modifications of SWRCB Order No. 2006-0003.

RCWD Monitoring, Measurement, and Program Modifications encompasses the following components:

(1) Maintain relevant information that can be used to establish and prioritize appropriate SSMP activities;

(2) Monitor the implementation and, where appropriate, measure the effectiveness of each element of the SSMP;

(3) Assess the success of the preventative maintenance program;

(4) Update program elements, as appropriate, based on monitoring or performance evaluations; and

(5) Identify and illustrate SSO trends, including: frequency, location, and volume.

9.1 COMPLIANCE SUMMARY

The District tracks the location and cause of all SSOs, blockages, and gravity main hot-spots. The District maintains a log of all cleaning activity by development tract, which details the size, material and location of each pipe cleaned, as well as the equipment utilized, and any relevant remarks observed during the cleaning. The District's maintains a Computerized Maintenance Management System (CMMS), which utilizes Orion software for preventative maintenance and work orders.

The District completed a system-wide video inspection of the trunk sewer system in 2002. Additionally, District Field Staff observe all gravity mains and manholes during routine cleaning, and conduct localized video inspections when their observations warrant further investigation. The District maintains a log of this continued video inspection in their *Video Inspection Report Log*. During both the system-wide and localized video inspections, each pipe is given a ranking based on the observed overall condition. These rankings, as well as the observed condition of each pipeline, allow the District to identify gravity mains that are at risk of collapse or prone to more frequent blockages due to pipe defects.

The District identifies all food preparation and service locations within their service area as part of their monitoring and surveillance program. A list of all such customers is maintained by the District in their *Interceptor Equipment Listing*. All interceptors on the *Interceptor Equipment Listing* are inspected between two to four times a year by the District's Source Control Division, with quarterly inspections for those interceptors tributary to sections of the sanitary sewer system subject to high levels of FOG. Each inspection is logged in the District's *Source Control Entry Log*, with the results of each inspection recorded in the District's *Interceptor Maintenance Plan Log Sheet*.

In order to monitor the implementation and measure the effectiveness of the SSMP, the District tracks several performance indicators, including:

- Location of all SSOs over the past 12 months;
- Number of SSOs over the past 12 months, distinguishing between dry weather overflows and wet weather overflows;
- Volume distribution of SSOs (e.g. number of SSOs < 100 gallons, 100 to 999 gallons, 1,000 to 9,999 gallons, > 10,000 gallons);
- Volume of SSOs that was contained in relation to total volume of SSOs;
- SSOs by cause (e.g. roots, grease, debris, pipe failure, pump station failure, capacity, other);
- Number of stoppages over the past 12 months;
- Stoppages by cause;
- Number of Interceptors inspected over the past 12 months;
- Percentage of Interceptors inspected over the past 12 months;
- Miles of gravity mains cleaned over the past 12 months;
- Percentage of total gravity mains cleaned over the past 12 months;
- Percentage of wet wells cleaned over the past 6 months;

In order the keep the SSMP up to date, the District has assigned a staff member to review the SSMP annually. In addition to tracking the above performance indicators, the staff member will review all sections of the SSMP for effectiveness and timeliness. Collection system personnel will also be consulted annually to review the effectiveness of the SSMP, and help identify potential areas for improvement.

In summary, the District maintains a Monitoring, Measurement, and Program Modifications which meets the requirements of Section D, 13 (ix) Monitoring, Measurement, and Program Modifications of SWRCB Order No. 2006-0003:

(1) The District tracks the location and cause of all SSOs, blockages, and gravity main hot-spots. They maintain a log of all cleaning activity by development tract, which details the size, material and location of each pipe cleaned. The District maintains a Computerized Maintenance Management System (CMMS), which utilizes Orion software for preventative maintenance and work orders, as well as a log of their continued video inspection efforts in

their *Video Inspection Report Log*. The District identifies all food preparation and service locations within their service area as part of their monitoring and surveillance program. A list of all such customers is maintained by the District in their *Interceptor Equipment Listing*. All interceptors on the *Interceptor Equipment Listing* are inspected between two to four times a year by the District's Source Control Division, with quarterly inspections for those interceptors tributary to sections of the sanitary sewer system subject to high levels of FOG. Each inspection is logged in the District's *Source Control Entry Log*, with the results of each inspection recorded in the District's *Interceptor Maintenance Plan Log Sheet*;

(2) The District monitors the implementation of the SSMP, and measures the effectiveness of each element by SSMP by developing and tracking performance indicators on an annual basis;

(3) By tracking performance indicators, the District is able to assess the success of their preventative maintenance program;

(4) The District has assigned a staff member to review the SSMP annually, in order to update all program elements as appropriate. In addition to tracking the above performance indicators, the staff member will review all sections of the SSMP for effectiveness and timeliness. Collection system personnel will also be consulted annually to review the effectiveness of the SSMP, and help identify potential areas for improvement;

(5) The District tracks the frequency, location and volume of all SSOs.

9.2 COMPLIANCE DOCUMENTS

The following documents allow the District to comply with the Monitoring, Measurement, and Program Modifications requirements of the WDR, and are attached as appendices.

- A sample of the District's *Video Inspection Log*, Rancho California Water District, Source Control Division, Appendix N.

- A Collection of Applications, Plans, and Logs developed by the District's Source Control Division, which support the FOG Control Program, Appendix V:

  - Waste Discharge Application
  - Interceptor Sizing Form
  - Interceptor Maintenance Plan
  - Source Control Entry Log
  - Interceptor Equipment Listing

- Sewer Line Problem Areas

9.3 DOCUMENT DESCRIPTIONS

A description for each compliance document listed above is described below:

9.3.1 Video Inspection Report Log-Sample, (Appendix N)

District Field Staff observe all gravity mains and pipes during routine cleaning, and conduct localized video inspections when their observations warrant such further investigation. The results of these video inspections are recorded in the *Video Inspection Report Log*.

9.3.2 A Collection of Applications, Plans, Logs and Lists, developed by the District's Source Control Division, which support the FOG Control Program (Appendix S).

- Waste Discharge Application – Application that must be completed by all Significant Industrial Users and potential Categorical Industrial Users when applying for service, and every five (5) years thereafter. Identifies customer as a preparer and/or server of food, thereby requiring the completion of the Interceptor Sizing Form.

- Interceptor Sizing Form – Calculates the size of the required grease interceptor, with minimum size of 750 gal.

- Interceptor Maintenance Plan – Identifies location, maintenance practices and schedule, responsible party for monitoring, independent vendor servicing the receptacle and any previous problems for each grease interceptor in the District's service area.

- Source Control Entry Log (3/06 – 6/07) – Provides a record of the District's actions taken, correspondence, discussions and inspections of each interceptor.

- Interceptor Maintenance Plan Log Sheet - Provides a record of the result of each interceptor inspection.

- Interceptor Equipment Listing – A list of all sand/oil separators and grease interceptors in the District's service area.

- Sewer Line Problem Areas – Sewer segments prone to FOG deposits, as identified by the District, and cleaned quarterly. This has prevented the District from previously experiencing an SSO due to FOG.

- A Map of the Sewer Line Problem Areas – A Map of the sewer segments prone to FOG deposits, as identified by the District, and cleaned quarterly.

- Partial List of Independent vendors which can provide collection and disposal services within their service area – There are several independent vendors which can provide

grease interceptor service. This list represents a random selection of a portion of these vendors, and does not imply District endorsement of any specific vendor.

CHAPTER 10. SSMP PROGRAM AUDITS

The District's SSMP Program Audits addresses the mandatory SSMP provision outlined in Section D, 13 (x) SSMP Program Audits of SWRCB Order No. 2006-0003.

RCWD is required to conduct periodic internal audits, appropriate to the size of the system and the number of SSOs. At a minimum, these audits must occur every two years and a report must be prepared and kept on file. This audit shall focus on evaluating the effectiveness of the SSMP and RCWD's compliance with the SSMP requirements identified in Section D, 13 of SWRCB Order No. 2006-0003, including the identification of any deficiencies in the SSMP and steps to correct them.

10.1 COMPLIANCE SUMMARY

RCWD will conduct an internal audit of their SSMP every two years, and focus on the effectiveness of the SSMP and the District's compliance with the SSMP requirements of Order No. 2006-0003, and Order R9-2007-0005. The audit will include, but may not be limited to, the following:

- Any significant changes to components of the SSMP, including but not limited to, Legal Authority, FOG Control Program or Overflow Emergency Response Plan.
- Any significant changes to the referenced compliance documents, presented as Volume II of the Sewer System Management Plan.
- SSMP implementation efforts over the past two years;
- A description of additions and improvements made the sanitary sewer collections system during the past two years;
- A description of the additions and improvements planned for the upcoming two years, with and estimated schedule for implementation.
- Strategies to correct deficiencies, if identified, will be developed by the responsible RCWD division.

10.2 COMPLIANCE DOCUMENTS

There are no compliance documents for this section.

10.3 DOCUMENT DESCRIPTIONS

There are no document descriptions for this section.

CHAPTER 11. COMMUNICATION PROGRAM

The District's Communication Program addresses the mandatory SSMP provision outlined in Section D, 13 (xi) Communication Program of SWRCB Order No. 2006-0003.

RCWD should communicate on a regular basis with the public on the development, implementation, and performance of its SSMP. The communication system shall provide the public the opportunity to provide input to the District as the program is developed and implemented. The District shall also create a plan of communication with systems that are tributary and/or satellite RCWD's sanitary sewer system.

11.1 COMPLIANCE SUMMARY

RCWD will communicate on a regular basis with interested parties on the implementation and performance of this SSMP. The communication program allows interested parties to provide input as the program is developed and implemented.

RCWD made a Draft version of the SSMP available to the public, allowed time for review, and invited public comments at a Board of Directors meeting on March 13, 2008, thereby allowing for public input. The District anticipates discussions regarding the development and implementation of their SSMP with each agency tributary to their sanitary sewer system in 2008. Additionally, the District's website (www.ranchowater.com) presents information about on-going efforts, as well as meeting agendas and minutes.

11.2 COMPLIANCE DOCUMENTS

There are no compliance documents for this section.

11.3 DOCUMENT DESCRIPTIONS

There are no compliance documents for this section.

Appendix N5:

Wasterwater Facilities Master Plan_2005

Final Report

2005 Wastewater Facilities Master Plan

April 2005
K/J 034404.00
RCWD No. 20107

Kennedy/Jenks Consultants
Engineers & Scientists

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A CMOM Checklist Completed by District in June 2004

Executive Summary

The Rancho California Water District (District) provides water and wastewater service to portions of the City of Temecula, the City of Murrieta and unincorporated portions of the County of Riverside. The District has experienced a steady growth in population, with an accompanying increased need for expanded wastewater service. In order to plan and develop a wastewater capital improvement program that ensures reliable and uninterrupted service, the District retained the services of Kennedy/Jenks Consultants to develop this wastewater system master plan.

The purpose of this Wastewater Facilities Master Plan was to update current and projected flows, and recommend system capital improvements and proposed facility cost estimates, based on the District's established design criteria. The development of an accurate wastewater hydraulic model, land use database and accurate wastewater projections were critical components of this Master Plan.

The District has established an ARC/INFO-based Geographic Information System (GIS) to assist in support of various planning, engineering and management-related projects. This Master Plan was developed in conjunction with the District's GIS to ensure the compatibility of the digital data and wastewater hydraulic model developed as part of this Master Plan.

The scope of work for this Master Plan included the following major tasks:

- Development of a land use database
- Development of EDU projections
- Review of multijurisdictional discharges
- Development of unit wastewater flows and sewer design criteria
- Development of projected wastewater flows
- Review of sewer system configuration and characteristics
- Assessment of the condition and capacity of existing facilities
- Evaluation of the Wastewater Treatment Plant
- Development of sewer hydraulic model using H20Map Sewer
- Hydraulic analysis of the existing and future collection system
- Review of recommended sewer system Capital Improvement Program
- Explanation and legislative background for the proposed Capacity, Management, Operations, and Maintenance (CMOM) Program

Findings

The findings of this study are based on a comprehensive evaluation of available data and an analysis of the existing wastewater system facilities ability to adequately meet existing and projected wastewater flows.

General

- The District's current wastewater production of 2.8 mgd is approximately 33.5% of the ultimate projected wastewater flow of 8.35 mgd. This total includes production from the City of Temecula, the City of Murrieta and unincorporated portions of the County of Riverside. New development and future growth will have a significant impact on the District's existing wastewater system and wastewater treatment facilities.

- Metering at SRWRF averaged 2.71 mgd for calendar year 2004, which is 22% less than predicted existing flows. This difference is attributed to pre-paid EDU's which have not yet been activated (approximately 541 EDUs), and an actual wastewater unit factor which is less than the conservative 250 gpd/EDU utilized in this master planning effort.

- The total estimated cost to construct the proposed ultimate wastewater system is $44.3 million. This cost includes recommended improvements for gravity mains and wastewater treatment facilities, as well as the costs associated with flow monitoring to insure that projects are implemented at the appropriate times. There are no recommended improvements for force mains or lift stations.

- The estimated rehabilitation cost due to depreciation of existing facilities over the next 4 years is $7.2 million, with an additional $126.5 million required over the lifetime of these facilities. This cost includes rehabilitation of existing gravity mains, force mains, lift stations, and the SRWRF.

Gravity Mains

- Approximately 11,982 LF of wastewater gravity pipelines have been identified as potentially hydraulically deficient. The capital improvement program (CIP) proposes for RCWD to upsize 3,455 LF of wastewater gravity pipelines, for a total estimated cost of $0.70 Million. This corresponds to 3.8% of the existing wastewater gravity system.

Wastewater Treatment Plants

- The SRWRF will require a capacity of 8.5 mgd to meet ultimate projected wastewater flow. Presently, the SRWRF has a 5.0 mgd capacity. The initial 2.5 mgd expansion, scheduled within the next five years, has an estimated cost of $31.4 million. The final 1.0 mgd expansion has an estimated cost of $12.0 million.

Capital Improvement Program

The purpose of the CIP is to enable the District to schedule projects and budget funds for the improvements proposed in this Wastewater Facilities Master Plan. The program establishes phasing of future improvements based upon the time increment that future facilities are

required. The CIP also includes costs associated with flow monitoring, which will allow the District to insure that projects are implemented at the appropriate time in order to mitigate future deficiencies. The CIP has been developed for wastewater facilities for the following time increments:

- 2005 through 2008
- 2009 through Ultimate

Facilities recommended in the Existing time step have been included in the 2005 through 2009 time increment.

Rehabilitation/Replacement Program

The wastewater collection system improvements recommended in the CIP were based upon existing versus future capacity requirements or hydraulic adequacy. The hydraulic capacity of the system was assessed using the District's H20Map Sewer computer model simulation, developed as part of this Wastewater Facilities Master Plan. However, a large portion of the existing collection system is adequately sized to accommodate future peak flows and therefore is not included in the recommended system improvements presented above. As time progresses, the condition of these facilities will deteriorate until such time as the facility needs to be repaired or replaced.

The District's oldest facilities within its wastewater collection were constructed around 1980. This collection system is relatively new compared to an average useful life of 90 years for wastewater collection system sewers. Although it will be approximately 70 years before the District needs to begin a rehabilitation/replacement program (assuming an average useful life of 90 years), the District needs to appropriate funds to cover these future repair/replacement costs.

The total annual cost for gravity sewer main rehabilitation is $525,200 and the total annual cost for force main rehabilitation is $16,100. In addition to gravity mains and force mains, existing lift stations were also assessed based upon condition and replacement/rehabilitation potential. The total annual cost for lift station rehabilitation is $51,000. Based upon historical data regarding repair and replacement for the SRWRF, the annualized capital repair/replacement cost for the SRWRF is estimated to be $1,215,500. Therefore, it is recommended that the District fund $1,807,300 annually to cover the cost of rehabilitation of existing wastewater facilities.

The summary of wastewater system facility costs is presented in the following table:

Table ES.1 – Summary of Wastewater System Facility Costs

Facility	Time Increment		Total
	2005 – 2008	2009 – Ultimate	
Flow Monitoring − Capacity Basis	$96,000	$160,000	$256,000
Gravity Sewers − Capacity Basis	$18,400	$684,290	$702,690
WWTP − Capacity Basis	$31,375,000	$12,000,000	$43,375,000

Table ES.1 – Summary of Wastewater System Facility Costs

SUBTOTAL – Capacity Basis	***$31,489,400***	***$12,844,290***	***$44,333,690***
Gravity Sewers − Rehabilitation Basis	$2,101,000	$36,766,000	$38,867,000
Force Mains − Rehabilitation Basis	$64,500	$1,129,000	$1,193,500
Lift Stations - Rehabilitation Basis	$204,100	$3,572,000	$3,776,100
WWTP - Rehabilitation Basis	$4,862,000	$85,085,000	$89,947,000
SUBTOTAL – Rehabilitation Basis	**$7,231,600**	**$126,552,000**	**$133,783,600**
GRAND TOTAL	***$38,721,000***	***$139,396,290***	***$178,117,290***

An explanation and legislative background for the proposed Capacity, Management, Operations, and Maintenance (CMOM) program is also included in this Wastewater Facilities Master Plan. Regulatory criteria which appear most probable to make the final CMOM program are discussed. Table 10.1 identifies the components of the Master Plan which address potential CMOM elements, as well as those portions of the CMOM program requiring further District attention.

Section 1: Introduction

1.1 General

The Rancho California Water District (District) is located in the southwestern portion of Riverside County and its southwestern border lies along the line with the County of San Diego. The location of the District is shown in Figure 1-1. The District total service area encompasses 100,100 acres (156.4 square miles) and is comprised of the City of Temecula, portions of the City of Murrieta, and unincorporated territory in the County of Riverside. The District provides wastewater services to only the western portion (50,520 acres known as the Santa Rosa Division) of its service area, which is the focus of this master plan.

The long-term vision of the Rancho California Water District is to effectively and efficiently meet the needs of its service area within the expressed and implied powers provided by law.

> **Mission Statement**
> The mission of the Rancho California Water District is to deliver reliable, high-quality water, sewer and reclamation services to its customers and communities in a prudent and sustainable manner.

As an agency in charge of providing water, wastewater, and reclamation service within its jurisdiction, the District periodically reviews and updates its Master Plan for providing services to future customers. This Wastewater Facilities Master Plan was prepared as an update to the District's 1997 Wastewater Facilities Master Plan (1997 Master Plan).

1.2 Authorization

Kennedy/Jenks Consultants was authorized by RCWD Project No. 20107 to perform this Wastewater Facilities Master Plan based on an engineering services agreement dated April 16, 2003.

1.3 Purpose and Scope

The purpose of this Wastewater Facilities Master Plan was to update the 1997 Master Plan while providing the District with the assumptions, data, results, and tools necessary for the District to perform future master plan updates. Therefore, development of accurate wastewater hydraulic models, a land use database, and accurate wastewater projections was an important facet of this Wastewater Facilities Master Plan.

The District has established an ArcGIS/ArcINFO-based geographic information system (GIS) to assist in support of various planning, engineering, and management-related projects. This Wastewater Facilities Master Plan was developed in conjunction with the District's GIS to ensure the compatibility of the digital data and wastewater hydraulic models developed as part of this Master Plan.

As part of the scope of work for this Master Plan Kennedy/Jenks Consultants will have performed the following major tasks:

- Created a GIS database containing annexed parcel information, land use data, and billing data using ArcMap.
- Developed design flow models, future flow projections, and system hydrographs.
- Developed a sewer model including tributary sewer systems and additional parcel loads using H_2OMap Sewer.
- Analyzed and calibrate existing sewer model establishing pipe design and unit cost criteria.
- Determined existing and future deficiencies in the sewer network.
- Analyzed future sewer system scenarios and preventable sanitary sewer overflows.
- Reviewed and evaluated the Santa Rosa Water Reclamation Facility to develop an expansion/replacement program.
- Developed a phased capital improvement and replacement program.
- Developed a CMOM compliance review

Consistent with the practice of master planning, project identification (including sizing, costs, time phasing, and location) are conceptual, and are based on projections of future indicators (such as growth and inflation costs). As such, recommended facilities contained in this master plan should undergo additional technical evaluations based on conditions present at the time of project implementation to confirm the recommendations (i.e. size, alignment, length, hydraulics, costs, etc.) of this master plan.

1.4 Abbreviations and Definitions

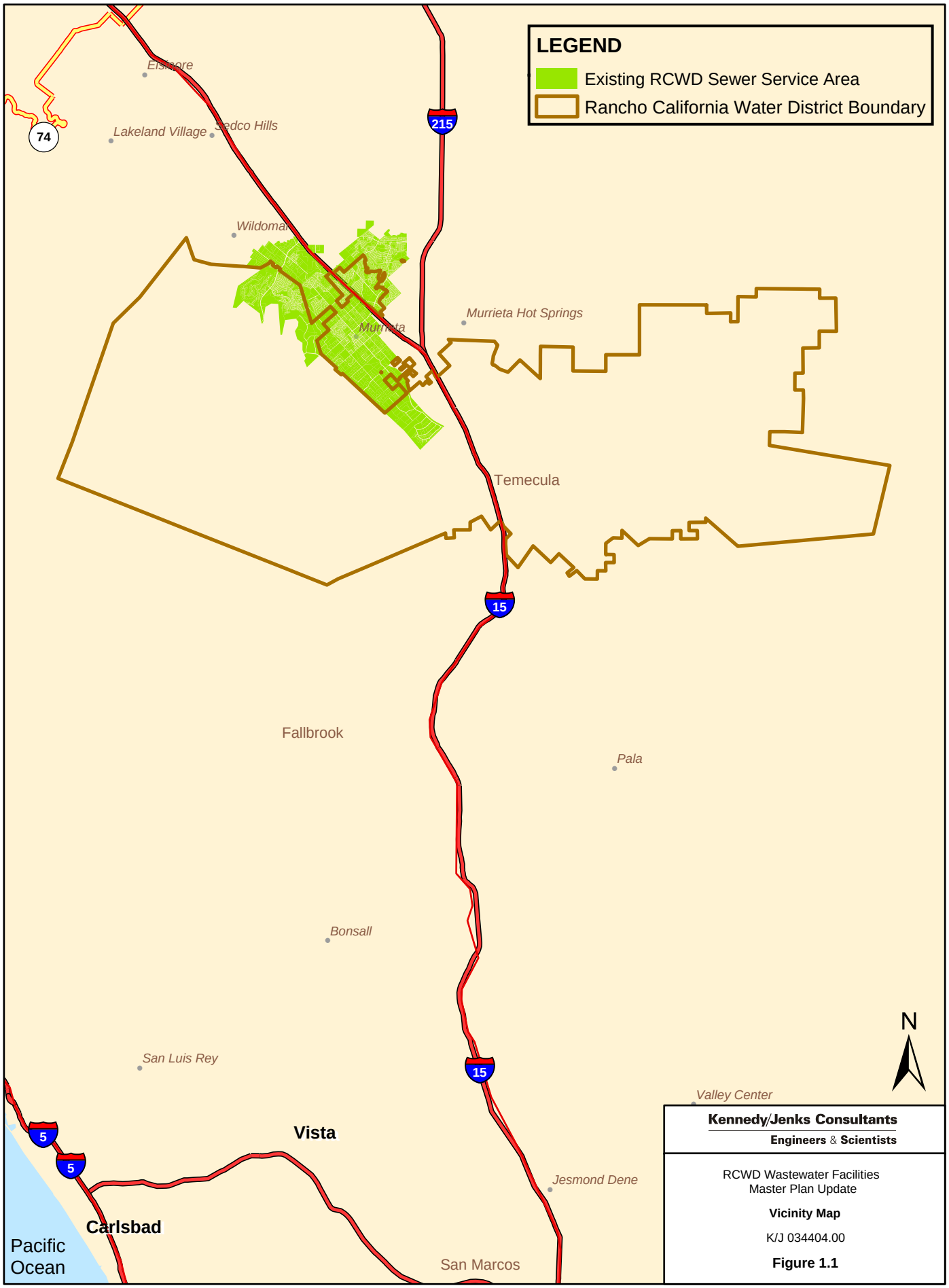
ac	acre
ADWF	average dry weather flow
APN	assessors parcel number
AWWF	average wet weather flow
CIP	capital improvement program
CMOM	capacity, management, operations, and maintenance program
CRP	capital replacement program
d/D	depth to diameter
dia.	diameter
EDU	equivalent dwelling unit
EMWD	Eastern Municipal Water District
ENR-CCI	Engineering News Record – construction cost index
EVMWD	Elsinore Valley Municipal Water District
fps	feet per second
FY	fiscal year

GIS	geographic information system
gpad	gallons per day per acre
gpd	gallons/day
gpm	gallons/minute
HGL	hydraulic grade line
hp	horsepower
I&I	infiltration and inflow
K/J	Kennedy/Jenks Consultants
LF	linear foot
LS	lift station
MCWD	Murrieta County Water District
mgd	million gallons/day
PDWF	peak dry weather flow
PVC	poly-vinyl chloride pipe
PWWF	peak wet weather flow
RCWD	Rancho California Water District
SCAG	Southern California Association of Governments
SRWRF	Santa Rosa Water Reclamation Facility
SSO	sanitary sewer overflow
VCP	vitrified clay pipe
WWTP	Wastewater Treatment Plant

1.5 References and Previous Planning Studies

Montgomery Watson, *Wastewater Facilities Master Plan*, Rancho California Water District, September 1997.

Rancho California Water District, *Sewer System Facility Requirements*, Rancho California Water District, January 1992.



Kennedy/Jenks Consultants
Engineers & Scientists

RCWD Wastewater Facilities
Master Plan Update

Vicinity Map

K/J 034404.00

Figure 1.1

Section 2: Study Area Characteristics

2.1 District Background

Rancho California Water District was formed from the consolidation of the Rancho California District and the Santa Rosa District. The former was originally organized on November 16, 1965 to supply water services to the eastern portion of the proposed Temecula/Rancho California development. The latter, organized two years later on January 24, 1968, was designated to serve the western portion of the development. Within a year of their respective formations, the Rancho California District was annexed by Eastern Municipal Water District (EMWD) and Santa Rosa District was annexed by Western Municipal Water District (WMWD). Both EMWD and WMWD are member agencies of the Metropolitan Water District of Southern California (MWD) which was also involved in the annexations of the Rancho California and Santa Rosa districts.

After its reformation and consolidation in early 1977, Rancho California Water District was allocated the authority by LAFCO to collect and treat wastewater from the area originally served by the Santa Rosa Water District (now called the Santa Rosa Division). The eastern portion of the Rancho California Water District is called the Rancho Division and is still served by EMWD for the purpose of wastewater collection and treatment. Water service for both divisions is handled by the Rancho California Water District.

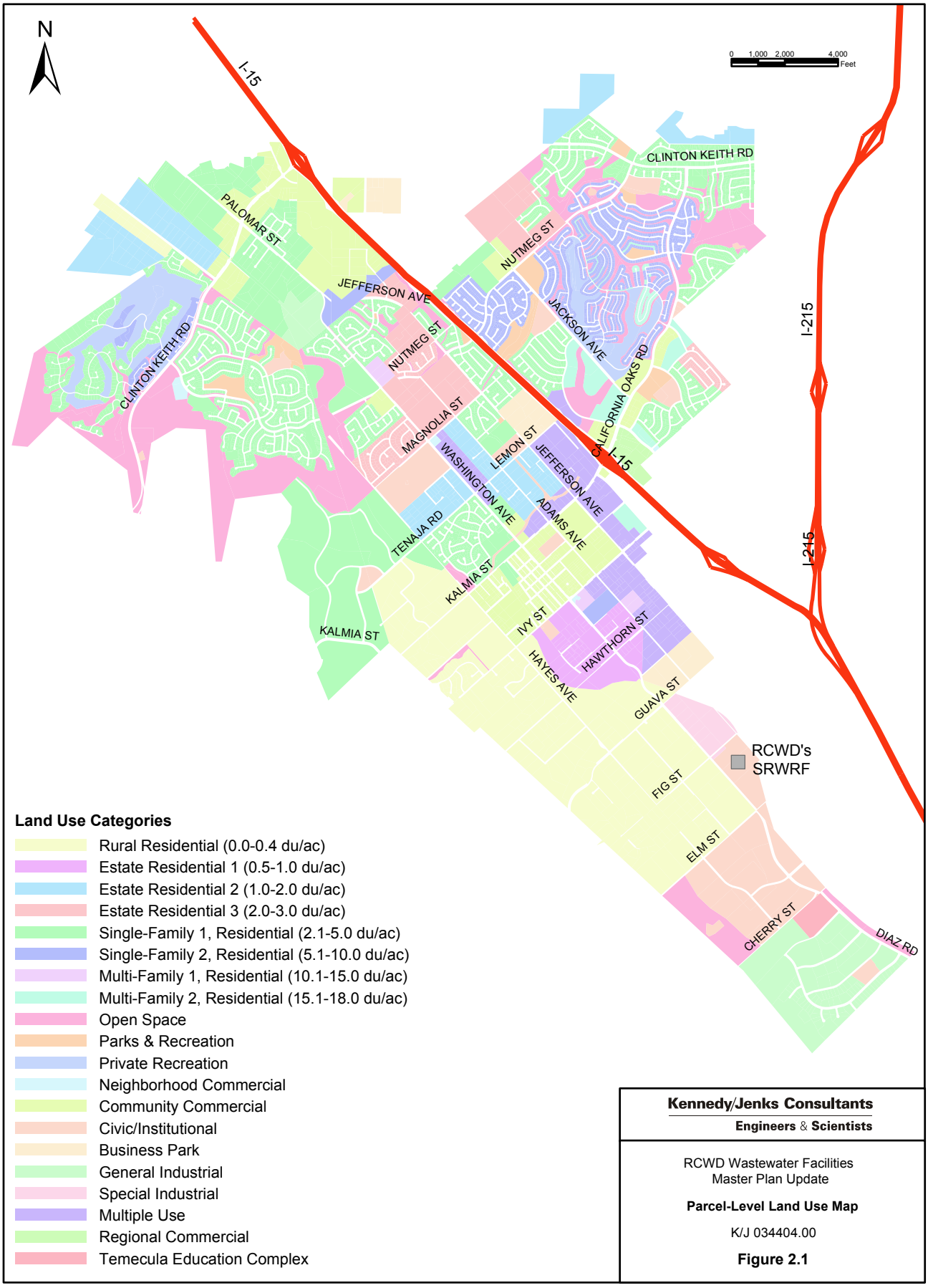
As of June 30, 2004, the District serves 14,671 EDU's producing approximately 2.8 mgd of flow. In addition to its own flow, the District accepts flows from the Murrieta County Water District and the Elsinore Valley Municipal Water District. The District also operates 103 miles of sewer lines and one treatment facility.

2.2 Study Area

The Rancho California Water District is responsible for wastewater collection and treatment within the Santa Rosa Division within the District's boundaries. This encompasses 50,250 acres (78.5 square miles) in the western portion of the District. Of this area, 10,644 acres lies within the District's ultimate sewer service boundary, including the City of Temecula, portions of the City of Murrieta, and unincorporated areas in the County of Riverside. The study area is presented in Figures 2.1 and 2.2.

2.3 Updated Parcel-Level Land Use Coverage

A master land use coverage file was developed in GIS to aid in the updating of this Wastewater Facilities Master Plan. GIS land use planning data was obtained from the City of Murrieta, and the City of Temecula and the County of Riverside in order to review land use types and current boundaries. The planning coverages for each separate land-planning agency were merged in GIS. The master GIS database includes 35 separate land use codes: 19 specific to the City of Murrieta, 4 specific to the City of Temecula, and 12 specific to the County of Riverside.



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RCWD Wastewater Facilities
Master Plan Update

Parcel-Level Land Use Map

K/J 034404.00

Figure 2.1

Each of the 35 specific land use classifications were used to create the land use categories for the District. Since RCWD contains less than 100 parcels from the City of Temecula, and County of Riverside and the City of Murrieta use similar land use categories, it was determined that the City of Murrieta's land use categories would be selected as the District's generalized land use categories. GIS overlay analysis was used to assign each parcel within the District's service area with a land use code specific to the 20 land use categories, creating a parcel-level GIS land use coverage. A comprehensive list of City of Temecula, City of Murrieta, and County of Riverside land uses used to reconcile the District's 20 land use codes and corresponding land use designations is presented as Table 2.1. Table 2.2 presents the 20 District land use designations.

Table 2.1 – Land Use Code Cross Reference

No.	Planning Agency	Planning Agency Land Use Code	Planning Agency Land Use Category	District Code	District Land Use Category
1	City of Murrieta	BP	Business Park	BP	Business Park
2	City of Murrieta	C/I	Civic/Institutional	C/I	Civic/Institutional
3	City of Murrieta	CC	Community Commercial	CC	Community Commercial
4	City of Murrieta	ER-1	Estate Residential 1	ER-1	Estate Residential 1
5	City of Murrieta	ER-2	Estate Residential 2	ER-2	Estate Residential 2
6	City of Murrieta	ER-3	Estate Residential 3	ER-3	Estate Residential 3
7	City of Murrieta	GI	General Industrial	GI	General Industrial
8	City of Murrieta	MF-1	Multi-Family 1, Residential	MF-1	Multi-Family 1, Residential
9	City of Murrieta	MF-2	Multi-Family 2, Residential	MF-2	Multi-Family 2, Residential
10	City of Murrieta	MU-3	Multiple Use, Area 3	MU	Multiple Use
11	City of Murrieta	NC	Neighborhood Commercial	NC	Neighborhood Commercial
12	City of Murrieta	OS	Open Space	OS	Open Space
13	City of Murrieta	P&R	Parks & Recreation	P&R	Parks & Recreation
14	City of Murrieta	PR	Private Recreation	PR	Private Recreation
15	City of Murrieta	RC	Regional Commercial	RC	Regional Commercial
16	City of Murrieta	RR	Rural Residential	RR	Rural Residential
17	City of Murrieta	SF-1	Single-Family 1, Residential	SF-1	Single-Family 1, Residential
18	City of Murrieta	SF-2	Single-Family 2, Residential	SF-2	Single-Family 2, Residential
19	City of Murrieta	SI	Special Industrial	SI	Special Industrial
20	City of Temecula	OS-C	Conservation	OS	Open Space
21	City of Temecula	LI	Light Industrial	GI	General Industrial
22	City of Temecula	PI	Public Institutional	C/I	Civic/Institutional
23	City of Temecula	PI	Public Institutional	TEC	Temecula Education Complex
24	County of Riverside	BP	Business Park	BP	Business Park
25	County of Riverside	C/I	Civic/Institutional	C/I	Civic/Institutional
26	County of Riverside	CC	Community Commercial	CC	Community Commercial
27	County of Riverside	ER-2	Estate Residential 2	ER-2	Estate Residential 2
28	County of Riverside	GI	General Industrial	GI	General Industrial

Table 2.1 – Land Use Code Cross Reference

No.	Planning Agency	Planning Agency Land Use Code	Planning Agency Land Use Category	District Code	District Land Use Category
29	County of Riverside	MF-2	Multi-Family 2, Residential	MF-2	Multi-Family 2, Residential
30	County of Riverside	OS	Open Space	OS	Open Space
31	County of Riverside	P&R	Parks & Recreation	P&R	Parks & Recreation
32	County of Riverside	PR	Private Recreation	PR	Private Recreation
33	County of Riverside	RR	Rural Residential	RR	Rural Residential
34	County of Riverside	SF-1	Single-Family 1, Residential	SF-1	Single-Family 1, Residential
35	County of Riverside	SF-2	Single-Family 2, Residential	SF-2	Single-Family 2, Residential

Table 2.2 – District Land Use Categories

No.	Land Use Category	Land Use Code
1	Rural Residential	RR
2	Estate Residential 1	ER-1
3	Estate Residential 2	ER-2
4	Estate Residential 3	ER-3
5	Single-Family 1, Residential	SF-1
6	Single-Family 2, Residential	SF-2
7	Multi-Family 1, Residential	MF-1
8	Multi-Family 2, Residential	MF-2
9	Open Space	PS
10	Parks & Recreation	P&R
11	Private Recreation	PR
12	Neighborhood Commercial	NC
13	Community Commercial	CC
14	Civic/Institutional	C/I
15	Business Park	BP
16	General Industrial	GI
17	Special Industrial	SI
18	Multiple Use	MU
19	Regional Commercial	RC
20	Temecula Education Complex	TEC

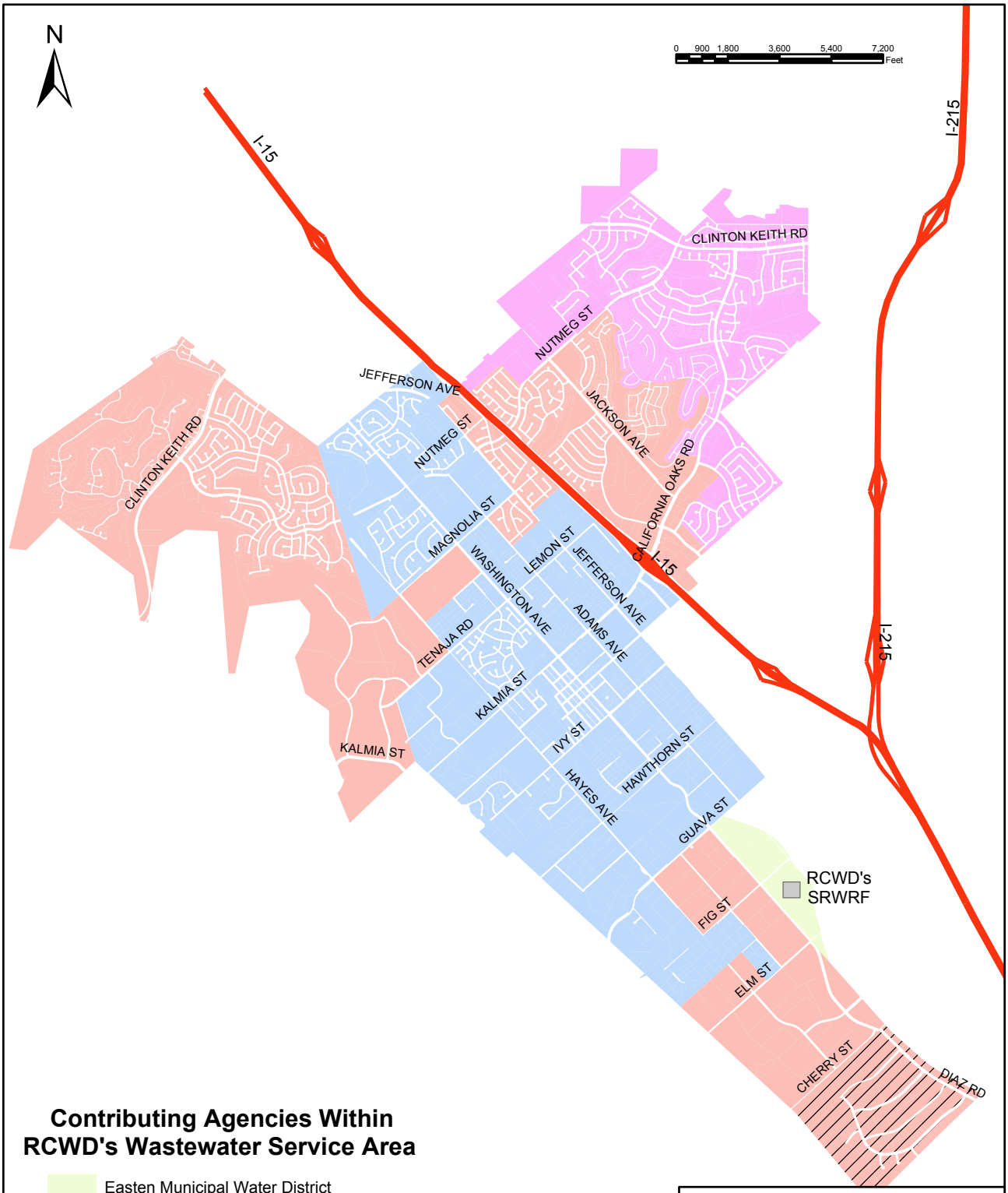
The planned land use coverage described above was overlaid with the District's GIS parcel coverage to develop a parcel-level land use coverage. This parcel-level land use coverage will be used to develop wastewater flows for each parcel within the District's ultimate wastewater boundary. The parcel-level land use coverage, as shown in Figure 2.1, has been supplied by District staff in digital shape file format (Parcels_kj.shp). Table 2.3 outlines the database structure for this file.

Table 2.3 – Planned Land Use (Parcels_kj.shp) Shape File Database Structure

Database Field Label	Description
APN	The planning agency supplied Assessor's Parcel Number.
AREA	The planning agency supplied parcel area in ft^2.
PERIMETER	The planning agency supplied parcel perimeter in ft.
LU_CODE	The planning agency supplied land use code. This code is unique to each planning agency.
DESCRIP	The planning agency supplied land use description.
DENSITY	The planning agency supplied density for residential parcels
FAR	The planning agency supplied Floor to Area Ratio for non-residential parcels.
CITY	The planning agency designation.
RCWD_CODE	The District generalized land use code.
RCWD_DESC	The District generalized land use description.

2.4 Proposed Wastewater Ultimate Service Area

In support of our overall master planning effort, K/J has developed the proposed ultimate wastewater service area to be used for this Wastewater Facilities Master Plan. This service area was developed based upon the 1997 ultimate service areas, conversations with the District, the District's current sewer boundaries, and wastewater service agreements with other agencies. Table 2.4 shows the acreage of each land use category based upon the proposed ultimate wastewater service areas. The ultimate wastewater service area and contributing agencies are shown in Figure 2.2. RCWD will cease treating wastewater flow from the Southwestern portion of Elsinore Valley Municipal Water District (EVMWD) in 2008, and therefore this portion of EVMWD is not shown in Figure 2.2.



Contributing Agencies Within RCWD's Wastewater Service Area

- Easten Municipal Water District
- Ellsinore Valley Municipal Water District
- Murrieta County Water District
- Rancho California Water District

Note: All properties in RCWD's wastewater service area are located in the City of Murrieta, with the exception of the cross-hatched area that is located in the City of Temecula.

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RCWD Wastewater Facilities
Master Plan Update

Proposed Ultimate Wastewater Service Area

K/J 034404.00

Figure 2.2

Table 2.4 – Acreage by RCWD Land Use Category

District Land Use Category	Sewer Area [ac]	Percentage of Total Ultimate Wastewater Service Area
Rural Residential	1,447	15.33%
Estate Residential 1	202	2.14%
Estate Residential 2	518	5.48%
Estate Residential 3	440	4.66%
Multi-Family 1, Residential	32	0.34%
Multi-Family 2, Residential	128	1.36%
Single-Family 1, Residential	2,295	24.29%
Single-Family 2, Residential	516	5.46%
Open Space	1,091	11.55%
Parks & Recreation	130	1.38%
Private Recreation	286	3.03%
Neighborhood Commercial	12	0.12%
Community Commercial	713	7.55%
Civic/Institutional	574	6.08%
Business Park	160	1.70%
General Industrial	399	4.23%
Special Industrial	70	0.74%
Multiple Use	358	3.79%
Regional Commercial	40	0.42%
Temecula Education Complex	33	0.35%
Total	***9,445***	***100.00%***

GIS data provided by the City of Murrieta, the City of Temecula, County of Riverside and the Rancho California Water District, had previously identified and removed public Right-of-Way area (ROW). This is significant as this land use category is not a source of wastewater and therefore, should not be considered in the overall area when calculating wastewater unit flow factors. As shown in Table 2.4, no acreage has been allocated as ROW. It is unclear as to whether ROW had been included in the 1997 Wastewater Facilities Master Plan. Table 2.5 illustrates the benefit of the removed ROW presented in this 2005 Wastewater Facilities Master Plan for the purposes of assigning acreage per land use category. As table 5 illustrates, the percentage of ROW removed from EVMWD, MCWD and RCWD is relatively equal.

Table 2.5 – Percent of District Acreage Excluded as ROW

Contributing Agency	Ultimate Service Area (ac)	Total Area of Parcels in Ultimate Service Area (ac)	Percentage of Ultimate Service Area Removed as ROW
EVMWD	2,680	2,372	11.49%
MCWD	3,528	3,158	10.49%
RCWD	4,436	3,915	11.74%
TOTAL	**10,644**	**9,445**	**11.26%**

Section 3: Wastewater System Design Criteria

3.1 Unit Wastewater Flow Factors

Each land use category in Table 2.1 was assigned a wastewater duty unit factor in Equivalent Dwelling Units (EDU's) per acre, which is consistent with RCWD design criteria referenced in Section III of the District Sewer System Facility Requirements Manual. The District considers an EDU to be equivalent to 250 gallons per day, as was verified using standard return-to-sewer ratios (explained below) and water billing data obtained within District boundaries.

The *1997 Wastewater Facilities Master plan* assigned wastewater duty factors for seven (7) land use categories as shown in Table 3.1.

Table 3.1 – 1997 Wastewater Facilities Master Plan EDU Projection by Land Use

Land Use	Projected EDU/ac
Rural Residential	0.2
Equestrian Residential	1.0
Single Family I	3.5
Single Family II	8.0
Multi-Family I	12.0
Multi-Family II	16.0
Commercial/Industrial/Business Park	10.0

The *2005 Wastewater Facilities Master Plan* land use categories presented, herein, contain eight (8) residential land use types as shown in Table 3.4. This is an increase from the six (6) used in 1997. The previous Master Plan grouped all non-residential land uses into 1 category. By splitting the non-residential land uses into 12 separate categories, as done in this *Wastewater Facilities Master Plan* (Table 3.5), allows for a higher degree of precision in estimating wastewater flows.

3.1.1 Sewer Billing Records

The District's sewer customer billing data was analyzed to determine which parcels had existing sewer accounts. For parcels with existing accounts, existing wastewater flows were assigned based on total EDUs presently billed to those parcels. If a parcel had no billing data, it was assumed to contribute no flow to the existing planning period. Table 3.2 illustrates the existing wastewater flows for development tracts and sub-areas utilized by K/J at the District's direction, sorted by contributing agency.

Table 3.2 – Existing EDUs Based on Customer Billing Data (As of 2003)

Contributing Agency	Sub-Area or Development Tract	Existing EDUs
EVMWD	6	59.00
EVMWD	12	7.00

Table 3.2 – Existing EDUs Based on Customer Billing Data (As of 2003)

Contributing Agency	Sub-Area or Development Tract	Existing EDUs
EVMWD	13	72.00
EVMWD	14	70.00
EVMWD	21072B	944.00
EVMWD	21515	241.00
EVMWD	22076	299.00
EVMWD	22077	631.00
EVMWD	22490	295.00
EVMWD	22491	116.00
EVMWD	22819	174.00
EVMWD	23049	160.00
EVMWD	23050	163.00
EVMWD	23108	337.00
EVMWD	23110	189.00
EVMWD	23155	72.00
EVMWD	23208	213.00
EVMWD	23435	252.00
EVMWD	24557	14.00
EVMWD	24592	100.00
EVMWD	25273	64.00
EVMWD	25362	136.00
EVMWD	28509	112.00
EVMWD	29231	56.00
EVMWD SUB-TOTAL		**4,776.00**
MCWD	17	4.18
MCWD	25	69.79
MCWD	26	3.31
MCWD	31	36.00
MCWD	38	1.69
MCWD	44	64.21
MCWD	49	1.28
MCWD	51	34.38
MCWD	55	2.81
MCWD	56	3.82
MCWD	57	26.00
MCWD	60	5.11
MCWD	61	16.02
MCWD	66	45.97
MCWD	69	0.86
MCWD	70	1.00
MCWD	79	3.01
MCWD	120	243.00

Table 3.2 – Existing EDUs Based on Customer Billing Data (As of 2003)

Contributing Agency	Sub-Area or Development Tract	Existing EDUs
MCWD	23095	426.00
MCWD	23187A	140.00
MCWD	23442	44.00
MCWD	28333	212.00
MCWD	28993	161.00
MCWD	29069	84.00
MCWD	29361	19.00
MCWD	29403	82.00
MCWD	29602	182.00
MCWD	30113	1.00
MCWD	30273	75.00
MCWD SUB-TOTAL		**1988.44**
RCWD	88	38.00
RCWD	89	30.00
RCWD	91	91.00
RCWD	92	3.00
RCWD	93	17.00
RCWD	94	112.00
RCWD	95	1.00
RCWD	99	391.00
RCWD	100	57.00
RCWD	103	16.00
RCWD	105	79.00
RCWD	106	95.00
RCWD	107	151.00
RCWD	109	3.00
RCWD	112	439.00
RCWD	119	345.00
RCWD	14854	274.00
RCWD	19535	80.00
RCWD	20403	59.00
RCWD	20840	233.00
RCWD	20841	335.00
RCWD	21072A	620.00
RCWD	21370	75.00
RCWD	21371	63.00
RCWD	21419	204.00
RCWD	21514	114.00
RCWD	21577	127.00
RCWD	21691	163.00
RCWD	21759	152.00

Table 3.2 – Existing EDUs Based on Customer Billing Data (As of 2003)

Contributing Agency	Sub-Area or Development Tract	Existing EDUs
RCWD	21987	57.00
RCWD	22346	71.00
RCWD	22437	384.00
RCWD	22603	37.00
RCWD	23127	90.00
RCWD	23187B	18.00
RCWD	23380	95.00
RCWD	23879	261.00
RCWD	23881	101.00
RCWD	24342	22.00
RCWD	28677A	873.00
RCWD	28677C	28.00
RCWD	29006	101.00
RCWD	29417	219.00
RCWD SUB-TOTAL		**6,724.00**
TOTAL		***13,488.44***

3.1.2 Additional District Direction

In the following cases, the District directed K/J to activate the following EDU's, based upon proposed specific plans, inter-agency agreements, and their local knowledge of development activity within the service area:

- The Temecula Educational Complex was assumed to contribute no flow in the existing time increment.

- Sewershed 9, which lies within EVMWD, contributes 347 EDUs to the existing time increment.

After identifying the parcels contributing flow using the District's customer billing data and using the District's specific guidance as described above for particular tracts or developments, existing active EDUs were defined. Applying the wastewater unit factor of 250 gpd/EDU yielded a total existing wastewater flow of 3.46 mgd (as shown in Table 4.1).

NOTE:

Metering at SRWRF averaged 2.71 mgd of influent entering the Santa Rosa WRF for calendar year 2004, which marks a 22% difference (0.75 mgd) from what was calculated in this Master Plan. This difference is due to pre-paid EDU's which have not yet been activated in RCWD's sewer service area (541 EDUs), and an actual wastewater unit factor which is less than 250 gpd/EDU (approximately 204 gpd/EDU).

3.1.3 Return-to-Sewer Ratios

In order to confirm the assumption that each EDU returns 250 gpd to the sewer, water billing data from RCWD was examined. RCWD was unable to access the complete billing data for the entire sewer service area, as Murrieta County Water District (MCWD) provides water service to a significant portion of RCWD's sewer service area. However, three years of billing data for 1348 of the 1398 residential Single-Family 2 (SF-2) parcels was provided. Based on the City of Murrieta's current zoning classifications, the residential land use classification SF-2 is 5.1-10.0 dwelling units per acre (du/ac). Table 3.3 shows the calculated sewer duty factor for this land use category assuming a zoned average of 7.5 du/ac.

Table 3.3 - Wastewater Unit Duty Factor for Single-Family 2, Residential

Zoned Average of 5.1 – 10.0 du/ac	Measured Water Duty (gpd/ac)	Assumed Return-to-Sewer Ratio	Calculated Sewer Duty (gpd/ac)	Calculated Unit Sewer Duty Factor (gpd/du)
7.5	2,939	60%	1763	235

Table 3.3 shows an average dwelling unit returned 235 gpd to the sewer based on RCWD consumption history and assumed Return-to-Sewer Ratio. In both the 1992 Sewer System Facility Requirements and the 1997 Wastewater Facilities Master plan, each EDU was assumed to return 250 gpd to the sewer. Therefore, Table 3.3 suggests that assigning each EDU a flow unit factor of 250 gpd is reasonable.

Having validated the wastewater duty unit factor utilized in the 1997 Wastewater Facilities Master Plan with the RCWD case study from Table 3.3 (above), it is now possible to assign wastewater duty factors to all residential land use categories. Each of the District's residential land use categories has a range of dwelling units that is described by the City of Murrieta's General Plan. Excluding Rural Residential, the average of this range, rounded up to the nearest integer, will be used in assigning wastewater duty unit factors to each residential land use category. Multi-Family 2, which has a range of 15.1-18.0 du/ac, will therefore be assigned a wastewater duty factor of 17.0 EDU/ac. Due to the low value for Rural Residential, 0.0-0.4 du/ac, the maximum value of 0.4 du/ac will be utilized for conservative purposes of this Master Plan. Table 3.4 shows the wastewater duty unit factors for all residential land use categories.

Table 3.4 – RCWD Wastewater Duty Unit Factors for Residential Dwellings

No.	Land Use Category	EDU/ac
1	Rural Residential (0.0-0.4 du/ac)	0.4
2	Estate Residential 1 (0.5-1.0 du/ac)	1.0
3	Estate Residential 2 (1.1-2.0 du/ac)	2.0
4	Estate Residential 3 (2.1-3.0 du/ac)	3.0
5	Single-Family 1, Residential (2.1-5.0 du/ac)	4.0
6	Single-Family 2, Residential (5.1-10.0 du/ac)	8.0
7	Multi-Family 1, Residential (10.1-15.0 du/ac)	13.0
8	Multi-Family 2, Residential (15.1-18.0 du/ac)	17.0

While residential land use categories have a specific range of dwelling units per acre, non-residential land use categories do not. Section III of the District Sewer System Facility Requirements references Section 8 of District ORD, No. 90-11-1 (Appendix R) which in turn outlines each non-residential land use category with an assigned Equivalent Dwelling Unit per unit of usage. Most non-residential land use categories are zoned to allow for a maximum Floor-to-Area ratio (FAR), which allows one to compute a maximum building floor area size allowed per unit parcel acreage area. Based on this computed maximum floor area and unit of usage per 1,000 sq. foot, as shown in Section 8 of District ORD, No. 90-11-1, the number of EDU's is determined. Adhering to this methodology, an average build out area per acre was calculated for each non-residential land use category by utilizing its maximum FAR. The wastewater duty unit factor was then calculated by assigning 1 EDU for the first 1,000 sq. feet of building floor area and an additional 0.6 EDU for each 1,000 square feet thereafter, pursuant to Section 8 of District ORD. No. 90-11-1 (Appendix R). If a maximum FAR could not be determined, the 1997 value of 10 EDU/ac was used. The EDU/ac value assigned to the proposed Temecula Education Complex Project (TEC), was generated from the conclusions drawn in the 2003 Initial Study for the Temecula Education Complex Project prepared by Tom Dodson & Associates. Table 3.5 below shows the calculated wastewater duty unit factors for the non-residential land use categories.

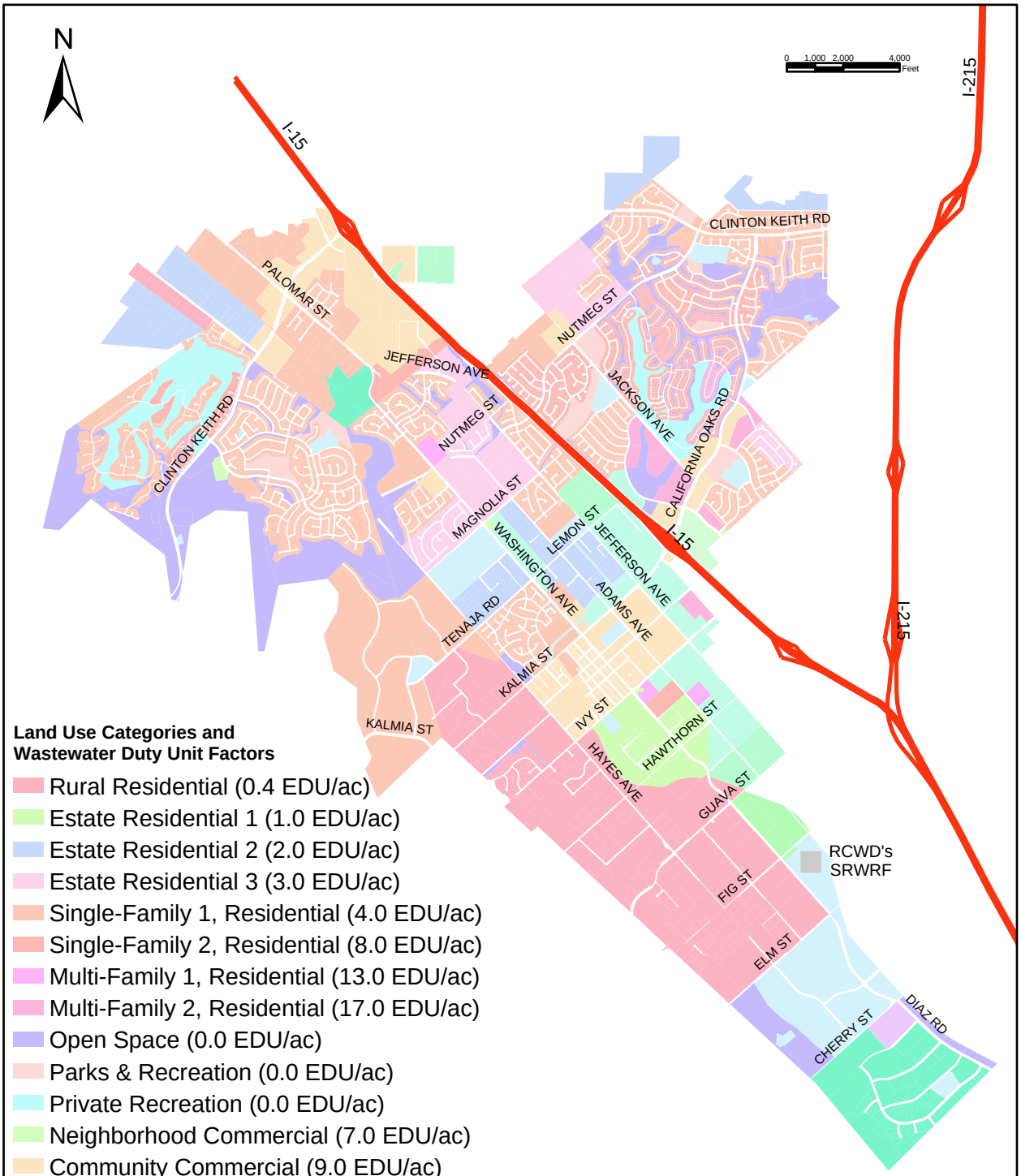
Table 3.5 - RCWD Non-Residential Wastewater Duty Unit Factors

No.	Land Use Category	Maximum Floor-Area-Ratio	EDU/ac
1	Open Space	0	0.0
2	Parks & Recreation	N/A	0.0
3	Private Recreation	N/A	0.0
4	Neighborhood Commercial	0.25	7.0
5	Community Commercial	0.27	8.0
6	Civic/Institutional	N/A	10.0
7	Business Park	0.4	11.0
8	General Industrial	0.4	11.0
9	Special Industrial	0.4	11.0
10	Multiple Use	0.5	14.0
11	Regional Commercial	0.5	14.0
12	Temecula Education Complex	N/A	19.0

The EDU/ac values generated from maximum Floor-to-Area Ratios shown in Table 3.5 range between 1750 gpd/ac (7.0 EDU/ac) and 3500 gpd/ac (14.0 EDU/ac) based on 250 gpd/EDU. The 1997 Wastewater Facilities Master Plan assumed a value of 10 EDU/ac for all non-residential land use categories. Table 3.6 summarizes the District's 20 generalized land use categories, along with their corresponding wastewater duty unit factors in EDU/ac. Figure 3.1 illustrates the RCWD Land Use Map as developed using methods described in this Master Plan.

Table 3.6 - Developed EDU/ac per Land Use Category

No.	Land Use Category	EDU/ac
1	Rural Residential (0.0-0.4 du/ac)	0.4
2	Estate Residential 1 (0.5-1.0 du/ac)	1.0
3	Estate Residential 2 (1.1-2.0 du/ac)	2.0
4	Estate Residential 3 (2.1-3.0 du/ac)	3.0
5	Single-Family 1, Residential (2.1-5.0 du/ac)	4.0
6	Single-Family 2, Residential (5.1-10.0 du/ac)	8.0
7	Multi-Family 1, Residential (10.1-15.0 du/ac)	13.0
8	Multi-Family 2, Residential (15.1-18.0 du/ac)	17.0
9	Open Space	0.0
10	Parks & Recreation	0.0
11	Private Recreation	0.0
12	Neighborhood Commercial	7.0
13	Community Commercial	8.0
14	Civic/Institutional	10.0
15	Business Park	11.0



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Existing RCWD Land Use Map

K/J 034404.00

Figure 3.1

3.1.4 Peak Dry Weather Curve

Three potential methods were available for generating Peak Dry Weather Curves. Each method produced varying levels of conservatism, especially near low flows. Selection of which curve to proceed with for the Capital Improvement Project (CIP) phase was based on District staff input and the results generated from the hydraulic model. The three methods are described below and provided in graphical view for comparison purposes as Figure 3.2.

- The 2001 Sewer Flow Monitoring Studies Report produced data to derive a peak wet weather curve. Temporary flow monitoring was conducted at nine sites throughout the District between February 9 and March 8, 2001. As discussed below in *Diurnal Patterns*, only eight of the nine sites were included in our analysis. Two separate rain events occurred during this study. Any data obtained during these rain events (or within 48 hours of a rain event) was classified as wet weather data. All other data was classified as dry weather data and was analyzed to calculate Average Dry Weather Flow Rates for each flow meter. A Peak Dry Weather Curve was derived by graphing the peaking factor derived from the measured Peak Dry Weather Flow Rates versus the Average Dry Weather Flow Rates for each of the eight (8) flow monitoring sites. This curve is illustrated as the "blue" curve in Figure 3.2.

- From Section III of the District's 1992 Sewer System Facility Requirements, a "step-function" is presented as a Peak Dry Weather Curve. This curve is shown as "orange" in Figure 3.2.

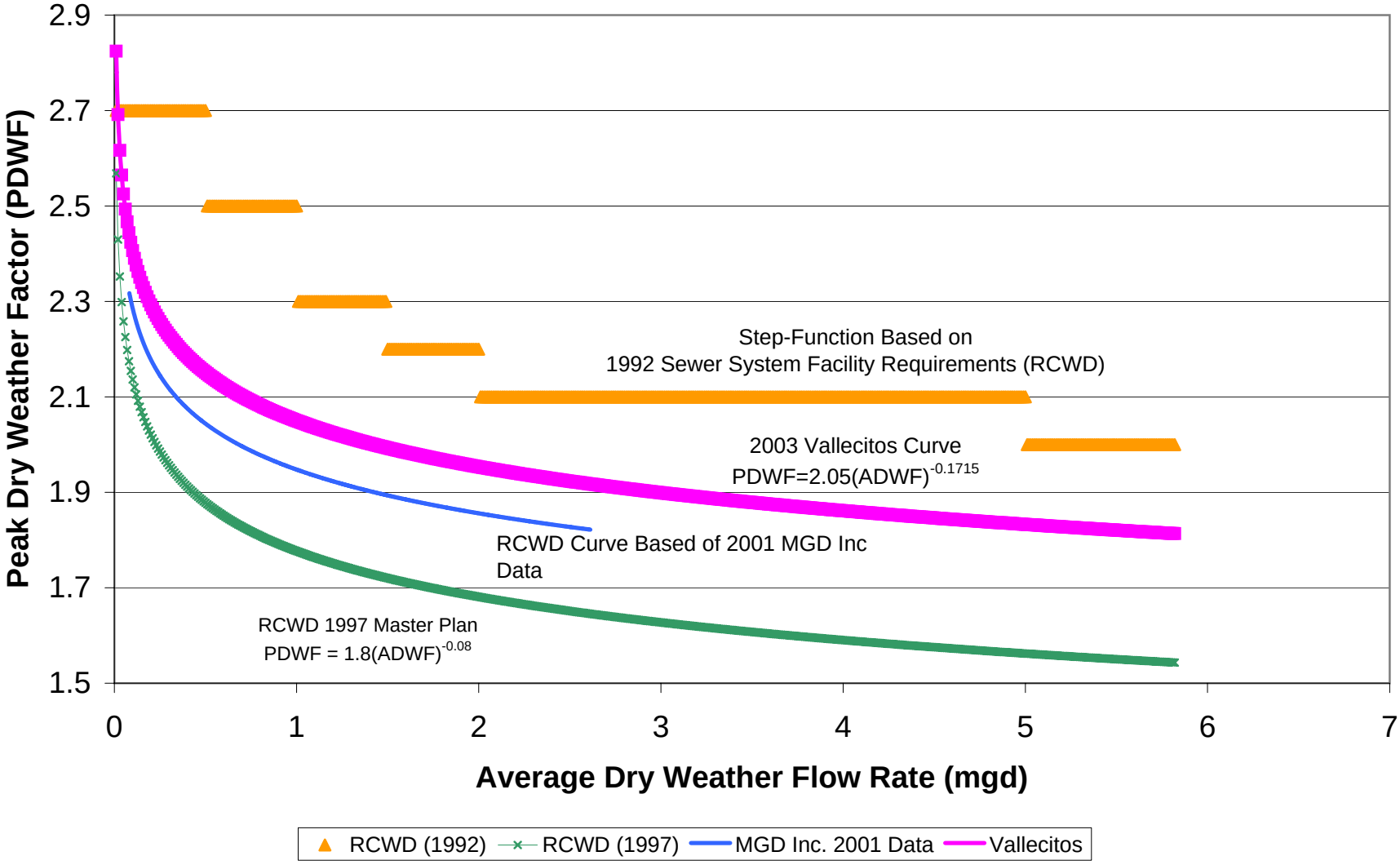
- In 1997 Montgomery Watson prepared RCWD's Wastewater Facilities Master Plan. The Peak Dry Weather Curve presented in that report is shown as "green" in Figure 3.2.

- In 2003 K/J prepared a Wastewater Facilities Master Plan for the Vallecitos Municipal Water District. The Peak Dry Weather Curve utilized in that report is presented as comparison for Peak Dry Weather Curves in similar communities of similar climate. This curve is presented as "magenta" in Figure 3.2.

As shown in Figure 3.2, the RCWD 1997 Master Plan curve is the least conservative estimate, while the District's 1992 sewer system facility requirements "Step-function" is the most conservative curve. These two curves appear to "bracket" a range of possible dry weather peaks corresponding to average dry weather flow rates. K/J recommends using the blue curve derived from the 2001 Sewer Flow Monitoring Survey Report, because it appears to consistently represent the District's wastewater collection system. The recommended peak dry weather curve is:

$$\textbf{Peak Dry Weather Factor} = 1.95 \times (\textbf{Average Dry Weather Flow Rate})^{-0.0696}$$

Figure 3.2 - Peak Dry Weather Curve Analysis



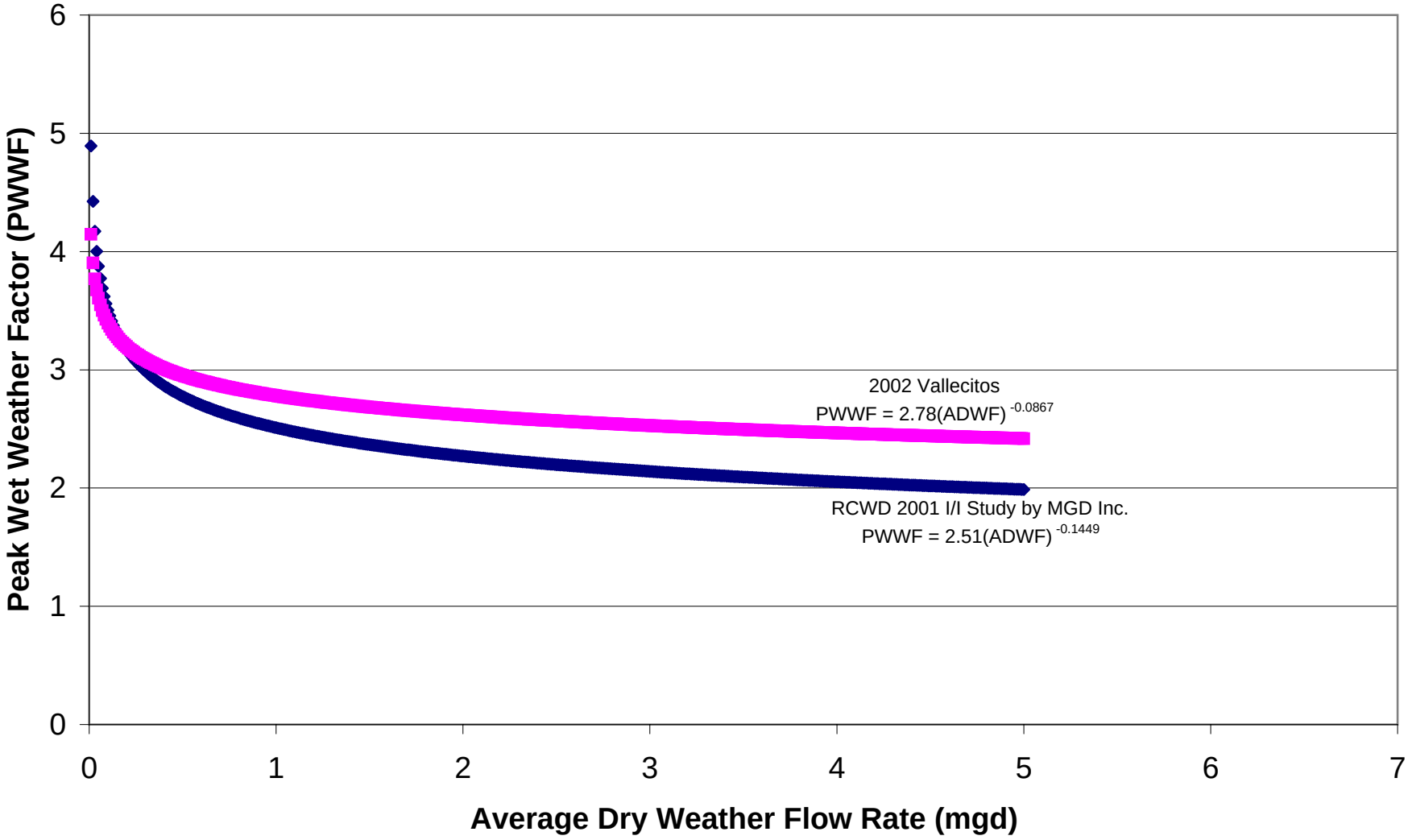
3.1.5 Peak Wet Weather Curve

The peak wet weather curve was calculated using data from the 2001 Sewer Flow Monitoring Studies Report. The wet weather flow monitoring data was analyzed as part of this TM. By plotting average dry weather flow rates versus peak flow rates, an equation for the Peak Wet Weather Factor (PWWF) was generated using a "best-fit" curve. The recommended equation for the PWWF curve is:

$$\textbf{Peak Wet Weather Factor} = 2.51 \times (\textbf{Average Dry Weather Flow Rate})^{-0.1449}$$

The PWWF Curve is illustrated in Figure 3.3, as well as the Peak Wet Weather Flow Factor Curve utilized in 2003 for the Vallecitos Municipal Water District for purposes of comparison.

Figure 3.3 - Peak Wet Weather Curve Analysis



3.2 Infiltration/Inflow Factors

For the purposes of modeling RCWD's Sewer System (as mentioned earlier) three main wastewater components were considered. For the purposes of approximating infiltration/inflow (I/I) and performing dynamic modeling each of these three components were estimated separately and then combined to determine the total wastewater flow. The three components in the I/I analysis are Base Wastewater Flow (BWF), Ground Water Infiltration (GWI) and Rainfall Dependent Infiltration/Inflow (RDI/I).

3.2.1 Base Flow

BWF is domestic (or sanitary) wastewater flow from residential, commercial, and institutional (schools, churches, hospitals, etc.) sources, plus industrial wastewater. The wastewater flow is affected by population and land uses in an area. Wastewater flow varies throughout the day in response to personal habits and business operation. BWF is normally estimated by applying wastewater duty unit factors to corresponding land use categories. The wastewater duty unit factors may be expressed in terms of average gallons per day (gpd) for a single family residential unit or per acre of commercial development. Diurnal and statistical variations are normally accounted for by applying a peak factor to the average BWF.

3.2.2 Groundwater Infiltration

GWI is defined as groundwater entering the collection system through pipe joints and manhole walls due to an aging system or improper construction. The magnitude of GWI depends on the depth of the groundwater table above the pipelines, the percentage of the system submerged, and the physical condition of the system. Variation in groundwater levels in the District is seasonal in nature. The GWI tends to be low during the summer and fall months (dry weather) and increases gradually as the wet weather season progresses. While GWI is affected by rainfall, it responds gradually and is not directly related to any one individual rainfall event.

It is assumed that the BWF and GWI are taken into account in the peak flow equations. Therefore, no further contingency for these components are necessary.

3.2.3 Rainfall Dependent Infiltration/Inflow

RDI/I is storm water that enters the wastewater collection system in direct response to the intensity and duration of individual rainfall events. RDI/I may recede gradually after a storm; however, any residual flow is considered to be a general increase in GWI. In addition to being dependent on rainfall events, RDI/I is sensitive to soil moisture, which may increase throughout the wet weather season. The ratio of RDI/I volume to the rainfall volume is referred to as the "R" value. K/J is recommending the following methodology for loading I/I into the wastewater system model for this Wastewater Facilities Master Plan:

1. Peak Dry Weather Flow (Average dry weather flow rate times the PDWF) at each time step will be routed through the model using the recommended diurnal pattern defined above. The volume at each outfall point is then totaled.

2. The Peak Wet Weather Flow (Average dry weather flow rate times the PWWF) at each time step will be calculated based upon the recommended peak wet weather flow curve discussed above.

3. The difference between the calculated Peak Dry Weather Flow and the modeled Peak Wet Weather Flow will be assumed to be attributed to RDI/I.

In both the *1992 Sewer System Facility Requirements* and the *1997 Wastewater Facilities Master Plan*, a "rule of thumb" RDI/I of 750 gpd/diameter-inch*mile was utilized in assigning I/I to each gravity main.

3.3 Collection System Design Criteria

Identifying Sanitary Sewer Overflows (SSOs) is a critical element of the U.S. Environmental Protection Agency (USEPA) Capacity, Management, Operations, and Maintenance (CMOM) program. Using the RCWD 1992 Sewer System Facility Requirements manual, facility system design criteria will be used to flag occurring SSOs and points of potential SSOs, while evaluating other important hydraulic criteria. There are three main components of the District's wastewater collection system: gravity sewers, force mains and lift stations. In an effort to address CMOM criteria and provide reliable gravity sewer service while minimizing excessive wear or energy usage through force mains and lift stations, design criteria for the following sub sections are recommended.

3.3.1 Gravity Main Criteria

For the purposes of the Wastewater Facilities Master Plan, gravity sewers will be evaluated through the use of a static sewer model. SSO identification and pipeline sizing will be based on the Manning's equation and the following criteria:

- Pipes 12-inches in diameter and smaller: ½ full at peak flow
- Pipes over 12-inches in diameter: ¾ full at peak flow
- Minimum velocity: 2 feet per second
- Maximum velocity: 10 feet per second
- Manning's n: .013
- Minimum Slope requirements: See Table 3.7 below

Table 3.7 – Minimum Slope Requirements

Sewer Size (in)	Grade (%)
8	0.400
10	0.280
12	0.240
15	0.120
18	0.108
21	0.088
24	0.068
27	0.060
30	0.052
33	0.044
36	0.040
42	0.032

3.3.2 Force Main Criteria

- Minimum Force Main Diameter: 4 inches
- Minimum Velocity: 3 feet per second
- Maximum Velocity: 5 feet per second
- Maximum allowable headloss: 10 feet/1000 feet of pipeline
- Maximum desirable headloss: 5 feet/1000 feet of pipeline
- Hazen-Williams C factor: 120

3.3.3 Lift Station Criteria

Lift Stations should be sized for the peak wet weather flow rate plus an additional 20% capacity to account for wear, miscellaneous debris, etc. that may reduce pumping performance. Lift stations should be capable of meeting the following criteria with the largest capacity pump serving as standby:

- Manufacturers recommended cycling times for pumping equipment.
- 60 percent pump efficiency should be assumed, except where other information is available.
- 90 percent motor efficiency should be assumed, except where other information is available.
- Wet well sized to minimize retention time such that maximum pump cycling time (usually at ½ design inflow) is within manufacturer's recommendations.

Section 4: Wastewater Flows and Projections

Wastewater flow projections for the Rancho California Water District were developed in support of the overall Wastewater Facilities Master Plan effort, including the development of the wastewater system hydraulic model.

Wastewater flow projections have been developed as described below:

- Wastewater flow projections by Development Tract
- Wastewater flow projections by District defined Sub-Areas for parcels outside of defined Development Tracts

It was important for the District to view projections by development tract or defined sub-area to refine the accuracy of the hydraulic model loading. The GIS database developed for these projections would allow the District to adjust future tract-specific flows to evaluate collection system and treatment plant impacts.

Wastewater flows were projected for the following time increments:

- Existing (2004) Conditions
- Five-year increments ('09,'14,'24)
- Ultimate (Build-out) Conditions

Multi-agency flows within the District's sewer service area have been considered as the agencies of Elsinore Valley Municipal Water District (EVMWD) and the Murrieta County Water District (MCWD) each contribute to the wastewater flow entering RCWD's collection system, with eventual treatment occurring at the Santa Rosa Wastewater Reclamation Facility (SRWRF).

Wastewater flow projections have been calculated for each time increment using either growth rates from the Southern California Association of Governments (SCAG) year 2000 census tract population projections, or existing inter-agency agreements with the District. Existing flows were developed based upon the District's existing sewer customer billing database, as well as specific plan information when applicable. Ultimate wastewater flow projections were calculated using the GIS land use database and the wastewater unit duty factors, as described in section 3, Wastewater System Design Criteria.

Historical and projected wastewater flows by year are presented as Figure 4.1. Table 4.1 below, summarizes projected wastewater flows to the SRWRF for existing, five-year time increments, and ultimate build-out, assuming 250 gpd/EDU.

Figure 4.1
Historic and Projected Watewater Flows

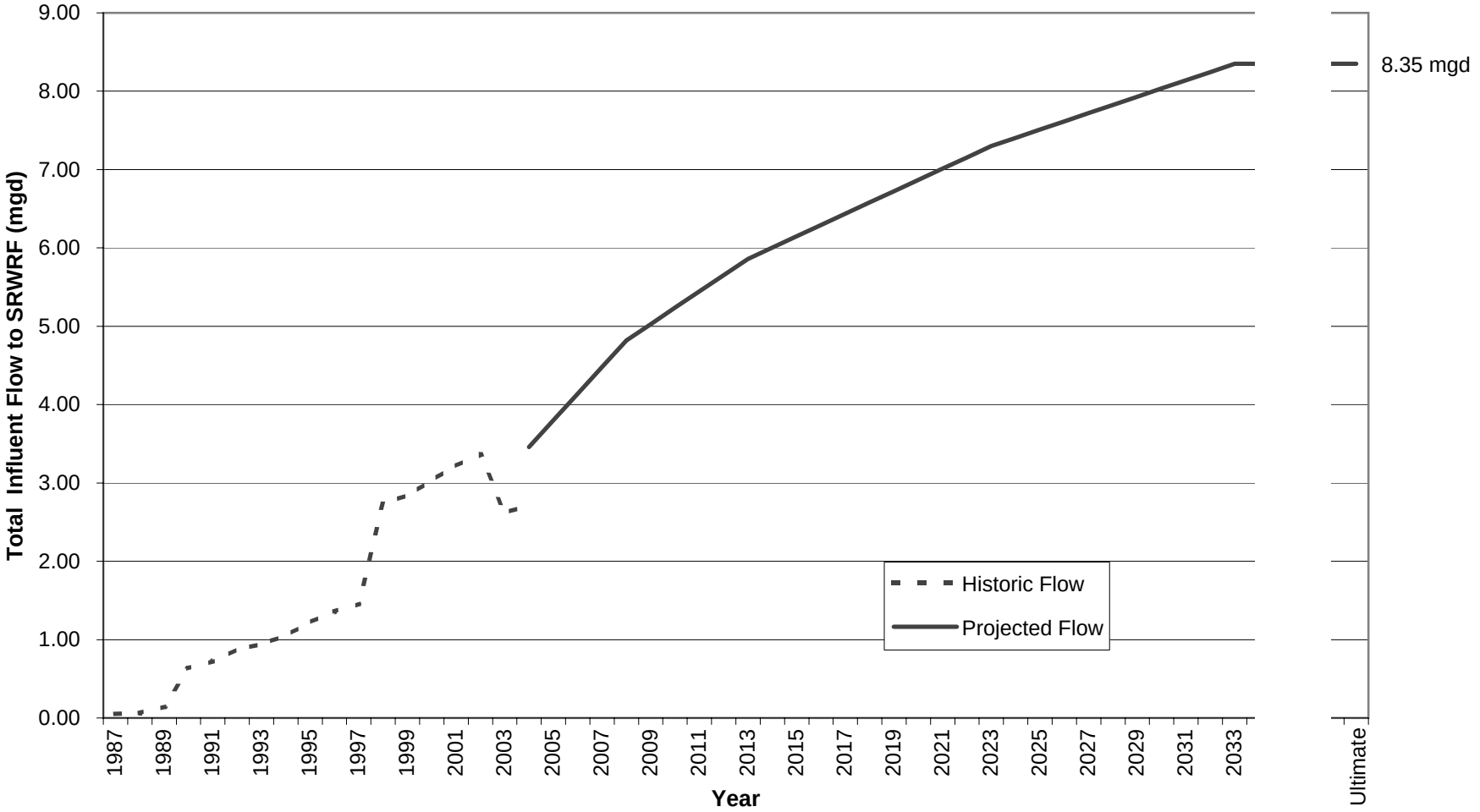


Table 4.1 - Proposed Wastewater Flow Projections

Contributing Agency	2004 (mgd)	2009 (mgd)	2014 (mgd)	2024 (mgd)	Ultimate (mgd)
EVMWD	1.28	1.50	1.34	1.47	1.47
MCWD	0.50	1.16	1.98	2.74	3.27
RCWD	1.68	2.16	2.54	3.09	3.61
SRWRF Total	**3.46**	**4.82**	**5.86**	**7.30**	**8.35**

Wastewater flow projections were developed by assigning each parcel in the District's GIS database an EDU value. The EDUs were then assigned the base unit flow factor of 250 gpd/EDU (as developed in section 3) to generate wastewater flows. If a different base unit flow factor (gpd/EDU) had been assigned, wastewater flow projections would change accordingly. Table 4.2, shown below, illustrates the sensitivity of projected wastewater flows to the base unit flow factor for the SRWRF for existing, five-year time increments, and ultimate build-out, assuming 210 gpd/EDU.

Table 4.2 – Wastewater Flow Projections Based on 210 gpd/EDU

Contributing Agency	2004 (mgd)	2009 (mgd)	2014 (mgd)	2024 (mgd)	Ultimate (mgd)
EVMWD	1.08	1.26	1.13	1.23	1.23
MCWD	0.42	0.98	1.66	2.30	2.74
RCWD	1.41	1.82	2.13	2.60	3.03
SRWRF Total	**2.91**	**4.05**	**4.92**	**6.13**	**7.01**

Figures 4.2, 4.2a, 4.2b and 4.2c illustrate the development tracts and sub-areas as used in the projections presented in Tables 4.1 and 4.2 above. The development tracts and sub-area flow projections for each contributing agency are presented in Tables 4.3 through 4.5.

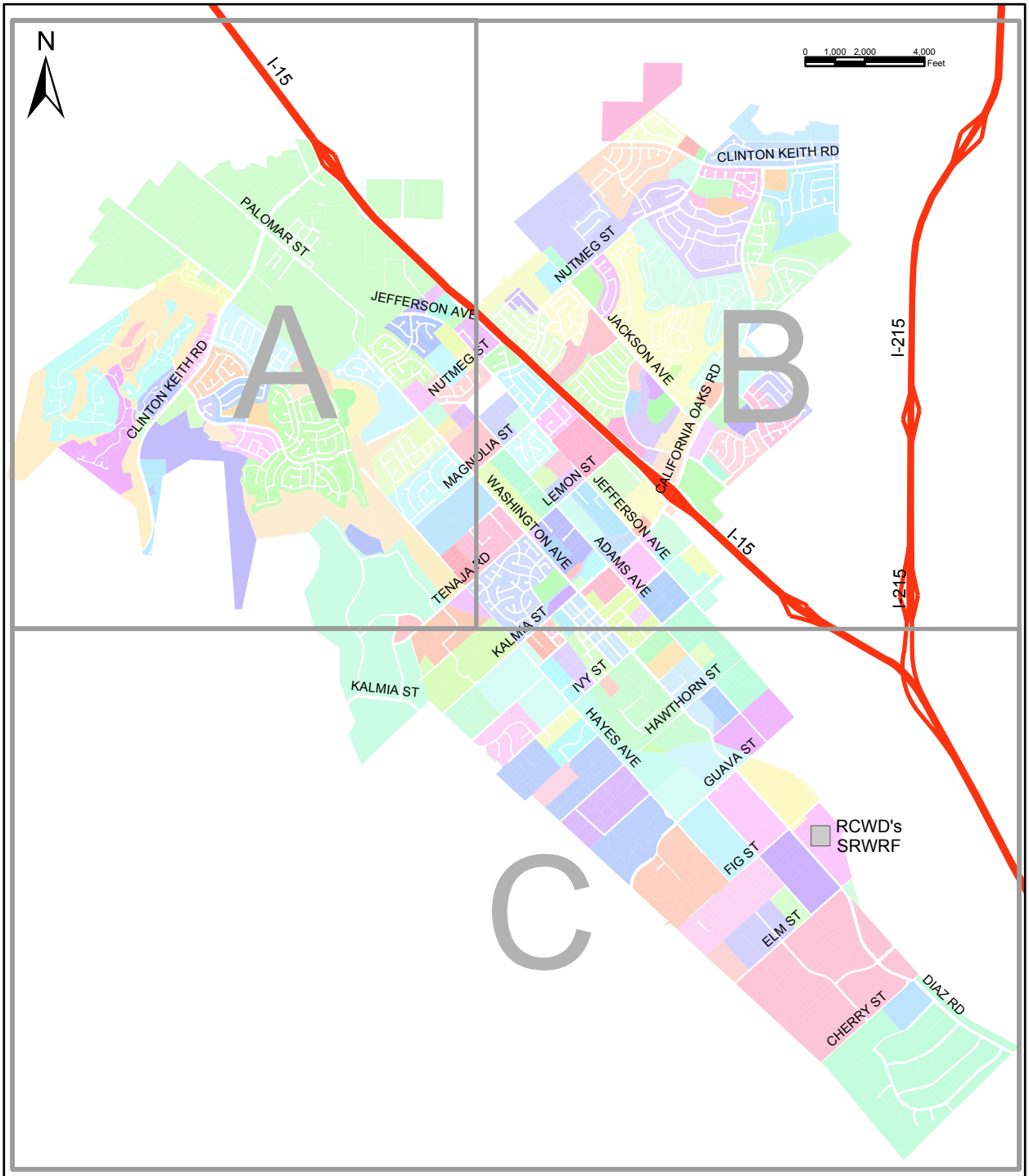


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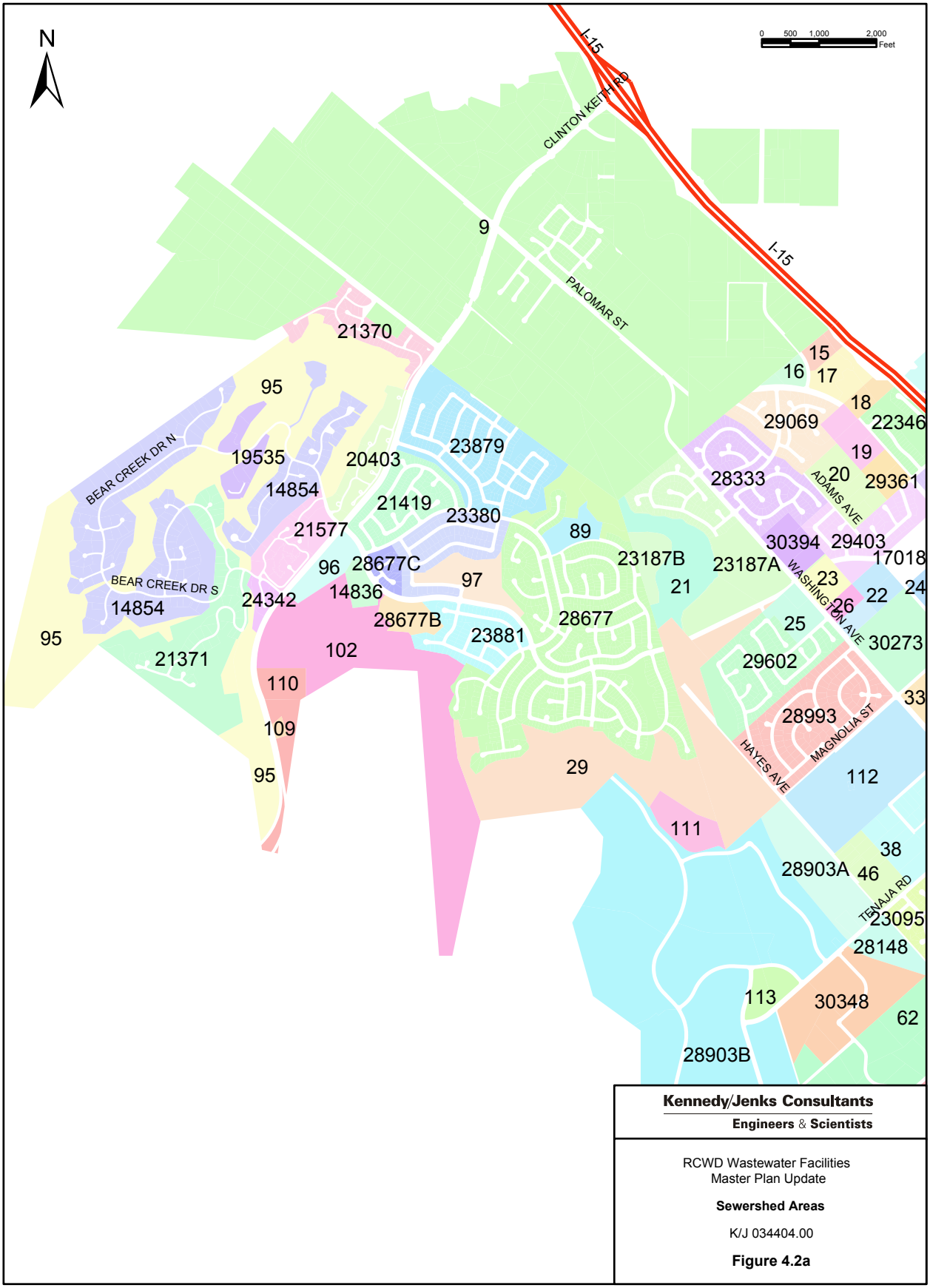
Figure 4.2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Feet
I-15
CLINTON KEITH RD
I-15
9
PALOMAR ST
21370
95
BEAR CREEK DR N
19535
20403
23879
14854
21419
23380
21577
89
BEAR CREEK DR S
96
28677C
97
14854
24342
14836
28677B
23881
28677
102
95
21371
110
109
95
29
111
23187B
23187A
21
WASHINGTON AVE
ADAMS AVE
HAYES AVE
MAGNOLIA ST
TENAJA RD
15
16
17
18
22346
29069
19
28333
20
29361
30394
29403
17018
23
22
24
26
25
30273
29602
33
28993
112
38
28903A
46
23095
28148
113
30348
62
28903B
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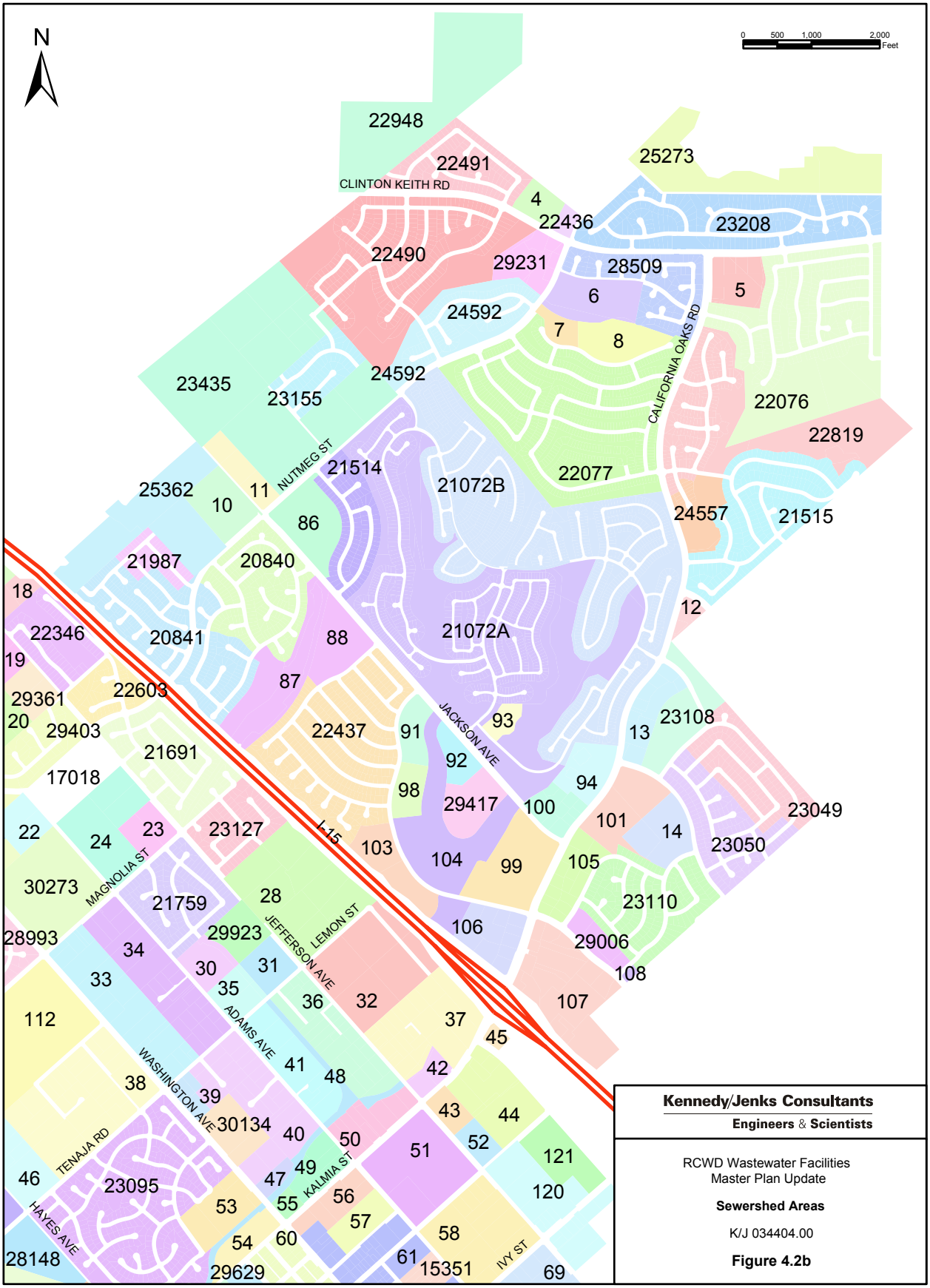
Figure 4.2a

2B

2C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22491
CLINTON KEITH RD
25273
4
22436
23208
22490
29231
28509
6
5
24592
7
8
CALIFORNIA OAKS RD
24592
23435
23155
22076
22819
NUTMEG ST
21514
21072B
22077
25362
11
10
86
24557
21515
21987
20840
18
12
22346
20841
88
21072A
19
87
29361
22603
JACKSON AVE
93
23108
20
29403
22437
91
13
21691
92
17018
98
94
29417
100
23049
22
23
23127
I-15
101
14
24
103
104
99
105
23050
MAGNOLIA ST
30273
28
23110
21759
JEFFERSON AVE
LEMON ST
106
28993
29923
29006
34
108
30
31
33
35
36
32
107
112
37
45
ADAMS AVE
WASHINGTON AVE
41
48
42
38
39
43
44
TENAJA RD
30134
40
50
51
52
121
46
23095
47
49
KALMIA ST
56
120
53
55
57
HAYES AVE
58
54
60
IVY ST
28148
61
15351
69
29629
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Figure 4.2b

2A

2C

2A 2B

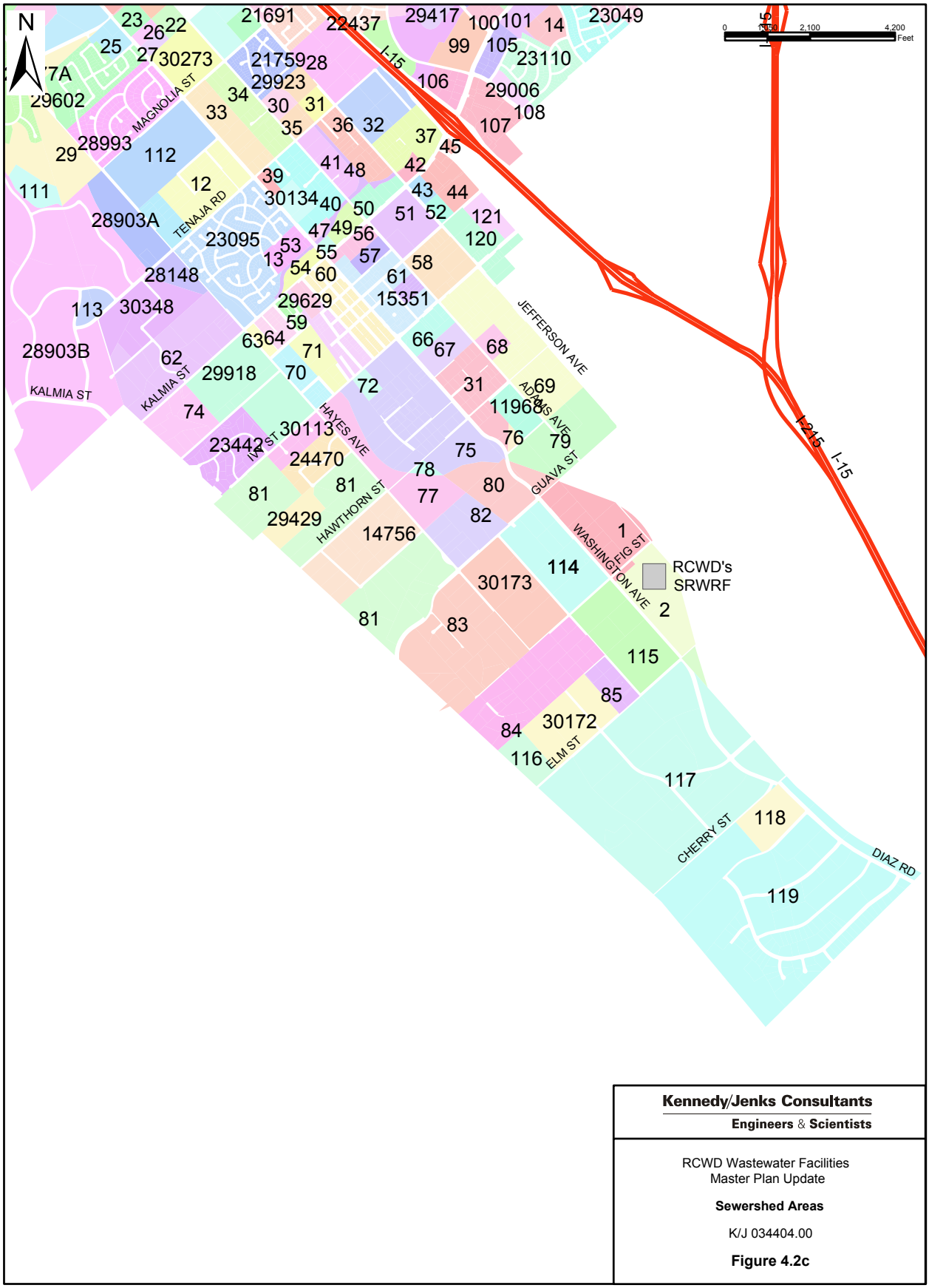

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Figure 4.2c

Table 4.3 – EVMWD Sub-Area/Development Tract Wastewater Flow Projections

Sub-Area or Development Tract	2004 Flow (EDU)	2004 Flow (mgd)	2009 Flow (EDU)	2009 Flow (mgd)	2014 Flow (EDU)	2014 Flow (mgd)	2024 Flow (EDU)	2024 Flow (mgd)	2034 Flow (EDU)	2034 Flow (mgd)	Ultimate Flow (EDU)	Ultimate Flow (mgd)
4	0	0.00	0	0.00	0	0.00	4	0.00	4	0.00	4	0.00
5	0	0.00	0	0.00	53	0.01	53	0.01	53	0.01	53	0.01
6	59	0.01	59	0.01	100	0.03	169	0.04	169	0.04	169	0.04
7	0	0.00	0	0.00	4	0.00	4	0.00	4	0.00	4	0.00
8	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
9	347	0.09	1,000	0.25	0	0.00	0	0.00	0	0.00	0	0.00
10	0	0.00	22	0.01	44	0.01	44	0.01	44	0.01	44	0.01
11	0	0.00	25	0.01	53	0.01	53	0.01	53	0.01	53	0.01
12	7	0.00	7	0.00	27	0.01	27	0.01	27	0.01	27	0.01
13	72	0.02	72	0.02	126	0.03	126	0.03	126	0.03	126	0.03
14	70	0.02	70	0.02	100	0.03	150	0.04	150	0.04	150	0.04
21072B	944	0.24	968	0.24	968	0.24	968	0.24	968	0.24	968	0.24
21515	241	0.06	241	0.06	241	0.06	241	0.06	241	0.06	241	0.06
22076	299	0.07	299	0.07	299	0.07	299	0.07	299	0.07	299	0.07
22077	631	0.16	631	0.16	631	0.16	631	0.16	631	0.16	631	0.16
22436	0	0.00	0	0.00	9	0.00	9	0.00	9	0.00	9	0.00
22490	295	0.07	295	0.07	295	0.07	295	0.07	295	0.07	295	0.07
22491	116	0.03	116	0.03	116	0.03	116	0.03	116	0.03	116	0.03
22819	174	0.04	174	0.04	174	0.04	174	0.04	174	0.04	174	0.04
22948	0	0.00	0	0.00	118	0.03	118	0.03	118	0.03	118	0.03
23049	160	0.04	160	0.04	160	0.04	160	0.04	160	0.04	160	0.04
23050	163	0.04	163	0.04	163	0.04	163	0.04	163	0.04	163	0.04
23108	337	0.08	337	0.08	337	0.08	337	0.08	337	0.08	337	0.08
23110	189	0.05	189	0.05	189	0.05	189	0.05	189	0.05	189	0.05
23155	72	0.02	72	0.02	72	0.02	72	0.02	72	0.02	72	0.02
23208	213	0.05	213	0.05	213	0.05	213	0.05	213	0.05	213	0.05
23435	252	0.06	306	0.08	306	0.08	306	0.08	306	0.08	306	0.08
24557	14	0.00	14	0.00	14	0.00	14	0.00	14	0.00	14	0.00
24592	100	0.03	100	0.03	100	0.03	100	0.03	100	0.03	100	0.03
25273	64	0.02	107	0.03	107	0.03	107	0.03	107	0.03	107	0.03
25362	136	0.03	187	0.05	187	0.05	187	0.05	187	0.05	187	0.05
28509	112	0.03	112	0.03	112	0.03	112	0.03	112	0.03	112	0.03
29231	56	0.01	56	0.01	56	0.01	56	0.01	56	0.01	56	0.01
TOTALS	***5,123***	***1.28***	***5,995***	***1.50***	***5,374***	***1.34***	***5,877****	***1.47****	***5,877****	***1.47****	***5,877****	***1.47****

* 380 EDUs activated in 2023 as per the District's instruction

Table 4.4 – MCWD Sub-Area/Development Tract Wastewater Flow Projections

Sub-Area or Development Tract	2004 Flow (EDU)	2004 Flow (mgd)	2009 Flow (EDU)	2009 Flow (mgd)	2018 Flow (EDU)	2018 Flow (mgd)	2024 Flow (EDU)	2024 Flow (mgd)	2034 Flow (EDU)	2034 Flow (mgd)	Ultimate Flow (EDU)	Ultimate Flow (mgd)
1	0	0.00	0	0.00	218	0.05	432	0.11	748	0.19	748	0.19
15	0	0.00	4	0.00	8	0.00	14	0.00	14	0.00	14	0.00
16	0	0.00	5	0.00	9	0.00	16	0.00	16	0.00	16	0.00
17	4	0.00	10	0.00	20	0.00	34	0.01	34	0.01	34	0.01
18	0	0.00	3	0.00	7	0.00	11	0.00	11	0.00	11	0.00
19	0	0.00	12	0.00	24	0.01	41	0.01	41	0.01	41	0.01
20	0	0.00	22	0.01	43	0.01	75	0.02	75	0.02	75	0.02
21	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
22	0	0.00	8	0.00	17	0.00	29	0.01	29	0.01	29	0.01
23	0	0.00	17	0.00	33	0.01	57	0.01	57	0.01	57	0.01
24	0	0.00	25	0.01	49	0.01	84	0.02	84	0.02	84	0.02
25	70	0.02	70	0.02	83	0.02	99	0.02	99	0.02	99	0.02
26	3	0.00	4	0.00	9	0.00	15	0.00	15	0.00	15	0.00
27	0	0.00	4	0.00	8	0.00	15	0.00	15	0.00	15	0.00
28	0	0.00	0	0.00	167	0.04	331	0.08	573	0.14	573	0.14
30	0	0.00	11	0.00	21	0.01	37	0.01	37	0.01	37	0.01
31	36	0.01	36	0.01	51	0.01	88	0.02	88	0.02	88	0.02
33	0	0.00	154	0.04	304	0.08	450	0.11	526	0.13	526	0.13
34	0	0.00	22	0.01	43	0.01	74	0.02	74	0.02	74	0.02
35	0	0.00	18	0.00	35	0.01	61	0.02	61	0.02	61	0.02
36	0	0.00	24	0.01	47	0.01	81	0.02	81	0.02	81	0.02
37	0	0.00	142	0.04	281	0.07	350	0.09	487	0.12	487	0.12
38	2	0.00	46	0.01	91	0.02	109	0.03	109	0.03	109	0.03
39	0	0.00	19	0.00	37	0.01	64	0.02	64	0.02	64	0.02
40	0	0.00	31	0.01	62	0.02	107	0.03	107	0.03	107	0.03
41	0	0.00	13	0.00	27	0.01	46	0.01	46	0.01	46	0.01
42	0	0.00	21	0.01	42	0.01	72	0.02	72	0.02	72	0.02
43	0	0.00	23	0.01	45	0.01	79	0.02	79	0.02	79	0.02
44	64	0.02	101	0.03	200	0.05	346	0.09	346	0.09	346	0.09
45	0	0.00	4	0.00	9	0.00	15	0.00	15	0.00	15	0.00
46	0	0.00	16	0.00	31	0.01	38	0.01	38	0.01	38	0.01
47	0	0.00	7	0.00	15	0.00	26	0.01	26	0.01	26	0.01

Table 4.4 – MCWD Sub-Area/Development Tract Wastewater Flow Projections

Sub-Area or Development Tract	2004 Flow (EDU)	2004 Flow (mgd)	2009 Flow (EDU)	2009 Flow (mgd)	2018 Flow (EDU)	2018 Flow (mgd)	2024 Flow (EDU)	2024 Flow (mgd)	2034 Flow (EDU)	2034 Flow (mgd)	Ultimate Flow (EDU)	Ultimate Flow (mgd)
48	0	0.00	37	0.01	50	0.01	100	0.03	128	0.03	128	0.03
49	1	0.00	43	0.01	85	0.02	100	0.02	147	0.04	147	0.04
50	0	0.00	57	0.01	114	0.03	150	0.04	197	0.05	197	0.05
51	34	0.01	80	0.02	158	0.04	200	0.05	274	0.07	274	0.07
52	0	0.00	23	0.01	45	0.01	77	0.02	77	0.02	77	0.02
53	0	0.00	18	0.00	35	0.01	61	0.02	61	0.02	61	0.02
54	0	0.00	11	0.00	21	0.01	37	0.01	37	0.01	37	0.01
55	0	0.00	6	0.00	12	0.00	21	0.01	21	0.01	21	0.01
56	4	0.00	25	0.01	50	0.01	86	0.02	86	0.02	86	0.02
57	26	0.01	28	0.01	55	0.01	96	0.02	96	0.02	96	0.02
58	0	0.00	85	0.02	150	0.04	200	0.05	291	0.07	291	0.07
59	0	0.00	14	0.00	28	0.01	49	0.01	49	0.01	49	0.01
60	5	0.00	50	0.01	100	0.02	150	0.04	239	0.06	239	0.06
61	16	0.00	97	0.02	191	0.05	250	0.06	331	0.08	331	0.08
62	0	0.00	17	0.00	33	0.01	40	0.01	40	0.01	40	0.01
63	0	0.00	12	0.00	23	0.01	39	0.01	39	0.01	39	0.01
64	0	0.00	28	0.01	56	0.01	96	0.02	96	0.02	96	0.02
65	0	0.00	52	0.01	104	0.03	150	0.04	180	0.04	180	0.04
66	46	0.01	69	0.02	137	0.03	175	0.04	237	0.06	237	0.06
67	0	0.00	45	0.01	88	0.02	100	0.03	153	0.04	153	0.04
68	0	0.00	36	0.01	70	0.02	122	0.03	122	0.03	122	0.03
69	1	0.00	415	0.10	822	0.21	1,000	0.25	1,423	0.36	1,423	0.36
70	1	0.00	45	0.01	90	0.02	125	0.03	156	0.04	156	0.04
71	0	0.00	52	0.01	103	0.03	150	0.04	179	0.04	179	0.04
72	0	0.00	19	0.00	38	0.01	66	0.02	66	0.02	66	0.02
73	0	0.00	14	0.00	28	0.01	48	0.01	48	0.01	48	0.01
74	0	0.00	7	0.00	13	0.00	16	0.00	16	0.00	16	0.00
75	0	0.00	42	0.01	84	0.02	100	0.02	145	0.04	145	0.04
76	0	0.00	12	0.00	24	0.01	41	0.01	41	0.01	41	0.01
77	0	0.00	8	0.00	15	0.00	26	0.01	26	0.01	26	0.01
78	0	0.00	1	0.00	2	0.00	3	0.00	3	0.00	3	0.00
79	3	0.00	211	0.05	418	0.10	600	0.15	724	0.18	724	0.18
80	0	0.00	6	0.00	12	0.00	21	0.01	21	0.01	21	0.01
81	0	0.00	34	0.01	67	0.02	81	0.02	81	0.02	81	0.02

Table 4.4 – MCWD Sub-Area/Development Tract Wastewater Flow Projections

Sub-Area or Development Tract	2004 Flow (EDU)	2004 Flow (mgd)	2009 Flow (EDU)	2009 Flow (mgd)	2018 Flow (EDU)	2018 Flow (mgd)	2024 Flow (EDU)	2024 Flow (mgd)	2034 Flow (EDU)	2034 Flow (mgd)	Ultimate Flow (EDU)	Ultimate Flow (mgd)
82	0	0.00	5	0.00	10	0.00	18	0.00	18	0.00	18	0.00
83	0	0.00	4	0.00	9	0.00	28	0.01	53	0.01	53	0.01
84	0	0.00	3	0.00	8	0.00	22	0.01	43	0.01	43	0.01
85	0	0.00	1	0.00	1	0.00	4	0.00	8	0.00	8	0.00
120	9	0.00	131	0.03	260	0.07	451	0.11	451	0.11	451	0.11
121	235	0.06	235	0.06	235	0.06	235	0.06	235	0.06	235	0.06
11968	0	0.00	57	0.01	113	0.03	150	0.04	195	0.05	195	0.05
14756	0	0.00	13	0.00	26	0.01	32	0.01	32	0.01	32	0.01
15351	0	0.00	16	0.00	31	0.01	54	0.01	54	0.01	54	0.01
23095	426	0.11	426	0.11	426	0.11	426	0.11	426	0.11	426	0.11
23187A	140	0.04	140	0.04	223	0.06	267	0.07	267	0.07	267	0.07
23442	44	0.01	44	0.01	44	0.01	44	0.01	44	0.01	44	0.01
24470	0	0.00	4	0.00	9	0.00	10	0.00	10	0.00	10	0.00
28148	0	0.00	26	0.01	51	0.01	61	0.02	61	0.02	61	0.02
28333	212	0.05	212	0.05	212	0.05	212	0.05	212	0.05	212	0.05
28993	161	0.04	161	0.04	161	0.04	161	0.04	161	0.04	161	0.04
29069	84	0.02	89	0.02	89	0.02	89	0.02	89	0.02	89	0.02
29361	19	0.00	19	0.00	19	0.00	19	0.00	19	0.00	19	0.00
29403	82	0.02	82	0.02	82	0.02	82	0.02	82	0.02	82	0.02
29429	0	0.00	4	0.00	7	0.00	9	0.00	9	0.00	9	0.00
29602	182	0.05	183	0.05	183	0.05	183	0.05	183	0.05	183	0.05
29629	0	0.00	9	0.00	19	0.00	32	0.01	32	0.01	32	0.01
29918	0	0.00	16	0.00	31	0.01	38	0.01	38	0.01	38	0.01
29923	0	0.00	12	0.00	24	0.01	41	0.01	41	0.01	41	0.01
30113	1	0.00	3	0.00	6	0.00	7	0.00	7	0.00	7	0.00
30134	0	0.00	15	0.00	29	0.01	50	0.01	50	0.01	50	0.01
30273	75	0.02	81	0.02	81	0.02	81	0.02	81	0.02	81	0.02
30303	0	0.00	17	0.00	33	0.01	57	0.01	57	0.01	57	0.01
30348	0	0.00	10	0.00	19	0.00	23	0.01	23	0.01	23	0.01
30394	0	0.00	54	0.01	107	0.03	184	0.05	184	0.05	184	0.05
TOTALS	***1,987***	***0.50***	***4,643***	***1.16***	***7,906***	***1.98***	***10,942***	***2.74***	***13,062***	***3.27***	***13,062***	***3.27***

Table 4.5 – RCWD Sub-Area/Development Tract Wastewater Flow Projections

Sub-Area or Development Tract	2004 Flow (EDU)	2004 Flow (mgd)	2009 Flow (EDU)	2009 Flow (mgd)	2014 Flow (EDU)	2014 Flow (mgd)	2024 Flow (EDU)	2024 Flow (mgd)	2034 Flow (EDU)	2034 Flow (mgd)	Ultimate Flow (EDU)	Ultimate Flow (mgd)
2	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
3	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
29	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
32	0	0.00	172	0.04	340	0.09	589	0.15	589	0.15	589	0.15
86	0	0.00	0	0.00	4	0.00	4	0.00	4	0.00	4	0.00
87	0	0.00	0	0.00	4	0.00	4	0.00	4	0.00	4	0.00
88	38	0.01	38	0.01	50	0.01	100	0.03	151	0.04	151	0.04
89	30	0.01	45	0.01	87	0.02	105	0.03	105	0.03	105	0.03
90	0	0.00	0	0.00	10	0.00	10	0.00	10	0.00	10	0.00
91	91	0.02	91	0.02	91	0.02	91	0.02	91	0.02	91	0.02
92	3	0.00	121	0.03	121	0.03	121	0.03	121	0.03	121	0.03
93	17	0.00	17	0.00	36	0.01	36	0.01	36	0.01	36	0.01
94	112	0.03	112	0.03	112	0.03	112	0.03	112	0.03	112	0.03
95	1	0.00	1	0.00	1	0.00	1	0.00	1	0.00	1	0.00
96	0	0.00	29	0.01	58	0.01	69	0.02	69	0.02	69	0.02
97	0	0.00	2	0.00	3	0.00	4	0.00	4	0.00	4	0.00
98	0	0.00	129	0.03	129	0.03	129	0.03	129	0.03	129	0.03
99	391	0.10	391	0.10	391	0.10	391	0.10	391	0.10	391	0.10
100	57	0.01	75	0.02	75	0.02	75	0.02	75	0.02	75	0.02
101	0	0.00	20	0.01	20	0.01	20	0.01	20	0.01	20	0.01
102	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
103	16	0.00	50	0.01	100	0.02	205	0.05	205	0.05	205	0.05
104	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
105	79	0.02	79	0.02	114	0.03	114	0.03	114	0.03	114	0.03
106	95	0.02	122	0.03	122	0.03	122	0.03	122	0.03	122	0.03
107	151	0.04	250	0.06	350	0.09	450	0.11	559	0.14	559	0.14
108	0	0.00	5	0.00	5	0.00	5	0.00	5	0.00	5	0.00
109	3	0.00	6	0.00	13	0.00	15	0.00	15	0.00	15	0.00
110	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
111	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
112	439	0.11	439	0.11	637	0.16	763	0.19	763	0.19	763	0.19
113	0	0.00	21	0.01	42	0.01	50	0.01	50	0.01	50	0.01
114	0	0.00	2	0.00	5	0.00	16	0.00	30	0.01	30	0.01
115	0	0.00	2	0.00	6	0.00	16	0.00	31	0.01	31	0.01

Table 4.5 – RCWD Sub-Area/Development Tract Wastewater Flow Projections

Sub-Area or Development Tract	2004 Flow (EDU)	2004 Flow (mgd)	2009 Flow (EDU)	2009 Flow (mgd)	2014 Flow (EDU)	2014 Flow (mgd)	2024 Flow (EDU)	2024 Flow (mgd)	2034 Flow (EDU)	2034 Flow (mgd)	Ultimate Flow (EDU)	Ultimate Flow (mgd)
116	0	0.00	1	0.00	1	0.00	4	0.00	8	0.00	8	0.00
117	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
118	0	0.00	625	0.16	625	0.16	625	0.16	625	0.16	625	0.16
119	345	0.09	345	0.09	697	0.17	2,021	0.51	3,880	0.97	3,880	0.97
14836	0	0.00	6	0.00	12	0.00	14	0.00	14	0.00	14	0.00
14854	274	0.07	274	0.07	274	0.07	274	0.07	274	0.07	274	0.07
19535	80	0.02	80	0.02	80	0.02	80	0.02	80	0.02	80	0.02
20403	59	0.01	59	0.01	59	0.01	59	0.01	59	0.01	59	0.01
20840	233	0.06	233	0.06	233	0.06	233	0.06	233	0.06	233	0.06
20841	335	0.08	336	0.08	336	0.08	336	0.08	336	0.08	336	0.08
21072A	620	0.16	620	0.16	620	0.16	620	0.16	620	0.16	620	0.16
21370	75	0.02	75	0.02	75	0.02	75	0.02	75	0.02	75	0.02
21371	63	0.02	63	0.02	63	0.02	63	0.02	63	0.02	63	0.02
21419	204	0.05	204	0.05	204	0.05	204	0.05	204	0.05	204	0.05
21514	114	0.03	114	0.03	114	0.03	114	0.03	114	0.03	114	0.03
21577	127	0.03	127	0.03	127	0.03	127	0.03	127	0.03	127	0.03
21691	163	0.04	163	0.04	163	0.04	163	0.04	163	0.04	163	0.04
21759	152	0.04	155	0.04	155	0.04	155	0.04	155	0.04	155	0.04
21987	57	0.01	57	0.01	57	0.01	57	0.01	57	0.01	57	0.01
22346	71	0.02	71	0.02	71	0.02	71	0.02	71	0.02	71	0.02
22437	384	0.10	384	0.10	384	0.10	384	0.10	384	0.10	384	0.10
22603	37	0.01	37	0.01	37	0.01	37	0.01	37	0.01	37	0.01
23127	90	0.02	90	0.02	90	0.02	90	0.02	90	0.02	90	0.02
23187B	18	0.00	18	0.00	33	0.01	40	0.01	40	0.01	40	0.01
23380	95	0.02	95	0.02	95	0.02	95	0.02	95	0.02	95	0.02
23879	261	0.07	261	0.07	261	0.07	261	0.07	261	0.07	261	0.07
23881	101	0.03	101	0.03	101	0.03	101	0.03	101	0.03	101	0.03
24342	22	0.01	22	0.01	22	0.01	22	0.01	22	0.01	22	0.01
28677A	873	0.22	873	0.22	873	0.22	873	0.22	873	0.22	873	0.22
28677B	0	0.00	4	0.00	4	0.00	4	0.00	4	0.00	4	0.00
28677C	28	0.01	28	0.01	28	0.01	28	0.01	28	0.01	28	0.01
28903A	0	0.00	108	0.03	108	0.03	108	0.03	108	0.03	108	0.03
28903B	0	0.00	431	0.11	845	0.21	1,013	0.25	1,013	0.25	1,013	0.25
29006	101	0.03	152	0.04	152	0.04	152	0.04	152	0.04	152	0.04

Table 4.5 – RCWD Sub-Area/Development Tract Wastewater Flow Projections

Sub-Area or Development Tract	2004 Flow (EDU)	2004 Flow (mgd)	2009 Flow (EDU)	2009 Flow (mgd)	2014 Flow (EDU)	2014 Flow (mgd)	2024 Flow (EDU)	2024 Flow (mgd)	2034 Flow (EDU)	2034 Flow (mgd)	Ultimate Flow (EDU)	Ultimate Flow (mgd)
29417	219	0.05	219	0.05	219	0.05	219	0.05	219	0.05	219	0.05
30172	0	0.00	2	0.00	4	0.00	13	0.00	25	0.01	25	0.01
30173	0	0.00	2	0.00	6	0.00	17	0.00	32	0.01	32	0.01
TOTALS	***6,724***	***1.68***	***8,655***	***2.16***	***10,155***	***2.54***	***12,369***	***3.09***	***14,449***	***3.61***	***14,449***	***3.61***

Table 4.6 – Service Area Summary of Sub-Area/Development Tract Wastewater Flow Projections

Sub-Area or Development Tract	2004 Flow (EDU)	2004 Flow (mgd)	2009 Flow (EDU)	2009 Flow (mgd)	2014 Flow (EDU)	2014 Flow (mgd)	2024 Flow (EDU)	2024 Flow (mgd)	2034 Flow (EDU)	2034 Flow (mgd)	Ultimate Flow (EDU)	Ultimate Flow (mgd)
EVMWD	5,123	1.28	5,995	1.5	5,374	1.34	5,877	1.47	5,877	1.47	5,877	1.47
MCWD	1,987	0.5	4,643	1.16	7,906	1.98	10,942	2.74	13,062	3.27	13,062	3.27
RCWD	6,724	1.68	8,655	2.16	10,155	2.54	12,369	3.09	14,449	3.61	14,449	3.61
TOTALS	***13,834***	***3.46***	***19,293***	***4.82***	***23,435***	***5.86***	***29,188***	***7.30***	***33,388***	***8.35***	***33,388***	***8.35***

4.1 Historic Wastewater Flows

With input from the District and the provision of key District data layers, K/J has used several methods to identify active EDUs for the existing time increment. The active EDUs were then assigned the base unit flow factor of 250 gpd/EDU (as developed in section 3) to generate wastewater flows. The development of existing EDUs involved varying levels of reconciliation that involved using customer billing data, and additional District direction, both of which are further described in Section 3.

4.2 Projected Wastewater Flows

4.2.1 Ultimate Wastewater Flow

4.2.1.1 District Direction

The District directed K/J to assign the following ultimate EDU values, based upon their local knowledge of development activity within the service area. The District also informed K/J as to which Development Tracts and Sub-Areas were already built-out in the existing time increment, and as a result these Development Tracts and Sub-Areas would have ultimate wastewater flow projections equal to their existing wastewater flow projections. Table 4.7 illustrates the ultimate wastewater flows for development tracts and sub-areas utilized by K/J at the District's direction, sorted by contributing agency.

Table 4.7 – Ultimate EDUs Based on District Direction

Contributing Agency	Sub-Area or Development Tract	Ultimate EDUs
EVMWD	4	4.00
EVMWD	5	53.00
EVMWD	6	169.00
EVMWD	7	4.00
EVMWD	8	0.00
EVMWD	10	44.00
EVMWD	11	53.00
EVMWD	12	27.00
EVMWD	13	126.00
EVMWD	14	150.00
EVMWD	21072B	968.00
EVMWD	21515	241.00
EVMWD	22076	299.00
EVMWD	22077	631.00
EVMWD	22436	9.00
EVMWD	22490	295.00
EVMWD	22491	116.00
EVMWD	22819	174.00
EVMWD	22948	118.00
EVMWD	23049	160.00

Table 4.7 – Ultimate EDUs Based on District Direction

Contributing Agency	Sub-Area or Development Tract	Ultimate EDUs
EVMWD	23050	163.00
EVMWD	23108	337.00
EVMWD	23110	189.00
EVMWD	23155	72.00
EVMWD	23208	213.00
EVMWD	23435	306.00
EVMWD	24557	14.00
EVMWD	24592	100.00
EVMWD	25273	107.00
EVMWD	25362	187.00
EVMWD	28509	112.00
EVMWD	29231	56.00
EVMWD SUB-TOTAL		**5,497.00**
MCWD	1	748.00
MCWD	23095	426.00
MCWD	23187A	267.00
MCWD	23442	44.00
MCWD	28333	212.00
MCWD	28993	161.00
MCWD	29069	89.00
MCWD	29361	19.00
MCWD	29403	82.00
MCWD	29602	183.00
MCWD	30273	81.00
MCWD SUB-TOTAL		**2,312.00**
RCWD	86	4.00
RCWD	87	4.00
RCWD	90	10.00
RCWD	91	91.00
RCWD	93	36.00
RCWD	95	1.00
RCWD	96	69.00
RCWD	97	4.00
RCWD	99	391.00
RCWD	101	20.00
RCWD	109	15.00
RCWD	113	50.00
RCWD	14836	14.00
RCWD	14854	274.00
RCWD	19535	80.00

Table 4.7 – Ultimate EDUs Based on District Direction

Contributing Agency	Sub-Area or Development Tract	Ultimate EDUs
RCWD	20403	59.00
RCWD	20840	233.00
RCWD	20841	336.00
RCWD	21072A	620.00
RCWD	21370	75.00
RCWD	21371	63.00
RCWD	21419	204.00
RCWD	21514	114.00
RCWD	21577	127.00
RCWD	21691	163.00
RCWD	21759	155.00
RCWD	21987	57.00
RCWD	22346	71.00
RCWD	22437	384.00
RCWD	22603	37.00
RCWD	23127	90.00
RCWD	23187B	40.00
RCWD	23380	95.00
RCWD	23879	261.00
RCWD	23881	101.00
RCWD	24342	22.00
RCWD	28677A	873.00
RCWD	28677B	4.00
RCWD	28677C	28.00
RCWD	28903A	108.00
RCWD	28903B	1013.00
RCWD	29006	152.00
RCWD	29417	219.00
RCWD	30172	25.00
RCWD	30173	32.00
RCWD SUB-TOTAL		**6,824.00**
TOTAL		***14,633.00***

4.2.1.2 Inter-Agency Agreements

In accordance with existing inter-agency agreements between EVMWD and RCWD the following ultimate wastewater flow projections were assigned:

- Sub-Area 9 (the southwestern portion of EVMWD) will contribute no wastewater flow in the ultimate time increment.

- 380 EDUs were distributed in the ultimate time increment at the four metering manholes monitoring flow from the Southeastern portion of EVMWD. This accounts for the discrepancy between the ultimate wastewater flows assigned to each development tract and sub-area in this portion on EVMWD, and the inter-agency agreement between RCWD and EVMWD. The 380 EDUs were divided among the four metering manholes based on the total flow tributary to each manhole.

4.2.1.3 Land Use

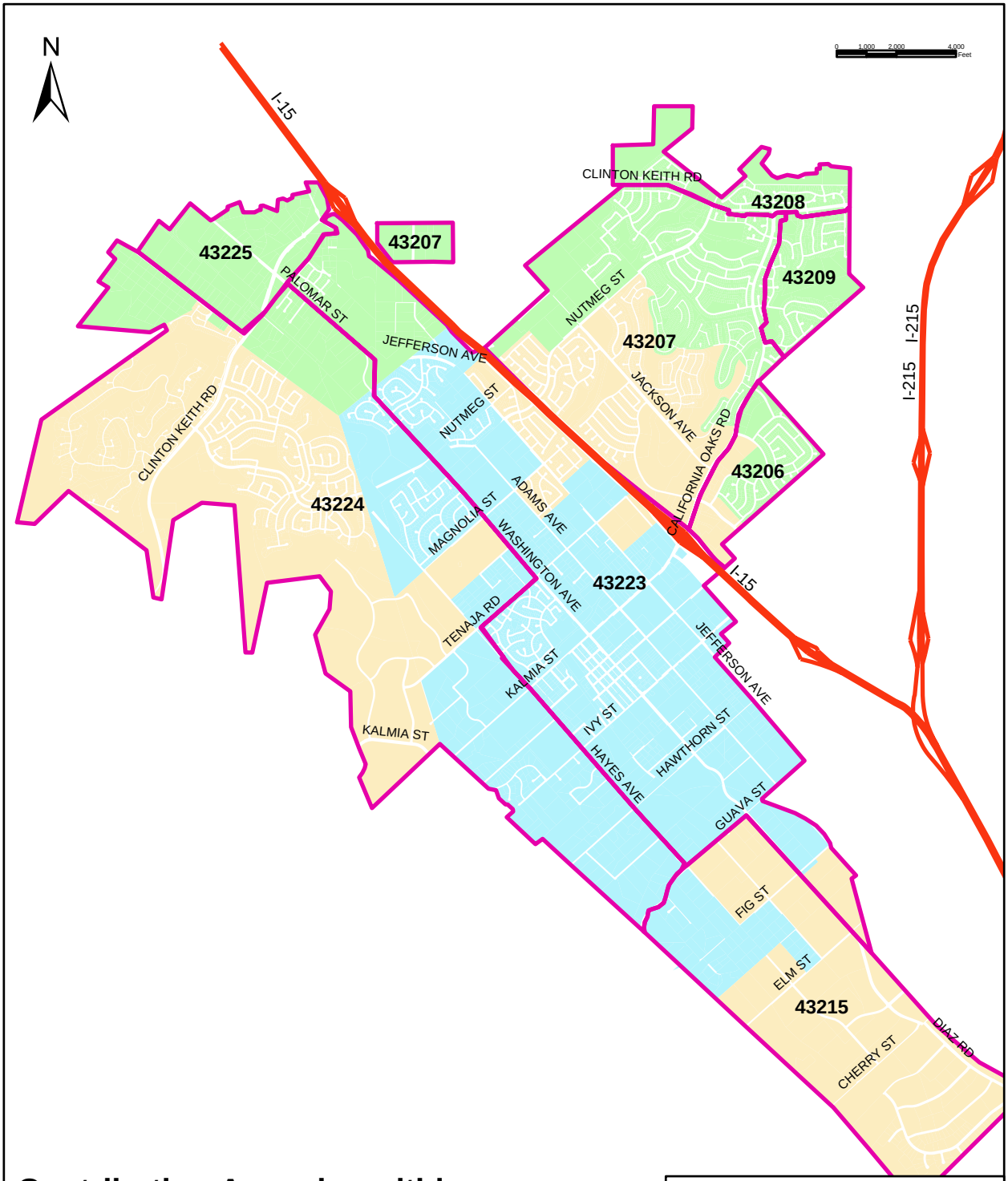
For all other parcels, ultimate wastewater flows were calculated using the wastewater duty unit factors and land use categories developed in section 3. Ultimate EDUs were calculated by multiplying the area of each parcel by its assigned wastewater duty unit factor.

4.2.2 Wastewater Flow Projections

K/J utilized SCAG's year 2000 census data to project how the District's wastewater flow generation will grow from existing to ultimate build-out. The SCAG data contained population projections for each census tract in the District for the years 2000, 2010, 2015, 2020, 2025 and 2030. A linear interpolation was conducted to determine population by census tracts for the planning periods of 2009, 2014, 2024, and 2034 for use in this Plan. A GIS layer containing the census tract boundaries was overlaid on all parcels within the District's sewer service area, as is illustrated in Figure 4.3.

Activation rates for parcels were then calculated based on the growth rate of the census data within the District. Having determined which parcels were currently active within the District, the total number of active residential dwelling units could be determined within the District per census tract. Similarly, since all parcels will be active in the ultimate build-out condition, an ultimate number of residential dwelling units for the District per census tract could also be calculated. Each census tract growth rate was then applied to the active residential dwelling units within the District's sewer service area, resulting in the number of 2009 active residential dwelling units. This process was then repeated for each 5-year increment until the ultimate amount of residential dwelling units for the area lying within the District's sewer service area based on census tract was reached.

For example, if within a census tract there were 1000 active residential dwelling units, 2500 ultimate residential dwelling units, and the SCAG population growth rate from 2004 to 2009 was 25% then the 2009 active residential dwelling units were calculated to be 1250. Since an additional 250 residential dwelling units out of an ultimate 1500 additional residential dwelling units were now active, the residential activation rate would be 16.7% (250/1500) for 2009. A one-to-one correlation between residential activation rates and commercial activation rates was assumed throughout the district. Therefore, for all existing inactive EDUs lying within this census tract in the District, 16.7% of their ultimate flow would be turned on in the year 2009.



Contributing Agencies within RCWD Sewer Service Area

- Elsinore Valley Municipal Water District
- Murrieta County Water District
- Rancho California Water District

Kennedy/Jenks Consultants
Engineers & Scientists

RCWD Wastewater Facilities
Master Plan Update

Census Tract Boundaries

K/J 034404.00

Figure 4.3

After discussions with the District, the following parcels were activated in a different manner.

- Sewershed 9 (the southwestern portion of EVMWD) was set to 1000 EDUs in 2008 and then turned off for all remaining time increments. This activation time reflects the proposed agreements between EVMWD and RCWD regarding treatment of EVMWD flows at the SRWRF.

- All parcels in the Southeastern portion of EVMWD were set to 100% in 2014, as projected in EVMWD *2002 Wastewater Facilities Master Plan*. The remaining 380 EDUS, discussed above, were activated in 2024 per the District's direction.

- The Temecula Educational Complex was set to 100% in 2009 and kept at 100% for all subsequent time increments.

Figure 4.4 illustrates the wastewater flow projections based on contributing agency. Figure 4.5 shows the total recommended wastewater flow projections developed by K/J. In addition, it also illustrates for comparison purposes the following:

- Total Capacity – The District's treatment capacity at the SRWRF is 5 mgd.

- Historic – This is the District's historic wastewater generation from 1987 – 2004.

- Projected Historic – This is a straight-line linear extrapolation of the District's historical growth.

- 1000 EDU/year –This is based upon the District's estimate of historical maximum connections per year.

Figure 4.4
Projected Flows to SRWRF by Contributing Agency

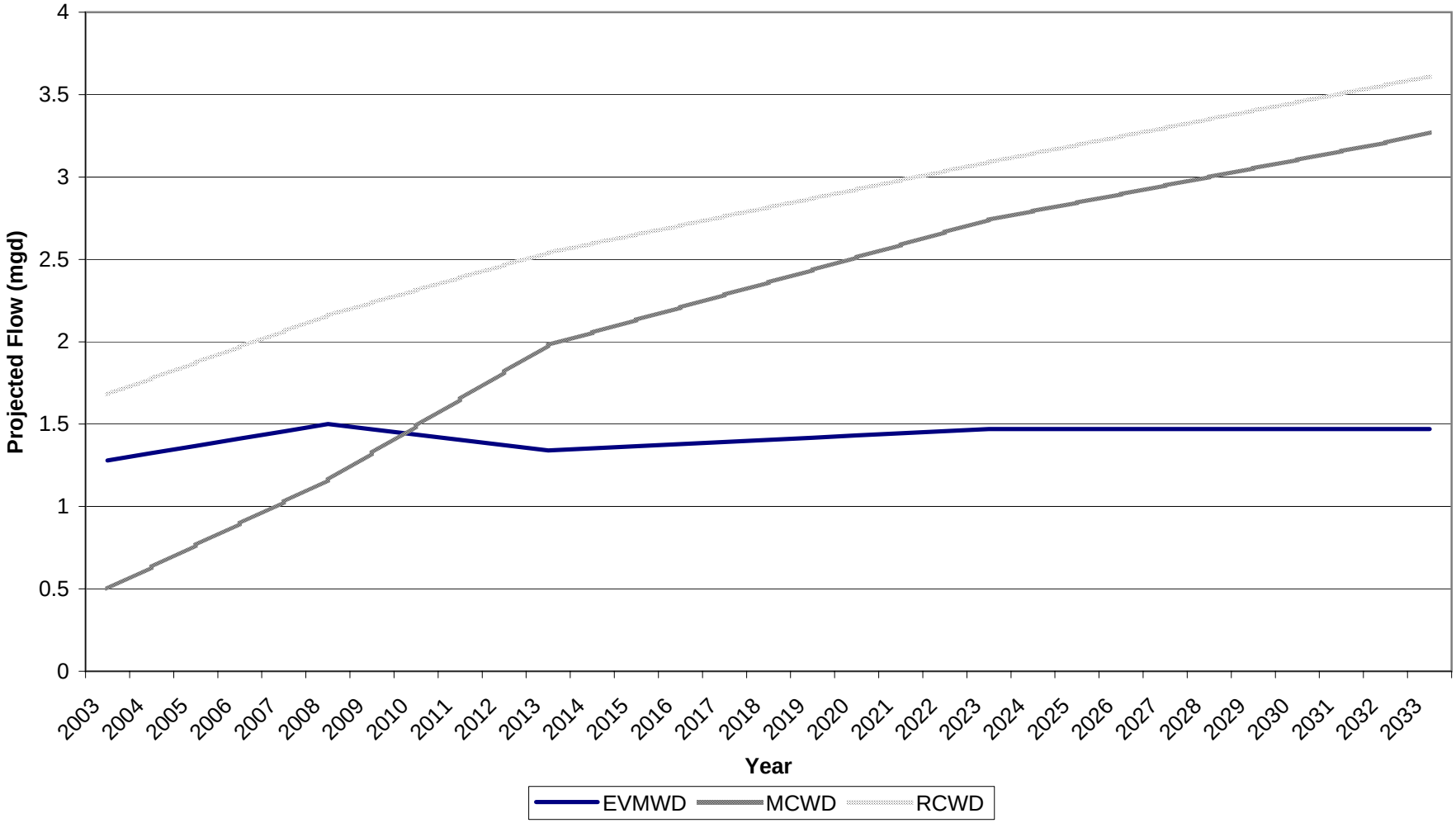
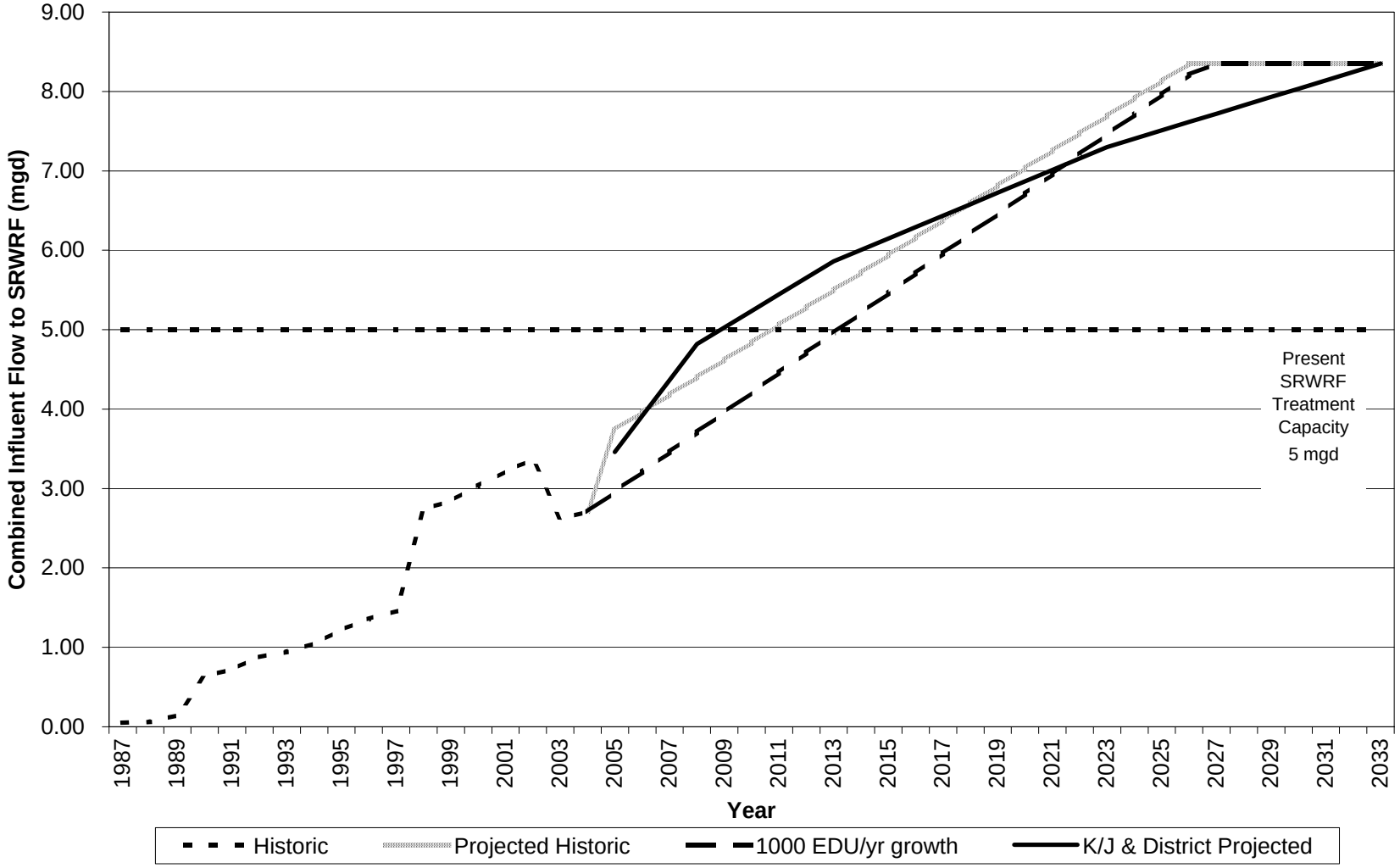


Figure 4.5
Wastewater Flow Projection Alternatives



Section 5: Santa Rosa Water Reclamation Facility Evaluation

In support of our overall master planning effort, Kennedy/Jenks Consultants (K/J) has evaluated the Santa Rosa Water Reclamation Facility (SRWRF) with regards to operational and expansion issues. This section addresses the following:

- Existing Treatment Processes and Operations
- Evaluation of Treatment Processes and Operational Issues
- Projected flow increase
- Improvements required for future expansion of SRWRF
- SRWRF Capital Replacement Program

5.1 Existing Treatment Processes and Operations

The SRWRF currently produces disinfected tertiary effluent suitable for all permitted uses provided in Title 22 California Code Regulations. SRWRF is regulated by Order No. 94-92 and Addenda No. 1, No. 2, No. 3, and No. 4 *Waste Discharge Requirements for the Rancho California Water District Wastewater Reclamation Facilities, Riverside County.* Order No. 94-92 sets forth effluent limitations for irrigation uses and percolation within onsite basins. The maximum allowable 24 hour discharge rate is 5.0 mgd. The treatment process includes headworks, secondary treatment, tertiary treatment, disinfection, and dechorination unit processes.

5.1.1 Headworks

Wastewater enters SRWRF through a Parshall Flume then flows through a drum grinder and on to the influent pump station. The headworks are designed for a peak flow of 40 mgd and an average flow of 25 mgd. To accommodate the current low flows, a smaller 12-inch flume has been installed into the larger 48-inch flume.

The existing drum grinders are designed hold a peak flow capacity of 16 mgd each. A bar screen bypass channel is provided for maintenance purposes.

The influent pump station is sized for an ultimate capacity of 25 mgd. The pump station consists of four vertical screw submersible centrifugal pumps with constant speed motors, in a dry pit configuration. There is capacity for a total of eight pumps at 4,000 gpm within the pump station for future flows. In the event that the dry well is flooded, submersible motors and pumps have been installed to allow continuous operation.

Flows from the pump station are delivered to the aerated grit chamber. The existing grit chamber is designed to handle 10 mgd with a detention time of 2.5 minutes. The system has been designed to accommodate three more grit chambers for future flows up to 40 mgd. From the grit chamber, wastewater flows are gravity fed to the sequencing batch reactors (SBRs).

5.1.2 Secondary Treatment

There are currently five SBRs online, each with the dimensions of 140 feet by 40 feet by 20 feet. Batch testing has been done with 4 SBRs online, resulting in a treated batch volume of 250,000 gallons per SBR. The SBRs were designed with a design detention time of 16 hours and an F/M ration of 0.15. Table 5.1 provides a summary of design criteria for SRWRF secondary treatment facilities.

A programmable controller regulates the SBR process and adjusts process conditions based upon flow. Effluent from the SBRs flows by gravity to either on-site percolation ponds or to two flow equalizations basin and then on to tertiary treatment. The waste activated sludge (WAS) from the SBRs is pumped to an aerobic digester.

Table 5.1 - Design Criteria for SRWRF Secondary Treatment Facilities

Category	Parameter	Criteria
Flow	Average design flow	5.0 million gallons per day (mgd)
	Peak design flow	10.0 mgd
	Rated plant hydrologic capacity	10.0 mgd
Influent flow meter	Type	Parshall flume
	Size	48-inch, with 12-inch nested flume
	Level Sensor	Ultrasonic
Influent screening	Type	Double drum grinder
	Size	4 feet
	Number	2
	Capacity: Average flow	4.5 mgd each
	Peak Flows	16 mgd each
	Maximum head-loss	6 inches
	Horsepower	5 hp
Influent pumps	Type	Wemco vertical screw centrifugal
	Number	4
	Capacities	Four @4000gallons per minute, 100 hp
Grit removal	Type	Aerated
	Volume	17,360 gallons
	Detention time	2.5 minutes
	Blower horsepower	5 hp
Grit pumps	Type	Wemco Model C
	Number	2
	Capacity	250 gallons per minute (gpm)
	Horsepower	25 hp
Cyclones	Type	Wemco Model 1000C
	Number	2
	Size	4-inch vortex, 6-ich pipe apex
	Capacity	250 gpm @ 6 pounds per square inch
Classifier	Type	Wemco 18-inch Full Fare
	Number	1
	RPM	1750
	Horsepower	1 hp

Table 5.1 - Design Criteria for SRWRF Secondary Treatment Facilities

Category	Parameter	Criteria
Sequential batch reactors	Number	5
	Volume per tank	830,000 gallons
	Hydraulic detention time	16 hours
	Aeration	Jet aeration, 1450 std. Cubic feet per minute
	Air supply: Aeration air supply	Positive displacement blowers
	Number of blowers	6
	Blower horsepower	150 hp
	Mixing horsepower	Lawrence Pumps, 100 hp each
	Side water depth	14 feet (minimum)
		20 feet (maximum)
	Dimensions	140 feet x 40 feet x 20 feet deep
Aerobic Digester	Volume	830,000 gallons
	Number	1
	Dimensions	140 feet x 40 feet x 20 feet deep
	Aeration	Jet aeration
	Air supply	Positive displacement blowers
	Number of blowers	1
	Mixing	Lawrence Pumps, 100 hp each
	Detention time	16 days@ 2 percent solids
	Solids loading rate	0.08 lbs per cubic foot per day
Gravity sludge thickener	Number	1
	Size	2 meter
	Horsepower	7.5 horsepower
	Liquid loading rate	200 gallons per minute
	Solids capture	99 percent
	Product solids	5 percent max
	Sludge pumps	In: Mono-15 hp, Series 500
		Out: Mono-10 hp, Series 400
Belt filter presses	Size	2 meter
	Horsepower	7.5 horsepower
	Number	2
	Solids loading rate	1100 pounds per hour
	Liquid loading rate	100 gallons per minute
	Solids capture	99 percent
	Product solids	12-14 percent
	Polymer usage	5 pounds per ton of dry solids
	Sludge pumps	Two Mono-10hp, 400 gpm
Percolation Ponds	Number	2 basins
	Area	10 acres (existing)
Waste activated sludge pumps	Type	Mono
	Number	4
Waste activated sludge pumps	Capacity	200 to 400 gallons per second
	Horsepower	20 horsepower
Final effluent flow	Type	Sparling

Table 5.1 - Design Criteria for SRWRF Secondary Treatment Facilities

Category	Parameter	Criteria
meter		
	Size	48-inch
	Sensor	Ultrasonic

5.1.3 Tertiary Treatment

The SRWRF produces disinfected tertiary effluent suitable for all permitted uses provided in Title 22 California Code Regulations and was designed to meet required reliability requirements for flows up to 5.0 mgd. Table 5.2 provides a detailed summary of the tertiary treatment facilities.

Table 5.2 - Design Criteria for SRWRF Tertiary Treatment Facilities

Category	Parameter	Criteria
Flow equalization basins	Number	2
	Volume	750,000 gallons
	Dimensions, per basin	150 feet x 100 feet x 12 feet deep
	Type	Earthen basin
	Basin side slopes	2:1
	Liner Material	High density polyethylene
Pump station	Number	Three (two duty, one standby)
	Type	Vertical turbine
	Capacity, per pump	3500 gpm at 30-foot dynamic head
	Horsepower, each	50 horsepower
	Speed control	Manually adjustable
Chemical rapid mix	Number	2
	Volume	1740 gallons
	Dimensions	4 feet x 4 feet x 14.5 feet deep
	Detention time	30 seconds
	Mixing gradient	1000 seconds^{-1}, 1-10 NPHP mixer
Flocculation basins	Number (with phosphorus removal)	4 basins, 6 cells per basin
	Volume, per basin	26,000 gallons
	Dimensions, per basin	30 feet x 10 feet x 11.6 feet deep
	Detention time (with phosphorus removal)	30 minutes
	Mixing gradient	100 seconds^{-1}, 3-1.0 NPHP mixers per basin
	Energy control	VFD speed control
Gravity filters	Number	4
	Type	Down-flow, dual media

Table 5.2 - Design Criteria for SRWRF Tertiary Treatment Facilities

Category	Parameter	Criteria
	Dimensions, per unit	13 feet x 18 feet
	Hydraulic loading (maximum)	5 gallons per square foot
	Sand Media: Depth	24 inches
	Effective size	0.5 to 0.6 millimeters
	Uniformity coefficient	1.6
	Anthracite: Depth	12 inches
	Effective size	1.0 to 1.2 millimeters
	Uniformity coefficient	1.6
	Capacity, per pump	6 to 8 feet
	Backwash rate	20 gallons per minute per square foot
	Air scour rate	2 - 4 cubic feet per minute per square foot
	Number of backwash pumps	Two (one duty, one standby)
	Backwash pump capacity, per pump	4700 gpm @ 10-15 foot total dynamic head
	Number of air scour blowers	Two (one duty, one standby)
	Capacity of each blower	1100 cubic feet per minute @ 6 pounds per square inch
Tertiary clarifiers	Number	2
	Volume, per clarifier	347,800 gallons
	Dimension, per clarifier	63 feet x 15 feet
	Detention time	3.3 hours
	Hydraulic loading	900 gallons per day per square foot (600 gpd per square foot for 1.0 mg/l phosphorus removal)
Chorine contact basin	Number	2
	Volume, per basin	208,300 gallons
	Detention time	120 minutes
	Passes, per basin	5
	Dimension, per basin	101 feet x 5 feet x 11 feet
	Length to width ratio	101:1
	Length to depth ratio	46:1
	Chlorine mixing	100 $seconds^{-1}$, 1-25 NPHP mixer
	Chlorine feed control	Forward feed
Sulfur dioxide contact basin	Number	1
	Volume	3500 gallons
Sulfur dioxide contact basin (cont'd)	Dimensions	10 feet x 4 feet x 11 feet deep
	Detention time	1.0 minute
	Chemical feed	Forward feed

Table 5.2 - Design Criteria for SRWRF Tertiary Treatment Facilities

Category	Parameter	Criteria
Spent filter backwash basin	Number	2
	Volume, per basin	51,582 cubic feet each
Sludge drying beds	Number	5
	Dimensions, per bed	75 feet x 85 feet x 5 feet deep
	Influent solids concentration	10,000 gpd @ 3 percent
	Detention time	120 days
	Final solids concentration	30 percent
Chlorination	Number of chlorinators	Three (two duty, one standby)
	Feed-rate	400 to 800 pounds per day
	Storage	10 days
	Number of residual analyzers	3
	Dosage range	10 to 20 mg/l
Dechlorination	Type	Sulfur dioxide
	Number of sulfonators	Two (one duty, one standby)
	Feed-rate	40 to 400 pounds per day
	Storage	20 days
	Number of residual analyzers	Two (one duty, one standby)
	Dosage range	1 to 10 mg/l

The equalization basins are designed to handle 15% of the 5 mgd – each having outer and inner lengths of 150 feet and 102 feet respectively, outer and inner widths of 100 feet and 52 feet, respectively, side water depth of 12 feet, and walls sloping at 2:1.

The pump station for the AWT contains 2 duty and 1 standby 50 hp pumps that allow for a safety factor of 1.15.

Two rapid mix basins are 232 ft^3 each, 4 feet by 4 feet with a side water depth of 14.5 feet and have detention times of 30 seconds. Only one tank is necessary but two are provided in case one is out of service or 1 minute of detention time is needed.

Flocculation basins, two 2.5 mgd trains, 6965 ft^3 each, have three staged flocculation with a velocity gradient (G) range of 10 to 150 sec^{-1}. Basins allow for 30 minutes of detention time for phosphorus removal with alum. Although not in the design, polymer is also being added to aid in phosphorus and turbidity removal. Turbine mixers were designed with 4 blades of 124 in^2 each.

Two circular tertiary clarifiers have hydraulic loading rates of 900 gpd/ft^2 and areas of 3,100 ft^2 each (600 gpd/ft^2 for 1.0 mg/l of phosphorus removal). The side water depth is 15 feet with a diameter of 63 feet. Water is pumped from the flocculation basin up through the center of the basin providing a detention time of 3.33 hours.

Four gravity filters, 13 feet by 18 feet each, have maximum hydraulic loading rates of 5 gpm/ft^2 each; the design allows for one filter to be backwashing while three operate. Filter run time is

assumed as 12 hours resulting in 2 backwashes per filter per day. Backwash rate is 20 gpm/ft^2 for 20 minutes. Two backwash basins of 25,000 ft^3 are provided. Back wash pumps operate at 4,700 gpm with a total dynamic head (TDH) of 10 feet to 15 feet. Air scour is 4.7 ft^3/min at 6 psig.

120 minutes of detention time is provided in the two chlorine contact basins, each having 5 passes with length, width, and height dimensions of 127 feet, 3.5 feet, and 12.5 feet respectively. One chlorine mixer of 15 hp is provided for each of the two chlorine mixing basins. Each basin is 5 feet by 3.5 feet by 12.5 feet. Sulfur dioxide is added after the chlorine contactor by a rotometer and operated when live stream discharge is used (Murrieta Creek or Temescal Wash).

Chemical requirements are shown in Table 5.3.

Table 5.3 - Chemical Requirements for SRWRF Facilities

Chemical	Maximum Dose Concentration Design	Current Operational Dose Concentration
Alum	100 mg/l	29 mg/l
Chlorine	20 mg/l	15.0 mg/l
Sulfur Dioxide [1]	10 mg/l	0 mg/l

1. Use limited to live stream discharge (Murrieta Creek or Temescal Wash) operating periods

Rancho California Water District (RCWD) has developed an extensive recycled water distribution system that includes pumping, pipeline, and storage facilities. Disinfected tertiary effluent is either pumped directly into the distribution system for delivery to irrigators or is placed into three existing seasonal storage reservoirs for future use.

5.1.4 Solids Handling Facilities

Grit captured in the aerated grit system is dewatered and washed and hauled offsite to a landfill.

Settled solids from the tertiary clarifier and the tertiary scum are sent to the aerobic digester after first filling the drying beds. Supernatant and leachate from the drying beds are reprocessed in the equalization basin. Filters are backwashed into the filter backwash basins. Filter backwash basin decant is sent to the equalization basin while the settled solids are pumped to either the drying beds or, if full, the aerobic digester. According to the operators, it takes 1 week to fill a drying bed and 3 months for that bed to dry.

The sludge dewatering basins were designed to accommodate 19,800 gpd of tertiary sludge with a liquid detention time of 19 days assuming a 1% solids concentration. The effluent is decanted leaving sludge at an assumed 10% solids concentration. This sludge is supposed to be transferred to another bed in order to dry to 50% solids; storage time was calculated at 38 days, yet instructions were given to clean the basins once a month.

WAS from the SBR process is sent directly to an aerobic digester. The digester has a volume of 830,000 gallons with an average flow rate at 8% of 57,000 gpd. A gravity thickener controls the concentration of sludge within the digester. A second thickener is located in the existing building to provide redundancy. A belt filter press and 40 gph polymer feed pump, with a second press and pump on standby, dewaters sludge from the aerobic digester mechanically. Space is available to install two more belt presses and four polymer feed pumps. Dewatered sludge is then is then trucked offsite for disposal or reclamation.

5.2 Existing Capacity and Facility Modifications

5.2.1 Capacity Analysis

Wastewater discharging into SRWRF includes flow from Elsinore Valley Municipal Water District and Murrieta County Water District. Wastewater from the Eastern Municipal Water District (EMWD) collection system has been diverted to the SRWRF at times, but a permanent discharge to the SRWRF has not yet been finalized between both agencies.

EMWD is discharging disinfected tertiary effluent into the SRWRF recycled water distribution system. This flow is combined with SRWRF effluent and delivered to recycled water users and/or stored in seasonal storage ponds located immediately adjacent to SRWRF.

An analysis of SRWRF capacity was developed in "Santa Rosa Water Reclamation Facility Interim Facility Improvements Project Report", May 2002, (*Interim Facility Improvements Project Report*). The analysis identified improvements needed within SRWRF to meet effluent limitations as flows approached the permitted capacity of 5.0 mgd.

At the time of the *Interim Facility Improvements Project Report* preparation, RCWD was discharging a portion of the effluent to the adjoining Murrieta Creek (live stream discharge), percolating effluent to the local groundwater basin and providing effluent for irrigation uses. The analysis concluded the existing facilities could meet effluent limitations for groundwater and irrigation discharges without major plant improvements. Meeting live stream effluent limitations would require the construction of additional sequencing batch reactor basins and improvements to the tertiary solids handling system.

A review of the daily and seasonal variation of influent flows indicated peak influent flows occur during weekend and holiday periods. This local area flow condition indicates the existing facilities capacity will be reached when these peak day flow periods reach 5 mgd and that will occur before the average annual daily flow reaches 5.0 mgd. The analysis concluded the maximum permitted 24 hour flow would likely occur when the average daily flow reaches 90% of the permitted capacity or 4.5 mgd.

Peak hourly flows are generally below the facility design value of 200% of the average flow. However peak flow rates have exceeded the design value on occasion. The *Interim Facility Improvements Project Report* developed a recommended maximum instantaneous design flow rate of 2.5 times the average daily flow rather than the 2.0 peaking factor used in the original design. The analysis determined such a peak flow rate can be accommodated by the existing unit processes up to the current permitted maximum 24 hour discharge flow of 5.0 mgd.

The existing plant site was established to accommodate a treatment facility considerably larger than the current 5.0 mgd facility. There is sufficient land for a larger facility that could serve as a regional water reclamation plant beyond the current service area.

5.2.2 Existing Facility Modifications

A number of modifications to several units processes is planned to improve operation efficiency and accommodate the increase of flows up to the permitted capacity of 5.0 mgd.

5.2.2.1 Headworks

The nested 12-inch Parshall flume will require replacement with a 24-inch flume (as recommended in a separate study) as the peak flows reach the capacity of 10.0 mgd, which will then accommodate flows up to 20 mgd. The existing 48-inch Parshall flume is capable of a maximum capacity of 40 mgd. The remaining headworks process units are capable of handling the anticipated peak flows.

The in-channel-grinders located in the influent channels immediately downstream from the parshall flume allow the passage of materials that can interfere with downstream unit processes, potentially reducing their efficiency. The installation of augers capable of removing larger solids from the grinder units prior to a future plant expansion project is recommended for increased operation and maintenance efficiency.

5.2.2.2 Sequencing Batch Reactors

The *Interim Facility Improvement Projects Report* identified the need to add two additional sequencing batch reactor (SBR) basins if nutrient removal is required to meet effluent limitations (as required for live stream discharge). Additional reactor basins are not required for the production of 5.0 mgd if effluent is utilized for irrigation as nutrient reduction is not required.

Although not analyzed in the *Interim Facility Improvement Projects Report*, biological nutrient removal required for the discharge of effluent into the onsite percolation basins may require an additional SBR tank for the design capacity of 5.0 mgd. A separate evaluation is recommended for this analysis.

Additional operating reliability and flexibility would be provided if one additional reactor basin is constructed as this would provide operators with the ability to remove a reactor out of service (at full permitted capacity) for maintenance and cleaning. The construction of two basins at one time offers an economical way of accomplishing this goal and would provide a second aerobic digester discussed in the following section.

5.2.2.3 Solids Handling System

The existing solids system is limited due to the size of the single aerobic digester. Designed in the late 1980's prior to the adoption of federal regulations now in affect, the original design criteria produces a non-Class B sludge. Additional aerobic digester basin capacity will be needed or conversion to an alternative digestion process (such as anaerobic digestion) is required to produce a sludge that would allow more disposal options (Class B or additional treatment process units capable of producing Class A as provided in USEPA 40 CFR 503 "Standards for the use and Disposal of Sewage Sludge" regulations). A second aerobic digester was identified in the *Interim Facility Improvements Project Report* in order to provide greater operation flexibility and a higher level of digestion (meeting Class B criteria).

Treatment of sewage sludge can achieve Class A requirements in several alternative treatment process trains. Generally, Class A biosolids has a greatly reduced level of pathogens and high level of organics stabilization that minimize vector attraction. The regulations include specific treatment requirements for a number of available technologies that expose the biomass to heat, various forms of radiation and chemicals.

Sludge disposal over the long term is problematic as counties are adopting more stringent land application rules. Consideration of alternative digestion processes will be needed as disposal options and associated treatment levels become more clear in the near future.

5.2.2.4 Tertiary Filters

Secondary effluent is discharged from the SBR basins into two flow equalization basins that provide sufficient storage to allow a constant flow rate into the advanced water treatment (AWT) process units. The AWT pump station delivers flows to flocculation basins, sedimentation basins, filters and chlorine contact basins.

The four existing filters are sized to provide a loading rate of 5 gpm/sf when the plant reaches the design influent rate of 5 mgd with one filter out of service. Flow through the tertiary filters includes the total influent flow plus backwash flows returned from the filters that are discharged into the flow equalization basins. When the plant influent flow reaches 5.0 mgd, flows through the filters would exceed 5.0 mgd and the 5 gpm/sf loading rate would be exceeded with one filter out of service.

The discharge requirements for SRWRF (Order No. 94-94) do not presently include a limit on the filter loading rates. Such a limit could be included in a future discharge order revision and the scheduling for the expansion of SRWRF should take this possibility into consideration.

The AWT pump station capacity is 6 mgd (two of three AWT pumps running at full speed) determined in a review of AWT pump curves and the development of a system head curve for the discharge piping system.

5.2.2.5 Seasonal Storage

Tertiary effluent flow exceeding irrigation demand and percolation pond capacity is stored in a series of seasonal storage ponds located immediately adjacent to the SRWRF site. RCWD has acquired sufficient land for the construction of additional ponds that may be required as flows increase. The construction of additional storage ponds will be addressed separately in the Water Facilities Master Plan.

RCWD has a connection to the effluent pipeline previously constructed by the Eastern Municipal Water District (EMWD), extending from the EMWD water reclamation facility located in Temecula to a discharge point within Temescal Wash, providing an additional discharge option for SRWRF. If this discharge option is used, then the volume required within the seasonal storage basins could be reduced, and further expansion may be deferred.

5.2.3 Existing Facility Replacements

RCWD has completed the Interim Facility Improvements as developed in the *Interim Facility Improvements Project Report*. The improvements implemented include odor control upgrades, gas delivery system upgrades, replacement of sequencing batch reactor (SBR) decant mechanisms, coating of the digester and batch reactor structures, addition of chorine analyzers, installation of an additional blower and miscellaneous improvements that will improve the operation and maintenance of the flow equalization basin and effluent pump station fore-bay.

Additional recommended improvements that were not constructed include the addition of two SBR units and the installation of new auger screens in the headworks. Normal replacement of equipment will continue as various process and support facilities reach the end of their useful lives and this will be discussed in the Capital Replacement Program section.

5.2.4 Evaluation of Treatment Process Modifications

There are a number of potential factors that could lead to the need for process modifications within SRWRF beyond the need to add process units as flows reach the current 5.0 mgd capacity.

5.2.5 Revised Units Processes

The existing facility utilizes the sequencing batch reactor (SBR) as the primary and secondary treatment process. This type of secondary process combines several unit process operations in a single basin and accommodates biological reduction of nutrients if required. The SBR process was selected to take advantage of the single reactor vessel process size efficiency and provide the ability to meet nutrient effluent limitations that required nutrient reduction in the treatment process.

The SBR process is a means of providing biological nutrient reduction in a single reactor vessel as noted. The primary benefit is the avoidance of multiple unit processes that would otherwise be required to meet effluent limitations. The SBR process requires a higher level of energy use compared to other processes as all of the reduction of the biological oxygen demand (BOD) takes place in the aerated reactor where mixing and aeration are required. Other unit process units are available (such as primary sedimentation basins) can be installed prior to the aeration system that would remove BOD and a portion of the total suspended solids with a corresponding lower energy consumption rate.

The SBR process also relies on a decant mechanism to remove settled secondary effluent. Large secondary clarifiers following aeration basins (in a conventional process train) offer a more controllable sedimentation process.

Alternative treatment process trains are possible including the process units mentioned above (such as primary sedimentation, aeration and clarification) and emerging technologies (such as membrane bioreactor systems). Sufficient land is available at the SRWRF site to accommodate expansion to alternative treatment process units.

An order of magnitude cost evaluation for the conversion of the existing 5.0 mgd facility to an alternative process has been prepared in an effort to determine the feasibility of such a change. The process units selected for the analysis include the replacement of the existing SBR unit process with the following process units:

- Installation of primary sedimentation basins
- Conversion of existing SBR basins to the mLE biological nutrient removal (BNR) process
- Installation of secondary clarifiers.

The existing SBR basins would be modified to provide nutrient removal as they would be configured with anoxic and oxic zones with internal return flows (MLE process). The estimated

capital cost (order of magnitude level) for these improvements is $11,781,000 as summarized in Table 5.4.

Table 5.4 - Conversion of SRWRF to mLE Process (Order of Magnitude Cost Estimate)

Item	Estimated Cost
Primary Sedimentation	1,650,000
SBR Basin Conversion to mLE	$3,150,000
Secondary Clarifiers	$2,160,000
Subtotal	$6,960,000
Site work, yard piping, electrical	$1,948,800
Subtotal	$8,908,000
Contingencies & Admin/Engineering	$2,873,000
Total	***$11,781,000***

The primary savings with this conversion is reduced energy consumption. The primary sedimentation basins would remove a portion of the organic matter thereby reducing aeration requirements within the activated sludge portion of the process (MLE basins). The estimated reduction in annual energy cost is $70,000 to $100,000 per year. Assuming an interest rate of 4%, the present worth value of such a savings is $950,000 to $1,400,000.

The analysis indicates the conversion of the existing SBR treatment process units to an alternative activated sludge process would not reduce operating cost sufficiently to justify the conversion capital cost.

For the expansion of SRWRF, a comparison of adding additional SBR basins with the conversion concept considered in this Section and other alternative processes should be investigated as a part of the preliminary design process. Other factors that might impact the economic analysis for the expansion include the need to increase aerobic digester capacity to meet Class B 40 CFR 503 regulations in addition to the higher solids loading from the higher plant flow. It is recommended to perform this analysis as part of a preliminary design report for the next facility expansion.

5.2.6 Extending Irrigation into Areas with more Stringent Effluent Limitations

Order No. 94-92 specifies areas where effluent can be utilized for irrigation. The specified use areas do not include the entire District service area.

The setting of effluent limits by the Regional Water Quality Control Board, San Diego Region (Regional Board) is determined by surface and groundwater quality objectives contained in the *Comprehensive San Diego Water Quality Control Plan* (Basin Plan). The current approved use areas allow disinfected tertiary effluent produced by SRWRF to be used without additional treatment.

A portion of the District's service area (Hydrologic sub area 2.42 in the eastern portion of RCWD), has groundwater quality objectives that would require the addition of demineralization process units. The addition of this type of unit process has generally been found to be cost prohibitive due to the high capital and operating costs and the need to dispose waste flow (concentrate) from the demineralization process. A separate detailed engineering analysis is recommended to investigate this option.

5.2.7 Live Stream Discharge Implementation

Discharge of disinfected tertiary effluent into Murrieta Creek was terminated by the District when the Regional Board issued a revised National Pollution Discharge Elimination System (NPDES) permit with nutrient limitations far more stringent that the previous NPDES permit and significant monitoring requirements. Significant process modifications would be required to meet the adopted limitations.

A preliminary review of the process requirements indicated the need to expand the SBR process to provide a higher level of nutrient reduction and the addition of a process such as reverse osmosis to reliably meet the nutrient limitations. As noted above, high capital and operating costs would be incurred and a method of disposing concentrate from the reverse osmosis process would be required. A detailed analysis of this option is not recommended until the Regional Board adopts a TMDL Plan for Murrieta Creek and the Santa Margarita River.

5.2.8 Groundwater Recharge

The current Order No. 94-92 allows percolation of effluent within on-site percolation basins. The volume is limited by percolation basin capacity constraints and is not a significant discharge option.

Groundwater is a major component of the District's water supply and recharge of groundwater basins represents and opportunity to expand effluent discharge options and augment local water supplies.

The local groundwater system is complex with shallow and deep aquifers extending over several large groundwater basins. The development and implementation of a planned groundwater recharge program would require a modification of existing Waste Discharge Requirements (Order No. 94-92). Revised effluent limitations would likely be included as this type of discharge would be regulated in accordance with groundwater recharge regulations contained in the State of California Water Code (Title 22).

The required plant process modifications are not clear without further study. Other important factors include the percentage of extracted groundwater derived from the discharge, travel time and distance form the point of discharge to extraction. A separate engineering analysis is recommended to investigate this option.

5.3 Future SRWRF Improvements

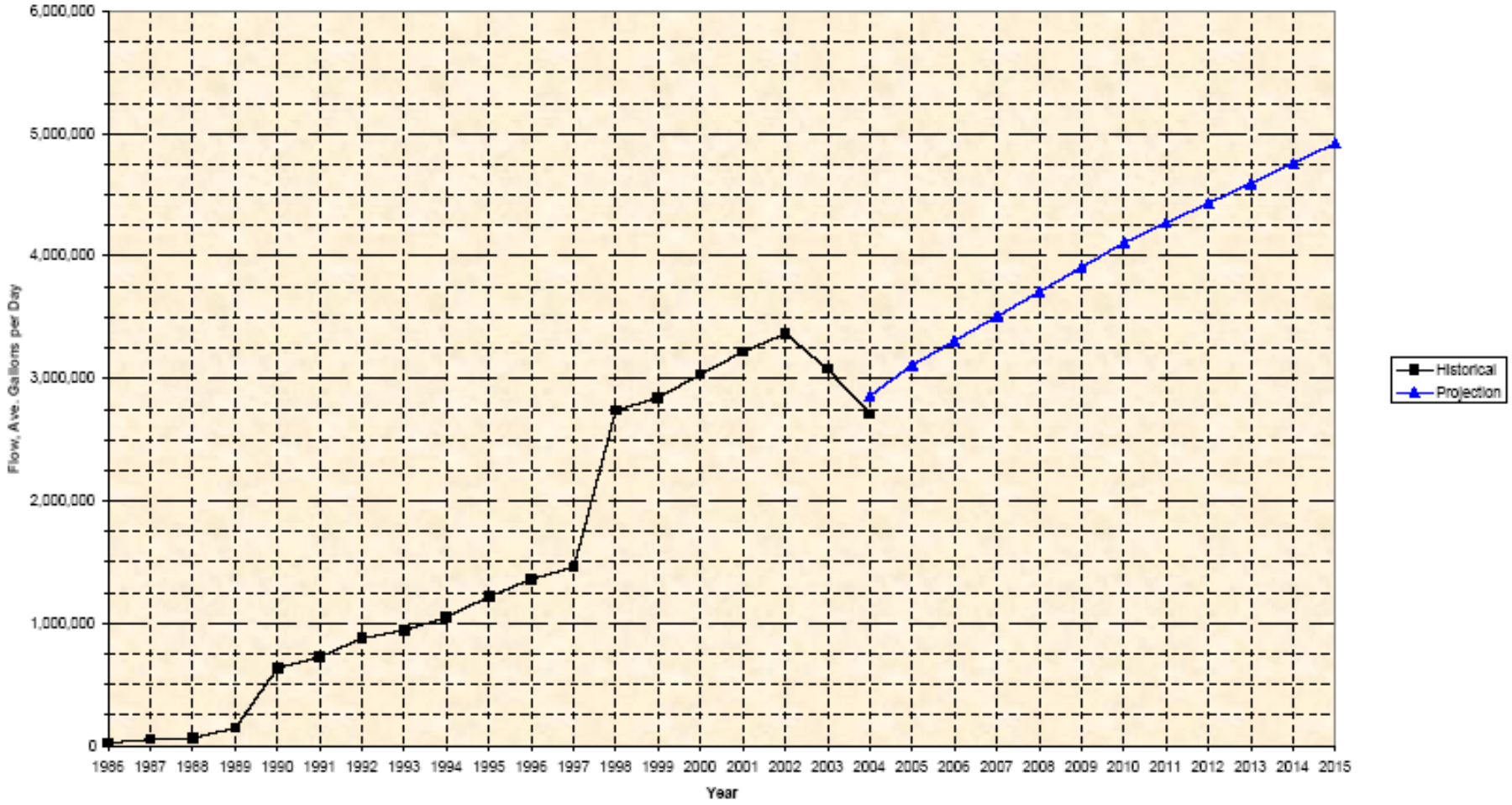
5.3.1 Expansion Schedule Requirements

The expansion of SRWRF is required by Discharge Order No 94-92 to be completed sufficiently advance of the date when flows are expected to reach the facility capacity to ensure compliance with discharge limitations. A plan for such expansion must be submitted to the Regional Board when the facility reaches 75% of its rated capacity. SRWRF is expected to reach the 75% capacity in 2008 and planning for the expansion should begin prior to that time, assuming no wastewater diversion from EMWD.

As discussed in section 4, wastewater flows were developed using the District's existing sewer customer database, as well as specific plan information for development tracts when available. Ultimate wastewater flow projections were calculated using the GIS land use database and the wastewater unit duty factors, both developed in section 3. Figure 5.1 summarizes predicted SRWRF wastewater influent flows based upon historical influent data, rather than the overly conservative EDU flow projection developed for Figure 4.1. The influent flow projection shown in Figure 5.1 is used only for the future SRWRF improvements.

Expansion from the current capacity of 5.0 mgd to 7.5 mgd would accommodate the projected increase in flow to about 2020 and appears to be the next logical expansion increment.

Figure 5.1 – Sewer Influent Projection



Legend	Description
Influent	Average Annual Historic Influent 1986 – 2004
Projection	See Notes

Notes	
Slope (1986-19979)	144,291
Slope projections 2004-2005 (1,000 EDU/year)	250,000
Slope projections 2006-2010 (800 EDU/year)	200,000
Slope projections 2011-2015 (650 EDU/year)	162,500

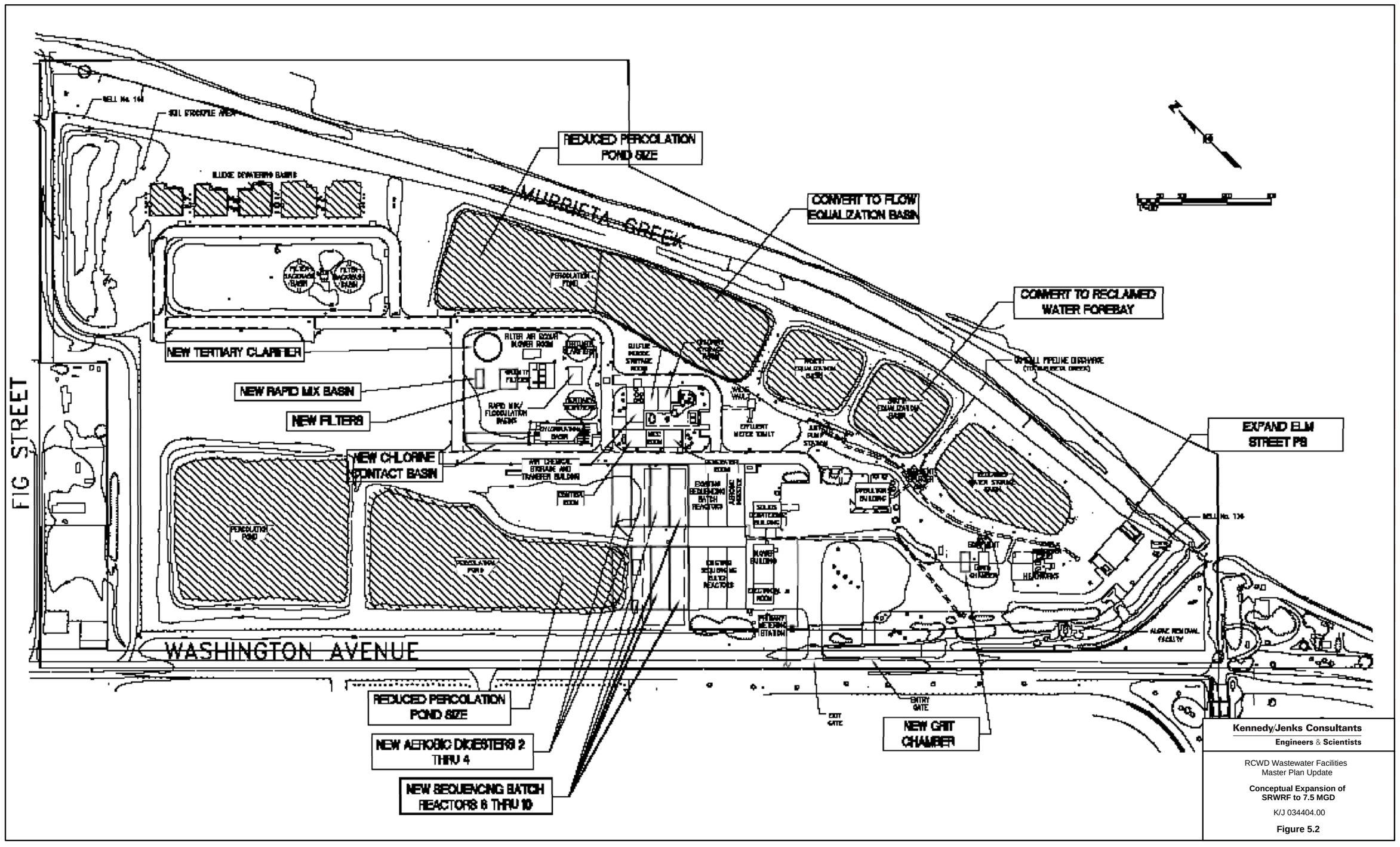
5.3.2 Expansion Improvements

Increasing the design capacity to 7.5 mgd, as illustrated in Figure 5.2, would require expansion of the following unit processes:

- Parshall flume modification (24")
- Additional influent pump station pumps and motors (2 new pumps and piping modifications)
- Grit removal (new grit chamber, classifier and pumps)
- Additional sequencing batch reactors (5 basins)
- Flow equalization basins and AWT pump station (2 new pumps)
- Rapid mix/flocculation basins, sedimentation and gravity filters (1 four filter module)
- Tertiary clarifier (1 clarifier)
- Chlorine contact basin (1 bay of a two bay module)
- Additional aerobic digester basins (3 basins)
- Elm Street Pump Station forebay (effluent forebay, flow equalization and onsite percolation/holding)

A budget level estimate of the expansion and upgrade capital cost is provided in Table 5.5. The estimate is based on the following assumptions:

1. Biological nutrient removal is required for continued discharge into the onsite percolation ponds and discharge into the Temescal Wash outfall pipeline.
2. The SBR process expansion includes 5 new basins for a total of 10 basins. Nine (9) are required to provide capacity for full nitrification and denitrification and 1 would serve as a redundant unit. The number of SBR basins recommended is based on providing full nitrification and denitrification to accommodate discharge requirements to Temescal Wash, as well as providing a stand-by basin. It is assumed there will be some discharge to Temescal Wash during the winter months, and this level of treatment would not be required for irrigation only discharge.
3. The aerobic digestion process will be modified to enable production of Class B biosolids for the expanded plant. Three (3) new basins would be added, each with the same configuration as the existing aerobic and SBR basins. A total of four (4) operating basins are required to meet Class B biosolids requirements as specified in 40 CFR 503 regulations. The number of addition digester basins is needed to produce Class B sludge.
4. The advanced water treatment process expansion will include units identical to the existing processes (rapid mix/flocculation basins, sedimentation basins, gravity filtration and chlorination).



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Conceptual Expansion of SRWRF to 7.5 MGD

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Figure 5.2

Table 5.5 – Opinion of Capital Cost for SWRF Expansion to 7.5 mgd (revise per CIP table)

Facility	Cost
New Influent Meter	$20,000
Influent Pump Station	$275,000
Grinder Augers	$800,000
Grit Removal	$476,000
SBR Basins	$8,460,000
Flow Equalization Basins	$337,500
AWT Pump Station	$90,000
Flocculation Basin	$294,500
Tertiary Sedimentation	$679,500
Filters	$862,400
Chlorine Contact Basin	$607,775
Aerobic Digesters	$5,076,000
Effluent Forebay	$225,000
Elm Street Pump Station	$350,000
Subtotal	**$18,533,675**
Site Work (8%)	$1,482,694
Yard Piping (10%)	$1,853,368
Electrical/Instrumentation (10%)	$1,853,368
Subtotal	**$23,723,104**
Contingencies (15%)	$3,558,466
Opinion of Construction Cost	**$27,281,570**
Administration & engineering (15%)	$4,093,430
Opinion of Total Project Cost	***$31,375,000***

The opinion of cost includes the addition of a new auger system to remove solids captured in the headworks grinders, additional blowers along with associated electrical, instrumentation and piping needed for the expanded unit processes.

The effluent pump station (Elm Street reclaimed Water Pump Station) would also require expansion for distribution of increased flows to the district's reuse areas along with the effluent forebay to accommodate higher flows.

An analysis of the existing gravity belt thickener and belt filter press units is needed to determine the ability of these existing units to accommodate the increased flow and associated increase in solids.

Additional improvements to the solids handling system (digester, thickening and dewatering systems) will be required if alternative methods of biosolids disposal become necessary or desirable.

Alternative filtration process units (such as disk filter units) are now available and may prove to be more cost effective than the existing gravity filter units. Also, the existing AWT combination of flocculation, sedimentation and filtration was designed to promote the reduction of phosphorus in order to meet live stream discharge limitations. Direct filtration systems (that do not include sedimentation basins) are commonly used to meet disinfected tertiary limitations and should be evaluated during the design phase of the next expansion.

Converting the SBR process units to an alternative BNR process (such as mLE) should be evaluated as a part of the preliminary design process. The economic comparison provided earlier indicates such a conversion is not cost effective when considering the current 5.0 mgd facility. A cost analysis for the expansion would include a comparison of additional SBR basins with such a conversion and should be reviewed again.

5.3.3 Capital Replacement Program

Based upon historical data regarding repair and replacement projects for the SRWRF, the annualized capital repair/replacement cost for the SRWRF is estimated to be $1,215,500.

Section 6: Existing Wastewater Facilities and Wastewater System Analysis

This section provides an overview of the existing wastewater collection system that is owned and operated by the District. Figure 6.1 shows an outline of all existing wastewater collection facilities contributing flow to the Santa Rosa Water Reclamation Facility (SRWRF), and delineates those facilities that are owned by Rancho California Water District (RCWD).

The District currently operates the SRWRF, which is discussed in detail in Section 5, *Wastewater Treatment Plant Evaluation.* The Elsinore Valley Municipal Water District (EVMWD) and the Murrieta County Water District (MCWD) each contribute to the wastewater flow entering RCWD's collection system, with eventual treatment occurring at the Santa Rosa Wastewater Reclamation Facility (SRWRF).

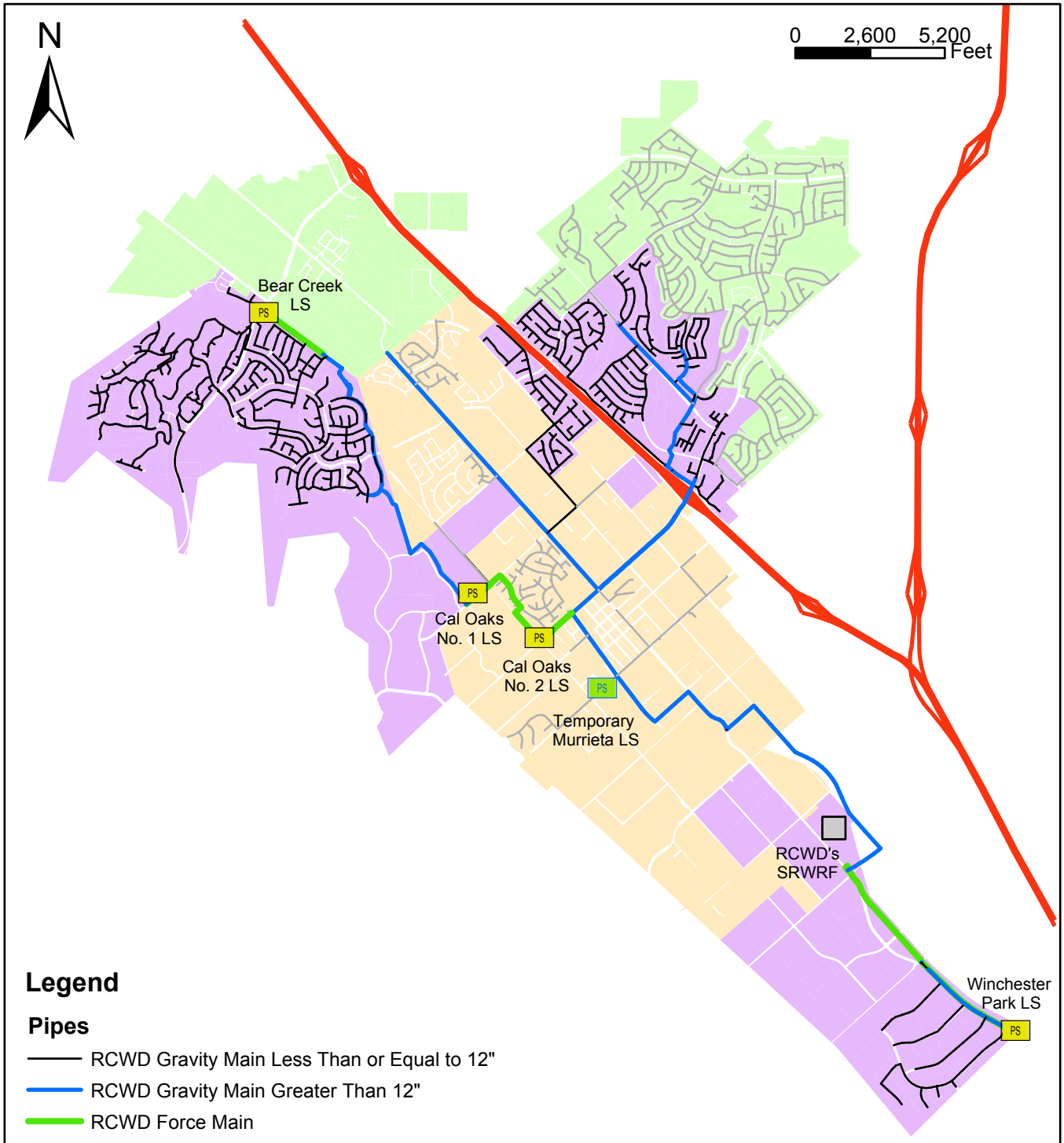
The District's service area consists of gravity collectors, trunk lines, lift stations and force mains, all of which convey flow to the SRWRF. Presently, there are 5 lift stations operating within the District's service area, although only four are owned and operated by RCWD. The wastewater collection system was analyzed using an H_20MAP Sewer hydraulic model in conjunction with the wastewater system design criteria established in Section 3, *Wastewater System Design Criteria*. Collection system deficiencies are presented for facilities owned by RCWD in the Existing, 2009 and Ultimate time increments.

6.1 Existing Wastewater Pumping and Collection System Facilities

This section provides a summary of the existing wastewater collection facilities that are owned and operated by RCWD, which primarily consist of gravity sewer mains, force mains and lift stations.

6.1.1 Wastewater Lift Stations

he District currently owns and operates 4 lift stations: Bear Creek, Cal Oaks No.1, Cal Oaks No.2 and Winchester Park. Tables 6.1 and 6.2 show the operation data, as obtained from as-built drawings and pump curves, for the wet wells and pumps currently comprising each of these lift stations.



Legend

Pipes

- RCWD Gravity Main Less Than or Equal to 12"
- RCWD Gravity Main Greater Than 12"
- RCWD Force Main
- Contibuting Gravity Main not Owned by RCWD

Lift Stations

- PS RCWD Lift Station
- PS MCWD Lift Station

Contributing Agency

- Elsinore Valley Municipal Water District
- Murrieta County Water District
- Rancho California Water District

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Existing Wastewater Collection Facilities

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Figure 6.1

Table 6.1 – Wet Well Hydraulic Information

Wet Well	Diameter (ft)	Lead Pump Off Level (ft)	Lead Pump On Level (ft)	Standby Pump Off Level (ft)	Standby Pump On Level (ft)
Bear Creek	10	3.5	6.5	4.5	7.5
Cal Oaks No. 1	12	4.0	10.0	5.0	11.0
Cal Oaks No. 2	9	4.0	10.0	5.0	11.0
Winchester Park	12	4.0	10.0	5.0	11.0

Table 6.2 – Pump Hydraulic Information

Pump Station	Function	Design Head (ft)	Design Flow Rate (gpm)	Horsepower (hp)
Bear Creek	Lead	65	610	20
Bear Creek	Standby	65	610	20
Cal Oaks No. 1	Lead	70	1700	50
Cal Oaks No. 1	Standby	70	1700	50
Cal Oaks No. 2	Lead	40	500	15
Cal Oaks No. 2	Standby	40	500	15
Winchester Park	Lead	65	1880	50
Winchester Park	Standby	65	1880	50

6.1.2 Wastewater Gravity Mains

A large portion of the District's collection system consists of 6-inch through 24-inch diameter collector and trunk sewer lines, primarily constructed with vitrified clay pipe (VCP) and poly-vinyl chloride pipe (PVC). Currently, the District's main interceptor line conveys flows from lift stations Cal Oaks No. 1 and No.2, as well as all EVMWD, to the SRWRF via a 21-inch to 24-inch VCP pipe. Table 6.3 provides a summary of RCWD's gravity sewer mains. All lengths and materials were obtained from the District's GIS database.

Table 6.3 – RCWD's Existing Gravity Mains

Diameter (in)	Material	Length (ft)
6	PVC	80
	VCP	40
	6" TOTAL	**120**
8	DIP	4,310
	PVC	93,740
	VCP	114620
	8" TOTAL	**212,670**
10	PVC	3,670
	VCP	7,150
	10" TOTAL	**10,850**
12	PVC	11,590
	VCP	9,970
	12" TOTAL	**21,560**
15	PVC	14,840
	VCP	14,060

Table 6.3 – RCWD's Existing Gravity Mains

Diameter (in)	Material	Length (ft)
	15" TOTAL	**28,900**
18	PVC	3,860
	VCP	9,740
	18" TOTAL	**13,600**
21	DIP	260
	VCP	5,290
	21" TOTAL	**5,550**
24	DIP	3,200
	VCP	14,220
	24" TOTAL	**17,420**
27	VCP	470
	27" TOTAL	**470**
33	VCP	1,190
	33" TOTAL	**1,190**
	GRAND TOTAL	***312,330***

6.1.3 Wastewater Force Mains

The District's wastewater collection system includes force mains ranging in size from 8-inch to 14-inch, each constructed of PVC. Table 6.4 provides a summary of force mains owned by RCWD. All lengths and materials were obtained from the District's GIS database.

Table 6.4 – RCWD's Existing Force Mains

Diameter (in)	Material	Length (ft)
8	PVC	2,570
12	PVC	5,730
14	PVC	8,480
	Grand Total	***16,780***

6.2 Proposed Facility Improvements

Utilizing the H_20map Sewer hydraulic model discussed in section 7, *Sewer System Model Development*, RCWD's collection facilities were analyzed in the Existing, 2009 and Ultimate time increments. Facility improvements have been identified for facilities owned by RCWD in order to mitigate system deficiencies, and meet projected wastewater flows in accordance with the District's design criteria. There are no recommended force main improvements in either of the time increments.

6.2.1 Wastewater Gravity Main Improvements

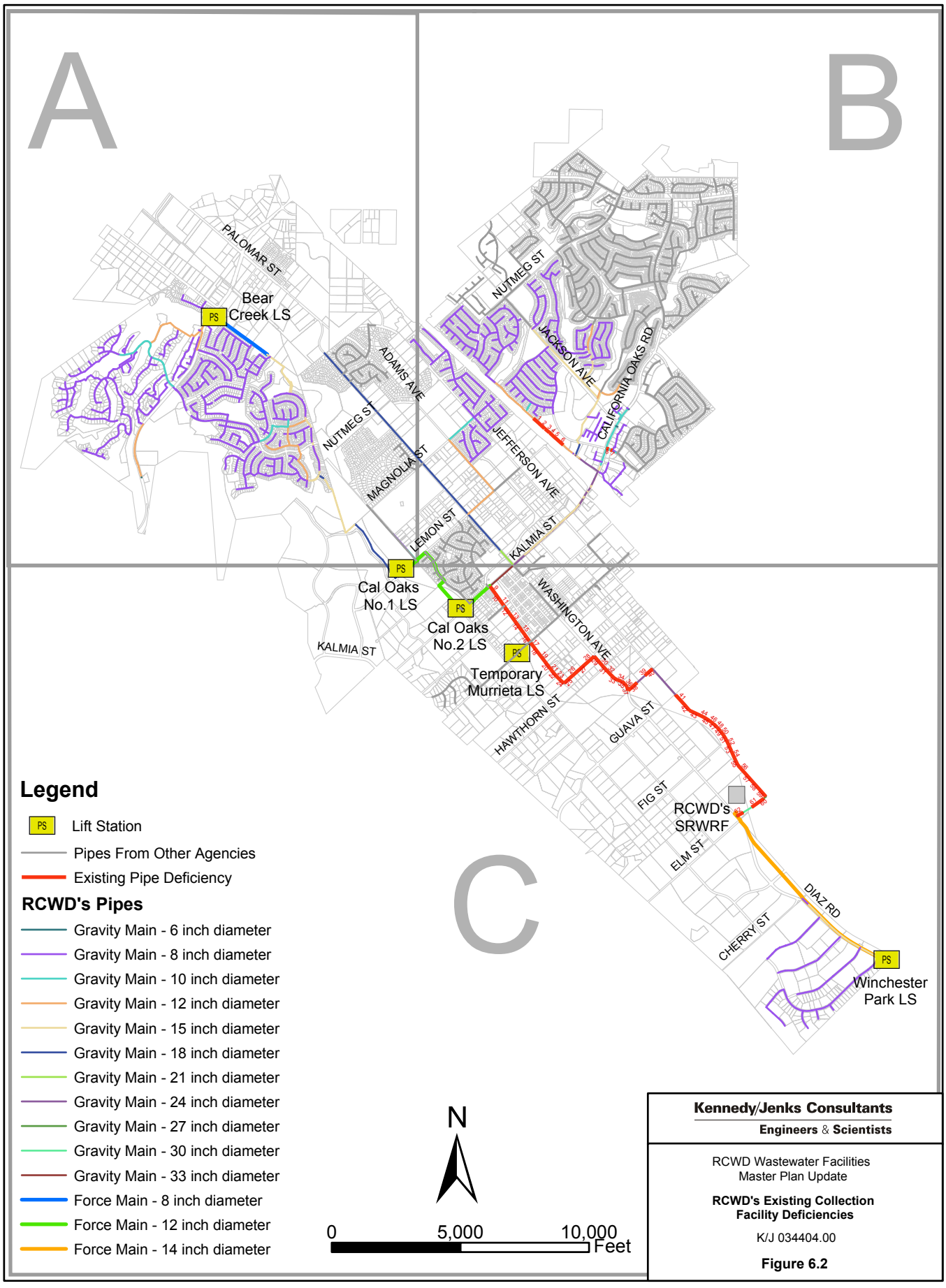
Gravity main improvements have been evaluated based on meeting the projected peak weather wastewater flows in accordance with the design criteria established in section 3, *Design Criteria*. As was discussed in section 7, *Sewer System Model Development*, the gravity mains were evaluated utilizing the H_20map Sewer hydraulic model developed as part of this Wastewater Facilities Master Plan in the Existing, 2009 and Ultimate time increments. Specifically, gravity mains that failed to meet the District's established design criteria in the Peak Wet Weather Scenario were identified.

Figures 6.2, 6.2a, 6.2b and 6.2c illustrate the location of the Existing gravity main deficiencies, and identify each deficiency with a corresponding Pipe ID. Table 6.5 presents the hydraulic information for these pipes as well as their recommended replacement diameters.

As shown in Figure 6.2c, pipes 9 through 62 are components of the District's main interceptor line, which conveys flows from the intersection of New Clay and Kalmia St to the SRWRF via a 21-inch to 24-inch VCP pipe. Although these pipes are shown as deficient in the Existing time increment, the flow in these pipes is actually less than the H_20map Sewer hydraulic model is predicting. This is attributed to the conservative wastewater flow projections that were discussed in Section 4, *Wastewater Flows and Projections*. This higher than observed peak wastewater flow is attributed to pre-paid EDU's which have not yet been activated in RCWD's sewer service area, and an actual wastewater unit factor which is less than 250 gpd/EDU.

The District reports that the existing peak flow conveyed by the District's main interceptor line to the SRWRF is 4.56 mgd. With less than 4 EDUs of wastewater flow entering the District's main interceptor line downstream of pipe 21, the flow in pipes 21 through 24 is approximately 4.56 mgd as well. Based on the District's design criteria, each of these pipes have design capacities between 4.47 and 4.55 mgd, confirming that these pipes are currently at their design capacity for peak wet weather flow.

Pipe deficiencies 9 through 62, which appear as Existing deficiencies, do not appear in either the 2009 or Ultimate deficiency tables or figures. With the planned construction of the Murrieta Valley Interceptor trunk line by 2006, these pipes are no longer deficient in the later time increments.



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RCWD's Existing Collection Facility Deficiencies

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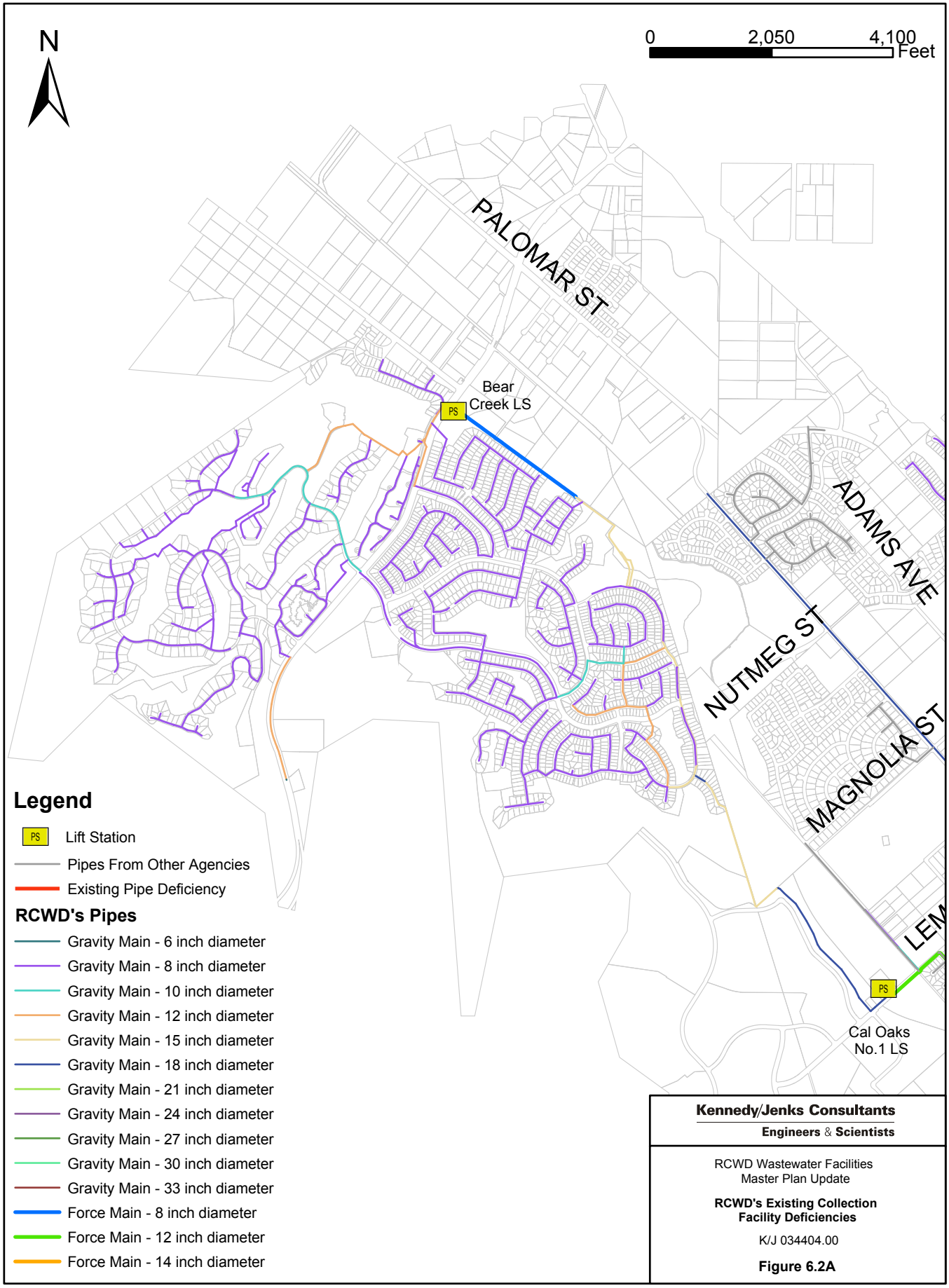
Figure 6.2


N
0
2,050
4,100
Feet
PALOMAR ST
Bear
Creek LS
PS
ADAMS AVE
NUTMEG ST
MAGNOLIA ST
LEM
PS
Cal Oaks
No.1 LS
2B
2C
Legend
PS Lift Station
Pipes From Other Agencies
Existing Pipe Deficiency
RCWD's Pipes
Gravity Main - 6 inch diameter
Gravity Main - 8 inch diameter
Gravity Main - 10 inch diameter
Gravity Main - 12 inch diameter
Gravity Main - 15 inch diameter
Gravity Main - 18 inch diameter
Gravity Main - 21 inch diameter
Gravity Main - 24 inch diameter
Gravity Main - 27 inch diameter
Gravity Main - 30 inch diameter
Gravity Main - 33 inch diameter
Force Main - 8 inch diameter
Force Main - 12 inch diameter
Force Main - 14 inch diameter
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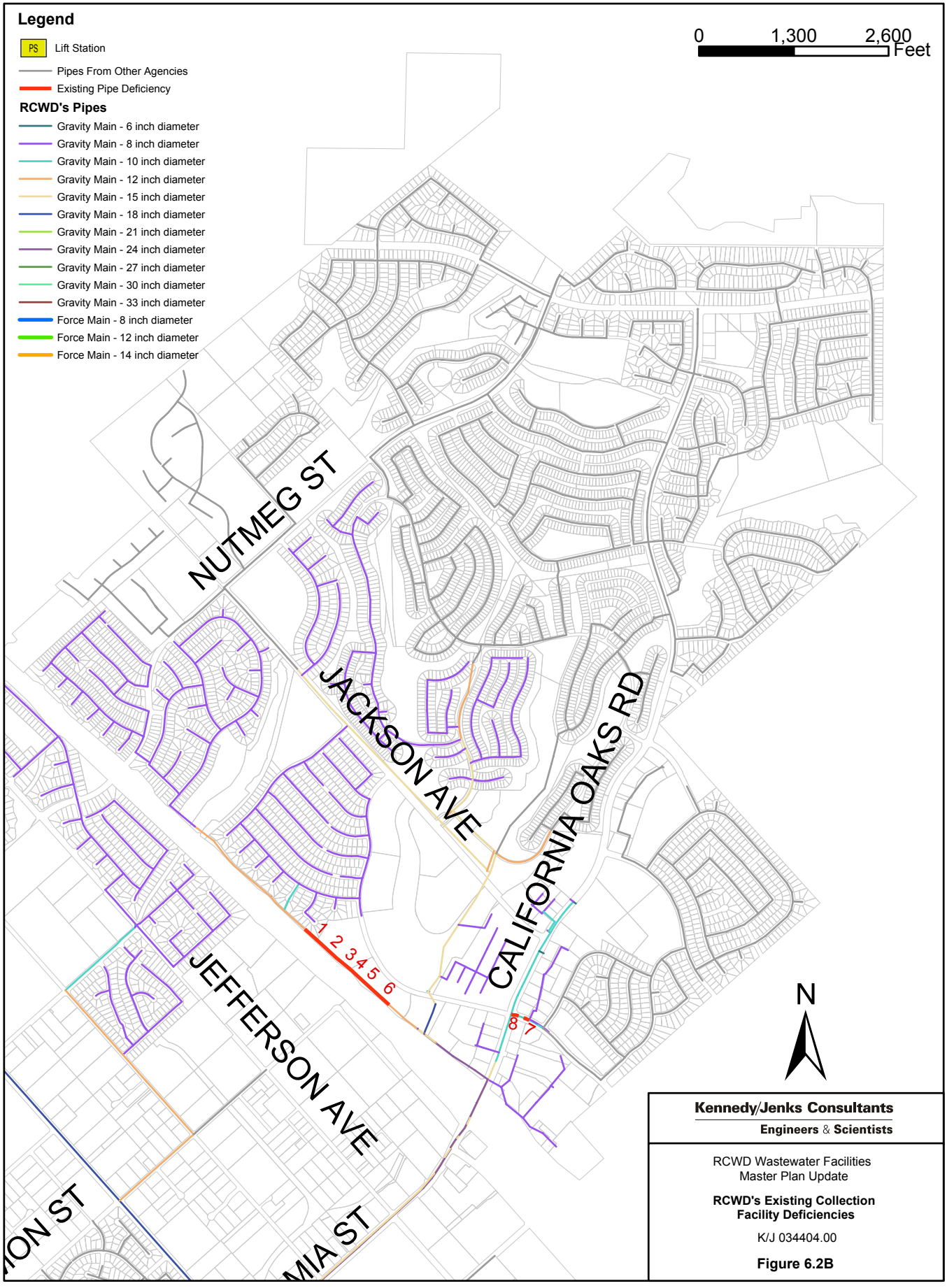
RCWD's Existing Collection
Facility Deficiencies
K/J 034404.00
Figure 6.2A


Legend
PS Lift Station
Pipes From Other Agencies
Existing Pipe Deficiency
RCWD's Pipes
Gravity Main - 6 inch diameter
Gravity Main - 8 inch diameter
Gravity Main - 10 inch diameter
Gravity Main - 12 inch diameter
Gravity Main - 15 inch diameter
Gravity Main - 18 inch diameter
Gravity Main - 21 inch diameter
Gravity Main - 24 inch diameter
Gravity Main - 27 inch diameter
Gravity Main - 30 inch diameter
Gravity Main - 33 inch diameter
Force Main - 8 inch diameter
Force Main - 12 inch diameter
Force Main - 14 inch diameter
0
1,300
2,600
Feet
NUTMEG ST
JACKSON AVE
CALIFORNIA OAKS RD
JEFFERSON AVE
1 2 3 4 5 6
8 7
N
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RCWD's Existing Collection
Facility Deficiencies
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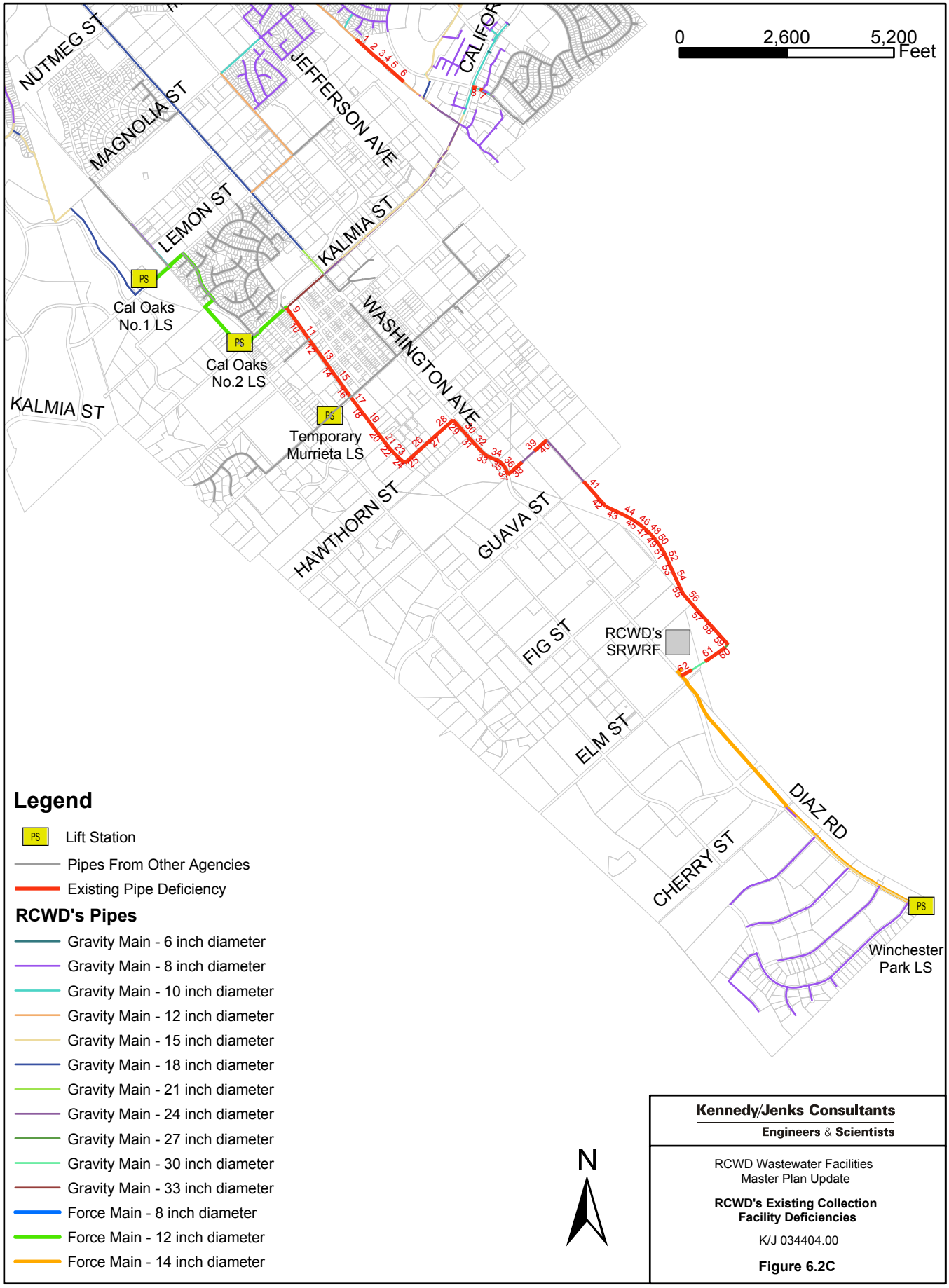
Figure 6.2B

2A

2C


2A
2B
0
2,600
5,200
Feet
NUTMEG ST
MAGNOLIA ST
JEFFERSON AVE
CALIFOR
LEMON ST
KALMIA ST
WASHINGTON AVE
KALMIA ST
Cal Oaks
No.1 LS
Cal Oaks
No.2 LS
Temporary
Murrieta LS
HAWTHORN ST
GUAVA ST
FIG ST
RCWD's
SRWRF
ELM ST
DIAZ RD
CHERRY ST
Winchester
Park LS
PS
Legend
Lift Station
Pipes From Other Agencies
Existing Pipe Deficiency
RCWD's Pipes
Gravity Main - 6 inch diameter
Gravity Main - 8 inch diameter
Gravity Main - 10 inch diameter
Gravity Main - 12 inch diameter
Gravity Main - 15 inch diameter
Gravity Main - 18 inch diameter
Gravity Main - 21 inch diameter
Gravity Main - 24 inch diameter
Gravity Main - 27 inch diameter
Gravity Main - 30 inch diameter
Gravity Main - 33 inch diameter
Force Main - 8 inch diameter
Force Main - 12 inch diameter
Force Main - 14 inch diameter
N
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RCWD Wastewater Facilities
Master Plan Update
RCWD's Existing Collection
Facility Deficiencies
K/J 034404.00
Figure 6.2C

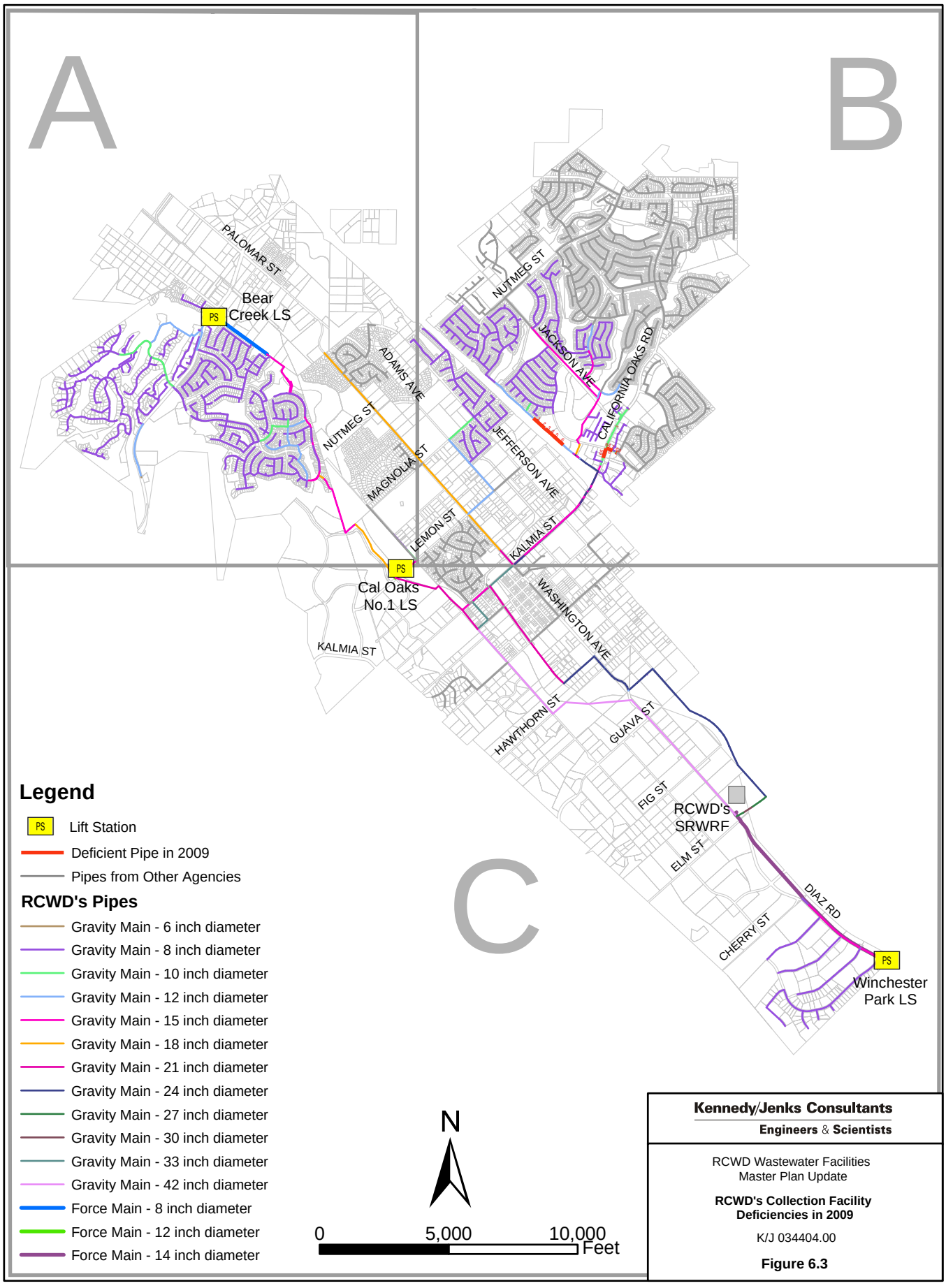
Table 6.5 – Existing Sewer Pipe Deficiencies

ID Number	RCWD Line No	Type	Existing Diameter (in)	Upstream Invert (ft)	Downstream Invert (ft)	Length (ft)	Slope	PWWF (mgd)	Projected d/D in 2004	Recommended Replacement Diameter (in)	Replacement d/D
1	S141088	Gravity Main	12	1,188.44	1,187.74	292	0.0024	0.73	0.58	15	0.41
2	S141086	Gravity Main	12	1,187.74	1,187.07	284	0.0024	0.73	0.59	15	0.41
3	S141084	Gravity Main	12	1,186.89	1,186.19	249	0.0028	0.73	0.56	15	0.40
4	S141071	Gravity Main	12	1,185.99	1,185.75	119	0.0020	0.74	0.62	15	0.43
5	S141080	Gravity Main	12	1,185.75	1,185.03	300	0.0024	0.74	0.59	15	0.41
6	S141078	Gravity Main	12	1,185.03	1,184.31	298	0.0024	0.74	0.59	15	0.41
7	T151032	Gravity Main	10	1,173.52	1,172.80	78	0.0093	0.70	0.51	12	0.38
8	T151030	Gravity Main	10	1,171.98	1,171.50	92	0.0052	0.70	0.60	15	0.33
9	R171014	Gravity Main	21	1,083.40	1,081.07	347	0.0067	8.76	1.00	24	0.63
10	R171024	Gravity Main	21	1,081.07	1,078.91	300	0.0072	8.76	1.00	24	0.62
11	R171006	Gravity Main	21	1,078.91	1,077.80	292	0.0038	8.76	1.00	27	0.62
12	R181002	Gravity Main	21	1,077.80	1,076.43	362	0.0038	8.76	1.00	27	0.62
13	R181001	Gravity Main	21	1,076.43	1,074.91	400	0.0038	8.77	1.00	27	0.62
14	S181010	Gravity Main	21	1,074.91	1,073.82	286	0.0038	8.77	1.00	27	0.62
15	S181011	Gravity Main	21	1,073.82	1,072.78	274	0.0038	8.77	1.00	27	0.62
16	S181012	Gravity Main	21	1,072.78	1,071.26	400	0.0038	8.77	1.00	27	0.62
17	S181016	Gravity Main	21	1,071.26	1,069.59	266	0.0063	9.28	1.00	24	0.68
18	S181015	Gravity Main	21	1,069.59	1,067.94	261	0.0063	9.29	1.00	24	0.67
19	S181018	Gravity Main	21	1,067.94	1,065.43	401	0.0063	9.29	1.00	24	0.68
20	S191016	Gravity Main	21	1,065.43	1,062.88	400	0.0064	9.29	1.00	24	0.67
21	S191020	Gravity Main	21	1,062.88	1,062.58	131	0.0023	9.29	1.00	30	0.63
22	S191019	Gravity Main	21	1,062.58	1,062.12	200	0.0023	9.29	1.00	30	0.63
23	S191021	Gravity Main	21	1,062.12	1,061.66	200	0.0023	9.29	1.00	30	0.63
24	S191022	Gravity Main	21	1,061.66	1,061.15	216	0.0024	9.30	1.00	30	0.63
25	S191026	Gravity Main	24	1,061.05	1,060.15	393	0.0023	9.30	1.00	30	0.63
26	S191027	Gravity Main	24	1,060.15	1,059.23	400	0.0023	9.30	1.00	30	0.63
27	S191029	Gravity Main	24	1,059.23	1,058.31	400	0.0023	9.30	1.00	30	0.63
28	S191030	Gravity Main	24	1,058.31	1,057.35	416	0.0023	9.31	1.00	30	0.63
29	T191019	Gravity Main	24	1,057.25	1,056.63	271	0.0023	9.31	1.00	30	0.64
30	T191018	Gravity Main	24	1,056.63	1,055.94	298	0.0023	9.31	1.00	30	0.63
31	T191014	Gravity Main	24	1,055.94	1,054.93	437	0.0023	9.32	1.00	30	0.63
32	T191013	Gravity Main	24	1,054.83	1,054.50	145	0.0023	9.32	1.00	30	0.64
33	T191012	Gravity Main	24	1,054.40	1,054.07	145	0.0023	9.32	1.00	30	0.64
34	T191011	Gravity Main	24	1,053.97	1,053.63	150	0.0023	9.32	1.00	30	0.64
35	T191010	Gravity Main	24	1,053.53	1,053.19	146	0.0023	9.32	1.00	30	0.63
36	T191009	Gravity Main	24	1,053.09	1,052.75	146	0.0023	9.32	1.00	30	0.63
37	T191007	Gravity Main	24	1,052.65	1,052.31	146	0.0023	9.32	1.00	30	0.63
38	T191008	Gravity Main	24	1,052.21	1,051.15	460	0.0023	9.33	1.00	30	0.63
39	T191005	Gravity Main	24	1,046.88	1,046.60	91	0.0031	9.33	1.00	27	0.70
40	T191005	Gravity Main	24	1,046.40	1,045.29	309	0.0036	9.33	1.00	27	0.66
41	U191010	Gravity Main	24	1,038.09	1,037.07	445	0.0023	9.35	1.00	30	0.64
42	U201017	Gravity Main	24	1,036.97	1,036.14	406	0.0020	9.35	1.00	30	0.66
43	U201016	Gravity Main	24	1,036.04	1,034.99	455	0.0023	9.35	1.00	30	0.64
44	U201015	Gravity Main	24	1,034.79	1,034.44	196	0.0018	9.35	1.00	30	0.70
45	U201014	Gravity Main	24	1,034.44	1,033.89	196	0.0028	9.36	1.00	27	0.73
46	U201013	Gravity Main	24	1,033.79	1,033.34	196	0.0023	9.36	1.00	30	0.64

Table 6.5 – Existing Sewer Pipe Deficiencies

ID Number	RCWD Line No	Type	Existing Diameter (in)	Upstream Invert (ft)	Downstream Invert (ft)	Length (ft)	Slope	PWWF (mgd)	Projected d/D in 2004	Recommended Replacement Diameter (in)	Replacement d/D
47	U201012	Gravity Main	24	1,033.24	1,032.79	196	0.0023	9.36	1.00	30	0.64
48	U201011	Gravity Main	24	1,032.69	1,032.33	160	0.0023	9.36	1.00	30	0.64
49	U201018	Gravity Main	24	1,032.33	1,032.24	36	0.0025	9.36	1.00	30	0.62
50	U201010	Gravity Main	24	1,032.14	1,031.69	196	0.0023	9.36	1.00	30	0.64
51	U201009	Gravity Main	24	1,031.59	1,031.14	196	0.0023	9.36	1.00	30	0.64
52	U201008	Gravity Main	24	1,031.04	1,030.39	282	0.0023	9.37	1.00	30	0.64
53	U201007	Gravity Main	24	1,030.39	1,029.93	200	0.0023	9.37	1.00	30	0.64
54	U201006	Gravity Main	24	1,029.93	1,029.01	398	0.0023	9.37	1.00	30	0.64
55	U211003	Gravity Main	24	1,028.91	1,028.46	196	0.0023	9.37	1.00	30	0.64
56	U211002	Gravity Main	24	1,028.36	1,027.44	404	0.0023	9.37	1.00	30	0.64
57	V211049	Gravity Main	24	1,027.44	1,026.52	400	0.0023	9.38	1.00	30	0.64
58	V211046	Gravity Main	24	1,026.52	1,025.60	400	0.0023	9.38	1.00	30	0.64
59	V211047	Gravity Main	24	1,025.60	1,024.68	398	0.0023	9.38	1.00	30	0.64
60		Gravity Main	27	1,019.99	1,019.22	350	0.0022	9.39	0.82	30	0.65
61		Gravity Main	27	1,019.22	1,018.48	341	0.0022	9.39	1.00	30	0.65
62		Gravity Main	27	1,017.69	1,017.44	117	0.0021	9.39	1.00	30	0.65

Figures 6.3, 6.3a, 6.3b and 6.3c illustrate the location of the 2009 gravity main deficiencies, and identify each deficiency with a corresponding Pipe ID. Similarly, figures 6.4, 6.4a, 6.4b and 6.4c correspond to the Ultimate gravity main deficiencies. Tables 6.6 and 6.7 present the hydraulic information for the 2009 and Ultimate deficient pipes respectively, as well as their recommended replacement diameters. Figures 6.5 through 6.8 present a more detailed illustration of all ultimate gravity main pipe deficiencies, with their corresponding pipe ID.



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Master Plan Update

RCWD's Collection Facility Deficiencies in 2009

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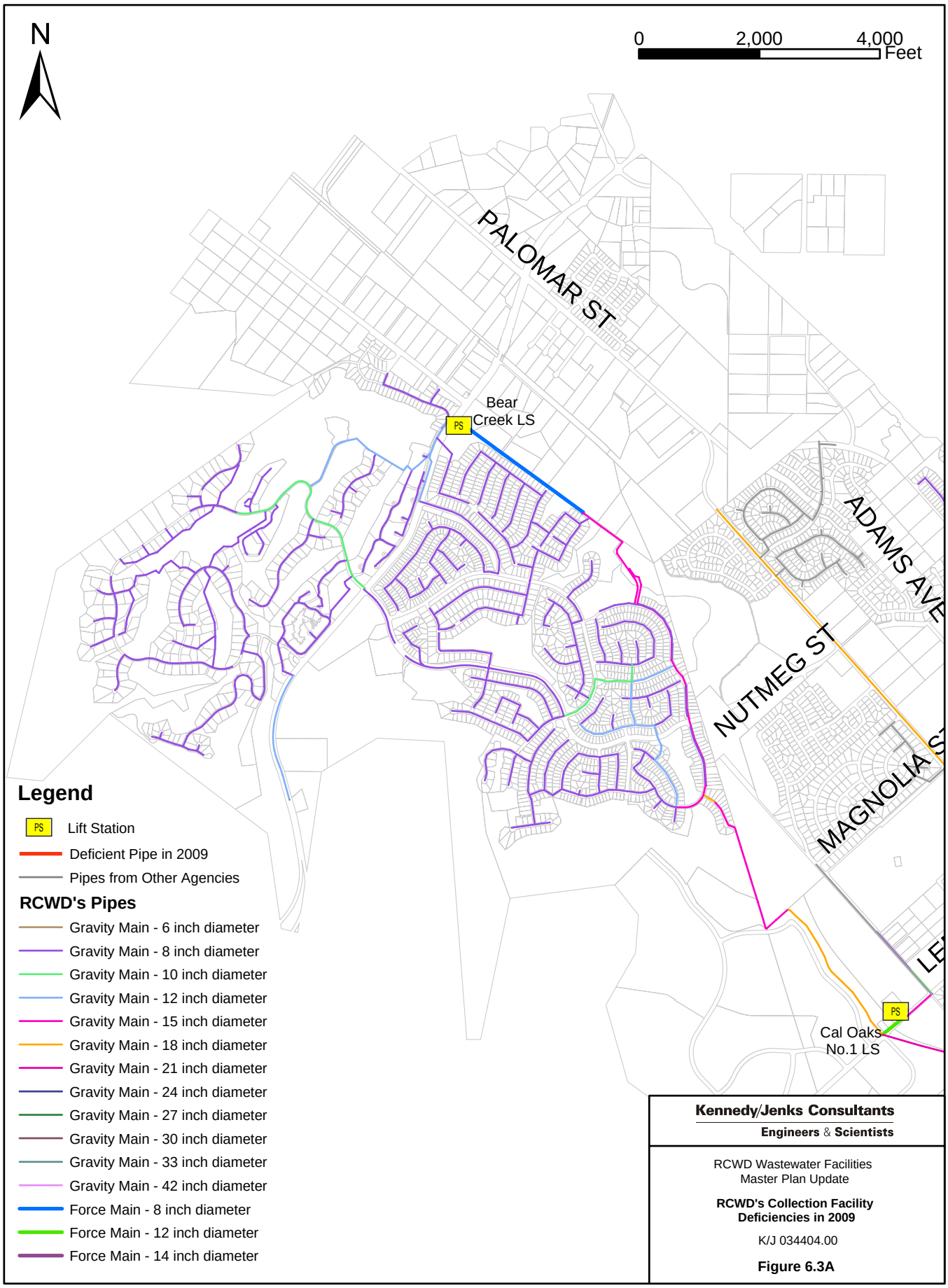
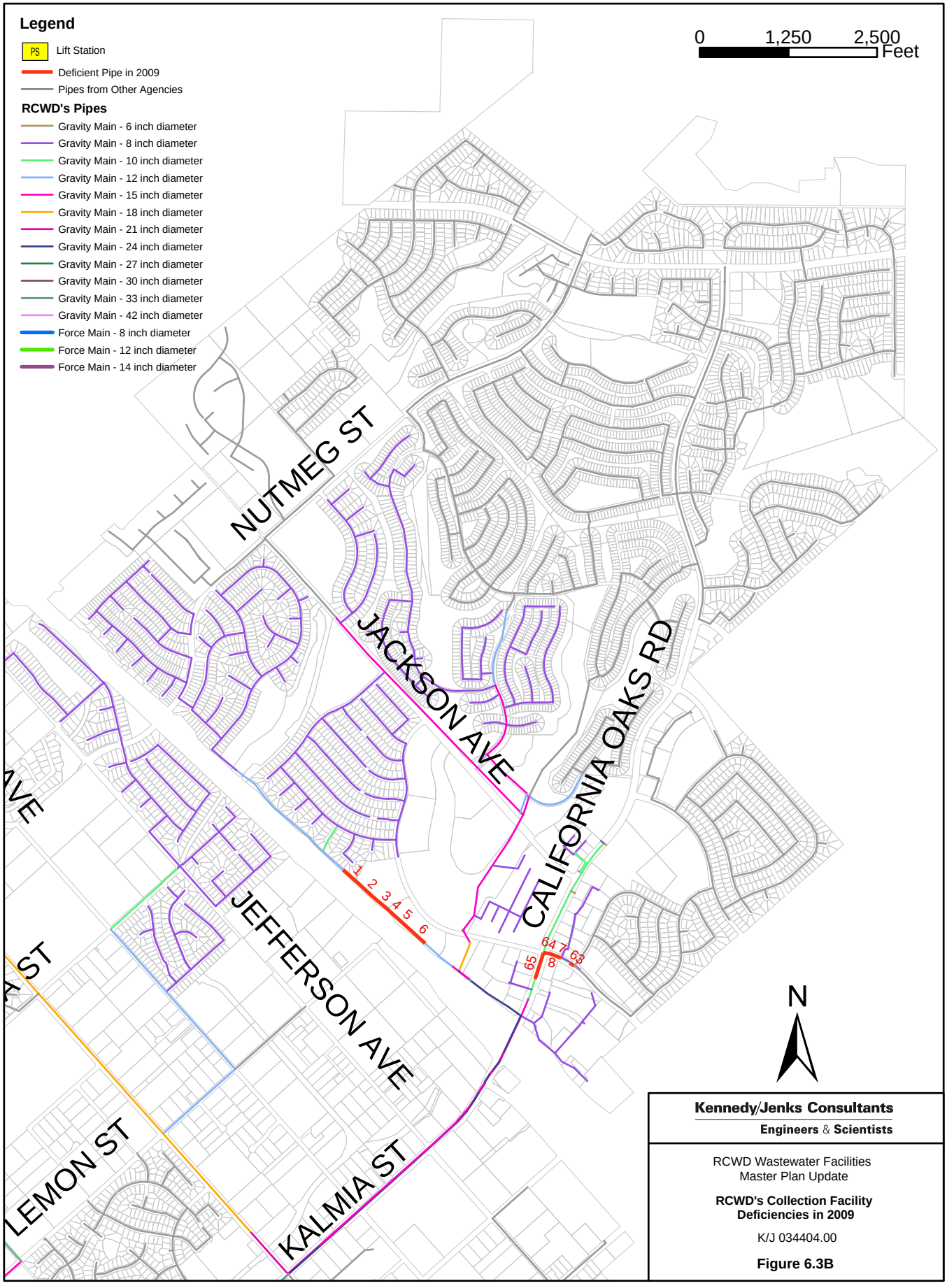
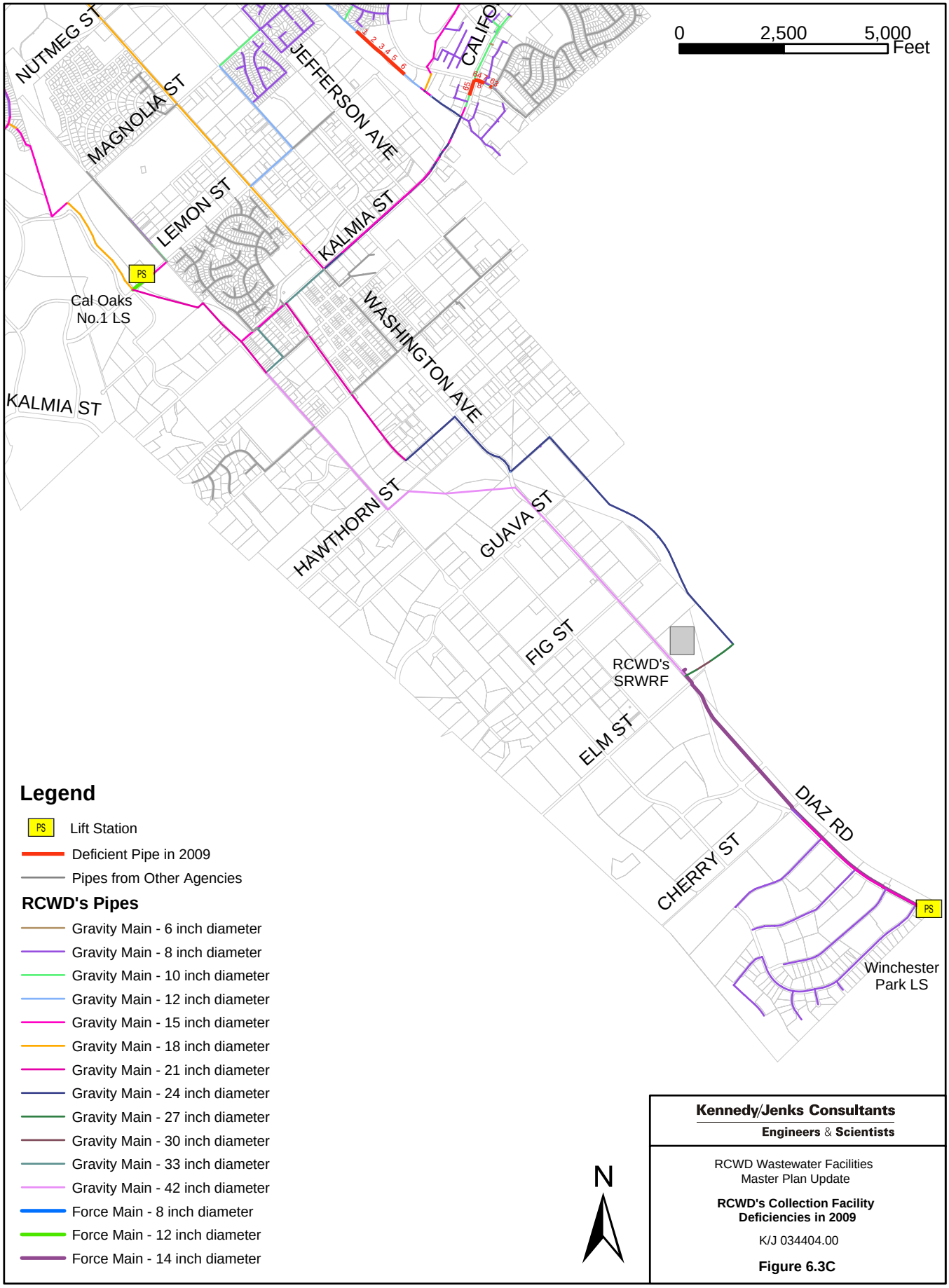
Figure 6.3


N
0
2,000
4,000
Feet
PALOMAR ST
Bear
Creek LS
PS
ADAMS AVE
NUTMEG ST
MAGNOLIA ST
Cal Oaks
No.1 LS
PS
3B
3C
Legend
PS Lift Station
Deficient Pipe in 2009
Pipes from Other Agencies
RCWD's Pipes
Gravity Main - 6 inch diameter
Gravity Main - 8 inch diameter
Gravity Main - 10 inch diameter
Gravity Main - 12 inch diameter
Gravity Main - 15 inch diameter
Gravity Main - 18 inch diameter
Gravity Main - 21 inch diameter
Gravity Main - 24 inch diameter
Gravity Main - 27 inch diameter
Gravity Main - 30 inch diameter
Gravity Main - 33 inch diameter
Gravity Main - 42 inch diameter
Force Main - 8 inch diameter
Force Main - 12 inch diameter
Force Main - 14 inch diameter
Kennedy/Jenks Consultants
Engineers & Scientists
RCWD Wastewater Facilities
Master Plan Update
RCWD's Collection Facility
Deficiencies in 2009
K/J 034404.00
Figure 6.3A


Legend
PS Lift Station
Deficient Pipe in 2009
Pipes from Other Agencies
RCWD's Pipes
Gravity Main - 6 inch diameter
Gravity Main - 8 inch diameter
Gravity Main - 10 inch diameter
Gravity Main - 12 inch diameter
Gravity Main - 15 inch diameter
Gravity Main - 18 inch diameter
Gravity Main - 21 inch diameter
Gravity Main - 24 inch diameter
Gravity Main - 27 inch diameter
Gravity Main - 30 inch diameter
Gravity Main - 33 inch diameter
Gravity Main - 42 inch diameter
Force Main - 8 inch diameter
Force Main - 12 inch diameter
Force Main - 14 inch diameter
0 1,250 2,500 Feet
NUTMEG ST
JACKSON AVE
CALIFORNIA OAKS RD
JEFFERSON AVE
LEMON ST
KALMIA ST
1 2 3 4 5 6
64 7 63
65 8
N
Kennedy/Jenks Consultants
Engineers & Scientists
RCWD Wastewater Facilities
Master Plan Update
RCWD's Collection Facility
Deficiencies in 2009
K/J 034404.00
Figure 6.3B

3A

3C


3A
3B
0
2,500
5,000
Feet
NUTMEG ST
MAGNOLIA ST
JEFFERSON AVE
CALIFO
LEMON ST
KALMIA ST
PS
Cal Oaks
No.1 LS
WASHINGTON AVE
KALMIA ST
HAWTHORN ST
GUAVA ST
FIG ST
RCWD's
SRWRF
ELM ST
DIAZ RD
CHERRY ST
PS
Winchester
Park LS
Legend
PS Lift Station
Deficient Pipe in 2009
Pipes from Other Agencies
RCWD's Pipes
Gravity Main - 6 inch diameter
Gravity Main - 8 inch diameter
Gravity Main - 10 inch diameter
Gravity Main - 12 inch diameter
Gravity Main - 15 inch diameter
Gravity Main - 18 inch diameter
Gravity Main - 21 inch diameter
Gravity Main - 24 inch diameter
Gravity Main - 27 inch diameter
Gravity Main - 30 inch diameter
Gravity Main - 33 inch diameter
Gravity Main - 42 inch diameter
Force Main - 8 inch diameter
Force Main - 12 inch diameter
Force Main - 14 inch diameter
N
Kennedy/Jenks Consultants
Engineers & Scientists
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Master Plan Update
RCWD's Collection Facility
Deficiencies in 2009
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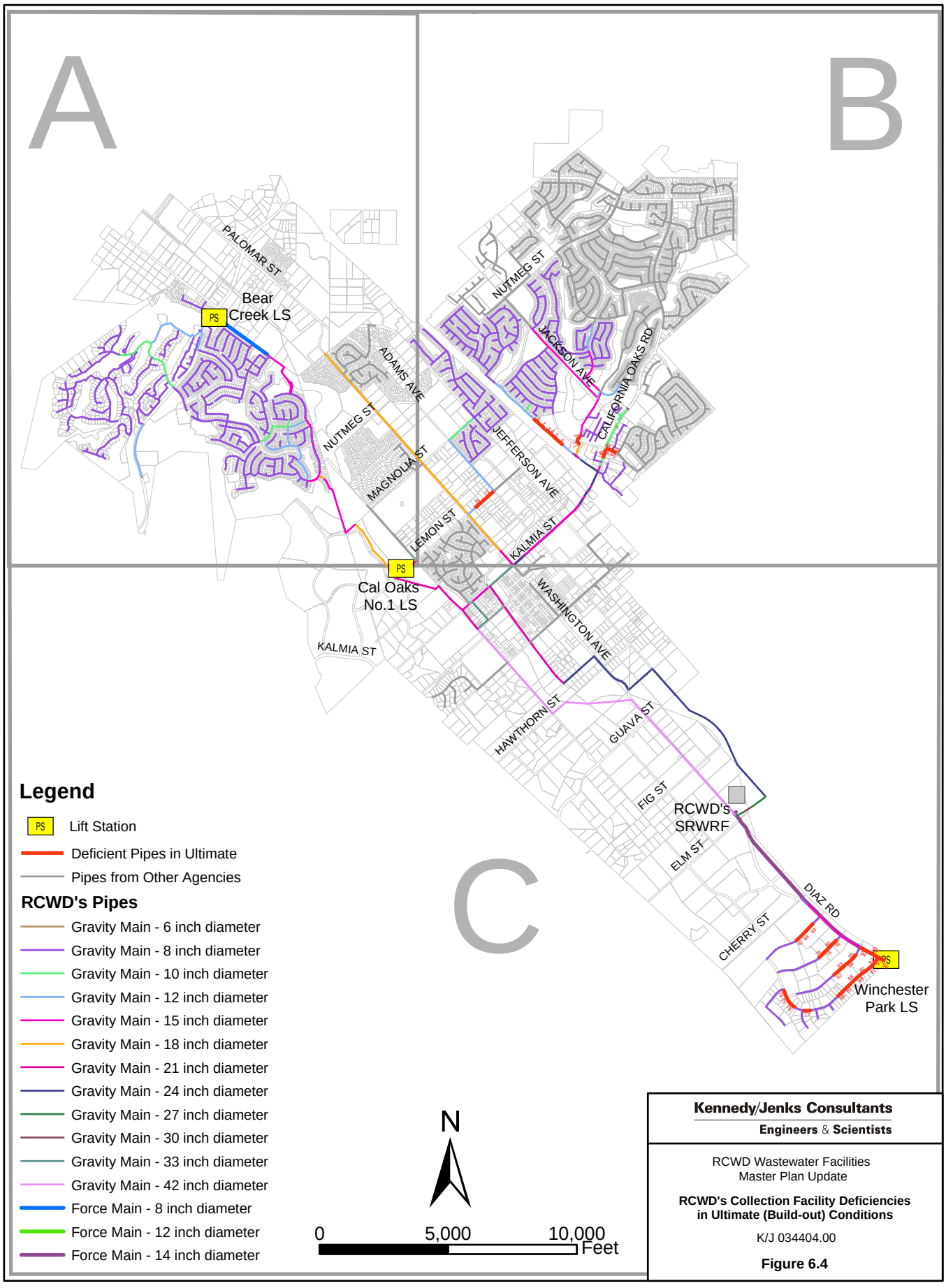
Figure 6.3C

Table 6.6 - Sewer Pipe Deficiencies in 2009

ID Number	RCWD Line No	Type	Existing Diameter (in)	Upstream Invert (ft)	Downstream Invert (ft)	Length (ft)	Slope	PWWF (mgd)	Projected d/D in 2009	Recommended Replacement Diameter (in)	Replacement d/D
1	S141088	Gravity Main	12	1,188.44	1,187.74	292	0.0024	0.80	0.62	15	0.43
2	S141086	Gravity Main	12	1,187.74	1,187.07	284	0.0024	0.81	0.63	15	0.44
3	S141084	Gravity Main	12	1,186.89	1,186.19	249	0.0028	0.81	0.59	15	0.42
4	S141071	Gravity Main	12	1,185.99	1,185.75	119	0.0020	0.82	0.67	15	0.46
5	S141080	Gravity Main	12	1,185.75	1,185.03	300	0.0024	0.82	0.63	15	0.44
6	S141078	Gravity Main	12	1,185.03	1,184.31	298	0.0024	0.83	0.63	15	0.44
7	T151032	Gravity Main	10	1,173.52	1,172.80	78	0.0093	0.72	0.52	12	0.39
8	T151030	Gravity Main	10	1,171.98	1,171.50	92	0.0052	0.73	0.62	15	0.33
63	T151051	Gravity Main	10	1,175.81	1,175.00	92	0.0088	0.68	0.51	12	0.38
64	T151031	Gravity Main	10	1,172.70	1,172.00	74	0.0095	0.72	0.51	12	0.39
65	T151034	Gravity Main	10	1,171.45	1,166.77	388	0.0121	0.84	0.52	12	0.40



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RCWD's Collection Facility Deficiencies in Ultimate (Build-out) Conditions

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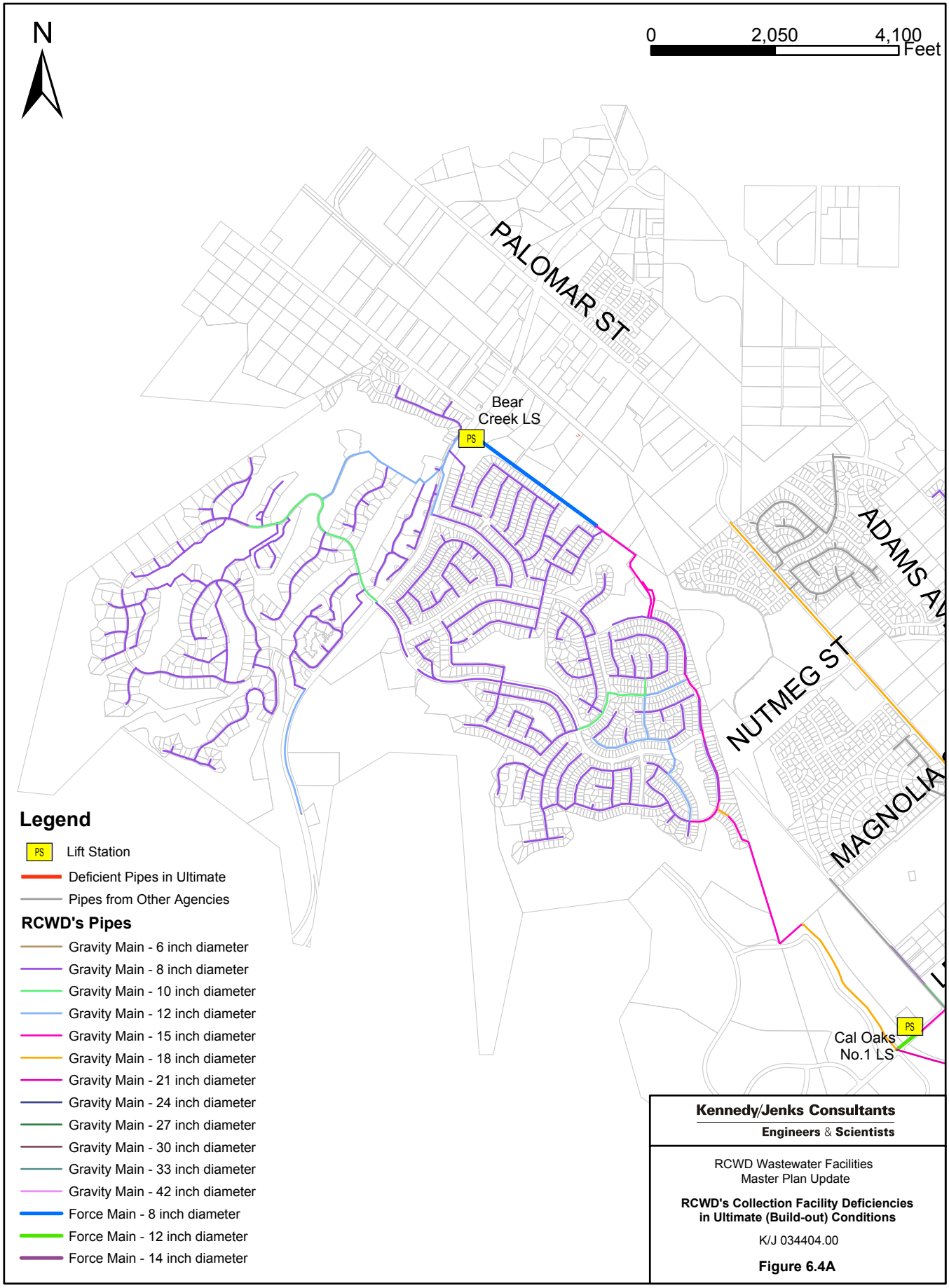
Figure 6.4


N
0
2,050
4,100
Feet
PALOMAR ST
Bear
Creek LS
PS
ADAMS AV
NUTMEG ST
MAGNOLIA
Cal Oaks
No.1 LS
PS
4B
4C
Legend
PS Lift Station
Deficient Pipes in Ultimate
Pipes from Other Agencies
RCWD's Pipes
Gravity Main - 6 inch diameter
Gravity Main - 8 inch diameter
Gravity Main - 10 inch diameter
Gravity Main - 12 inch diameter
Gravity Main - 15 inch diameter
Gravity Main - 18 inch diameter
Gravity Main - 21 inch diameter
Gravity Main - 24 inch diameter
Gravity Main - 27 inch diameter
Gravity Main - 30 inch diameter
Gravity Main - 33 inch diameter
Gravity Main - 42 inch diameter
Force Main - 8 inch diameter
Force Main - 12 inch diameter
Force Main - 14 inch diameter
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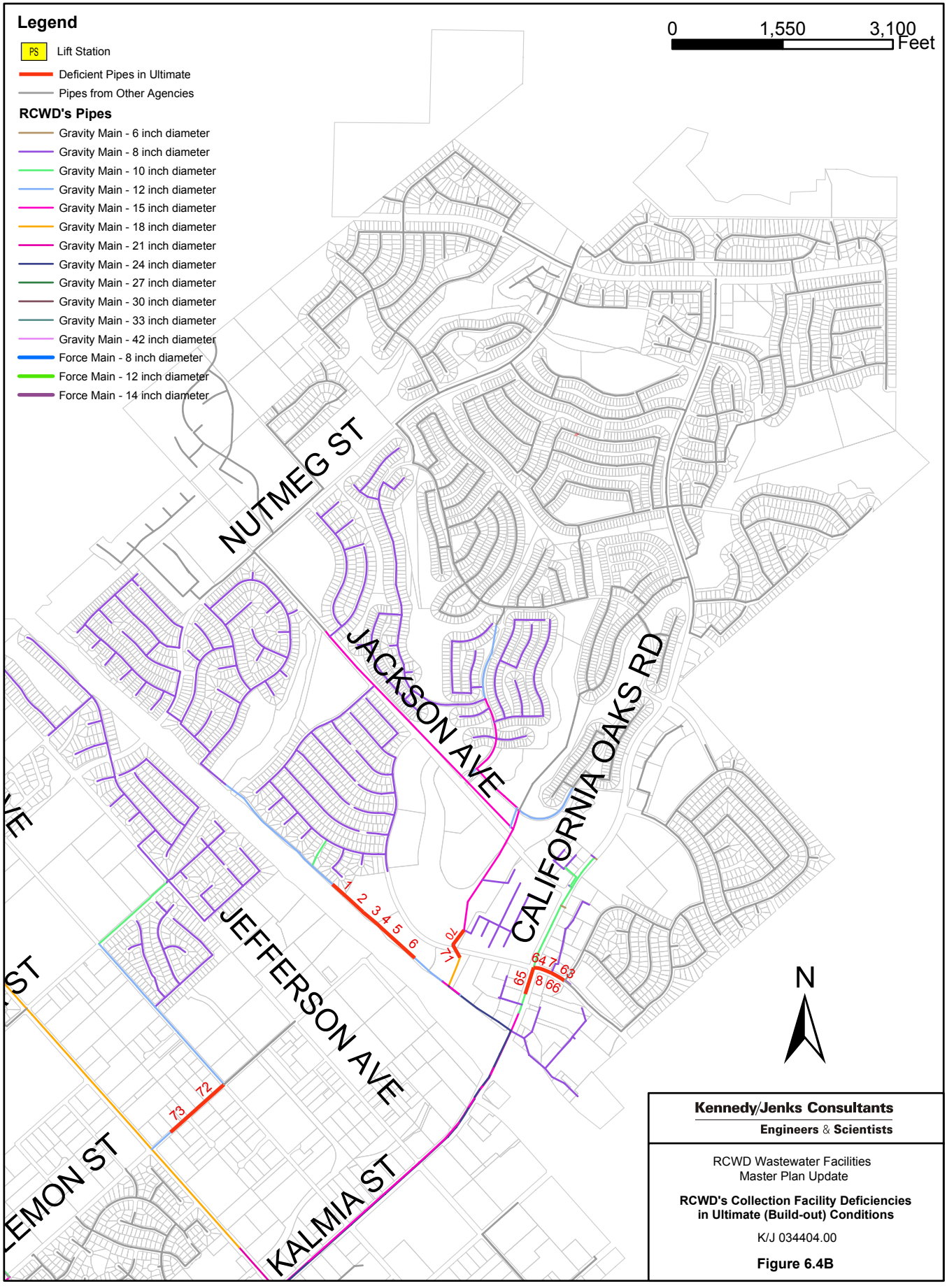
Engineers & Scientists
RCWD Wastewater Facilities
Master Plan Update
RCWD's Collection Facility Deficiencies
in Ultimate (Build-out) Conditions
K/J 034404.00
Figure 6.4A


Legend
PS Lift Station
Deficient Pipes in Ultimate
Pipes from Other Agencies
RCWD's Pipes
Gravity Main - 6 inch diameter
Gravity Main - 8 inch diameter
Gravity Main - 10 inch diameter
Gravity Main - 12 inch diameter
Gravity Main - 15 inch diameter
Gravity Main - 18 inch diameter
Gravity Main - 21 inch diameter
Gravity Main - 24 inch diameter
Gravity Main - 27 inch diameter
Gravity Main - 30 inch diameter
Gravity Main - 33 inch diameter
Gravity Main - 42 inch diameter
Force Main - 8 inch diameter
Force Main - 12 inch diameter
Force Main - 14 inch diameter
0
1,550
3,100
Feet
NUTMEG ST
JACKSON AVE
CALIFORNIA OAKS RD
JEFFERSON AVE
KALMIA ST
1
2
3
4
5
6
70
71
72
73
64
7
63
65
8
66
N
Kennedy/Jenks Consultants
Engineers & Scientists
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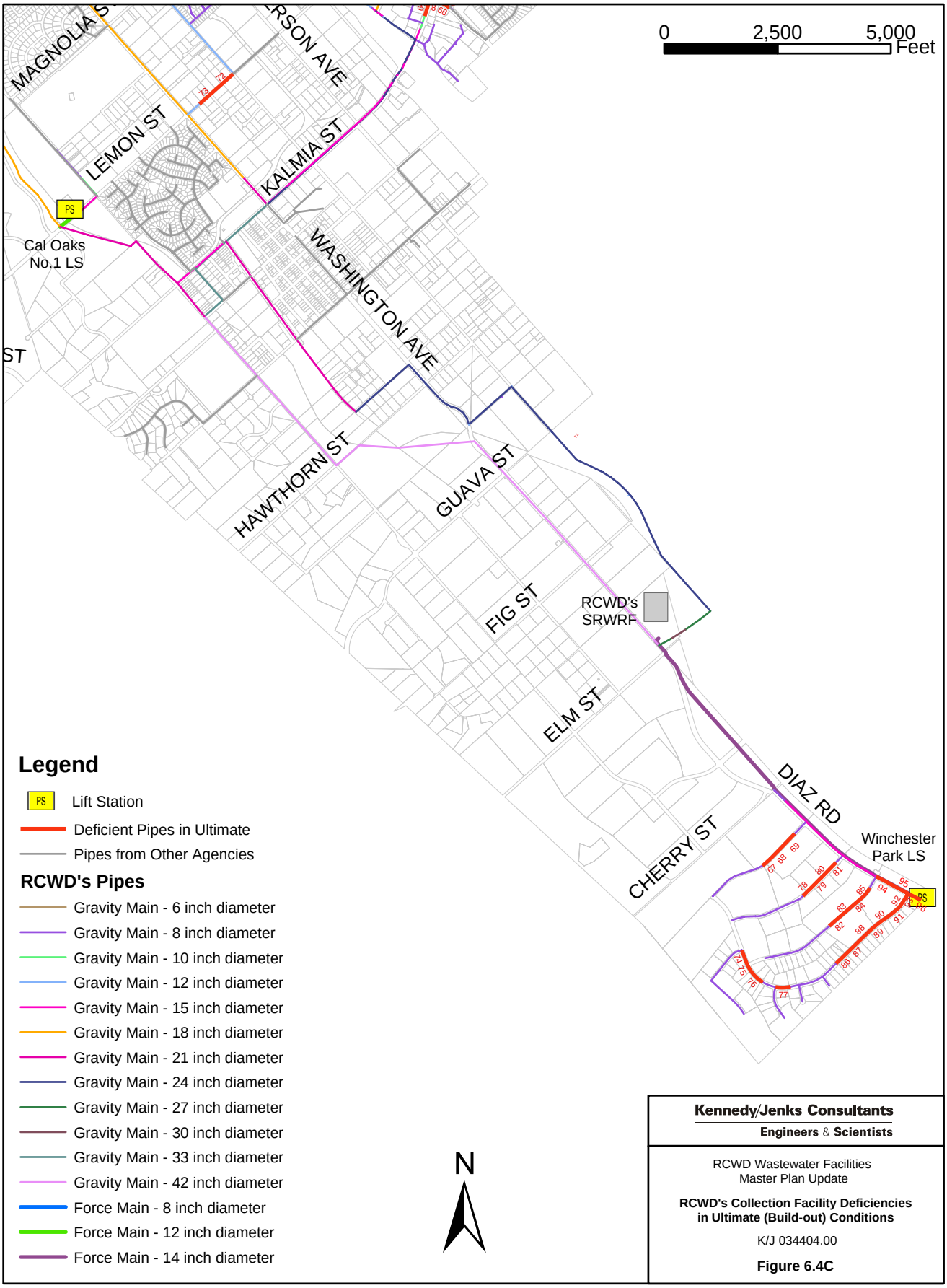
in Ultimate (Build-out) Conditions
K/J 034404.00
Figure 6.4B

4A

4C


4A
4B
0
2,500
5,000
Feet
MAGNOLIA ST
LEMON ST
KALMIA ST
WASHINGTON AVE
HAWTHORN ST
GUAVA ST
FIG ST
ELM ST
CHERRY ST
DIAZ RD
PS
Cal Oaks
No.1 LS
RCWD's
SRWRF
Winchester
Park LS
Legend
Lift Station
Deficient Pipes in Ultimate
Pipes from Other Agencies
RCWD's Pipes
Gravity Main - 6 inch diameter
Gravity Main - 8 inch diameter
Gravity Main - 10 inch diameter
Gravity Main - 12 inch diameter
Gravity Main - 15 inch diameter
Gravity Main - 18 inch diameter
Gravity Main - 21 inch diameter
Gravity Main - 24 inch diameter
Gravity Main - 27 inch diameter
Gravity Main - 30 inch diameter
Gravity Main - 33 inch diameter
Gravity Main - 42 inch diameter
Force Main - 8 inch diameter
Force Main - 12 inch diameter
Force Main - 14 inch diameter
N
Kennedy/Jenks Consultants
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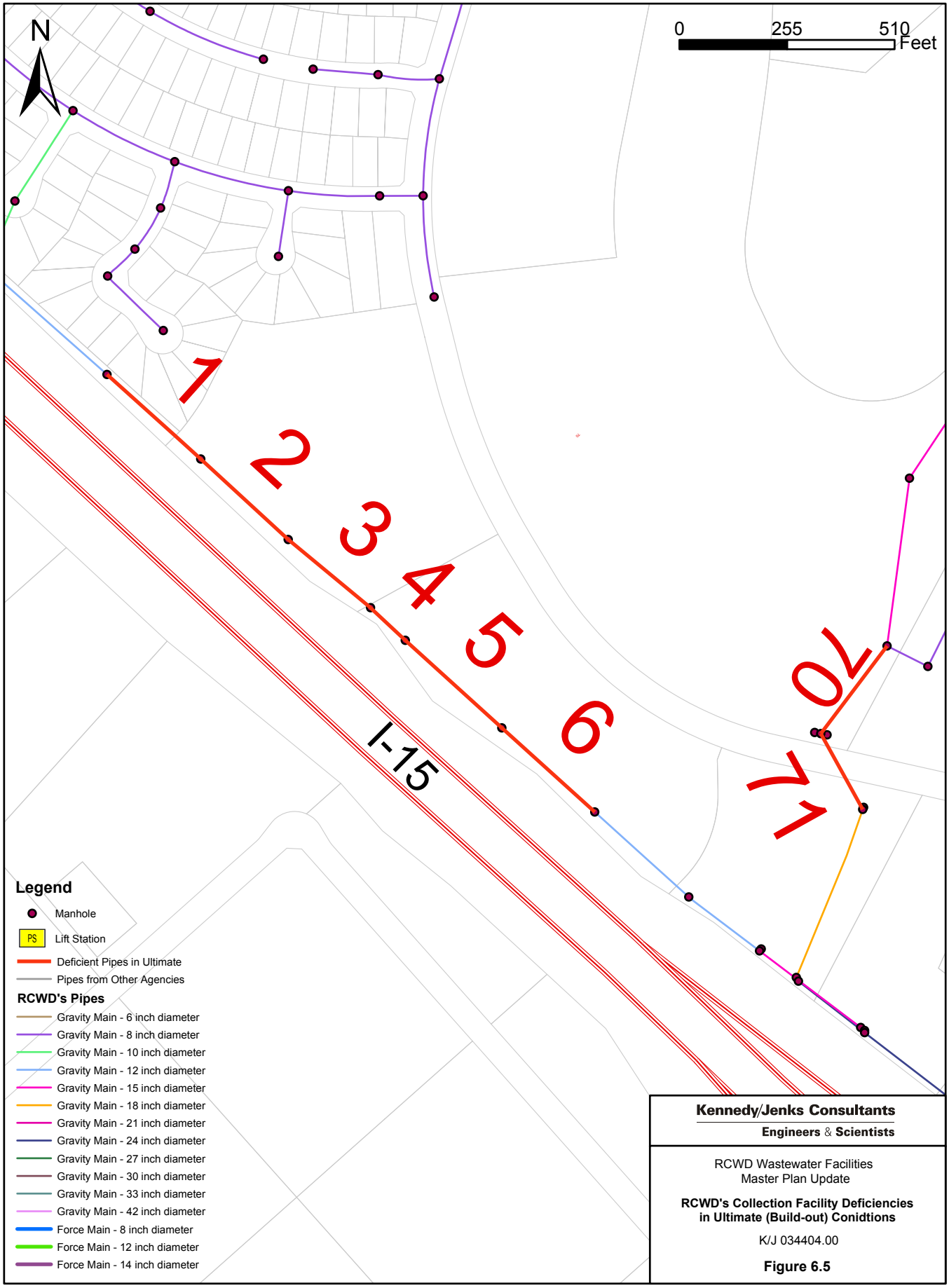
RCWD Wastewater Facilities
Master Plan Update
RCWD's Collection Facility Deficiencies
in Ultimate (Build-out) Conditions
K/J 034404.00
Figure 6.4C

Table 6.7 - Sewer Pipe Deficiencies in Ultimate

ID Number	RCWD Line No	Type	Existing Diameter	Upstream Invert (ft)	Downstream Invert (ft)	Length (ft)	Slope	PWWF (mgd)	Projected d/D in Ultimate	Recommended Replacement Diameter	Replacement d/D
1	S141088	Gravity Main	12	1,188.44	1,187.74	292	0.0024	0.85	0.65	15	0.45
2	S141086	Gravity Main	12	1,187.74	1,187.07	284	0.0024	0.91	0.68	15	0.47
3	S141084	Gravity Main	12	1,186.89	1,186.19	249	0.0028	0.91	0.64	15	0.45
4	S141071	Gravity Main	12	1,185.99	1,185.75	119	0.0020	0.96	0.76	15	0.51
5	S141080	Gravity Main	12	1,185.75	1,185.03	300	0.0024	0.96	0.71	15	0.48
6	S141078	Gravity Main	12	1,185.03	1,184.31	298	0.0024	0.96	0.70	15	0.48
7	T151032	Gravity Main	10	1,173.52	1,172.80	78	0.0093	0.81	0.55	12	0.42
8	T151030	Gravity Main	10	1,171.98	1,171.50	92	0.0052	0.85	0.69	15	0.36
63	T151051	Gravity Main	10	1,175.81	1,175.00	92	0.0088	0.75	0.54	12	0.40
64	T151031	Gravity Main	10	1,172.70	1,172.00	74	0.0095	0.85	0.57	12	0.43
65	T151034	Gravity Main	10	1,171.45	1,166.77	388	0.0121	0.96	0.57	12	0.43
66	T151033	Gravity Main	10	1,175.00	1,173.56	148	0.0097	0.75	0.69	12	0.39
67	V241012	Gravity Main	8	1,025.50	1,023.90	229	0.0070	0.45	0.61	10	0.43
68	V241011	Gravity Main	8	1,023.90	1,020.15	370	0.0101	0.53	0.60	10	0.42
69	V241010	Gravity Main	8	1,020.15	1,018.15	400	0.0050	0.53	0.79	12	0.39
70	S141079	Gravity Main	15	1,157.38	1,155.47	255	0.0075	3.39	0.77	18	0.54
71	S141037	Gravity Main	15	1,155.37	1,153.84	209	0.0073	3.39	0.78	18	0.55
72	R151001	Gravity Main	12	1,120.19	1,119.00	496	0.0024	1.13	1.00	15	0.53
73	R161010	Gravity Main	12	1,118.90	1,115.03	496	0.0078	1.14	0.53	15	0.38
74	V251043	Gravity Main	8	1,081.30	1,079.86	289	0.0050	0.31	0.53	10	0.38
75	V251045	Gravity Main	8	1,079.86	1,078.59	255	0.0050	0.31	0.53	10	0.38
76	V251047	Gravity Main	8	1,078.59	1,076.99	320	0.0050	0.34	0.56	10	0.40
77	V251052	Gravity Main	8	1,072.70	1,068.34	342	0.0127	0.46	0.51	10	0.37
78	V241001	Gravity Main	8	1,022.36	1,020.92	293	0.0049	0.34	0.57	10	0.40
79	W241021	Gravity Main	8	1,020.92	1,019.64	257	0.0050	0.36	0.59	10	0.41
80	W241022	Gravity Main	8	1,019.64	1,018.39	250	0.0050	0.39	0.62	10	0.43
81	W241023	Gravity Main	8	1,018.39	1,017.18	241	0.0050	0.39	0.62	10	0.43
82	W251030	Gravity Main	8	1,017.06	1,015.80	314	0.0040	0.28	0.54	10	0.38
83	W251032	Gravity Main	8	1,015.80	1,014.54	314	0.0040	0.28	0.54	10	0.38
84	W251034	Gravity Main	8	1,014.54	1,013.29	314	0.0040	0.28	0.54	10	0.38
85	W241028	Gravity Main	8	1,013.29	1,012.12	292	0.0040	0.35	0.62	10	0.43
86	W251024	Gravity Main	8	1,021.81	1,015.94	290	0.0202	0.60	0.52	10	0.37
87	W251025	Gravity Main	8	1,015.94	1,014.40	385	0.0040	0.62	1.00	12	0.45
88	W251027	Gravity Main	8	1,014.40	1,012.86	386	0.0040	0.64	1.00	12	0.46
89	W251029	Gravity Main	8	1,012.86	1,012.11	187	0.0040	0.65	1.00	12	0.47
90	W251031	Gravity Main	8	1,012.11	1,010.75	340	0.0040	0.65	1.00	12	0.47
91	W251033	Gravity Main	8	1,010.75	1,009.67	270	0.0040	0.67	1.00	12	0.47
92	W251035	Gravity Main	8	1,009.67	1,008.60	262	0.0041	0.68	1.00	12	0.48
93	W241019	Gravity Main	8	1,008.60	1,006.33	105	0.0216	0.68	0.55	10	0.39
94	W241017	Gravity Main	15	1,007.03	1,006.41	400	0.0016	1.64	0.82	18	0.57
95	W241018	Gravity Main	15	1,006.39	1,005.75	400	0.0016	1.65	0.98	18	0.56
96	W241020	Gravity Main	15	1,005.75	1,005.20	333	0.0016	2.24	1.00	18	0.68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510
Feet
1
2
3
4
5
6
7
I-15
Legend
Manhole
PS
Lift Station
Deficient Pipes in Ultimate
Pipes from Other Agencies
RCWD's Pipes
Gravity Main - 6 inch diameter
Gravity Main - 8 inch diameter
Gravity Main - 10 inch diameter
Gravity Main - 12 inch diameter
Gravity Main - 15 inch diameter
Gravity Main - 18 inch diameter
Gravity Main - 21 inch diameter
Gravity Main - 24 inch diameter
Gravity Main - 27 inch diameter
Gravity Main - 30 inch diameter
Gravity Main - 33 inch diameter
Gravity Main - 42 inch diameter
Force Main - 8 inch diameter
Force Main - 12 inch diameter
Force Main - 14 inch diameter
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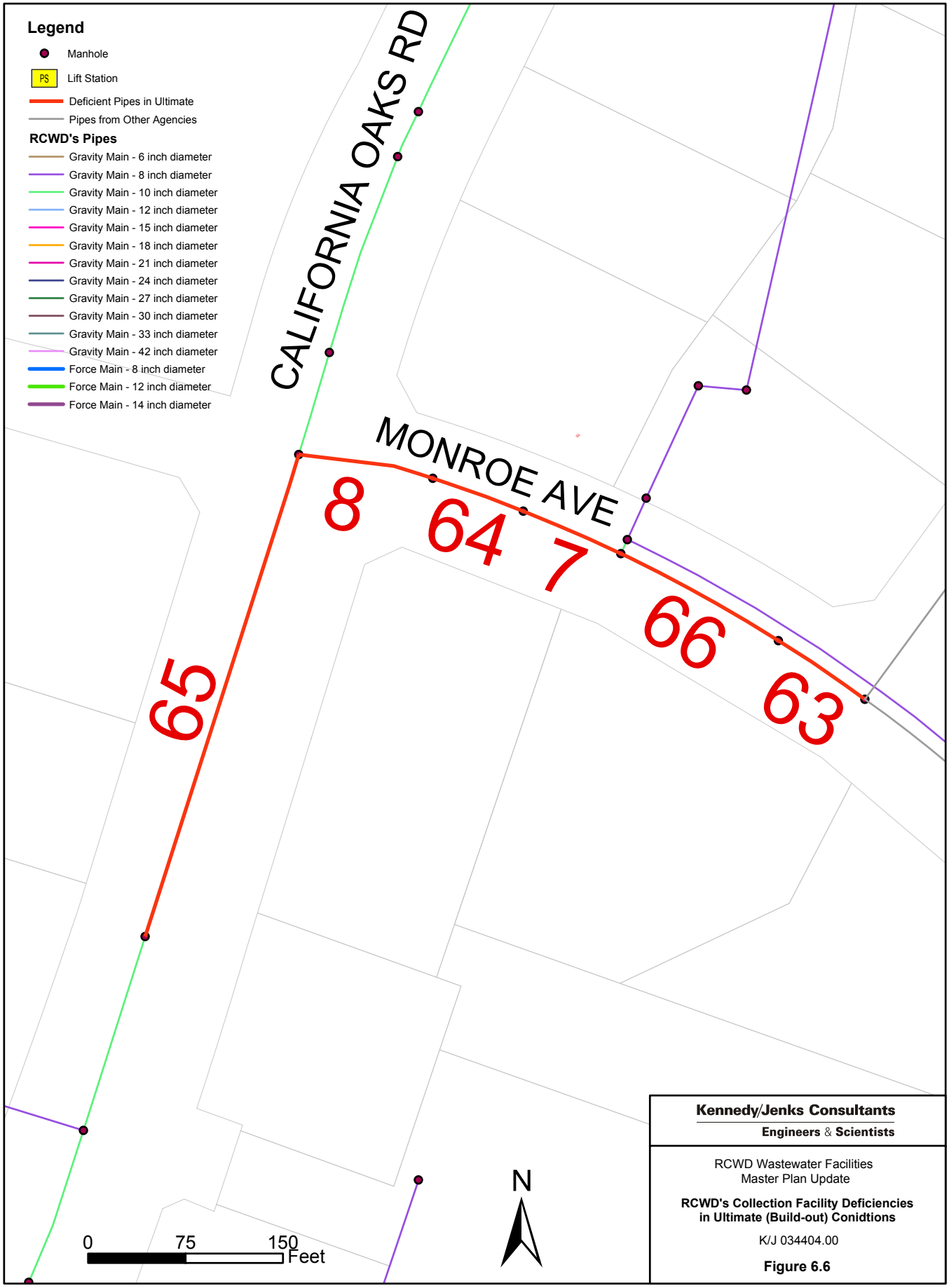
Master Plan Update
RCWD's Collection Facility Deficiencies
in Ultimate (Build-out) Conidtions
K/J 034404.00
Figure 6.5


Legend
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PS
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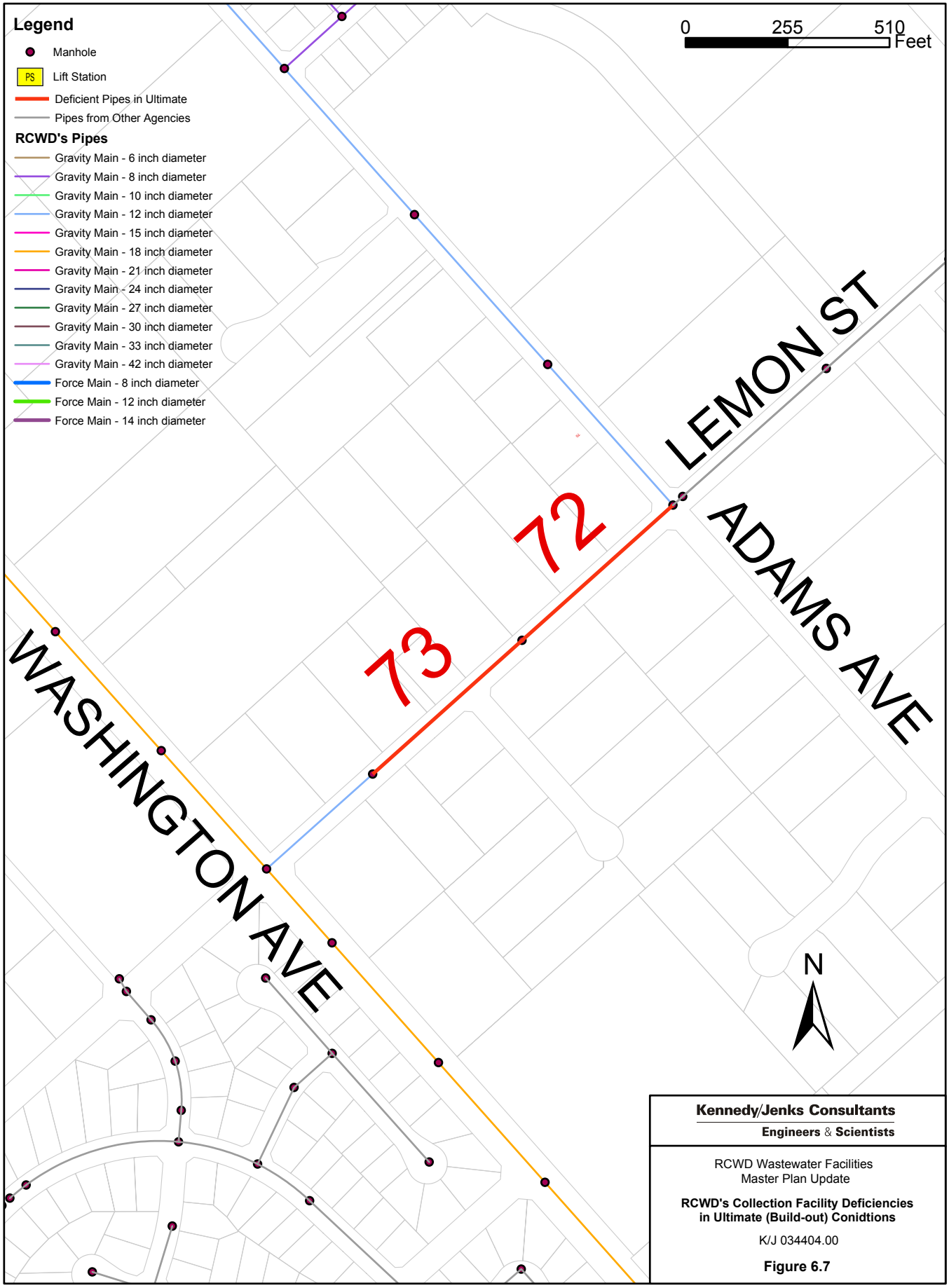
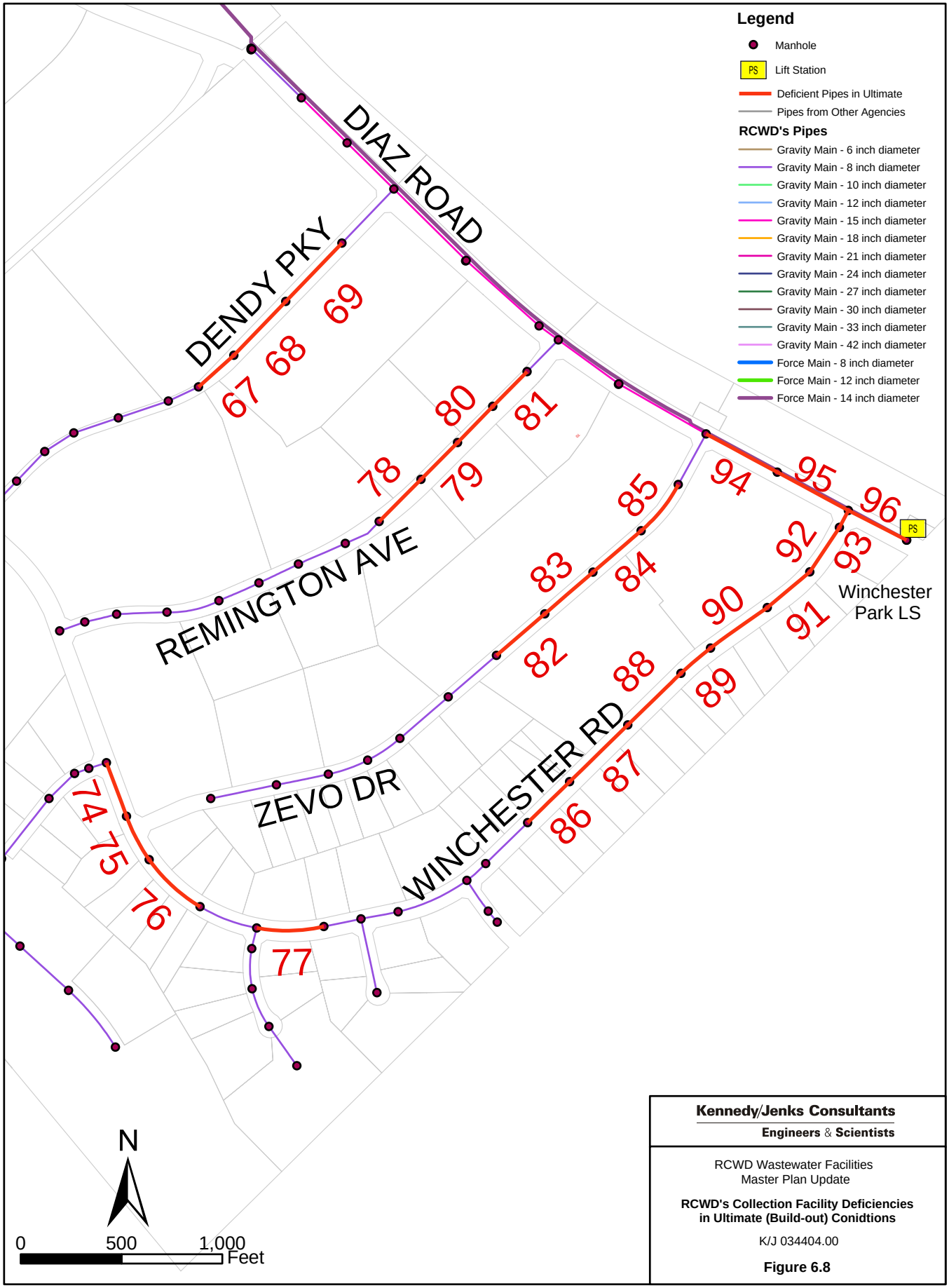
Gravity Main - 10 inch diameter
Gravity Main - 12 inch diameter
Gravity Main - 15 inch diameter
Gravity Main - 18 inch diameter
Gravity Main - 21 inch diameter
Gravity Main - 24 inch diameter
Gravity Main - 27 inch diameter
Gravity Main - 30 inch diameter
Gravity Main - 33 inch diameter
Gravity Main - 42 inch diameter
Force Main - 8 inch diameter
Force Main - 12 inch diameter
Force Main - 14 inch diameter
CALIFORNIA OAKS RD
MONROE AVE
8
64
7
66
63
65
0
75
150
Feet
N
Kennedy/Jenks Consultants
Engineers & Scientists
RCWD Wastewater Facilities
Master Plan Update
RCWD's Collection Facility Deficiencies
in Ultimate (Build-out) Conidtions
K/J 034404.00
Figure 6.6


Legend
Manhole
PS
Lift Station
Deficient Pipes in Ultimate
Pipes from Other Agencies
RCWD's Pipes
Gravity Main - 6 inch diameter
Gravity Main - 8 inch diameter
Gravity Main - 10 inch diameter
Gravity Main - 12 inch diameter
Gravity Main - 15 inch diameter
Gravity Main - 18 inch diameter
Gravity Main - 21 inch diameter
Gravity Main - 24 inch diameter
Gravity Main - 27 inch diameter
Gravity Main - 30 inch diameter
Gravity Main - 33 inch diameter
Gravity Main - 42 inch diameter
Force Main - 8 inch diameter
Force Main - 12 inch diameter
Force Main - 14 inch diameter
0
255
510
Feet
LEMON ST
ADAMS AVE
WASHINGTON AVE
72
73
N
Kennedy/Jenks Consultants
Engineers & Scientists
RCWD Wastewater Facilities
Master Plan Update
RCWD's Collection Facility Deficiencies
in Ultimate (Build-out) Conidtions
K/J 034404.00
Figure 6.7


Legend
Manhole
PS
Lift Station
Deficient Pipes in Ultimate
Pipes from Other Agencies
RCWD's Pipes
Gravity Main - 6 inch diameter
Gravity Main - 8 inch diameter
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Gravity Main - 12 inch diameter
Gravity Main - 15 inch diameter
Gravity Main - 18 inch diameter
Gravity Main - 21 inch diameter
Gravity Main - 24 inch diameter
Gravity Main - 27 inch diameter
Gravity Main - 30 inch diameter
Gravity Main - 33 inch diameter
Gravity Main - 42 inch diameter
Force Main - 8 inch diameter
Force Main - 12 inch diameter
Force Main - 14 inch diameter
DIAZ ROAD
DENDY PKY
REMINGTON AVE
ZEVO DR
WINCHESTER RD
Winchester Park LS
PS
67
68
69
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
N
0
500
1,000
Feet
Kennedy/Jenks Consultants
Engineers & Scientists
RCWD Wastewater Facilities Master Plan Update
RCWD's Collection Facility Deficiencies in Ultimate (Build-out) Conidtions
K/J 034404.00
Figure 6.8

Section 7: Sewer System Model Development

A wastewater collection system hydraulic model (model) for the Rancho California Water District (RCWD) was developed in H2OMAP hydraulic modeling software. The model was used to evaluate existing and future collection facilities, and will be submitted to the District as a deliverable.

The District's GIS database was used to create the wastewater collection facilities in the H20MAP Sewer hydraulic model. Hydraulic information was assigned to all wet wells, pump stations, gravity mains, force mains and manholes in the hydraulic model. Four wastewater flow scenarios were modeled for the existing time increment, and seven wastewater flow scenarios were modeled for both the 2009 and Ultimate time increments.

The main components involved in developing the RCWD wastewater system model are as follows:

- Assignment of attribute data and system controls to emulate RCWD's physical facilities and system operations, respectively.
- Parcel-level loading of existing and projected wastewater flows.
- Scenario development for the CIP, involving 1) identification of deficiencies per planning period and 2) analysis of system-specific operational issues, per District direction.

7.1 Modeling RCWD's Collection System Facilities

7.1.1 Wet Wells and Pump Stations

With the exception of the temporary wet well in MCWD, all wet well geometries and pump activation levels were obtained from as built drawings. Hydraulic information for the temporary wet well and pump station was supplied through conversations with MCWD. As instructed by RCWD, all wet wells are active in the existing time increment, while only Bear Creek, Cal Oaks No.1 and Winchester Park are active in the 2009 and Ultimate Time increments. All wet well hydraulic information is presented in Table 7.1.

Table 7.1 – Wet Well Hydraulic Information

Wet Well	Diameter (ft)	Lead Pump Off Level (ft)	Lead Pump On Level (ft)	Standby Pump Off Level (ft)	Standby Pump On Level (ft)
Bear Creek	10	3.5	6.5	4.5	7.5
Cal Oaks No. 1	12	4.0	10.0	5.0	11.0
Cal Oaks No. 2	9	4.0	10.0	5.0	11.0
Temporary MCWD	9	2.5	6.5	3.5	7.5
Winchester Park	12	4.0	10.0	5.0	11.0

All pump hydraulic information is shown below in Table 7.2.

Table 7.2 – Pump Hydraulic Information

Pump Station	Function	Design Head (ft)	Design Flow Rate (gpm)	Horsepower (hp)
Bear Creek	Lead	65	500	20
Bear Creek	Standby	65	500	20
Cal Oaks No. 1	Lead	70	1700	50
Cal Oaks No. 1	Standby	70	1700	50
Cal Oaks No. 2	Lead	40	500	15
Cal Oaks No. 2	Standby	40	500	15
Temporary MCWD	Lead	30	200	15
Temporary MCWD	Standby	30	200	15
Winchester Park	Lead	65	1880	50
Winchester Park	Standby	65	1880	50

7.1.2 Sewer Pipes

Invert elevations, length, material, and diameters were obtained from the District's GIS database for all gravity and force mains in RCWD's collection system. Pursuant to conversations with the District, sewer pipes were identified as being active in the existing time increment and/or the 2009 and Ultimate time increments. Table 7.3 presents the total linear feet of gravity mains in both the 2004 and 2009/Ultimate time increments.

Table 7.3 – Gravity Main Hydraulic Information

Diameter (in)	2004 Linear Feet	2009/Ultimate Linear Feet
6	1,811	1,811
8	406,297	406,297
10	32,680	32,680
12	30,254	30,254
15	32,216	32,216
18	14,134	17,558
21	5,552	5,532
24	17,550	17,550
27	905	905
30	362	362
33	1,210	3,597
42	0	14,045

Table 7.4 presents the total linear feet of the force mains in the 2004 and 2009/Ultimate time increments.

Table 7.4 – Force Main Hydraulic Information

Diameter (in)	2004 Linear Feet	2009/Ultimate Linear Feet
8	2,623	2,575
12	5,732	574
14	8,480	8,480

7.2 Loading the Wastewater Model

The projected wastewater flows, presented in section 4, were extracted from RCWD's GIS database into the H20MAP Sewer hydraulic model. Each parcel in RCWD's wastewater service area has been assigned a wastewater flow projection for each time increment in RCWD's GIS database. All parcels generating wastewater flow in each time increment were identified. Each contributing parcel's projected wastewater flow was assigned to the furthest upstream manhole that conveys that flow to the remainder of the wastewater collection facilities in the H20MAP Sewer hydraulic model.

7.3 Hydraulic Model Scenario Development

Development of the scenarios in H20Map Sewer which modeled three time increments (Existing, 2009, Ultimate) are explained in this section.

7.3.1 2004 Facilities Model (Existing)

Four different scenarios were developed to model RCWD's 2005 Wastewater collection facilities:

- Average Dry Weather Flow (ADWF) – A steady state scenario where the wastewater flows in each pipe were not peaked. All lead pumps were modeled as on, while all standby pumps were modeled as off.

- Peak Dry Weather Flow (PDWF) – A steady state scenario where the wastewater flows in each gravity main were peaked according to the Peak Dry Weather Factor (PDWF) curve presented in Section 3. Wastewater Flows in force mains were not peaked. All lead pumps were modeled as on, while all standby pumps were modeled as off.

- Peak Wet Weather Flow (PWWF) – A steady state scenario where the wastewater flows in each gravity main were peaked according to the Peak Wet Weather Factor (PWWF) curve presented in section 3. Wastewater Flows in the force mains were not peaked. All lead pumps were modeled as on, while all standby pumps were modeled as off.

- Extended Period Simulation (EPS) – A 24 hour extended period simulation where the wastewater flow assigned to each manhole was adjusted hourly according to the Diurnal Pattern presented in section 3. The difference between the wastewater flow received at the Santa Rosa Wastewater Reclamation Facility (SRWRF) in the PWWF steady state scenario and the PDWF steady state scenario was assumed to be a result of Rainfall Dependent Inflow & Infiltration (RDI/I), as discussed in section 3. The total RDI/I of the system was divided among all gravity mains based on diameter inch – mile of pipe. RDI/I flow was not peaked. All pumps were allowed to turn on and off as needed throughout the EPS and as validated with SRWRF plant operators.

7.3.2 2009 and Ultimate Facilities Model

Seven different scenarios were developed to model both the 2009 and Ultimate wastewater collection facilities:

- ADWF with NEW CLAY DIVERSION - A steady state scenario where the wastewater flows in each pipe were not peaked. Half of the wastewater flow, up to 2 mgd, in the 33" gravity main in Kalmia St was diverted to the 21" gravity main in New Clay St. The 33" gravity main on Kalmia St conveys the remainder of the flow towards the Murrieta Valley Interceptor. This diversion is illustrated in Figure 7.1. Wastewater flows in force mains were not peaked. All lead pumps were modeled as on, while all standby pumps were modeled as off.

- PDWF with NEW CLAY DIVERSION - A steady state scenario where the wastewater flows in each gravity main were peaked according the Peak Dry Weather Factor (PDWF) curve presented in Section 3. Half of the wastewater flow, up to 2 mgd, in the 33" gravity main in Kalmia St was diverted to the 21" gravity main in New Clay St. The 33" gravity main on Kalmia St conveys the remainder of the flow towards the Murrieta Valley Interceptor. This diversion is illustrated in Figure 7.1. Wastewater flows in force mains were not peaked. All lead pumps were modeled as on, while all standby pumps were modeled as off.

- PWWF with NEW CLAY DIVERSION - A steady state scenario where the wastewater flows in each gravity main were peaked according to the Peak Wet Weather Factor (PWWF) curve presented in section 3. Half of the wastewater flow, up to 2 mgd, in the 33" gravity main in Kalmia St was diverted to the 21" gravity main in New Clay St. The 33" gravity main on Kalmia St conveys the remainder of the flow towards the Murrieta Valley Interceptor. This diversion is illustrated in Figure 7.1. Wastewater flows in the force mains were not peaked. All lead pumps were modeled as on, while all standby pumps were modeled as off.

- EPS with NEW CLAY DIVERSION – A 24 hour extended period simulation where the wastewater flow assigned to each manhole was adjusted hourly according to the Diurnal Pattern presented in section 3. The difference between the wastewater flow received at the Santa Rosa Wastewater Reclamation Facility (SRWRF) in the PWWF with New Clay Diversion steady state scenario and the PDWF with NEW CLAY DIVERSION steady state scenario was assumed to be a result of Rainfall Dependent Inflow & Infiltration (RDI/I). The total RDI/I was divided among all gravity mains based on diameter inch – mile of pipe. RDI/I flow was not peaked. Half of the wastewater flow, up to 2 mgd, in the 33" gravity main in Kalmia St was diverted to the 21" gravity main in New Clay St. The 33" gravity main on Kalmia St conveys the remainder of the flow towards the Murrieta Valley Interceptor. All pumps were allowed to turn on and off as needed throughout the EPS.

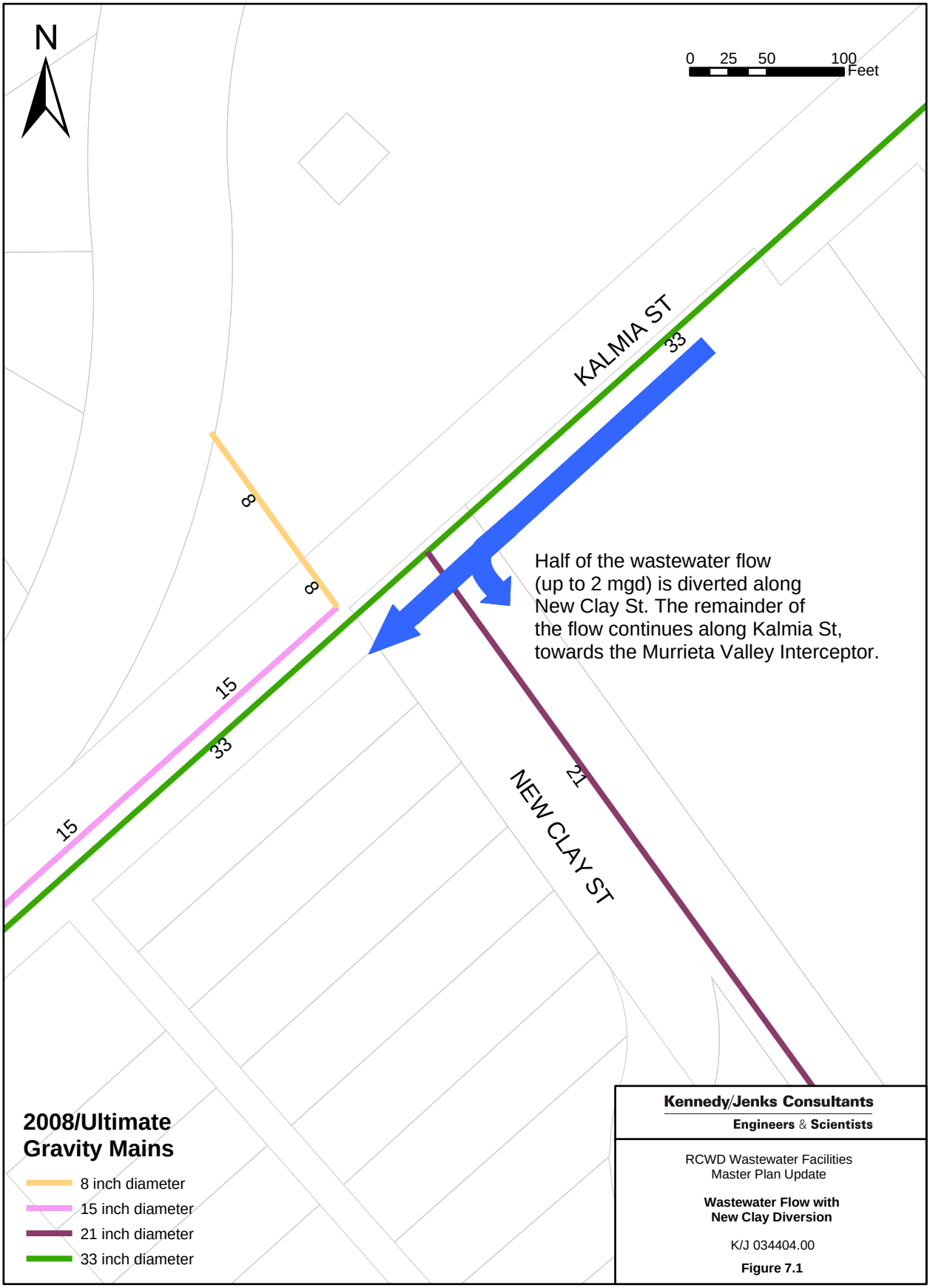
- ADWF without NEW CLAY DIVERSION - A steady state scenario where the wastewater flows in each pipe were not peaked. No wastewater flow in the 33" gravity main on Kalmia St was diverted to the 21" gravity main on New Clay St, with all flow continuing along the 33" gravity main on Kalmia St towards the Murrieta Valley Interceptor. The wastewater flow along Kalmia St is illustrated in Figure 7.2. All lead pumps were modeled as on, while all standby pumps were modeled as off.

- PDWF without NEW CLAY DIVERSION – A steady state scenario where the wastewater flows in each gravity main were peaked according the Peak Dry Weather Factor (PDWF) curve presented in section 3. No wastewater flow in the 33" gravity main on Kalmia St was diverted to the 21" gravity main on New Clay St, with all flow continuing along the 33" gravity main on Kalmia St towards the Murrieta Valley Interceptor. The wastewater

flow along Kalmia St is illustrated in Figure 7.2. Wastewater Flows in force mains were not peaked. All lead pumps were modeled as on, while all standby pumps were modeled as off.

- PWWF without NEW CLAY DIVERSION – A steady state scenario where the wastewater flows in each gravity main were peaked according to the Peak Wet Weather Factor (PWWF) curve presented in section 3. No wastewater flow in the 33" gravity main on Kalmia was diverted to the 21" gravity main on New Clay St, with all flow continuing along the 33" gravity main on Kalmia St towards the Murrieta Valley Interceptor. The wastewater flow along Kalmia St is illustrated in Figure 7.2. Wastewater Flows in the force mains were not peaked. All lead pumps were modeled as on, while all standby pumps were modeled as off.

It is the intent of the District to utilize the EPS models to examine the variable flow rates arriving at the Santa Rosa Wastewater Reclamation Facility (SRWRF) throughout a peak wet weather day, and the effect that these flow rates have upon the facilities at the SRWRF. The New Clay Diversion had no effect upon the flow patterns observed in the hydraulic models at the SRWRF. Therefore, it was not necessary to develop a separate EPS scenario for the 2009 and Ultimate conditions without the New Clay Diversion.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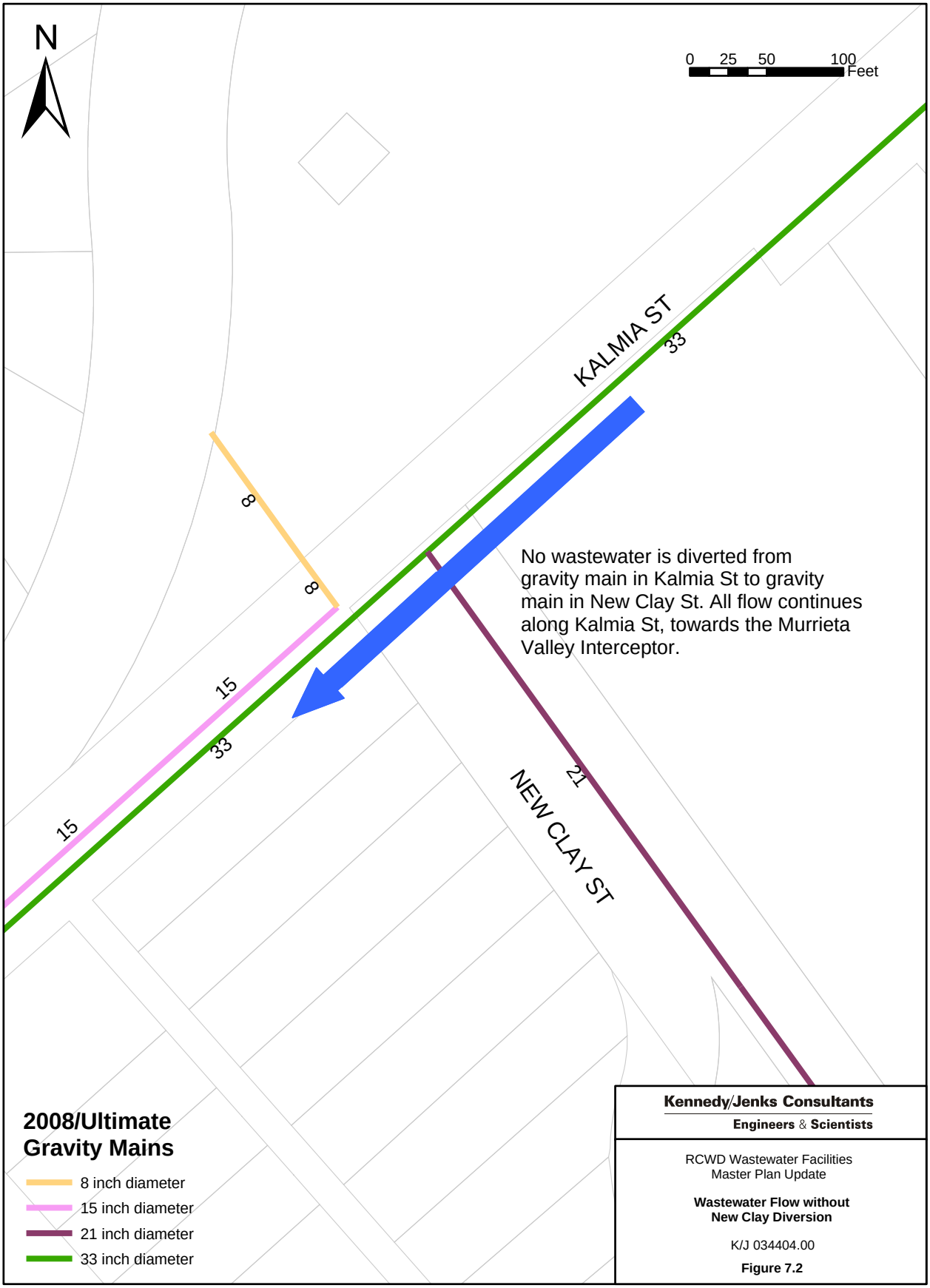
Half of the wastewater flow
(up to 2 mgd) is diverted along
New Clay St. The remainder of
the flow continues along Kalmia St,
towards the Murrieta Valley Interceptor.
2008/Ultimate
Gravity Mains
8 inch diameter
15 inch diameter
21 inch diameter
33 inch diameter
Kennedy/Jenks Consultants
Engineers & Scientists
RCWD Wastewater Facilities
Master Plan Update
Wastewater Flow with
New Clay Diversion
K/J 034404.00
Figure 7.1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NEW CLAY ST
No wastewater is diverted from gravity main in Kalmia St to gravity main in New Clay St. All flow continues along Kalmia St, towards the Murrieta Valley Interceptor.
2008/Ultimate Gravity Mains
8 inch diameter
15 inch diameter
21 inch diameter
33 inch diameter
Kennedy/Jenks Consultants
Engineers & Scientists
RCWD Wastewater Facilities Master Plan Update
Wastewater Flow without New Clay Diversion
K/J 034404.00
Figure 7.2

Section 8: Capital Improvement Program

A Wastewater Facilities Master Plan Capital Improvement Program (CIP) was developed in support of the overall planning efforts. The development of the CIP is based on the hydraulic capacity of the District's wastewater collection facilities, and does not incorporate costs associated with replacing existing facilities to mitigate deterioration due to age. Replacement costs are discussed in *Section. 9 – Capital Replacement Costs* (CRP). Specifically, the CIP addresses the following:

- Unit Costs
  - Flow Monitoring
  - Gravity Sewers
  - Wastewater Treatment Facilities
- Proposed Wastewater Collection System Improvements and Cost Estimates
  - Flow Monitoring
  - Gravity Sewers
  - Wastewater Treatment Facilities

The wastewater system was analyzed using the H_20map Sewer wastewater collection system model developed as part of this Master Plan effort, and discussed in *Section 7- Sewer System Model Development*. The H_20map Sewer model was used to identify facility requirements for each time interval by routing Peak Wet Weather Flows (PWWF) through the H_20map Sewer model. Facilities not meeting the design criteria established in *Section 3 - Wastewater Collection System Design Criteria,* were designated as deficient and recommended improvements were defined. Proposed improvements to gravity sewers were presented in *Section 6- Existing System Deficiencies*. Proposed improvements, as well as associated costs, to the Santa Rosa Water Reclamation Facility (SRWRF) are detailed in *Section 5 - Treatment Plant Update*. The total estimated cost to construct the proposed ultimate wastewater system is $44.3 million.

8.1 Unit Costs

The capital cost estimates for the proposed facilities were developed based on the Engineering New Record Construction Cost Index (ENR-CCI). The ENR-CCI is an inflation index used to adjust prices from one time period to another. The cost estimates presented in this Master Plan are based upon an ENR-CCI cost index of 7298, for September 2004. Costs estimated herein for recommended facilities should be adjusted in the future either by making new estimates or by comparing the future ENR-CCI index value.

The capital costs provided in this Master Plan are based on unit costs obtained from recently designed and constructed projects. These unit construction costs are approximate planning costs and include miscellaneous work necessary for complete and operable facilities, but they do not include right-of-way or site acquisition.

Engineering and administration services have been included as a percentage of total construction costs. A factor of 25 percent of total construction cost has been used for engineering and administration, which includes but is not limited to the following:

- Planning and design reports
- Design
- CEQA Compliance
- Permits
- Surveying/Soils Testing
- Services during construction (submittals, as-builts)
- Inspection

A contingency factor of 20 percent of construction costs has been added to develop the total project cost.

8.1.1 Unit Cost Estimate for Flow Monitoring

The District has elected to perform flow monitoring studies on all ultimate gravity main deficiencies presented in Section 6 - Existing System Deficiencies. The individual consulting firms which perform these flow monitoring studies base their fee upon the total number of flow monitoring sites, the weather during the study, as well as the length of the study. As the number of flow monitoring sites increases, the price per flow monitoring site decreases. Therefore, it is difficult to give an exact cost estimate for each flow monitoring site. However, based upon similar studies that K/J has recently been involved in, the price of performing a two-week flow monitoring study at 11 sites is approximately $32,000.

8.1.2 Unit Cost Estimate for Gravity Sewers

Pipe materials, pavement replacement, traffic control, installation of miscellaneous appurtenances, excavation, bedding and backfill were taken into consideration in developing unit costs for gravity sewer construction. Table 8.1 represents gravity sewer unit costs used in developing capital costs.

Table 8.1 - Gravity Main Total Project Unit Costs

Pipe Diameter (in)	Pipe Unit Cost ($/LF)
8	120
10	160
12	190
15	200
18	230
21	270
24	310
27	345
30	380

Table 8.1 - Gravity Main Total Project Unit Costs

Pipe Diameter (in)	Pipe Unit Cost ($/LF)
33	425
36	460
39	535
42	570

8.1.3 Unit Cost Estimate for Wastewater Treatment Facilities

Wastewater Treatment Facility costs for the proposed 2.5 mgd plant expansion are discussed in detail in *Section 5 – Treatment Plan Update*. The costs for the ultimate 1.0 mgd expansion are based on a treatment cost of $12/gallon of treated capacity. The costs outlined in *Section 5 – Treatment Plant Update*, as well as the unit cost, include engineering, administration and contingencies.

8.2 Proposed Facilities Excluded from Capital Costs

In some instances, deficiencies will not influence the capital improvements plan, as the eventual costs associated with facility replacement will be assigned to parties other than the District. These deficiencies, presented by time increment and their previously assigned Pipe ID include the following:

2005-2008:

- Pipes 1 through 6: Replacement costs potentially assigned to future development activity in sub-area 103. Replacement costs are not included in the CIP due to potential developer upsizing and detailed flow monitoring which will determine actual need for pipe upsizing.
- Pipes 9 through 62: With the planned construction of the Murrieta Valley Interceptor (MVI) Trunk Sewer by 2006, these pipes will no longer be deficient, and therefore require no upsizing.
- Pipes 63 and 66: Replacement costs assigned to EVMWD.
- Pipes 7, 64 and 65: Pipes are marginally over-capacity. Detailed flow monitoring will determine the actual need for upsizing these pipes.
- Pipes 70 and 71: Replacement costs assigned to EVMWD, per existing agreement.

2009 - Buildout:

- Pipes 72 and 73: Replacement costs assigned to MCWD/Development Activity.
- Pipes 67 though 68, 74 though 86, and 93: The H_20Map Sewer hydraulic indicates that these pipes are marginally over capacity in the ultimate (build-out) conditions. Detailed flow monitoring will determine the actual need for upsizing of these pipes. Maximum average daily flows for each of these pipes have been calculated in order to comply with the District's design criteria. The maximum average daily flows for these pipes are

presented in Table 8.2. If these average daily flows are exceeded, the resultant peak wet weather flow would violate the District's sewer design criteria based on pipeline capacity. Replacement costs for these pipes could potentially be assigned to whichever development exceeds the maximum average daily flow allotted to each pipe. For the sake of completeness, all deficient gravity mains in the City of Temecula have been included in Table 8.2.

Table 8.2 - Capacity Limits for Deficient Pipes in Temecula

Pipe No.	Maximum Average Flow Allowable Based on Capacity (EDU)
67	580
68	708
69	480
74	479
75	478
76	477
77	790
78	476
79	479
80	479
81	479
82	427
83	425
84	422
85	422
86	1,008
87	403
88	401
89	402
90	399
91	398
92	401
93	1,036
94	2,943
95	2,991
96	2,996

8.3 Estimated Cost of Proposed Facilities Based on Hydraulic Capacity

Costs for flow monitoring, and the proposed improvements to the wastewater collection system and treatment facilities are presented in Tables 8.3 through 8.8. These costs are presented by their corresponding time increment as follows:

- 2005 through 2008 facilities

- 2009 through ultimate facilities

Construction of the MVI Trunk Sewer, which is currently under design, is the critical facility improvement identified for the 2004 time increment. All proposed improvements identified in this Master Plan are assigned subsequent time steps. The time step associated with each proposed improvement is based upon inter-agency agreements, the District's local knowledge of development activity within the service area, and the Southern California Association of Governments (SCAG) year 2000 census tract population projections. However, the exact timing of recommended wastewater facility improvements is dependant upon the level and location of actual development in the community. If growth does not occur as projected and the projected wastewater flow is not reached, facility improvements may be delayed. Conversely, if actual growth occurs more rapidly than projected growth, facility improvements may be required before they are scheduled to occur as part of this CIP. Results from annual flow monitoring studies will allow the District to adjust these time increments as needed, based on the actual levels of growth experienced by the District.

8.4 Estimated Annual Cost for District Flow Monitoring

Beginning in 2006, the District has elected to perform an annual two-week flow monitoring study on all gravity main deficiencies presented in section 6 - Existing System Deficiencies. While costs associated with replacement facilities are assigned to specific time increments in the CIP based upon the hydraulic model results, the flow monitoring results will allow the District to enact replacement projects when facilities are operating near capacity. K/J has identified 11 sites for flow monitoring, which will allow the District to monitor all of the identified ultimate gravity main deficiencies. Table 8.3 illustrates which gravity mains, based on pipe ID numbers, each flow monitor site will evaluate.

Table 8.3 – Flow Monitoring Sites

Flow Monitor Number	Pipe IDs Evaluated
1	1 – 6
2	7-8, 63-66
3	9-62
4	67-79
5	70-71
6	72-73
7	74-77
8	78-81
9	82-85
10	86-93
11	94-96

It is estimated that the annual cost of performing a two-week flow monitoring study at 11 sites is $32,000 per year. For the purposes of this CIP, it is assumed that only five annual flow monitoring studies will be necessary in the 2009 through ultimate time step. Table 8.4 presents the total costs associated with the proposed flow monitoring studies.

Table 8.4 - Proposed Flow Monitoring Costs

Number of Annual Flow Monitoring Studies During Time Increment	Time Increment	
	2005 - 2008	2009 - Ultimate
3	$96,000	-
5	-	$160,000
GRAND TOTAL		***$256,000***

8.4.1 Gravity Sewer Replacement Cost Estimate

Gravity sewer requirements have been evaluated based upon meeting projected peak wet weather wastewater flows in accordance with the design criteria established in *Section 3 - Wastewater Collection System Design Criteria*. Gravity sewers have been evaluated utilizing the H_20map Sewer hydraulic model developed as part of this Master Plan.

All proposed sewers are assumed to replace the existing gravity sewer main. It is anticipated that the replacement costs for Pipes 7 through 8, and 63 through 66 will be pro-rated between RCWD and EVMWD based on the percent of total wastewater flow generated by each agency. Cost estimates for proposed replacement gravity sewers are presented in Table 8.5.

Table 8.5 - Proposed Replacement Gravity Main Costs

Pipe ID	Existing RCWD Line No	Replacement Diameter (in)	Length (ft)	Time Increment	
				2005 - 2008	2009 - Ultimate
8	T151030	15	92	$18,400	-
69	V241010	12	400	-	$76,000
87	W251025	12	385	-	$73,150
88	W251027	12	386	-	$73,340
89	W251029	12	187	-	$35,530
90	W251031	12	340	-	$64,600
91	W251033	12	270	-	$51,300
92	W251035	12	262	-	$49,780
94	W251017	18	400	-	$92,000
95	W251018	18	400	-	$92,000
96	W251020	18	333	-	$76,590
TOTAL				**$18,400**	**$684,290**
GRAND TOTAL					***$702,690***

8.4.2 Wastewater Treatment Facilities Cost Estimate

Wastewater treatment facility costs are specific to the proposed 2.5 mgd expansion, scheduled prior to 2008. These costs are outlined in *Section 5 – Treatment Plan Update*. For the remaining 1.0 mgd expansion, the costs were based on a treatment unit cost of $12/gallon of treated capacity. These costs, presented in Table 8.6, include engineering, administration and contingencies.

Table 8.6 – Proposed Wastewater Treatment Plant Costs

Treatment Plant	WWTP Capacity (mgd)	Incremental Capacity (mgd)	Time Increment	
			2005 - 2008	2009 - Ultimate
SRWRF	8.5	3.5	$31,375,000	$12,000,000
GRAND TOTAL				***$43,375,000***

Table 8.7 summarizes the hydraulic capacity wastewater system capital costs, including costs for flow monitoring, gravity sewers, and treatment facilities. Based on hydraulic capacity, the total estimated cost to construct the proposed ultimate wastewater system is $44.3 million.

Table 8.7– Summary of Capital Costs Based on Capacity Analysis

Facility	Time Increment		Total
	2005 - 2008	2009 - Ultimate	
Flow Monitoring	$96,000	$160,000	$256,000
Gravity Sewers	$18,400	$684,290	$702,690
WWTP	$31,375,000	$12,000,000	$43,375,000
TOTAL	***$31,489,400***	***$12,844,290***	***$44,333,690***

Section 9: Capital Replacement Program

Rancho California Water District's (RCWD) wastewater system was studied to assess the existing conditions of the collection and treatment facilities. Existing capacities and future deficiencies for the collections system were presented in *Section 6– Existing System Deficiencies*. The Santa Rosa Water Reclamation Facility (SRWRF) conditions and recommendations were presented in *Section 5 – Treatment Plant Update.* The cost of these recommended improvements, which were based upon hydraulic adequacy, were presented in *Section 8 – Capital Improvement Plan.*

A majority of the existing collection system is adequately sized to accommodate future peak flows and therefore is not included in the recommended system improvements discussed above. As time progresses, the condition of these facilities will deteriorate until such time as the facility needs to be repaired or replaced. K/J has evaluated the condition of these collection facilities, and has developed a Capital Replacement Program (CRP) based upon the average useful life of the District's collection and conveyance facilities. The estimated annual cost of the of the District's CRP is presented below in Table 9.1.

Table 9.1 – Estimated Annual Cost of RCWD's CRP

Facility	Annual Cost ($/yr)
Gravity Sewers	$525,200
Force Mains	$16,100
Lift Stations	$51,000
SRWRF	$1,215,000
TOTAL	***$1,807,300***

9.1 Sewer Flow Monitoring Study

In an effort to better assess the condition of its wastewater collection system and the magnitude of existing infiltration/inflow rates, Kennedy/Jenks Consultants prepared the *2001 Sewer Flow Monitoring Study* for the Rancho California Water District. This study included the following:

- Summary of collection system video inspections conducted in insitu conditions between January 29, 2001 and April 2, 2001, and again between October 2, 2001 and October 4, 2001 on portions of the District's wastewater collection system
- Evaluation of wet weather wastewater flows at 7 locations throughout the District's collection system for 28 consecutive days, beginning February 9, 2001 and ending March 8, 2001.
- Assessment of infiltration and inflow rates based on the collected flow monitoring data.

Based on a review of the sewer inspection videos, the *2001 Sewer Flow Monitoring Study* contained the following general conclusions pertaining to the condition of the District's existing wastewater collection:

- The District's vitrified clay pipe sewers and PVC appear overall to be in good condition, free from excessive amounts of cracking, root intrusions, joint defects, or sags.

- Routine pipe cleaning may be able to help reduce grease and debris problems in low laying areas of the collection system to further reduce the potential for flow blockages or overflows.

- A cursory review of the sewer manholes video inspections suggests that the majority of the collection manholes appear to be in adequate condition. However, in other locations, there were signs of hydrogen sulfide corrosion, as evidences by exposed concrete aggregate and corroded manhole ladder rungs and manhole covers.

- Provide further investigation of the existing corroded section of 10-inch cast iron pipe located between Manholes 2-179-06 and 2-243-07.

- Perform follow-up video inspection of the trunk sewer collection system within the next 5 years.

Since the completion of the *2001 Sewer Flow Monitoring Study*, the District has taken the following actions to address the above conclusions:

- The District has expanded the location and frequency of cleaning efforts to address those areas where moderate to heavy grease buildup and debris deposits were observed.

- The 10-inch cast iron pipe located between Manholes 2-179-06 and 2-243-07 has been replaced with PVC.

- Pipes and manholes with root intrusion have been treated with a foam herbicide.

- Manholes identified with hydrogen sulfide corrosion have been lined with an epoxy, to prevent future corrosion.

- Infiltration & Inflow (I&I) problem areas have been remedied as they have been detected.

9.2 Repair/Replacement of Existing Facilities

The District's oldest facilities within its wastewater collection system are approximately 25 years old. As illustrated in the *2001 Sewer Flow Monitoring Study*, the system is in relatively new and good condition, when compared to the average useful life of 90 years for wastewater collection system facilities. The CRP presents the costs that the District will incur for either repairing or replacing these facilities over the course of their average useful life.

The decision to repair or replace existing facilities is based primarily on facility condition. Eroding pipelines with reasonable structural integrity are often repaired using a "slip lining" or "cure-in-place" process. While this common approach is less disruptive than pipeline replacement, facility replacement is generally considered the most cost effective solution for extremely deteriorated pipelines and facilities that have exceeded or are approaching their presumed useful life. Accordingly, facility type and probable life expectancy must be accurately

assessed to establish the appropriate remedy for component of the District's wastewater collection system.

9.3 Unit Costs

The capital cost estimates for repair and replacement of facilities were developed based on the Engineering New Record Construction Cost Index (ENR-CCI). The ENR-CCI is an inflation index used to adjust prices from one time period to another. The cost estimates presented in this Master Plan are based upon an ENR-CCI of 7298, for September 2004. Costs estimated herein for recommended facilities should be adjusted in the future either by making new estimates or by comparing the future ENR-CCI value.

The capital costs provided in this Master Plan are based on unit costs obtained from recently designed and constructed projects. These unit construction costs are approximate planning costs and include miscellaneous work necessary for complete and operable facilities, but they do not include right-of-way or site acquisition.

Engineering and administration services have been included as a percentage of total construction costs. A factor of 25 percent of total construction cost has been used for engineering and administration, which includes but is not limited to the following:

- Planning and design reports
- Design
- CEQA Compliance
- Permits
- Surveying/Soils Testing
- Services during construction (submittals, as-builts)
- Inspection

A contingency factor of 20 percent of construction costs has been added to develop the total project cost. Replacement unit costs and repair unit costs for gravity mains and for force mains are presented in Tables 9.2 and 9.3.

Table 9.2 – Gravity Sewer Unit Replacement/Repair Costs

Pipe Diameter (inches)	Pipe Unit Cost ($/LF)	Repair Unit Cost ($/LF)
8	120	70
10	160	95
12	190	105
15	200	115
18	230	150
21	270	180
24	310	210

Table 9.2 – Gravity Sewer Unit Replacement/Repair Costs

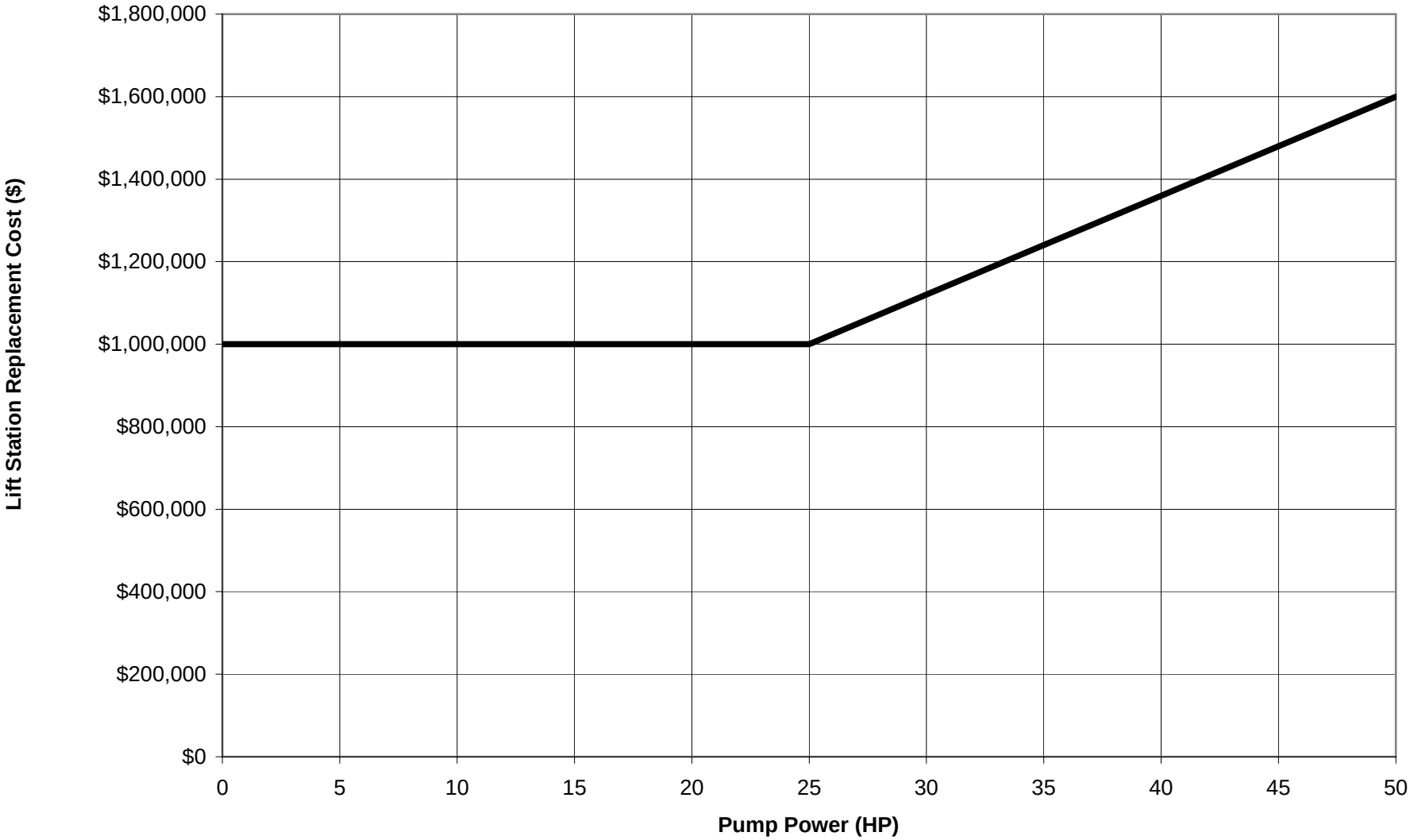
Pipe Diameter (inches)	Pipe Unit Cost ($/LF)	Repair Unit Cost ($/LF)
27	345	220
30	380	235
33	425	260

Table 9.3 – Force Main Unit Replacement/Repair Costs

Pipe Diameter (inches)	Pipe Unit Cost ($/LF)	Repair Unit Cost ($/LF)
8	95	60
14	165	95

Lift station capital costs are estimated based on the operating pump horsepower (not including redundant pump) of the lift station. The unit cost for lift stations includes pumps and motors (not including standby), lift station building, odor controls, grading, miscellaneous piping and valving, fencing, landscaping, instrumentation, controls engineering, administration, and contingencies. Basically, this is the cost to completely replace the lift station. Figure 9.1 presents the lift station unit cost curve assumed for the CRP.

Figure 9.1 - Lift Station Replacement Cost by HP



9.4 Annual Cost

To determine the annual cost, the facility replacement cost is divided by the remaining life of the facility. As mentioned earlier, unit cost is the facility replacement cost divided by a representative unit such as total lineal feet of pipe or total pump horsepower. Since annual cost and unit cost both use the same facility replacement value, annual cost is assumed using the September 2004 ENR-CCI mentioned in the Unit Costs section. Future costs should be adjusted using the current ENR-CCI index.

9.5 Pipeline Rehabilitation Costs

With all existing wastewater pipelines less than 25 years old, it is assumed that when existing facilities reach their presumed useful life, they will be remediated with a 50/50 repair/replacement strategy. Utilizing the “install date” attribute field in the District’s GIS database, pipelines were tabulated by diameter and age to determine the repair/replacement cost of existing gravity mains and force mains. If a pipeline was included in the District’s CIP due to deficient capacity, it was not included in the rehabilitation program.

- In addition, the following assumptions were made when calculating rehabilitation costs for the District’s gravity mains:

- 6-inch gravity pipelines will be replaced with 8-inch facilities.

- Ductile Iron pipelines are lined with cement mortar, resulting in all future costs allocated to replacement costs, with no future repair costs.

Rehabilitation costs for gravity mains and force mains are presented in Tables 9.4 and 9.5. The total annual cost for gravity sewer main rehabilitation is $525,200 and the total annual cost for force main rehabilitation is $16,100.

Table 9.4 – Rehabilitation Costs for Gravity Mains

Year	Age (yrs)	Diameter (in)	Total Length (ft)	Replace Unit Cost ($/lf)	Repair Unit Cost ($/lf)	Replace Length (ft)	Replace Cost ($)	Repair Length (ft)	Repair Cost ($)	Total Cost ($)	Remaining Life (yrs)	Total Annual Cost
1980	25	8	33,263	$120	$70	16,631	$1,995,759	16,631	$1,164,193	$3,159,952	65	$48,615
1980	25	10	3,558	$160	$95	1,779	$284,618	1,779	$168,992	$453,609	65	$6,979
1980	25	12	3,641	$190	$105	1,820	$345,858	1,820	$191,132	$536,990	65	$8,261
1980	25	15	2,160	$200	$115	1,080	$216,035	1,080	$124,220	$340,255	65	$5,235
1985	20	6	122	$120	-	61	$7,320	0	$0	$7,320	70	$105
1985	20	8	91,032	$120	$70	46,563	$5,587,566	44,469	$3,112,834	$8,700,400	70	$124,291
1985	20	10	3,790	$160	$95	1,895	$303,178	1,895	$180,012	$483,191	70	$6,903
1985	20	12	11,098	$190	$105	5,549	$1,054,268	5,549	$582,622	$1,636,889	70	$23,384
1985	20	15	15,867	$200	$115	7,934	$1,586,732	7,934	$912,371	$2,499,103	70	$35,701
1985	20	18	9,736	$230	$150	4,868	$1,119,674	4,868	$730,222	$1,849,896	70	$26,427
1985	20	21	5,536	$270	$180	2,898	$782,495	2,638	$474,863	$1,257,359	70	$17,962
1985	20	24	11,450	$310	$210	7,325	$2,270,708	4,125	$866,221	$3,136,929	70	$44,813
1985	20	27	812	$345	$220	406	$140,148	406	$89,370	$229,517	70	$3,279
1985	20	30	362	$380	$235	181	$68,746	181	$42,514	$111,260	70	$1,589
1990	15	8	31,138	$120	$70	15,680	$1,881,612	15,458	$1,082,067	$2,963,679	75	$39,516
1990	15	10	487	$160	$95	244	$38,960	244	$23,133	$62,093	75	$828
1990	15	12	22	$190	$105	11	$2,090	11	$1,155	$3,245	75	$43
1995	10	8	38,932	$120	$70	19,905	$2,388,571	19,027	$1,331,873	$3,720,444	80	$46,506
1995	10	10	2,109	$160	$95	1,054	$168,699	1,054	$100,165	$268,864	80	$3,361
1995	10	12	1,748	$190	$105	874	$166,058	874	$91,769	$257,827	80	$3,223
1995	10	15	9,275	$200	$115	4,637	$927,470	4,637	$533,295	$1,460,765	80	$18,260
1995	10	18	3,443	$230	$150	1,722	$396,000	1,722	$258,261	$654,261	80	$8,178
1995	10	24	5,974	$310	$210	2,987	$925,897	2,987	$627,221	$1,553,118	80	$19,414
1995	10	33	3,490	$425	$260	1,745	$741,665	1,745	$453,725	$1,195,390	80	$14,942
2000	5	8	11,605	$120	$70	5,802	$696,291	5,802	$406,170	$1,102,461	85	$12,970
2000	5	10	45	$160	$95	23	$3,600	23	$2,138	$5,738	85	$68
2000	5	12	2,525	$190	$105	1,263	$239,887	1,263	$132,569	$372,457	85	$4,382
Total			***303,219***			***154,936***	***$24,339,906***	***148,221***	***$13,683,105***	***$38,023,011***		***$525,234***

Table 9.5 – Rehabilitation Costs for Force Mains

Year	Age (yrs)	Diameter (in)	Total Length (ft)	Replace Unit Cost ($/lf)	Repair Unit Cost ($/lf)	Replace Length (ft)	Replace Cost ($)	Repair Length (ft)	Repair Cost ($)	Total Cost ($)	Remaining Life (yrs)	Total Annual Cost
1995	10	14	8,480	$165	$95	4,240	$699,600	4,240	$402,800	$1,102,400	80	$13,780
2000	5	8	2,575	$95	$60	1,288	$122,313	1,288	$77,250	$199,563	85	$2,348
Total			***11,055***			***5,528***	***$821,913***	***5,528***	***$480,050***	***$1,301,963***		***$16,128***

9.6 Lift Station Rehabilitation Costs

Existing lift stations must be assessed based upon condition and replacement/rehabilitation potential. Kennedy/Jenks Consultants worked with the District to assess the condition and capacity of the Bear Creek, Cal Oaks #1 and Winchester Park Lift Stations. Cal Oaks #2 lift station is not included in the CRP, as is scheduled to be decommissioned once the Murrieta Valley Interceptor (MVI) is constructed.

After reviewing maintenance records and pump efficiency data, the condition of each lift station was determined. Less than 10 years old, the lift stations are in very good condition and do not need rehabilitation in the foreseeable future. As rehabilitation is required, it is assumed that the District will elect to replace failing components of their lift stations. The total annual cost for the lift station rehabilitation is $51,000, and is presented in Table 9.6. The lift station conditions are presented in Table 9.7, attached to the end of this document.

Table 9.6 – Rehabilitation Cost for Lift Stations

Name	Year Built	Age (yrs)	HP	Replacement Cost ($)	Remaining Life (yrs)	Total Annual Cost ($/yr)
Bear Creek	1999	5	20	$1,000,000	85	$11,765
Cal Oaks #1	1995	9	50	$1,600,000	81	$19,755
Winchester Park	1996	8	50	$1,600,000	82	$19,515
Total				***$4,200,000***		***$51,035***

Table 9.7 – Lift Station Conditions

	Bear Creek	Cal Oaks #1	Winchester Park
Year Built	1999	1995	1996
Maintenance Dates/Schedule	Weekly - equipment check Monthly - pump & motor check Quarterly - clean wet well Semiannual - motor oil change, generator maintenance, & odor reduction unit maintenance	Weekly - equipment check Monthly - pump & motor check Quarterly - clean wet well Semiannual - motor oil change, generator maintenance, & odor reduction unit maintenance	Weekly - equipment check Monthly - pump & motor check Quarterly - clean wet well & air scour blower maintenance Semiannual - motor oil change, generator maintenance, & odor reduction unit maintenance
Dates/Type of Minor Upgrades/Rehab/Mods	None	None	None
Age of Pump (Date of Replacement)	5 Years Pump #1 overhaul: 5/02 & 5/04	9 years Pump #1 overhaul: 02/04 Pump #2 replaced volute and wear rings 06/04	8 Years
Age of Motor (Date of Replacement)	5 Years Motor #1 overhaul: 5/02 & 5/04	9 years Motor #1 overhaul: 02/04	8 Years
Name/Address/ Contact Person of Pump Maintenance Contractor	Mark Sturns Swain's Electric Motor Service 400 E. Devonshire Hemet, CA 92543	Mark Sturns Swain's Electric Motor Service 400 E. Devonshire Hemet, CA 92543	Mark Sturns Swain's Electric Motor Service 400 E. Devonshire Hemet, CA 92543
Stand-by Power Source	Generac	Onan	Onan
Generator Condition	Very good	Very good	Very good
Wet Well Condition	Very good	Very good	Very good
Pipe Condition	Very good	Very good	Very good
Gate Valves	None	None	None
Check Valve Condition	Good	Good	Good
Controls (e.g. MCC)	Very good	Very good	Very good
SCADA	Very good	Very good	Very good

Table 9.7 – Lift Station Conditions

	Bear Creek	Cal Oaks #1	Winchester Park
Traffic Conditions	Moderate	Moderate	Moderate
Site Accessibility	1 Double Gate (Front) 1 Single Gate (Side)	1 Double Gate	2 Double Gates
Wet Well Access	Dual Hatches with Railings	Dual Hatches with Railings	Dual Hatches with Railings
Wet Well Lid Condition	Very good	Very good	Very good
Wet Well Lid Material	Diamond Plate Aluminum	Diamond Plate Aluminum	Diamond Plate Aluminum
Wet-Well Lining	T-lock	T-lock	T-lock
Gas Detection System	None	None	None
Odors (Prevention)	Minor (No Prevention Method)	Minor (Odor Scrubber Unit)	Minor (Odor Scrubber Unit)

9.7 SRWRF Costs

As identified in Section 5.3.3, the annualized capital repair/replacement cost for the SRWRF is $1,215,500. This annual amount was utilized for all years included in the CRP. Similar to other costs outlined in the CRP, future costs should be adjusted using the most up-to-date ENR-CCI index.

9.8 Cost Summary

Table 9.7 presents the District's Capital Rehabilitation Costs allocated to the 2005 through 2008, and 2009 - Ultimate time increments.

Table 9.7 – Summary of Capital Costs Based on Repair/Replacement Analysis

Facility	Time Increment		Total
	2005 - 2008	2009 – Ultimate	
Gravity Sewers	$2,101,000	$36,766,000	$38,867,000
Force Mains	$64,500	$1,129,000	$1,193,500
Lift Stations	$204,100	$3,572,000	$3,776,100
SRWRF	$4,862,000	$85,085,000	$89,947,000
TOTAL	***$7,231,600***	***$126,552,000***	***$133,783,600***

Not included in this cost summary is the determination of the rehabilitation cost participation from RCWD's contract sewer agencies, EVMWD and MCWD.

Section 10: CMOM Compliance Summary

This Section provides the explanation and legislative background for the proposed Capacity, Management, Operations, and Maintenance (CMOM) program. Regulatory criteria which appear most probable to make the final CMOM program are discussed. Table 10.1 identifies the components of the *2005 Wastewater Facilities Master Plan* which address potential CMOM elements, as well as those portions of the CMOM program requiring further District attention.

10.1 Background

Municipal sanitary sewer collection systems with discharges to waters of the United States are required by the Clean Water Act of 1972 to have a National Pollutant Discharge Elimination System (NPDES) permit. In response to the increasing frequency of sanitary sewer overflows (SSO) in the United States, the EPA has developed the proposed SSO rule focused on the capacity, management, operation, and maintenance (CMOM) of sanitary sewer collection systems. CMOM is intended to be a proactive approach for reducing the public health and environmental impact of overflows, extending the life of sanitary sewer collection systems, and improving customer service.

The proposed SSO rule will impact all current NPDES permit-holders and owners of satellite sewer collection systems by requiring them to develop and implement CMOM programs. After adoption, the proposed SSO rule will require collection system owners and operators to implement CMOM programs that:

- Properly manage, operate, and maintain their sanitary sewer collection systems
- Provide adequate collection system capacity
- Respond promptly and effectively to stop or mitigate SSO events
- Notify affected parties of an SSO event
- Make the CMOM Program Plan and ongoing audits available to the general public

Currently, the SSO rule is awaiting review by the Federal Office of Management and Budget (OMB) before being published in the *Federal Register* for public review and comment. Public comments will be incorporated into the final SSO rule for adoption, at which time CMOM requirements for sanitary sewer collection systems will become enforceable.

To satisfy the regulatory requirements of the proposed SSO Rule, communities will be required to develop a CMOM Program Plan with four primary components:

1. CMOM Program Summary;
2. System Evaluation and Capacity Assurance Plan (SECAP);
3. Overflow Emergency Response Plan; and
4. Ongoing CMOM program audits.

10.2 CMOM Program Summary

The CMOM Program Summary is a general compilation of information about the management, operation and maintenance of the District's sanitary sewer collection system, including:

- Program goals;
- Organization;
- Legal Authority;
- Measures and Activities;
- Design and Performance Provisions;
- Monitoring, Measurement and Program Modifications; and
- Communication.

10.2.1 Program Goals

Program goals help determine the steps that must be undertaken to establish the CMOM program, and should define the purpose and anticipated results of the program. Goals should reflect performance, safety, customer service, resource use, compliance, and other considerations.

Some example goals for a sanitary sewer system, contained in *Wastewater Collection Systems Management Manual of Practice #7* by the Water Environment Federation, include:

- Prevent public health hazards;
- Minimize inconvenience and damage by responsibly handling service interruptions;
- Protect municipal invest by maximizing the useful life and capacities of the sanitary sewer collection system;
- Prevent unnecessary damage;
- Use funds efficiently;
- Convey wastewater with minimum inflow, infiltration, and exfiltration;
- Prevent excessive claims and legal fees related to backup by providing immediate, concerned, and efficient service to all emergency calls; and
- Perform all activities safely and avoid injury.

10.2.2 Organization

An organization chart should be provided identifying administration and management positions responsible for implementing the CMOM program, as well as operations and maintenance personal. Employees must be provided with required training to perform their assigned CMOM activity.

The chain of communication for reporting SSO events should be provided from receipt of a complaint to the notification of permitting authorities, other agencies, and the public.

10.2.3 Legal Authority

Sufficient legal authority must be provided to implement an effective CMOM program. The proposed SSO Rule identifies five areas where legal authority is necessary for implementing an effective CMOM program:

- Controlling inflow and infiltration (I/I);
- Requiring sewers and connections to be properly designed and constructed;
- Ensure proper installation, testing, and inspection of new and rehabilitated sewers;
- Addressing flows from municipal satellite collection systems; and
- Implementing the general and specific prohibitions of the national pretreatment program under 40 CFR 403.5.

Legal authority can be provided through sewer use ordinances, service agreements, or other legally binding documents.

10.2.4 Measures and Activities

Measures and activities specified for implementation as part of a CMOM program should be tailored to the size, complexity, and specific features of the District's collection system. The CMOM Program Summary should include the six measures and activities and identify the person or position on the organization chart responsible for each.

10.2.4.1 Maintenance of facilities

List all maintenance facilities owned by the District and used for operation and maintenance of the sanitary sewer collection system.

10.2.4.2 Maintenance of a collection system map

Describe how the District maintains and updates the existing GIS coverages and databases for the sanitary sewer collection system.

10.2.4.3 Management and use of information to establish and prioritize CMOM activities

Describe the District's information management systems used for tracking all CMOM-related information, including maintenance, rehabilitation, and emergency calls. Identify and illustrate trends in SSO events. A dynamic CMOM program should focus on approaches for planning, implementing, reviewing, evaluating, and taking appropriate actions in response to available information. The key to these approaches is the ability to disseminate information to managers in the field. Timely information is necessary for:

- Emergency response;
- Investigating problems and complaints that cause or may lead to overflows and determining an appropriate response;
- Scheduling and tracking inspections;
- Planning maintenance activities, schedules, and work orders;
- Managing parts, equipment, and tool inventories;
- Developing training plans and schedules;
- Tracking and preventing safety incidents;
- Planning staffing and budgeting;
- Identifying hydraulic and physical deficiencies and prioritizing responses; and
- Identifying programmatic deficiencies and developing appropriate responses.

10.2.4.4 Routine preventive, operation, and maintenance activities

Describe routine preventive operation and maintenance activities. A good preventive maintenance program is one of the best ways to keep a system in good repair and to prevent service interruptions and system failures that can result in overflows or back-ups. A preventive maintenance program also protects the capital investment in the collection system. Preventive maintenance activities involve:

- Routine inspection of the sanitary sewer collection system, including pump stations, and addressing noted problems;
- Planning for scheduled and systematic inspections of the collection system to determine current conditions and plan for maintenance and repairs;
- Planning for scheduled cleaning and repair of the collection system based on past performance history;
- Proper sealing and maintenance of manholes;
- Regular repair of deteriorating sewer lines;

- Remediation of poor construction;
- Inspection and maintenance of pump stations and other appurtenances; and
- A program to ensure that new sewers and connections are properly designed and constructed and that new connection of inflow sources are prohibited.

10.2.4.5 Appropriate training on a regular basis

Develop a training program for inspectors, operators, and maintenance personnel. Training programs should address emergency response, safety procedures and confined space entry, collection system operation and maintenance, and other training to ensure District collection system staff are adequately prepared to implement provisions of the CMOM program.

10.2.4.6 General and Critical equipment and replacement parts inventories

Include an inventory of equipment and replacement parts and a list of critical parts needed for collection system operation. Maintain an adequate replacement parts inventory, and provide proper storage facilities. The process for identifying critical parts should be based on a review of existing equipment and manufacturers' recommendations, supplemented by the experience of District collection system staff. The quantity and type of replacement parts will depend on size, age, and condition of the sewer collection system.

10.2.5 Design and Performance Provisions

The District is required to develop and implement programs to ensure new and rehabilitated sewers are properly designed and installed, and will not contribute to future SSO events or operation and maintenance problems. The District will be required to develop Design and Performance Standards to ensure:

- Requirements and standards are in place for the design and construction of new and rehabilitated of collection system components; and
- Procedures and specifications to ensure the inspection and testing of new and rehabilitated collection system components.

10.2.6 Monitoring, Measurement, and Program Modifications

Activities and methods to be used in evaluating CMOM program implementation should be specified. Standards for measuring and monitoring progress in program implementation should also be specified. Specific program elements should be modified as appropriate based upon performance evaluations. Resulting program modifications should be summarized and included in ongoing audits and the CMOM Program Summary. Satisfaction of this requirement will involve the development of performance indicators to describe and track CMOM program implementation.

10.2.7 Communication

Communication systems should be established in the CMOM program to allow interested parties to provide input to the District as the program is being developed and implemented. Communication systems may include public education and outreach programs, public notification, and public workshops. Communication systems should seek broad public input before major CMOM program components are developed and at key points during program implementation. A formal communications plan for the program should be included in the CMOM Program Summary.

10.3 System Evaluation and Capacity Assurance Plan (SECAP)

Most of the essential SECAP elements are addressed in the District's sanitary sewer collection system master plan. At a minimum, the SECAP must include a collection system evaluation, recommended capacity enhancement measures, and provide for future updates.

10.3.1 Collection System Evaluation

Evaluation of a sanitary sewer collection system should include a summary of steps planned or undertaken to identify and characterize hydraulic deficiencies contributing to SSOs. The scope of evaluation for each identified deficiency will vary depending on it's cause, nature, complexity, and severity.

The system evaluation must provide estimates of peak flows (including flows from SSOs that escape from the system), provide capacity estimates for key system components, identify hydraulic deficiencies, identify components of the system with limiting capacity, and identify the major sources of inflow and infiltration contributing to SSO events. The evaluation should also include recommended remedial actions to address system deficiencies.

10.3.2 Capacity Assurance

Capacity assurance is the process of developing solutions to address hydraulic deficiencies identified during the sanitary sewer collection system evaluation. Under the proposed CMOM permit provision, permittees would be required to implement a program to assess the current capacity of the collection system and treatment facilities that they own or over which they have operation control (i.e. satellite collection systems).

Capacity enhancement measures should establish short and long term actions to correct each identified hydraulic deficiency contributing to SSOs. Short and long term actions for each hydraulic deficiency should include alternative analyses, a prioritization of recommended projects, and an implementation schedule.

10.3.3 Future SECAP Updates

Updates to the SECAP should be completed on a regularly scheduled basis to describe any significant change in proposed actions and/or implementation schedule. The SECAP should also be updated to reflect available information on the performance of implemented measures. It is recommended that hydraulic models used to identify deficiencies either be maintained on a continuous basis, or updated on the same regularly scheduled basis.

10.4 Overflow Emergency Response Plan

An Overflow Emergency Response Plan (OERP) provides a standardized course of action to be followed by collection system personnel during an SSO to protect public health and the environment. An up-to-date OERP is necessary to ensure that a municipality is adequately prepared to respond to an SSO event. The OERP should describe the protocols SSO response, remediation, and notification under varying scenarios. The public should be given access to review and comment on the OERP.

The OERP should identify measures to protect the public health and the environment for a broad range of potential collection system failures that could lead to an SSO. At a minimum, the OERP should ensure:

- Identification of all SSOs;
- Immediate response, emergency operations, and submittal of reports to appropriate personnel for investigation;
- Appropriate notification and reporting to the public, health officials, NPDES authority, and other affected entities;
- Personnel are aware of the OERP and properly trained in responding to an SSO; and
- Effective organization of emergency operations during an SSO.

10.5 Ongoing CMOM Program Audits

Ongoing audits are required to demonstrate CMOM program effectiveness to the NPDES permitting authority, health officials, and the public. The CMOM audit should include a discussion of CMOM program compliance with permit requirements, identified CMOM deficiencies, and necessary corrective measures. The audit should indicate the size of the sewer collection system and the quantity and severity of SSO events.

10.5.1 2005 Wastewater Facilities Master Plan Relevance to CMOM Program Compliance

Through the preparation of the *2005 Wastewater Facilities Master Plan*, certain elements of the CMOM program have been addressed by the District. In addition, the District recently completed a checklist to identify areas of the CMOM program that require further attention, attached as an appendix to this master plan. Probable components of the CMOM program addressed in the master plan, as well as those elements yet to be satisfied, are presented in Table 1. The summary table also provides recommendations for the District in order to satisfy the remaining components.

10.5.2 System Evaluation and Capacity Assurance Plan (SECAP)

Most of the essential SECAP elements have been addressed in the District's sanitary sewer collection system master plan. As Table 1 illustrates, the elements of two major SECAP components, Collection System Evaluation and Capacity Assurance, have been discussed

throughout this Wastewater Facilities Master Plan. Due to the pending nature of CMOM legislation, it remains uncertain which components of RCWD's wastewater system will be considered key components, and thereby require capacity limitations as a component of SECAP. Limitations for all lift stations and SRWRF have been provided in this Wastewater Facilities Master Plan. However, it is difficult to predict which trunk sewer lines comprise "key system elements." For this reason, the District has elected to show deficiencies for all District owned gravity mains in Existing, 2009 and the Ultimate (build-out) conditions. In addition, the District has identified specific projects in their Capital Improvements Program to mitigate each one of these deficiencies, in order to eliminate any future preventable SSOs. If, at a later date, it should be necessary to produce capacity elements for specific trunk sewer lines, the H20MAP hydraulic model, developed as part of this master planning effort, can be utilized to easily satisfy this requirement.

Table 10.1 – Summary Table of CMOM Criteria

CMOM Component	Description	Applicable Method/Activity Undertaken by RCWD	Location in 2005 Wastewater Facilities Master Plan	Future RCWD Action Recommended
CMOM PROGRAM SUMMARY	General compilation of information about the management, operation and maintenance of the sanitary sewer collection system.	N/A	N/A	N/A
Program Goals	The purpose and anticipated results of the CMOM program	Preparation of the *2005 Wastewater Facilities Master Plan.*	Section 10.2.1 lists typical goals.	RCWD should generate program goals specific to its sanitary sewer collection system as part of the final development of the CMOM program.
Organization	Identifies administration and management positions responsible for implementing the CMOM program, as well as operations and maintenance personal. Includes the chain of communication for reporting SSO events.	RCWD has created an organizational chart, which includes: • Up-to-date job descriptions; • Responsibilities of personnel; • Authority for each position. Organizational Structure (OC) is addressed on Page 6 of the CMOM checklist.	Organization chart not included in *Wastewater Facilities Master Plan*. The CMOM checklist is located in an appendix to this *Wastewater Facilities Master Plan*.	None
Legal Authority	Sufficient legal authority to implement an effective CMOM program includes: • Controlling inflow and infiltration (I/I); • Requiring sewers and connections to be properly designed and constructed; • Ensuring proper installation, testing, and inspection of new and rehabilitated sewers; • Addressing flows from municipal satellite collection systems; • Implementing the general and specific prohibitions of the national pretreatment program under 40 CFR 403.5	"Rules and Regulations Governing Sewer System Facilities and Services" as outlined in Exhibit "A" of *Ordinance No. 90-11-1*, as adopted on November 9, 1990 by the Board of Directors of the Rancho California Water District, governs the general and specific provisions regarding sewer facilities and sewer service in RCWD. Satellite communities are required to enter into agreements with RCWD. Satellite communities and sewer use ordinances (SUO) are addressed on page 5 of the CMOM checklist.	The CMOM checklist is located in an appendix to this *Wastewater Facilities Master Plan*.	None
Measures and Activities Measures and Activities	Identified the measures, activities, person and/or position on the organization responsible for: • Maintenance of facilities • Maintenance of a collection system map • Management and use of information to establish and prioritize CMOM	Organizational chart identifies personnel/position responsible for maintenance of facilities and collection system map. System Mapping (MAP) is addressed on page 15 of the CMOM checklist. Management Information System (MIS) maintained by	The CMOM checklist is located in an appendix to this *Wastewater Facilities Master Plan*.	None

Table 10.1 – Summary Table of CMOM Criteria

CMOM Component	Description	Applicable Method/Activity Undertaken by RCWD	Location in 2005 Wastewater Facilities Master Plan	Future RCWD Action Recommended
(cont.)	activities • Routine preventive, operation, and maintenance activities. • Appropriate training on a regular basis • General and Critical equipment and replacement parts inventories	RCWD tracks maintenance activities, and is addressed on page 14 of the CMOM checklist. Mandatory training (TR) for key personnel is addressed on page 9 of the CMOM checklist. Equipment and collection system maintenance (ESM) is addressed on page 12 of the CMOM checklist. Equipment parts inventory (EPI) is addressed on page 13 of the CMOM checklist.		
Design and Performance Provisions	Develop and implement programs to ensure new and rehabilitated sewers are properly designed and installed, and will not contribute to future SSO events or operation and maintenance problems.	Design criteria, testing and inspection procedures for new and rehabilitated sewers are outlined in RCWD's Sewer System Design Criteria. Engineering design (ED) is addressed on page 4 of the CMOM checklist. *Section 3 – Wastewater System Design Criteria* details the design criteria utilized for the purposes of this *Wastewater Facilities Master Plan*.	The CMOM checklist is located in an appendix to this *Wastewater Facilities Master Plan*.	None
Monitoring, Measurement and Program Modifications	Activities and methods to be used in evaluating CMOM program implementation should be specified. Standards for measuring and monitoring progress in program implementation should also be specified. Involves the development of performance indicators to describe and track CMOM program implementation.	None	None	RCWD should establish monitoring, measurement and CMOM program modifications upon adopting their CMOM program.
Communication Communication (cont)	Communication systems should be established in the CMOM program to allow interested parties to provide input to the City as the program is being developed and implemented.	Internal communications (IC) are addressed on page 7 of the CMOM checklist. Customer Service (CS) is addressed on Page 11 of the CMOM checklist. Communications between the public and RCWD can occur via telephone, e-mail, fax, mail, in-person at RCWD's headquarters, or at the monthly RCWD Board meetings.	The CMOM checklist is located in an appendix to this *Wastewater Facilities Master Plan*.	RCWD should develop a specific communications plan to be included in their CMOM program.
SECAP	Includes a collection system evaluation, recommended capacity enhancement	N/A	N/A	N/A

Table 10.1 – Summary Table of CMOM Criteria

CMOM Component	Description	Applicable Method/Activity Undertaken by RCWD	Location in 2005 Wastewater Facilities Master Plan	Future RCWD Action Recommended
	measures, and provides for future updates.			
Collection System Evaluation	Identifies and characterizes hydraulic deficiencies contributing to SSOs. The system evaluation must include: • Estimates of peak flows (including flows from SSOs that escape from the system); • Capacity estimates for key system components; • Identify hydraulic deficiencies, components of the system with limiting capacity, and the major sources of inflow and infiltration contributing to SSO events. • Recommends remedial actions to address system deficiencies.	Peaking factors are presented in *Section 3 – Wastewater System Design Criteria,* and peak flows are utilized in developing the hydraulic model scenarios presented in *Section 7 – Sewer System Model Development*. Capacity estimates for all pump stations are addressed in *Section 6.1.1 – Wastewater Lift Stations*, and capacity estimates for the SRWRF are presented in *Section 5 – Santa Rosa Reclamation Facility Evaluation*. Hydraulic Deficiencies are presented in *Section 6.2 – Proposed Facility Improvements.* The methodology for Estimating Infiltration and Inflow is detailed in *Section 3 – Wastewater System Design Criteria*, and is utilized in the development of the hydraulic model presented in *Section 7 – Sewer System Model Development*. Actions necessary to mitigate all deficiencies and SSOs are presented in *Section 8 – Capital Improvement Program*. Recent SSOs are discussed on page 21 (TRK) of the CMOM checklist.	The following Sections are components of this *Wastewater Facilities Master Plan*: • *Section 3 – Wastewater System Design Criteria* • *Section 6 – Existing Wastewater Facilities and Wastewater System Analysis* • *Section 7 – Sewer System Model Development* • *Section 8 – Capital Improvement Program.* The CMOM checklist is located in an appendix to this *Wastewater Facilities Master Plan*.	RCWD should generate capacity estimates for the major trunk sewer lines comprising their wastewater collection system during the preparation of their CMOM program.
Capacity Assurance	Assess the current capacity of the collection system and treatment facilities, and address the hydraulic deficiencies identified during the sanitary sewer collection system evaluation. Establish short and long term actions to correct each deficiency contributing to SSOs, including alternative analyses, a prioritization of recommended projects, and an implementation schedule.	Hydraulic deficiencies for all collection facilities are addressed in *Section 6.2 – Proposed Facility Improvements*. Capacity estimates for the Santa Rosa Water Reclamation Facility are addressed in *Section 5 – Santa Rosa Reclamation Facility Evaluation*. Actions necessary to mitigate all deficiencies and SSOs, as well as their prioritization based on time (phasing/implementation schedule), are presented in *Section 8 – Capital Improvement Program.*	The following Sections are components of *this Wastewater Facilities Master Plan*: • *Section 5 – Santa Rosa Reclamation Facility Evaluation* • *Section 6 – Existing Wastewater Facilities and Wastewater System Analysis* • *Section 8 – Capital Improvement Program* The CMOM checklist is located in an appendix to this *Wastewater Facilities Master Plan*.	RCWD should generate capacity estimates for the major trunk sewer lines comprising their wastewater collection system during the preparation of their CMOM program.
Future SECAP Updates	Describes any significant change in proposed actions and/or implementation schedule. The	SECAP Updates will be addressed in future Wastewater Facilities Master Plans commissioned by RCWD.	This Wastewater Facilities Master Planning effort.	Continue commissioning Wastewater Facilities Master Plans as necessary.

Table 10.1 – Summary Table of CMOM Criteria

CMOM Component	Description	Applicable Method/Activity Undertaken by RCWD	Location in 2005 Wastewater Facilities Master Plan	Future RCWD Action Recommended
	SECAP should also be updated to reflect available information on the performance of implemented measures.			
OVERFLOW EMERGENCY RESPONSE PLAN	Provides a standardized course of action to be followed by collection system personnel during an SSO to protect public health and the environment. The OERP should describe the protocols SSO response, remediation, and notification under varying scenarios. At a minimum, the OERP should ensure: • Identification of all SSOs; • Immediate response, emergency operations, and submittal of reports to appropriate personnel for investigation; • Appropriate notification and reporting to the public, health officials, NPDES authority, and other affected entities; • Personnel are aware of the OERP and properly trained in responding to an SSO; • Effective organization of emergency operations during an SSO.	The overflow emergency response plan (OERP) is addressed on page 22 of the CMOM checklist. RCWD has a documented an OERP available for utility staff to use.	The CMOM checklist is located in an appendix to this *Wastewater Facilities Master Plan*.	None
ONGOING CMOM AUDITS	Includes a discussion of CMOM program compliance with permit requirements, identified CMOM deficiencies, and necessary corrective measures. The audit should indicate the size of the sewer collection system and the quantity and severity of SSO events.	The size of the collection system (Collection System Design) is addressed on pages 2 and 3 of the CMOM checklist. The size and severity of recent SSO events (TRK) is addressed on page 21 of the CMOM checklist.	The CMOM checklist is located in an appendix to this *Wastewater Facilities Master Plan*.	Upon implementation of a CMOM program, RCWD should develop an appropriate audit program.

References

Montgomery Watson, *Wastewater Facilities Master Plan*, Rancho California Water District, September 1997.

Rancho California Water District, *Sewer System Facility Requirements*, Rancho California Water District, January 1992.

Appendix A

CMOM Checklist Completed by District in June 2004

Appendix A – CMOM Checklist Completed by RCWD in 2004

General Information

CHECKLIST COMPLETED BY:

Michael Calvert — Date 6/8/04

Name

909 296 6965

Daytime Telephone Number

UTILITY CONTACT INFORMATION

Utility Name: Rancho CA Water District

LOCATION

P.O. Box 9017

Street Address

Street Address (continued)

Temecula CA 92589-9017

City State Zip

STAFF

Michael Calvert

Name

Water Reclamation Manager

Title

Calvert M@ranchowater.com

Email

Phone: 909 296 6965 Fax: 909 698 5889

PERMITTED TREATMENT & COLLECTION FACILITIES

NPDES or STATE PERMIT #	PERMITTEE/CO-PERMITTEE/JURISDICTIONS	PERMIT COVERAGE: WWTP Effluent	Collection System	WET Weather Facility
94-92		X	☐	☐
96-04		☐	X	☐
		☐	☐	☐
		☐	☐	☐
		☐	☐	☐

Page 1

Collection System Description

SYSTEM INVENTORY

			Conveyance & Pumping	Gravity Sewers	Force Mains	Pump Stations
	1 NUMBER	# of Treatment facilities				
Treatment Facilities		WWTP design capacity 5.0 MGD	*Pipes and pumps* Length/quantity	65 MILES	11.6 MILES	4 NUMBER
		Average daily flow 2.7 MGD	*Age of system* 0 - 25 years old	100 % PERCENT	100 % PERCENT	100 % NUMBER
		Average dry weather flow 2.7 MGD	26 - 50 years old	% PERCENT	% PERCENT	% NUMBER
Access & Maintenance		Manholes 1620 NUMBER	51 - 75 years old	% PERCENT	% PERCENT	% NUMBER
		Number of air vacuum relief valves 3 NUMBER	>76 years old	% PERCENT	% PERCENT	% NUMBER
			Number of inverted siphons		0	

SERVICE AREA CHARACTERISTICS

Service area: 3,915 ACRES

Service population: 13,320 PEOPLE

Annual precipitation: 13" INCHES

Number of Service Connections

Residential		Commercial		Industrial		TOTAL
5,128 NUMBER	+	96 NUMBER	+	32 NUMBER	=	5,256 NUMBER

Collection system service lateral responsibility *(check one)*

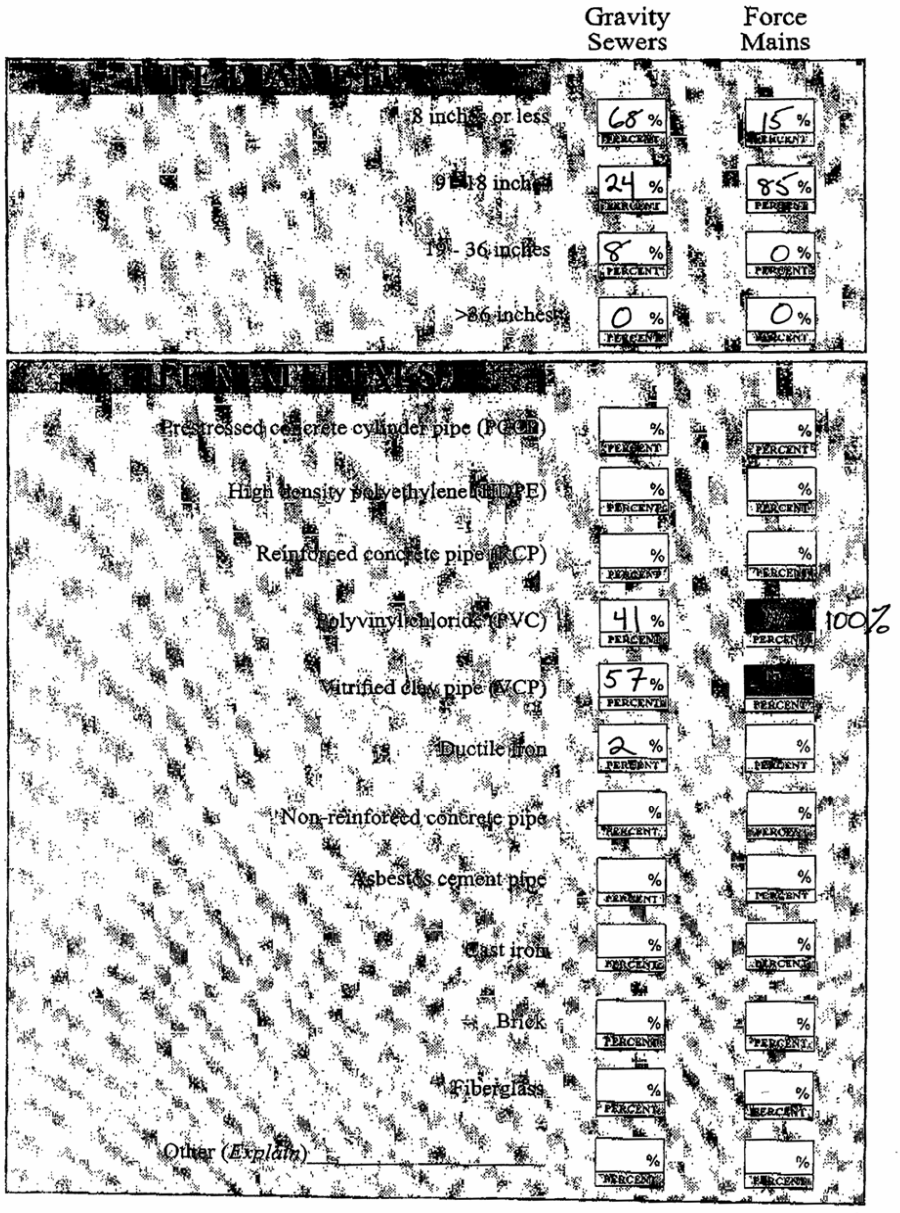
- ☐ At main line connection only
- ☒ From main line to property line or easement/cleanout
- ☐ Beyond property line/clean out
- ☐ Other: _____

Combined Sewer Systems

What percent of sewer system is served by combined sewers (i.e., sanitary sewage and storm water in the same pipe)? 0% PERCENT

Page 2

Collection System Description



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Engineering Design (ED)

ED-01	Is there a document which includes design criteria and standard construction details?	YES	NO
ED-02	Is there a document that describes the procedures that the utility follows in construction design review?	YES	NO
ED-03	Are WWTP and O&M staff involved in the design review process?	YES	NO
ED-04	Is there a procedure for testing and inspecting new or rehabilitated system elements both during and after the construction is completed?	YES	NO
ED-05	Are construction sites supervised by qualified personnel (such as professional engineers or certified engineering technicians) to ascertain that the construction is taking place in accordance with the agreed upon plans and specifications?	YES	NO
ED-06	Are new manholes tested for inflow and infiltration?	YES	NO
ED-07	Are new gravity sewers checked using closed circuit TV inspection?	YES	NO
ED-08	Does the utility have documentation on private service lateral design and inspection standards?	YES	NO
ED-09	Does the utility attempt to standardize equipment and sewer system components?	YES	NO

Satellite Communities and Sewer Use Ordinance (SUO)

SUO-01	Does the utility receive flow from satellite communities? IF NO, GO TO PAGE 6	YES	NO
SUO-02	What is the total area from satellite communities that contribute flow to the collection system? *(Acres or square miles)*		
SUO-03	Does the utility require satellite communities to enter into an agreement? IF NO, GO TO QUESTION SUO-06.	YES	NO
SUO-04	Does the agreement include the requirements listed in the sewer use ordinance (SUO)?	YES	NO
SUO-05	Do the agreements have a date of termination and allow for renewal under different terms?	YES	NO
SUO-06	Does the utility maintain the legal authority to control the maximum flow introduced into the collection system from satellite communities?	YES	NO
SUO-07	Are standards, inspections, and approval for new connections clearly documented in a SUO?	YES	NO
SUO-08	Does the SUO require satellite communities to adopt the same industrial and commercial regulator discharge limits as the utility?	YES	NO
SUO-09	Does the SUO require satellite communities to adopt the same inspection and sampling schedules as required by the pretreatment ordinance?	YES	NO
SUO-10	Does the SUO require that satellite communities or the utility to issue control permits for significant industrial users?	YES	NO
SUO-11	Does the SUO contain provisions for addressing overstrength wastewater from satellite communities?	YES	NO

SUO-12 Does the SUO contain procedures for the following? *(Check all that apply)*

- [X] Inspection standards
- [X] Pretreatment requirements
- [X] Building/sewer permit issues

SUO-13 Does the SUO contain general prohibitions of the following materials? *(Check all that apply)*

- [X] Fire and explosions hazards
- [X] Corrosive materials
- [X] Obstructive materials
- [X] Oils or petroleum
- [X] Material which may cause interference at the wastewater treatment plant

SUO-14 Does the SUO contain procedures and enforcement actions for the following? *(Check all that apply)*

- [X] Fats, oils, and grease (FOG)
- [X] Storm water connections to sanitary lines (downspouts)
- [X] Infiltration and inflow
- [ ] Defects in service laterals located on private property
- [ ] Building structures over the sewer lines
- [X] Sump pumps, air conditioner connections

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Organizational Structure (OC)

OC-01	Is an organizational chart available that shows the overall personnel structure for the utility, including operation and maintenance staff?	☒ YES	☐ NO
OC- 02	Are up-to-date job descriptions available that delineate responsibilities and authority for each position?	☒ YES	☐ NO

OC-03 Are the following items discussed in the job descriptions? *(Check all that apply)*

- ☒ Nature of work to be performed
- ☒ Examples of the types of work
- ☒ Minimum requirements for the position
- ☒ List of licenses required for the position
- ☒ Necessary special qualifications or certifications
- ☒ Performance measures or promotion potential

OC-04 What percent of staff positions are currently vacant? 0 %

OC-05 On average how long do positions remain vacant? *(months)* 2

OC-06 What percent of utility work is contracted out? 0 %

Internal Communications (IC)

IC-01	Which of the following methods are used to communicate with utility staff? *(Check all that apply)*	☒ Regular meetings ☒ Bulletin board ☒ E-mail ☒ Other (walkie talkie/pager)	
IC-02	How often are staff meetings held? *(e.g., Daily, Weekly, Monthly, etc.)*	Daily	
IC-03	Are incentives offered to employees for performance improvements?	YES	NO
IC-04	Does the utility have an "Employee of the Month/Quarter/Year" program?	YES	NO
IC-05	How often are performance reviews conducted? *(e.g., Semi-annually, Annually, etc.)*	Annually	
IC-06	Does the utility regularly communicate/coordinate with other municipal departments?	YES	NO

Budgeting (BUD)

BUD-01	What is the average annual fee for residential users?	$ 300
BUD-02	How often are user charges evaluated and adjusted? *(e.g. annually, biannually, etc.)*	annually
BUD-03	Are utility-generated funds used for non-utility programs?	YES [ ] NO [X]
BUD-04	Are costs for collection system operation and maintenance (O&M) separated from other utility services such as water, storm water, and treatment plants? IF NO, GO TO QUESTION BUD-07.	YES [X] NO [ ]
BUD-05	What is your average annual (O&M) budget?	$ 200,000
BUD-06	What percentage of the utility's overall budget is allocated to maintenance of the collection system?	5 %
BUD-07	Does the utility have a Capital Improvement Plan (CIP) that provides for system repairs/replacements on a prioritized basis?	YES [X] NO [ ]
BUD-08	What is your average annual CIP budget?	$ 350,000
BUD-09	What percentage of the maintenance budget is allotted to the following maintenance?	
	Predictive maintenance (tracking design, life span, and scheduled parts replacements)	0 %
	Preventive maintenance (identifying and fixing system weaknesses which, if left unaddressed, could lead to overflows)	1 %
	Corrective maintenance (fixing system components that are functioning but not at 100% capacity/efficiency, for example partially blocked lines)	10 %
	Emergency maintenance (reactive maintenance, overflows, equipment breakdowns)	10 %
BUD-10	Does the utility have a budgeted program for the replacement of under-capacity pipes?	YES [ ] NO [X]
BUD-11	Does the utility have a budgeted program for the replacement of over-capacity pipes?	YES [X] NO [ ]

Training (TR)

TR-01	Does the utility have a formal job knowledge, skills, and abilities (KSA) training program?	YES	NO
TR-02	Does the training program address the fundamental mission, goals, and policies of the utility?	YES	NO
TR-03	Does the utility have mandatory training requirements identified for key employees?	YES	NO
TR-04	What percentage of employees met or exceeded their annual training goals during the past year?	100 %	

TR-05 Does the utility provide training in the following areas? *(Check all that apply)*

- [X] Safety
- [X] Traffic control
- [ ] Public relations
- [ ] Routine line maintenance
- [ ] Record keeping
- [X] SSO/Emergency response
- [X] Confined space entry
- [ ] Electrical and instrumentation
- [X] Pump station operations and maintenance
- [ ] Other
- [ ] Pipe repair
- [X] CCTV and trench/shoring
- [ ] Bursting CIPP

TR-06	Are operator and maintenance certification programs used? IF NO, GO TO QUESTION TR-08	YES	NO
TR-07	Are operator and maintenance certification programs required?	YES	NO
TR-08	Is on-the-job training progress and performance measured?	YES	NO

TR-09 Which of the following methods are used to assess the effectiveness of the training? *(Check all that apply)*

- [ ] None
- [ ] Periodic testing
- [ ] Drills
- [X] Demonstrations

TR-10 What percentage of the training offered by the utility is in the form of the following?

Manufacturer training	25 %	In-house classroom training	0 %
On-the-job training	50 %	Industry-wide training	25 %

Safety (SAF)

SAF-01	Does the utility have a written safety policy?	YES	NO
SAF-02	How often are safety procedures reviewed and revised? *(e.g. Semiannually, Annually, etc.)* 3-5 years	YES	NO
SAF-03	Does the utility have a safety committee?	YES	NO
SAF-04	Are regular safety meetings held with the utility employees?	YES	NO
SAF-05	Does the utility have a safety training program?	YES	NO
SAF-06	Are records of employee safety training kept up to date?	YES	NO

SAF-07 Does the utility have written procedures for the following? *(Check all that apply)*

- [x] Lockout/tagout
- [x] Material safety data sheets (MSDS)
- [x] Chemical handling
- [x] Confined spaces permit program
- [x] Trenching and excavations safety
- [x] Biological hazards in wastewater
- [x] Traffic control and work site safety
- [x] Electrical and mechanical systems
- [x] Pneumatic and hydraulic systems safety

SAF-08 What is your agency's lost-time injury rate? 4.1 % or _____ hours

SAF-09 Are the following equipment items available and in adequate supply? *(Check all that apply)*

- [x] Rubber/disposable gloves
- [x] Confined space ventilation equipment
- [x] Hard hats, safety glasses, rubber boots
- [x] Antibacterial soap and first aid kit
- [x] Tripods or non-entry rescue equipment
- [x] Fire extinguishers
- [x] Equipment to enter manholes
- [x] Portable crane/hoist
- [x] Atmospheric testing equipment and gas detectors
- [x] Oxygen sensors
- [x] H_2S Monitors
- [x] Full body harness
- [x] Protective clothing
- [x] Traffic/public access control equipment
- [ ] 5-minute escape breathing devices
- [x] Life preservers for lagoons
- [x] Safety buoy at activated sludge plants
- [ ] Fiberglass or wooden ladders for electrical work
- [x] Respirators and/or self contained breathing apparatus
- [ ] Methane gas or optical vector (GVA) analyzer
- [x] Lower explosion limit (LEL) metering

SAF-10 Are safety monitors clearly identified? YES NO

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Customer Service (CS)

CS-01 Does the utility have a customer service and public relations program? IF NO GO TO QUESTION CS-03 — YES / NO

CS-02 Does the customer service program include giving formal presentations on the wastewater field to the following? *(Check all that apply)*

- ☒ Schools and universities
- ☐ Local officials
- ☐ Media
- ☐ Building Inspector(s)
- ☒ Community gatherings
- ☐ Businesses
- ☒ Citizens
- ☐ Public utility officials

CS-03 Are employees of the utility specifically trained in customer service? — YES / NO

CS-04 Are there sample correspondence, Q/A's, or "scripts" to help guide staff through written or oral responses to customers? — YES / NO

CS-05 What methods are used to notify the public of major construction or maintenance work? *(Check all that apply)*

- ☐ Door hangers
- ☒ Newspaper
- ☒ Fliers
- ☒ Signs
- ☐ Other
- ☐ None
- ☐ Public radio or T.V. announcements

CS-06 Is a homeowner notified prior to construction that his/her property may be affected? — YES / NO

CS-07 Do you provide information to residents on cleanup and safety procedures following basement backups and overflows from manholes when they occur? — YES / NO

CS-08 Does the utility have a customer service evaluation program to obtain feedback from the community? — YES / NO

CS-09 Do customer service records include the following information? *(Check all that apply)*

- ☐ Personnel who received the complaint or request
- ☒ Name, address, and telephone number of customer
- ☐ Nature of the complaint or request
- ☐ Location of the problem
- ☐ To whom the follow-up action was assigned
- ☐ Date the follow up action was assigned
- ☐ Date of the complaint or request
- ☐ Cause of the problem
- ☐ Date the complaint or request was resolved
- ☐ Feedback to customer
- ☐ Total days to end the problem

CS-10 Does the utility have a goal for how quickly customer complaints (or emergency calls) are resolved? IF NO, GO TO THE NEXT PAGE. — YES / NO

CS-11 What percentage of customer complaints (or emergency calls) are resolved within the timeline goals? _____ %

Page 11

Equipment and Collection System Maintenance (ESM)

ESM-01	Is a maintenance card or record kept for each piece of mechanical equipment within the collection system? IF NO, GO TO QUESTION ESM-03.	YES	NO

ESM-02 Do equipment maintenance records include the following information? *(Check all that apply)*

- ☒ Maintenance recommendations
- ☒ Maintenance schedule
- ☒ Instructions on conducting the specific maintenance activity
- ☒ A record of maintenance on the equipment to date
- ☒ Other observations on the equipment

ESM-03	Are dated tags used to show out-of-service equipment?	YES	NO
ESM-04	Is there an established system for prioritizing equipment maintenance needs?	YES	NO
ESM-05	What percent of repair funds are spent on emergency repairs?	1 %	
ESM-06	Are corrective repair work orders backlogged more than six months?	YES	NO
ESM-07	Do collection system personnel coordinate with state, county, and local personnel on repairs, before the street is paved?	YES	NO

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Equipment Parts Inventory (EPI)

EPI-01	Have critical spare parts been identified?	YES X	NO
EPI-02	Are adequate supplies on hand to allow for two point repairs in any part of the system?	YES X	NO
EPI-03	Is there a parts standardization policy in place?	YES X	NO
EPI-04	Does the utility have a central location for storing spare parts?	YES X	NO
EPI-05	Does the utility maintain a stock of spare parts on its maintenance vehicles?	YES X	NO
EPI-06	Does the utility have a system in place to track and maintain an accurate inventory of spare parts?	YES X	NO
EPI-07	For those parts which are not kept in inventory, does the utility have a readily available source or supplier?	YES X	NO

Management Information System (MIS)

MIS-01	Does the utility have a management information system (MIS) in place for tracking maintenance activities? *(Either electronic or good paper files)* IF NO, GO TO PAGE 15.	[X] YES	[ ] NO
MIS-02	Are the MIS records maintained for a period of at least three years?	[X] YES	[ ] NO
MIS-03	Is the MIS able to distinguish activities taken in response to an overflow event?	[ ] YES	[X] NO

MIS-04 Are there written instructions for managing and tracking the following information? *(Check all that apply)*

- [ ] Complaint work orders
- [X] Scheduled inspections
- [ ] Compliance/overflow tracking
- [X] Scheduled work orders
- [X] Sewer system inventory
- [X] Equipment/tools tracking
- [ ] Customer service
- [ ] Safety incidents
- [ ] Parts inventory
- [X] Scheduled preventive maintenance
- [X] Scheduled monitoring/ sampling

MIS-05 Do the written instructions for tracking procedures include the following information? *(Check all that apply)*

- [X] Accessing data and information
- [X] Updating the MIS
- [X] Instructions for using the tracking system
- [X] Developing and printing reports

MIS-06 How often is the management information system updated? *(Check one)*

- [ ] Immediately
- [ ] Within one week of the incident
- [X] Monthly
- [ ] As time permits

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System Mapping (MAP)

MAP-01 Are "as built" plans (record drawings) or maps available for use by field crews in the office and in the field? [X] YES [ ] NO

MAP-02 Is there a procedure for field crews to record changes or inaccuracies in the maps and update the mapping system? [X] YES [ ] NO

MAP-03 Do the maps show the date the map was drafted and the date of the last revision? [X] YES [ ] NO

MAP-04 Do the sewer line maps include the following? *(Check all that apply)*

- [X] Scale
- [X] North arrow
- [X] Date the map was drafted
- [X] Date of last revision
- [X] Service area boundaries
- [X] Property lines
- [X] Other landmarks (Roads, water bodies, etc.)
- [X] Manhole and other access points
- [X] Location of building laterals
- [X] Street names
- [ ] SSOs occurrences/CSOs outfalls
- [X] Flow monitors
- [X] Force mains
- [X] Pump stations
- [X] Lined sewers
- [X] Main, trunk, and interceptor sewers
- [X] Easement lines and dimensions
- [X] Pipe material
- [X] Pipe diameter
- [X] Installation date
- [X] Slope
- [X] Manhole rim elevation
- [X] Manhole coordinates
- [X] Manhole invert elevation
- [X] Distance between manholes

MAP-05 Are the following sewer attributes recorded? *(Check all that apply)*

- [X] Size
- [X] Shape
- [X] Invert elevation
- [X] Material
- [X] Separate/combined sewer
- [X] Installation Date

MAP-06 Are the following manhole attributes recorded? *(Check all that apply)*

- [X] Shape
- [X] Depth
- [X] Age
- [X] Type (e.g., precast, cast in place, etc.)
- [ ] Material

MAP-07 Is there a systematic numbering and identification method/system established to identify sewer system manhole, sewer lines, and other items (pump stations, etc.)? [X] YES [ ] NO

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Internal TV Inspection (TVI)

TVI-01	Does the utility have a standardized pipeline condition assessment program?	YES	NO
TVI-02	Is internal TV inspection used to perform condition assessment? IF NO, GO TO PAGE 17.	YES	NO
TVI-03	Are there written operation procedures and guidelines for the internal TV inspection program?	YES	NO

TVI-04 Do the internal TV record logs include the following? *(Check all that apply)*

- [X] Pipe size, type, length, and joint spacing
- [X] Distance recorded by internal TV
- [X] Results of the internal TV inspection (including a structural rating)
- [X] Internal TV operator name
- [X] Cleanliness of the line
- [X] Location and identification of line being televised by manholes

TVI-05	Is a rating system used to determine the severity of the defects found during the inspection process?	YES	NO
TVI-06	Is there documentation explaining the codes used for internal TV results reporting?	YES	NO

TVI-07 Approximately what percent of the total defects determined by TV inspection during the past 5 years were the following?

Failed coatings or linings	0 %	Line deflection	32 %
House connection leaks	0 %	Joint separation	1 %
Illegal connections	0 %	Crushed pipes	0 %
Pipe corrosion (H_2S)	1 %	Collapsed pipes	0 %
Fats, oil, and grease	26 %	Offset joints	1 %
Broken pipes	0 %	Root intrusions	7 %
Debris	29 %	Minor cracks	3 %
Other	0 %		

TVI-08	Are main line and lateral repairs checked by internal TV inspection after the repair(s) have been made?	YES	NO

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Sewer Cleaning (CLN)

CLN-01	What is the system cleaning frequency? (the entire system is cleaned every "X" years)	1
CLN-02	What is the utility's plan for system cleaning (% or frequency in years)?	Log Plan
CLN-03	What percent of the sewer lines are cleaned, even high/repeat cleaning trouble spots, during the past year?	Entire system annually trouble spots quarterly %
CLN-04	Is there a program to identify sewer line segments, with chronic problems, that should be cleaned on a more frequent schedule?	YES / NO
CLN-05	Does the utility have a root control program? (PERFORMED ON A AS-NEEDED BASIS)	YES / NO
CLN-06	Does the utility have a fats, oils, and grease (FOG) program?	YES / NO
CLN-07	What is the average number of stoppages experienced per mile of sewer pipe per year?	>1 %
CLN-08	Has the number of stoppages increased, decreased, or stayed the same over the past 5 years?	☐ Increased ☒ Decreased ☐ Stayed the same
CLN-09	Are stoppages plotted on maps and correlated with other data such as pipe size and material or location?	YES / NO
CLN-10	Do the sewer cleaning records include the following information? *(Check all that apply)*	☒ Date and time ☒ Method of cleaning ☒ Identity of cleaning crew ☒ Cause of stoppage ☒ Location of stoppage or routine cleaning activity ☒ Further actions necessary/initiated
CLN-11	If sewer cleaning is done by a contractor are videos taken of before and after cleaning?	YES / NO

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Manhole Inspection and Assessment (MAN)

MAN-01	Does the utility have a routine manhole inspection and assessment program? IF NO, GO TO QUESTION MAN-06.	YES	NO
MAN-02	Are the results and observations from the routine manhole inspections recorded?	YES	NO
MAN-03	Does the utility have a goal for the number of manholes inspected annually?	YES	NO

MAN-04 How many manholes were inspected during the past year? 800

MAN-05 Do the records for manhole/pipe inspection include the following? *(Check all that apply)*

- ☑ Conditions of the frame and cover
- ☑ Evidence of surcharge
- ☑ Offsets or misalignments
- ☐ Atmospheric hazards measurements (especially hydrogen sulfide)
- ☑ Details on the root cause of cracks or breaks in the manhole or pipe including blockages
- ☑ Recording conditions of (corbel, walls, bench, trough, and pipe scale)
- ☑ Presence of corrosion
- ☑ If repair is necessary
- ☑ Manhole identifying number/location
- ☑ Wastewater flow characteristics (flowing freely or backed up)
- ☑ Accumulations of grease, debris, or grit
- ☑ Presence of infiltration, location, and estimated quantity
- ☑ Inflow from manhole covers

MAN-06 Does the utility have a grouting program? (PERFORMED ON AN AS-NEEDED BASIS) YES NO

Pump Stations (PS)

PS-01	Are Standard Operation Procedures (SOPs) and Standard Maintenance Procedures (SMPs) used for each pump station?	YES	NO
PS-02	Are there enough trained personnel to properly maintain all pump stations?	YES	NO
PS-03	Is there an emergency operating procedure for each pump station?	YES	NO
PS-04	Is there an alarm system to notify personnel of pump station failures and overflow?	YES	NO
PS-05	Percent of pump stations with back up power sources	100 %	
PS-06	Does the utility use the following methods when loss of power occurs? *(Check all that apply)* ☒ On-site electrical generators ☒ Portable electric generators ☒ Alternate power source ☐ Other ☒ Vacuum trucks to bypass pump station		
PS-07	Is there a procedure for manipulating pump operations (manually or automatically) during wet weather to increase in-line storage of wet weather flows?	YES	NO
PS-08	Are wet well operating levels set to limit pump start/stops?	YES	NO
PS-09	Are the lead, lag, and backup pumps rotated regularly?	YES	NO
PS-10	Are operation logs maintained for all pump stations?	YES	NO
PS-11	Are the original manuals that contain the manufacturers recommended maintenance schedules for all pump station equipment easily available?	YES	NO
PS-12	On average, how often were pump stations inspected during the past year?	Weekly	YES NO
PS-13	Are records maintained for each inspection?	YES	NO
PS-14	Average annual labor hours spent on pump station inspection	48	
PS-15	Percent of pump stations with pump capacity redundancy	100 %	
PS-16	Percent of pump stations with dry weather capacity limitations	0 %	
PS-17	Percent of pump stations with wet weather capacity limitations	0 %	
PS-18	Percent of pump stations calibrated annually	100 %	
PS-19	Percent of pump stations with permanent flow meters	0 %	

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Capacity Assessment (CA)

CA-01	Does the utility have a flow monitoring program?	YES	NO
CA-02	Does the utility have a comprenhensive capacity assessment and planning program?	YES	NO
CA-03	Are flows measured prior to allowing new connections?	YES	NO
CA-04	Do you have a tool (hydraulic model, spreadsheet, etc.) for assessing whether adequate capacity exists in the sewer system? IF NO, GO TO QUESTION CA-06.	YES	NO
CA-05	Does your capacity assessment tool produce results consistent with conditions observed in the system?	YES	NO

CA-06 What is the ratio of peak wet weather flow to average dry weather flow at the wastewater treatment plant? 1.79

CA-07 How many permanent flow meters are currently in the system? *(Include meters at pump stations and wastewater treatment plants)* 10

CA-08 How frequently are the flow meters checked? *(e.g. Daily, Weekly, Monthly, etc.)* Annually

CA-09 Do the flow meter checks include the following? *(Check all that apply)*

- ☒ Independent water level
- ☒ Velocity reading
- ☒ Downloading data
- ☒ Checking the desiccant
- ☒ Cleaning away debris
- ☒ Battery condition

CA-10	Are records maintained for each inspection? IF NO, GO TO QUESTION CA-12.	YES	NO

CA-11 Do the flow monitoring records include the following? *(Check all that apply)*

- ☒ Descriptive location of flow meter
- ☒ Frequency of flow meter inspection
- ☒ Type of flow meter
- ☒ Frequency of flow meter calibration

CA-12	Does the utility maintain any rain gauges or have access to local rainfall data?	YES	NO
CA-13	Does the utility have any wet weather capacity problems?	YES	NO
CA-14	Are low points or flood-plain areas monitored during rain events?	YES	NO
CA-15	Does the utility have any dry weather capacity problems?	YES	NO
CA-16	Is flow monitoring used for billing purposes, capacity analysis, and/or inflow and infiltration investigations?	YES	NO

Tracking SSOs (TRK)

TRK-01 How many SSO events have been reported in the past 5 years? 3

TRK-02 What percent of the SSOs were less than 1,000 gallons in the past 5 years ? 100 %

TRK-03 Does the utility document and report all SSOs regardless of size? [X] YES [ ] NO

TRK-04 Does the utility document basement backups? [ ] YES [X] NO

TRK-05 Are there areas that experience frequent basement or street flooding? [ ] YES [X] NO

TRK-06 Approximately what percent of SSOs discharges were from each of the following in the last 5 years?

Manholes 100 % Main and trunk sewers ___ % Structural bypasses ___ %

Pump stations ___ % Lateral and branch sewers ___ %

TRK-07 Approximately what percent of SSOs discharges were caused by the following in the last 5 years?

Debris buildup 33 % Root intrusion 33 % Excessive infiltration and inflow 0 %

Collapsed pipe 0 % Capacity limitations 0 % Fats, oil, and grease 0 %

Vandalism 33 %

TRK-07A What percentage of SSOs were released to:

Soil 66 % Basements 0 % Paved area 0 %

Surface water (rivers/lakes/streams) 33 % Coastal, ocean, beaches 0 %

TRK-07B For surface water releases, what percent are to areas that could affect: N/A

Contact recreation (beaches, swimming, areas) ___ % Drinking water sources ___ %

Shellfish growing areas ___ %

TRK-08 How many chronic SSO locations are in the collection system? 0

TRK-09 Are pipes with chronic SSOs being monitored for sufficient capacity and/or structural condition? [ ] YES [ ] NO N/A

TRK-10 Prior to collapse, are structurally deteriorating pipelines being monitored for renewal or replacement? [X] YES [ ] NO

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Overflow Emergency Response Plan (OERP)

OERP-01	Does the utility have a documented OERP available for utility staff to use? IF NO, GO TO QUESTION OERP-04.	YES X	NO
OERP-02	How often is the OERP reviewed and updated? *(Annually, Biannually, etc.)*	Annually	
OERP-03	Are specific responsibilities detailed in the OERP for personnel who respond to emergencies?	YES X	NO
OERP-04	Are staff continuously trained and drilled to respond to emergency situations?	YES X	NO
OERP-05	Do work crews have immediate access to tools and equipment during emergencies?	YES X	NO
OERP-06	Does the utility have standard procedures for notifying state agencies, local health departments, the NPDES authority, the public, and drinking water authorities of significant overflow events?	YES X	NO
OERP-07	Does the procedure include a current list of the names, titles, phone numbers, and responsibilities of all personnel involved?	YES X	NO
OERP-08	Does the utility have a public notification plan?	YES X	NO
OERP-09	Does the utility have procedures to limit public access to and contact with areas affected with SSOs? *(Procedure can be delegated to another authority)*	YES X	NO
OERP-10	Does the utility use containment techniques to protect the storm drainage systems?	YES X	NO
OERP-11	Do the overflow records include the following information? *(Check all that apply)*		
	[X] Date and time [X] Location [X] Any remediation efforts [X] Cause(s) [X] How it was stopped [X] Estimated flow/volume discharged [X] Names of affected receiving water(s) [X] Duration of overflow		
OERP-12	Does the utility have signage to keep public from effected area?	YES X	NO

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Smoke and Dye Testing (SDT)

SDT-01	Does the utility have a smoke testing program to identify sources of inflow and infiltration?	YES	NO X
SDT-01A	Does the utility have a smoke testing program to identify sources of inflow and infiltration in illegal connectors?	YES	NO X
SDT-01B	Does the utility have a smoke testing program to identify sources of inflow and infiltration in house laterals (private service laterals)?	YES	NO X
SDT-02	Are there written procedures for the frequency and schedule of smoke testing?	YES	NO X
SDT-03	Is there a documented procedure for isolating line segments?	YES	NO X
SDT-04	Is there a documented procedure for notifying local residents that smoke testing will be conducted in their area?	YES	NO X
SDT-05	What is the guideline for the maximum amount of the line to be tested at one time? *(Feet or Miles)*	N/A	
SDT-06	Are there guidelines for the weather conditions under which smoke testing should be conducted?	YES	NO X
SDT-07	Does the utility have a goal for the percent of the system smoke tested each year?	YES	NO X
SDT-08	What percent of the system has been smoke tested over the past year?	N/A	%
SDT-09	Do the written records contain location, address, and description of the smoking element that produced a positive result?	YES	NO X
SDT-10	Does the utility have a dye testing program?	YES	NO X
SDT-11	Are there written procedures for dye testing?	YES	NO X
SDT-12	Does the utility have a goal for the percent of the system dye tested each year?	YES	NO X
SDT-13	What percent of the main collection system has been dye tested over the past year?	N/A	%
SDT-14	Does the utility share smoke and dye testing equipment with another utility?	YES	NO X

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Hydrogen Sulfide Monitoring and Control (HSMC)

HSMC-01 How would you rate the system's vulnerability for hydrogen sulfide corrosion? *(Check only one)*

☒ Not a problem ☐ Only in a few isolated areas ☐ A major problem

HSCM-02	Does the utility have a corrosion control program?	YES	NO
HSCM-03	Does the utility take hydrogen sulfide corrosion into consideration when designing new or replacement sewers?	YES	NO
HSCM-04	Does the utility have written procedures for the application of chemical dosages?	YES	NO
HSCM-05	Are the chemical dosages, dates, and locations documented?	YES	NO
HSCM-06	Does the utility document where odor is a continual problem in the system?	YES	NO
HSCM-07	Does the utility have a program in place for renewing or replacing severely corroded sewer lines to prevent collapse?	YES	NO

HSCM-08 Are the following methods used for hydrogen sulfide control? *(Check all that apply)*

☐ Aeration ☐ Chlorine ☐ Potassium permanganate
☐ Iron salts ☐ Sodium hydroxide ☐ Biofiltration
☐ Enzymes ☐ Hydrogen peroxide ☐ Other
☐ Activated charcoal canisters

HSCM-09	Does the system contain air relief valves at the high points of the force main system?	YES	NO

HSCM-10 How often are the valves maintained and inspected? *(Weekly, Monthly, etc.)*

HSMC-11	Does the utility enforce pretreatment requirements?	YES	NO

Appendix O:

Western Municipal Water District Reference Materials

Appendix O1:

2005 Urban Water Management Plan

Urban Water Management Plan • 2005

WESTERN MUNICIPAL WATER DISTRICT

WESTERN MUNICIPAL WATER DISTRICT

John V. Rossi
General Manager

S.R. Al Lopez *President* | Kevin D. Jeffries *Vice President* | Elizabeth L. Cunnison *Secretary/Treasurer* | Wayne H. Holcomb *Director* | Donald D. Galleano *Director*

December, 2005

Readers of Western Municipal Water District's
2005 Urban Water Management Plan

Western Municipal Water District is pleased to publish its 2005 Urban Water Management Plan.

This plan provides significant information regarding Western's retail service area, specifically related to water demands and supplies, but also contains information on a regional basis related to demands and supplies within the 510 square mile area comprising Western's General District.

This plan has been prepared pursuant to procedures of California Water Code Sections 10640 through 10645 and is organized as recommended in the Guidebook to Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan. It satisfies the requirements contained within the applicable code sections and provides information to aid in the evaluation of future water supplies in accordance with Senate Bill SB 610 and SB 221.

As this document is reviewed and used as an informative resource, should you have questions please contact us.

JOHN V. ROSSI
General Manager

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Section 1
Introduction

Western Municipal Water District (Western) was formed by the voters in 1954 to bring supplemental water to growing western Riverside County. Today, the District serves more than 19,000 retail and nine wholesale customers with water from both the Colorado River and the State Water Project. Supplemental water is also received from the City of Riverside.

As a member agency of the Metropolitan Water District of Southern California (MWD), Western provides wholesale water to the cities of Corona, Norco, and Riverside and the water agencies of Elsinore Valley and Rancho California. Western serves customers in the unincorporated areas of El Sobrante, Eagle Valley, Temescal Creek, Woodcrest, Lake Mathews, and March Air Reserve Base.

Western operates and maintains domestic and industrial wastewater collection and conveyance systems for retail and contract services customers in Lake Hills, March Air Reserve Base, Home Gardens, and the City of Norco.

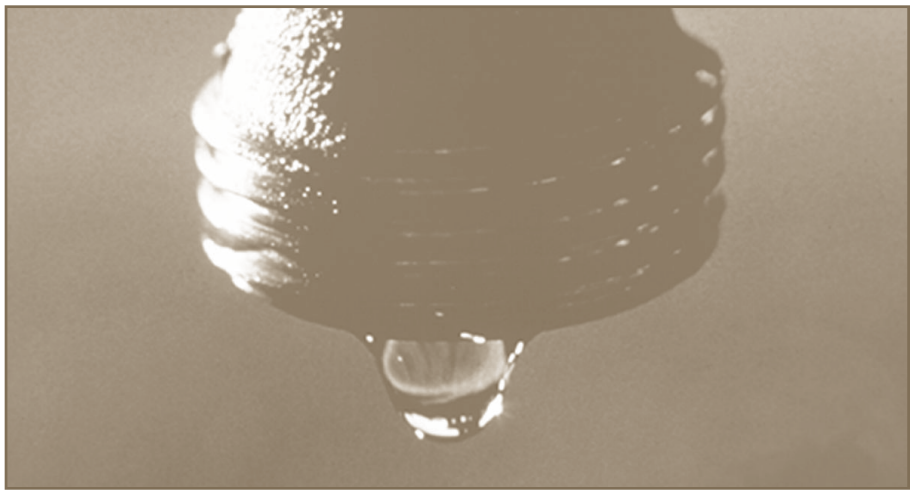
Western is one of five of the member agencies of the Santa Ana Watershed Project Authority (SAWPA), a regional water resources planning and project implementation organization. Western's general manager is a court-appointed Watermaster, responsible for reporting compliance with water quality and quantity provisions of court orders regarding water rights issues in the Santa Ana watershed.

Western's general district consists of a 510 square mile area of western Riverside County and a population of more than one-half million people. Western currently sells over 90,000 acre-feet (AF) of water annually. Improvement districts, the retail portion of Western's general district, covers about 73 square miles and Western's retail service provides water to an estimated population of 61,000, based on 3.2 persons per household for about 19,100 residential domestic services. The location of Western and its retail and wholesale areas are shown in Figure 1.

About sixty percent of the water Western sells is treated; the balance is untreated or raw water. About one-third of Western's water sales are for domestic purposes; the rest wholesale. Water sold by the District for agricultural purposes is used to irrigate crops such as citrus and avocados, and nurseries. Agricultural water use in the retail area has decreased in past years with increasing urbanization.

About one-quarter of the water Western purchases from the MWD comes from the Colorado River Aqueduct and about three-quarters from the State Water Project, which transports water from Northern California via the California Aqueduct. Western also imports a small quantity of groundwater from the Riverside/San Bernardino area. Western owns no wells for groundwater production.

The five member Board of Directors comprise the governing body of the District and are responsible to the members of the public of his or her division, and to the general public within the District, for proper conduct of District affairs. Board members are elected to four-year terms by the registered voters in five geographic divisions apportioned by population. Terms are staggered to ensure continuity, with public elections held in at least two divisions every two



years. The director must reside in the division from which he or she is elected.

This Urban Water Management Plan (UWMP) provides information regarding projected water use and supplies. This Plan is organized as recommended in the *Guidebook to Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan* (January 18, 2005). For each discussion provided in the Plan, the regulatory citation is presented followed by the requested information.

Section 2
Agency Coordination

Western is a retail and wholesale water agency serving more than 3,000 customers and therefore, is submitting an UWMP. This UWMP provides information for our retail area only, unless specifically noted.

2.1 Law

Water Code Section 10620

10620. (a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).

(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.

(c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.

(d) (1) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.

(2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

Water Code Section 10621

10621. (a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero.

(b) Every urban water supplier required to prepare a plan pursuant to this part shall notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

(c) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

Water Code Section 106110617. "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

2.2 Coordination with Appropriate Agencies

This 2005 UWMP has been coordinated with a variety of agencies throughout the process. In the planning stages, Western coordinated with Metropolitan Water District of Southern California and our wholesale customers to determine potential demands and supplies. The draft UWMP was

Table 1. Coordination with Appropriate Agencies

Agency	Participated in UWMP Development	Commented on Draft	Attended Public Meeting	Contacted for Assistance	Received Copy of Draft	Sent Notice of Intention to Adopt
City of Riverside				X	X	10/5
City of Corona				X	X	10/5
City of Norco					X	10/5
County of Riverside					X	10/5
MWD of Southern California				X		10/5
Rancho California Water District				X	X	10/5
Box Spring Mutual Water Company				X	X	10/5
SAWPA					X	10/5
Rubidoux Community Services District					X	10/5
Jurupa Community Services District					X	10/5
Elsinore Valley Municipal Water District				X	X	10/5
Home Gardens County Water District					X	10/5
Lee Lake Water District				X	X	10/5

provided to local agencies for their comment. A summary of the coordination effort is provided in Table 1. A copy of the letter requesting information and inviting participation are provided in Appendix A.

2.3 Resource Maximization/ Import Minimization Plan

Western has used many tools and options to maximize resources and minimize the need to import water. These tools include, but are not limited to, regional planning; water efficiency programs; and water transfers and exchanges.

Through a variety of basin water management programs, Western is attempting to ensure that the regional water supply is being efficiently used and re-used. Western's commitment to cooperation as the avenue for solving regional problems dates back to the District's formation. Western has been involved in virtually every water rights adjudication in the region since then. For example, several decades of litigation among users in the Santa Ana River watershed culminated in settlement in 1969. The stipulated judgment contains a declaration of rights of the entities in the lower area of the Santa Ana River Basin downstream of Prado Dam against those in the upper area, and provides a physical solution to implement the provisions of the judgment. Western's general manager serves as a court-appointed watermaster for the judgment.

The Seven Oaks Dam Conservation Project is a long-term attempt to better utilize storm water runoff within its watershed. This regional program has the potential to greatly improve the management of local urban water supplies in the Santa Ana River watershed and increase the water available to such beneficiaries as Agua Mansa, Meeks and Daley Water Companies, and the city of Riverside. The impact on the entire District will be a reduced rate of demand growth for imported water as more local waters are conserved and reused.

During the past 15 years, Western has addressed the long-standing issues of liquefaction in the San Bernardino Basin area. These efforts were made to produce

groundwater in the pressure area in a manner in which liquefaction and associated earthquake-related damages would not occur. Additional safe yield is declared annually that benefits users. Western is currently working with San Bernardino Valley Municipal Water District and the city of Riverside on the Riverside-Corona Feeder, a major water storage and conveyance pipeline that will assist with liquefaction and provide a dry-year supply of water and provide other benefits to the San Bernardino Valley community.

Western has assumed responsibility for a cooperative well-measuring program in the basin. Twice yearly, a Well Measurement Report is distributed to purveyors within the District. The report includes data from 47 agencies for more than 1820 wells in the Santa Ana and San Jacinto watersheds.

Western also participates in regional planning through the Santa Ana Watershed Project Authority (SAWPA), a joint powers agency charged with basin planning and development of regional water and wastewater facilities. SAWPA is composed of the five major water districts that share the Santa Ana and San Jacinto rivers, including Western. Those agencies are committed to working collectively and have prepared a Basin Plan under contract to the California Regional Water Quality Control Board to protect the Santa Ana River basin. The Plan calls for extensive wastewater treatment facilities, changes in imported water supply, massive export of saline waters, and a brine line from the upper watershed to the ocean. Among the water quality improvement projects that Western has participated in through SAWPA to benefit the region, are:

Santa Ana Regional Interceptor – The SARI line is a water pipeline designed to convey 30 million gallons of non-reclaimed wastewater from the upper Santa Ana River basin to the ocean for disposal after treatment. An extension of the SARI line southerly from Corona through the Temescal Canyon to the Lake Elsinore area and the San Jacinto watershed has recently been completed.

Arlington Desalter – The Arlington Desalter extracts and treats impaired groundwater from the Arlington Basin in Riverside with delivery of high quality product water to Norco. Western provided local match for this project and serves as operator of the facility.

Lake Elsinore San Jacinto Watershed Authority (LESJWA) – LESJWA works to curtail the impacts of the flood and drought cycles that have plagued Lake Elsinore in the past. The project has restricted the boundaries of the Lake and provides a source of replenishment water to replace evaporative losses. Through SAWPA, Western has provided funding and participation on LESJWA.

Western Riverside County Regional Wastewater Treatment Facility – In 1992, a Joint Powers Authority was formed to pursue the construction and operation of a new regional wastewater treatment facility on a site located just northwest of Norco. The facilities include processes needed for reaching tertiary treatment levels that meet or exceed all California Regional Water Quality Control Board standards.

Rapid Infiltration/Extraction (RIX) Wastewater Treatment Project – This demonstration project was developed to evaluate the effectiveness of using an experimental wastewater tertiary treatment process.

With SAWPA, Western is also participating in the Integrated Water Resources Plan (IWRP) process for the Santa Ana River watershed that focuses on the following:

• Changes in terms of recent water districts' planning updates and funding status that warrant a fresh analysis of the watershed.

• Planning time horizons for 2010, 2025, and 2050 of water demands and supplies.

• Water resource plans by member districts.

• A breakdown of planned water resource projects into six major project categories.

• Balancing and integration of available resources, including projects that enhance the environment.

• Identification of regional problems, issues, and descriptions of long-term integrated solutions.

2.4 City and County Notification and Participation

Western has notified appropriate cities and counties regarding the UWMP update process. Draft Plans were provided to the agencies listed in Table 1 and copies of letters inviting participation are provided in Appendix A.

2.5 Review and Adoption of UWMP Changes

Western follows the procedures of Water Code sections 10640 through 10645 when reviewing and making changes or additions to the UWMP. This revision of the UWMP is provided for the year 2005, meeting the deadline for providing UWMPs by December 31 in years ending in "0" and "5". The plan was adopted by the Western Board of Directors on December 7th through Resolution No. 2388. A copy of Resolution No. 2388 is provided in Appendix B.

Section 3
UWMP Planning Steps

3.1 Appropriate Level of Planning

3.1.1 Law

Water Code Section 10630

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

3.1.2 Contents of Plan

Western supplies water to both retail and wholesale customers. This UWMP focuses on retail services and provides all elements required by the Urban Water Management Planning Act. The retail service information is provided to a level of detail appropriate for planning for the current customer base. As available, historic information is provided.

Western supplies wholesale water to the cities of Corona, Norco and Riverside and the water agencies and companies of Elsinore Valley, Rancho California, Box Springs, Eagle Valley, and Lee Lake. Information regarding our wholesale customers is provided in Section 3.11.

3.2 Service Area Information With 20 Year Projections

3.2.1 Law

Water Code Section 10631(a)

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

3.2.2 Service Area Information

Demographic factors that may affect water use include current and projected population, climate, population density, and customer type.

Western's retail service area is within the County of Riverside. The County of Riverside is one of the most rapidly growing areas of the State of California. Between 1994 and 1999, the population of Riverside County increased at an overall growth rate of 7% (David Taussing & Associates, Inc. 2003). In western Riverside County, the overall growth rate between 1994 and 1999 was 6% with population growth in cities and unincorporated areas at 7.9% and 1.1%, respectively. The 2000 Census indicated that Riverside County had a residential population of

over 1.5 million and approximately 585,000 dwelling units (David Taussing & Associates, Inc. 2003). The Southern California Association of Governments (SCAG) estimates that by 2020 the population in Riverside County will nearly double to approximately 2.8 million people with about 918,000 dwelling units (David Taussing & Associates, Inc. 2003). A separate study by the California Department of Finance estimates that the County population will be 3.5 million by 2030 (David Taussing & Associates, Inc. 2003). SCAG estimates that population in Riverside County will grow at an annual rate of 3.4% (Southern California Association of Governments [SCAG], 2004). The population in western Riverside County, which includes Western's retail service area, is projected to increase at an annual rate of 3.3% and the number of households is expected to show an average annual growth rate of 3.9% (SCAG, 2004).

Based on the total number of domestic customers, Western experienced growth of about 4% for the period from 2002 to 2004. This exceeds the growth rate estimated by SCAG for western Riverside County. Western's accelerated growth rate is influenced by the amount of undeveloped area in the retail service area compared to historically urban areas. This growth rate is expected to continue for several years then slow to the annual rate for western Riverside County (3.3%). Based on these assumptions, the estimated current and projected population for the Western retail service area is presented in Table 2.

Table 2. Estimated Population – Current and Projected

	2005	2010	2015	2020	2025	2030
Retail Service Area Population	16,000	72,700	85,500	100,600	118,400	139,200

Note: Population is estimated based on served residential customers.

Table 3. Climate Characteristics

	Jan	Feb	Mar	Apr	May	Jun	
Standard Monthly Average ETo (Inches)	2.49	2.91	4.16	5.27	5.94	6.56	
Average Rainfall (Inches)	2.16	2.15	1.75	0.81	0.23	0.07	
Average Temperature (Fahrenheit)	54.0	55.5	57.5	61.4	65.9	71.3	
	Jul	Aug	Sept	Oct	Nov	Dec	Annual
Standard Monthly Average ETo (Inches)	7.22	6.92	5.35	4.05	2.94	2.56	56.37
Standard Monthly Average ETo (Inches)	0.04	0.12	0.26	0.32	0.93	1.21	10.04
Standard Monthly Average ETo (Inches)	77.0	77.7	74.4	67.3	59.1	54.3	64.6

Western is located in the Inland Valley approximately 50 miles east of Los Angeles where the warm dry climate is generally considered Mediterranean in characteristics (WMWD, 2004a). The climate typically exhibits hot, dry summers and mild, wet winters. Annual precipitation totals vary substantially from year to year. Most rainfall occurs during the months of November through April. Onshore airflow occurs during most of the year producing southwesterly winds. "Santa Ana" conditions occur occasionally producing warm, dry, northeast winds that can reach high velocities. Average temperatures are 64.6° F. Table 3 provides average climatic data for a weather station near the Western retail service area.

Note: Evapotranspiration (ETo) data from station at University of Riverside as provided on the CIMIS website database at www.cimis.water.ca.gov for the period of record from June 1985. Rainfall and temperature data from station at the Riverside Citrus Experiment Station as provided on the NOAA Western Regional Climate Center website database at www.wrcc.dri.edu for the period of record from July 1948. Copies of the downloaded data are provided in Appendix C.

Other demographic factors may also influence water usage. Residential development within Western's retail area ranges from homes on large lots to small mobile home parks and apartments. Businesses are generally neighborhood shopping centers and commercial strips along major streets, such as Van Buren Boule-

vard. The industrial base is growing and includes a Pepsi Bottling Plant and Ralph's Grocery Dairy Unit. One large industrial/commercial park, the Meridian Business Center, is in construction and other industrial/commercial units are planned.

The Riverside County General Plan provides information about the Lake Mathews/Woodcrest Area (Figure 2). This area encompasses most of Western's retail service area, but it does not include the commercial/industrial area immediately west of Interstate 215. The General Plan describes the Lake Mathews/Woodcrest Area as generally rural in characteristics with a strong equestrian presence (County of Riverside, 2003). Thirty percent of the land in this area is designated as open space. Planned housing density ranges from 8 dwelling units per acre to a minimum 10-acre lot size. Over 60% of the area is planned as residential with a lot size of greater than 0.5 acres. Less than 4% of the area is planned as residential with a lot size of less than 0.5 acres. Less than 1% of the area is planned as commercial, retail or light industrial and no heavy industry areas are planned. Minimum ten-acre agricultural areas are specified for 66 acres. It is estimated that the total population for this area will be 30,887 based on 3.1 persons per dwelling unit (County of Riverside, 2003). The total estimated employment for Lake Mathews/Woodcrest Area is 5,162 (County of Riverside, 2003).

The Western retail area is partially within the boundary of the City of Riverside with the remainder in the County of Riverside. The respective municipal and county authorities perform master planning within their jurisdictions. Master Planning is controlled by other agencies, with limited input by Western. Therefore, Western does not have the independent authority to approve new development in its service area.

3.3 Water Sources

3.3.1 Law

Water Code Section 10631(b)

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

3.3.2 Current and Planned Water Supplies

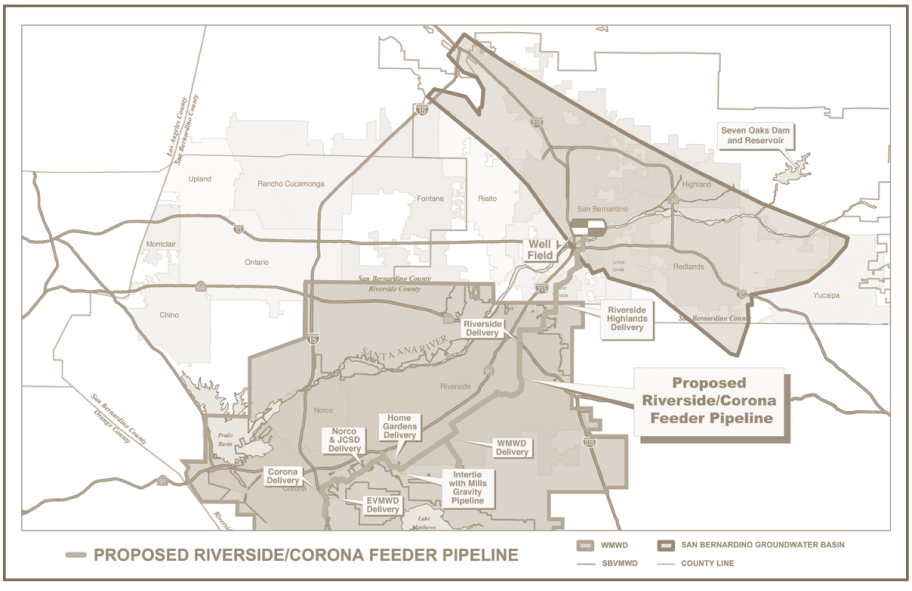
Western provides both potable and non-potable water in the retail service area from various sources.

Potable sources include Metropolitan Water District of Southern California State Water Project water and supplemental water from the City of Riverside. Western became a member agency of MWD in November 1954 and has a purchase agreement for an initial base demand of 65,298.5 AF with an initial Tier 1 annual maximum of 58,768.7 AF (Appendix D). Supplemental water may be purchased from the City of Riverside (Appendix D). The City of Riverside operates a well water supply system of over 40 domestic quality wells. When surplus water is available from the City of Riverside and required by Western, an intertie and portable chloramination station allows Western to take up to approximately 4,900 gallons per minute. Water is purchased from Riverside on an emergency or off-season basis.

Non-potable water is used for irrigation purposes at various locations throughout the retail area. The irrigation distribution system distributes non-potable irrigation water through a large area of the retail service area. The main sources of non-potable water are the Colorado River Aqueduct (CRA) and groundwater from the San Bernardino/Riverside Area. Western does not treat this surface water supply, and, therefore, it is not considered a potable water source for Western. An intertie with a local irrigation system provides access to up to 6,000 acre-feet per year (AF/YR) of non-potable water for irrigation purposes. This water is pumped from wells in the San Bernardino/ Riverside area and wheeled through canals and pipelines under an agreement with Elsinore Valley Municipal Water District. Western has the right to purchase up to 9.0 cfs of groundwater and transport the water through the Riverside Canal or Gage Canal to turnouts connecting to Western's non-potable irrigation system. The use of this high Total Dissolved Solids and nitrate groundwater can make high quality imported water available for domestic purposes.

The Riverside/Corona Feeder project will make Western less dependent on the direct delivery of water from MWD (WMWD, 2005a). The proposed project will provide the infrastructure to allow Western to purchase SWP water from MWD when available and store this water in the San Bernardino Basin Area. This water would then be extracted as needed, and transported to Western's customers and other water purveyors within Western's boundaries for use during dry years. The surplus water could be derived from not only the State Water Project, but also local runoff from regulated releases from the Army Corps of Engineers Seven Oaks Reservoir and other local water sources with surplus water during wet periods.

Water derived from the Seven Oaks Reservoir will be distributed based on priorities. The highest priority would be direct delivery within the Western and San Bernardino Valley Municipal Water District's areas (WMWD, 2004b), mainly to water treatment plants replacing water that would otherwise be met by imported water or groundwater. The second priority would be direct groundwater recharge of basins within the San Bernardino area to provide for future recovery of stored surplus water. The third priority would be recharge of groundwater basins outside the San Bernardino area, but within the Western and San



Bernardino Valley Municipal Water District areas. The fourth and last priority would be delivery of water to agencies outside the Western and San Bernardino Valley Municipal Water District areas as part of an exchange.

Non-potable water from the March Wastewater Reclamation Facility (WWRF) also is used for irrigation purposes in the Western retail area. Currently, all treated wastewater is used to irrigate the Riverside National Cemetery and the Archie J. Old Golf Course. In 2004, a total of 138.7 million gallons [(MG), 425.5 AF] were provided to the National Cemetery and the Golf Course. In January through March 2005, a total of 21.4 MG (65.8 AF) were provided to the National Cemetery and the Golf Course. During the summer months, the reclaimed wastewater must be supplemented with CRA water to meet the demand. In the winter months when precipitation reduces demand, treated wastewater can be stored in open reservoirs until demand increases. As the flow to the March WWRF increases with corresponding increased volumes of treated wastewater, the plant will be upgraded to tertiary treatment and the treated effluent will be pumped into the non-potable irrigation distribution system for delivery to additional non-potable customers. It is anticipated that treated wastewater volumes available for irrigation will increase to 6,130 AF/YR by 2030 as shown in Table 4. These volumes were derived by projections of estimated domestic and industrial discharges based on projects known to Western then application of growth factors of 3.3% per year.

Western does not directly extract groundwater for potable or non-potable purposes in its retail area. The retail area generally is underlain by an area characterized by the Regional Water Quality Control Board as not within a designated groundwater basin (California Regional Water Quality Control Board, Santa Ana Region, 1995, Figure 4-1). Therefore, Tables 6 and 7 as referenced in the Guidebook are not included.

A summary of the water sources is provided in Table 4. A further discussion of MWD supplied water is provided in Sections 3.4 and 3.11.

3.4 Reliability of Supply

3.4.1 Law

Water Code Section 10631(c)

(c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

(1) An average water year.

(2) A single dry water year.

(3) Multiple dry water years.

For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

3.4.2 Normal and Drought Supply Years

A normal supply year is a year in the historical sequence that most closely represents median runoff levels and patterns. Normal is defined by evaluating a minimum of 30 years of historical records for rainfall and runoff. From the basis of a normal year, years of surplus and drought can be defined. MWD developed a computer model named IRPSIM that uses 70 years of historical hydrology (from 1922 to 1991) to develop estimates of water surplus and shortage over a

Table 4. Current and Projected Water Supplies

Water Supply Sources	2005	2010	2015	2020	2025	2030
MWD- Retail Service Area	26,688	31,007	35,726	41,278	47,809	55,491
MWD – Western Wholesale Service	78,024	88,902	101,146	111,837	123,784	134,028
Riverside/Corona Feeder (Potential as needed source)			10,000	40,000	40,000	40,000
Agricultural Water Purchase	3,000	6,000	6,000	6,000	6,000	6,000
Recycled Water-March WWRF	450	2,680	3,850	4,430	5,210	6,130

Quantities in Acre-Feet per Year
MWD – Metropolitan Water District of Southern California
SWP –State Water Project
CRA – Colorado River Aqueduct
WWRF – Wastewater Reclamation Facility

Table 8. Supply Reliability

			Multiple Dry Water Years		
	Normal Water Year (AF Year)	Single Dry Water Year (% of Normal)	Year 1(% of Normal)	Year 2(% of Normal)	Year 3(% of Normal)
MWD Supplies	Varies (see Table 4)	100	100	100	100
Non-potable groundwater	6,000	100	100	100	100
Recycled water	Varies (see Table 33)	100	100	100	100

Table 9. Basis of Water Year Data

Water Source	Water year Type	Base Year(s)	Historic Sequence
MWD Supplies			
	Normal Water Year	NA-Modeled by IRPSIM	
	Single - Dry Year	1977	1922-1991
	Multiple - Dry Years (3)	1990-1992	1922-1991

Ref: MWD, 2005

20-year period (MWD, 2005). The model is used to analyze the extent to which a particular supply option can add to the region's supply reliability and determine the need for additional supplies and aid in determining the appropriate supply targets.

Core water supplies provide a base quantity of water each year, regardless of whether surplus supplies already exist (MWD, 2005), such as recycled water projects, safe yield groundwater production, and CRA base supplies. They provide a reliable source, but if developed to meet demands of infrequent dry years can result in redundancy in wet years and higher costs. Flexible water supplies provide supply only when needed (such as a dry year) and do not result in increased amounts of surplus water during years of plentiful supply, such as voluntary water transfers and storage. Flexible supplies tend to be more cost-effective, but are less reliable.

The IRPSIM model studies tested the supply reliability of a mix of core and flexible supplies (MWD, 2005). The IRPSIM modeled MWD's ability to respond in future years under a repeat of the 1977 and 1990-92 drought cycles, that is, in the case of worst single year and multiple dry year droughts. The IRPSIM analyses of the IRP Update report show that MWD can maintain reliable supplies under the conditions that have existed in past dry periods throughout the period 2005 through 2030.

Supplies associated with the Riverside/Corona Feeder are expected to be reliable sources during drought period. These supplies will be derived from excess SWP stored in the San Bernardino area and local groundwater. Santa Ana Water diversions may also be stored for future extraction.

Western's local non-potable supplies will also be reliable sources. Recycled water has little dependency on drought conditions and the supply of non-potable water from a nearby groundwater basin that is imported by canals and pipelines also will not be impacted by drought. The groundwater to be purchased from Elsinore Valley Municipal Water District is based on water rights Elsinore Valley Municipal Water District holds in the Meeks and Daley Water Company.

A summary of estimated water supply during a normal and drought years is shown in Table 8. The modeled drought years are summarized in Table 9.

3.4.3 Factors in Inconsistency of Supply

Historical water deliveries provide us with an indication, but not a certainty, as to the reliability of future water supplies. Significant changes over time may impact water delivery including changes in water storage and delivery facilities, regulatory constraints on the use of facilities, water quality issues, long-term climatic changes, and legal re-allocation of supply. However, MWD has identified a resource management plan that should result in reliability for non-discounted non-interruptible demands through 2030 (MWD, 2005). This plan relies on a multi-faceted approach using local resources, various storage programs, and transfer agreements.

Water quality issues and implementation risks were identified as concerns to future supply reliability by MWD (MWD, 2005). Water

quality concerns may occur through contamination of supplies or more stringent water quality standards. These factors may cause a loss of water supply or a reduced usefulness because of the need to blend supplies to meet standards. Implementation concerns include the competitive approach to securing new local supplies or a failure to acquire the supply within the expected schedule. Imported water supplies may also not perform as expected. Environmental issues may also impact imported supplies for concerns such as endangered species requiring a minimum water flow limiting quantities that can be exported from the source.

Drought conditions always pose a threat to water supplies, but especially in low rainfall areas such as southern California. Drought conditions in the water supply areas such as the Colorado River system and northern California have been shown to impact supplies available to the SWP and CRA. Plans continue to reduce potential shortfalls with the development of storage and new supplies.

The non-potable supplies, including groundwater and recycled water, are expected to be consistent. These supplies are not expected to be affected by legal issues since the water rights are held by EVMWD for the non-potable groundwater and the recycled water is controlled by Western and distribution facilities generally are in place. Endangered species are also not a concern since these supplies are not a source used by endangered species. Since the supplies are not used for domestic purposes, water quality issues are of lesser importance. They also are not impacted by drought.

A summary of factors that may cause an inconsistency of supply is provided in Table 10.

Table 10. Factors Potentially Resulting in Supply Inconsistency

Name of Supply	Legal	Environmental	Water Quality	Climatic
MWD	Competition for new supplies	Endangered species	Contamination of Supply More Stringent Water Quality Standards	Drought Condition

3.5 Transfer and Exchange Opportunities

3.5.1 Law

Water Code Section 10631(d)

(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

3.5.2 Transfers and Exchanges for Western's Retail Area

Western's primary source of potable water is the SWP from MWD. MWD has established various transfer and storage programs (MWD, 2005). MWD believes it currently has in place transfer and storage programs to supplement deliveries from the SWP with 300,000 AF of water. The MWD transfer and storage program includes the following agreements:

- Semitropic;
- Arvin-Edison;
- San Bernardino Valley Municipal Water District (one current and one under development);
- Kern Delta Water District;
- Desert Water Agency/Coachella Valley Water District;
- Mojave Storage Program;
- North Kern Storage Program; and
- Kern Water Bank (under development).

In any given year, actual yields may vary from the expected values, but MWD models indicate that in the aggregate, the resource targets can be met under a wide range of hydrologic conditions. Additional details on these and other programs can be found in the Regional Urban Water Management Plan (MWD, 2005).

MWD also expects to use spot markets and option contracts to provide water to meet dry-year demands (MWD, 2005). The quantities obtained from these will vary significantly from year to year. For example, in 2003, MWD secured options to purchase approximately 145,000 AF of water from the Sacramento Valley during the irrigation season. These options protect against potential shortages that might arise from a decrease in Colorado River supply or as a result of drier-than-expected hydrologic conditions.

Table 11. Transfer and Exchange Opportunities

Source Transfer Agency	Tansfer or Exchange	Short Term	Proposed Quantities	Long Term	Proposed Quantities
NA					

Western also participates both directly and indirectly in many regional water exchanges, acting as a direct participant or as the Santa Ana watershed's Watermaster. However, Western has no specific transfer or exchange agreements specifically for its retail area. Therefore, no specific transfers or exchanges are identified in Table 11.

3.6 Water Use by Customer-type – Past, Current and Future

3.6.1 Law

Water Code Section 10631(e)

(e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:

(A) Single-family residential.
(B) Multifamily.
(C) Commercial.
(D) Industrial.
(E) Institutional and governmental.
(F) Landscape.
(G) Sales to other agencies.
(H) Saline water intrusion

Table 12. Past, Current, and Projected Water Deliveries

		Water Use Sectors	Single family	Multi-family	Com-mercial	Indus-trial	Institu-tional/gog	Land-scape	Agri-culture	Other	Total
2000	metered	# of accounts	13,747	2	136	5	174	175	231		14,470
		Deliveries AF/YR	12,406		756	407	543	1,032	8,049	768	23,959
	unmetered	# of accounts	0	0	0	0	0	0	0	0	0
		Deliveries AF/YR	NA	NA	NA	NA	NA	NA	NA	NA	NA
2005	metered	# of accounts	19,725	1	300	5	300	250	198		20,779
		Deliveries AF/YR	17,338	180	1890	720	578	1472	4,227	283	26,688
	unmetered	# of accounts	0	0	0	0	0	0	0	0	0
		Deliveries AF/YR	NA	NA	NA	NA	NA	NA	NA	NA	NA
2010	metered	# of accounts	23,500	1	360	6	360	300	198		24,725
		Deliveries AF/YR	20,672	215	2,254	858	689	1,755	4,227	337	31,007
	unmetered	# of accounts	0	0	0	0	0	0	0	0	0
		Deliveries AF/YR	NA	NA	NA	NA	NA	NA	NA	NA	NA
2015	metered	# of accounts	27,700	2	420	7	420	360	198		29,107
		Deliveries AF/YR	24,315	253	2,651	1,009	810	2,065	4,227	396	35,726
	unmetered	# of accounts	0	0	0	0	0	0	0	0	0
		Deliveries AF/YR	NA	NA	NA	NA	NA	NA	NA	NA	NA
2020	metered	# of accounts	32,500	2	490	8	500	420	198		34,118
		Deliveries AF/YR	28,601	297	3,118	1,187	953	2,429	4,227	466	41,278
	unmetered	# of accounts	0	0	0	0	0	0	0	0	0
		Deliveries AF/YR	NA	NA	NA	NA	NA	NA	NA	NA	NA
2025	metered	# of accounts	38,300	3	580	10	590	490	198		40,171
		Deliveries AF/YR	33,642	350	3,668	1,396	1,121	2,857	4,227	548	47,809
	unmetered	# of accounts	0	0	0	0	0	0	0	0	0
		Deliveries AF/YR	NA	NA	NA	NA	NA	NA	NA	NA	NA
2030	metered	# of accounts	45,000	3	680	11	690	580	198		47,162
		Deliveries AF/YR	39,571	412	4,314	1,643	1,319	3,360	4,227	645	55,491
	unmetered	# of accounts	0	0	0	0	0	0	0	0	0
		Deliveries AF/YR	NA	NA	NA	NA	NA	NA	NA	NA	NA

barriers, groundwater recharge, or conjunctive use, or any combination thereof.
(I) Agricultural.
(2) The water use projections shall be in the same five-year increments described in subdivision (a).

3.6.2 Western's Customers

Western tracks retail water usage by customer types including residential, commercial, industrial, institutional, and agricultural accounts. Tracking is done by user code and reports can be generated to determine the number of accounts and quantities.

The number of future residential and commercial/industrial customers is expected to increase at the same rate as the estimated population growth. Based on 4 percent growth per year for 2006 and 2007 and subsequent 3.3 percent growth to 2030, Western will have nearly 39,500 residential, 600 commercial, and 605 governmental/ institutional customers by 2030. Landscape irrigation customers are also expected to grow at the same rate. The number of agricultural users is not expected to increase, but rather may decrease with urbanization. However, to be conservative in demand estimations, the number of agricultural customers was kept at the 2005 level. A summary of the expected accounts by category is provided in Table 12. Water delivery projections are also based on increases at the same rate as the estimated population growth. The projected water deliveries are summarized in Table 12.

Western also provides wholesale water sales to various agencies within the District boundaries. These agencies provided an estimate of potential water demands through 2030. The projected wholesale demands include both domestic and non-domestic water uses such as commercial/ industrial and landscape and agricultural irrigation. Some of these demands may be interruptible during water shortages. These projected demands are summarized in Table 13.

Western does not use water for saline barriers, groundwater recharge or conjunctive use within its retail area. However, our distribution system does have unaccounted for water losses. These water losses are summarized in Table 14.

A summary of total water demand is provided in Table 15.

3.7 Demand Management Measures

3.7.1 Law

Water Code Section 10631(f)

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

(A) Water survey programs for single-family residential and multifamily residential customers.

(B) Residential plumbing retrofit.

(C) System water audits, leak detection, and repair.

(D) Metering with commodity rates for all new connections and retrofit of existing connections.

(E) Large landscape conservation programs and incentives.

(F) High-efficiency washing machine rebate programs.

(G) Public information programs.

(H) School education programs.

(I) Conservation programs for commercial, industrial, and institutional accounts.

(J) Wholesale agency programs.

(K) Conservation pricing.

(L) Water conservation coordinator.

(M) Water waste prohibition.

(N) Residential ultra-low-flush toilet replacement programs.

Table 13. Sales to Other Agencies- AF/YR

Water Distributed	2000	2005	2010	2015	2020	2025	2030
Box Springs Mutual Water Company	121	132	448	448	448	448	448
City of Corona	25,056	22,948	21,302	23,519	25,967	28,670	28,670
City of Riverside	400	2,300	3,800	5,300	6,800	8,300	9,800
Elsinore Valley Municipal Water District	12,900	15,023	22,715	29,515	35,015	41,515	49,015
Lee Lake Water District	945	3,980	5,753	6,236	6,236	6,236	6,236
Rancho California Water District	32,698	33,641	34,884	36,128	37,371	38,615	39,859
Total	**72,120**	**78,024**	**88,902**	**101,146**	**111,837**	**123,784**	**134,028**

Note: Includes both domestic, commercial/industrial and interruptible uses such as landscape and agricultural irrigation.

Table 14. Additional Water Uses and Losses - AF/YR

Water Distributed	2000	2005	2010	2015	2020	2025	2030
Saline Barriers	0	0	0	0	0	0	0
Groundwater recharge	0	0	0	0	0	0	0
Conjunctive use	0	0	0	0	0	0	0
Raw water	0	0	0	0	0	0	0
Recycled (Golf Course/Cemetery)	386	450	500	500	500	500	500
Unaccounted - for system losses	6	1,415	1,690	1,980	2,330	2,750	3,230
Total	**492**	**1,865**	**2,190**	**2,480**	**2,830**	**3,250**	**3,730**

Notes: Raw and recycled water, except as noted, were included in Table 12 and therefore not included in Table 14.

Values for 2010 include 4% increase for 2 years then 3.3% for 3 years to match projected population growth. Subsequent years are increased 3.3% per year.

System losses for 2000 were unusually low.

System losses for 2005 were based on 2001 to 2004 average quantity escalated by 4%.

Table 15. Total Water Use – AF/YR

Water Use	2000	2005	2010	2015	2020	2025	2030
Total of Tables 12, 13, 14	96,571	106,577	122,099	139,352	155,945	174,843	193,249

(2) A schedule of implementation for all water demand management measures proposed or described in the plan.

(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.

3.7.2 California Urban Water Conservation Council Reporting

Western is a signatory to the California Urban Water Conservation Council and submits annual reports in accordance with the "Memorandum of Understanding Regarding Urban Water Conservation in California." Copies of our Best Management Practices (BMP) Reports are provided in Appendix E to meet the information requirements for Demand Management Measures (DMMs).

In summary, Western's regional water education, public information and water conservation programs continue to expand with the surge in population.

Water Education

Western has been a leader in the field of water education support for area schools since 1982. There are seven school districts with more than 225 public and private schools in Western's service area. Western's School Program is designed to encourage and assist educators as they teach students about water supply, distribution, reclamation, conservation and the future of water supplies. The material and services offered meet the requirements of the California Science Framework Addendum and are provided at no charge to participating teachers, schools and students, public and private, within Western's 510 square mile District. Western offers materials including student workbooks, teachers' guides, videos, speakers and field trips. Complete class water education units are also distributed along with needed in-servicing.

Public Information

Western provides extensive public outreach to the communities it serves by participating in local events such as the Community Water Festival, a one-day festival celebrating water that attracts hundreds of people including children held in Temecula in the spring. Through its Water Talk program, Western staff makes a direct connection by presenting water information to local service groups and chambers of commerce within its service area. In the calendar year ended December 31, 2004, Western's public affairs staff conducted more than 25 presentations.

Water Conservation

Western and its wholesale customers participate in a Metropolitan Water District managed water conservation incentive program for commercial, industrial and institutional water customers. The program, called *Save Water – Save A Buck*, is administered by a Metropolitan contracted vendor. The vendor maintains a toll-free number and processes rebates throughout Southern California. Rebates range from $60 for the installation of a commercial ULFT, $100 for a high pressure water broom, $500 for a cooling tower conductivity controller, to $2,000 for a hospital X-ray film processing water re-circulation system. Four-color informational brochures are regularly distributed at local chamber of commerce meetings and in business newsletters.

Businesses in Western's general service area have received more than $115,000 in incentive funds. The installation of water conserving fixtures and appliances and the implementation of new water saving technologies resulting from this incentive program represent an annual savings of 72 acre-feet per year.

Western has been working with Riverside County Planning Office and developers to enforce the County's water-efficient landscaping ordinance by providing area developers with educational materials. This new program is still in its infancy, but in addition to the water conservation education materials that are being given to new home developers for their customers, Western has met with County Planning staff to encourage the enforcement of the County's landscape ordinance.

Western's staff conducts landscape plan reviews and inspections of all new commercial, industrial and institutional landscapes within Western's retail service area to ensure compliance with either the City or County of Riverside's water efficient landscape ordinance resulting from AB 325.

Western cosponsors an Irrigation Water Management Laboratory (CIMIS Mobile Lab) with the Riverside-Corona Resource Conservation District and the City of Riverside. This service offers those with large (one-acre or larger) parcels of land a free irrigation evaluation by the Conservation District staff. Each irrigator is given a detailed report on where and how to improve the irrigation system's efficiency and instructions on how to set their timers. The Conservation District will also visit residential homeowners within Western's general service area, conduct a landscape inspection and leave a helpful checklist of recommendations to improve landscape water-use efficiency.

Western opened the gates to its *Landscapes Southern California Style℠* June 24, 1989. Through *Landscapes Southern California Style℠*, Western reaches the community with its outdoor water conservation message. During the months of September through May, seminars are conducted for the general public, addressing such topics as landscape design, irrigation methods, drip irrigation systems and many other subjects that impact the water-efficiency of a homeowner's landscape. Western reaches roughly 300 residents annually with these water-efficient landscaping messages. Local schoolchildren participate in special activities within the garden that contribute toward making them lifelong conscientious water users. For example, up to 100 students attend the annual Earth Day celebration where they learn about water conservation measures during this fun and engaging event. Staff members work continuously to make water-efficient landscaping techniques even easier to understand and incorporate into the everyday environment. To date, more than 150,000 people have walked the trails in this unique one-acre, water conservation education center.

In the last five years, more than 8,800 (data through 12/31/2004) non-conserving toilets were replaced with ultra-low-flow toilets (ULFT) in single and multi-family residences within Western's general service area. Western and its wholesale customers provide incentives ranging from $50 to $75 per non-conserving unit replaced. The installation of these ULFTs represents an annual water savings of more than 235 acre-feet of water. Since the inception of the High Efficiency Clothes Washer (HECW) incentive program in 2002, more than 3,850 (data through 12/31/2004) HECW rebates were distributed for the installation of qualified washers in single family homes. The HECW incentive is $100 per unit. To date the program has saved an estimated 90 acre-feet of water. A summary of Western's water conservation program history is included in Appendix E.

3.8 Evaluation of Demand Management Measures Not Implemented

3.8.1 Law

Water Code Section 10631(g)

(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:

(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.

(2) Include a cost-benefit analysis, identifying total benefits and total costs.

(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.

(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

3.8.2 Unimplemented DMMs

Western has implemented all DMMS except System Water Audits, Leak Detection & Repair. Although all identified leaks are repaired in a timely manner, Western does not have a formal leak detection program. Water loss for Fiscal Year 2003-2004 (latest data available) is estimated (Western MWD Construction & Operations Report 2004) to be 100.4 acre-feet or 0.36% of all water delivered through the system.

Western has determined the cost-effectiveness of the unimplemented DMMs using the California Urban Water Conservation Council cost-benefit formula. The cost-effectiveness evaluation identifies all relevant costs and benefits from the perspective of society/supplier/customer, as appropriate; addresses program cost-sharing with other project beneficiaries; and discusses all major assumptions and data used to measure, value and discount program costs and benefits with a sensitivity analysis.

3.9 Planned Water Supply Projects and Programs

3.9.1 Law

Water Code Section 10631(h)

(h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

3.9.2 Expected Future Water Supply Projects and Programs

Western has several projects and programs planned to meet the demands. Some of these projects were previously discussed in Section 3.3.2.

Table 16. Evaluation of unit cost of water resulting from non-implemented / non-scheduled DMMs and planned water supply project and programs

Non-implemented & Not Scheduled DMM / Planned Water Supply Projects (Name)	Per-AF Cost ($)
System Water Audits, Leak Detection & Repair	$2054.28

Cost Effectiveness Summary for System Water Audits, Leak Detection and Repair

Total Costs	$206,250 ($750 per mile)
Total Benefits	$52,610 ($524 per AF)
Discount Rate	4.0
Time Horizon	1 year
Cost of Water ($ per AF)	$524 (Tier 2 Water)
Water Savings (AF/Yr)	100.4

Table 17. Future Water Supply Projects

Project Name	Projected Start Date	Project Completion Date	Normal-year AF to Agency	Single-Dry AF/Year to Agency	Mutliple-Dry AF/ Years to gency		
					Year 1 AF	Year 2 AF	Year 3 AF
Riversid/ Corona/Feeder/ Santa Ana Water Divisions	2010	2015	0	40,000	40,000	40,000	40,000

Note: Multiple dry years are as described in Section 3.4. Planned Water Supply Projects and Programs.

Potable demand will be supplemented through the Riverside/ Corona Feeder Project. This project will allow the capture and storing of new water sources, especially in wet years. The water would be stored in the San Bernardino Basin area, most likely the Bunker Hill Basin, which has a safe yield of 5,000,000 AF. Water from the SWP and local runoff, including releases from Seven Oaks Reservoir, could be stored until needed then pumped out for delivery to western Riverside County. This would reduce the cost of water and reliability of supply, especially during drought years. The project would provide better water table control in the City of San Bernardino's high groundwater area and improve water quality in the San Bernardino area.

San Bernardino Municipal Water District and Western have jointly filed two applications with the State Water Resource Control Board to appropriate water from the Santa Ana River (WMWD, 2004b). The applications seek the right to divert up to 200,000 AF-YR of local water to help meet anticipated demands. Over the long-term, the average annual diversions could be as high as 27,000 AF. This project would allow increased capture of storm flows otherwise lost.

A summary of the future projects and programs is provided in Table 17.

3.10 Development of Desalinated Water

3.10.1 Law

Water Code Section 10631(i)

(i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

3.10.2 Desalination Project Potential in the Western Retail Area

As discussed in Section 3.3, Western does not extract groundwater for retail supply. The retail area generally is underlain by an area characterized by the Regional Water Quality Control Board as not within a designated groundwater basin (California Regional Water Quality Control Board, Santa Ana Region, 1995, Figure 4-1), nor is Western near an ocean water supply. Therefore, Western has no opportunity to provide desalinated water for its retail customers except from wells outside its retail area or by purchase from or exchanges with other agencies. Because no desalination projects are proposed Table 18 as provided in the guidebook is not included in this Plan.

The Arlington Desalter Facility extracts and treats water from the Arlington Groundwater Basin to the north of Western's retail area. The Desalter is owned by SAWPA, and lies outside the Western retail area. The Desalter supplied the City of Norco with 4,594 AF during 2004. The treated groundwater from the Desalter can be pumped into Western's retail area as an emergency supply. However, pumping costs are high and economics limit the usefulness as a normal supply source.

3.11 Current or Projected Supply Includes Wholesale Water

3.11.1 Law

Water Code Section 10631(k)

(k) Urban water suppliers that rely upon a wholesale agency for a source of water, shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).

3.11.2 Wholesale Water Supply

Western currently receives all non-emergency potable water for its retail service area from Metropolitan Water District of Southern California. This supply is supplemented as needed on an emergency basis with water from the City of Riverside. Western provided demand projections to MWD for the period from 2005 to 2030 (Table 19) and MWD has provided information on the planned sources and quantities in their Regional Urban Water Management Plan (MWD, 2005). MWD's average supply capability for all its member agencies is summarized in Table 20. These supplies exceed the estimated demand (MWD, 2005). A summary of MWD projected total demands and demands for Western's service area is provided in Appendix F.

As previously discussed in Section 3.4.2, MWD's IRPSIM analyses of the IRP Update report shows that Metropolitan can maintain reliable supplies under the conditions that have existed in past dry periods throughout the period 2005 through 2030 (MWD, 2005). Table 21 summarizes MWD expected reliability for drought periods. Potential inconsistencies in MWD supplies were discussed in Section 3.4.3 and summarized below in Table 22.

Table 19. Agency Demand Projections Provided to Wholesale Supplier – AF/YR

Wholesaler	2010	2015	2020	2025	2030
MWD					
Estimated Retail Demand	33,197	38,206	44,108	51,059	59,221
Estimated Wholesale Demand	88,902	101,146	111,837	123,784	134,028

Note: Retail Demand includes water loss.

Table 20. Wholesaler Identified and Quantified Existing and Planned Sources of Water – AF/YR

Wholesaler sources	2010	2015	2020	2025	2030
MWD					
Current Supplies					
Colorado River	711,000	678,000	677,000	677,000	677,000
California Aqueduct	1,772,000	1,772,000	1,772,000	1,772,000	1,772,000
In-Basin Storage	0	0	0	0	0
Supplies Under Development					
Colorado River	0	0	0	0	0
California Aqueduct	185,000	185,000	240,000	240,000	240,000
Transfers to other agencies	0	0	0	0	0
Maximum Supply Capability (1)	2,688,000	2,600,000	2,654,000	2,654,000	2,654,000

Notes: 1 — Represents expected supply capability for resource programs for all of MWD. Source: MWD, 2005

Table 21. Wholesale Supply Reliability - % of Normal Supply

		Multiple Dry Years		
Wholesaler sources	**Single Dry**	**Year 1**	**Year 2**	**Year 3**
MWD	100	100	100	100

Table 22. Factors Resulting in Inconsistency of Wholesaler's Supply

Name of Supply	Legal	Environment	Water Quality	Cimatic
MWD	Competition for new supplies	Endangered species	Contamination of Supply More strigent Water Quality Standards	Drought Conditions

Table 23. Water Supply Shortage Stage and Conditions

Stages No.	Water Supply Conditions (1)	% Reduction in Deliveries
I	Severe Shortage	10% (goal) for firm deliveries, voluntary conservation for non-firm deliveries
II	Extreme Shortage	5% for firm deliveries, 20% for non-firm deliveries
III	Extreme Shortage	10% for firm deliveries, 30% for non-firm deliveries
IV	Extreme Shortage	15% for firm deliveries, 40% for non-firm deliveries
V	Extreme Shortage	20% for firm deliveries, 50% for non-firm deliveries
VI	Extreme Shortage	30% for firm deliveries, 90% for non-firm deliveries

Note: (1) Terminology of Water Surplus and Drought Management Plan (MWD, 2005)

Section 4
Determination of DMM Implementation

4.1 Law

Water Code Section 10631.5

The department shall take into consideration whether the urban water supplier is implementing or scheduled for implementation, the water demand management activities that the urban water supplier identified in its urban water management plan, pursuant to Section 10631, in evaluating applications for grants and loans made available pursuant to Section 79163. The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities.

4.2 Implemented DMMs

Western is a signatory to the CUWCC MOU regarding Urban Water Conservation in California and has provided the 2004 Best Management Practices Report in Appendix E to show DMM implementation.

Section 5
Water Shortage Contingency plan

Western has prepared a Water Shortage Contingency Plan to respond to water shortages within its retail service area.

5.1 Stages of Action

5.1.1 Law

Water Code Section 10632 (a)

The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:

(a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.

5.1.2 Water Shortage Stages

Supply shortage triggering levels are set by MWD for their supplies of SWP and CRA (MWD, 2005). Under most shortages, MWD believes it will be able to meet demands for water by withdrawals from storage. Should mandatory import water allocations become necessary for a severe long-term drought, allocation will be calculated on the basis of need, rather than historical purchases. The following would be considered for equitable allocation of imported water:

- Impact on retail consumers and regional economy;
- Investments in local resources including recycling and conservation;
- Population growth;
- Changes in local supplies;
- Participation in MWD interruptible programs; and
- Investment in MWD facilities.

Under a severe water shortage, MWD would enforce allocations using rate surcharges of up to 3 times the full-service rate for deliveries exceeding 102% of the allocation.

During a previous drought period, Western developed a Drought Contingency Plan (WMWD, 1992). The plan identified stages of action with required reductions in water use. These stages of action were enforced with mandatory water use restrictions which could also be enforced during future severe water shortages. Water use restrictions included:

- Street/sidewalk Cleaning;
- Washing Cars;
- Watering Lawn/Landscapes;
- Uncorrected Plumbing Leaks;
- Gutter Flooding;
- Restricted Outdoor Watering (watering per schedule only);
- Non-permanent Agriculture;
- Restriction on Construction Water Use; and
- Restrictions on New Landscaping.

5.2 Estimation of Minimum Supply for the Next Three Years

5.2.1 Law

Water Code Section 10632 (b)

(b) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.

5.2.2 Supply for 2006 to 2008

The minimum water supply for the next three years has been estimated for the Western retail service area. Based on a three-year drought sequence, both SWP and Colorado River sources could be reduced. However, MWD has identified a resource management plan that should result in 100 percent reliability for non-discounted non-interruptible demands through 2030 (MWD, 2005). A summary of the estimated minimum water supply is provided in Table 24.

5.3 Catastrophic Supply Interruption Plan

5.3.1 Law

Water Code Section 10632 (c)

(c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

5.3.2 Plan for Water Supply During Catastrophes

For non-drought events, interruption in supplies may occur. Such events may include sudden unexpected occurrences such as fires, floods, earthquakes, accident or sabotage. These types of events could interrupt power supplies or cause damage to facilities. Western participated in the Multi-Jurisdictional Local Hazard Mitigation Plan (LHMP) for the Riverside Operational Area (County of Riverside, 2004) to identify and plan for local hazards. Identified hazards include earthquakes, flooding, hazardous material incidents, power losses, extreme weather, and terrorism as summarized below. Some facilities modification identified in the LHMP may help limit the severity of potential impacts should a catastrophe occur. This would lessen the potential for impact to the water supply.

Table 24. Three-Year Estimated Minimum Water Supply – AF/YR

Source	Normal	2006	2007	2008
MWD-Retail Service Area	26,688	27,755	28,866	29,818
Total	26,688	27,755	28,866	29,818

Notes: Multiple dry years are as described in Section 3.4. Planned Water Supply Projects and Programs
Values include 4% increase for 2006 and 2007, then 3.3% for 2008 to match projected population growth. Normal year is assumed to be 2005.

Western Municipal Water District Critical Facilities Assessed July 2003 Hazard Assessment			
Hazard	**Probability of occurrence**	**2006**	**2007**
Step 1	**Step 2**	**Step 3**	**Step 4**
Natural Events			
Earthquake	3	3	9
Import Failure	2	3	6
Severe Storm	2	2	4
High Winds (70+)	2	2	4
Landslide	0	3	0
Flood	1	2	2
Drought	2	1	2
Man-Made Events			
Waterborne Disease	2	2	4
Fire/Arson	1	3	3
Loss of Key Staff	1	2	2
Full Shortage	1	1	1
Terrorism	1	3	3
Technological Events			
Power Outage	3	3	9
HVAC Failure	2	2	4
SCADA Failure	2	2	4
Computer Virus	3	3	9

Step 2:

0 = Not Applicable
1 = Low
2 = Medium
3 = High

Step 3:

3 = No Early Warning
2 = Short Duration Early Warning
1 = Long Early Warning

Step 4:

Probability X Reaction
The higher the rating, the greater the potential

Table 25. Preparation Actions for a Catastrophe

Possible Catastrophe	Summary of Actions
Regional power outage	Assess facility/systems; Repair or reactivate as appropriate; Work with MWD and local agencies to provide potable water; Perform appropriate community outreach
Earthquake	Assess facility/systems; Repair or reactivate as appropriate; Work with MWD and local agencies to provide potable water; Perform appropriate community outreach; MWD to release from Emergency Storage as required.
Extreme Weather	Assess facility/systems; Repair or reactivate as appropriate; Work with MWD and local agencies to provide potable water; Perform appropriate community outreach
Terrorism/Sabotage (includung computer	Check for signs of contamination; Assess facility/systems; Repair or reactivate as appropriate; Work with MWD and local agencies to provide potable water; Perform appropriate community outreach
Water Borne Disease	Check for signs of contamination; Assess facility/systems; Repair or reactivate as appropriate; Work with MWD and local agencies to provide potable water; Perform appropriate community outreach
System Failure (HVAC and SCADA)	Assess facility/systems; Repair or reactivate as appropriate; Work with MWD and local agencies to provide potable water; Perform appropriate community outreach

To respond to catastrophes, Western has prepared an Emergency Response and Recovery Plan (WMWD, 2005b). This document is designed to prepare Western for a planned response to emergency situations associated with natural disasters, technological incidents, and national security emergencies in, or affecting, a water/ wastewater utility facility and its service area. This plan describes the following:

- Western's emergency management organization required to assist in mitigating any significant emergency or disaster.
- Authorities, policies, responsibilities, and procedures required to protect the health and safety of customers, personnel, and facility property.
- Operational concepts and procedures associated with field response to emergencies, Emergency Operations Center (EOC) activities, and the recovery process.
- Implementation of the Standardized Emergency Management System (SEMS) for use within Riverside County operational area, regional, and state systems.
- Multi-agency and multi-jurisdictional coordination, particularly between Western and local, state, and federal agencies during emergency operations.
- Pre-event emergency planning as well as emergency operations procedures.

This plan has been designed for conformance with SEMS (Government Code Section 8607) and should be used in conjunction with the State Emergency Plan and local emergency plans.

To manage water supply concerns during catastrophes, Western will isolate areas that will take the longest to restore to service and work with local government and MWD to provide alternate water supplies. The Office of Emergency Services has developed a guidance document entitled *Multi-Agency Emergency Response Procedures for Potable Water Procurement and Distribution* to assist water utilities and local governments in meeting the requirement to provide water to the public, and Western will work with this Agency to provide the public with potable water.

In general to manage catastrophes, Western will:

- Set priorities on repair work.
- Plan to restore service area by area.
- Get input from the emergency operations center on essential uses.
- Consider feeder lines.
- Keep in mind the need for firefighting water.
- Request mutual aid/assistance if the needed repairs exceed Western's ability to complete repairs in a timely manner.

The public will be kept informed through activating Western's Water Service Emergency Notification Plan.

MWD has also prepared plans to safeguard from a catastrophic loss of water supply by developing emergency storage (MWD, 2005). MWD emergency storage require-

ments have been based on the potential for a major earthquake damaging aqueducts and causing supply interruptions through the aqueducts for six months. In this scenario, MWD would suspend interruptible service deliveries and firm supplies would be limited to 75% of normal-year demand levels. With only a few exceptions, the emergency supplies would be deliverable through gravity, reducing dependence on power sources.

5.4 Prohibitions, Penalties and Consumption Reduction Methods

5.4.1 Law

Water Code Section 10632 (d-f)

(d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.

(e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

(f) Penalties or charges for excessive use, where applicable.

5.4.2 Prohibitions During Water Shortages

Previously, Western has adopted Ordinances to restrict water usage and apply penalties for excess usage using water shortages. Copies of these Ordinances are provided in Appendix G. Although ordinances were rescinded after the water shortage, these restrictions will serve as a model for future needs. A summary of the prohibi-

Table 26. Mandatory Prohibitions

Examples of Prohibitions	Stage When Prohibition Becomes Mandatory
Street/sidewalk Cleaning	May Vary
Washing Vars	May Vary
Watering Lanw/Landscapes	May Vary
Non-permanent Agriculture	May Vary
Uncorrected Plumbing Leaks	May Vary
Gutter Flooding	May Vary
Restricted Outdoor Watering (watering per schedule only)	May Vary
Restriction on Construction Water Use	May Vary
Restriction on New Landscaping	May Vary

Table 27. Consumption Reduction Methods

Consumption Reduction Methods	Stage When Method Takes Effect	Project Reduction (%)
Demand Reduction Program	May Vary	Varies with Stage
Voluntary Rationing	May Vary	10% (Total)
Education Program	May Vary	10% (Total)
Plumbing Fixture Replacement	May Vary	10% (Total)
Mandatory Rationing	May Vary	Up to 50% (Total)
Flow Restriction	May Vary	Up to 50% (Total)
Use Prohibitions	May Vary	Up to 50% (Total)
Water Shortage Pricing	May Vary	Up to 50% (Total)
Per Capita Allotment by Customer Type	May Vary	Up to 50% (Total)
Percentage Reduction by Customer Type	May Vary	Up to 50% (Total)

Table 28. Penalties and Charges

Penalties or Charges	Stages When Penalty Takes Effect
Charge for Excess Use	May Vary
Charge per Unit over Allotment	May Vary

tions is provided in Table 26 and consumption reduction methods in Table 27. Penalties that have been imposed are summarized in Table 28. The stage at which prohibitions become mandatory and consumption reduction methods are imposed could be staggered such that sufficient reductions in demand are achieved. Additional penalties also could be required such as citations for violations of outdoor watering, such as were imposed during the February 2005 water shortage (See Ordinance 358 in Appendix G).

5.5 Analysis of Revenue Impacts of Reduced Sales During Shortages

5.5.1 Law

Water Code Section 10632 (g)

(g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

5.5.2 Impact to Revenues from Consumption Reduction

Consumption reduction will impact revenues by decreasing the amount of water sold to customers. Historically, the penalties for excess water use have encouraged conservation, thereby, reducing revenues from water sales. Generally, penalties provide only a very small amount of revenues. If the water shortage is deemed temporary, a rate increase may not be required. However, for long-term shortages, immediate rate increases would be considered. A consequence of rate increases may be further conservation by customers. Fixed domestic monthly service charges would not be expected to significantly change due to a water shortage. These charges would provide revenue for operational expenditures.

Water shortages may also impact construction activities. A reduction in construction activities will reduce fees collected by Western such as water service connection fees, engineering services fees such as plan checking, and annexation fees.

A summary of actions and conditions that impact revenues is provided below.

As consumption decreases, some expenditures are expected to increase. Staff costs for community education, enforcement of ordinances, monitoring and evaluation of water use, drought planning, and dealing with customer questions and complaints are expected to rise. If construction is drastically reduced, staff may not be required for certain functions, but it is expected that the increased work load to deal with water shortage issues will more than offset the reduced work load for construction support. Operations and maintenance costs may also increase because of the need to identify and quickly repair all water losses. Power costs may also increase if supplies from temporary sources such as the Arlington Desalter must be used. MWD has adopted a policy expected to stabilize rates during water shortages (MWD, 2005). Therefore, water supply costs from MWD are not expected to increase because of water shortages.

A summary of actions and conditions that impact expenditures is provided below.

Western has developed reserve funds to sustain the revenue and expendi-

Actions and Conditions that Impact Revenues

Type	Anticipated Revenue Reduction
Reduced Sales	Proportional to the decrease in water sales and are expected to range from 10to 30%.
Reduced Construction	Reduction in fees collected during planning and construction activities.

Actions and Conditions that Impact Expenditures

Category	Anticipated cost
Increase Staff Cost	Estimated at 5 to 15%
Increase O&M Cost	Estimated at 5 to 15%
Increase Cost of Supply	Temporary supplies at increase cost. MWD supply cost expected to be stable

ture impacts of a short-term water shortage. Reserve funds could be withdrawn for a 1 to 2 year period to cover the increased costs and reduced revenue. If the water shortage is long-term, rate increases are expected to be considered to mitigate the increased expenditures. Long-term water shortages may also require reducing capital expenditures by delaying projects for major facilities construction, upgrade or replacement, limiting new connections to decrease operational expenditures, and evaluating methods to reduce overhead. Summaries of measures to overcome revenue and expenditure impacts are provided in Table 29 and 30.

Table 29. Proposed Measures to Overcome Revenue Impacts

Names of measures	Summary of Effects
Rate Sales	Proportion to the rate increase and amount of water sold. Increased rates may also decrease water usage.
Reserves	Use of reserves may provide short-term rate stabilization, but require delays in capital expenditures and rebuilding of reserves after the water shortage.

Table 30. Proposed Measures to Overcome Expenditure Impacts

Names of measures	Summary of Effects
Decrease Capital Expenditurs	Delay major construction projects for facilities as well as upgrades and replacements.
Reduce Overhead	If staff reductions required, may impact operations and customer response.

5.6 Draft Ordinance and Use Monitoring Procedure

5.6.1 Law

Water Code Section 10632 (h&i)

(h) A draft water shortage contingency resolution or ordinance.

(i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

5.6.2 Draft Water Shortage Ordinance

Western has previously adopted several ordinances for water shortages. These ordinances have dealt with drought conditions and water shortage emergencies.

Ordinances passed in 1991 outlined Western's mandatory water use restrictions to deal with water supply cutbacks caused by drought. Conservation measures included:

- Prohibitions on hosing of driveways and sidewalks, and washing of vehicles;
- Timing of landscape watering;
- Serving of water in restaurants and other public places serving food only on request;
- Operation of irrigation systems to avoid overspray, runoff, and waste;
- Prohibition of water use for certain construction uses; and
- Prohibition of new connections unless water efficient landscaping approved by Western was installed.

Customers were recommended to install spa and pool covers, check for indoor leaks, use water saving devices, and incorporate low water demand landscaping in new construction. Surcharges were imposed for excess water consumption.

Copies of the 1991 drought ordinances are provided in Appendix G.

In February 2005, a 5-day shutdown of the MWD treatment plant supplying potable water to Western required mandatory water conservation under a water shortage emergency. Ordinance 358 (provided in Appendix G) restricted all non-essential indoor and outdoor water use to maintain water supply levels necessary for human consumption, sanitation and fire protec-

tion. This water shortage emergency required prohibition of use of potable water for:

- Irrigation of lawns and landscapes, parks, school grounds, golf courses, medians, agriculture, groves and other outdoor planted areas;
- Hosing down of driveways, sidewalks, patios, building walls or other paved areas excepted as required by health and safety codes;
- Washing of cars, trucks, vans, campers, trailers, or other vehicles without using solely a hose with an automatic shutoff nozzle other than at a commercial car wash or service station using reclaimed or recycled water; and
- Construction purposes such as dust control, site cleanup, compaction or street washing.

Additionally, Western could, at any time during the Water Shortage Emergency period, discontinue wholesale water deliveries.

Similar ordinances would be passed in the event of a future water shortage.

5.6.3 Use Monitoring Procedures

Western monitors sales and deliveries on a monthly and daily basis. All Western's water sales are metered and all connections are read monthly. Water orders are scheduled on a daily basis with water deliveries recorded daily. Water deliveries and transfers at booster stations can be monitored through Western's SCADA system to determine usage in various portions of the retail area.

Table 31 summarizes the water use monitoring mechanisms.

Table 31. Water Use Monitoring Mechanisms

Mechanisms for determining actual reductions	Type and Quality of Data Expected
Normalized/Average Water Use Baseline Used to Determine Reduction	Quantity Comparisons of Previous Water Use, expected to be within approximately 10% if weather conditions are similar and other user conditions have not changed.

Section 6
Recycled Water Plan

6.1 Law

Water Code Section 10633

The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

6.2 Introduction

Western Municipal Water District is responsible for the collection and treatment of wastewater at the March Wastewater Reclamation Facility (WWRF). The wastewater collection and treatment system originally served an Air Force installation. This installation has been realigned from an active military base to an Air Reserves Base with the on-going conversion of a large portion of the former facility to non-military uses. Additionally, the wastewater collection and treatment area is expanding to include an area of former agricultural lands that is rapidly changing into residential and commercial developments. The portion of the Western retail service area that is served by the March WWRF is shown in Figure 3. Wastewater in the remainder of the retail service area is collected and treated by the City of Riverside or the West Riverside County Regional Wastewater Treatment Plant or individual septic treatment systems. The City of Riverside sewer collection system area is shown in Figure 4. The West Riverside County Regional Wastewater Treatment Plant

services the Lake Hills area in the extreme northwest portion of Western's retail area.

Many private septic systems serve residences in the less-densely developed area of Western's retail service area. Prior to 1988 all homes and business in the retail service area were on septic systems and the majority of those units remain on septic systems, as well as additional homes in outlying areas not near a location with a sewage collection system. After 1988, some areas were annexed into the City of Riverside and installation of sewers began.

6.3 Coordination

Western has coordinated the development of the plan with the appropriate agencies. Western owns and operates the water delivery system through its retail area with minor exceptions that are served by the City of Riverside. Western also operates the March WWRF and the West Riverside County Regional Wastewater Treatment Plant. Only a small portion of the retail area is serviced by a wastewater collection system operated by the City of Riverside. The City of Riverside has been provided a copy of the draft UWMP for review. The City and County of Riverside are the planning agencies with jurisdiction in the Western retail area, and they have also been provided with a copy of the draft UWMP for review.

6.4 Wastewater Quantity, Quality and Current Uses

6.4.1 Law

Water Code Section 10633 (a-c)

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

Table 32. Participating Agencies

	Role in Plan Development
Water agencies	Provided for review
Wastewater agencies	Provided for review
Groundwater agencies	NA
Planning agencies	Provided for review

6.4.2 Wastewater Collection and Treatment in the Retail Service Area

The March Wastewater Reclamation Facility (WWRF) currently treats to secondary standards approximately 0.3 million gallons per day (MGD) collected from the area shown in Figure 3. An ongoing upgrade of the facility will allow the plant to treat up to 1.0 MGD. It is predicted that the increased residential and commercial load to the facility will require expansion to treat up to 5 MGD within the next 25 years.

The treated wastewater is currently reclaimed for irrigation at a public golf course and the Riverside National Cemetery. These two irrigators use, on average, 0.75 MGD for seven months of the year. When wastewater flow exceeds irrigation demands (during the winter months), the treated wastewater is stored in an existing 40 million gallon pond until demand increases. The existing distribution system for the reclaimed water from the March WWRF consists of storage ponds and piping to deliver water only to the public golf course and the Riverside National Cemetery north of the treatment plant. Treated wastewater is stored in a pond at the treatment plant and pumped out to the users on demand. When irrigation demand exceeds the treatment plant supply, untreated imported water from the Colorado River Aqueduct purchased from MWD is pumped and gravity fed through an existing non-potable irrigation distribution system to a holding pond southwest of the golf course. This water then can be delivered from the holding pond to the public golf course and the Riverside National Cemetery.

Currently treated wastewater cannot be fed into the existing non-potable irrigation distribution system.

The existing non-potable distribution system consists of an interconnected series of pipelines, reservoirs and pump stations designed to distribute non-potable water through a large area of the District. The water in this system can be derived from two sources - imported water from Metropolitan Water District of Southern California (MWD) or non-potable groundwater pumped from a nearby groundwater basin and delivered via a canal and pump station to the system. Not including the facilities delivering non-potable groundwater, the non-potable irrigation distribution system has approximately 180,000 feet of main pipelines ranging from 42 inches to 8 inches in diameter. Pump stations and gravity feed from reservoirs move water to the extremes of the distribution system. There is available storage capacity of approximately 19 million gallons in nine tanks, not including holding ponds for irrigation of the public golf course and the Riverside National Cemetery. The main system has 23 pumps in 6 pump stations with a combined rating of 4285 horsepower.

With the expansion of the March WWRF, additional recycled water will be available in excess of that used by the public golf course and the National Cemetery. This will require integration of the system distributing treated wastewater to the golf course and the National Cemetery with the existing non-potable distribution system. A study is currently underway to provide the required information for conversion of the system for use of recycled water.

Wastewater volumes treated at the March WWRF are expected to increase. Commercial and residential wastewater volumes are expected to be 2250 AF in 2010 based on currently anticipated growth. Using a growth factor of 3.3% per year from 2010 to 2030, volumes treated at the March WWRF will reach 3780 AF in 2030. A summary of estimated wastewater volumes to March WWRF is provided in Table 33. All treated wastewater from the March WWRF is expected to be recycled for irrigation or industrial purposes. As shown in Table 34, no recycled water is expected to be disposed of by methods other than beneficial use. Table 35a provides the amount of recycled water sent to the golf course and cemetery in 2005.

Wastewater is collected in the areas within the City of Riverside shown on Figure 4 by the City of Riverside for treatment at the Riverside Regional Water Quality Control Plant. Minor amounts are reclaimed for irrigation use and the remainder is discharged to the Santa Ana River for downstream and in-stream uses. A majority of the discharge flow is required to meet downstream water right obligations (Orange County Water District vs. City of Chino et. al., Case #117628). The City of Riverside has conceptual plans to expand recycling (Personal communication, Rod Cruze, City of Riverside, March 2005).

Wastewater from the Lake Hills area in the extreme northwestern portion of Western's retail service area flows to the Western Riverside County Wastewater Treatment Plant. This plant also receives flows from the City of Norco and unincorporated areas of Riverside County. Treated wastewater from this facility is currently discharged to the Santa Ana River. However, diversion of some of the flows to the City of Norco for landscape

Table 33. Wastewater Collected and Treated – AF/YR

Water Distributed	2000	2005	2010	2015	2020	2025	2030
Wastewater collected & treated in service area	386	450	2680	3850	4430	5210	6130
Volume that meets recycled water standard	386	450	2680	3850	4430	5210	6130

Table 34. Disposal of Wastewater (non-recycled) - AF/YR

Water Distributed	Treatment Level	2005	2010	2015	2020	2025	2030
	Total	0	0	0	0	0	0

Note: All wastewater from the March WWRF is and will be recycled. Depending on rainfall, some storm water may require disposal, on an emergency basis.

irrigation will be initiated in mid-2005. It is estimated that up to 3 MGD of treated wastewater may be supplied to the City of Norco for parkway irrigation and supply of Lake Norcoian.

In areas of Western's retail area not serviced by the systems described above, septic systems are still in use.

6.5 Potential and Projected Use, Optimization Plan with Incentives

6.5.1 Law

Water Code Section 10633 (d-g)

(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

Table 35a. Recycled Water Uses – Actual AF/YR

User type	Treatment Level	2005
Agriculture		0
Landscape	Secondary	450
Wildlife Habitat		0
Wetlands		0
Industrial		0
Groundwater Recharge		0
	Total	0

Note: Actual volumes through mid- 2005. Remainder of year is estimated based on historic demand.

Table 35b. Recycled Water Uses – Potential AF/YR

User type	Treatment Level	2010	2015	2020	2025	2030
Agriculture/Landscape	Tertiary	2,100	2,970	3,910	4,920	6,020
Landscape	Secondary	1,100	1,150	1,210	1,270	1,340
Wildlife Habitat		0	0	0	0	0
Wetlands		0	0	0	0	0
Industrial		0	0	0	0	0
Groundwater Recharge		0	0	0	0	0
	Total	3,200	4,120	5,120	6,190	7,360

Note: This table provides information for the March WWRF. Assumes 3% increase in usage of tertiary treated wastewater per 5 year increment. Additional wastewater from Western's retail area may be recycled at the Western Riverside County Wastewater Treatment Facility and the Riverside Regional Water Quality Control Plant. Flows from Western will be a small percentage of the total flows to these plants, and, therefore, a small percentage of the wastewater recycled from these plants.

6.5.2 Future Recycled Water Uses in Retail Service Area

As previously discussed, recycled water from the March WWRF will be available for additional uses with the upgrade to tertiary treatment. The amount of available recycled water is anticipated to increase within the next 5 to 10 years as the flows to the March WWRF increase with the rapid expansion of residential and commercial development in the District. As flows exceed the demands of the golf course and the Riverside National Cemetery, the excess reclaimed water must be either reused, discharged, or allowed to percolate. With construction of the tertiary treatment facilities and associated interconnection to the distribution system, it is expected that all recycled wastewater generated can be used at various locations. Current agricultural users, including nurseries, could then be supplied tertiary treated reclaimed water through the existing non-potable distribution

Table 36. Projected Future Use of Recycled Water in Service Area – AF/YR

User type	Treatment Level	2010	2015	2020	2025	2030
Agriculture/Landscape	Secondary	1,100	1,150	1,210	1,270	1,340
Landscape	Tertiary	1,580	2,700	3,220	3,940	4,790
Wildlife Habitat		0	0	0	0	0
Wetlands		0	0	0	0	0
Industrial		0	0	0	0	0
Groundwater Recharge		0	0	0	0	0
Total		2,680	3,850	4,430	5,210	6,130

system. The existing distribution system can supply up to 7,200 gallons per minute to potential users. Table 35b provides a summary of the potential for use of recycled water. These projections are based on historic use of non-potable water within Western's retail service area, including the golf course and national cemetery. Additional landscape users such as new golf course, school playgrounds and parks are expected. Table 36 shows the expected available recycled water for these potential users.

In the 2000 Urban Water Management Plan, recycled water use was expected to increase rapidly. It was also anticipated that the interconnection to the treatment plant would be completed. However, actual usage is less than estimated 5 years ago as summarized in Table 37. One major factor has been the decreased agricultural uses. Additionally, other sources of non-potable water such as the importation of groundwater from a nearby basin have reduced the urgency to expend the funds for treatment plant upgrades and pipeline interconnection as long as all treated wastewater is being recycled at the golf-course and cemetery.

Methods are being pursued to encourage use of recycled water. It is expected that recycled water will be available to customers at rates below that of potable water. It is also expected that recycled water use will be mandated by ordinance at sites where recycled water is available and can be properly used. Additionally, industrial/commercial developers near non-potable distribution pipelines are required to plan for the future use of recycled water. This includes installation of proper piping and facilities to minimize economic impacts when recycled water becomes available at the use site. This is being implemented through the plan checking process, with plans not approved until required recycled water facilities are designed. Western also launched a public outreach campaign in 2005 to inform the general public about the benefits of use of recycled water. A summary of the methods to encourage use of recycled water is provided in Table 38.

Table 37. Recycled Water Uses – 2000 Projection Compared with 2005 Actual – AF/YR

User type	2000 Projection for 2005	2005 use
Agriculture/Landscape	6,000	0
Landscape	5,500	450
Wildlife Habitat		
Wetlands		
Industrial		
Groundwater Recharge		
Total	11,500	450

Table 38. Methods to Encourage Recycled Water Use

User type	AF of use projected to result from this action				
Agriculture/Landscape	2010	2015	2020	2025	2030
Landscape	X	X	X	X	X
Wildlife Habitat	X	X	X	X	X
Wetlands	X	X	X	X	X
Total	3	3	3	3	3

Section 7
Water Quality Impacts on Reliability

7.1 Law

Water Code Section 10634

The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

Table 39. Wastewater Collected and Treated – AF/YR

Water Source	2005	2010	2015	2020	2025	2030
Potable: SWP	0	0	0	0	0	0
Non-potable: CRA, Recycled and Groundwater	0	0	0	0	0	0

7.2 Water Quality Effects to Water Management Strategies and Reliability

For potable water, Western relies almost entirely on SWP. The salinity of SWP delivered to Western is generally less than 300 mg/L and not a significant concern. In drought periods this may rise and was up to 430 mg/L in the 1977 drought (MWD, 2005). Other water quality issues to SWP include total organic carbon, bromide, pathogenic microbes and other unknown contaminants. The Delta Improvement Package including the Franks Tract levee modification is a series of projects designed to increase water supply reliability, improved water quality, environmental protection and ecosystem restoration, protection of the Delta Levee system, and improved real-time and long-term management. Supply reliability would also be enhanced. Recent modeling has shown that bromide concentrations could be significant reduced by modifications of the Franks Tract levee. Currently there are no significant constraints due to water quality. If projects continue as planned no reduction in supply due to water quality are projected.

Non-potable water may be supplied by CRA, recycled water, or purchased imported groundwater. Because this is used for non-potable purposes such as landscape irrigation, there is no expected reduction in water supply due to water quality.

Table 39 summarized the current and projected water supply changes due to water quality.

Section 8
Water Service Reliability

8.1 Law

Water Code Section 10635

(a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

(b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

(c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

8.2 Projected Normal Water Year Supply and Demand

The projected normal water year supply includes both potable water from the SWP for various uses and untreated non-potable water from the CRA for agricultural and landscape irrigation. Wholesale water sales also comprise a portion of the supply Western receives from MWD. MWD has projected that sufficient supplies exist to meet demands for their agencies (MWD, 2005). Therefore, supplies will equal demands since MWD will deliver the needed quantities of water while placing supplies not required on a yearly basis into storage for use in droughts or emergency conditions. Table 40 summarizes the projected supply for the Western retail and wholesale transactions. These supplies will be used to meet the demand summarized in Table 41. A comparison of the supply and demand is provided in Table 42.

Table 40. Projected Normal Water Year Supply – AF/YR

Water Source	2010	2015	2020	2025	2030
Supply					
Retail Service Area	33,197	38,206	44,108	51,059	59,221
Wholesale Water Sales	88,902	101,146	111,837	123,784	134,028
% of Normal year	100	100	100	100	100

Note: Normal Year supply will vary as MWD brings on additional supplies.

Table 41. Projected Normal Water Year Demand – AF/YR

	2010	2015	2020	2025	2030
Demand					
Retail Service Area	33,197	38,206	44,108	51,059	59,221
% of Year 2005	116%	134%	154%	179%	207%
Wholesale Water Sales	88,902	101,146	111,837	123,784	134,028
% of Year 2005	114%	130%	143%	159%	172%

Note: See Table 12, 13, 14 and 15 for further details.

Table 42. Projected Normal Year Supply and Demand Comparison – AF/YR

	2010	2015	2020	2025	2030
Retail Service Area					
Supply Totals	33,197	38,206	44,108	51,059	59,221
Demand Totals	33,197	38,206	44,108	51,059	59,221
Difference (Supply Minus D Demand)	0	0	0	0	0
Difference as % of Supply	0	0	0	0	0
Difference as % of Demand	0	0	0	0	0
Wholesale Water Sales					
Supply Totals	88,902	101,146	111,837	123,784	134,028
Demand Totals	88,902	101,146	111,837	123,784	134,028
Difference (Supply Minus D Demand)	0	0	0	0	0
Difference as % of Supply	0	0	0	0	0
Difference as % of Demand	0	0	0	0	0

Table 43. Projected Single Dry Year Supply – AF/YR

Water Source	2010	2015	2020	2025	2030
Supply					
Retail Service Area	33,197	38,206	44,108	51,059	59,221
Wholesale Water Sales	91,174	104,098	115,339	127,936	138,930
% of Projected Normal	101%	102%	102%	102%	102%

Note: Normal as defined on Table 40.

Table 44. Projected Single Dry Year Demand – AF/YR

Water Source	2010	2015	2020	2025	2030
Demand					
Retail Service Area	33,197	38,206	44,108	51,059	59,221
Wholesale Water Sales	91,174	104,098	115,339	127,936	138,930
% of Projected Normal	104%	104%	104%	104%	104%

Note: Normal as defined on Table 41.

Table 45. Projected Single Dry Year Supply and Demand Comparison – AF/YR

	2010	2015	2020	2025	2030
Retail Service Area					
Supply Totals	33,197	38,206	44,108	51,059	59,221
Demand Totals	33,197	38,206	44,108	51,059	59,221
Difference (Supply Minus D Demand)	0	0	0	0	0
Difference as % of Supply	0	0	0	0	0
Difference as % of Demand	0	0	0	0	0
Wholesale Water Sales					
Supply Totals	91,174	104,098	115,339	127,936	138,930
Demand Totals	91,174	104,098	115,339	127,936	138,930
Difference (Supply Minus D Demand)	0	0	0	0	0
Difference as % of Supply	0	0	0	0	0
Difference as % of Demand	0	0	0	0	0

8.3 Projected Single Dry Year Supply and Demand Comparison

MWD has predicted that sufficient supply exists to meet demands for single dry year requirements. As required, droughts may prompt additional water conservation measures to ensure sufficient supply is maintained. However, normal demands are used to provide conservative estimations of demand. MWD has projected that sufficient supplies exist to meet demands during dry years for their agencies (MWD, 2005). Therefore, supplies will equal demands since MWD will deliver only the needed quantities of water. Supplies during years of excess water that are not required for normal demands will be placed into storage for use in droughts or emergency conditions. A summary of projected single dry year supply is summarized in Table 43, single dry year demand in Table 44, and a comparison in Table 45.

8.4 Projected Multiple Dry Year Supply and Demand Comparison

MWD has predicted that sufficient supply exists to meet demands for multiple dry year requirements. As required, droughts may prompt additional water conservation measures to ensure sufficient supply is maintained. However, normal demands are used to provide conservative estimations of demand. MWD has projected that sufficient supplies exist to meet demands during dry years for

Table 46. Projected Supply During Multiple Dry Year Period Ending in 2010 – AF/YR

Water Source	2006	2007	2008	2009	2010
Supply					
Retail Service Area	29,557	30,715	31,403	32,286	33,197
Wholesale Water Sales	81,856	84,185	86,515	88,844	91,174
% of Projected Normal	102%	102%	102%	102%	103%

Note: Normal as defined on Table 40. Multiple Dry Year Period is based on Table 8.

Table 47. Projected Demand During Multiple Dry Year Period Ending in 2010 – AF/YR

Water Source	2006	2007	2008	2009	2010
Demand					
Retail Service Area	29,557	30,715	31,403	32,286	33,197
Wholesale Water Sales	81,856	84,185	86,515	88,844	91,174
% of Projected Normal	102%	102%	102%	102%	103%

Note: Normal as defined on Table 41. Multiple Dry Year Period is based on Table 8.

Table 48. Projected Supply and Demand Comparison During Multiple Dry Year Period Ending in 2010– AF/YR

	2006	2007	2008	2009	2010
Retail Service Area					
Supply Totals	29,557	30,715	31,403	32,286	33,197
Demand Totals	29,557	30,715	31,403	32,286	33,197
Difference (Supply Minus D Demand)	0	0	0	0	0
	0	0	0	0	0
Difference as % of Demand	0	0	0	0	0
Wholesale Water Sales					
Supply Totals	81,856	84,185	86,515	88,844	91,174
Demand Totals	81,856	84,185	86,515	88,844	91,174
Difference (Supply Minus D Demand)	0	0	0	0	0
Difference as % of Supply	0	0	0	0	0
Difference as % of Demand	0	0	0	0	0

their agencies (MWD, 2005). Therefore, supplies will equal demands since MWD will deliver only the needed quantities of water. Supplies during years of excess water not required for normal demands will be placed into storage for use in droughts or emergency conditions. A summary of projected multiple year supply is summarized in Table 46, multiple dry year demand in Table 47, and a comparison in Table 48 for the period ending 2010. A summary of projected multiple year supply is summarized in Table 49, multiple dry year demand in Table 50, and a comparison in Table 51 for the period ending 2015. A summary of projected multiple year supply is summarized in Table 52, multiple dry year demand in Table 53, and a comparison in Table 54 for the period ending 2020. A summary of projected multiple year supply is summarized in Table 55, multiple dry year demand in Table 56, and a comparison in Table 57 for the period ending 2025. A summary of projected multiple year supply is summarized in Table 58, multiple dry year demand in Table 59, and a comparison in Table 60 for the period ending 2030.

Table 49. Projected Supply During Multiple Dry Year Period Ending in 2015 – AF/YR

Water Source	2011	2012	2013	2014	2015
Supply					
Retail Service Area	34,138	35,109	36,110	37,142	38,207
Wholesale Water Sales	93,758	96,343	98,928	101,513	104,098
% of Projected Normal	102%	102%	102%	102%	103%

Note: Normal as defined on Table 41. Multiple Dry Year Period is based on Table 8.

Table 50. Projected Demand During Multiple Dry Year Period Ending in 2015 – AF/YR

Water Source	2011	2012	2013	2014	2015
Demand					
Retail Service Area	34,138	35,109	36,110	37,142	38,207
Wholesale Water Sales	93,758	96,343	98,928	101,513	104,098
% of Projected Normal	102%	102%	102%	102%	103%

Note: Normal as defined on Table 41. Multiple Dry Year Period is based on Table 8.

Table 51. Projected Supply and Demand Comparison During Multiple Dry Year Period Ending in 2015– AF/YR

	2011	2012	2013	2014	2015
Retail Service Area					
Supply Totals	34,138	35,109	36,110	37,142	38,207
Demand Totals	34,138	35,109	36,110	37,142	38,207
Difference (Supply Minus D Demand)	0	0	0	0	0
Difference as % of Supply	0	0	0	0	0
Difference as % of Demand	0	0	0	0	0
Wholesale Water Sales					
Supply Totals	93,758	96,343	98,928	101,513	104,098
Demand Totals	93,758	96,343	98,928	101,513	104,098
Difference (Supply Minus D Demand)	0	0	0	0	0
Difference as % of Supply	0	0	0	0	0
Difference as % of Demand	0	0	0	0	0

Table 52. Projected Supply During Multiple Dry Year Period Ending in 2020 – AF/YR

Water Source	2016	2017	2018	2019	2020
Supply					
Retail Service Area	39,316	40,460	41,639	42,855	44,109
Wholesale Water Sales	106,346	108,594	110,842	113,090	115,339
% of Projected Normal	103%	103%	103%	103%	103%

Note: Normal as defined on Table 40. Multiple Dry Year Period is based on Table 8.

Table 53. Projected Demand During Multiple Dry Year Period Ending in 2020 – AF/YR

Water Source	2011	2012	2013	2014	2015
Demand					
Retail Service Area	39,316	40,460	41,639	42,855	44,109
Wholesale Water Sales	106,346	108,594	110,842	113,090	115,339
% of Projected Normal	103%	103%	103%	103%	103%

Note: Normal as defined on Table 41. Multiple Dry Year Period is based on Table 8.

Table 54. Projected Supply and Demand Comparison During Multiple Dry Year Period Ending in 2020 – AF/YR

	2016	2017	2018	2019	2020
Retail Service Area					
Supply Totals	39,316	40,460	41,639	42,855	44,109
Demand Totals	39,316	40,460	41,639	42,855	44,109
Difference (Supply Minus D Demand)	0	0	0	0	0
Difference as % of Supply	0	0	0	0	0
Difference as % of Demand	0	0	0	0	0
Wholesale Water Sales					
Supply Totals	106,346	108,594	110,842	113,090	115,339
Demand Totals	106,346	108,594	110,842	113,090	115,339
Difference (Supply Minus D Demand)	0	0	0	0	0
Difference as % of Supply	0	0	0	0	0
Difference as % of Demand	0	0	0	0	0

Table 55. Projected Supply During Multiple Dry Year Period Ending in 2025 – AF/YR

Water Source	2021	2022	2023	2024	2025
Supply					
Retail Service Area	45,415	46,762	48,151	49,583	51,059
Wholesale Water Sales	117,858	120,377	122,897	125,416	127,936
% of Projected Normal	103%	103%	103%	103%	103%

Note: Normal as defined on Table 40. Multiple Dry Year Period is based on Table 8.

Table 56. Projected Demand During Multiple Dry Year Period Ending in 2025 – AF/YR

Water Source	2021	2022	2023	2024	2025
Demand					
Retail Service Area	45,415	46,762	48,151	49,583	51,059
Wholesale Water Sales	117,858	120,377	122,897	125,416	127,936
% of Projected Normal	103%	103%	103%	103%	103%

Note: Normal as defined on Table 41. Multiple Dry Year Period is based on Table 8.

Table 57. Projected Supply and Demand Comparison During Multiple Dry Year Period Ending in 2025 – AF/YR

	2021	2022	2023	2024	2025
Retail Service Area					
Supply Totals	45,415	46,762	48,151	49,583	51,059
Demand Totals	45,415	46,762	48,151	49,583	51,059
Difference (Supply Minus D Demand)	0	0	0	0	0
Difference as % of Supply	0	0	0	0	0
Difference as % of Demand	0	0	0	0	0
Wholesale Water Sales					
Supply Totals	117,858	120,377	122,897	125,416	127,936
Demand Totals	117,858	120,377	122,897	125,416	127,936
Difference (Supply Minus D Demand)	0	0	0	0	0
Difference as % of Supply	0	0	0	0	0
Difference as % of Demand	0	0	0	0	0

Table 58. Projected Supply During Multiple Dry Year Period Ending in 2030 – AF/YR

Water Source	2026	2027	2028	2029	2030
Supply					
Retail Service Area	52,593	54,175	55,806	57,487	59,221
Wholesale Water Sales	130,134	132,333	134,532	136,731	138,930
% of Projected Normal	103%	103%	103%	103%	104%

Note: Normal as defined on Table 40. Multiple Dry Year Period is based on Table 8.

As shown, supplies are expected to meet demands for all multiple dry year scenarios.

Section 9
Adoption and Implementation of UWMP

9.1 Law

Water Code Section 10640-10645

10640. Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630). The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

10641. An urban water supplier required to prepare a plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

10643. An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

10644. (a) An urban water supplier shall submit to the department, the California State Library,

Table 59. Projected Demand During Multiple Dry Year Period Ending in 2030 – AF/YR

Water Source	2026	2027	2028	2029	2030
Demand					
Retail Service Area	52,593	54,175	55,806	57,487	59,221
Wholesale Water Sales	130,134	132,333	134,532	136,731	138,930
% of Projected Normal	103%	103%	103%	103%	104%

Note: Normal as defined on Table 41. Multiple Dry Year Period is based on Table 8.

Table 60. Projected Supply and Demand Comparison During Multiple Dry Year Period Ending in 2030– AF/YR

	2026	2027	2028	2029	2030
Retail Service Area					
Supply Totals	52,593	54,175	55,806	57,487	59,221
Demand Totals	52,593	54,175	55,806	57,487	59,221
Difference (Supply Minus D Demand)	0	0	0	0	0
Difference as % of Supply	0	0	0	0	0
Difference as % of Demand	0	0	0	0	0
Wholesale Water Sales					
Supply Totals	132,333	134,532	136,731	138,930	132,333
Demand Totals	132,333	134,532	136,731	138,930	132,333
Difference (Supply Minus D Demand)	0	0	0	0	0
Difference as % of Supply	0	0	0	0	0
Difference as % of Demand	0	0	0	0	0

and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

(b) The department shall prepare and submit to the Legislature, on or before December 31, in the years ending in six and one, a report summarizing the status of the plans adopted pursuant to this part. The report prepared by the department shall identify the outstanding elements of the individual plans. The department shall provide a copy of the report to each urban water supplier that has submitted its plan to the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans submitted pursuant to this part.

10645. Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

9.2 Adoption Resolution

Western has adopted the 2005 Urban Water Management Plan with Resolution No. 2388. A copy of the resolution is provided in Appendix B.

9.3 DMM Implementation

At its regular meeting held on January 12, 1994, Western's Board of Directors authorized signing the Memorandum of Understanding regarding Urban Water Conservation in California. Since signing the MOU, Western has worked to implement the California Urban Water Conservation Council's Best Management Practices (BMPs) throughout its service area. A copy of the Minutes of the meeting is provided in Appendix E along with the BMP reports.

9.4 Public Review of 2005 UWMP

Public review of the 2005 Urban Water Management Plan included a public meeting conducted on December 7th. Documentation of

the announcement of the public meeting is provided in Appendix H. The draft Plan was made available prior to the public meeting to provide opportunity for review prior to the meeting. Comments received on the Plan at the public meeting include:

No comments received during public review period.

All comments on the 2005 UWMP were resolved prior to finalization of the document.

9.5 Distribution of 2005 UWMP

The final Western Municipal Water District 2005 UWMP was distributed to the following entities:

- City of Riverside;
- City of Corona;
- City of Norco;
- County of Riverside;
- MWD of Southern California;
- Rancho California Water District;
- Box Spring Mutual Water Company;
- SAWPA;
- Rubidoux Community Services District;
- Jurupa Community Services District;
- Elsinore Valley Municipal Water District;
- Home Gardens County Water District; and
- Lee Lake Water District.

Copies of the Plan are available to the general public upon request.

SECTION 10 REFERENCES

California Regional Water Quality Control Board, Santa Ana Region, 1995
Water Quality Control Plan Santa Ana River Basin (8).

City of Riverside, 2004.
General Plan and Supporting Documents, Environmental Impact Report.

County of Riverside, 2003.
General Plan, October 2003.

County of Riverside, 2004.
Multi-Jurisdictional Local Hazard Mitigation Plan (LUMP),
Riverside Operational Area.

David Taussing & Associates, Inc. 2003.
Western Riverside County Multiple Species Habitat Conservation Plan,
Final Mitigation Fee Nexus Report, July 2003.

Department of Water Resources Bay-Delta Office, 2002.
The State Water Project Delivery Reliability Report.

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Riverside LAFCO, Water & Wastewater Municipal Service Review,
Final Report, February 2005.

MWD, 2005.
Draft Regional Urban Water Management Plan, May 2005.

Southern California Association of Governments, 2004.
2004 Regional Transportation Plan/Growth Vision: Socio-Economic
Forecast Report, June 2004.

U.S. Census Bureau,
American FactFinder Web Site 2005
County and City Data Book: 2000.

WMWD, 1992.
The Drought Contingency Plan of Western Municipal Water District of
Riverside County, January 1992.

WMWD, 2004a.
Santa Ana River Water Right Application for Supplemental Water
Supply, Draft Environmental Impact Report, October 2004.

WMWD, 2004b.
Santa Ana River Water Right Application for Supplemental Water
Supply, Community Report, October 2004.

WMWD, 2005a.
Riverside-Corona Feeder Program Environmental Impact Report,
prepared by Albert Webb & Associates, May 2005.

WMWD, 2005b.
Emergency Response and Recovery Plan, January 2005.

LIST OF ACRONYMS

AF	Acre-Feet
AF/YR	Acre-Feet per Year
BMP	Best Management Practices
CRA	Colorado River Aqueduct
DMM	Demand Management Measures
IWRP	Integrated Water Resources Plan
MG	Million Gallons
MWD	Metropolitan Water District of Southern California
SAWPA	Santa Ana Watershed Project Authority
SCAG	Southern California Association of Governments
SWP	State Water Project
UWMP	Urban Water Management Plan
WMWD	Western Municipal Water District
WWRF	Wastewater Reclamation Facility

FIGURES

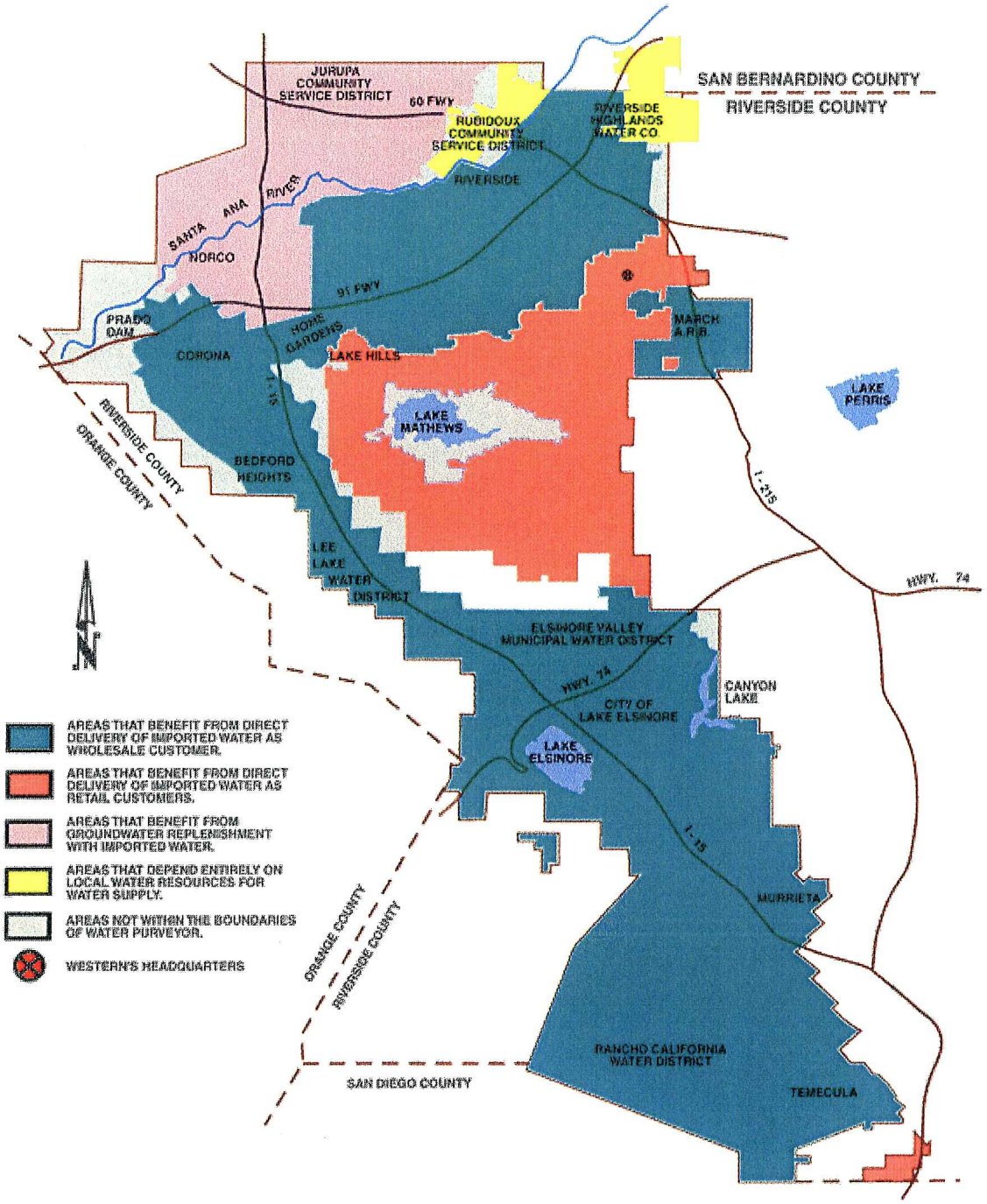

Figure 1
Western Municipal Water District
Boundary and Subagencies

WASTEWATER MAP

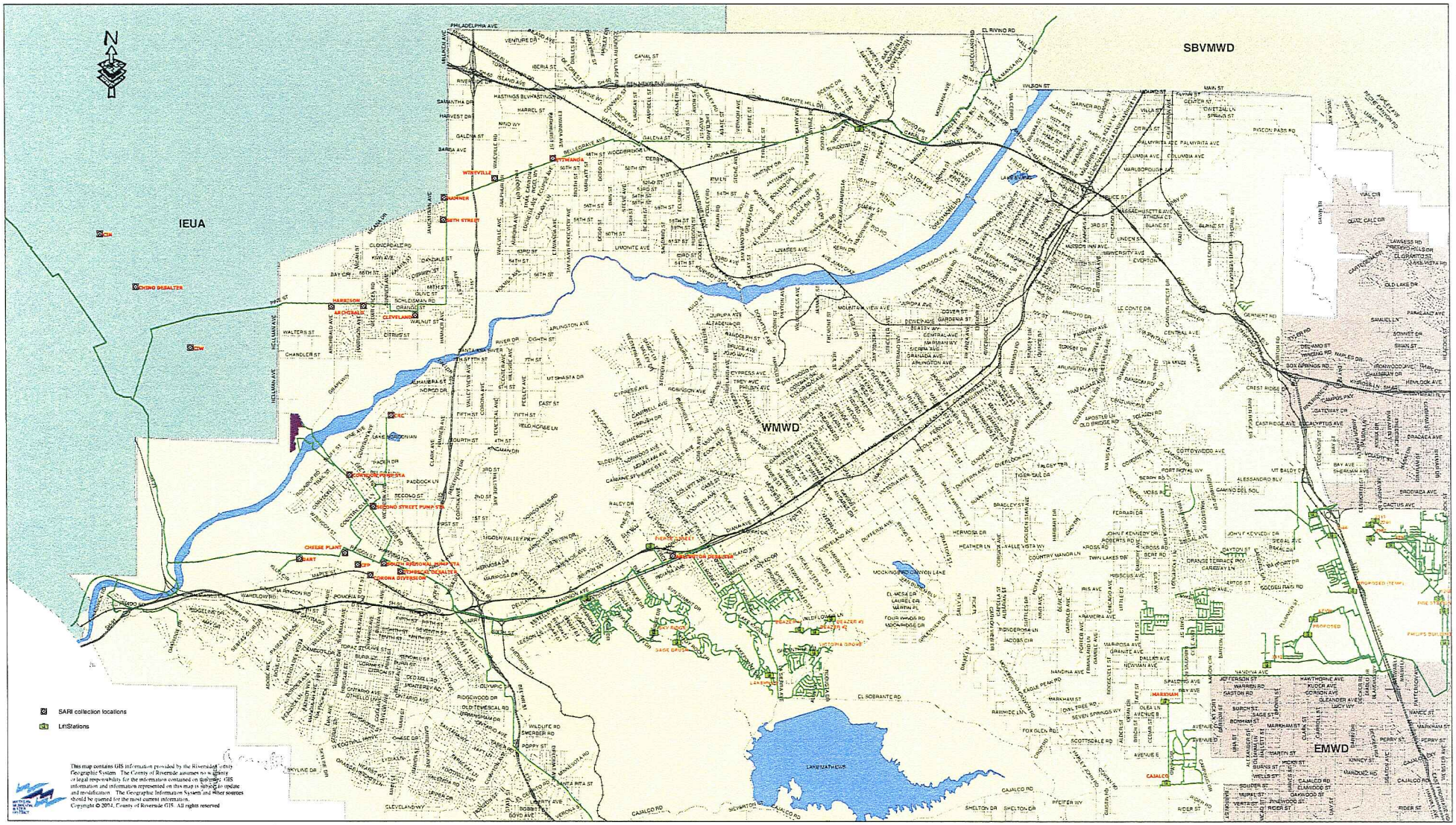

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Figure 3

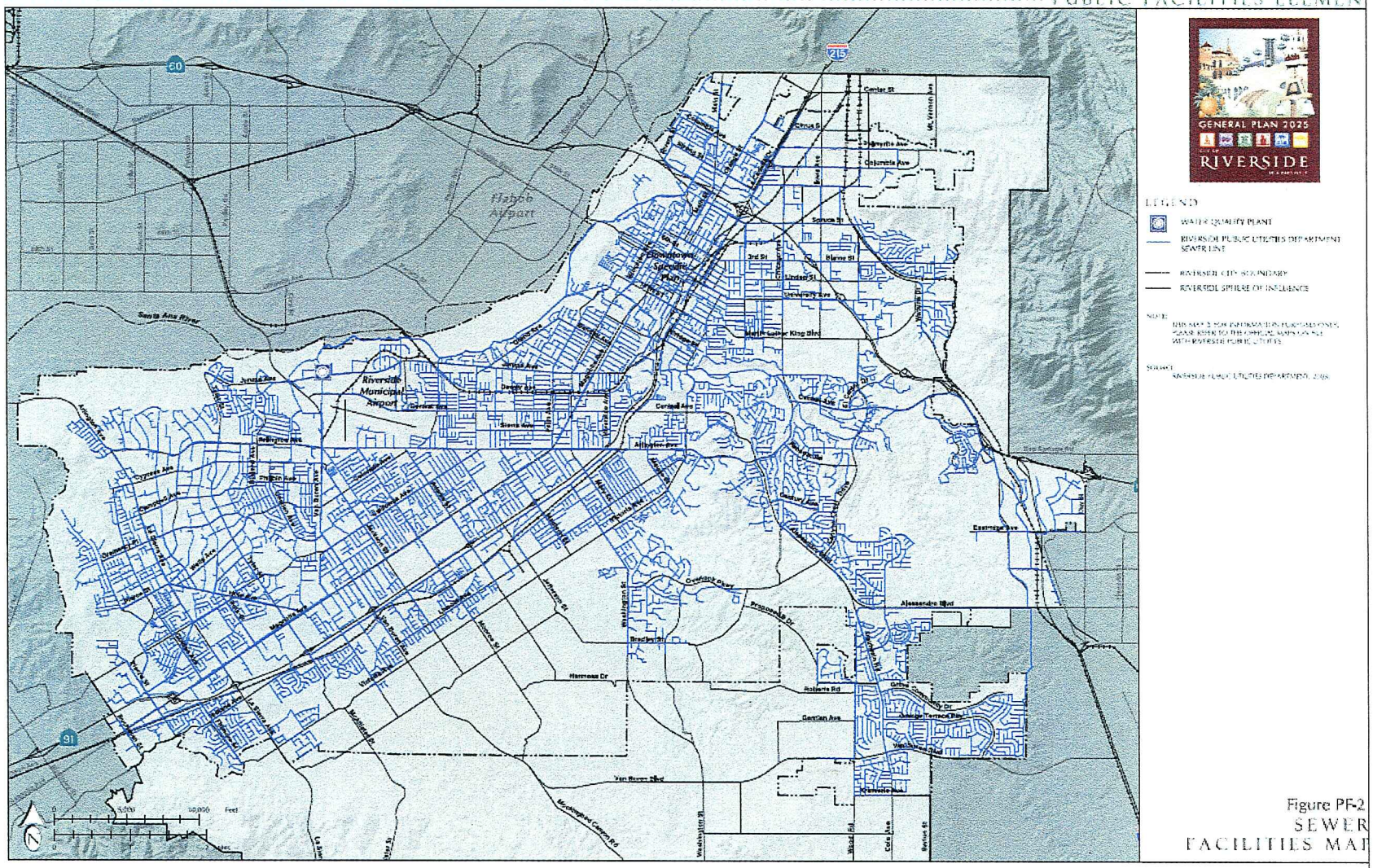


Figure 4
City of Riverside, Wastewater Collection Area

Appendix A
Requests for Participation in Western's 2005 Urban Water Management Plan

February 1, 2005

«FirstName» «LastName»
«Company»
«Address1»
«City», «State» «PostalCode»

REQUEST FOR INFORMATION FOR THE 2005 URBAN WATER MANAGEMENT PLAN

Western Municipal Water District (Western) is reviewing its Urban Water Management Plan (UWMP) and is considering amendments or changes. This plan provides a means to assess water resource needs and supplies. To complete this assessment, water use projections for water supplied from Western to your agency will be required. This information will be required in 5-year increments for at least the next 20 years as shown below.

Actual and Projected Demand in AF/YR

Water Demand	2000	2005	2010	2015	2020	2025	2030

Western is also requesting information for 2030 to provide a full 20-year period for integration into water supply assessments. Please also provide any supplemental information that is required to fully evaluate your water use projections, such as expected demand change for a single dry year or multiple dry years. In turn, Western will provide information to your agency identifying and quantifying, to the extent practicable, the existing and planned sources of water over the 5-year increments and during various water-year types as that information is provided to us by Metropolitan Water District of Southern California.

When Western's UWMP is available in draft form later this year, a copy will be provided to you for your review. Additionally, a public hearing will be conducted to discuss the plan.

We appreciate your assistance in providing information for this vital plan. Should you have any questions, please do not hesitate to contact me at (951) 789-5077 or by email at bmeyer@wmwd.com.

BRENDA MEYER, P.E.
Civil Engineer

bsm/bj

cc: Central File: UWMP 2005

UWMP 2005
REQUEST FOR INFORMATION LETTERS SENT 2/1/05
TO:

Mr. Ethan Gottschalk
Box Springs Mutual Water Company
21740 Dracea Ave.
Moreno Valley, CA 92553

Mr. Kevin Milligan
City of Riverside Public Utilities
3900 Main Street
Riverside, CA 92522

Mr. Dieter Wirtzfeld Assistant Director - Water
City of Riverside Public Utilities
3900 Main Street
Riverside, CA 92522

Mr. Don Williams
City of Corona
730 Corporate Yard Way
Corona, CA 92880

Mr. Bill Thompson
City of Norco
2820 Clark Avenue
Norco, CA 91760

Mr. Julius Ma, P.E.
Elsinore Valley Municipal Water District
P.O. Box 3000
Lake Elsinore, CA 92530

Mr. Andy Webster
Rancho California Water District
P.O. Box 9017
Temecula, CA 92589

Mr. John Pastore
Lee Lake Water District
22646 Temescal Canyon Road
Corona, CA 91719

Appendix B
Resolution Adopting Western's 2005 Urban Water Management Plan

RESOLUTION 2388

RESOLUTION OF THE BOARD OF DIRECTORS
OF WESTERN MUNICIPAL WATER DISTRICT
OF RIVERSIDE COUNTY ADOPTING THE 2005
URBAN WATER MANAGEMENT PLAN

WHEREAS, The California Legislature enacted Assembly Bill 797 during the 1983-84 regular session of the California Legislature (Water Code Section 100610 et. seq.), known as the Urban Water Management Planning Act, which mandates that every urban supplier of water providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre feet of water annually, prepare an Urban Water Management Plan, the primary objective of which is to plan for the conservation and efficient use of water;

WHEREAS, AB 797 requires that said Plan be adopted by December 31, 1985, after public review and hearing, and filed with the California Department of Water Resources within thirty days of adoption;

WHEREAS, Western Municipal Water District of Riverside County did prepare and file said Plan with the California Department of Water Resources in December 1985;

WHEREAS, AB 797 requires that said Plan be periodically reviewed at least once every five years, and that the urban water supplier shall make any amendments or changes to its plan which are indicated by the review; and

WHEREAS, Western Municipal Water District of Riverside County is an urban supplier of water providing water to over 19,000 customers, and prepared and circulated for public review a draft Urban Water Management Plan (2015 Update), in compliance with the requirements of AB 797, and held a properly noticed public hearing regarding said draft Plan on October 5, 2005, prior to publishing the final Plan.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of Western Municipal Water District of Riverside County as follows:

1. The Urban Water Management Plan for 2005, is hereby adopted as amended by changes incorporated by the Board of Directors as a result of input received (if any) at the public hearing and ordered filed with the Secretary of the Board of Directors;

2. The General Manager is hereby authorized and directed to file the 2005 Plan with the California Department of Water Resources within 30 days after the date adopted in accordance with AB 797; and

3. The General Manager is hereby authorized and directed to further consider the adopted 2005 Urban Water Management Plan, and to provide recommendations to the Board of Directors regarding necessary budgets, procedures, rules, and regulations to carry out effective and equitable water conservation programs.

ADOPTED this 7th day of December 2005.

Elizabeth L. Cunnison
Secretary-Treasurer

I HEREBY CERTIFY that the foregoing is a full, true and correct copy of Resolution 2388 adopted by the Board of Directors of Western Municipal Water District of Riverside County at its Regular Meeting held December 7, 2005.

JOHN V. ROSSI
General Manager

FIN01\ACES\ADMIN\BOARD\RES\R-2388

Appendix C
Climate Data

RIVERSIDE CITRUS EXP ST, CALIFORNIA

Period of Record General Climate Summary - Temperature

Station:(047473) RIVERSIDE CITRUS EXP ST

From Year=1948 To Year=2004

	Monthly Averages			Daily Extremes				Monthly Extremes				Max. Temp.		Min. Temp.	
	Max.	Min.	Mean	High	Date	Low	Date	Highest Mean	Year	Lowest Mean	Year	>= 90 F	<= 32 F	<= 32 F	<= 0 F
	F	F	F	F	dd/yyyy or yyyymmdd	F	dd/yyyy or yyyymmdd	F	-	F	-	# Days	# Days	# Days	# Days
January	66.4	41.5	54.0	97	31/2003	24	13/1963	62.8	103	49.0	***	0.0	0.0	1.9	0.0
February	67.9	43.1	55.5	92	07/1963	27	17/1956	60.7	95	48.5	***	0.2	0.0	0.8	0.0
March	70.1	44.9	57.5	98	26/1988	29	01/1962	66.5	104	50.6	***	0.7	0.0	0.4	0.0
April	75.1	47.8	61.4	104	06/1989	33	02/1956	66.6	92	53.2	***	2.5	0.0	0.0	0.0
May	79.4	52.4	65.9	108	29/1984	38	08/1965	73.3	97	61.5	77	4.6	0.0	0.0	0.0
June	86.5	56.2	71.3	112	16/1961	44	10/1964	77.9	81	63.8	65	12.2	0.0	0.0	0.0
July	93.7	60.3	77.0	113	21/1960	49	09/1960	81.1	84	71.2	87	23.7	0.0	0.0	0.0
August	94.3	61.1	77.7	112	30/1976	49	22/1968	83.0	98	74.0	89	24.5	0.0	0.0	0.0
September	90.4	58.4	74.4	113	14/1971	42	21/1965	80.1	84	66.9	65	16.9	0.0	0.0	0.0
October	82.3	52.3	67.3	108	01/1980	32	28/1970	73.1	103	62.4	69	7.8	0.0	0.0	0.0
November	73.1	45.2	59.1	97	02/1997	26	17/1958	64.0	76	53.6	94	1.1	0.0	0.2	0.0
December	67.4	41.2	54.3	93	04/1958	22	23/1990	59.3	58	48.7	71	0.0	0.0	1.5	0.0
Annual	78.9	50.4	64.6	113	19600721	22	19901223	66.7	97	61.6	82	94.2	0.0	4.9	0.0
Winter	67.2	41.9	54.6	97	20030131	22	19901223	58.2	81	50.5	69	0.2	0.0	4.3	0.0

RIVERSIDE CITRUS EXP ST, CALIFORNIA (047473)

Period of Record Monthly Climate Summary

Period of Record : 7/ 1/1948 to 9/30/2004

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	66.4	67.9	70.1	75.1	79.4	86.5	93.7	94.3	90.4	82.3	73.1	67.4	78.9
Average Min. Temperature (F)	41.5	43.1	44.9	47.8	52.4	56.2	60.3	61.1	58.4	52.3	45.2	41.2	50.4
Average Total Precipitation (in.)	2.16	2.15	1.75	0.81	0.23	0.07	0.04	0.12	0.26	0.32	0.93	1.21	10.04
Average Total SnowFall (in.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0

Percent of possible observations for period of record.
Max. Temp.: 85.3% Min. Temp.: 85.3% Precipitation: 91.5% Snowfall: 85.8% Snow Depth: 85.8%
Check Station Metadata or Metadata graphics for more detail about data completeness.

Western Regional Climate Center, wrcc@dri.edu

Monthly Average ETo Report

California Irrigation Management Information System
Department of Water Resources
Office of Water Use Efficiency
Rendered in ENGLISH units
Printed on January 25, 2005

Number	Name	Region
44	U.C. Riverside	Los Angeles Basin

Stn	Jan	Mar	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
44	2.49	2.91	4.16	5.27	5.94	6.56	7.22	6.92	5.35	4.05	2.94	2.56	56.37

Back to:

NOTE:
To print data frame (right side), click on right frame before printing.

1971 - 2000

- Daily Temp. & Precip.
- Daily Tabular data (~23 KB)
- Monthly Tabular data (~1 KB)
- NCDC 1971-2000 Normals (~3 KB)

1961 - 1990

- Daily Temp. & Precip.
- Daily Tabular data (~23 KB)
- Monthly Tabular data (~1 KB)
- NCDC 1961-1990 Normals (~3 KB)

Period of Record

- Station Metadata
- Station Metadata Graphics

General Climate Summary Tables
- Temperature
- Precipitation
- Heating Degree Days
- Cooling Degree Days
- Growing Degree Days

Temperature
- Daily Extremes and Averages
- Spring 'Freeze' Probabilities
- Fall 'Freeze' Probabilities
- 'Freeze Free' Probabilities
- Monthly Temperature Listings
    - Average
    - Average Maximum
    - Average Minimum

Precipitation
- Monthly Average
- Daily Extreme and Average
- Daily Average
- Precipitation Probability by Duration.
- Precipitation Probability by Quantity.
- Monthly Precipitation Listings

Monthly Totals

Snowfall

- Daily Extreme and Average
- Daily Average
- Monthly Snowfall Listings

Monthly Totals

Snowdepth

- Daily Extreme and Average
- Daily Average

Heating Degree Days

- Daily Average

Cooling Degree Days

- Daily Average

Period of Record Data Tables

- Daily Summary Stats (~55 KB)
- Monthly Tabular data (~2 KB)

Western Regional Climate Center,
wrcc@dri.edu

General
- CIMIS Overview
- CIMIS Data Uses

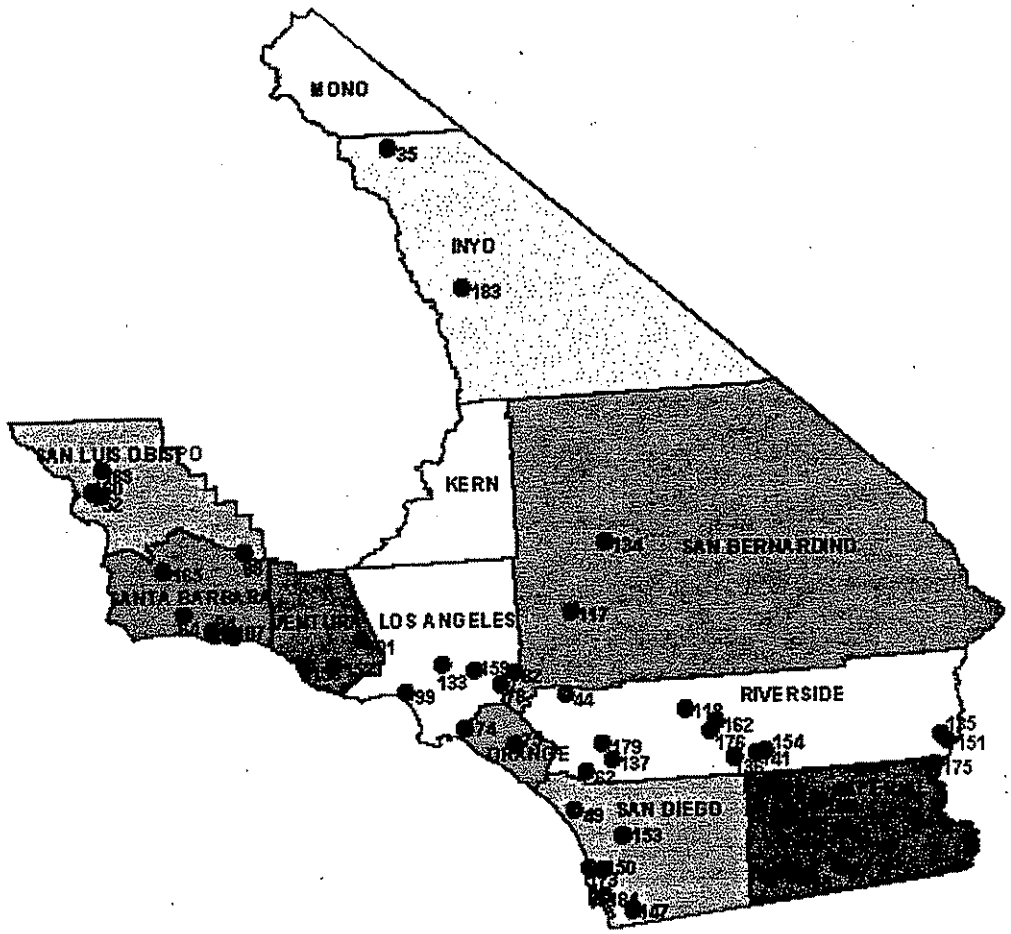
Weather Stations
- Station List
- Location Maps
- Sensor Specs
- Siting Info
- Network Maintenance

Evapotranspiration
- ET Overview
- Equations
- Crop Coefficients
- ETo Zones Map

Irrigation
- Irrigation Overview
- Water Budget
- Irrigation Scheduling
- Mobile Labs
- Software
- Consultants

Southern District

Click on any station to view its detailed station description.



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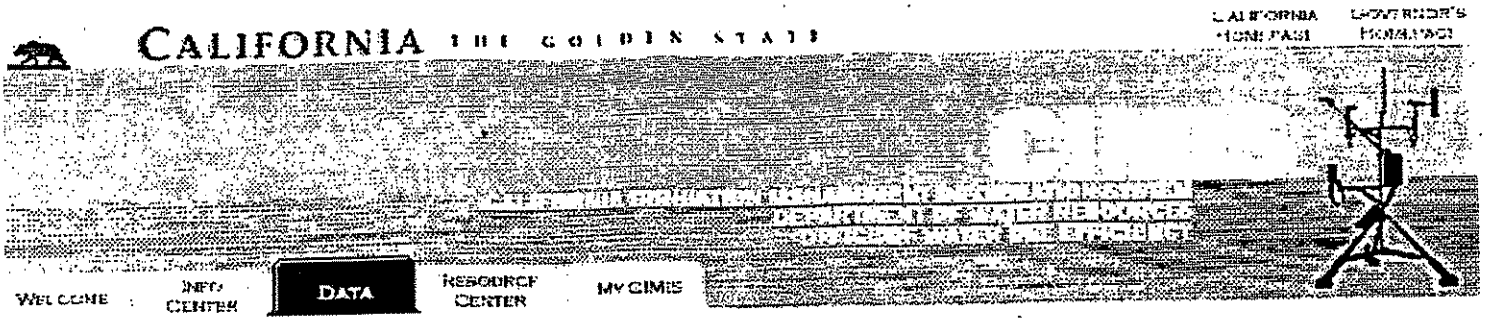

Unregistered User
Registration
Sample Daily Report
Sample Monthly Report

Registered User
Logon
Hourly
Daily
Daily ETo Variance
Monthly
Monthly Average ETo

Quality Control
QC Overview
Current Flag Summary
Current Hourly Flags
Current Daily Flags
Former Flag Summary
Former Hourly Flags
Former Daily Flags

More Info
Station List
Data Types
Data Formats
Data Size

Station Detail Report

The **Station Detail Report** provides detailed information on CIMIS stations including the region in which they are located, nearby city, installation dates, termination dates (if inactive), geographic locations (latitude and longitude), elevations above see level, zip codes, surface types (grass or alfalfa), station site descriptions, and photographs of the stations.

U.C. Riverside #44

Los Angeles Basin Region Riverside County Southern District
Nearby city is Riverside

- Activated On June 02, 1985
- Station is Active
- ETo Reported
- Reference Surface is Grass
- Datalogger is CR10

Station 44
North | South | East | West |

Geographic Information

Elevation (ft):	1020
Latitude:	33°57'54"N / 33.97
Longitude:	117°20'08"W / -117.34

Associated Zip Codes

92501, 92502, 92503, 92504, 92505, 92506, 92507, 92509, 92513, 92514, 92515, 92516, 92517, 92518, 92519, 92521, 92522

Station Siting Description

Sorry, this information is not available at this time.

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Appendix D
Western's Water Supply Agreements

PURCHASE ORDER FOR IMPORTED WATER SUPPLY TO BE PROVIDED BY THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

PURCHASER: **Western Municipal Water District of Riverside County**	**TERM** 10 years
INITIAL BASE DEMAND: **65,298.5** acre-feet	**EFFECTIVE DATE:** January 1, 2003
INITIAL TIER 1 ANNUAL MAXIMUM: **58,768.7** acre-feet	
PURCHASE ORDER COMMITMENT: **391,791.0** acre-feet	

Definitions of capitalized terms used in this Purchase Order are provided in Attachment 1. Terms used in this Purchase Order and not defined in Attachment 1 are defined in Metropolitan's Administrative Code.

COMMITMENT TO PURCHASE.

In consideration of Purchaser's commitment to purchase System Water pursuant to this Purchase Order, Metropolitan agrees to sell such System Water to Purchaser at the Tier 1 Supply Rate each year in an amount up to the Tier 1 Annual Maximum. System Water sold to Purchaser (excluding deliveries of System Water made under the Interim Agricultural Water Program and Long-term Seasonal Storage Service) in an amount greater than the Tier 1 Annual Maximum shall be sold to the Purchaser at the Tier 2 Supply Rate. In connection with the receipt of System Water, the Purchaser also agrees to pay all other applicable rates and charges, as established by Metropolitan from time to time in accordance with Section 4304 of the Administrative Code. The rates and charges applicable to System Water as of the Effective Date are shown in Attachment 2.

Purchaser agrees to purchase System Water from Metropolitan during the Term in an amount (excluding deliveries of System Water, made under the Interim Agricultural Water Program and Long-term Seasonal Storage Service) not less than the Purchase Order Commitment.

Purchaser recognizes and agrees that Metropolitan has relied and will, during the term of this Purchase Order, rely on this commitment by Purchaser in setting its rates and charges, planning and providing its capital facilities and developing its water supply, management and reliability programs. If Purchaser's applicable System Water purchases during the Term are less than the Purchase Order Commitment, Purchaser agrees to pay Metropolitan an amount equal to the difference between the Purchase Order Commitment and Purchaser's applicable System Water purchases during the Term times the average of the Tier 1 Supply Rate in effect during the Term. The Purchaser agrees to pay such amount to Metropolitan within the next regular billing cycle following the reconciliation of all certifications for special programs that the Purchaser may participate in (e.g. Interim Agricultural Water Program, Long-term Seasonal Storage Service). The Purchaser may elect to pay such amount in twelve equal monthly

payments over the course of the next twelve months beginning with the first regular billing cycle following the reconciliation of all outstanding certifications for special programs. If the Purchaser elects to pay such amount over the course of the next twelve months following the regular billing cycle any outstanding balance shall bear interest at Metropolitan's then current investment portfolio average yield. All other amounts payable under this Purchase Order shall be billed and paid in accordance with the Administrative Code.

The Purchaser further recognizes that this Purchase Order is entered into for the direct benefit of the holders and owners of Metropolitan's Bonds issued from time to time under the Act and the Bond Resolutions, and the income and revenues derived from this Purchase Order will be pledged for the purposes set forth in the Bond Resolutions, including the payment of principal of and interest on such Bonds.

RENEWAL:

Prior to but not later than December 31, 2010, the Purchaser may provide a non-binding written notice to Metropolitan of the Purchaser's determination to extend this Purchase Order. Upon the receipt of such notice, the Board of Directors of Metropolitan (the "Board") shall determine whether Metropolitan will continue to provide System Water to member agencies by Purchase Order. If the Board so determines, the Purchaser and Metropolitan shall amend this Purchase Order to include an extended term and/or to include such other terms and conditions as may be mutually agreed by the parties. If the Purchaser elects not to renew this Purchase Order it will terminate upon the expiration of the Term.

WATER SERVICE:

Conditions of water service by Metropolitan to the Purchaser, including but not limited to (i) delivery points, (ii) water delivery schedules, and (iii) water quality, will be determined in accordance with Chapter 5 (Section 4500 through 4514, inclusive, as applicable) of Metropolitan's Administrative Code.

In accordance with its Administrative Code, Metropolitan shall use its reasonable best efforts to supply System Water in the quantities requested by the Purchaser, but is not obligated to dedicate any portion of System capacity for the conveyance, distribution, storage or treatment of System Water for the benefit of the Purchaser or any other member agency. Metropolitan shall use its reasonable best efforts to deliver the Base Demand when needed by the Purchaser during the Term; provided however, there shall be no default under this Purchase Order if Metropolitan fails to deliver water to the Purchaser in accordance with any such schedule of deliveries during the Term.

By execution of this Purchase Order, the Purchaser recognizes and agrees that it acquires no interest in or to any portion of the System or any other Metropolitan facilities, or any right to receive water delivered through the System, excepting the right to purchase up to Purchaser's Tier 1 Annual Maximum at the Tier 1 Supply Rate provided that System Water is available. This Purchase Order governs pricing of the System Water delivered to the Purchaser pursuant to this Purchase Order and does not confer any entitlement to receive System Water.

System Water provided to the Purchaser under the terms of this Purchase Order shall be subject to reduction in accordance with the shortage allocation provisions of the Water Surplus and Drought Management Plan (the "WSDM Plan") or other such policies and principles governing the allocation of System Water as adopted by the Board.

In the event that Metropolitan's Board determines to reduce, interrupt or suspend deliveries of System Water (excluding deliveries of System Water made under the Interim Agricultural Water Program and Long-term Seasonal Storage Service) any outstanding balance of the Purchase Order Commitment at the end of the Term shall be reduced by the reduction in System Water made available to the Purchaser under this Purchase Order.

MISCELLANEOUS:

This Purchase Order will be interpreted, governed and enforced in accordance with the laws of the State of California.

This Purchase Order will apply to and bind the successors and assigns of the Purchaser and Metropolitan.

No assignment or transfer of the rights of the Purchaser under this Purchase Order will be valid and effective against Metropolitan or the Purchaser without the prior written consent of Metropolitan and the Purchaser.

If at any time during the Term, by reason of error in computation or other causes, there is an overpayment or underpayment to Metropolitan by the Purchaser of the charges provided for under this Purchase Order, which overpayment or underpayment is not accounted for and corrected in the annual re-determination or reconciliation of said charges, the amount of such overpayment or underpayment shall be credited or debited, as the case may be, to the Purchaser. .Metropolitan will notify the Purchaser in writing regarding the amount of such credit or debit, as the case may be. In no case will credits or debits for charges provided for under this Purchase Order be administered beyond the limit for billing adjustments as specified in Metropolitan's Administrative Code.

IN WITNESS WHEREOF, this Purchase Order is executed by the duly authorized officers of the Metropolitan Water District of Southern California and [Purchaser], to be effective January 1, 2003.

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

By: _____
Ronald R. Gastelum
Chief Executive Officer

WESTERN MUNICIPAL WATER DISTRICT OF RIVERSIDE COUNTY

By: _____

[Title] GENERAL MANAGER

APPROVED AS TO FORM AND CONTENT:

_____
General Counsel

Best Best & Krieger LLP
General Counsel

By: _____

By: _____

Attachment 1
Purchase Order for Imported Water Supplies
DEFINITIONS

"Act" means the Metropolitan Water District Act, California Statutes 1969, Chapter 209, as amended and supplemented from time to time.

"Base Demand" means the greater of (i) the Initial Base Demand or (ii) the ten-year rolling average of the Purchaser's Firm Demand, measured on a fiscal year basis.

"Bonds" means water revenue bonds or notes issued under the Bond Resolutions.

"Bond Resolutions" means Resolution No. 8329 or Resolution No. 8322, both as amended and supplemented, or any other resolution authorizing the issuance of bonds, notes or other obligations secured by Metropolitan's water sales revenues.

"Effective Date" means the effective date of this Purchase Order as specified above.

"Firm Demand" means the Purchaser's purchases of non-surplus System Water supplies, including full-service and seasonal shift deliveries.

"Initial Base Demand" means the Purchaser's highest annual Firm Demand on Metropolitan in any fiscal year during the period from fiscal year 1989/90 through fiscal year 2001/02. In accordance with procedures set forth in Metropolitan's Administrative Code, the Initial Base Demand will be revised to reflect certified and verified deliveries under the Interim Agricultural Water Program and Long-term Seasonal Storage Service Program as such certifications affect the Initial Base Demand.

"Metropolitan" means The Metropolitan Water District of Southern California.

"Purchase Order Commitment" means 60% of the Initial Base Demand times 10. Deliveries of System Water made under the Interim Agricultural Water Program and Long-term Seasonal Storage Service, will not count toward the Purchase Order Commitment.

"Purchase Order" means this Purchase Order.

"Purchaser" means the member public agency specified above, a duly organized [city/water district/county water authority] of the State of California.

"System" means the properties, works and facilities of Metropolitan necessary for the supply, development, storage, conveyance, distribution, treatment or sale of water.

"System Water" means water supplies developed by Metropolitan and delivered to the Purchaser through the System or other means (e.g. conjunctive use storage).

"Term" means the term of this Purchase Order as specified above.

"Tier 1 Annual Maximum" means an amount equal to 90% of the Base Demand.

"Tier 1 Supply Rate" means Metropolitan's per-acre-foot Tier 1 Supply Rate, as determined from time to time by Metropolitan's Board of Directors. The initial Tier 1 Rate is $73/AF.

"Tier 2 Supply Rate" means Metropolitan's per-acre-foot Tier 2 Supply Rate, as determined from time to time by Metropolitan's Board of Directors. The initial Tier 2 Rate is $154/AF.

"Water Surplus and Drought Management Plan (WSDM)" means Metropolitan's policy and procedures for managing supplies and drought conditions as adopted by the Board from time to time.

Attachment 2
Purchase Order for Imported Water Supplies
RATES AND CHARGES

	Effective January 1, 2003
Tier 1 Supply Rate ($/af)	$73
Tier 2 Supply Rate ($/af)	$154
System Access Rate ($/af)	$141
System Power Rate ($/af)	$89
Water Stewardship Rate ($/af)	$23
Untreated Long-term Storage Water Rate ($/af)	$233
Untreated Interim Agricultural Water Program ($/af)	$236
Treated Long-term Storage Water Rate ($/af)	$290
Treated Interim Agricultural Water Program ($/af)	$294
Treatment Surcharge ($/af full-service)	$82
Readiness-to-Serve Charge ($millions)	$80.0
Capacity Reservation Charge ($/cfs)	$6,100
Peaking Surcharge ($/cfs)	$18,300

NON-POTABLE WATER PROJECT AGREEMENT CITY OF RIVERSIDE AND WESTERN MUNICIPAL WATER DISTRICT OF RIVERSIDE COUNTY

AGREEMENT, made this 5th day of March 2003 between the City of Riverside ("City") , a municipal corporation, and Western Municipal Water District of Riverside County ("Western"), a municipal water district.

RECITALS:

1. The City owns and operates a municipal water supply system which provides water for domestic and irrigation purposes. Included as part of the City's water system are wells, pipelines and appurtenant facilities located in the Colton and Riverside Basins, and in the San Bernardino Basin Area, as those areas are described in the Judgment in *Western Municipal Water District v. East San Bernardino Water District*, Riverside Superior Court No. 78426.

2. Western also owns and operates potable and non-potable water supply systems which provide water service to the eastern portion of the City located at high elevations, and to adjacent areas located outside of the City but within the City's sphere of influence. Western's present water supply comes from The Metropolitan Water District of Southern California ("MWD"), and is used for both domestic purposes and the irrigation of

agricultural and other lands. Western has a need for non-potable water to be used for irrigation purposes in lieu of deliveries from MWD.

3. The Santa Ana Watershed Project Authority ("SAWPA") is a joint powers agency established for the protection of water quality and supply within the Santa Ana River Watershed. One SAWPA project, known as Project No. 16, calls for additional pumping of non-potable water from the Colton and Riverside Basins in order to lower the groundwater table, to enhance storm flow recharge, and thereby to improve the quality of groundwater in the Basin.

4. The City also owns and operates the Riverside Canal, which transports water from the Colton and Riverside Basins as far as Jefferson Street in the City. At times, the Canal also carries storm flow runoff.

5. Western also asserts that it may have groundwater available from the San Bernardino Basin Area and the Colton and Riverside Basins pursuant to agreements with the San Bernardino Valley Municipal Water District and the Elsinore Valley Municipal Water District (as successor to the rights of Agua Mansa and Meeks & Daley mutual water companies).

6. The purpose of this Agreement is to provide for the sale of non-potable water from the City to Western and to allow the limited use of surplus capacity in the Riverside Canal, and in City pipelines and appurtenant facilities, when such capacity is available, in order to supply non-potable water to Western; to improve the quality of groundwater in the Colton and Riverside Basins; and to assist in the improvement of the Riverside Canal.

7. Western represents, as the appropriate lead agency for the project, that all proceedings required under the California Environmental Quality Act ("CEQA") in order to permit approval of the project, and execution of this Agreement have been completed in accordance with law, and to the satisfaction of SAWPA and the State Water Resources Control Board for purposes of grant funding.

8. Proposition 13, adopted by the California voters in March of 2000, authorized the Southern California Integrated Watershed Program ("SCIWP") for the purpose of allocating Proposition 13 Water Bond Funds. The Santa Ana Watershed Project Authority, which acts initially as the State of California's representative for funding under the SCIWP, recommended to the State for approval and the State has now approved, a $5,250,000 grant to the City of Riverside for the reconstruction of portions of the Riverside Canal, and a $7,425,000 grant to Western for the non-potable water project. Both of these grants have now been approved by the State Water Resources Control Board. The City's grant is subject to the execution of this Agreement.

Based upon the foregoing facts, and in consideration of the mutual covenants of the parties, it is hereby agreed as follows:

9. Supply. To the extent that the City has surplus non-potable water available, the City shall sell to Western such quantities of non-potable water as Western may determine it needs, subject to two conditions: (1) such quantities shall not exceed a rate of flow of 7,200 gpm and 6,000 acre-feet per year at the point of delivery, and (2) surplus capacity is available in the Riverside Canal for the delivery of such water to Western. The wells to be used for such purpose shall be determined by the City in its sole discretion, provided that the City shall use its best efforts to use wells best suited to accomplish the purposes of SAWPA's Project 16, as identified in the SAWPA Project Information Form for Potential SCIWP Funding, a copy of which is attached hereto as Exhibit A. The City, at its sole discretion, may provide surplus water to Western in excess of the quantities stated above, but Western shall have no right under this agreement to demand such sale.

The City makes no representations or warranties as to the capacity of its wells or the quality of the water to be sold. The City will use its best efforts to sell whatever amounts of non-potable water that may be requested by Western, but does not guarantee either the quantity or timing of such deliveries. The parties recognize (aside from capacity limitations)

that the City's facilities and the Riverside Canal may sometimes be shut down for repairs, or the Canal may be unavailable because of storm flow conditions.

If the City does not have sufficient non-potable water to sell and meet the 7,200 gpm/6,000 acre-feet per year quantities identified above, Western may acquire such supplies, in whole or in part, from others who pump from the Santa Ana River System, or from its own wells, for delivery through the Riverside Canal. Western shall bear the full cost of constructing and operating facilities necessary to deliver water into the Riverside Canal other than the City's wells. In addition, with City approval, Western may utilize surplus capacity in the Riverside Canal, as set forth below, to convey water which Western may acquire from the Santa Ana River System.

Any water introduced by Western into the Canal shall not result in the diminution of the beneficial use or quality of the water otherwise in the Canal. Any such water shall only be introduced if City has approved point of delivery of any such water and quality of such water. Western shall construct, operate and pay for all facilities necessary to take water from the pont of delivery.

10. Riverside Canal Capacity. The surplus carrying capacity existing from time to time in the Riverside Canal for the transportation of non-potable water shall be subject to: (1) the City's own present and future uses for the Canal; (2) the carrying rights of the

Elsinore Valley Municipal Water District, as successor to the Confirming Agreement with the Temescal Water Company, dated November 18, 1974, or to any party holding rights thereto by agreement with Elsinore Valley Municipal Water District; (3) the Water Exchange Agreement between the City and The Gage Canal Company, dated March 12, 1991; and (4) any use of the canal for storm flow runoff. The Canal capacity subject to this Agreement extends from its headworks, downstream to approximately Jefferson Street in the City.

11. Pumping and Transportation Payments. The pricing structure for all water pumped and delivered by the City to Western pursuant to this Agreement shall be based upon the incremental costs incurred by the City. It is the intent of the parties that such costs will be calculated so that financially the City is no better off, nor worse off, than it would be in the absence of water deliveries to Western. Initially, Western shall pay the City $38 per acre-foot for non-potable delivered water. This total is based on the cost of the following components: (a) energy to pump groundwater from wells, $20 per acre-foot; (b) well and well pump operating labor and maintenance, $11 per acre-foot; (c) amortization of well rehabilitation, $2 per acre-foot; and (d) additional maintenance or other legally-required improvement to Riverside Canal from Arlington to Jefferson, $5 per acre-foot. Such incremental cost does not include a general fund transfer fee, which is currently set by the Riverside City Council at 11.5%.

To the extent that Western may convey water through the Riverside Canal that is not pumped by the City, as provided in Section 9 above, Western shall pay only the costs of additional maintenance of the Riverside Canal from Arlington to Jefferson Street, as provided in Section 11(d) above. Charges for the use of the Riverside Canal for water delivered to Western pursuant to Agua Mansa and Meeks & Daley water rights, and agreement with Elsinore Valley Municipal Water District, are governed by prior agreements affecting those rights, and are not subject to this Agreement. Western's rights to the use of surplus capacity in the Riverside Canal, as provided herein, are in addition to any rights that Western may hold pursuant to agreement with the Elsinore Valley Municipal Water District.

The prices paid by Western hereunder shall be reviewed periodically as requested by either party, and shall be adjusted as may be necessary to reflect changes in any incremental cost components associated with this Agreement.

12. Point of Delivery and Metering. The point of delivery to Western of water sold or transported pursuant to this Agreement shall be at the end of the active portion of Riverside Canal near Jefferson Street. Western shall install, maintain and calibrate a meter on the discharge side of its pumps at the point of delivery. Charges shall be determined on the basis of such metered deliveries. Western shall present evidence that the meter is properly calibrated and read. The City may require the meter to be recalibrated. Western

shall have the sole responsibility to construct, operate and pay for all facilities necessary to take the water from the point of delivery for use within its own service area.

13. Treatment of Delivered Water. Western at its own expense shall have the right to treat the non-potable water delivered hereunder, and to put all or any part of such deliveries to any beneficial use for which the treated water is appropriate; provided that Western shall not require any degree of quality of the non-potable water delivered in order to make such water treatable for domestic use, or to complain otherwise about any condition affecting the Riverside Canal that would preclude the use of water delivered hereunder for domestic purposes. This Agreement shall not preclude the City from using the Riverside Canal for transmission and/or delivery of recycled water. The quality of the water shall be in accordance with California Code of Regulations, Title 22, Section 60304(a)(5), pertaining to use of recycled water for irrigation of unrestricted access golf courses.

14. Elsinore Water. By agreement with the Elsinore Valley Municipal Water District, Western has the right to 9 cfs of water from the former Meeks & Daley, Agua Mansa wells ("Elsinore Water"), and carrying rights for such water in the Gage or Riverside Canals. Western shall have the right to deliver its Elsinore water, whenever it is available, through the Riverside Canal and the City's storm drain system for discharge to the Santa Ana River. So long as the City delivers to Western 7,200 gpm/6,000 acre-feet per year of non-potable water, Western shall not utilize the City's Olivewood booster station to take delivery

of its Elsinore water at the Gage Canal, and instead will discharge such water to the Santa Ana River through the City's storm drain system. If the City does not deliver to Western 7,200 gpm/6,000 acre-feet per year of non-potable water, then Western will still take delivery of any Elsinore water from the Riverside Canal at its Jefferson Street pump station, provided Western's pump station and pipeline to the Gage Canal are operational. However, if such facilities are not operational, then Western reserves the right to require delivery of its Elsinore water at the end of the Gage Canal.

15. Recordation Filings. The City shall include all Riverside Basin pumping for delivery to Western in its Notices filed pursuant to Water Code Sections 5000 et seq. Western, however, does not waive any claim to the water rights associated with such pumping.

16. Indemnity. Except as to sole negligence, or willful misconduct of City, Western shall defend, indemnify and hold City, their officers, agents, and employees harmless from and against any and all liability, loss, expense (including reasonable attorneys' fees), or claims for injury or damages arising out of this Agreement to the extent such liability, loss, expense, attorneys' fees, or claims for injury or damages are caused by or resulting from the acts or omissions of Western, its officers, agents, or employees. The parties expressly agree that any payment, attorney fee, cost or expense City incurs or makes to or on behalf of an injured employee under City's self-administered workers' compensation

program is included as a loss, expense or cost. The provisions of this paragraph shall survive the expiration or early termination of this Agreement.

17. Term. The term of this Agreement shall be for 20 years, commencing when the City first delivers water to Western hereunder. The parties may renew the Agreement for an additional 20-year term, subject to re-negotiation of costs on an incremental basis, and approval thereof shall not be unreasonably withheld. If the City decides to abandon the Riverside Canal during the term of this Agreement, or any renewal thereof, Western shall have an option to acquire the City's interest in the portion of the Riverside Canal covered by this Agreement at the fair market value of the property at the time the option is exercised, and subject to whatever obligations may then exist.

18. Integration. This Agreement constitutes the final, complete, and exclusive statement of the terms of the agreement between the Parties pertaining to the subject matter of this Agreement, and supersedes all prior and contemporaneous understandings or agreements of the parties. Neither party has been induced to enter into this Agreement by, and neither party is relying on, any representation or warranty outside those expressly set forth in this Agreement.

19. CEQA. If any court, governmental official, agency, department or bureau having jurisdiction over activities arising out of this Agreement or under Project 16, requires

further review or compliance under the California Environmental Quality Act ("CEQA) by or from the City, Western shall, at its own expense, comply with all such requirements. Western shall also reimburse the City for any costs the City may incur in complying with such CEQA requirements or in any lawsuit arising out of such CEQA requirements, including but not limited to attorneys' fees, filing fees or other court costs, any costs incurred in connection with any lawsuits brought against City as a result of this Agreement, and any costs of environmental studies and reviews.

IN WITNESS WHEREOF, the parties have executed this Agreement, to be effective on the date above written.

CITY OF RIVERSIDE

By _____
City Manager

ATTEST:

_____
City Clerk
City of Riverside

APPROVED AS TO FORM:

_____
City Attorney

WESTERN MUNICIPAL WATER
DISTRICT OF RIVERSIDE COUNTY

By: _____

President

ATTEST:

_____

Secretary

APPROVED AS TO FORM:

BEST BEST & KRIEGER LLP

By: _____

Arthur L. Littleworth

AMENDMENT NO. 1

AGREEMENT BETWEEN THE WESTERN MUNICIPAL WATER DISTRICT OF RIVERSIDE COUNTY AND THE ELSINORE VALLEY MUNICIPAL WATER DISTRICT FOR THE RECIPROCAL USE OF CERTAIN ASSETS RELATED TO THE PRODUCTION AND/OR CONVEYANCE OF WATER

THIS FIRST AMENDMENT ("Amendment") is executed by and between the WESTERN MUNICIPAL WATER DISTRICT OF RIVERSIDE COUNTY, a municipal water district ("Western"), and the ELSINORE VALLEY MUNICIPAL WATER DISTRICT, a municipal water district ("EVMWD"). Western and EVMWD are sometimes hereinafter individually referred to as "Party" and hereinafter collectively referred to as the "Parties." This Amendment shall be considered by the Parties to be dated and effective as of February 1, 2003.

RECITALS

A. Western and EVMWD are parties to an agreement dated August 23, 2001, entitled "Agreement Between the Western Municipal Water District of Riverside County and the Elsinore Valley Municipal Water District for the Reciprocal Use of Certain Assets Related to the Production and/or Conveyance of Water" (hereinafter "Reciprocal Use Agreement"). In general, the Reciprocal Use Agreement provides that subject to specified terms and conditions, EVMWD may use up to nine (9.0) cubic feet per second (cfs) of capacity in Reaches A through F of the Mills Pipeline to receive water, and Western may use certain groundwater production rights and facilities, and certain canal carrying rights owned by EVMWD ("EVMWD Assets"), to produce and convey up to nine (9.0) cubic feet per second of water.

B. Western is also party to an agreement with the Orange County Water District ("OCWD"), dated December 16, 2001 ("OCWD Agreement"), which provides that subject to certain terms and conditions, the groundwater produced and conveyed by Western with the EVMWD Assets shall be discharged by Western into the Santa Ana River, and OCWD shall pay Western $150.00 for every acre-foot of delivered groundwater, for purposes of helping recharge groundwater resources in Orange County.

C. EVMWD has determined that the EVMWD Assets are capable of producing and conveying additional quantities of groundwater, and Western and EVMWD now desire to amend the Reciprocal Use Agreement to provide for the delivery and conveyance of additional quantities of groundwater to meet the purposes identified in the Reciprocal Use Agreement and the OCWD Agreement.

NOW THEREFORE, in consideration of the mutual covenants and conditions stated herein and other valuable consideration, the sufficiency of which is hereby acknowledged, the Parties agree as follows:

TERMS

1.0 Section 3.3 Added to Reciprocal Use Agreement. A new Section 3.3 is hereby added to the Reciprocal Use Agreement to read as follows:

> "3.3 Production, Conveyance, and Payment of Additional Water. Notwithstanding Sections 3.0 and 3.1 of this Agreement, and subject to the availability of water and capacity in the EVMWD Assets, EVMWD may produce and deliver to Western, at the locations designated in Section 3.1 of this Agreement, more than nine (9.0) cfs of water. Notwithstanding Section 3.2 of this Agreement, if during any one (1) month, EVMWD produces and delivers to Western, at the locations designated in Section 3.1 of this Agreement, more than five hundred and forty three (543) acre-feet of water, then Western shall pay to EVMWD one hundred and fifty dollars ($150.00) for every acre-foot of water produced and delivered to Western during that month in excess of five hundred and forty three (543) acre-feet, and no other charges shall be applied or assessed to Western for the production or delivery of such water. Western, however, shall have no obligation to make any payment for water delivered by EVMWD pursuant to this Section during such times as the water would escape to the ocean and not be available for recharge purposes within Orange County; provided that Western has given notice to EVMWD of such conditions."

2.0 Affirmation of Reciprocal Use Agreement. Except as amended by this Amendment, all provisions of the Reciprocal Use Agreement shall remain in full force and effect and shall govern the actions of the Parties. Each Party represents and warrants to the other that except as amended by this Amendment, there have been no written or oral modifications of the Reciprocal Use Agreement. Each Party ratifies and reaffirms each and every one of their respective rights and obligations arising under the Reciprocal Use Agreement. Each Party represents and warrants to the other that the Reciprocal Use Agreement is currently an effective, valid, and binding obligation.

3.0 Definitions. Terms not otherwise expressly defined in this Amendment, shall have the meaning and intent set forth in the Reciprocal Use Agreement.

IN WITNESS WHEREOF, the Parties have caused this Amendment to be executed by their respective duly authorized officers.

WESTERN MUNICIPAL WATER DISTRICT OF RIVERSIDE COUNTY

By: _____
President

Date: 4-16-03

ELSINORE VALLEY MUNICIPAL WATER DISTRICT

By: _____
President

Date: 4/23/04

PURCHASE ORDER FOR IMPORTED WATER SUPPLY TO BE PROVIDED BY THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

PURCHASER: **Western Municipal Water District of Riverside County**	**TERM** 10 years
INITIAL BASE DEMAND: **65,298.5** acre-feet	**EFFECTIVE DATE:** January 1, 2003
INITIAL TIER 1 ANNUAL MAXIMUM: **58,768.7** acre-feet	
PURCHASE ORDER COMMITMENT: **391,791.0** acre-feet	

Definitions of capitalized terms used in this Purchase Order are provided in Attachment 1. Terms used in this Purchase Order and not defined in Attachment 1 are defined in Metropolitan's Administrative Code.

COMMITMENT TO PURCHASE.

In consideration of Purchaser's commitment to purchase System Water pursuant to this Purchase Order, Metropolitan agrees to sell such System Water to Purchaser at the Tier 1 Supply Rate each year in an amount up to the Tier 1 Annual Maximum. System Water sold to Purchaser (excluding deliveries of System Water made under the Interim Agricultural Water Program and Long-term Seasonal Storage Service) in an amount greater than the Tier 1 Annual Maximum shall be sold to the Purchaser at the Tier 2 Supply Rate. In connection with the receipt of System Water, the Purchaser also agrees to pay all other applicable rates and charges, as established by Metropolitan from time to time in accordance with Section 4304 of the Administrative Code. The rates and charges applicable to System Water as of the Effective Date are shown in Attachment 2.

Purchaser agrees to purchase System Water from Metropolitan during the Term in an amount (excluding deliveries of System Water, made under the Interim Agricultural Water Program and Long-term Seasonal Storage Service) not less than the Purchase Order Commitment.

Purchaser recognizes and agrees that Metropolitan has relied and will, during the term of this Purchase Order, rely on this commitment by Purchaser in setting its rates and charges, planning and providing its capital facilities and developing its water supply, management and reliability programs. If Purchaser's applicable System Water purchases during the Term are less than the Purchase Order Commitment, Purchaser agrees to pay Metropolitan an amount equal to the difference between the Purchase Order Commitment and Purchaser's applicable System Water purchases during the Term times the average of the Tier 1 Supply Rate in effect during the Term. The Purchaser agrees to pay such amount to Metropolitan within the next regular billing cycle following the reconciliation of all certifications for special programs that the Purchaser may participate in (e.g. Interim Agricultural Water Program, Long-term Seasonal Storage Service). The Purchaser may elect to pay such amount in twelve equal monthly

payments over the course of the next twelve months beginning with the first regular billing cycle following the reconciliation of all outstanding certifications for special programs. If the Purchaser elects to pay such amount over the course of the next twelve months following the regular billing cycle any outstanding balance shall bear interest at Metropolitan's then current investment portfolio average yield. All other amounts payable under this Purchase Order shall be billed and paid in accordance with the Administrative Code.

The Purchaser further recognizes that this Purchase Order is entered into for the direct benefit of the holders and owners of Metropolitan's Bonds issued from time to time under the Act and the Bond Resolutions, and the income and revenues derived from this Purchase Order will be pledged for the purposes set forth in the Bond Resolutions, including the payment of principal of and interest on such Bonds.

RENEWAL:

Prior to but not later than December 31, 2010, the Purchaser may provide a non-binding written notice to Metropolitan of the Purchaser's determination to extend this Purchase Order. Upon the receipt of such notice, the Board of Directors of Metropolitan (the "Board") shall determine whether Metropolitan will continue to provide System Water to member agencies by Purchase Order. If the Board so determines, the Purchaser and Metropolitan shall amend this Purchase Order to include an extended term and/or to include such other terms and conditions as may be mutually agreed by the parties. If the Purchaser elects not to renew this Purchase Order it will terminate upon the expiration of the Term.

WATER SERVICE:

Conditions of water service by Metropolitan to the Purchaser, including but not limited to (i) delivery points, (ii) water delivery schedules, and (iii) water quality, will be determined in accordance with Chapter 5 (Section 4500 through 4514, inclusive, as applicable) of Metropolitan's Administrative Code.

In accordance with its Administrative Code, Metropolitan shall use its reasonable best efforts to supply System Water in the quantities requested by the Purchaser, but is not obligated to dedicate any portion of System capacity for the conveyance, distribution, storage or treatment of System Water for the benefit of the Purchaser or any other member agency. Metropolitan shall use its reasonable best efforts to deliver the Base Demand when needed by the Purchaser during the Term; provided however, there shall be no default under this Purchase Order if Metropolitan fails to deliver water to the Purchaser in accordance with any such schedule of deliveries during the Term.

By execution of this Purchase Order, the Purchaser recognizes and agrees that it acquires no interest in or to any portion of the System or any other Metropolitan facilities, or any right to receive water delivered through the System, excepting the right to purchase up to Purchaser's Tier 1 Annual Maximum at the Tier 1 Supply Rate provided that System Water is available. This Purchase Order governs pricing of the System Water delivered to the Purchaser pursuant to this Purchase Order and does not confer any entitlement to receive System Water.

System Water provided to the Purchaser under the terms of this Purchase Order shall be subject to reduction in accordance with the shortage allocation provisions of the Water Surplus and Drought Management Plan (the "WSDM Plan") or other such policies and principles governing the allocation of System Water as adopted by the Board.

In the event that Metropolitan's Board determines to reduce, interrupt or suspend deliveries of System Water (excluding deliveries of System Water made under the Interim Agricultural Water Program and Long-term Seasonal Storage Service) any outstanding balance of the Purchase Order Commitment at the end of the Term shall be reduced by the reduction in System Water made available to the Purchaser under this Purchase Order.

MISCELLANEOUS:

This Purchase Order will be interpreted, governed and enforced in accordance with the laws of the State of California.

This Purchase Order will apply to and bind the successors and assigns of the Purchaser and Metropolitan.

No assignment or transfer of the rights of the Purchaser under this Purchase Order will be valid and effective against Metropolitan or the Purchaser without the prior written consent of Metropolitan and the Purchaser.

If at any time during the Term, by reason of error in computation or other causes, there is an overpayment or underpayment to Metropolitan by the Purchaser of the charges provided for under this Purchase Order, which overpayment or underpayment is not accounted for and corrected in the annual re-determination or reconciliation of said charges, the amount of such overpayment or underpayment shall be credited or debited, as the case may be, to the Purchaser. .Metropolitan will notify the Purchaser in writing regarding the amount of such credit or debit, as the case may be. In no case will credits or debits for charges provided for under this Purchase Order be administered beyond the limit for billing adjustments as specified in Metropolitan's Administrative Code.

IN WITNESS WHEREOF, this Purchase Order is executed by the duly authorized officers of the Metropolitan Water District of Southern California and [Purchaser], to be effective January 1, 2003.

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

By: Ronald R. Gastelum
Ronald R. Gastelum
Chief Executive Officer

WESTERN MUNICIPAL WATER DISTRICT OF RIVERSIDE COUNTY

By:
[Title] GENERAL MANAGER

APPROVED AS TO FORM AND CONTENT:

General Counsel

Best Best & Krieger LLP
General Counsel

By:

By: Steven M. Anderson

Attachment 1
Purchase Order for Imported Water Supplies
DEFINITIONS

"Act" means the Metropolitan Water District Act, California Statutes 1969, Chapter 209, as amended and supplemented from time to time.

"Base Demand" means the greater of (i) the Initial Base Demand or (ii) the ten-year rolling average of the Purchaser's Firm Demand, measured on a fiscal year basis.

"Bonds" means water revenue bonds or notes issued under the Bond Resolutions.

"Bond Resolutions" means Resolution No. 8329 or Resolution No. 8322, both as amended and supplemented, or any other resolution authorizing the issuance of bonds, notes or other obligations secured by Metropolitan's water sales revenues.

"Effective Date" means the effective date of this Purchase Order as specified above.

"Firm Demand" means the Purchaser's purchases of non-surplus System Water supplies, including full-service and seasonal shift deliveries.

"Initial Base Demand" means the Purchaser's highest annual Firm Demand on Metropolitan in any fiscal year during the period from fiscal year 1989/90 through fiscal year 2001/02. In accordance with procedures set forth in Metropolitan's Administrative Code, the Initial Base Demand will be revised to reflect certified and verified deliveries under the Interim Agricultural Water Program and Long-term Seasonal Storage Service Program as such certifications affect the Initial Base Demand.

"Metropolitan" means The Metropolitan Water District of Southern California.

"Purchase Order Commitment" means 60% of the Initial Base Demand times 10. Deliveries of System Water made under the Interim Agricultural Water Program and Long-term Seasonal Storage Service, will not count toward the Purchase Order Commitment.

"Purchase Order" means this Purchase Order.

"Purchaser" means the member public agency specified above, a duly organized [city/water district/county water authority] of the State of California.

"System" means the properties, works and facilities of Metropolitan necessary for the supply, development, storage, conveyance, distribution, treatment or sale of water.

"System Water" means water supplies developed by Metropolitan and delivered to the Purchaser through the System or other means (e.g. conjunctive use storage).

"Term" means the term of this Purchase Order as specified above.

"Tier 1 Annual Maximum" means an amount equal to 90% of the Base Demand.

"Tier 1 Supply Rate" means Metropolitan's per-acre-foot Tier 1 Supply Rate, as determined from time to time by Metropolitan's Board of Directors. The initial Tier 1 Rate is $73/AF.

"Tier 2 Supply Rate" means Metropolitan's per-acre-foot Tier 2 Supply Rate, as determined from time to time by Metropolitan's Board of Directors. The initial Tier 2 Rate is $154/AF.

"Water Surplus and Drought Management Plan (WSDM)" means Metropolitan's policy and procedures for managing supplies and drought conditions as adopted by the Board from time to time.

Attachment 2
Purchase Order for Imported Water Supplies
RATES AND CHARGES

	Effective January 1, 2003
Tier 1 Supply Rate ($/af)	$73
Tier 2 Supply Rate ($/af)	$154
System Access Rate ($/af)	$141
System Power Rate ($/af)	$89
Water Stewardship Rate ($/af)	$23
Untreated Long-term Storage Water Rate ($/af)	$233
Untreated Interim Agricultural Water Program ($/af)	$236
Treated Long-term Storage Water Rate ($/af)	$290
Treated Interim Agricultural Water Program ($/af)	$294
Treatment Surcharge ($/af full-service)	$82
Readiness-to-Serve Charge ($millions)	$80.0
Capacity Reservation Charge ($/cfs)	$6,100
Peaking Surcharge ($/cfs)	$18,300

WATER SUPPLY AGREEMENT
BETWEEN
CITY OF RIVERSIDE PUBLIC UTILITIES DEPARTMENT
AND
WESTERN MUNICIPAL WATER DISTRICT

WHEREAS, the City of Riverside (Riverside) has rights and access to certain water supplies in the Bunker Hill and Riverside basins in excess of its immediate needs; and

WHEREAS, depending on seasonal and other peaking constraints, the existing water system infrastructure is generally capable of transporting this water to the Western Municipal Water District (Western) facilities at Mockingbird; and

WHEREAS, Western presently purchases its water requirements from MWD at rates considerably higher than Riverside's marginal cost of delivery;

NOW, THEREFORE, Riverside agrees to provide this excess water to the Western Mockingbird Pumping Plant and Western agrees to purchase said water to the maximum extent possible, at a price intended to split the savings equally after accounting for each organizations incremental costs associated with this delivery. Based on the cost information detailed in Attachment A, the initial price to Western shall be set at $210/per acre foot. The cost information in Attachment A shall be reviewed at least annually and revised by the mutual consent of both parties.

FURTHERMORE, the Operating Divisions of both organizations shall develop operating protocols to effectively coordinate these water sales and provide for proper accounting and billing procedures.

This agreement supersedes any previous agreements or portions of agreements regarding potable water sales by Riverside to Western and shall be effective the last day signed and shall remain in effect until terminated by either party on 30 day notice.

Bill D. Carnahan
City of Riverside

10/21/96
Date

Don Harriger
Western Municipal Water District

10/16/96
Date

Attachment

WATER SUPPLY AGREEMENT
BETWEEN
CITY OF RIVERSIDE PUBLIC UTILITIES DEPARTMENT
AND
WESTERN MUNICIPAL WATER DISTRICT

ATTACHMENT "A"*

Riverside Incremental Costs

Riverside Well Pumping	$27/AF	
Riverside Booster Pumping	$27/AF	
Riverside O&M	$08/AF	
	Total:	$62/AF

Western Incremental Costs

Western Booster Pumping	$62/AF	
Western O&M	$04/AF	
		$66/AF

Total Incremental Costs: **$128/AF**

Calculation of Savings

Metropolitan Rate to Western	$425/AF
Less - Incremental Costs	($128)
Total Project Savings:	$297/AF

Split the Savings $297÷2 = $148/AF

Sale Price to Western

Riverside Savings	$148/AF	
Riverside Costs	$ 62/AF	
		$210/AF

*Costs based on no new facilities constructed, and equal split of savings between Riverside and Western.

Costs based on an incremental cost analysis and is independent of total sales under this agreement, which are projected to be between 1,200 and 2,000 AF/YR.

AGREEMENT BETWEEN THE WESTERN MUNICIPAL WATER DISTRICT OF RIVERSIDE COUNTY AND THE ORANGE COUNTY WATER DISTRICT FOR THE DELIVERY OF WATER

THIS AGREEMENT ("Agreement") is made by and between the WESTERN MUNICIPAL WATER DISTRICT OF RIVERSIDE COUNTY, a municipal water district ("Western"), and the ORANGE COUNTY WATER DISTRICT, a municipal water district ("OCWD"). Western and OCWD are sometimes hereinafter individually referred to as "Party" and hereinafter collectively referred to as the "Parties." This Agreement is dated this 16th day of December, 2001 for reference purposes only.

RECITALS

A. A comprehensive settlement affecting the waters of the Santa Ana River System was reached in 1969 which included two stipulated judgments in the cases of Orange County Water District v. City of Chino, et al., Orange County Superior Court Action No. 117628 ("Orange County Judgment"), and Western Municipal Water District of Riverside County v. East San Bernardino County Water District, et al., Riverside Superior Court Action No. 78426 ("Western Judgment").

B. Pursuant to an agreement dated August 23, 2001, between Western and the Elsinore Valley Municipal Water District ("EVMWD"), Western acquired the right to temporarily use certain groundwater production and conveyance assets owned by EVMWD ("EVMWD Assets") to produce and convey up to nine (9.0) cubic feet per second ("cfs") of water, for a maximum of 6,515.46 acre-feet per year. The EVMWD Assets are identified on the map set forth in Exhibit "A," and are more particularly described as follows:

1. Meeks and Daley Rights. EVMWD owns a controlling interest in the Meeks and Daley Water Company, a mutual water company and California corporation, which entitles EVMWD to 56% of the groundwater production rights and facilities, and 56% of the canal carrying rights owned by the Meeks and Daley Water Company ("Meeks and Daley Rights"). The Meeks and Daley Rights are more particularly described as follows:

a. The groundwater production rights and facilities owned by the Meeks and Daley Water Company are located in the San Bernardino Basin Area and are subject to the Western Judgment, which provides that the Meeks and Daley Water Company holds a right to produce up to 7,833 acre-feet per year in the San Bernardino Basin Area.

b. The canal carrying rights owned by the Meeks and Daley Water Company are located in the Riverside Canal and Gage Canal.

2. Palm Avenue Well. Separate and apart from EVMWD's interest in the Meeks and Daley Water Company, EVMWD also owns a well in the Riverside South Basin which is physically capable of producing water into the Riverside Canal and Gage Canal. The production rights of EVMWD in the Riverside South Basin are not specifically provided for in the Western Judgment.

C. Western and OCWD now desire to execute an agreement for the delivery of water by Western to OCWD through use of the EVMWD Assets, to help reduce high groundwater levels in the San Bernardino Basin Area and Riverside Basin Area through increased groundwater extractions, and to help recharge groundwater resources in Orange County by discharging the extracted groundwater into the Santa Ana River or its tributaries. The location of the wells that will be used in the program are shown on Exhibit B.

NOW THEREFORE, in consideration of the mutual covenants and conditions stated herein and other valuable consideration, the sufficiency of which is hereby acknowledged, the Parties hereby agree as follows:

TERMS

1.0 Delivery of Water. Western shall cause to be delivered into the Santa Ana River or its tributaries up to a maximum of 6,515 acre-feet of water per year beginning on the Effective Date of this Agreement.

1.1 Point and Schedule for Delivery. All water delivered by Western to OCWD under this Agreement shall be delivered to the Santa Ana River at such location(s) and at such time(s) as shall be mutually agreed on by both Parties. If the Parties are unable to agree on mutually acceptable location(s) or time(s) for delivery of the water, either Party may immediately terminate this Agreement upon providing written notice to the other Party.

1.2 Measuring and Accounting for Deliveries. The Parties shall mutually agree on a methodology for quantifying the water delivered by Western to OCWD under this Agreement. If the Parties are unable to agree on mutually acceptable methodology for quantifying the water delivered under this Agreement, either Party may immediately terminate this Agreement upon providing written notice to the other Party.

1.2.1 OCWD shall bear all losses of water which may occur between the point at which the water is discharged into the Santa Ana River or tributaries and the place of use by OCWD. Such deliveries shall not be considered as base flow under the Orange County Judgment, and the Upper Area districts (as defined in the Orange County Judgment) shall not be entitled to credit at Prado or Riverside Narrows for any such deliveries. All water delivered under this Agreement shall be in

addition to all obligations of the Upper Area districts under the Orange County Judgment.

1.2.2 All water delivered under this Agreement through Western's use of the Meeks and Daley Rights is part of the natural water supply to the San Bernardino Basin Area, and shall be appropriately accounted for by the Watermaster established under the Western Judgment. No water delivered under this Agreement is from the State Water Project.

1.3 No Minimum Delivery Guarantee. The actual amount of water delivered under this Agreement is contingent on groundwater extractions made by Western through its use of the EVMWD Assets. Western shall make a good faith effort to deliver as much water as feasible, but no minimum deliveries are assured. Western shall not be responsible or liable to OCWD, for any damage, injury, or economic loss suffered by OCWD, or any third party including its customers, due to any interruption, reduction, lack of flow, or cessation in deliveries of water made under this Agreement.

2.0 Water Quality. Western makes no warranty or representation as to the quality of the water delivered to OCWD pursuant to this Agreement, provided that such deliveries shall comply with any requirements of the Santa Ana Regional Water Quality Control Board. If such compliance is not feasible or other required approvals cannot be obtained, as determined by Western in its discretion, Western shall have the option to immediately terminate this Agreement upon providing written notice to OCWD. Western shall not be liable for any damage or injury to persons or facilities resulting from the quality of water delivered under this Agreement. Western shall provide OCWD all available historic water quality data on all wells utilized in this agreement within 30 days of execution of the agreement. All future water quality data on any wells in this program will also be transmitted to OCWD.

3.0 Water Rights Not Affected. No production or delivery of water under this Agreement shall confer any appropriative, overlying, public trust, or other water right on any person or entity. The only rights granted to the Parties as a result of this Agreement are those expressly set forth herein.

4.0 Permits and CEQA Compliance. Western shall be responsible for obtaining any permits and regulatory approvals, and shall be the lead agency for purposes of complying with the California Environmental Quality Act (CEQA).

5.0 Payment. OCWD shall pay to Western the sum of One Hundred and Fifty Dollars ($150.00) per acre-foot of water delivered to OCWD by Western in accordance with the terms of this Agreement. OCWD shall have no obligation to pay for water delivered by Western during such times as the water would escape to the ocean and not be available for recharge purposes within Orange County; provided that OCWD has given notice to Western of such conditions. During such times, Western shall have no

obligation under this Agreement to deliver water to OCWD. All sums owed under this Agreement shall be payable by OCWD within thirty (30) days of its receipt from Western of a written invoice indicating the amount of water delivered and the applicable charges as set forth in this section. Any amount not paid when due, shall bear interest at the maximum legal rate.

6.0 Term. This Agreement shall begin on the Effective Date and shall continue in effect until terminated in accordance with the provisions of this Agreement.

7.0 Termination. In addition to the rights of the Parties to terminate this Agreement as provided in other sections, this Agreement may be terminated in accordance with the following:

7.1 Termination by Notice. Either Party may terminate this Agreement by providing the other Party written notice that the Agreement will terminate on the date specified in the notice, which shall be no earlier than one (1) year from the date such notice is placed in the mail or delivered.

7.2 Termination for Nonpayment. Either Party may terminate this Agreement fifteen (15) days after providing written notice to the other Party of its failure to pay when due any sums required under this Agreement.

8.0 Effect of Termination. Within thirty (30) days of the termination of this Agreement, OCWD shall pay to Western all sums due and owing under this Agreement. Western's rights under this section are in addition to any legal rights and remedies which it may otherwise have in the event of a breach of this Agreement.

9.0 Assignment or Transfer of Agreement. Neither Party shall assign, hypothecate, or transfer, either directly or by operation of law, this Agreement or any interest or obligation herein without prior written consent of the other Party, which shall not be unreasonably withheld. Any attempt to do so shall be null and void, and any assignee, hypothecatee, or transferee shall acquire no right or interest by reason of such attempted assignment, hypothecation, or transfer.

10.0 Reciprocal Indemnities.

10.1 Western's Indemnification. Western agrees to indemnify, defend, and hold harmless OCWD, its officers, employees, and agents, from any and all claims, demands, causes of action, liability, loss, damage, injury, to property or persons, including wrongful death, whether imposed by a court of law or by administrative action of any federal, state, or local governmental body or agency arising out of or connected with Western's performance or non-performance of this Agreement. Western's indemnification obligation includes, without limitation, the payment of all penalties, fines, judgments, awards, decrees, attorneys fees, and related costs or expenses, and the

reimbursement of OCWD, its elected officials, officers, employees, and agents for all legal expenses and costs incurred by each of them. Western's indemnification obligation under this section shall survive the expiration or termination of this Agreement.

10.2 OCWD's Indemnification. OCWD agrees to indemnify, defend, and hold harmless Western, its officers, employees, and agents, from any and all claims, demands, causes of action, liability, loss, damage, injury, to property or persons, including wrongful death, whether imposed by a court of law or by administrative action of any federal, state, or local governmental body or agency arising out of or connected with: (1) use by OCWD, its customers, or other third parties of the water delivered to OCWD under this Agreement, or (2) OCWD's performance or non-performance of this Agreement. OCWD's indemnification obligation includes, without limitation, the payment of all penalties, fines, judgments, awards, decrees, attorneys fees, and related costs or expenses, and the reimbursement of Western, its elected officials, officers, employees, and agents for all legal expenses and costs incurred by each of them. Western's indemnification obligation under this section shall survive the expiration or termination of this Agreement.

11.0 Future Judicial Proceedings. In any future proceedings to interpret, modify or enforce the Orange County Judgment, or for violation thereof, neither this Agreement, nor any specific project subject to this Agreement, nor any previous agreements between or among any of the parties hereto, including, but not limited to the Agreement to Produce Additional Water From The Artesian Zone of the San Bernardino Basin Area and for Reimbursement of Costs, dated February 25, 1985; the Joint Participation Agreement Between the Orange County Water District, the Western Municipal Water District of Riverside County and the Santa Ana Watershed Project Authority for the Development and the Utilization of Desalted Water From the Arlington Desalter, dated July 6, 1988; the Agreement for Temporary Exchange of Well Water for Metropolitan Water District Water between the Western Municipal Water District of Riverside County, the Orange County Water District and the Municipal Water District of Orange County, dated May 22, 1991; and the Water Exchange and Storage Agreement between the Western Municipal Water District of Riverside County, the Orange County Water District and the City of Anaheim, dated August 24, 1993, or any action taken pursuant to such agreements, shall constitute an admission or precedent with respect to the meaning of the Judgment, or grounds for modification thereof, and shall not be offered into evidence (except for the purpose of giving effect to this paragraph). Nor shall any claim of laches, waiver or estoppel be made based upon the decision to approve and implement this Agreement rather than to seek a judicial resolution of the disagreement over the meaning of the Orange County Judgment concerning the rights of OCWD, or the limitation of such rights, to export or otherwise cause water to flow from the Upper to the Lower Area.

12.0 General Provisions.

12.1 Authority to Enter Agreement. Each Party warrants that the individuals who have signed this Agreement have the legal power, right, and authority make this Agreement and bind each respective Party.

12.2 Notice. All notices, demands, invoices, and written communications required to be provided under this Agreement, shall be delivered at following addresses or such other addresses as Parties may designate by written notice:

To Western:
Western Municipal Water District
Attn: General Manager
P.O. Box 5286
Riverside, California 92517-5286
Tel: 909-780-4170
Fax: 909-780-3837

To OCWD:
Orange County Water District
Attn: General Manager
P.O. Box 8300
Fountain Valley, CA 92728-8300
Tel: 714-378-3200
Fax: 714-378-3373

Depending on the method of transmittal, notice shall be deemed received as follows: by facsimile, as of the date and time sent; by messenger, as of the date delivered; and by U.S. Mail first class postage prepaid, as of seventy-two (72) hours after deposit in the U.S. Mail.

12.3 Amendment; Modification. No supplement, modification, or amendment of this Agreement shall be binding unless executed in writing and signed by the Parties.

12.4 Waiver. No waiver of any default shall constitute a waiver of any other default or breach, whether of the same or other covenant or condition. No waiver, benefit, privilege, or service voluntarily given or performed by a Party shall give the other Party any contractual right by custom, estoppel, or otherwise.

12.5 No Third Party Beneficiaries. There are no intended third party beneficiaries of any right or obligation assumed by the Parties.

12.6 Time is of the Essence. Time is of the essence in this Agreement, and the Parties agree to execute all documents and proceed with due diligence to complete all covenants and conditions.

12.7 Counterparts. This Agreement may be signed in counterparts, each of which shall constitute an original and which collectively shall constitute one instrument.

12.8 Entire Agreement. This Agreement contains the entire agreement between the Parties on the subject matter of this Agreement, and it supersedes any prior oral or written statements or agreements between the Parties.

13.0 Effective Date. This Agreement shall become effective on the date water is first delivered by Western to OCWD in accordance with the terms of this Agreement, even if such date precedes the date upon which the Parties sign this Agreement.

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed by their respective duly authorized officers.

WESTERN MUNICIPAL WATER DISTRICT OF RIVERSIDE COUNTY

By: _____
President

Date: December 16, 2001

ORANGE COUNTY WATER MUNICIPAL DISTRICT

By: _____
President

Date: 12-19-01

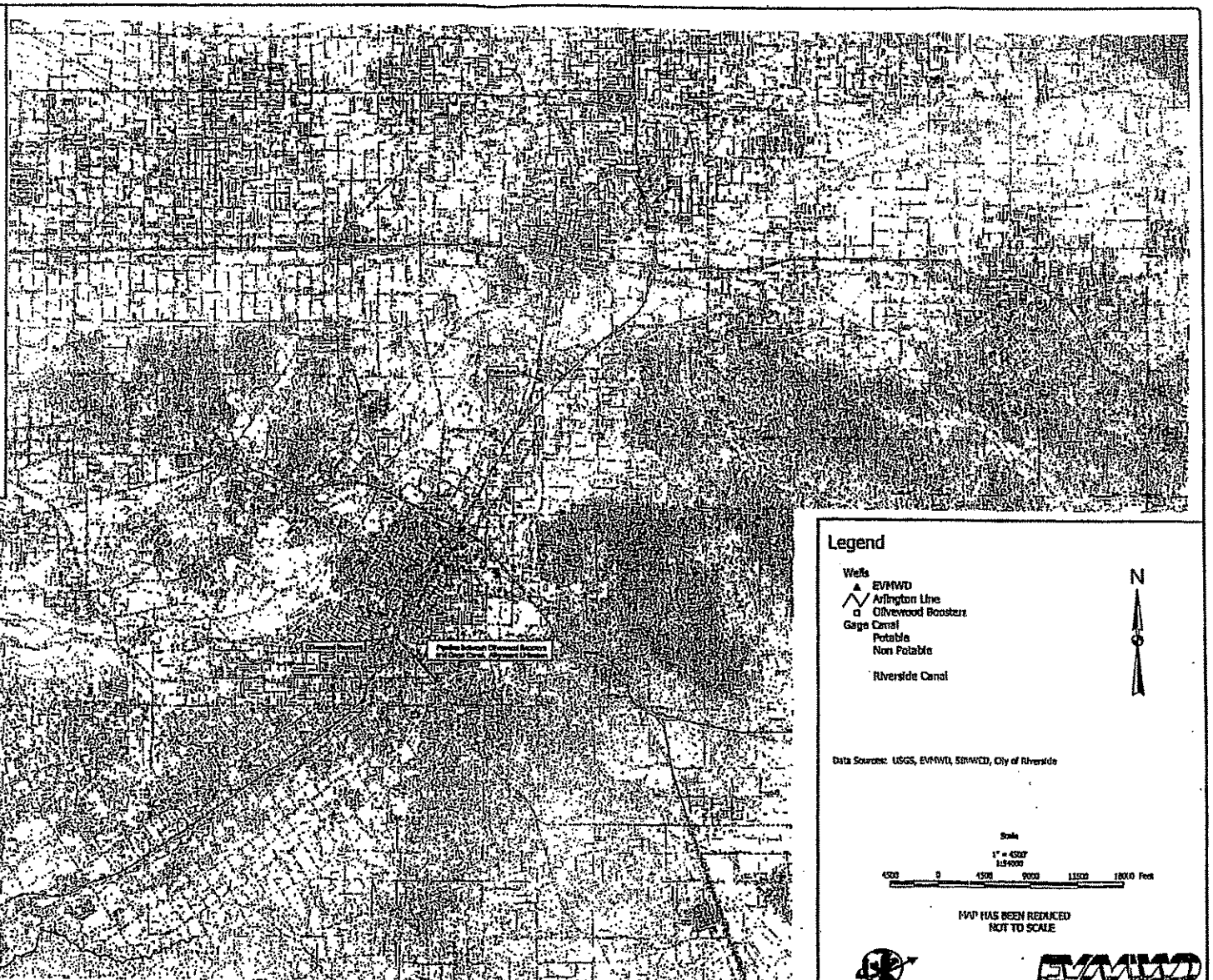
By: _____
General Manager

APPROVED AS TO FORM

By _____
General Counsel for
Orange County Water District

Mutual System Overview

Area of Interest



Legend

Wells
- EVMWD
- Arlington Line
- Olivewood Boosters

Gage Canal
- Potable
- Non Potable

Riverside Canal

N

Data Sources: USGS, EVMWD, SBVWCD, City of Riverside

Scale
1" = 4500'
1:54000
4500 0 4500 9000 13500 18000 Feet

MAP HAS BEEN REDUCED
NOT TO SCALE

EVMWD GIS

EVMWD
Elsinore Valley Municipal Water District

Appendix E
Best Management Practices (BMP) Report & DMM Information

BMP 03: System Water Audits, Leak Detection and Repair

Reporting Unit:	BMP Form Status:	Year:
Western MWD of Riverside County - Wholesale	**100% Complete**	**2004**

A. Implementation

1. Has your agency completed a pre-screening system audit for this reporting year?	no
2. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:	
a. Determine metered sales (AF)	
b. Determine other system verifiable uses (AF)	
c. Determine total supply into the system (AF)	
d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required.	0.00
3. Does your agency keep necessary data on file to verify the values used to calculate verifiable uses as a percent of total production?	yes
4. Did your agency complete a full-scale audit during this report year?	no
5. Does your agency maintain in-house records of audit results or the completed AWWA audit worksheets for the completed audit?	no
6. Does your agency operate a system leak detection program?	no
a. If yes, describe the leak detection program:	

B. Survey Data

1. Total number of miles of distribution system line.	275
2. Number of miles of distribution system line surveyed.	0

C. System Audit / Leak Detection Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No
a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."	

E. Comments

Western has no specific charge account to record labor costs associated with leak detection activities. The cost is charged to general maintenance activities.

BMP 07: Public Information Programs

Reporting Unit:	BMP Form Status:	Year:
Western MWD of Riverside County - Wholesale	**100% Complete**	**2004**

A. Implementation

1. Does your agency maintain an active public information program to promote and educate customers about water conservation? yes

a. If YES, describe the program and how it's organized.

Western's public affairs team broadcasts water information to customers via many activities. The activities are focused into categories including media information, customer communication, public information, Landscapes Southern California Style garden, consumer confidence report, government affairs, and water use efficiency programs.

2. Indicate which and how many of the following activities are included in your public information program.

Public Information Program Activity	Yes/No	Number of Events
a. Paid Advertising	no	0
b. Public Service Announcement	yes	1
c. Bill Inserts / Newsletters / Brochures	yes	8
d. Bill showing water usage in comparison to previous year's usage	yes	
e. Demonstration Gardens	yes	18
f. Special Events, Media Events	yes	10
g. Speaker's Bureau	yes	4
h. Program to coordinate with other government agencies, industry and public interest groups and media	yes	

B. Conservation Information Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	142624	145277
2. Actual Expenditures	111506	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Western's budget categories are not divided in such a way as to easily distinguish public information program expenditures solely for water conservation: The dollar amounts in section B above include all public information activities.

BMP 08: School Education Programs

Reporting Unit: **Western MWD of Riverside County - Wholesale**

BMP Form Status: **100% Complete**

Year: **2004**

A. Implementation

1.Has your agency implemented a school information program to promote water conservation? yes

2. Please provide information on your school programs (by grade level):

Grade	Are grade-appropriate materials distributed?	No. of class presentations	No. of students reached	No. of teachers' workshops
Grades K-3rd	yes	24	6981	0
Grades 4th-6th	yes	0	358	0
Grades 7th-8th	yes	0	0	0
High School	yes	0	22	0

3. Did your Agency's materials meet state education framework requirements? yes

4. When did your Agency begin implementing this program? 09/01/1982

B. School Education Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	61783	57065
2. Actual Expenditures	53564	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

No comments BMP 8 - Wholesale

BMP 10: Wholesale Agency Assistance Programs

Reporting Unit:
Western MWD of Riverside County - Wholesale

BMP Form Status:
100% Complete

Year:
2004

A. Implementation

1. Financial Support by BMP

BMP	Financial Incentives Offered?	Budgeted Amount	Amount Awarded	BMP	Financial Incentives Offered?	Budgeted Amount	Amount Awarded
1	yes	0	0	8	No	0	0
2	yes	0	0	9	yes	0	0
3	yes	0	0	10	yes	9573	8518
4	No	0	0	11	No	0	0
5	yes	20000	20000	12	No	0	0
6	yes	0	0	13	No	0	0
7	No	0	0	14	yes	0	0

2. Technical Support

a. Has your agency conducted or funded workshops addressing CUWCC procedures for calculating program savings, costs and cost-effectiveness?	No
b. Has your agency conducted or funded workshops addressing retail agencies' BMP implementation reporting requirements?	No
c. Has your agency conducted or funded workshops addressing:	
1) ULFT replacement	No
2) Residential retrofits	No
3) Commercial, industrial, and institutional surveys	No
4) Residential and large turf irrigation	No
5) Conservation-related rates and pricing	No

3. Staff Resources by BMP

BMP	Qualified Staff Available for BMP?	No. FTE Staff Assigned to BMP	BMP	Qualified Staff Available for BMP?	No. FTE Staff Assigned to BMP

1	yes	1	8	yes	1
2	yes	1	9	yes	1
3	yes	1	10	yes	1
4	yes	1	11	yes	1
5	yes	1	12	yes	1
6	yes	1	13	yes	1
7	yes	1	14	yes	1

4. Regional Programs by BMP

BMP	Implementation/ Management Program?	BMP	Implementation/ Management Program?
1	No	8	yes
2	No	9	No
3	No	10	No
4	No	11	No
5	No	12	No
6	No	13	No
7	No	14	No

B. Wholesale Agency Assistance Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	43212	41190
2. Actual Expenditures	35209	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

All BMP incentives offered by Metropolitan Water District of Southern California are passed through to Western's subagencies. Western and its subagencies participate in MWD's regional CII incentive program. Western's Board approved payment of 50% of it subagencies' CUWCC dues in 2003. Western sponsors a regional school education program and included activities in its general service area.

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
Western MWD of Riverside County - Wholesale	**100% Complete**	**2004**

A. Implementation

Rate Structure Data Volumetric Rates for Water Service by Customer Class

1. Residential	
a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	$28855660
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$261520
2. Commercial	
a. Water Rate Structure	
b. Sewer Rate Structure	
c. Total Revenue from Volumetric Rates	$
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$
3. Industrial	
a. Water Rate Structure	
b. Sewer Rate Structure	
c. Total Revenue from Volumetric Rates	$
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$
4. Institutional / Government	
a. Water Rate Structure	
b. Sewer Rate Structure	
c. Total Revenue from Volumetric Rates	$
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$
5. Irrigation	
a. Water Rate Structure	
b. Sewer Rate Structure	
c. Total Revenue from Volumetric Rates	$
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$
6. Other	
a. Water Rate Structure	
b. Sewer Rate Structure	
c. Total Revenue from Volumetric Rates	$
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$

B. Conservation Pricing Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

No comments regarding BMP 11 - Wholesale

BMP 12: Conservation Coordinator

Reporting Unit:	BMP Form Status:	Year:
Western MWD of Riverside County - Wholesale	**100% Complete**	**2004**

A. Implementation

1. Does your Agency have a conservation coordinator?	yes
2. Is this a full-time position?	yes
3. If no, is the coordinator supplied by another agency with which you cooperate in a regional conservation program ?	no
4. Partner agency's name:	N/A
5. If your agency supplies the conservation coordinator:	
a. What percent is this conservation coordinator's position?	60%
b. Coordinator's Name	TIM BARR
c. Coordinator's Title	COMMUNICATION SPECIALIST
d. Coordinator's Experience and Number of Years	13 YEARS
e. Date Coordinator's position was created (mm/dd/yyyy)	01/12/1994
6. Number of conservation staff, including Conservation Coordinator.	1

B. Conservation Staff Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	17029	12904
2. Actual Expenditures	19779	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	no
a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."	

D. Comments

ACTUAL EXPENDITURES ARE YEAR-TO-DATE TOTALS (11.30.04). BUDGET FIGURES FROM WMWD ACTIVITY A465 ONLY (COORDINATOR SALARY).

Water Conservation Incentive Program History

All Programs in Western's General Service Area

Year	Residential Programs: Ultra-Low-Flow Toilets unit quantity	Ultra-Low-Flow Toilets water savings(AF)	High Efficiency Clothes Washers unit quantity	High Efficiency Clothes Washers water savings(AF)
1995	-	-	-	-
1996	2359	82	-	-
1997	2450	85.6	-	-
1998	1780	62	-	-
1999	1708	59.7	-	-
2000	1384	48	-	-
2001	1468	51.3	-	-
2002	1914	66.9	204	3.3
2003	2182	76.2	1346	21.5
2004	1892	66.1	2317	37.1

Residential Water Savings Totals (savings in acre feet) current year	cumulative total	Year
0.0	0.0	1995
82.4	82.4	1996
85.6	250.4	1997
62.2	563.1	1998
59.7	853.0	1999
48.4	1191.2	2000
51.3	1580.8	2001
70.1	2040.5	2002
97.8	2597.9	2003
103.2	3258.6	2004

Year	Total Incentive Dollars: by Metropolitan ULFT	by Metropolitan HECW	Third Party Grants ULFT	Third Party Grants HECW	by Local Agency ULFT	by Local Agency HECW	Totals ULFT	Totals HECW
1995	-	-	-	-	-	-	-	-
1996	$141,540	-	-	-	$141,540	-	$283,080	-
1997	$147,000	-	$48,000	-	$70,650	-	$265,650	-
1998	$106,800	-	-	-	$74,760	-	$181,560	-
1999	$102,480	-	-	-	$69,738	-	$172,218	-
2000	$83,040	-	-	-	$58,128	-	$141,168	-
2001	$88,080	-	-	-	$42,252	-	$130,332	-
2002	$114,840	$7,140	-	$15,300	$45,378	$10,545	$160,218	$32,985
2003	$130,920	$47,110	-	$100,950	$44,466	$28,035	$175,386	$176,095
2004	$113,520	$81,095	-	$173,775	$41,271	$38,490	$154,791	$293,360

Average AF Cost of Water Saved (over the estimated life of device) ULFT (10years)	HECW (14 years)	Year
-	-	1995
$343.45	-	1996
$310.33	-	1997
$291.93	-	1998
$288.58	-	1999
$291.93	-	2000
$254.10	-	2001
$239.58	$721.84	2002
$230.05	$584.06	2003
$234.15	$565.23	2004

MINUTES
ADJOURNED REGULAR MEETING OF THE BOARD OF DIRECTORS
WESTERN MUNICIPAL WATER DISTRICT
OF RIVERSIDE COUNTY

January 12, 1994

14673 The adjourned regular meeting of the Board of Directors of Western Municipal Water District was held in the District office at 9:30 a.m., January 12, 1994.

14674 Directors Present:

Present

President Donald L. Schroeder, Presiding
Wayne C. Keith, Vice President
John M. Mylne III, Secretary-Treasurer
Wayne H. Holcomb
Frances J. Nelson

Others Present:

Donald L. Harriger, General Manager and Deputy Secretary-Treasurer
Norman L. Thomas, Manager of Engineering and Operations
Kenneth P. Weel, Manager of Finance
Renae M. Hinchey, Manager of Administration and Public Affairs
Anne Thomas, Best, Best & Krieger
Joan Seeley, Recording Secretary

Dick Smith, SAWPA
Mike Wright, SAWPA
Tim Quinn, MWD
Kathy Gibson, MWD
Doug Beeman, Press-Enterprise
Mrs. Liz Cunnison, Riverside

14675 President Schroeder appointed District Counsel, Anne Thomas, as Temporary Chairman. Ms. Thomas stated that this was the time and place to consider the election of a president, vice president and secretary-treasurer of the Board, and opened the floor for nominations for president. Director Mylne nominated Director Keith for the Office of President of the Board of Directors. Director Holcomb nominated Director Schroeder for the Office of President. Director Mylne moved that the nominations be closed. Director Nelson seconded the motion. Counsel Thomas asked for a show of hands of all those in favor of Director Keith as President. There were four ayes and one no vote. Counsel Thomas stated that by a majority vote of the Board, Director Keith is elected President of the Board of Directors.

M-4311
Election of President

M-4312
Election of
Vice
President

14676 Nominations were opened for the Office of Vice President of the Board of Directors. Director Nelson nominated Director Holcomb for the Office of Vice President. Director Mylne moved that the nominations for vice president be closed. The motion was seconded by Director Keith and there was a unanimous vote for Director Holcomb to serve as Vice President of the Board of Directors.

M-4313
Election of
Secretary-
Treasurer

14677 Nominations were opened for the Office of Secretary-Treasurer. Director Nelson nominated Director Mylne for the Office of Secretary-Treasurer. Director Nelson moved that nominations be closed for the office of secretary-treasurer. Director Keith seconded the motion and there was a unanimous vote for Director Mylne to serve as Secretary-Treasurer of the Board of Directors.

The gavel was passed to the newly elected President of the Board, Director Keith, who thanked the Board and stated that in looking back over the past few years, Western has made some great progress. A mission statement was adopted, long range planning was done, and procedures were developed to identify revenue and expenses and how they relate to each other. At the same time, the District went through some difficult times. MWD chose to pass on a large increase in water rates and this had to be passed on to Western's customers. Efforts were also made by this district for our agricultural customers in terms of water supply with arrangements made for wheeling water, and making arrangements with Orange County and San Bernardino for water exchanges. President Keith stated that Western can look back and see that great strides forward have been made and hopefully this will continue in supplying water and sewer service to our customers.

The Board thanked the outgoing president, Director Schroeder for his efforts during the past year.

M-4314
Minutes
12/8/93
12/15/93
1/5/94

14678 Director Holcomb moved, Director Mylne seconded and it carried that approval be given to the minutes of the Adjourned Regular Board Meeting of December 8, 1993, as corrected, theRegular Board Meeting of December 15, 1993, and the Regular Board Meeting of January 5, 1994, as mailed to the Directors.

14679 A letter signed by General Manager Harriger, dated January 12, 1994, addressed to the Board of Directors regarding the proposal to provide water and sewer service to March Air Force Base, was read by Manager of Engineering Norman Thomas. March AFB was annexed to Western in 1968, at their request, and the District now provides service not only to March AFB but the National Cemetery and Air Force Village West as well. Early in 1993 the Civil Engineering

office at March contacted the District regarding alternative water and sewer service in the event of base realignment or closure. The President's decision in July changed the mission at March to that of Air Force Reserve and Air National Guard. District staff, at the request of Chancellor Orbach, has been participating in the Technical Advisory Committee for March Realignment in order to provide technical support. Western's Board adopted a resolution December 1, 1993, affirming its obligations and commitments to provide water and wastewater services to March, the golf course, the National Cemetery, Air Force Village West and adjacent lands which might be converted to private use. The District also prepared a conceptual proposal for the March realignment entitled "Revitalizing the March Community". The Ad Hoc Committee, at their meeting December 30, approved the proposal and distribution to Air Force personnel in Washington, D.C., as well as March AFB, the National Cemetery, Air Force Village West. The Committee also recommended further distribution to members of the Joint Powers Authority and Technical Advisory Committee for March Realignment, including representatives of the County of Riverside, City of Riverside, City of Moreno Valley, City of Perris, Western Riverside Council of Governments, and Chancellor Raymond Orbach. Following discussion, it was moved by Director Nelson, seconded by Director Mylne and carried unanimously that the action of the Ad Hoc Committee be ratified.

M-4315
March AFB

14680 A letter, signed by General Manager Harriger, dated January 12, 1994, addressed to the Board of Directors regarding an application to LAFCo and a resolution for determining property tax exchange with Riverside County in relation to the 35th Fringe Annexation to WMWD, Elsinore Valley MWD, and MWD was summarized by Manager of Engineering, Norman Thomas. Following discussion, it was moved by Director Schroeder, seconded by Director Holcomb and carried unanimously that Resolutions 1861 and 1862 be adopted as follows:

RESOLUTION 1861

RESOLUTION OF THE BOARD OF DIRECTORS OF WESTERN MUNICIPAL WATER DISTRICT OF RIVERSIDE COUNTY MAKING APPLICATION TO THE LOCAL AGENCY FORMATION COMMISSION OF RIVERSIDE COUNTY FOR THE ANNEXATION OF CERTAIN UNINHABITED TERRITORY IDENTIFIED AS THE THIRTY-FIFTH FRINGE AREA

R-1861
Application to LAFCo 35th Fringe Area Annexation

(See Resolution Book)

14681 General Manager Harriger stated that Tim Quinn of MWD has not yet arrived. Mr. Quinn is scheduled to talk on the next agenda item, the Memorandum of Understanding regarding Urban Water Conservation in California. Mr. Harriger requested that this item be postponed until Mr. Quinn arrives.

Report on Arlington Desalter

14682 General Manager Harriger reported on the Arlington Desalter, as requested by the Board at their last meeting. The problem at the Desalter is the result of a change in the MWD pricing structure. MWD abandoned the interruptible rate structure a couple of years ago in favor of the seasonal storage rate. Interruptible water was available to a replenishment agency like Orange County Water District on a year round basis and was only interrupted in the event MWD was having trouble making service. The effect on the project has been that Orange County WD can only buy water at this preferred rate during certain months of the year and our agreement with Orange County WD says that to the extent that Western MWD can take water and serve it in its area, we have a right to one-half the water. We were unable to establish a market for this water largely because water at the same price is available from other sources within MWD, particularly the Mills Filtration Plant, at a higher elevation which means more energy and less nitrates than in the Mills water and Colorado River water. The market for Arlington Desalter water would be in Norco and Corona but both cities have problems with high nitrates so they are looking for water they can blend with their local supply. The agreement with Orange County states that if Western does not have a market for the water, Orange County WD is obligated to take the water. At the time of the agreement, Orange County assumed that obligation on the basis the interruptible rate would stay in place on a year round basis. When MWD implemented the seasonal storage rate, Orange County was buying non-interruptible water, during the summer months, at the non-interruptible rate. In 1992, arrangements were made with MWD whereby the seasonal rate paid by Orange County WD was extended through the summer months while we were trying to work out this problem. In 1993, because of the abundance of water in the MWD service area, the seasonal storage rate was extended for all seasonal storage users through the summer months so it was not a problem in 1993. MWD recognizes that they are essentially the cause of the problem so it is hoped there will also be relief for 1994.

Dick Smith of SAWPA addressed the Board and stated that one of the primary alternatives SAWPA would very much like to take advantage of is to move the Arlington Desalter out of the local projects program and into Metropolitan's ground

water recovery program which offers some advantages in terms of subsidy from MWD. It would require, however, that the product water be placed in a potable water system. Mr. Smith stated that the most cost effective way to currently operate the Arlington Desalter is one that pushes the nitrate level near the upper limits as allowed by the State Health Department. There are opportunities, under the groundwater recovery program, but until there is a firm commitment on the purchase of the water, it is not feasible to evaluate the alternative of producing lower nitrate water from the Desalter. A question and answer period followed this report.

14683 Director Holcomb reported to the Board on the Special Districts Meeting held January 5, 1994 in Banning. The purpose of this meeting was to elect a special district member to LAFCo. Mr. Holcomb reported that Western was supporting the election of Don Galleano, however, Marion Ashley of Eastern MWD won the election by four votes. Don Galleano will remain an alternate. Mr. Holcomb also stated that Director Mylne and MWD Representative, Lois Krieger also attended the meeting.

Directors Reports

Director Mylne reported to the Board on MWD activities. The Blue Ribbon Committee made an extensive report to the MWD Board on Tuesday, January 11. Each of the sub-committee members also made their own report. Chancellor Ray Orbach led the sub-committee on integrated resources planning combined with the financial structure. Jack Yeager led a sub-committee on the business aspects of MWD activities. The recommendation made by Chancellor Orbach was that the integrated resource planning process should be as open as possible and that all resources be brought up for consideration, and that this be combined with the rate setting process. It is felt that the facilities that are being proposed to serve water into the next century are associated with the cost. Another area the Blue Ribbon Committee covered was the governance issue. The Committee felt strongly that MWD needed to be much more than an engineering function for the acquisition, conveyance and delivery of water; MWD needs to broaden its political base and its perspective in what it was doing to support the business people infrastructure of Southern California and possibly

throughout the State. Mr. Mylne stated that the Committee was very complimentary of MWD in a number of ways, but also had suggestions where certain elements could be improved upon. One element the Committee felt strongly about was that the rates MWD is suggesting can have a significant effect on agriculture. They want to be sure that a segment of business that needs a resource in this area is not destroyed. Mr. Mylne also reported that Assemblyman Haynes spoke to the Water Problems Committee on Monday, January 10th regarding agriculture water pricing. The MWD General Manager asked the Board for approval to appoint an ad hoc committee to review agriculture water pricing. Approval was given to appoint this committee.

Director Nelson stated that since she and Director Holcomb were appointed to the Ad Hoc Committee regarding March AFB they have been handling the issues as they come up. In this regard, Mrs. Nelson stated it would be helpful for the Board members to pass on any information they might obtain through discussions or meetings.

14684 A letter, signed by General Manager Harriger, dated January 12, 1994, addressed to the Board of Directors regarding the Memorandum of Understanding regarding Urban Water Conservation in California was summarized by Manager of Administration and Public Affairs, Renae Hinchey. This agreement was formulated in cooperation with the State Department of Water Resources and the State Water Conservation Coalition, and has been signed by many of the major urban water suppliers and environmental and public interest groups in California. Miss Hinchey introduced Tim Quinn and Kathy Gibson of MWD, who came out at the request of MWD Representative Lois Krieger, to make a presentation to the Board on the subject. Mr. Quinn addressed the Board and stated that he is a division director at MWD responsible for the State Water Project, everything that happens with respect to the Bay Delta, water transfer negotiations in the Central Valley and conservation. Mr. Quinn stated that conservation is a vital part of the job in convincing people that MWD is a wise user of water and that demand management in Southern California is an equal and important part of the long range planning exercise. Part of the long term planning is the integrated resources plan which was discussed by the Blue Ribbon Committee. Mr. Quinn stated that Mr. Harriger, on behalf of Western MWD, has been one of the general managers playing a continuous role in the planning process. Mr. Quinn also stated that it is quite apparent that conservation, reclamation, and groundwater recovery are going to play a major role in the long term reliability program. The basis of the MOU is that the water suppliers who sign will focus on implementing water conservation programs that are cost effective. There are

16 different conservation measures identified in the MOU and they are referred to as Best Management Practices. Agencies can exempt themselves from BMP requirements if they can show that a particular program is not cost effective for them. The member agencies will make their own decisions on the programs but MWD will provide service, not only in the conservation credits program, but also staff support. Mr. Quinn also stated that Western has a conservation record to be very proud of. Following a question and answer period, it was moved by Director Mylne, seconded by Director Schroeder and carried unanimously that the Board approve the MOU Regarding Urban Water Conservation in California, and authorize signature by the President.
The Board requested that staff bring this item back for re-evaluation in one year.

M-4316
MOU Re Urban Water Conservation in California

14685 Director Holcomb reported to the Board that the SAWPA Commission, on Tuesday, January 11, 1994, approved payment to Western of the $567,846 receivable. The Board was very pleased with this outcome.

SAWPA Receivable

14686 The Minutes of the November 1993 Meeting of the Santa Ana Watershed Project Authority were received and filed.

SAWPA Minutes 11/93

14687 MWD Representative, John Mylne III, reported to the Board that the Chairman of the Blue Ribbon Committee appointed a Review Committee of the Board to determine how the recommendations of the Blue Ribbon Committee could be integrated into MWD's operations. Mr. Mylne reported that he was appointed to this committee. Mr. Mylne also reported that the MWD Board gave the general manager approval to pay the State Contract as he felt necessary and desirable in compliance with the contract.

MWD Report

14688 Manager of Administration and Public Affairs, Renae Hinchey, stated that the presentation that General Manager Harriger made before the Senate Agriculture and Water Resources Committee has been put in slide presentation. This was shown to the Board. Following this showing Director Mylne stated that the Ag Committee appointed at the MWD Board Meeting January 11, was requested to report back with

Slide Presentation on the Effect of MWD Pricing Polic on Agricultur

their report and recommendations at the April Board Meeting. Mr. Mylne stated he felt this was because it has been made clear to MWD by General Manager Harriger that that is the time agriculture is most likely to turn off the water for the summer.

Mr. Harriger stated there would be more focus on this issue between now and the next couple of months.

Adjourn

14689 There being no further business to come before the Board, at 11:31 a.m., President Keith adjourned the meeting.

Wayne C. Keith
President

John M. Mylne III
Secretary-Treasurer

Appendix F
Metropolitan Water District
Summary Demand Forecasts

Final Draft

Western Municipal Water District

Average Year

Demographics (1)	2005	2010	2015	2020	2025	2030
Population	779,700	838,200	932,000	1,022,000	1,106,300	1,185,700
Occupied Housing Units	234,200	259,000	294,400	330,600	366,700	402,500
Single Family	172,000	188,800	209,000	235,200	261,000	281,600
Multi-Family	62,200	70,100	85,400	95,300	105,600	120,900
Persons Per Household	3.26	3.17	3.10	3.03	2.96	2.89
Urban Employment	275,600	320,000	364,900	409,800	456,200	504,500

Conservation	2005	2010	2015	2020	2025	2030
Conservation (2)	18,500	25,400	32,400	38,600	46,400	54,200
Installed Active Devices Through 2004	800	700	700	300	0	0
Code-Based and Price-Effect Savings	17,700	24,700	31,700	38,300	46,400	54,200

Total Demands After Conservation	2005	2010	2015	2020	2025	2030
Total Demand	303,600	337,200	365,300	388,400	411,500	432,100
Retail Agricultural	82,300	74,400	67,300	60,800	54,900	49,700
Retail Municipal and Industrial (3)	220,300	251,800	277,000	306,600	335,600	361,400
Groundwater Replenishment	1,000	11,000	21,000	21,000	21,000	21,000
Sea Water Barrier	0	0	0	0	0	0

Local Supplies	2005	2010	2015	2020	2025	2030
Total Local Supplies	205,900	206,100	206,100	206,100	206,100	206,100
Groundwater	189,000	189,000	189,000	189,000	189,000	189,000
Surface Water	0	0	0	0	0	0
Los Angeles Aqueduct	0	0	0	0	0	0
Groundwater Recovery	14,200	14,200	14,200	14,200	14,200	14,200
Total Recycling	2,700	2,900	2,900	2,900	2,900	2,900
M&I and Agricultural	*2,700*	*2,900*	*2,900*	*2,900*	*2,900*	*2,900*
Groundwater Replenishment	*0*	*0*	*0*	*0*	*0*	*0*
Seawater Barrier	*0*	*0*	*0*	*0*	*0*	*0*
Other Imported Supplies	0	0	0	0	0	0

Demands on Metropolitan	2005	2010	2015	2020	2025	2030
Total Metropolitan Demands	97,700	131,200	159,200	182,300	205,500	226,000
Full Service (Tier I and Tier II)	72,800	98,600	118,700	143,700	168,500	190,600
Replenishment Water Rate (4)	1,000	11,000	21,000	21,000	21,000	21,000
Interim Agricultural Water Program	23,900	21,600	19,500	17,600	15,900	14,400

Notes:
All units are acre-feet unless specified, rounded to the nearest hundred
Totals may not sum due to rounding
(1) Growth Projections: SCAG 2004 Regional Transportation Plan; SANDAG 2030 Forecast
(2) Includes code-based, price-effect and existing active savings through 2004; does not include future active conservation savings
Code-based conservation includes plumbing codes for pre-rinse spray heads and high-efficiency washing machines
(3) The retail M&I projections include existing active conservation through 2004, but do not include future active conservation savings
(4) Replenishment Water Rate demands include: seasonal shift, groundwater spreading, and groundwater in-lieu

Metropolitan Water District of Southern California

Average Year

Demographics (1)	2005	2010	2015	2020	2025	2030
Population	18,233,700	19,138,000	19,914,600	20,664,600	21,367,500	22,053,200
Occupied Housing Units	5,803,800	6,145,200	6,444,600	6,751,100	7,075,600	7,376,400
Single Family	3,477,300	3,651,000	3,767,600	3,945,800	4,128,700	4,250,100
Multi-Family	2,326,500	2,494,200	2,677,000	2,805,300	2,946,800	3,126,300
Persons Per Household	3.08	3.05	3.03	3.01	2.97	2.94
Urban Employment	8,186,200	8,991,300	9,402,700	9,795,200	10,163,000	10,537,600

Conservation	2005	2010	2015	2020	2025	2030
Total Conservation	735,900	865,200	955,200	1,027,600	1,106,900	1,188,300
Installed Active Devices Through 2004	91,200	85,800	63,200	23,000	900	100
IRP Conservation Target (2)	6,100	27,100	38,300	45,700	30,500	23,800
Code-Based and Price-Effect Savings (3)	388,600	502,300	603,700	708,900	825,500	914,400
Pre-1990 Conservation	250,000	250,000	250,000	250,000	250,000	250,000

Total Demands After Conservation	2005	2010	2015	2020	2025	2030
Total Demands	4,303,900	4,649,500	4,767,600	4,930,600	5,071,500	5,193,800
Retail Agricultural	347,800	318,800	285,000	250,500	215,000	194,600
Retail Municipal and Industrial	3,768,000	4,053,400	4,196,900	4,392,100	4,569,600	4,719,400
Groundwater Replenishment	140,100	200,400	212,800	215,100	214,000	206,900
Seawater Barrier	48,000	76,900	72,900	72,900	72,900	72,900

Local Supplies	2005	2010	2015	2020	2025	2030
Total Local Supplies	2,084,600	2,352,400	2,441,000	2,567,500	2,588,500	2,587,100
Groundwater	1,343,500	1,418,000	1,431,800	1,433,000	1,445,500	1,444,300
Surface Water	59,400	100,000	99,500	99,200	99,200	98,600
Los Angeles Aqueduct	373,300	252,500	253,000	252,900	253,200	253,600
IRP Local Resource Program Target	600	28,900	43,400	49,500	49,500	49,500
Groundwater Recovery	58,100	79,300	79,700	82,900	82,900	82,900
Total Recycling	208,800	315,100	342,900	366,900	367,700	367,700
M&I and Agricultural	*140,000*	*165,200*	*193,000*	*217,000*	*217,800*	*217,800*
Groundwater Replenishment	*52,000*	*90,000*	*90,000*	*90,000*	*90,000*	*90,000*
Sea Water Barrier	*16,800*	*59,900*	*59,900*	*59,900*	*59,900*	*59,900*
Other Imported Supplies	40,900	158,600	190,600	283,100	290,600	290,600

Demands on Metropolitan	2005	2010	2015	2020	2025	2030
Total Metropolitan Demands	2,219,100	2,297,200	2,326,700	2,363,200	2,482,900	2,606,700
Full Service (Tier 1 and Tier II)	1,941,900	2,034,100	2,067,500	2,114,600	2,253,800	2,393,200
Replenishment Water Rate (4)	167,500	169,200	179,700	182,800	183,100	176,800
Interim Agricultural Water Program	109,700	93,900	79,500	65,800	46,000	36,700
Firm Demands on Metropolitan (5)	2,019,000	2,100,000	2,123,000	2,161,000	2,286,000	2,419,000

Notes:
All units are acre-feet unless specified, rounded to the nearest hundred
Totals may not sum due to rounding
(1) Growth Projections: SCAG 2004 Regional Transportation Plan; SANDAG 2030 Forecast
(2) The 2030 savings target is derived from the 2003 IRP Update forecast projections for 2030; it is not an official target for 2030.
(3) Measured from 1990; Includes plumbing codes for pre-rinse spray heads and high efficiency washing machines
(4) Replenishment Water Rate demands include: seasonal shift, groundwater spreading, and groundwater in-lieu
(5) Firm demand on Metropolitan equals Full Service demands plus 70% of the Interim Agricultural Water Program demands

Appendix G
Sample Drought Management Resolutions

ORDINANCE 268

AN ORDINANCE OF THE BOARD OF DIRECTORS
OF WESTERN MUNICIPAL WATER DISTRICT
OF RIVERSIDE COUNTY ESTABLISHING A
RETAIL DOMESTIC WATER CONSERVATION PLAN

WHEREAS, California is in the fifth consecutive year of below normal precipitation, and reduced supplies in storage will cause shortfalls in imported water deliveries to the region unless appropriate conservation measures are implemented; and

WHEREAS, one hundred percent (100%) of the Western Municipal Water District's ("District") water supply is imported from the Metropolitan Water District of Southern California ("MWD"); and

WHEREAS, MWD has implemented a staged program called its Incremental Interruption and Conservation Plan requiring its member agencies to achieve stepped reductions ranging from twenty percent (20%) to fifty percent (50%) in the use of water for interruptible deliveries and from five percent (5%) to twenty percent (20%) for firm deliveries and imposes economic penalties for failure to meet such goals; and

WHEREAS, MWD has called upon its member agencies and subagencies to comply with its mandatory water conservation program to mitigate a water supply shortfall and related impacts; and

WHEREAS, in response to drought conditions, Western has determined that the existing stage of water shortage within Western requires that it adopt and enforce water conservation measures for retail domestic customers set forth in this ordinance; and

WHEREAS, on February 20, 1991, the District passed Resolution No. 1720, thereby declaring a water shortage emergency pursuant to Water Code Sections 350 et seq. and Water Code Sections 71640 et seq; and

WHEREAS, the District has the power and authority to enact a water conservation plan and water conservation measures pursuant to Water Code Sections 350 et seq., 375 et seq. and 71640 et seq.; and

WHEREAS, The Board of Directors may enact future amendments to this ordinance increasing or decreasing water conservation measures to reflect then-existing water shortage conditions; and

WHEREAS, the District has determined that adoption of a water conservation plan is necessary to meet the target reduction in water use mandated by MWD and to protect the public health, safety and welfare.

NOW, THEREFORE, BE IT ORDAINED BY THE BOARD OF DIRECTORS OF WESTERN MUNICIPAL WATER DISTRICT OF RIVERSIDE COUNTY as follows:

Section 1. Definitions.

The following terms are defined for the purposes of this ordinance:

"Base year" means fiscal year 1990 (July 1, 1989 through June 30, 1990).

"Board of Directors" means the Board of Directors of the Western Municipal Water District.

"Customer" means all retail domestic or municipal customers of the District.

"Developer" means any person, company or corporation which plans to construct or to have constructed a single family dwelling unit or any other new structure which will require new water connection and service from the District.

"District" means the Western Municipal Water District.

"General Manager" means the general manager of the Western Municipal Water District.

"Target water use" means 80% of the amount used by the customer during the same month in the base year of fiscal 1990, or 20 units,

whichever is greater, except that there shall be no base year allowance for construction water.

"Unit of water means an amount equal to 748 gallons or 100 cubic feet of water.

"Wasteful use" means any unreasonable or nonbeneficial use of water, or any unreasonable method of use of water, included, but not limited to, the specific uses restricted by this ordinance as hereinafter set forth.

"Water" means water supplied by the Western Municipal Water District.

"Water Conservation Measure" means a measure calculated to reduce the amount of water used by District customers.

Section 2. Purpose and Scope.

(a) The purpose of this ordinance is to provide a mandatory water conservation plan to minimize the effects of a water supply shortage on the customers of the District. Pursuant to Water Code Sections 350 et seq., and 71640 et seq., the Board of Directors has previously declared a water shortage emergency. The adoption of a water conservation plan and implementation of water conservation measures is therefore necessary to (1) protect the health, safety, and welfare of the inhabitants and customers of the District, (2) assure the maximum beneficial use of the water supplies of the District and (3) ensure sufficient water supplies to meet the basic needs of human consumption, sanitation and fire protection.

(b) This ordinance adopts regulations to implement a mandatory water conservation plan consistent with the goals of MWD's Incremental Interruption and Conservation Plan and projected water supply availability.

(c) This ordinance shall remain in effect until the Board of Directors finds and declares by ordinance that the provisions of this ordinance are no longer applicable to existing water supply conditions or until increasing or decreasing water shortages require the Board to amend the ordinance.

Section 3. Authorization.

(a) The Board of Directors may adopt a water conservation plan following a public hearing upon the determination by majority vote that such implementation is necessary to reduce water consumption by District customers to conserve water supplies.

(b) A public hearing shall be held to determine whether the District should adopt a water conservation plan. Notice of the time and place of this public hearing shall be published not less that ten (10) days before the hearing in a newspaper of general circulation.

(c) The provisions of Section 6 of this ordinance shall become effective immediately upon adoption by the Board of Directors. Section 5 and any other sections related to curtailment in the use of water shall become effective at the start of the first full billing period commencing on or after August 1, 1991. Prohibitions related to construction water use and new connections provided for in Sections 7 and 8 shall become effective on August 1, 1991.

Section 4. Application.

The provisions of this ordinance shall apply to all retail domestic water customers served by the District.

Section 5. Curtailment of Consumer Water Usage.

(a) No customer shall use District water in excess of eighty percent (80%) of the amount used by the customer during the same month in the base year of fiscal 1990. The customer's target water use amount for the following month will be included on each monthly District invoice.

(b) Notwithstanding the above, no customer shall be required to reduce water consumption below the minimum allocation amount of twenty (20) units of water per month. Twenty (20) units of water constitutes approximately five hundred (500) gallons of water per day per connection. If actual customer water usage is twenty (20) units of water or less per month, the base year allocation does not apply. New residential and commercial connections shall be allocated twenty (20) units of water per month.

Section 6. Water Conservation Measures.

The following uses shall be prohibited:

(a) Hosing down driveways, sidewalks, patios, building walls or any paved area except as necessary for public health or sanitation.

(b) Washing cars, trucks, vans, campers, trailers or any other vehicle without using a bucket or a hose equipped with an automatic shutoff nozzle except on the premises of a commercial car wash or service station using reclaimed or recycled water.

(c) Restaurants and other public places serving food shall not serve drinking water to customers unless expressly requested.

(d) Lawns or outdoor landscaping shall be irrigated only between the hours of 6:00 p.m. and 6:00 a.m.

(e) Parks, school grounds and golf courses shall be irrigated only between the hours of 6:00 p.m. and 6:00 a.m.

(f) The operation of sprinklers and irrigation systems shall be adjusted to avoid overspray, runoff and waste. Irrigation using these systems is prohibited during high wind periods.

The following water conservation measures are strongly recommended:

(a) The installation and use of spa and pool covers.

(b) All indoor and outdoor plumbing, such as pipes, faucets and toilets should be periodically checked for leaks and repaired promptly.

(c) The use of water saving devices such as ultra low flush toilets, toilet dams, low flow shower-heads and faucet aerators.

(d) New landscaping should incorporate low water demand trees, shrubs, grasses, and water-efficient irrigation systems. The installation of large turf areas is discouraged. District resources are available to provide reasonable assistance regarding water conservation techniques. The District recommends the use of a landscaping manual entitled "Landscapes Southern California Style". The District's garden display provides examples of water conservation landscaping.

Section 7. Prohibition on Construction Water Use.

No District water shall be used for construction purposes unless no alternative water sources are available and the General Manager has determined that the District has water available for this purpose. Developers may be required to find alternative sources of water for uses such as dust control, site clean-up and compaction purposes. Potable water may only

be used for construction purposes for the disinfection and pressure testing of the delivery system and for pressure testing and limited on-site building construction needs. No potable water shall be used in conjunction with construction to wash down streets without written authorization from the District. In the event District water is available for construction uses, the rate for such water shall be twice the regular rate for such water.

New temporary unmetered connections ("jumpers") shall be prohibited after the effective date of this ordinance unless the General Manager determines that the District has water available for this purpose.

Section 8. Prohibition on New Connections Unless Water Efficient Landscaping is used.

No new connections shall be approved by the District unless the applicant has a plan for water efficient landscaping approved by the District. Developers must submit a water efficient landscaping plan for all developer planted areas to the District for approval prior to the issuance of new meter connections. These areas include, but are not limited to, landscaping medians, common areas, model homes and developer planted yard areas. Developers are encouraged to use as a resource the landscaping manual entitled "Landscapes Southern California Style".

Individual homeowners may comply with this Section by one or more of the following:

(a) Submission of a plan for low water use irrigation system acceptable to the District;

(b) Submission of a plan for low water use landscaping materials acceptable to the District;

(c) Such other measures as the District may approve upon individual application.

Section 9. Surcharge for Excess Water Consumption.

Water use in excess of the target amount permitted in Section 5 shall be billed at twice the normal water rate established by the District.

Section 10. Exemption from Compliance.

Any customer may apply in writing for exemption from any provision of this ordinance with the District. District staff may grant such exemption if special circumstances make compliance not reasonably possible, or that the restrictions herein would:

(a) Cause an unnecessary and undue hardship to the customer or the public; or

(b) Cause an emergency condition affecting the health, sanitation, fire protection or safety of the customer or of the public; or

(c) Cause unfairness if historic water use records of the customer indicated that substantial existing water conservation actions have previously been taken. Such indications would include:

(i) Use of xeriscape landscaping during the base year.

(II) Installation of interior and/or exterior permanent plumbing fixtures to conserve water, such as low flow showerheads, ultra low flush toilets, or a drip irrigation system.

(d) Cause unfairness due to the customer's justifiable increase in water use from the base year.

The request for exemption must be supported by evidence to support the applicant's request for special consideration. District staff may require the applicant to submit any additional information necessary to verify the request for exemption and may conduct an inspection of the premises in question before deciding whether to grant such

relief. A decision shall be made on the application within thirty (30) days of receipt of the request and the District shall inform the applicant of the decision in writing. If an exemption is granted, the District may impose any conditions it deems proper.

Section 11. Appeal.

An applicant shall have the right to appeal the decision regarding his or her application in writing to the Board of Directors. The appeal must be in writing and received by the District within ten(10) days of the date of the District's initial written decision. The appeal shall be heard by the Board of Directors within thirty (30) days from the date the appeal is filed. The Board of Directors, at its discretion, may affirm, reverse or modify the decision and impose any conditions it deems proper. The decision of the Board of Directors shall be final.

Section 12. Severability.

If any provision, section, subsection, sentence, clause, or phrase of this ordinance or the application of same to any person or set of circumstances is held to be unconstitutional, void, or invalid, such decision shall not affect the remaining portions of this ordinance which shall remain in full force and effect, and all provisions of this ordinance are declared to be severable for that purpose.

Section 13. Incompatible Provisions.

To the extent any provision of this ordinance is incompatible with or at variance with any prior adopted ordinance or resolution, the provisions of this ordinance shall take precedence, and all prior ordinances and resolutions shall be interpreted to harmonize with and not change the provisions of this ordinance.

Section 14. Public Health and Safety Not to be Affected.

Nothing in this ordinance shall be construed to require the District to curtail the supply of water to any customer when such water is required by that customer to maintain an adequate level of public health or public safety.

Section 15. Exemption from California Environmental Quality Act.

The Board of Directors hereby determines that the adoption of this ordinance and implementation of the measures set forth herein are exempt from review under the California Environmental Quality Act (California Public Resources Code Section 21000 et seq.) as it is an action take to mitigate a water shortage emergency. The Board of Directors hereby directs staff to prepare and file a Notice of Exemption within five (5) working days of adoption of this ordinance.

ADOPTED AND APPROVED this 3rd day of July, 1991, by the Board of Directors of Western Municipal Water District of Riverside County.

Frances J. Nelson
Frances J. Nelson
President of the Board of Directors

ATTEST:

Wayne C. Keith
Wayne C. Keith
Secretary of the Board of Directors

ORDINANCE 279

AN ORDINANCE OF THE BOARD OF DIRECTORS
OF WESTERN MUNICIPAL WATER DISTRICT
OF RIVERSIDE COUNTY AMENDING ORDINANCE 268
TO MODIFY THE RETAIL DOMESTIC WATER
CONSERVATION PLAN

WHEREAS, California is in the fifth consecutive year of below normal precipitation, and reduced supplies in storage will cause shortfalls in imported water deliveries to the region unless appropriate conservation measures are implemented; and

WHEREAS, one hundred percent (100%) of the Western Municipal Water District's ("District") water supply is imported from the Metropolitan Water District of Southern California ("MWD"); and

WHEREAS, MWD has implemented a staged program called its Incremental Interruption and Conservation Plan requiring its member agencies to achieve stepped reductions ranging from twenty percent (20%) to fifty percent (50%) in the use of water for interruptible deliveries and from five percent (5%) to twenty percent (20%) for firm deliveries and imposes economic penalties for failure to meet such goals; and

WHEREAS, MWD has called upon its member agencies and subagencies to comply with its mandatory water conservation program to mitigate a water supply shortfall and related impacts; and

WHEREAS, in response to drought conditions, Western has determined that the existing stage of water shortage within Western requires that it adopt and enforce water conservation measures for retail domestic customers set forth in this ordinance; and

WHEREAS, on February 20, 1991, the District passed Resolution No. 1720, thereby declaring a water shortage emergency pursuant to Water Code Sections 350 et seq. and Water Code Sections 71640 et seq; and

WHEREAS, the District has the power and authority to enact a water conservation plan and water conservation measures pursuant to Water Code Sections 350 et seq., 375 et seq. and 71640 et seq.; and

WHEREAS, The Board of Directors may enact future amendments to this ordinance increasing or decreasing water conservation measures to reflect then-existing water shortage conditions; and

WHEREAS, the District has determined that adoption of a water conservation plan is necessary to meet the target reduction in water use mandated by MWD and to protect the public health, safety and welfare.

WHEREAS, on July 3, 1991, the District adopted Ordinance 268 establishing a retail water conservation plan which prohibits District residential and commercial customers from using water in excess of eighty percent (80%) of the amount used during the same month in the base year of fiscal 1990; and

WHEREAS, approximately twenty-five percent (25%) of District residential customers did not use District water service in all twelve months of the base year of fiscal 1990 and therefore do not have a complete year in which to compare water usage; and

WHEREAS, in order to implement the plan uniformly for the benefit of all residential customers, the District has determined that the target water use of these customers should be adjusted to reflect the average usage of similar water users; and

WHEREAS, certain customers reside within the boundaries of governmental agencies that overlap the District's service area which do not limit water usage or impose a surcharge for excess water consumption; and

WHEREAS, in certain situations, water from these governmental agencies may be made available to the District; and

WHEREAS, the cost of making such water available to District customers within the boundaries of the governmental agency would be borne by the agency and no additional costs would be incurred by the District; and

WHEREAS, in order to implement the plan fairly for the benefit of all customers, the District has determined that such water can be supplied to these customers at the District's regular rate without a surcharge for excess water consumption.

NOW, THEREFORE, BE IT ORDAINED BY THE BOARD OF DIRECTORS OF WESTERN MUNICIPAL WATER DISTRICT OF RIVERSIDE COUNTY as follows:

Section 1. Section 1 of Ordinance No. 268 is hereby amended to read as follows:

Section 1. Definitions.

The following terms are defined for the purposes of this ordinance:

"Base year" means fiscal year 1990 (July 1, 1989 through June 30, 1990).

"Board of Directors" means the Board of Directors of the Western Municipal Water District.

"Customer" means all retail domestic or municipal customers of the District.

"Developer" means any person, company or corporation which plans to construct or to have constructed a single family dwelling unit or any other new structure which will require new water connection and service from the District.

"District" means the Western Municipal Water District.

"General Manager" means the general manager of the Western Municipal Water District.

"Target water use" means eighty percent (80%) of the amount used by the customer during the same month in the base year of fiscal 1990, or 20 units, whichever is greater, except that

residential customers who did not receive more than 25 units of water in any month of the base year shall be considered to have used an amount of water equal to the average usage of similar users as determined by the General Manager and there shall be no base year allowance for construction water.

"Unit of water means an amount equal to 748 gallons or 100 cubic feet of water.

"Wasteful use" means any unreasonable or nonbeneficial use of water, or any unreasonable method of use of water, included, but not limited to, the specific uses restricted by this ordinance as hereinafter set forth.

"Water" means water supplied by the Western Municipal Water District.

"Water Conservation Measure" means a measure calculated to reduce the amount of water used by District customers.

Section 2. Section 5 of Ordinance 268 is hereby amended to read as follows:

Section 5. Curtailment of Consumer Water Usage.

(a) No customer shall use District water in excess of eighty percent (80%) of the amount used by the customer during the same month in the fiscal year. The customer's target water use amount for the following month will be included on each monthly District invoice.

(b) Notwithstanding the above, no customer shall be required to reduce water consumption below the minimum allocation amount of twenty (20) units of water per month. Twenty (20) units of water constitutes approximately five hundred (500) gallons of water per day per connection. If actual customer water usage is twenty (20) units of water or less per month, the base year allocation does not apply. Customers granted new service connections after August 1, 1991 shall be allocated twenty (20) units of water per month.

(c) Further not withstanding the above, residential customers who were granted water service prior to August 1, 1991 but did not receive more than 25 units of water in any month of the base year of fiscal 1990 shall not use District water in excess of eighty percent (80%) of the average amount of water used by similar customers during the same month in the base year. The average amount of water shall be determined by the General Manager. The customer's target water use amount for the following month will be included on each monthly District invoice.

Section 3. Section 10 of Ordinance 268 is hereby amended to read as follows:

Section 10. Exemption from Compliance.

Any customer may apply in writing for exemption from any provision of this ordinance with the District. District staff may grant such exemption if special circumstances make compliance not reasonably possible, or that the restrictions herein would:

(a) Cause an unnecessary and undue hardship to the customer or the public; or

(b) Cause an emergency condition affecting the health, sanitation, fire protection or safety of the customer or of the public; or

(c) Cause unfairness if historic water use records of the customer indicated that substantial

existing water conservation actions have previously been taken. Such indications would include:

(i) Use of xeriscape landscaping during the base year.

(II) Installation of interior and/or exterior permanent plumbing fixtures to conserve water, such as low flow showerheads, ultra low flush toilets, or a drip irrigation system.

(d) Cause unfairness due to the customer's justifiable increase in water use from the base year.

The request for exemption must be supported by evidence to support the applicant's request for special consideration. District staff may require the applicant to submit any additional information necessary to verify the request for exemption and may conduct an inspection of the premises in question before deciding whether to grant such relief. A decision shall be made on the application within thirty (30) days of receipt of the request and the District shall inform the applicant of the decision in writing. If an exemption is granted, the District may impose any conditions it deems proper.

Staff may exempt groups of customers from Sections 5 and 9 provided the following conditions are met:

(a) A city, county or other governmental agency which both overlaps the District's service area and represents the interests of the District's customers submits a request for exemption from Sections 5 and 9 for a specific group of District customers.

(b) The city, county or other governmental agency requesting an exemption enters into an agreement with the District to make water available to the District for delivery to the

specific group of customers at the District's regular rate under terms and conditions acceptable to the District.

(c) Customers exempted from provisions of Sections 5 and 9 pursuant to the above shall receive notification through the normal billing procedure of their allowable usage, the actual amount of usage and the amount of surcharge that would have been required in the absence of the exemption

(d) The District shall report monthly to the city, county or other governmental agency the amount of water delivered to the exempted group of customers in excess of the amounts allowed under Section 5.

ADOPTED AND APPROVED this 4th day of September, 1991, by the Board of Directors of Western Municipal Water District of Riverside County.

Frances J. Nelson
Frances J. Nelson
President of the Board of Directors

ATTEST:

Wayne C. Keith
Wayne C. Keith
Secretary of the Board of Directors

ORDINANCE 280

AN ORDINANCE OF THE BOARD OF DIRECTORS
OF WESTERN MUNICIPAL WATER DISTRICT
OF RIVERSIDE COUNTY REPEALING
ORDINANCE 268 AND ALL AMENDING ORDINANCES

WHEREAS, the Board finds that drought emergency conditions no longer exist,

NOW, THEREFORE, BE IT ORDAINED BY THE BOARD OF DIRECTORS OF WESTERN MUNICIPAL WATER DISTRICT OF RIVERSIDE COUNTY, as follows:

Ordinance No. 268 and all ordinances amendatory thereof, are hereby repealed and rescinded effective March 30, 1992.

ADOPTED AND APPROVED this 18th day of March 1992.

Ayes: Holcomb
Keith
Mylne
Nelson
Schroeder

Noes: None

Absent: None

Frances J. Nelson
Frances J. Nelson
President, Board of Directors

ATTEST:

Secretary-Treasurer

ORDINANCE 358

AN ORDINANCE OF THE BOARD OF DIRECTORS OF WESTERN MUNICIPAL WATER DISTRICT OF RIVERSIDE COUNTY DECLARING THAT A WATER SHORTAGE EMERGENCY CONDITION WILL EXIST IN THE DISTRICT DURING A SCHEDULED SHUTDOWN OF THE MILLS FILTRATION PLANT AND ESTABLISHING A SUPPLY INTERRUPTION WATER CONSERVATION PLAN

WHEREAS, Western Municipal Water District was formed by the voters in 1954 for the purpose of importing water supplies from the Metropolitan Water District of Southern California; and

WHEREAS, Western delivers these imported water supplies, from the State Water Project and the Colorado River Aqueduct and treated at Metropolitan's Henry J. Mills and Robert A. Skinner Filtration Plants, to communities on a wholesale basis to augment their own supplies; and

WHEREAS, Western serves a population of more than 60,000 people directly on a retail basis with State Water Project water treated at the Mills Filtration Plant; and

WHEREAS, the Metropolitan Water District periodically interrupts its water supply deliveries and/or treatment facilities operations for extended periods for routine and/or emergency maintenance; and

WHEREAS, Metropolitan has scheduled a shutdown of its Mills Filtration Plant from February 1 through February 5, 2005, creating such an extended interruption in water supply to Western; and

WHEREAS, on October 6, 2004, the Board of Directors of the Western Municipal Water District adopted Resolution

2314, setting a public hearing regarding the proposed declaration of water shortage emergency during the scheduled shutdown of the Mills Filtration Plant; and

WHEREAS, Water Code Section 71640 et seq. authorizes the District to restrict the use of District water during any emergency caused by drought, or other threatened or existing water shortage, and may prohibit the wastage of District water or the use of District water during such periods for any purpose other than household uses or such other restricted uses as the District determines to be necessary; and

WHEREAS, Water Code Section 350 et seq. and Section 375 et seq. authorize the District to declare a water shortage emergency condition whenever it finds and determines that the ordinary demands and requirements of water consumers will not be satisfied without depleting the water supply of the District to the extent that there will be insufficient water for human consumption, sanitation and fire protection; and

WHEREAS, the District has the power and authority to enact a water conservation plan and water conservation measures pursuant to Water Code Section 350 et seq., 375 et seq and 71640 et seq; and

WHEREAS, the District has determined that adoption of a water conservation plan is necessary to ensure an available water supply at the levels necessary to maintain human consumption, sanitation, and fire protection during the period of this shutdown; and

WHEREAS, in order to ensure that there are adequate water supplies to meet the needs of human consumption, sanitation, and fire protection, the District is requiring that all customers refrain from using water for non-essential

indoor and all outdoor uses, and to implement conservation measures for essential uses; and

WHEREAS, customers within the District's service area have been given notice of the severity of the situation and the restrictions, which will be in place during the water shortage emergency.

NOW, THEREFORE, BE IT ORDAINED BY THE BOARD OF DIRECTORS OF WESTERN MUNICIPAL WATER DISTRICT OF RIVERSIDE COUNTY AS FOLLOWS:

Section 1. Notice and Public Hearing. The Board conducted a public hearing on October 20, 2004 at 450 Alessandro Blvd., Riverside CA in order for customers to have the opportunity to be heard to protest against the proposed declaration of a water shortage emergency and to present their respective needs to the Board. Notice of the public hearing was published on October 12, 2004 in the Press Enterprise.

Section 2. Declaration of Water Shortage Emergency. The Board of Directors hereby determines that the scheduled shutdown of the Metropolitan Water District of its Mills Filtration Plant from February 1 through February 5, 2005, will constitute, during that time, a water shortage emergency condition. Therefore, the Board hereby declares that for the period of February 1 through February 5, 2005 ("Emergency Period"), a water shortage emergency condition shall be deemed to be in effect. The restrictions set forth in this Ordinance shall constitute a mandatory water conservation plan ("Plan") to minimize the effects of the water shortage emergency condition during the Emergency Period. The Emergency Period may be extended or revised if it is determined, in the discretion of the General Manager, that the period of the

shutdown of the Mills Filtration Plant has been extended or revised.

Section 3. Application of the Plan. The provisions of the Plan and this Ordinance shall apply to all retail and wholesale water customers served water treated at the Mills Filtration Plant by the District. The District shall provide appropriate notice and instructions to customers and recommendations for wise water usage during the Emergency Period.

Section 4. Curtailment of Water Usage by Retail Customers. The following restrictions shall apply during the Emergency Period to District retail customers served water treated at the Mills Filtration Plant.

(a) The following uses shall be prohibited:

1. Irrigating outdoor lawns and landscapes, parks, school grounds, golf courses, medians, agriculture, groves, and any other outdoor planted areas, whether for personal, aesthetic, commercial, or recreational use.

2. Hosing down driveways, sidewalks, patios, building walls, or any paved area except as required by local, county, or state health and safety codes and laws.

3. Washing cars, trucks, vans, campers, trailers or any other vehicle without using solely a hose equipped with an automatic shutoff nozzle other than on the premises of a commercial car wash or service station using reclaimed or recycled water.

(b) No District water shall be used for exterior construction purposes, including, but not limited to dust control, site cleanup, compaction or wash down of streets.

Section 5. Curtailment of Water Usage by Wholesale Customers.

a) The District will discontinue water deliveries on a wholesale basis during all or any portion of the Emergency Period. Based on availability, as determined by the General Manager, limited supply delivery may be made available in the discretion of the General Manager if the General Manager determines that such deliveries are necessary for domestic use, sanitation or fire protection.

Section 6. Enforcement.

a) Retail Customers, Excluding Construction Water Service Customers. Any user of District water in violation of the provisions of the Plan and this Ordinance shall receive a written citation upon the first occurrence. Upon the second occurrence by the same customer, the District will turn water service off to the customer's building, residence, or irrigation. Following expiration of the Emergency Period, the customer will be required to pay in person at the District's offices all applicable turn-on fees, in order to resume service, as established by the District's rules and regulations for water service. Customers without separate irrigation or landscape meters will not be required to wait for the expiration of the Emergency Period to pay fees for resumption of service.

b) Construction Water Service Customers. Any user of District water for construction water service in violation of the provisions of the Plan and this Ordinance shall receive a written citation and all water service to the construction site shall be turned off at the time of citation. Following expiration of the Emergency Period, the customer will be

required to pay all applicable turn-on fees in person at the District's offices, in order to resume service, as established by the District's rules and regulations. In addition, all water used on a construction site in violation of the Plan and this Ordinance will be billed at twice the normal District rate for such water.

Section 7. Severability. If any provision, section, subsection, sentence, clause, or phrase of this Ordinance or the application of same to any person or set of circumstances is held to be unconstitutional, void, or invalid, such decision shall not affect the remaining portions of this Ordinance which shall remain in full force and effect, and all provisions of this Ordinance are declared to be severable for that purpose.

Section 8. Incompatible Provisions. To the extent any provision of this Ordinance is incompatible with or at variance with any other District policy or rules and regulations, the provisions of this Ordinance shall be controlling, and all other District policies and rules and regulations shall be interpreted to harmonize with and not change the provisions of this Ordinance.

Section 9. Public Health and Safety Not To Be Affected. Nothing in this Ordinance shall be construed to require the District to curtail the supply of water to any customer when such water is required by that customer to maintain an adequate level of public health or public safety.

Section 10. Exemption From California Environmental Quality Act. The Board determines that the adoption of the Plan and this Ordinance, for the purpose of addressing the

supply interruption due to the scheduled maintenance of the Mills Filtration Plant, are exempt from the requirements of the California Environmental Quality Act pursuant to sections 15268(a) and 15378(b)(2) of the State CEQA Guidelines. The Board hereby directs staff to prepare and file a Notice of Exemption within five (5) working days of adoption of this Ordinance.

Section 11. Effective Date. This Ordinance shall be effective immediately upon adoption and shall remain in effect until expiration of the Emergency Period, as said Emergency Period may be extended or revised as set forth in this Ordinance. Upon said expiration of the Emergency Period, this Ordinance shall be deemed to expire and shall be of no further force or effect. Within ten days from the date of adoption, this Ordinance shall be published one time in full in the Press Enterprise. The Plan shall only be effective during the Emergency Period, as said Emergency Period may be extended or revised as set forth in this Ordinance.

ADOPTED AND APPROVED this 20th day of October, 2004 by the Board of Directors of the Western Municipal Water District.

WAYNE H. HOLCOMB
President

October 20, 2004

I HEREBY CERTIFY that the foregoing is a full, true and correct copy of Ordinance 358 adopted by the Board of Directors of Western Municipal Water District of Riverside County at its Regular Meeting held October 20, 2004.

ELIZABETH L. CUNNISON
Secretary-Treasurer

Appendix H
Public Meeting Documentation

NOTICE OF PUBLIC HEARING
ON URBAN WATER
MANAGEMENT PLAN

The Western Municipal Water District of Riverside County provides retail water service to about 14,000 customers and wholesales imported water to ten water purveyors in Western Riverside County. Western has prepared a draft water conservation and water management plan for its retail service areas to satisfy the Urban Water Management Planning Act, Water Code Section 10610 et. Seq. (Act).

There will be a public hearing pursuant to the Act on the draft plan on Wednesday, December 7, 2005 at 9:30 a.m. at the District office located at 450 Alessandro Blvd. In Riverside. Copies of the draft plan may be obtained by contacting Ms. Carroll at (951) 789-5064.

Jeffrey D. Sims
District Engineering Manager

WESTERN
MUNICIPAL
WATER
DISTRICT

Western Municipal Water District
450 Alessandro Blvd • Riverside, California 92508
Website: www.wmwd.com • Email: water@wmwd.com • (951) 789-5000

Appendix O2:

Master Water Planned Facilities_2008

MURRIETA DIVISION DEVELOPMENT IMPACT FEE UPDATE FOR MASTER WATER PLANNED FACILITIES

Prepared For:

WESTERN MUNICIPAL WATER DISTRICT

WESTERN MUNICIPAL WATER DISTRICT

DRAFT

November, 2008

ALBERT A. WEBB ASSOCIATES
ENGINEERING CONSULTANTS

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SECTION 1 - EXECUTIVE SUMMARY

ULTIMATE EDUS

The total number of EDUs for the Murrieta Division at ultimate build-out is 7,576 EDUs based on the City of Murrieta's existing land-use designations. The Murrieta Division currently has 2,538 customers with the total number of remaining additional EDUs estimated at 5,038.

ULTIMATE DEMAND

Ultimate water demand for the Murrieta Division Development Impact Fee (DIF) area based on existing General Plan land use is estimated at 6,440 af-ft/yr for 7,576 EDU's.

PROJECT COST

The updated costs for the proposed master planned facilities are $29,900,000. The facilities included account for water supply, storage, pumping, and major transmission systems necessary to deliver maximum day demand, fire flow, and peak hour demand at ultimate build-out.

RECOMMENDED DEVELOPMENT IMPACT FEE

The recommended Development Impact Fee (DIF) increases by $2,989 per EDU for a ¾-in meter to $4,921 for CFD 88-1 areas and $8,871 for Non-CFD 88-1 areas. The fire flow fee increases from $409 per acre to $535 per acre for all commercial, industrial, or high density residential fire flow connections. The current acreage fee of $2,045 per acre would be eliminated. The proposed DIF fee would be indexed for increasing construction costs and adjusted annually based on the ENR CCI-LA index. To account for the current bond indebtedness of CFD 88-1 for water master planned facilities, the fee differential between CFD 88-1 and Non-CFD 88-1 areas must be phased out over time. The proposed DIF for CFD 88-1 areas would be raised $29 per year for the first twelve years and $14 per year for the next twelve years. The proposed DIF for Non-CFD 88-1 areas would be reduced by $191 per year for the first twelve years and $95 per year for the next twelve years.

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SECTION 2 - SCOPE OF WORK

The objective of this report is to review:

1) The existing DIF for the Western Municipal Water District (WMWD) Murrieta Division,

2) The existing indebtedness for the Murrieta Division Community Facilities Districts (CFDs)

3) Update cost estimates and master planned facilities

4) Recommend a new DIF structure based on the latest information available.

Data developed in the *Murrieta County Water District 2004 Water Facilities Master Plan* (Krieger and Stewart, Inc.) and *Connection Fee Review for the Murrieta Division Retail System, WMWD – Letter Report Update* dated May 25, 2007 (Albert A. Webb Associates) were used as a basis for the required improvements for the ultimate water supply and distribution system. The hydraulic assumptions and calculations developed in the 2004 Water Facilities Master Plan have been assumed to be valid and have not been verified or changed.

This report summarizes project costs for the required improvements, the current CFD funding, the number of EDUs proposed within the service area, and calculations for the proposed DIF update that will fully fund the proposed master planned water facilities required for the WMWD Murrieta Division. The scope details are as follows:

- Develop a data base of land use and water demand for each parcel within the study area.
- Confirm the definition of an EDU to be used within the study area.
- Confirm the unit water demand for an individual EDU.
- Determine the Ultimate Water Demand
- Determine the Ultimate Water Supply Requirements
- Determine master plan facilities to be funded by DIF for
    - Pumping Requirements
    - Storage Requirements
    - Transmission Pipeline Requirements
- Prepare Cost Estimates for facilities proposed.
- Calculate proposed master plan fees required to fund proposed ultimate facilities.

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SECTION 3 - STUDY AREA

The study area is shown in **Figure 1,** and includes all parcels within the former Murrieta County Water District (MCWD) now known as the Murrieta Division of Western Municipal Water District. The entire area lies within the City of Murrieta and is approximately 6.5 square miles in size. The service area has 2,538 existing connections. Planning Data was obtained from the City of Murrieta and summarized in the letter report Connection Fee Review for the Murrieta Division Retail System prepared by Albert A. Webb Associates dated May 25, 2007. This data is used as the basis of the EDU's, water demand and project costs.

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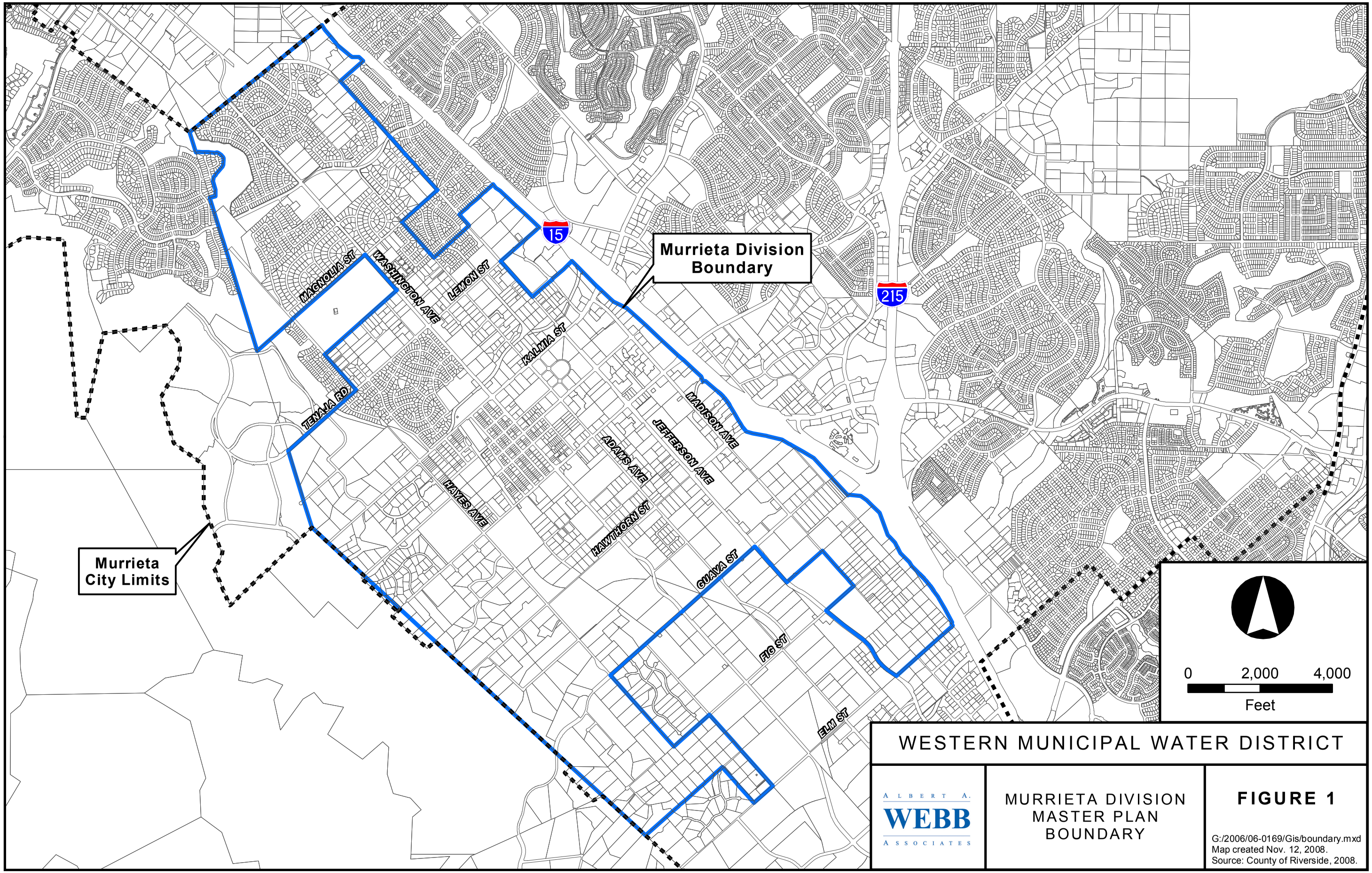

WESTERN MUNICIPAL WATER DISTRICT

ALBERT A. WEBB ASSOCIATES

MURRIETA DIVISION MASTER PLAN BOUNDARY

FIGURE 1

G:/2006/06-0169/Gis/boundary.mxd
Map created Nov. 12, 2008.
Source: County of Riverside, 2008.

SECTION 4 - PRESSURE ZONES

The Murrieta Division has two pressure zones per the 2004 Water Facilities Master Plan report, the 1280′ pressure zone and the 1430′ pressure zone. The boundaries of each pressure zone are based on data provided by the District. The boundaries are shown in **Figure 2**. Minor changes to the boundaries due to development may be allowable based on operational considerations at the time of development.

The 1280′ pressure zone has storage provided by the Olga Gordon Tanks with a high water level of 1282′ MSL. The former Lemon Reservoir site has been abandoned in favor of this higher hydraulic grade. Some localized areas of the west edge of the 1280′ pressure zone may have low pressures due to the local topography. Private pumping systems may be necessary to maintain adequate pressures beyond the meter connection. The 1430′ pressure zone has storage provided by the Grizzly Ridge Tanks at a high water level of 1434′ MSL.

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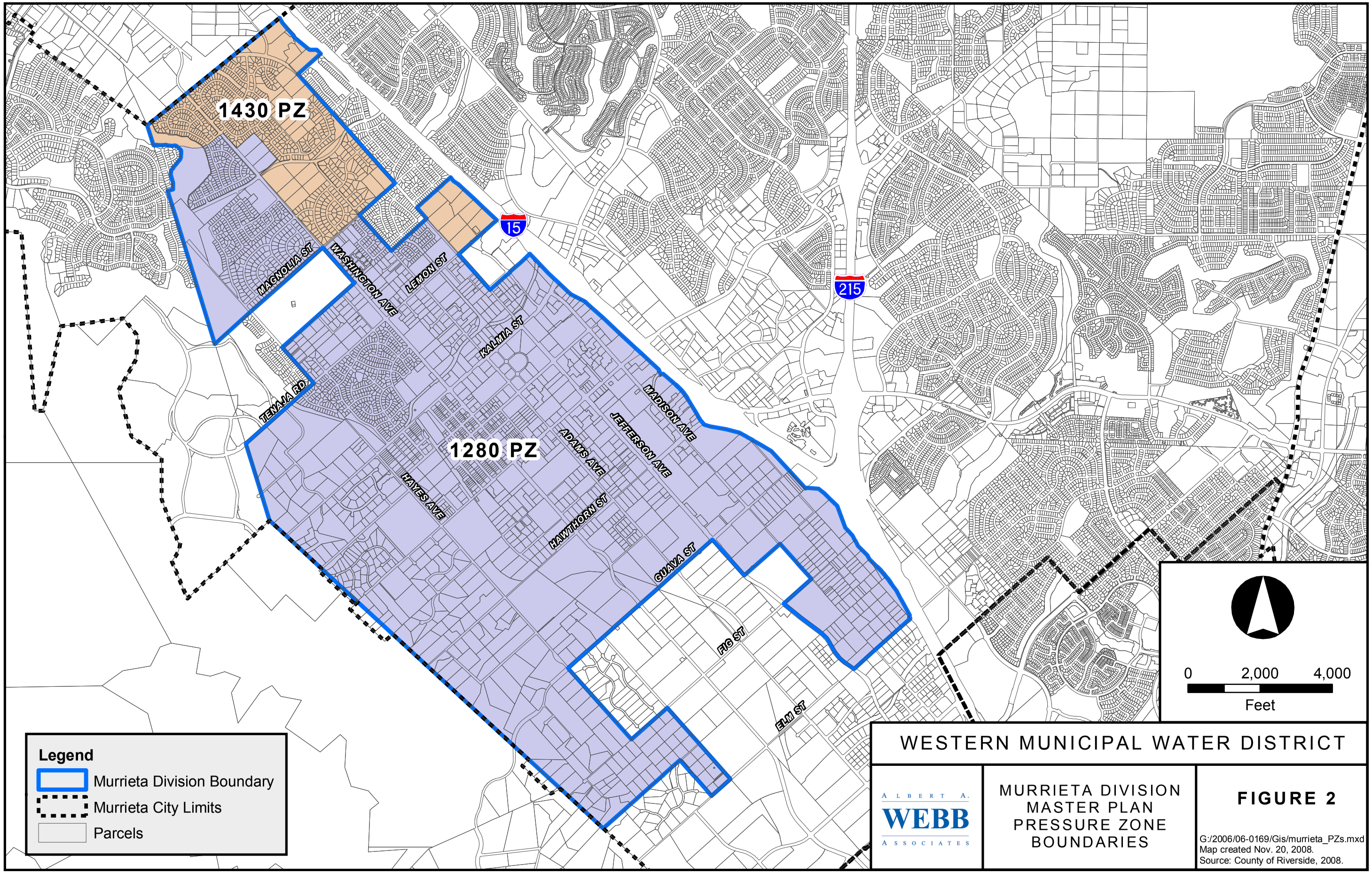

WESTERN MUNICIPAL WATER DISTRICT

ALBERT A. WEBB ASSOCIATES

MURRIETA DIVISION
MASTER PLAN
PRESSURE ZONE
BOUNDARIES

FIGURE 2

G:/2006/06-0169/Gis/murrieta_PZs.mxd
Map created Nov. 20, 2008.
Source: County of Riverside, 2008.

SECTION 5 - UNIT WATER DEMAND AND LAND USE

An Equivalent Dwelling Unit (EDU) for the Murrieta Division is defined as a single family residence with a ¾" meter and an annual unit water demand of 0.85 ac-ft/year. Other land uses have been normalized to EDUs based on their projected unit water demands. This unit water demand is consistent with the unit water demand used in the 2004 report and similar to the unit water demand used in the District's North Added Facilities Area with similar development types and densities.

Maximum, Median, and Minimum Number of new EDUs still to be developed within the Murrieta Division have been estimated based on the City of Murrieta's General Plan Zoning. **Table 1** summarizes the results.

Table 1

Western Municipal Water District

Murrieta Division

Potential Number of New EDUs at Ultimate Build-out

Options	Remaining Development - CFD		Remaining Development - Non CFD		Total
	Residential	Non-Residential	Residential	Non-Residential	
Maximum	3,025	4,493	1,830	235	9,583
Median	2,256	3,631	1,195	210	7,292
Minimum	1,613	2,769	470	186	5,038

Differences between all three options are due to density ranges allowed for a particular land use designation by the City of Murrieta. **Appendix I** gives detailed calculations for each option to determine the Maximum, Median, and Minimum Number of new ultimate EDUs within Murrieta Division service area using current City of Murrieta zoning designations. Existing meters are then subtracted to give the potential number of new EDUs at ultimate build-out as listed in Table 1. An independent photo-metric analysis conducted by Western staff using the same City of Murrieta supplied data suggests an ultimate build-out of approximately 7,600 EDUs. If the existing 2,538 customers are subtracted from that estimated total, then 5,062 EDUs are left to develop, closely matching the minimum density calculation of 5,038. Therefore, this analysis

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recommends using the Minimum number of remaining EDUs of 5,038 as the basis for further calculations in this report.

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SECTION 6 - PROJECTED ULTIMATE WATER DEMAND

Land use acreages were determined using the applicable city planning documents and from data bases provided by the City of Murrieta. The projected number of EDU's was calculated for each pressure zone. Commercial water demand is estimated at 2000 gpd/acre.

Table 2 contains a summary of projected land use, annual, maximum day, and peak hour water demands for each pressure zone within the Murrieta Division.

Table 2
Western Municipal Water District
Murrieta Division
Ultimate Water Demand by Pressure Zone

Pressure Zone	Acreage	EDU's	Annual Demand (ac-ft/yr)	Maximum Day Demand (gpm) (1)	Maximum Day Demand (cfs) (1)	Peak Hour Demand (cfs) (2)
1280′	3,378	6,049	5140	8,725	19.4	29.1
1430′	571	1,529	1,300	2,200	4.9	7.3
TOTALS	**3,949**	**7,576**	**6,440**	**10,925**	**24.3**	**36.4**

(1) Maximum Day is 150% of the average day of Maximum Month; Maximum Month is based on 15% of total annual water demand
(2) Peak Hour is 150% of Maximum Day

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SECTION 7 - WATER SYSTEM AND HYDRAULICS

The Murrieta Division water system is designed to deliver pumped groundwater and imported treated water to its customers under maximum day demand, fire flow, and peak hour conditions. The system consists of five components: supply, storage, pumping, transmission, and local distribution. The first four components are included in the master planned water facilities. Each facility must be sized to provide an adequate level of service at maximum day demand and peak hour conditions. Local distribution, limited to local pipelines adjacent or within a new tract or project, is specific to the new development and is therefore excluded from the master planned facilities. These local distribution pipelines are funded directly by individual property owners. The most recent report analyzing the water system is the *Murrieta County Water District 2004 Water Facilities Master Plan* ("Master Plan") prepared by Krieger and Stewart, Inc. This report describes the necessary master planned facilities needed to meet maximum day demand at ultimate build out of the Murrieta Division. The report included a detailed analysis of the existing water infrastructure, an analysis of the storage and well capacity needed, and a hydraulic analysis to determine the size and extent of the transmission pipeline and pumping system required to meet ultimate maximum day demand. The findings of this report have been used as a basis for determining the master planned facilities and their current estimated costs for the development impact fee calculation.

The existing pressure zones for the Murrieta Division are shown in **Figure 2**. The system currently has two pressure zones, two active storage sites – one for each zone, a pump station to lift water from the lower zone into the higher zone, several active wells in the lower zone, one imported water connection to the lower zone from Eastern Municipal Water District (EMWD), and one emergency connection to the higher zone from Elsinore Valley Municipal Water District (EVMWD).

Since the 2004 Master Plan was prepared, several significant changes have occurred. First, Murrieta County Water District was dissolved and absorbed into WMWD as the Murrieta Division. Second, contrary to initial assumptions, the local groundwater supply is now

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recognized as unable to meet ultimate maximum day demand. Several existing wells have been removed from service due to water quality concerns. Additionally, basin hydrological studies indicate that the local groundwater basin may already be in an overdraft condition. WMWD has responded to these issues by working closely with neighboring water purveyors to obtain viable long-term connections for conveying imported water to the Murrieta Division for existing demands. It should be noted that these new connections are more expensive than new groundwater wells but current conditions within the underlying groundwater basin makes relying solely on groundwater a risky and untenable long term water supply plan for the Murrieta Division. Therefore, WMWD has updated the master planned facilities shown in the original 2004 Master Plan by adding additional imported water supply facilities.

The imported water facilities include upgrading the existing EMWD connection at Los Alamos Road to a permanent connection and installing a new emergency connection to EVMWD on Washington Ave near Palomar Road. The agreement between WMWD and EMWD requires that EMWD convey up to 5 cfs imported water from MWD's Skinner Treatment Plant through EMWD's conveyance system to the Murrieta Division at Los Alamos Road when water is available from MWD. The EVMWD connection is an emergency connection to be used for mutual aid in emergency situations only.

The 2004 master plan report also indicated that future water storage would be available through EVMWD; however WMWD has decided that Murrieta Division should plan to construct its own water storage facilities rather than relying on EVMWD. The costs for these facilities, as well as updated costs for other master planned facilities, were summarized in *Connection Fee Review for the Murrieta Division Retail System, WMWD – Letter Report Update* dated May 25, 2007 (Albert A. Webb Associates).

In addition, Western staff has simplified the proposed pipeline conveyance system to include only major transmission facilities in order to keep the development impact fee as low as possible. Any additional pipelines necessary to serve a particular parcel will be the responsibility of the individual property owner or developer. It is expected that development will occur near existing pipelines and would proceed as the distribution system expands. Any outlaying property could

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construct additional off-site water facilities or wait until those off-site water facilities were constructed by others. The proposed master planned facilities are shown in **Figure 3** with costs summarized in **Table 3 at $27,900,000**. A more detailed discussion of the required master planned facilities for transmission pipelines, storage and pumping requirements are given in **Appendices II, III and IV** respectively. Additional details regarding the proposed master planned facility costs are given in **Appendix V.**

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Grizzly Ridge Tank Site

EMWD Supply Connection

15

MADISON AVE

JEFFERSON AVE

ADAMS AVE

HAYES AVE

WASHINGTON AVE

MAGNOLIA ST

LEMON ST

KALMIA ST

HAWTHORN ST

GUAVA ST

FIG ST

TENAJA RD

12"

24"

16"

PS

South Well

North Well

New Clay Well

Alson Pump Station

Olga Gordon Tank Site

Legend

- Murrieta Division Boundary
- Murrieta City Limits
- Parcels
- Proposed Water Lines
- Existing Lines
- 1280 PZ
- 1430 PZ

0 2,000 4,000

Feet

WESTERN MUNICIPAL WATER DISTRICT

ALBERT A. WEBB ASSOCIATES

MURRIETA DIVISION MASTER PLAN EXISTING AND PROPOSED FACILITIES

FIGURE 3

G:/2006/06-0169/Gis/prop_facil.mxd
Map revised Nov. 20, 2008.
Source: County of Riverside, 2008.

Table 3

Western Municipal Water District
Construction and Project Cost for
Proposed Murrieta Division Master Planned Facilities

DESCRIPTION		CONSTRUCTION COST
Water Supply - Wells		$6,625,000
Pumping Facilities		$0
Storage Facilities		$3,700,000
Pipeline		$6,475,500
Construction Cost		$16,800,500
Project overhead (40% of construction cost) [1]		$6,720,200
Project Cost		$23,520,700
External Water Supply		$4,350,000
Total Project Cost		$27,870,700
	use	$27,900,000

[1] Project Cost is 1.4 times construction cost. Project cost includes: construction costs, construction contingencies, design engineering including plans and specifications; design and construction surveying and mapping; geotechnical evaluation and report; engineering contract administration; field inspection and nominal environmental documentation. Costs are based on Engineering News Record (ENR) Construcion Cost Index Los Angeles, August, 2008 (ENR CCI LA = 9342.44). Escalation, financing, interest during construction, legal, EIR/EIS, land acquisition, except where expicitly noted

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SECTION 8 - HISTORY OF MCWD FEE STRUCTURE

The existing Murrieta Division Development Fee Impact (DIF) structure for new water meters was developed based on estimated costs to construct the needed water infrastructure, funds currently available to pay for those costs, and an estimate of future revenues from various sources such as CFD financing or development impact fees. The most recent report for the needed water infrastructure is the *Murrieta County Water District 2004 Water Facilities Master Plan* ("Master Plan") prepared by Krieger and Stewart, Inc. (October 2004). The current fee structure for new meters and fire service connections is given in **Table 4**.

Table 4
Western Municipal Water District
Murrieta Division
Development Impact Fee – Current

	Within CFD 88-1	Non CFD 88-1 Areas
DIF (per EDU or 3/4" meter)	$1,932	$5,882
Commercial Fire Service Fee (per acre)	$409	$409
Acreage Fee (per acre)	$2,045	$2,045

These charges were in effect when WMWD acquired MCWD and have not been revised since that time. The existing fee has three major components: a DIF charged for each and every new meter installed, a commercial fire service fee charged for any fire service connections necessary for on-site fire protection within a commercial, industrial, or high density residential development, and an acreage fee charged for a parcel or parcels when new meters are installed. These fees are intended to provide an equitable means of funding any future water user's share of the master planned facilities.

DIF is charged for each new meter when vacant land is developed and requires water service from the District. Since master planned facility sizing ultimately depends on the flow capacity demand placed on the system from each meter, the meter capacity charge is a relative way to

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determine the benefit for a given parcel. Meter fees for high density residential or other commercial uses that may have large master meters are based on a calculation converting the anticipated water demand to equivalent dwelling units. In these situations, meter sizes for commercial, industrial, or high density residential development are then determined to best match the required peak flow of each proposed development.

The $3,950 difference in DIF meter fees between CFD 88-1 and Non-CFD 88-1 areas accounts for master planned water facilities financed by the existing CFD 88-1 and paid for by property owners with the CFD. Properties within the CFD 88-1 boundary are responsible for repayment of the associated bond indebtedness. It is estimated that half of the bonds will be retired in approximately 12 years and with the remaining half retired in another 12 years. Additional details of the bond funding are given in **Section 9**.

The Commercial Fire Service Fee is charged for any new fire service connections and funds the additional water system capacity necessary to supply the higher fire flow requirements typically required for commercial, industrial, or high density residential development. The higher capacity translates to larger pipeline diameters and increased storage capacity to deliver that increased fire flow. Water supply and pump station capacity are not impacted as their ultimate size is typically based on maximum day demand of the system irrespective of fire flow demand.

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SECTION 9 - EXISTING COMMUNITY FACILITY DISTRICTS

MCWD established Community Facilities District (CFD) 88-1 to construct water, wastewater, and other capital facilities such as street improvements, storm drains, and financing costs within MCWD's water service boundary. As MCWD expanded to its current 6.5 square mile service area, new parcels were annexed to MCWD but not to CFD 88-1. Therefore, MCWD established different DIFs for those areas inside or outside of CFD 88-1 to account for water master planned facilities already being financed by the CFD. Subsequent to the original 1988 bond issuance, additional bond series have been issued for a variety of reasons including additional funds for facilities or refinancing previous bond issues. These details are discussed in this section of the report. In addition, MCWD established CFD 99-1 for an area outside CFD 88-1 to finance fees associated with a new Tract development. Since this CFD was to finance facilities and fees specific for that development and not used to finance construction of any water master planned facilities benefiting the entire District, CFD 99-1 has been excluded from this analysis.

CFD 88-1 ANALYSIS

MCWD has issued a number of separate bonds under CFD 88-1. A list of all Issued Bonds and their amounts is given below in **Table 5**. A more detailed description of all Issued Bonds is found in **Appendix VI**. These bonds were used to finance various improvements beyond water facilities such as sewer facilities, street improvements, storm drains, and associated financing costs (such as Reserve fund, Underwriter's Discount, and Cost of Issuance).

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Table 5

Western Municipal Water District

Murrieta Division

List of Issued Bonds under CFD 88-1

Issued Bond	Bond Amount	Status
CDF No. 88-1 Series 1988 Special Tax Bond	$1,975,000	Defeased
CFD No. 88-1 Series 1990 Special Tax Bond	$2,255,000	Defeased
CFD No. 88-1 Series 1991 Special Tax Bond	$7,840,000	Defeased
CFD No. 88-1 1996 Series A (Senior Lien Bond)	$7,325,000	Active
CFD No. 88-1 1996 Series A (Junior Lien Bond)	$4,965,000	Active
CFD No. 88-1 Series 2000 Junior Lien Special Tax Bond	$2,690,000	Active

Some information regarding the use and allocation of funds for all Issued Bonds (CFD 88-1) was obtained from their respective Issue-Books. However, these books do not provide enough information to determine which water and sewer facilities have actually been constructed. *Water System Development Impact Fee Report* dated May 21, 1991 prepared by CQC Engineering, Inc. provided more detailed estimates of water and sewer facilities constructed and is considered the best information available regarding the water facilities constructed with CFD financing. Approximately 43% of the bond proceeds were used to construction water and sewer facilities for the Murrieta division.

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SECTION 10 - WATER SUPPLY

The estimated ultimate water demand is 6,440 ac-ft/year. The Murrieta Division currently has ground water wells and a connection from EMWD for imported water at 5 cfs. Based on recent hydrologic studies of the underlying groundwater basin, extraction for the Murrieta Division could be limited to 1,500 ac-ft/year. Maximum water supply from the EMWD connection is estimated at 3,600 ac-ft/year assuming a 99.4% utilization of the existing 5 cfs connection. Therefore, an additional 1,340 ac-ft/year of imported water is required to meet ultimate demand. Most of this additional imported water will be needed for peak summer demand. The seasonally adjusted demand versus water supply for the ultimate condition is given in **Figure 4**. It is estimated the ultimate maximum month water demand will be 837 ac-ft. Additional imported water must provide an additional 348 ac-ft in the maximum month with a peak flow of 16.3 cfs to account for maximum day demand.

As shown in Figure 4, the supply through the EMWD connection has been used as the baseline supply to maximum the imported supply through this 5 cfs connection. Well production will be used as an additional baseline supply in higher demand months assuming a well production limit of 1,375 gpm. Additional imported water supply must be provide to meet the ultimate summer peak demands.

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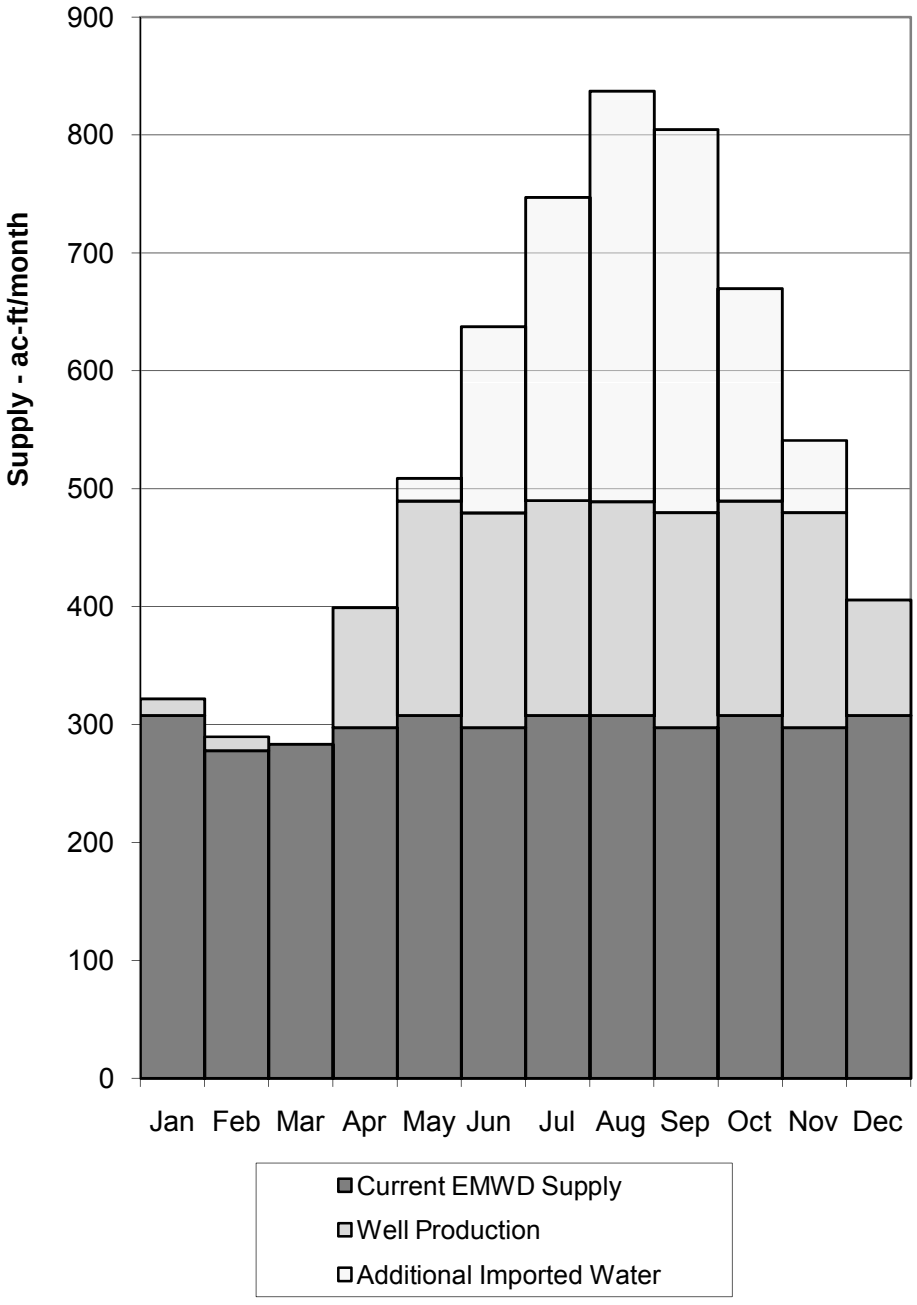
Figure 4
Western Municipal Water District
Murrieta Division
Water Supply
Ultimate Demand of 6,440 ac-ft/yr
and Well Production Limit of 1,500 ac-ft/yr



SECTION 11 - PROPOSED DEVELOPMENT IMPACT FEE

All connection fees imposed by WMWD must have a nexus to the benefits provided. Within the Murrieta Division, the DIF is intended to finance master planned water facilities for the general benefit of the entire District. These facilities include water supply, storage, pumping, and pipeline facilities necessary to convey water throughout the District and meet maximum day, fire flow, and peak hour demand criteria established by the State of California Department of Public Health.

Updated costs for proposed ultimate system are **$27,900,000**, as shown in **Section 7** and include additional facilities for water supply, as well as higher costs for each water system component due to increased construction costs. Using the current DIF charges presented in Section 4 and the potential number of new EDUs estimated in Section 3, the Murrieta Division would collect approximately $16,710,000, leaving a shortfall of $11,190,000. Therefore, a fee increase is necessary to cover the funding shortfall.

In addition to the DIF, the former MCWD instituted the use of an "acreage fee", which was a means for allocating capital costs (and thus the connection fee) based on the total acreage of the parcel as well as the size of the meter supplied. Although this is a valid methodology, this report recommends that the acreage fee be eliminated to conform to the connection fee philosophy of Western's main retail area.

The proposed DIF meter component would increase for both CFD and Non-CFD areas by $3,041 to a single fee of $4,978 for CFD areas and $8,928 for Non-CFD areas when a ¾-inch meter is purchased. Additional details are given in **Appendix VII**. Higher fees would apply for larger meter sizes based on their higher capacity. Commercial, industrial, or high density residential with a master meter would pay fees based on an actual demand/EDU comparison to ¾-inch meter fees. **Table 6** compares the existing to proposed DIF/acreage/fire flow fees.

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Table 6
Western Municipal Water District
Murrieta Division
Development Impact Fee – Current vs. Proposed

	Current		Proposed	
	Within CFD 88-1	**Non-CFD Area**	**Within CFD 88-1**	**Non-CFD Area**
DIF (per EDU or ¾" meter)	$1,932	$5,882	$4,978	$8,928
Commercial Fire Service Fee (per acre)	$409	$409	$535	$535
Acreage Fee (per acre)	$2,045	$2,045	--	--
Total (assume 1 acre)	$4,386	$8,336	$5,370	$9,320

Recognizing that property owners within the CFD areas are paying a tax increment towards retiring the bonds used to construct certain water master planned facilities and that those two bond issues are estimated to be retired in 12 and 24 years, the ultimate DIF for both the CFD and Non-CFD areas should be equal when the bonds are fully retired. Therefore, the DIF for both the CFD and Non-CFD areas should approach a weighted average fee over the life of the bonds. In order to adjust the fees accordingly, it is recommended that 1) the DIF for the CFD areas increase by $29 per year for the first 12 years and $14 per year for the remaining 12 years and 2) the DIF for the Non-CFD areas be reduced by $191 per year for the first 12 years and $95 per year for the remaining 12 years. This adjustment would need to be revised if any new bonds are issued for water facilities or any existing bonds are refinanced with new retirement dates.

Construction costs typically increase over time and fees adjustments must be made to the connection fee to incorporate these increased costs for water master planned facilities. The Engineering and News Record Construction Cost Index for Los Angeles (ENR CCI LA) is a widely accepted cost index for local public works projects. The current index value is $9,181.67 for December 2007 and adjusted on a monthly basis. To keep the connection fee current with increasing construction costs, the fee would be multiplied by the ratio of the new index value to the previous index value. Historically, this index has changed between two and four percent per

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year over the last several years. If the fee is not increased, the Murrieta Division will not collect enough money to fully fund the required master planned facilities.

It is recommended that an annual adjustment be made to the DIF on or about January 1 using both ENR CCI LA and the Bond Repayment schedule noted above. In this way, the DIF will automatically adjust for construction cost inflation and appropriately and fairly account for the existing CFD financing. Periodically, on a five-year cycle, the cost structure of the master plan, the current fund balance, the CFD bonding status, and the projected future fees should be revised to ensure that an appropriate and equitable connection fee is in effect.

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APPENDIX I

EDU CALCULATIONS

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Appendix I-1: Estimated Remaining EDUs within Murrieta District - Minimum

					Ultimate Development			Existing Meter Count		Remaining Development	
Area No.	Zoning	Acreage	Location	Description	Residential (DU)	Non-Residential (Gross Acreage)	Non-Residential (DU)	Residential (Meters)	Non-Residential (Meters)	Residential (DU)	Non-Residential (DU)
11	BP	53.7	88-1	Non-Res	0	21.5	53	0	0	0	53
13	C/I	14.9	88-1	Non-Res	0	0.0	0	0	1	0	0
16	NC	2.7	88-1	Non-Res	0	0.7	2	0	0	0	2
17	MU-3	39.2	88-1	Non-Res	0	117.6	292	0	0	0	292
19	MU-3	28.6	88-1	Non-Res	0	85.8	213	0	7	0	206
21	MU-3	20.9	88-1	Non-Res	0	62.7	155	0	9	0	146
24	MU-3	5.7	88-1	Non-Res	0	17.1	42	0	0	0	42
31	MU-3	22.9	88-1	Non-Res	0	68.7	170	0	9	0	161
32	VP/C/I	40.5	88-1	Non-Res	0	0.0	0	0	18	0	0
33	VMU	15.3	88-1	Non-Res	0	3.4	8	0	1	0	7
34	VCN	5.3	88-1	Non-Res	0	1.2	3	0	1	0	2
36	VCN	3.8	88-1	Non-Res	0	0.9	2	0	3	0	0
37	VP/C/I	18.5	88-1	Non-Res	0	0.0	0	0	12	0	0
39	VRO	10.7	88-1	Non-Res	0	2.5	6	0	0	0	6
40	VP/C/I	2.3	88-1	Non-Res	0	0.0	0	0	0	0	0
41	VRO	2.8	88-1	Non-Res	0	0.6	2	0	0	0	2
43	VCN	9.5	88-1	Non-Res	0	2.2	5	0	3	0	2
44	VMU	20.2	88-1	Non-Res	0	4.4	11	0	19	0	0
45	VMU	7.5	88-1	Non-Res	0	1.7	4	0	4	0	0
46	VMU	11.9	88-1	Non-Res	0	2.6	6	0	0	0	6
48-B	VP/C/I	15.0	88-1	Non-Res	0	0.0	0	0	0	0	0
55	MU-3	39.8	88-1	Non-Res	0	119.4	296	0	23	0	273
56	MU-3	29.3	88-1	Non-Res	0	87.9	218	0	16	0	202
58	MU-3	9.8	88-1	Non-Res	0	29.4	73	0	2	0	71
63	CC	30.5	88-1	Non-Res	0	8.2	20	0	4	0	16
64	CC	45.4	88-1	Non-Res	0	12.3	30	0	0	0	30
65	CC	39.6	88-1	Non-Res	0	10.7	27	0	11	0	16
66	CC	40.5	88-1	Non-Res	0	10.9	27	0	0	0	27
67	MU-3	39.2	88-1	Non-Res	0	117.6	292	0	5	0	287
68	BP	40.6	88-1	Non-Res	0	16.2	40	0	0	0	40
70	BP	43.2	88-1	Non-Res	0	17.3	43	0	1	0	42
20-A	CC	29.0	88-1	Non-Res	0	7.8	19	0	1	0	18
22-B	CC	14.0	88-1	Non-Res	0	3.8	9	0	0	0	9
23-A	MU-3	13.6	88-1	Non-Res	0	40.8	101	0	6	0	95
23-B	CC	3.0	88-1	Non-Res	0	0.8	2	0	1	0	1
29-B	MU-3	20.7	88-1	Non-Res	0	62.1	154	0	7	0	147
52-B	MU-3	8.2	88-1	Non-Res	0	24.6	61	0	17	0	44
12	SF-1	19.7	88-1	Res	41	0.0	0	55	0	0	0
14	ER-2	4.8	88-1	Res	5	0.0	0	0	0	5	0
18	ER-2	83.1	88-1	Res	91	0.0	0	19	0	72	0
25	SF-1	162.6	88-1	Res	341	0.0	0	429	0	0	0
35	VRM-1	16.6	88-1	Res	168	0.0	0	0	0	168	0
38	VP/C/I	2.8	88-1	Res	0	0.0	0	0	0	0	0
42	VRS-2	8.5	88-1	Res	43	0.0	0	0	0	43	0

Appendix I-1: Estimated Remaining EDUs within Murrieta District - Minimum

					Ultimate Development			Existing Meter Count		Remaining Development	
Area No.	Zoning	Acreage	Location	Description	Residential (DU)	Non-Residential (Gross Acreage)	Non-Residential (DU)	Residential (Meters)	Non-Residential (Meters)	Residential (DU)	Non-Residential (DU)
47	VRS-2	35.9	88-1	Res	183	0.0	0	6	0	177	0
48-A	VRS-1	80.2	88-1	Res	168	0.0	0	44	0	124	0
49	VRR	23.1	88-1	Res	2	0.0	0	2	0	0	0
54	MF-2	10.2	88-1	Res	154	0.0	0	0	0	154	0
57	MF-1	9.8	88-1	Res	99	0.0	0	2	0	97	0
59	SF-2	20.7	88-1	Res	106	0.0	0	0	0	106	0
60	MF-1	10.3	88-1	Res	104	0.0	0	2	0	102	0
69	ER-1	19.1	88-1	Res	10	0.0	0	24	0	0	0
71	ER-1	94.0	88-1	Res	47	0.0	0	1	0	46	0
72	RR	44.3	88-1	Res	4	0.0	0	0	0	4	0
73	ER-1	39.7	88-1	Res	20	0.0	0	0	0	20	0
74	RR	46.8	88-1	Res	5	0.0	0	0	0	5	0
11-A	SF-1	15.0	88-1	Res	32	0.0	0	0	0	32	0
15-A	ER-2	25.2	88-1	Res	28	0.0	0	1	0	27	0
15-B	SF-1	15.0	88-1	Res	32	0.0	0	0	0	32	0
20-B	ER-2	29.9	88-1	Res	33	0.0	0	0	0	33	0
22-A	ER-2	46.0	88-1	Res	51	0.0	0	4	0	47	0
61-A	ER-1	123.9	88-1	Res	62	0.0	0	5	0	57	0
61-B	RR	38.0	88-1	Res	4	0.0	0	1	0	3	0
8	CC	9.7	District	Non-Res	0	2.6	6	0	20	0	0
76	MU-2	105.2	District	Non-Res	0	21.0	52	0	6	0	46
77	MU-2	93.6	District	Non-Res	0	18.7	46	0	0	0	46
78	BP	39.9	District	Non-Res	0	16.0	40	0	3	0	37
79	BP	49.4	District	Non-Res	0	19.8	49	0	0	0	49
51-A	CC	9.8	District	Non-Res	0	2.6	7	0	13	0	0
51-B	CC	17	District	Non-Res	0	4.6	11	0	4	0	7
1	ER-3	91.1	District	Res	182	0.0	0	56	0	126	0
2	SF-1	101.5	District	Res	213	0.0	0	300	0	0	0
3	MF-1	15.9	District	Res	161	0.0	0	0	0	161	0
4	SF-1	124.2	District	Res	261	0.0	0	261	0	0	0
5	ER-3	81.9	District	Res	164	0.0	0	112	0	52	0
6	ER-3	77.2	District	Res	154	0.0	0	91	0	63	0
7	ER-3	5.8	District	Res	12	0.0	0	8	0	4	0
9	SF-1	65.7	District	Res	138	0.0	0	188	0	0	0
10	ER-2	83.1	District	Res	91	0.0	0	161	0	0	0
26	SF-1	16.9	District	Res	35	0.0	0	41	0	0	0
27	RR	169.8	District	Res	17	0.0	0	0	0	17	0
50	RR	201.0	District	Res	20	0.0	0	48	0	0	0
62	RR	178.1	District	Res	18	0.0	0	15	0	3	0
75	RR	178.1	District	Res	18	0.0	0	0	0	18	0
80	RR	38.9	District	Res	4	0.0	0	0	0	4	0
81	RR	20.3	District	Res	2	0.0	0	0	0	2	0
82	RR	136.7	District	Res	14	0.0	0	0	0	14	0
83	RR	69.2	District	Res	7	0.0	0	0	0	7	0

Appendix I-1: Estimated Remaining EDUs within Murrieta District - Minimum

Area No.	Zoning	Acreage	Location	Description	Ultimate Development Residential (DU)	Ultimate Development Non-Residential (Gross Acreage)	Ultimate Development Non-Residential (DU)	Existing Meter Count Residential (Meters)	Existing Meter Count Non-Residential (Meters)	Remaining Development Residential (DU)	Remaining Development Non-Residential (DU)
51	RC	27.5	IA-2	Non-Res	0	13.8	34	0	16	0	18
53	MU-3	29.5	IA-2	Non-Res	0	88.5	219	0	0	0	219
28-A	CC	20.8	IA-2	Non-Res	0	5.6	14	0	16	0	0
28-B	NC	10.1	IA-2	Non-Res	0	2.5	6	0	3	0	3
29-A	MU-3	20.0	IA-2	Non-Res	0	60.0	149	0	5	0	144
52-A	MU-3	20.0	IA-2	Non-Res	0	60.0	149	0	12	0	137
30	MF-2	17.5	IA-2	Res	264	0.0	0	4	0	260	0
TOTAL					**3607**	**1279.1**	**3172**	**1880**	**279**	**2083**	**2955**

Assumptions:

1.5	AF / acre / yr
325,851	gal / AF
540	gal / day / DU

BP	0.40	F/A Ratio
C/I		
CC	0.27	F/A Ratio
ER-1	0.50	DU/acres
ER-2	1.10	DU/acres
ER-3	2.00	DU/acres
GI	0.40	
MF-1	10.10	DU/acres
MF-2	15.10	DU/acres
MU-1		(There is no specific designation for this category)
MU-2	0.20	(There is no specific designation for this category)
MU-3	3.00	(There is no specific designation for this category)
NC	0.25	F/A Ratio
PC	0.50	F/A Ratio
RC	0.50	F/A Ratio
RR	0.10	DU/acres
RRC	0.25	F/A Ratio
SF-1	2.10	DU/acres
SF-2	5.10	DU/acres
SI	0.40	
SP		
VCN	0.23	F/A Ratio
VMU	0.22	F/A Ratio
VP/C/I		
VRM-1	10.10	DU/acres
VRO	0.23	F/A Ratio
VRR	0.10	DU/acres
VRS-1	2.10	DU/acres
VRS-2	5.10	DU/acres

Appendix I-2: Estimated Remaining EDUs within Murrieta District - Average

					Ultimate Development			Existing Meter Count		Remaining Development	
Area No.	Zoning	Acreage	Location	Description	Residential (DU)	Non-Residential (Gross Acreage)	Non-Residential (DU)	Residential (Meters)	Non-Residential (Meters)	Residential (DU)	Non-Residential (DU)
11	BP	53.7	88-1	Non-Res	0	21.5	53	0	0	0	53
13	C/I	14.9	88-1	Non-Res	0	0.0	0	0	1	0	0
16	NC	2.7	88-1	Non-Res	0	0.7	2	0	0	0	2
17	MU-3	39.2	88-1	Non-Res	0	156.8	389	0	0	0	389
19	MU-3	28.6	88-1	Non-Res	0	114.4	284	0	7	0	277
21	MU-3	20.9	88-1	Non-Res	0	83.6	207	0	9	0	198
24	MU-3	5.7	88-1	Non-Res	0	22.8	57	0	0	0	57
31	MU-3	22.9	88-1	Non-Res	0	91.6	227	0	9	0	218
32	VP/C/I	40.5	88-1	Non-Res	0	0.0	0	0	18	0	0
33	VMU	15.3	88-1	Non-Res	0	3.4	8	0	1	0	7
34	VCN	5.3	88-1	Non-Res	0	1.3	3	0	1	0	2
36	VCN	3.8	88-1	Non-Res	0	0.9	2	0	3	0	0
37	VP/C/I	18.5	88-1	Non-Res	0	0.0	0	0	12	0	0
39	VRO	10.7	88-1	Non-Res	0	2.5	6	0	0	0	6
40	VP/C/I	2.3	88-1	Non-Res	0	0.0	0	0	0	0	0
41	VRO	2.8	88-1	Non-Res	0	0.6	2	0	0	0	2
43	VCN	9.5	88-1	Non-Res	0	2.3	6	0	3	0	3
44	VMU	20.2	88-1	Non-Res	0	4.4	11	0	19	0	0
45	VMU	7.5	88-1	Non-Res	0	1.7	4	0	4	0	0
46	VMU	11.9	88-1	Non-Res	0	2.6	6	0	0	0	6
48-B	VP/C/I	15.0	88-1	Non-Res	0	0.0	0	0	0	0	0
55	MU-3	39.8	88-1	Non-Res	0	159.2	395	0	23	0	372
56	MU-3	29.3	88-1	Non-Res	0	117.2	291	0	16	0	275
58	MU-3	9.8	88-1	Non-Res	0	39.2	97	0	2	0	95
63	CC	30.5	88-1	Non-Res	0	8.2	20	0	4	0	16
64	CC	45.4	88-1	Non-Res	0	12.3	30	0	0	0	30
65	CC	39.6	88-1	Non-Res	0	10.7	27	0	11	0	16
66	CC	40.5	88-1	Non-Res	0	10.9	27	0	0	0	27
67	MU-3	39.2	88-1	Non-Res	0	156.8	389	0	5	0	384
68	BP	40.6	88-1	Non-Res	0	16.2	40	0	0	0	40
70	BP	43.2	88-1	Non-Res	0	17.3	43	0	1	0	42
20-A	CC	29.0	88-1	Non-Res	0	7.8	19	0	1	0	18
22-B	CC	14.0	88-1	Non-Res	0	3.8	9	0	0	0	9
23-A	MU-3	13.6	88-1	Non-Res	0	54.4	135	0	6	0	129
23-B	CC	3.0	88-1	Non-Res	0	0.8	2	0	1	0	1
29-B	MU-3	20.7	88-1	Non-Res	0	82.8	205	0	7	0	198
52-B	MU-3	8.2	88-1	Non-Res	0	32.8	81	0	17	0	64
12	SF-1	19.7	88-1	Res	69	0.0	0	55	0	14	0
14	ER-2	4.8	88-1	Res	7	0.0	0	0	0	7	0
18	ER-2	83.1	88-1	Res	125	0.0	0	19	0	106	0
25	SF-1	162.6	88-1	Res	569	0.0	0	429	0	140	0
35	VRM-1	16.6	88-1	Res	183	0.0	0	0	0	183	0
38	VP/C/I	2.8	88-1	Res	0	0.0	0	0	0	0	0
42	VRS-2	8.5	88-1	Res	55	0.0	0	0	0	55	0

Appendix I-2: Estimated Remaining EDUs within Murrieta District - Average

Area No.	Zoning	Acreage	Location	Description	Ultimate Development Residential (DU)	Ultimate Development Non-Residential (Gross Acreage)	Ultimate Development Non-Residential (DU)	Existing Meter Count Residential (Meters)	Existing Meter Count Non-Residential (Meters)	Remaining Development Residential (DU)	Remaining Development Non-Residential (DU)
47	VRS-2	35.9	88-1	Res	233	0.0	0	6	0	227	0
48-A	VRS-1	80.2	88-1	Res	221	0.0	0	44	0	177	0
49	VRR	23.1	88-1	Res	5	0.0	0	2	0	3	0
54	MF-2	10.2	88-1	Res	168	0.0	0	0	0	168	0
57	MF-1	9.8	88-1	Res	123	0.0	0	2	0	121	0
59	SF-2	20.7	88-1	Res	155	0.0	0	0	0	155	0
60	MF-1	10.3	88-1	Res	129	0.0	0	2	0	127	0
69	ER-1	19.1	88-1	Res	14	0.0	0	24	0	0	0
71	ER-1	94.0	88-1	Res	71	0.0	0	1	0	70	0
72	RR	44.3	88-1	Res	18	0.0	0	0	0	18	0
73	ER-1	39.7	88-1	Res	30	0.0	0	0	0	30	0
74	RR	46.8	88-1	Res	19	0.0	0	0	0	19	0
11-A	SF-1	15.0	88-1	Res	53	0.0	0	0	0	53	0
15-A	ER-2	25.2	88-1	Res	38	0.0	0	1	0	37	0
15-B	SF-1	15.0	88-1	Res	53	0.0	0	0	0	53	0
20-B	ER-2	29.9	88-1	Res	45	0.0	0	0	0	45	0
22-A	ER-2	46.0	88-1	Res	69	0.0	0	4	0	65	0
61-A	ER-1	123.9	88-1	Res	93	0.0	0	5	0	88	0
61-B	RR	38.0	88-1	Res	15	0.0	0	1	0	14	0
8	CC	9.7	District	Non-Res	0	2.6	6	0	20	0	0
76	MU-2	105.2	District	Non-Res	0	26.3	65	0	6	0	59
77	MU-2	93.6	District	Non-Res	0	23.4	58	0	0	0	58
78	BP	39.9	District	Non-Res	0	16.0	40	0	3	0	37
79	BP	49.4	District	Non-Res	0	19.8	49	0	0	0	49
51-A	CC	9.8	District	Non-Res	0	2.6	7	0	13	0	0
51-B	CC	17	District	Non-Res	0	4.6	11	0	4	0	7
1	ER-3	91.1	District	Res	228	0.0	0	56	0	172	0
2	SF-1	101.5	District	Res	355	0.0	0	300	0	55	0
3	MF-1	15.9	District	Res	199	0.0	0	0	0	199	0
4	SF-1	124.2	District	Res	435	0.0	0	261	0	174	0
5	ER-3	81.9	District	Res	205	0.0	0	112	0	93	0
6	ER-3	77.2	District	Res	193	0.0	0	91	0	102	0
7	ER-3	5.8	District	Res	15	0.0	0	8	0	7	0
9	SF-1	65.7	District	Res	230	0.0	0	188	0	42	0
10	ER-2	83.1	District	Res	125	0.0	0	161	0	0	0
26	SF-1	16.9	District	Res	59	0.0	0	41	0	18	0
27	RR	169.8	District	Res	68	0.0	0	0	0	68	0
50	RR	201.0	District	Res	80	0.0	0	48	0	32	0
62	RR	178.1	District	Res	71	0.0	0	15	0	56	0
75	RR	178.1	District	Res	71	0.0	0	0	0	71	0
80	RR	38.9	District	Res	16	0.0	0	0	0	16	0
81	RR	20.3	District	Res	8	0.0	0	0	0	8	0
82	RR	136.7	District	Res	55	0.0	0	0	0	55	0
83	RR	69.2	District	Res	28	0.0	0	0	0	28	0

Appendix I-2: Estimated Remaining EDUs within Murrieta District - Average

Area No.	Zoning	Acreage	Location	Description	Ultimate Development Residential (DU)	Ultimate Development Non-Residential (Gross Acreage)	Ultimate Development Non-Residential (DU)	Existing Meter Count Residential (Meters)	Existing Meter Count Non-Residential (Meters)	Remaining Development Residential (DU)	Remaining Development Non-Residential (DU)
51	RC	27.5	IA-2	Non-Res	0	13.8	34	0	16	0	18
53	MU-3	29.5	IA-2	Non-Res	0	118.0	293	0	0	0	293
28-A	CC	20.8	IA-2	Non-Res	0	5.6	14	0	16	0	0
28-B	NC	10.1	IA-2	Non-Res	0	2.5	6	0	3	0	3
29-A	MU-3	20.0	IA-2	Non-Res	0	80.0	198	0	5	0	193
52-A	MU-3	20.0	IA-2	Non-Res	0	80.0	198	0	12	0	186
30	MF-2	17.5	IA-2	Res	289	0.0	0	4	0	285	0
TOTAL					**5285**	**1636.6**	**4059**	**1880**	**279**	**3451**	**3841**

Assumptions:

1.5	AF / acre / yr
325,851	gal / AF
540	gal / day / DU

BP	0.40	F/A Ratio
C/I		
CC	0.27	F/A Ratio
ER-1	0.75	DU/acres
ER-2	1.50	DU/acres
ER-3	2.50	DU/acres
GI	0.40	
MF-1	12.50	DU/acres
MF-2	16.50	DU/acres
MU-1		(There is no specific designation for this category)
MU-2	0.25	(There is no specific designation for this category)
MU-3	4.00	(There is no specific designation for this category)
NC	0.25	F/A Ratio
PC	0.50	F/A Ratio
RC	0.50	F/A Ratio
RR	0.40	DU/acres
RRC	0.25	F/A Ratio
SF-1	3.50	DU/acres
SF-2	7.50	DU/acres
SI	0.40	
SP		
VCN	0.24	F/A Ratio
VMU	0.22	F/A Ratio
VP/C/I		
VRM-1	11.00	DU/acres
VRO	0.23	F/A Ratio
VRR	0.20	DU/acres
VRS-1	2.75	DU/acres
VRS-2	6.50	DU/acres

Appendix I-3: Estimated Remaining EDUs within Murrieta District - Maximum

					Ultimate Development			Existing Meter Count		Remaining Development	
					Residential	Non-Residential	Non-Residential	Residential	Non-Residential	Residential	Non-Residential
Area No.	Zoning	Acreage	Location	Description	(DU)	(Gross Acreage)	(DU)	(Meters)	(Meters)	(DU)	(DU)
11	BP	53.7	88-1	Non-Res	0	21.5	53	0	0	0	53
13	C/I	14.9	88-1	Non-Res	0	0.0	0	0	1	0	0
16	NC	2.7	88-1	Non-Res	0	0.7	2	0	0	0	2
17	MU-3	39.2	88-1	Non-Res	0	196.0	486	0	0	0	486
19	MU-3	28.6	88-1	Non-Res	0	143.0	355	0	7	0	348
21	MU-3	20.9	88-1	Non-Res	0	104.5	259	0	9	0	250
24	MU-3	5.7	88-1	Non-Res	0	28.5	71	0	0	0	71
31	MU-3	22.9	88-1	Non-Res	0	114.5	284	0	9	0	275
32	VP/C/I	40.5	88-1	Non-Res	0	0.0	0	0	18	0	0
33	VMU	15.3	88-1	Non-Res	0	3.4	8	0	1	0	7
34	VCN	5.3	88-1	Non-Res	0	1.3	3	0	1	0	2
36	VCN	3.8	88-1	Non-Res	0	1.0	2	0	3	0	0
37	VP/C/I	18.5	88-1	Non-Res	0	0.0	0	0	12	0	0
39	VRO	10.7	88-1	Non-Res	0	2.5	6	0	0	0	6
40	VP/C/I	2.3	88-1	Non-Res	0	0.0	0	0	0	0	0
41	VRO	2.8	88-1	Non-Res	0	0.6	2	0	0	0	2
43	VCN	9.5	88-1	Non-Res	0	2.4	6	0	3	0	3
44	VMU	20.2	88-1	Non-Res	0	4.4	11	0	19	0	0
45	VMU	7.5	88-1	Non-Res	0	1.7	4	0	4	0	0
46	VMU	11.9	88-1	Non-Res	0	2.6	6	0	0	0	6
48-B	VP/C/I	15.0	88-1	Non-Res	0	0.0	0	0	0	0	0
55	MU-3	39.8	88-1	Non-Res	0	199.0	493	0	23	0	470
56	MU-3	29.3	88-1	Non-Res	0	146.5	363	0	16	0	347
58	MU-3	9.8	88-1	Non-Res	0	49.0	122	0	2	0	120
63	CC	30.5	88-1	Non-Res	0	8.2	20	0	4	0	16
64	CC	45.4	88-1	Non-Res	0	12.3	30	0	0	0	30
65	CC	39.6	88-1	Non-Res	0	10.7	27	0	11	0	16
66	CC	40.5	88-1	Non-Res	0	10.9	27	0	0	0	27
67	MU-3	39.2	88-1	Non-Res	0	196.0	486	0	5	0	481
68	BP	40.6	88-1	Non-Res	0	16.2	40	0	0	0	40
70	BP	43.2	88-1	Non-Res	0	17.3	43	0	1	0	42
20-A	CC	29.0	88-1	Non-Res	0	7.8	19	0	1	0	18
22-B	CC	14.0	88-1	Non-Res	0	3.8	9	0	0	0	9
23-A	MU-3	13.6	88-1	Non-Res	0	68.0	169	0	6	0	163
23-B	CC	3.0	88-1	Non-Res	0	0.8	2	0	1	0	1
29-B	MU-3	20.7	88-1	Non-Res	0	103.5	257	0	7	0	250
52-B	MU-3	8.2	88-1	Non-Res	0	41.0	102	0	17	0	85
12	SF-1	19.7	88-1	Res	99	0.0	0	55	0	44	0
14	ER-2	4.8	88-1	Res	10	0.0	0	0	0	10	0
18	ER-2	83.1	88-1	Res	166	0.0	0	19	0	147	0
25	SF-1	162.6	88-1	Res	813	0.0	0	429	0	384	0
35	VRM-1	16.6	88-1	Res	199	0.0	0	0	0	199	0
38	VP/C/I	2.8	88-1	Res	0	0.0	0	0	0	0	0
42	VRS-2	8.5	88-1	Res	68	0.0	0	0	0	68	0
47	VRS-2	35.9	88-1	Res	287	0.0	0	6	0	281	0
48-A	VRS-1	80.2	88-1	Res	281	0.0	0	44	0	237	0
49	VRR	23.1	88-1	Res	9	0.0	0	2	0	7	0
54	MF-2	10.2	88-1	Res	184	0.0	0	0	0	184	0
57	MF-1	9.8	88-1	Res	147	0.0	0	2	0	145	0
59	SF-2	20.7	88-1	Res	207	0.0	0	0	0	207	0

Appendix I-3: Estimated Remaining EDUs within Murrieta District - Maximum

					Ultimate Development			Existing Meter Count		Remaining Development	
					Residential	Non-Residential	Non-Residential	Residential	Non-Residential	Residential	Non-Residential
Area No.	Zoning	Acreage	Location	Description	(DU)	(Gross Acreage)	(DU)	(Meters)	(Meters)	(DU)	(DU)
60	MF-1	10.3	88-1	Res	155	0.0	0	2	0	153	0
69	ER-1	19.1	88-1	Res	19	0.0	0	24	0	0	0
71	ER-1	94.0	88-1	Res	94	0.0	0	1	0	93	0
72	RR	44.3	88-1	Res	18	0.0	0	0	0	18	0
73	ER-1	39.7	88-1	Res	40	0.0	0	0	0	40	0
74	RR	46.8	88-1	Res	19	0.0	0	0	0	19	0
11-A	SF-1	15.0	88-1	Res	75	0.0	0	0	0	75	0
15-A	ER-2	25.2	88-1	Res	50	0.0	0	1	0	49	0
15-B	SF-1	15.0	88-1	Res	75	0.0	0	0	0	75	0
20-B	ER-2	29.9	88-1	Res	60	0.0	0	0	0	60	0
22-A	ER-2	46.0	88-1	Res	92	0.0	0	4	0	88	0
61-A	ER-1	123.9	88-1	Res	124	0.0	0	5	0	119	0
61-B	RR	38.0	88-1	Res	15	0.0	0	1	0	14	0
8	CC	9.7	District	Non-Res	0	2.6	6	0	20	0	0
76	MU-2	105.2	District	Non-Res	0	31.6	78	0	6	0	72
77	MU-2	93.6	District	Non-Res	0	28.1	70	0	0	0	70
78	BP	39.9	District	Non-Res	0	16.0	40	0	3	0	37
79	BP	49.4	District	Non-Res	0	19.8	49	0	0	0	49
51-A	CC	9.8	District	Non-Res	0	2.6	7	0	13	0	0
51-B	CC	17	District	Non-Res	0	4.6	11	0	4	0	7
1	ER-3	91.1	District	Res	273	0.0	0	56	0	217	0
2	SF-1	101.5	District	Res	508	0.0	0	300	0	208	0
3	MF-1	15.9	District	Res	239	0.0	0	0	0	239	0
4	SF-1	124.2	District	Res	621	0.0	0	261	0	360	0
5	ER-3	81.9	District	Res	246	0.0	0	112	0	134	0
6	ER-3	77.2	District	Res	232	0.0	0	91	0	141	0
7	ER-3	5.8	District	Res	17	0.0	0	8	0	9	0
9	SF-1	65.7	District	Res	329	0.0	0	188	0	141	0
10	ER-2	83.1	District	Res	166	0.0	0	161	0	5	0
26	SF-1	16.9	District	Res	85	0.0	0	41	0	44	0
27	RR	169.8	District	Res	68	0.0	0	0	0	68	0
50	RR	201.0	District	Res	80	0.0	0	48	0	32	0
62	RR	178.1	District	Res	71	0.0	0	15	0	56	0
75	RR	178.1	District	Res	71	0.0	0	0	0	71	0
80	RR	38.9	District	Res	16	0.0	0	0	0	16	0
81	RR	20.3	District	Res	8	0.0	0	0	0	8	0
82	RR	136.7	District	Res	55	0.0	0	0	0	55	0
83	RR	69.2	District	Res	28	0.0	0	0	0	28	0
51	RC	27.5	IA-2	Non-Res	0	13.8	34	0	16	0	18
53	MU-3	29.5	IA-2	Non-Res	0	147.5	366	0	0	0	366
28-A	CC	20.8	IA-2	Non-Res	0	5.6	14	0	16	0	0
28-B	NC	10.1	IA-2	Non-Res	0	2.5	6	0	3	0	3
29-A	MU-3	20.0	IA-2	Non-Res	0	100.0	248	0	5	0	243
52-A	MU-3	20.0	IA-2	Non-Res	0	100.0	248	0	12	0	236
30	MF-2	17.5	IA-2	Res	315	0.0	0	4	0	311	0
TOTAL					**6730**	**1994.2**	**4945**	**1880**	**279**	**4855**	**4728**

Assumptions:

Appendix I-3: Estimated Remaining EDUs within Murrieta District - Maximum

					Ultimate Development			Existing Meter Count		Remaining Development	
					Residential	Non-Residential	Non-Residential	Residential	Non-Residential	Residential	Non-Residential
Area No.	Zoning	Acreage	Location	Description	(DU)	(Gross Acreage)	(DU)	(Meters)	(Meters)	(DU)	(DU)

1.5	AF / acre / yr
325,851	gal / AF
540	gal / day / DU

BP	0.40	F/A Ratio	
C/I			
CC	0.27	F/A Ratio	
ER-1	1.00	DU/acres	
ER-2	2.00	DU/acres	
ER-3	3.00	DU/acres	
GI	0.40		
MF-1	15.00	DU/acres	
MF-2	18.00	DU/acres	
MU-1			(There is no specific designation for this category)
MU-2	0.30		(There is no specific designation for this category)
MU-3	5.00		(There is no specific designation for this category)
NC	0.25	F/A Ratio	
PC	0.50	F/A Ratio	
RC	0.50	F/A Ratio	
RR	0.40	DU/acres	
RRC	0.25	F/A Ratio	
SF-1	5.00	DU/acres	
SF-2	10.00	DU/acres	
SI	0.40		
SP			
VCN	0.25	F/A Ratio	
VMU	0.22	F/A Ratio	
VP/C/I			
VRM-1	12.00	DU/acres	
VRO	0.23	F/A Ratio	
VRR	0.40	DU/acres	
VRS-1	3.50	DU/acres	
VRS-2	8.00	DU/acres	

APPENDIX II

PIPELINE REQUIREMENTS FOR ULTIMATE SYSTEM

The design criteria used to size the transmission pipeline network is consistent with criteria used in previous Master Plans as well as the District's current design criteria contained in the District's "Developer Handbook and Standard Drawings" manual. The transmission network will serve as the backbone of the water distribution system with additional pipelines constructed to provide service to individual parcels or tracts. The following is a summary of the design criteria used:

- Maximum velocity of 6ft/sec in transmission pipelines under replenishment conditions.
- Maximum friction loss of 3.5ft/1000 ft of transmission line under replenishment conditions.
- Maximum velocity of 7.5 ft/sec in any water pipelines during peak hour or maximum day demand plus emergency fire flow conditions.
- Transmission pipelines shall be no smaller than 12-in diameter.

The proposed transmission pipelines for the ultimate system are shown in **Figure 3**. The proposed system requires approximately 7.9 miles of new pipeline which is broken down as follows:

18,900 lf of 12-in diameter pipeline
17,100 lf of 16-in diameter pipeline
5,500 lf of 24- in diameter pipeline

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APPENDIX III

STORAGE REQUIREMENTS FOR THE ULTIMATE SYSTEM

EXISTING STORAGE

The Murrieta Division has 5.2 MG storage within existing active facilities as shown in **Table A-III-1**.

Table A-III-1
Western Municipal Water District
North AFC
Existing Storage Facilities

Reservoir	Pressure Zone	Existing Storage (MG)	HWL	LWL
Olga Gordon	1280′	3.0	1282′	1250′
Grizzly Ridge	1434′	2.2	1434′	1394′
Totals		**5.20**		

STORAGE DESIGN CRITERIA

The proposed storage facilities are required to meet the peak hour demand, maximum day demand, fire flow and other emergency conditions and are equivalent to 75% of maximum day demand plus worst case fire flow storage requirements. The following criteria were used to determine storage volume:

Equalizing Storage

Pumping facilities have been sized to meet maximum day demand flows. Any peak demands (ie peak hour) greater than maximum day must be supplied from storage. Equalizing storage provides the storage to meet these short term peak demands. Twenty-five percent (25%) of the estimated maximum day demand is used as the criteria needed to meet the daily demand fluctuations within each pressure zone.

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Fire Flow Storage

Fire flow requirements for each pressure zone must be met through storage and have been estimated based on the fire flow criteria given in Table 2.

Emergency Storage

Emergency storage capacity would be needed to sustain the water needs during periods of total or partial shutdown of the water supply facilities. One-half (50%) of the estimated maximum day demand is used to calculate emergency storage by pressure zone.

Fire flows and durations used in the analysis are given in **Table A-III-2** for the Murrieta Division. Worst case conditions were used for each pressure zone.

Table A-III-2
Western Municipal Water District
Murrieta Division
Maximum Fire flows and Duration used by Pressure Zone

Pressure Zone	Fire Flow (gpm)	Duration (hour)	Total Storage Volume (gallons)
1280′	2,500	2	300,000
1430′	2,000	2	240,000

ULTIMATE STORAGE REQUIREMENTS:

The projected ultimate storage requirements for each pressure zone were calculated to meet peak hour, fire flow, and emergency conditions per the listed criteria. No storage was included to wheel water through a pressure zone to a higher pressure zone except where noted. These ultimate requirements were then compared to existing storage capacity to determine additional storage required to meet ultimate demands. **Table A-III-3** gives the existing and required storage by zone for the North AFC and South AFC areas respectively.

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Table A-III-3
Western Municipal Water District
Murrieta Division
Ultimate Storage Requirements by Pressure Zone

Pressure Zone	Existing Storage (MG)	Additional Storage (MG)	Ultimate Storage (MG)
1280′	3.0	6.7	9.7
1430′	2.2	0.0	2.2
Totals	**5.2**	**6.7**	**11.90**

1280′ Pressure Zone

Currently the two Olga Gordon Tanks are the only storage within the 1280′ pressure zone, with a combined total storage of 3.0 MG. This site is now fully developed. Additional storage required within the 1280′ pressure zone must be provided at a new, unidentified site.

1430′ Pressure Zone

Based on the forementioned criteria, the storage requirements for the 1480′ pressure zone is 26 MG. The second Grizzly Ridge Tank was recently constructed, matching the same HWL as the older tank. In order to maximize the storage capacity at the existing site, the second tank LWL was constructed at 1394′ approximately 16′ lower than the older tank. Since the Grizzly Ridge Site is considered the only feasible tank site for this pressure zone and the site configuration has maximum storage capacity, additional pumping capacity may need to be planned for at ultimate conditions

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APPENDIX IV

PUMPING REQUIREMENTS FOR THE ULTIMATE SYSTEM

The existing pumping facilities are given in **Table A-IV-1** for the Murrieta Division area. These facilities include all available pumps. For any potable water pumping system, firm pumping capacity is determined by assuming that the largest available pump is out of service. Both actual and firm pumping capacities are given for each pump station.

Table A-IV-1
Western Municipal Water District
Murrieta Division
Existing Pumping Facilities

Site	Pump	Pump Capacity, gpm	Pump HP	Station Total Capacity, gpm	Station Firm Capacity, gpm [(1)]
Alson	E1	800	60	2,400	1,600
	E2	800	60		
	E3	800	60		

[(1)]Firm Pumping Capacity is defined as Total Station Pumping Capacity less largest pump capacity

Pumping Station Description

Alson

The existing facility has three pumping units, each with an 800 gpm 60 hp pumping unit. Actual pump performance indicates that the pumps can pump approximately 1,000 gpm each.

Ultimate Pumping Requirement

Pumping requirements for the proposed ultimate system have been calculated based on maximum day demand. **Table A-IV-2** gives the required pumping capacity for the ultimate Murrieta Division system. Final pump station horsepower and total discharge head will be determined during final design of each pump station.

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Table A-IV-2
Western Municipal Water District
North AFC
Ultimate Pumping Requirements

Pump Station	Pressure Zone	Existing Firm Pumping Capacity, cfs	Additional Pumping Capacity, cfs	Ultimate Required Pumping Capacity, cfs
Alson Booster	1430′	3.6	1.3	4.9

Expansion of the Alson Pump Station

Space constraints of the existing site will not allow the addition of additional pumping units. The existing units are currently pumping approximately 20 % higher than the design . It is anticipated that the existing pump will be replaced by slightly higher capacity pumps within the same pump can and unit piping. Since pumps are replaced on a more routine basis as part of major maintenance expense, no additional costs for pumping facilities have been added to the master plan cost estimates.

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APPENDIX V

CONSTRUCTION AND PROJECT COST ESTIMATES

Cost estimates have been developed for the facilities proposed to serve each pressure zone at ultimate development. The cost estimates are based on unit costs for water pipelines ($/lf) and lump sum estimates for pump stations, reservoirs and PRV stations. For the Murrieta Division AFC Area, cost estimates are given in **Table A-V-1.**

The construction and project cost shown were obtained from manufacturers, construction firms and recorded data from result bid results for similar water facilities. The estimated project costs are based on the September, 2007 ENR-Los Angeles Construction Cost Index of 9215.07.75. Estimated project costs include construction cost and project overhead. Project overhead is estimated at 40% of construction costs and is broken down as follows:

(1) Contingencies - 10% of construction cost.

(2) Technical Services – 15% of construction cost which includes preparation of a non-controversial environmental assessment, processing of necessary approvals and permits, engineering survey and photogrammetry, design and specifications.

(3) Field Engineering – 10% of construction costs which includes contract administration, coordination with other agencies, administration of geotechnical and other necessary outside services, construction surveying, construction inspection and preparation f as-built drawings.

(4) District Contract Administration – 5% of construction cost.

Escalation, financing, interest during construction, legal, EIR/EIS, land acquisition and right of way agent costs are not included.

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APPENDIX VI

CFD BOND DETAILS

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APPENDIX VI- CFD Bond Details

Bond	Sources of Bond Money	Amount	Uses of Bond Money	Amount Allocated
CFD No. 88-1	Paramount of Bond	$ 1,975,000.00	Underwriter's Discount	$ 57,275.00
Series 1988 Special Tax Bond	Accrued Interest	$ 13,473.81	Cost of Issuance	$ 200,000.00
			Accrued Interest	$ 13,473.81
		$ 1,988,473.81	Capitalized Interest	$ 142,996.19
			Debt Service Reserve	$ 180,532.50
			Net Construction Fund Account	$ 1,338,874.31
			Contingency	$ 55,322.00
				$ 1,988,473.81
			Projects included in Construction Account	
			1.5 MG Reservoir	$ 500,000.00
			Hayes Street Transmission Main	$ 300,000.00
			El Rancho / Murrieta Transmission Main	$ 170,000.00
			Kalmia Force Main and Pump Station	$ 330,000.00
			EMWD Interconnect	$ 200,000.00
			Jefferson Street Transmission Main	$ 400,000.00
				$ 1,900,000.00
CFD No. 88-1	Principal Amount	$ 2,255,000.00	Construction Fund	$ 369,175.00
Series 1990 Special Tax Bond	Accrued Interest	$ 5,772.00	Retention Fund	$ 1,735,000.00
	Underwriter's Discount	$ (33,825.00)	Bond Service Fund	$ 5,772.00
			Reserve Fund	$ 52,000.00
		$ 2,226,947.00	Cost of Issuance	$ 65,000.00
				$ 2,226,947.00
			Projects included in Construction Account	
			Water Transmission Lines	N/A
			Storage Tanks	N/A
			Sewer Lines	N/A
			MWD Annexation Costs	N/A
				$ -

APPENDIX VI- CFD Bond Details

Bond	Sources of Bond Money	Amount	Uses of Bond Money	Amount Allocated
CFD No. 88-1	Principal Amount	$ 7,840,000.00	Construction Fund	$ 5,316,429.46
Series 1991 Special Tax Bond	Accrued Interest	$ 12,463.74	Cost of Issuance Account	$ 361,067.54
	Underwriter's Discount	$ (174,440.00)	Bond Service Fund	$ 1,076,161.74
			Reserve Fund	$ 784,000.00
		$ 7,678,023.74	Administrative Expense Fund	$ 140,365.00
				$ 7,678,023.74
		Projects included in Construction Amount		
			Road Facilities	$ 3,312,235.00
			Flood Control Facilities	$ 42,441.00
			Water & Sewer Facilities	$ 1,927,427.00
			Dry Utilities	$ 262,105.00
				$ 5,544,208.00
CFD No. 88-1	Principal Amount	$ 7,325,000.00	Purchase Fund	$ 7,172,384.50
1996 Series A (Senior Lien	Accrued Interest	$ 6,459.00	Senior Lien Reserve Fund	$ 555,600.00
Bonds)	Original Issue Discount	$ (62,677.50)	Junior Lien Reserve Fund	$ -
	Refunding Bond	$ 555,600.00	Underwriter's Discount	$ 96,397.00
		$ 7,824,381.50		**$ 7,824,381.50**
CFD No. 88-1	Principal Amount	$ 4,965,000.00	Purchase Fund	$ 4,859,266.09
1996 Series A (Junior Lien	Accrued Interest	$ 5,134.54	Senior Lien Reserve Fund	$ -
Bonds)	Original Issue Discount	$ -	Junior Lien Reserve Fund	$ 440,625.00
	Refunding Bond	$ 440,625.00	Underwriter's Discount	$ 110,868.45
		$ 5,410,759.54		**$ 5,410,759.54**
Refunding Bond	Principal Amount	$ 3,360,000.00	Escrow Fund	$ 3,248,773.91
District	Accrued Interest	$ 3,169.59	Acquisition and Construction Fund	$ 272,668.20
	Original Issue Discount	$ (17,135.59)	Interest Account	$ 3,169.59
	Related Prior Bonds	$ 626,106.11	Amount Transferred to 1996 Bonds Trustee	$ 268,831.44
			Cost of issuance	$ 122,032.05
		$ 3,972,140.11	Purchaser's Discount	$ 56,664.92
				$ 3,972,140.11
Refunding Bond	Principal Amount	$ 8,930,000.00	Escrow Fund	$ 8,645,710.86
Improvement Area	Accrued Interest	$ 8,423.95	Acquisition and Construction Fund	$ 434,247.73
	Original Issue Discount	$ (45,541.91)	Interest Account	$ 8,423.95
	Related Prior Bonds	$ 1,353,299.92	Amount Transferred to 1996 Bonds Trustee	$ 716,483.56
			Cost of issuance	$ 292,715.33
		$ 10,246,181.96	Purchaser's Discount	$ 150,600.53
				$ 10,248,181.96
CFD No. 88-1	Bonds Proceeds	$ 2,690,000.00	Deposit to Acquisition and Construction Fund	$ 940,421.13
Series 2000 Junior Lien	Underwriter's Discount	$ (53,800.00)	Deposit to Escrow Fund	$ 1,463,412.68

APPENDIX VI- CFD Bond Details

Bond	Sources of Bond Money	Amount	Uses of Bond Money	Amount Allocated
Special Tax Bonds			Deposit to Capitalized Interest Subaccount of the Interest Account	$ 20,416.19
		$ 2,636,200.00		
			Deposit to Reserve Fund	$ 100,950.00
			Deposit to the Costs of Issuance Account	$ 111,000.00
				$ 2,636,200.00
		Projects inlcuded in Construction Account		
			MWD Annexation Fees	N/A
			Construction and Installation of Facilities	N/A
				$ -
CFD No. 99-1	Bonds Proceeds	$ 3,050,000.00	Deposit to Construction Fund (Water	$ 1,553,292.25
Series 2000 Special Tax Bond	Underwriter's Discount		Construction Account)	
		$ (61,000.00)		
			Deposit to Construction Fund (School	
		$ 2,989,000.00	Construction Account)	
			Deposit to Capitalized Interest Account of Bond Fund	$ 38,707.75
			Deposit to Reserve Fund	$ 305,000.00
			Deposit to the Costs of Issuance Account	$ 192,000.00
				$ 2,989,000.00

APPENDIX VII

CONNECTION FEE CALCULATIONS

DRAFT

Modified Fee Increase Calculation

Ultimate Collections based on Current Fee

	Current Fees CFD 88-1	Current Fees Non-CFD	Possible Amount Collected CFD 88-1	Possible Amount Collected Non-CFD	Total
Meter Charge ($/conn.)	$ 1,932.00	$ 5,882.00	$ 8,467,956	$ 3,852,710	$ 12,320,666
Comm. FS Connec. ($/ac)	$ 535.00	$ 535.00	$ 94,160	$ 140,170	$ 234,330
Acreage ($/ac)	$ 2,045.00	$ 2,045.00	$ 3,614,441	$ 540,146	$ 4,154,586
TOTAL					$ 16,709,582

Description	Amount Needed to be Funded
Cost of Facilities - Estimated	$ 27,900,000
Possible Amount Collected from Current Fees	$ (16,709,582)
Total Increased Fee	$ 11,190,418

Description	Increase in Fee per EDU
Increase due to Cost of Facilities - Estimated	$2,221
Increase due to Elimination of Acreage Fee	$825
Total Increased Fee	$3,046

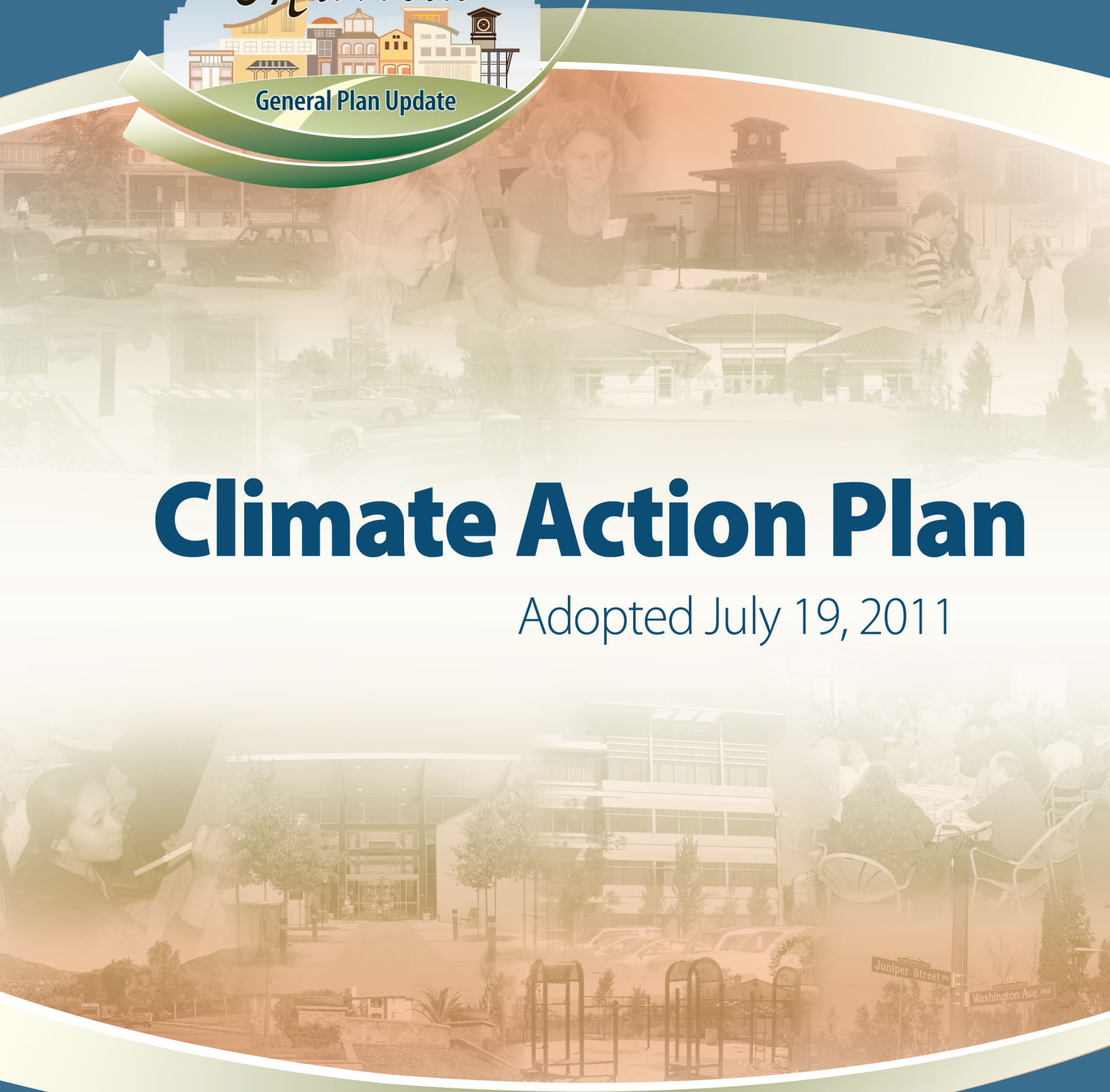
Assumptions:

Total Remaining Number of EDUs	5,038	DU
Remaining CFD 88-1 Dwelling Units	4,383	DU (per Table 2) - It also includes IA No.2
Remaining Non-CFD Dwelling Units	655	DU (per Table 2)
Remaining CFD 88-1 Commercial Acreage	176	acres (per Master Plan)
Remaining Non-CFD Commercial Acreage	262	acres (per Master Plan)
Remaining CFD 88-1 Residential Acreage	1,767	acres (Based on 4383 DU)
Remaining Non-CFD Residential Acreage	264	acres (Based on 655 DU)

Appendix P:

Climate Action Plan

the future of southern california
Murrieta
General Plan Update



Climate Action Plan

Adopted July 19, 2011

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Chapter 1
Introduction

Chapter 1 Introduction

PURPOSE OF THE CLIMATE ACTION PLAN

In order to aggressively address the threats of global climate change, the City has prepared a Climate Action Plan (CAP), which provides a framework for reducing GHG emissions and managing resources to best prepare for a changing climate. The CAP recommends GHG emissions targets that are consistent with the reduction targets of the State of California and presents a number of strategies that will make it possible for the City to meet the recommended targets. The CAP also suggests best practices for implementation and makes recommendations for measuring progress.

The CAP is intended to address the main sources of the emissions that cause climate change, which include emissions from the energy consumed in buildings and for transportation, as well as the solid waste sent to landfills. The purpose of the CAP is to guide the development, enhancement, and ultimately the implementation of actions that will reduce Murrieta's GHG emissions by 15 percent below existing levels. The CAP has been designed to support the following functions:

- Describe Murrieta's emissions sources;
- Provide projections of future emissions based on growth;
- Provide clear guidance to City staff regarding when and how to implement key provisions of the plan;
- Recommend strategies and actions to achieve GHG reductions;
- Demonstrate Murrieta's commitment to comply with State GHG reduction efforts; and
- Define a strategy for turning this plan into action and transparently tracking and reporting progress toward the GHG reduction goals.

RELATIONSHIP TO THE GENERAL PLAN

The CAP implements policies that have been identified in the Land Use, Economic Development, Circulation, Infrastructure, Healthy Community, Conservation, Recreation and Open Space, and Air Quality Elements of the Murrieta General Plan Update. The General Plan Update includes specific goals and policies that guide the City's approach to climate change, including emissions reductions targets, guidelines for preparing inventories or plans, and general reduction strategies. As climate change is a cross-cutting issue addressed by many elements of the General Plan, the CAP as a whole is considered an implementation measure for the policies described in this CAP. This structure allows the City to update the CAP on an on-going, as-needed basis to ensure that the City's climate protection efforts reflect both current legislation and emerging best practices.

RELATIONSHIP TO CALIFORNIA ENVIRONMENTAL QUALITY ACT

The City's approach to addressing GHG emission reductions within the General Plan Update is parallel to the climate change planning process being followed by more than 50 other California jurisdictions. This process includes:

- Completing a baseline GHG emissions inventory and projecting future emissions;
- Identifying a community‐wide GHG reduction target;
- Preparing a CAP to identify strategies and measures to meet the reduction target;
- Identifying targets and reduction strategies in the General Plan and evaluating the environmental impacts of the CAP in the General Plan Environmental Impact Report (EIR);
- Monitoring effectiveness of reduction measures and adapting the plan to changing conditions; and
- Adopting the CAP in a public process following environmental review.

This approach is consistent with the California Environmental Quality Act (CEQA) Guidelines Section 15183.5 that allows jurisdictions to analyze and mitigate the significant effects of GHGs at a programmatic level, by adopting a plan for the reduction of GHG emissions.

One of the primary uses for a CAP is to establish significance thresholds for reviewing projects under CEQA. CEQA requires the City to identify the significant environmental impacts of its discretionary actions and to avoid or mitigate those impacts if feasible. The CEQA Guidelines, as updated pursuant to Senate Bill (SB) 97, acknowledges that climate change is an environmental issue that requires analysis under CEQA and encourages the use of a plan consistency threshold for cumulative impacts on climate change. Projects that demonstrate consistency with the strategies, actions, and emission reduction targets contained in the CAP would have a less than significant impact on climate change.

When the City undertakes a discretionary action, such as approval of a proposed development project, plan, policy, or code change, the City will evaluate whether that action would result in a significant climate change impact.

Adoption of the CAP itself by the City is considered a project under CEQA. The overall purpose of the CAP is to reduce the impact that the community will have on global climate change to reduce the impact on the environment. However, implementation of the CAP could potentially result in adverse impacts on the physical environment, such as degrading visual resources, biological resources, or cultural resources. The potential impacts of the CAP are being evaluated as part of the EIR for the Murrieta General Plan Update. With completion and adoption of the General Plan Update EIR, the CAP will have undergone environmental review under CEQA. The CAP is intended to reduce the City's impact on climate change; therefore, determining the consistency of a proposed project with the CAP is one way to evaluate whether a project would have a significant climate change impact.

When determining whether a proposed project is consistent with the CAP, the following should be considered:

- The extent to which the project supports or includes applicable strategies and measures, or advances the actions identified in the CAP;
- The consistency of the project with the Murrieta General Plan Update population growth projections, which are the basis of the GHG emissions inventory projections;
- The consistency of the project with the emission reduction targets set by the CAP; and
- The extent to which the project would interfere with implementation of CAP strategies, measures, or actions.

The emission reduction targets are a critical factor in determining CAP consistency. Therefore, the CAP target must be set at a level that demonstrates consistency with State targets, but should be feasible for the vast majority of projects to achieve. If the reduction target percentage is set at a level that is infeasible, EIRs could be required for a large number of projects. A statement of overriding considerations would be required and no additional emission reductions would be achieved if feasible emission reductions were not available.

If the City determines in its environmental review that the proposed project would conflict with the CAP, the City would be required to incorporated mitigation measures, where feasible, within the proposed project to minimize its GHG emissions and/or climate change impact. If a potentially significant impact cannot be reduced to a less than significant level through the application of mitigation, it is categorized as a significant unavoidable impact and the City has the option to adopt a statement of overriding considerations as described in Section 15093 of the State CEQA Guidelines.

PUBLIC PARTICIPATION

City of Murrieta residents and business leaders participated in the formulation of the CAP through participation in General Plan Update community workshops. The General Plan Update is being completed simultaneously with this CAP. Community members have provided valuable input that has been used to select GHG reduction measures.

The City conducted three General Plan community visioning workshops in January 2010. On January 22, 2010, the City held a workshop and collected input from 48 students from Vista Murrieta High School. On January 28 and 30, 2010, the City held workshops which were attended by over 60 community members. Ten meetings were held between March and June which focused on community involvement in the development of the Land Use Alternatives in each of the focus areas and to refine the vision and community priorities. Opinions were also gathered through several online surveys throughout the General Plan Update process. Community members participated in small group discussion and presentation sessions, 'Treasures, Challenges, and Visions' Post-it Note exercise, surveys, and entire room discussions. The information gathered from these meetings and surveys were used in the General Plan Update and to formulate goals and policies for the CAP.

GREENHOUSE EFFECT AND GREENHOUSE GASES

The natural process through which heat is retained in the troposphere is called the "greenhouse effect."[1] The greenhouse effect traps heat in the troposphere through a three-fold process, summarized as follows: short wave radiation emitted by the Sun is absorbed by the Earth; the Earth emits a portion of this energy in the form of long wave radiation; and GHGs in the upper atmosphere absorb this long wave radiation and emit this long wave radiation into space and toward the Earth. This "trapping" of the long wave (thermal) radiation emitted back toward the Earth is the underlying process of the greenhouse effect. This process is illustrated in Exhibit 1, *The Greenhouse Effect*.

The most abundant GHGs are water vapor and carbon dioxide. Many other trace gases have greater ability to absorb and re-radiate long wave radiation; however, these gases are not as plentiful. For this reason, and to gauge the potency of GHGs, scientists have established a Global Warming Potential for each GHG based on its ability to absorb and re-radiate long wave radiation. The Global Warming Potential of a gas is determined using carbon dioxide as the reference gas with a Global Warming Potential of one (1).

GHGs normally associated with a proposed project include the following:[2]

- **Water Vapor (H_2O).** Although water vapor has not received the scrutiny of other GHGs, it is the primary contributor to the greenhouse effect. Natural processes, such as evaporation from oceans and rivers, and transpiration from plants, contribute 90 percent and 10 percent of the water vapor in our atmosphere, respectively.

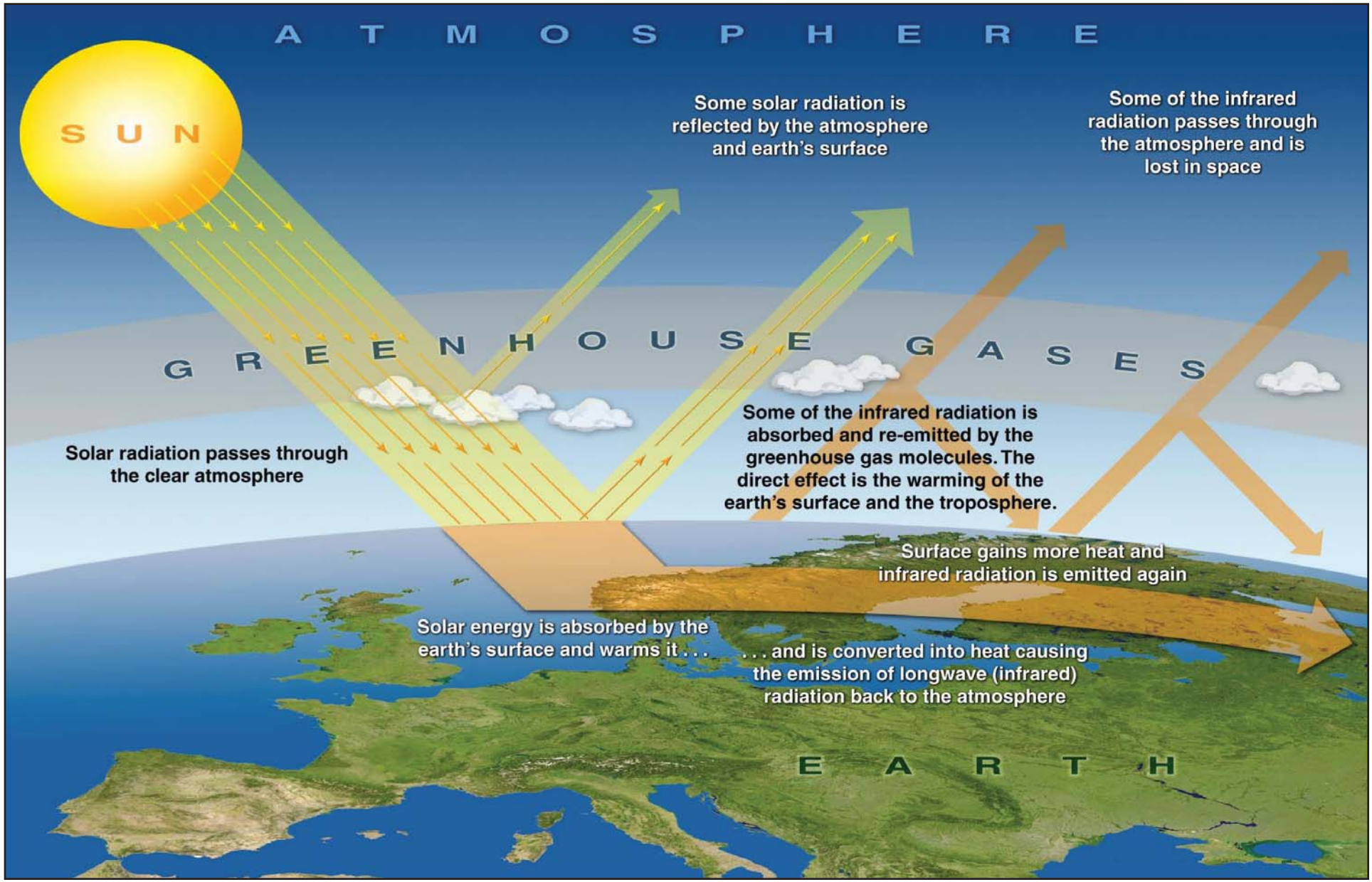
  The primary human related source of water vapor comes from fuel combustion in motor vehicles; however, this is not believed to contribute a significant amount (less than one percent) to atmospheric concentrations of water vapor. The Intergovernmental Panel on Climate Change (IPCC) has not determined a GWP for water vapor.

- **Carbon Dioxide (CO_2).** CO_2 is primarily generated by fossil fuel combustion in stationary and mobile sources. Due to the emergence of industrial facilities and mobile sources in the past 250 years, the concentration of CO_2 in the atmosphere has increased 36 percent.[3] CO_2 is the most widely emitted GHG and is the reference gas (GWP of 1) for determining GWPs for other GHGs.

[1] The troposphere is the bottom layer of the atmosphere, which varies in height from the Earth's surface to 10 to 12 kilometers.

[2] All Global Warming Potentials are given as 100 year GWP. Unless noted otherwise, all Global Warming Potentials were obtained from the Intergovernmental Panel on Climate Change. Climate Change (Intergovernmental Panel on Climate Change, *Climate Change, The Science of Climate Change – Contribution of Working Group I to the Second Assessment Report of the IPCC*, 1996).

[3] U.S. Environmental Protection Agency, *Inventory of United States Greenhouse Gas Emissions and Sinks 1990 to 2008*, April 2010.



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CLIMATE ACTION PLAN

The Greenhouse Effect

Exhibit 1

- **Methane (CH_4).** CH_4 is emitted from biogenic sources, incomplete combustion in forest fires, landfills, manure management, and leaks in natural gas pipelines. In the United States, the top three sources of CH_4 are landfills, natural gas systems, and enteric fermentation. CH_4 is the primary component of natural gas, which is used for space and water heating, steam production, and power generation. The GWP of CH_4 is 21.

- **Nitrous Oxide (N_2O).** N_2O is produced by both natural and human related sources. Primary human related sources include agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic acid production, and nitric acid production. The GWP of N_2O is 310.

- **Hydrofluorocarbons (HFCs).** HFCs are typically used as refrigerants for both stationary refrigeration and mobile air conditioning. The use of HFCs for cooling and foam blowing is growing, as the continued phase out of chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) gains momentum. The GWP of HFCs range from 140 for HFC-152a to 11,700 for HFC-23.[4]

- **Perfluorocarbons (PFCs).** PFCs are compounds consisting of carbon and fluorine. They are primarily created as a byproduct of aluminum production and semi conductor manufacturing. PFCs are potent GHGs with a GWP several thousand times that of CO_2, depending on the specific PFC. Another area of concern regarding PFCs is their long atmospheric lifetime (up to 50,000 years).[5] The GWP of PFCs range from 6,500 to 9,200.

- **Sulfur hexafluoride (SF_6).** SF_6 is a colorless, odorless, nontoxic, nonflammable gas. It is most commonly used as an electrical insulator in high voltage equipment that transmits and distributes electricity. SF_6 is the most potent GHG that has been evaluated by the Intergovernmental Panel on Climate Change with a GWP of 23,900. However, its global warming contribution is not as high as the GWP would indicate due to its low mixing ratio compared to carbon dioxide (4 parts per trillion [ppt] in 1990 versus 365 parts per million [ppm], respectively).[6]

In addition to the six major GHGs discussed above (excluding water vapor), many other compounds have the potential to contribute to the greenhouse effect. Some of these substances were previously identified as stratospheric O_3 depletors; therefore, their gradual phase out is currently in effect. The following is a listing of these compounds:

- **Hydrochlorofluorocarbons (HCFCs).** HCFCs are solvents, similar in use and chemical composition to CFCs. The main uses of HCFCs are for refrigerant products and air conditioning systems. As part of the Montreal Protocol, all developed countries that adhere to the Montreal Protocol are subject to a consumption cap and gradual phase out of HCFCs. The United States is scheduled to achieve a 100 percent

[4] U.S. Environmental Protection Agency, *High GWP Gases and Climate Change*, June 22, 2010.

[5] Ibid.

[6] Ibid.

reduction to the cap by 2030. The GWPs of HCFCs range from 93 for HCFC-123 to 2,000 for HCFC-142b.[7]

- **1,1,1 trichloroethane.** 1,1,1 trichloroethane or methyl chloroform is a solvent and degreasing agent commonly used by manufacturers. The GWP of methyl chloroform is 110 times that of CO_2.[8]

- **Chlorofluorocarbons (CFCs).** CFCs are used as refrigerants, cleaning solvents, and aerosols spray propellants. CFCs were also part of the U.S. Environmental Protection Agency's (EPA) Final Rule (57 FR 3374) for the phase out of O_3 depleting substances. Currently, CFCs have been replaced by HFCs in cooling systems and a variety of alternatives for cleaning solvents. Nevertheless, CFCs remain suspended in the atmosphere contributing to the greenhouse effect. CFCs are potent GHGs with GWPs ranging from 4,600 for CFC 11 to 14,000 for CFC 13.[9]

GLOBAL GHG EMISSIONS

Atmospheric data for GHG concentrations over the past 800,000 years demonstrates that concentrations of CO_2 (which comprises the majority of GHG emissions) have increased since pre-industrial times. Concentrations have increased from approximately 280 parts per million (ppm) to approximately 353 ppm in 1990, and to approximately 379 ppm in 2005.

In 2000, the United Nations International Panel on Climate Change (IPCC) outlined potential global emission scenarios for the coming century. The scenarios vary from a best case scenario with a low population growth, clean technologies, and low GHG emissions, to a worst case scenario of a high population growth and fossil fuel dependence resulting in extreme levels of GHG emissions. While some degree of climate change is inevitable, most climate scientists agree that in order to avoid dangerous climate change, atmospheric GHG concentrations should be stabilized at 350 to 400 ppm.

NATIONWIDE GHG EMISSIONS

Based data produced by the EPA's *2010 Inventory of U.S. Greenhouse Gas Emissions and Sinks*, GHG emissions in the United States were 6,956.8 teragrams (Tg) CO_2eq[10] in 2008.[11] As

[7] U.S. Environmental Protection Agency, *Protection of Stratospheric Ozone: Listing of Global Warming Potential for Ozone Depleting Substances*, November 7, 2006.

[8] Ibid.

[9] U.S. Environmental Protection Agency, *Class I Ozone Depleting Substances*, March 7, 2006.

[10] Carbon Dioxide Equivalent (CO_2eq) - A metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential.

[11] U.S. Environmental Protection Agency, *2010 Inventory of U.S. Greenhouse Gas Emissions and Sinks*, 2010.

indicated by the EPA, total nationwide emissions have risen by approximately 14 percent from 1990 to 2008. Emissions declined from 2007 to 2008, decreasing by 2.9 percent (211.3 Tg CO_2eq.). This decrease is primarily a result of a decrease in demand for transportation fuels associated with the record high costs of these fuels that occurred in 2008. Additionally, electricity demand declined in 2008 in part due to a significant increase in the cost of fuels used to generate electricity. In 2008, temperatures were cooler in the United States than in 2007, both in the summer and the winter. This lead to an increase in heating related energy demand in the winter, but much of this increase was offset by a decrease in cooling related electricity demand in the summer. Overall, from 1990 to 2008 total GHG emissions increased by 820.4 Tg CO_2eq (16.1 percent), while CH_4 and N_2O emissions decreased by 45.8 Tg CO_2eq (7.5 percent) and 4.1 Tg CO_2eq (1.3 percent), respectively.

STATEWIDE GHG EMISSIONS

In May 2010, the California Air Resources Board (CARB) prepared a GHG inventory that compiles statewide anthropogenic GHG emissions and sinks. It includes estimates for CO_2, CH_4, N_2O, SF_6, nitrogen trifluoride (NF_3), HFCs, and PFCs for the years 2000 through 2008. According to the CARB GHG emission inventory estimates, California emitted approximately 474 million metric tons (MMT) of CO_2eq emissions in 2008.[12] California's total GHG emissions are larger than every other state with the exception of Texas. However, California has a relatively low carbon emission intensity. In 2001, California ranked the fourth lowest per-capita CO_2 emissions from fossil fuel combustion in the country, due to the success of its energy efficiency and renewable energy programs. California's energy programs and policies have had multiple benefits that include not only reducing GHG emissions, but reducing energy demand and improving air quality and public health.[13] If emissions continue to increase at business as usual (BAU)[14] rates, statewide emissions are expected to increase to approximately 600 metric tons (MT) CO_2eq by 2020, which represents a 40 percent increase above 1990 levels. In order for the State to participate in global efforts to avoid dangerous climate change, California's GHG emissions need to be reduced to at least 1990 levels by 2020 and 80 percent below 1990 levels by 2050.

GLOBAL EFFECTS OF CLIMATE CHANGE

The primary effect of global climate change has been a rise in average global tropospheric temperature of 0.2 degrees Celsius per decade, determined from meteorological measurements

[12] California Air Resources Board, *Greenhouse Gas Inventory Data - 2000 to 2008*, May 28, 2010.

[13] California Energy Commission, *Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004 - Final Staff Report, publication # CEC-600-2006-013-SF*, January 23, 2007.

[14] "Business as Usual" refers to emissions that would be expected to occur in the absence of GHG reductions. See http://www.arb.ca.gov/cc/inventory/data/forecast.htm. Note that there is significant controversy as to what BAU means. In determining the GHG 2020 limit, CARB used the above as the "definition." It is broad enough to allow for design features to be counted as reductions.

worldwide between 1990 and 2005.[15] Climate change modeling using year 2000 emission rates shows that further warming would occur, which would include further changes in the global climate system during the current century.[16] Changes to the global climate system and ecosystems and to California would include, but would not be limited to:

- The loss of sea ice and mountain snow pack resulting in higher sea levels and higher sea surface evaporation rates with a corresponding increase in tropospheric water vapor due to the atmosphere's ability to hold more water vapor at higher temperatures;[17]
- Rise in global average sea level primarily due to thermal expansion and melting of glaciers and ice caps and the Greenland and Antarctic ice sheets;[18]
- Changes in weather that include widespread changes in precipitation, ocean salinity, and wind patterns, and more energetic extreme weather including droughts, heavy precipitation, heat waves, extreme cold, and the intensity of tropical cyclones;[19]
- Decline of the Sierra snow pack (which accounts for approximately half of the surface water storage in California) by 70 percent to as much as 90 percent over the next 100 years;[20]
- Increase in the number of days conducive to ozone formation by 25 to 85 percent (depending on the future temperature scenario) in high ozone areas of Los Angeles and the San Joaquin Valley by the end of the 21st century;[21] and
- High potential for erosion of California's coastlines and sea water intrusion into the Delta and levee systems due to the rise in sea level.[22]

While there is broad agreement on the causative role of GHGs to climate change, there is considerably less information or consensus on how climate change would affect any particular location, operation, or activity. The IPCC has published numerous reports on potential impacts

[15] Intergovernmental Panel on Climate Change, *Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, 2007.

[16] Ibid.

[17] Ibid.

[18] Ibid.

[19] Ibid.

[20] California Environmental Protection Agency, *Climate Action Team, Climate Action Team Report to Governor Schwarzenegger and the Legislature (Executive Summary)*, March 2006.

[21] Ibid.

[22] Ibid.

of climate change on the human environment. These reports provide a comprehensive and up-to-date assessment of the current state of knowledge on climate change. Despite the extensive peer review of reports and literature on the impacts of global climate change, the IPCC notes the fact that there is little consensus as to the ultimate impact of human interference with the climate system and its causal connection to global warming trends.

LOCAL EFFECTS OF CLIMATE CHANGE

The following climate change effects could affect the City. However, the type and degree of the impacts that climate change would have on humans and the environment is difficult to predict at the local scale.

- **Sea Level Rise.** According to the IPCC, climate change is expected to raise sea levels by up to four feet. The City of Murrieta is approximately 22 miles from the Pacific Ocean and ranges from approximately 1,050 feet above mean sea level (msl) to 1,700 feet above msl. Sea levels are anticipated to rise 12 to 18 inches by 2050.[23] Therefore, sea level rise of this magnitude would be unlikely to inundate the City. Additionally, the effects related to sea level rise are speculative at this time. However, if determined to be a significant threat, protective measures such as levees would likely be installed by regional and local governments to protect urbanized areas.

- **Water Supply.** The City receives some of its water supplies from the State Water Project through the Metropolitan Water District of Southern California (MWD). Surface water supplies in the City from the State Water Project could potentially be reduced as a result of climate change effects.[24] Climate change could also impact groundwater supplies. Warmer temperatures could lead to higher evaporation or shorter rainfall seasons, which would mean that soil deficits would persist for longer time periods. Higher evapotranspiration would likely reduce the amount of water available for recharge and can lead to greater pumping of groundwater to make up for losses in surface water.[25] Groundwater serves as a source of water supply in Murrieta, which could result in serious implications for water supply in the City.

- **Natural Disasters.** Climate change could result in increased flooding and weather-related disasters. The City is located approximately 22 miles from the Pacific Ocean and would not be exposed to intense coastal storms. The frequency of large floods on rivers and streams could also increase. However, the City is not expected to be impeded by flood flows from Murrieta Creek or be susceptible to increased flooding; thus, flood-related impacts would be less than significant even under an intensified flooding scenario.

[23] California Natural Resources Agency, *2009 California Climate Adaptation Strategy*, December 2009.

[24] California Department of Water Resources, *Progress on Incorporating Climate Change into Management of California's Water Resources*, July 2006.

[25] California Natural Resources Agency, *2009 California Climate Adaptation Strategy*, December 2009.

- **Wildfires.** Climate change could result in increased occurrences and duration of wildfire events due to warmer temperatures, longer dry seasons, reduced winter precipitation, and early snowmelt. The City is located within areas designated by the California Department of Forestry and Fire Protection (CalFire) as Very High Fire Hazard Severity Zones (VHFHSZ) and Non-VHFHSZ. Development within the VHFHSZ is required to meet strict building construction requirements specified in the California Building Code Chapter 7A which would substantially reduce the risk and significance of wildland fires.

- **Public Health.** Climate change could cause an increase in infections, disease, asthma, and other health-related problems.[26] Heat waves are expected to have a major impact on public health as well as decreasing air quality and an increase in mosquito breeding and mosquito-borne diseases. Vector control districts throughout the State are already evaluating how they will address the expected changes to California's climate.[27]

- **Air Quality.** Climate change would compound negative air quality impacts in the South Coast Air Basin, resulting in respiratory health impacts.[28] The California Climate Adaptation Strategy states that climate change influences on atmospheric processes will promote formation of ground-level pollutants, such as ozone and secondary aerosols (particulate matter), and that these increases could offset much of the potential gains achieved through air pollution control measures. However, this would be a regional effect.

Other predicted physical and environmental impacts associated with climate change include heat waves, alteration of disease vectors, biome shifts, impacts on agriculture and the food supply, reduced reliability in the water supply, and strain on the existing capacity of sanitation and water-treatment facilities. While these issues are a concern for society at large, none of these impacts would have a disproportionate effect on the City of Murrieta. However, Chapter 3, *Climate Action Strategies*, identifies actions and strategies aimed at reducing the effects of climate change on the City.

LEGISLATION AND REGULATORY CONTEXT

Federal

The Federal Clean Air Act (FCAA) requires the EPA to define national ambient air quality standards (national standards) to protect public health and welfare in the United States. The FCAA does not specifically regulate GHG emissions; however, on April 2, 2007 the U.S. Supreme Court in *Massachusetts v. U.S. Environmental Protection Agency*, determined that GHGs are pollutants that can be regulated under the FCAA. The EPA adopted an endangerment finding and cause or contribute finding for GHGs on December 7, 2009. The

[26] California Climate Change Center, *Our Changing Climate, Assessing the Risks to California,* July 2006.

[27] California Natural Resources Agency. *2009 California Climate Adaptation Strategy*, December 2009.

[28] California Environmental Protection Agency, *AB 1493 Briefing Package*, 2008.

final findings were published in the Federal Register on December 15, 2009 under Docket ID No. EPA-HQ-OAR-2009-0171. The final rule was effective January 14, 2010.

Under the endangerment finding, the Administrator found that the current and projected atmospheric concentrations of the six, key, well-mixed GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) threaten the public health and welfare of current and future generations. Under the cause of contribute finding, the Administrator found that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution which threatens public health and welfare.

Based on these findings, on April 1, 2010, the EPA finalized the light-duty vehicle rule controlling GHG emissions. This rule confirmed that January 2, 2011, is the earliest date that a 2012 model year vehicle meeting these rule requirements may be sold in the United States. On May 13, 2010, the EPA issued the final GHG Tailoring Rule. This rule set thresholds for GHG emissions that define when permits under the Prevention of Significant Deterioration and Title V Operating Permit programs are required for new and existing industrial facilities. Currently, EPA rules do not cover residential construction projects. Implementation of the Federal rules is expected to reduce the level of emissions from new motor vehicles and large stationary sources. The EPA annually publishes the *Inventory of U.S. Greenhouse Gas Emissions and Sinks* for estimating sources of GHGs that is generally consistent with the IPCC methodology developed in its *Guidelines for National Greenhouse Gas Inventories*.

State of California

Various statewide and local initiatives to reduce California's contribution to GHG emissions have raised awareness that, even though the various contributors to and consequences of global climate change are not yet fully understood, global climate change is occurring, and that there is a real potential for severe adverse environmental, social, and economic effects in the long term. Every nation emits GHGs and as a result makes an incremental cumulative contribution to global climate change; therefore, global cooperation will be required to reduce the rate of GHG emissions enough to slow or stop the human-caused increase in average global temperatures and associated changes in climatic conditions.

There are currently no state regulations in California that establish ambient air quality standards for GHGs. However, California has passed laws directing CARB to develop actions to reduce GHG emissions, and several state legislative actions related to climate change and GHG emissions have come into play in the past decade.

ASSEMBLY BILL 1493

In 2002, then-Governor Gray Davis signed AB 1493 (Chapter 200, Statutes of 2002, amending Section 42823 of the California Health and Safety Code and adding Section 43018.5 to the code). AB 1493 required CARB to develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of GHGs emitted by passenger vehicles and light-duty trucks and other vehicles determined by CARB to be vehicles whose primary use is noncommercial personal transportation in the State."

To meet the requirements of AB 1493, CARB approved amendments to the California Code of Regulations (CCR) in 2004 by adding GHG emissions standards to California's existing standards for motor vehicle emissions. Amendments to CCR Title 13, Sections 1900 and 1961 (13 CCR Section 1900, 1961), and adoption of Section 1961.1 (13 CCR Section 1961.1), require automobile manufacturers, beginning with the 2009 model year, to meet fleet-average GHG emissions limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty passenger vehicle weight classes (i.e., any medium-duty vehicle with a gross vehicle weight rating less than 10,000 pounds that is designed primarily for the transportation of persons). The regulations would reduce GHG emissions from California passenger vehicles by about 22 percent by 2012 and about 30 percent by 2016.

In December 2004, a group of car dealerships, automobile manufacturers, and trade groups representing automobile manufacturers filed suit against CARB to prevent enforcement of 13 CCR Sections 1900 and 1961, as amended by AB 1493 and 13 CCR 1961.1 (*Central Valley Chrysler-Jeep et al. v. Catherine E. Witherspoon, in Her Official Capacity as Executive Director of the California Air Resources Board, et al*. [456 F.Supp.2d 1150, 1172, E.D. Cal. 2006]). The suit in the U.S. District Court for the Eastern District of California contended that California's implementation of regulations that regulate vehicle fuel economy would violate various federal laws, regulations, and policies.

In January 2007, the judge hearing the case accepted a request from the California Attorney General's office that the trial be postponed until a decision is reached by the U.S. Supreme Court on a separate case addressing GHGs. In the U.S. Supreme Court case, *Massachusetts v. U.S. Environmental Protection Agency*, the primary issue in question was whether the FCAA authorizes the EPA to regulate CO_2 emissions. The EPA contended that the FCAA does not authorize regulation of CO_2 emissions, whereas Massachusetts and ten other states, including California, sued the EPA to begin regulating CO_2. As mentioned above, the U.S. Supreme Court ruled on April 2, 2007, that GHGs are "air pollutants" as defined under the FCAA and that the EPA is granted authority to regulate CO_2 (*Massachusetts v. U.S. Environmental Protection Agency* [2007] 549 U.S. 05-1120).

On December 12, 2007, the U.S. District Court for the Eastern District of California rejected the automakers' claim by finding that if California receives appropriate authorization from the EPA (the last remaining factor in enforcing the standard), these regulations would be consistent with and have the force of federal law. This authorization to implement more stringent standards in California was requested in the form of a FCAA Section 209(b) waiver in 2005. Since that time, the EPA has failed to act in granting California authorization to implement the standards. The EPA denied California's request for the waiver to implement AB 1493 in late December 2007. On January 21, 2009, CARB submitted a letter to EPA Administrator Jackson regarding California's request to reconsider the waiver denial. The EPA approved the waiver on June 30, 2009.

EXECUTIVE ORDER S-20-04

Executive Order S-20-04, the California Green Building Initiative, (signed into law on December 14, 2004), establishes a goal of reducing energy use in state-owned buildings by 20 percent

from a 2003 baseline by 2015. It also encourages the private commercial sector to set the same goal.

The initiative places the California Energy Commission in charge of developing a building efficiency benchmarking system, commissioning and retro-commissioning (commissioning for existing commercial buildings) guidelines, and developing and refining building energy efficiency standards under Title 24 to meet this goal.[29]

EXECUTIVE ORDER S-3-05

Executive Order S-3-05 was established in 2005, in recognition of California's vulnerability to the effects of climate change. Executive Order S-3-05 set forth a series of target dates by which statewide emissions of GHGs would be progressively reduced, as follows:

- By 2010, reduce GHG emissions to 2000 levels;
- By 2020, reduce GHG emissions to 1990 levels; and
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

The executive order directed the secretary of the CalEPA to coordinate a multi-agency effort to reduce GHG emissions to the target levels. The secretary will also submit biannual reports to the governor and California Legislature describing the progress made toward the emissions targets, the impacts of global climate change on California's resources, and mitigation and adaptation plans to combat these impacts. To comply with the executive order, the secretary of CalEPA created the California Climate Action Team (CAT), made up of members from various state agencies and commissions. The team released its first report in March 2006. The report proposed to achieve the targets by building on the voluntary actions of California businesses, local governments, and communities and through state incentive and regulatory programs.

ASSEMBLY BILL 32 (CALIFORNIA GLOBAL WARMING SOLUTIONS ACT OF 2006)

California passed the California Global Warming Solutions Act of 2006 (AB 32; California Health and Safety Code Division 25.5, Sections 38500 - 38599). AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and establishes a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. This reduction will be accomplished by enforcing a statewide cap on GHG emissions that will be phased in starting in 2012. To effectively implement the cap, AB 32 directs CARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then CARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

[29] California Energy Commission, *Green Building Initiative, State of California Executive Order S-20-04,* http://www.energy.ca.gov/greenbuilding/, accessed on January 13, 2011.

AB 32 requires CARB to adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrived at the cap; institute a schedule to meet the emissions cap; and develop tracking, reporting, and enforcement mechanisms to ensure that the state reduces GHG emissions enough to meet the cap. AB 32 also includes guidance on instituting emissions reductions in an economically efficient manner, along with conditions to ensure that businesses and consumers are not unfairly affected by the reductions. Using these criteria to reduce statewide GHG emissions to 1990 levels by 2020 would represent an approximate 25 to 30 percent reduction in current emissions levels. However, CARB has discretionary authority to seek greater reductions in more significant and growing GHG sectors, such as transportation, as compared to other sectors that are not anticipated to significantly increase emissions. Under AB 32, CARB must adopt regulations by January 1, 2011 to achieve reductions in GHGs to meet the 1990 emission cap by 2020.

SENATE BILL 1368

SB 1368 (Chapter 598, Statutes of 2006) is the companion bill of AB 32 and was signed into law in September 2006. SB 1368 required the California Public Utilities Commission (CPUC) to establish a performance standard for baseload generation of GHG emissions by investor-owned utilities by February 1, 2007. SB 1368 also required California Energy Commission (CEC) to establish a similar standard for local publicly owned utilities by June 30, 2007. These standards could not exceed the GHG emissions rate from a baseload combined-cycle, natural gas–fired plant. Furthermore, the legislation states that all electricity provided to California, including imported electricity, must be generated by plants that meet the standards set by CPUC and CEC.

EXECUTIVE ORDER S-1-07

Executive Order S-1-07 proclaims that the transportation sector is the main source of GHG emissions in California, generating more than 40 percent of statewide emissions. It establishes a goal to reduce the carbon intensity of transportation fuels sold in California by at least ten percent by 2020. This order also directs CARB to determine whether this Low Carbon Fuel Standard (LCFS) could be adopted as a discrete early-action measure as part of the effort to meet the mandates in AB 32.

On April 23, 2009 CARB approved the proposed regulation to implement the LCFS. The LCFS will reduce GHG emissions from the transportation sector in California by about 16 million metric tons (MMT) in 2020. The LCFS is designed to reduce California's dependence on petroleum, create a lasting market for clean transportation technology, and stimulate the production and use of alternative, low-carbon fuels in California. The LCFS is designed to provide a durable framework that uses market mechanisms to spur the steady introduction of lower carbon fuels. The framework establishes performance standards that fuel producers and importers must meet each year beginning in 2011. One standard is established for gasoline and the alternative fuels that can replace it. A second similar standard is set for diesel fuel and its replacements.

The standards are "back-loaded"; that is, there are more reductions required in the last five years, than the first five years. This schedule allows for the development of advanced fuels that are lower in carbon than today's fuels and the market penetration of plug-in hybrid electric vehicles, battery electric vehicles, fuel cell vehicles, and flexible fuel vehicles. It is anticipated that compliance with the LCFS will be based on a combination of strategies involving lower carbon fuels and more efficient, advanced-technology vehicles.

SENATE BILL 97

SB 97, signed in August 2007 (Chapter 185, Statutes of 2007; PRC Sections 21083.05 and 21097), acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA. This bill directs the Governor's Office of Planning and Research (OPR), which is part of the state Natural Resources Agency, to prepare, develop, and transmit to CARB guidelines for the feasible mitigation of GHG emissions (or the effects of GHG emissions), as required by CEQA, by July 1, 2009. The Natural Resources Agency is required to certify and adopt those guidelines by January 1, 2010. SB 97 also removes, both retroactively and prospectively, the legitimacy of litigation alleging inadequate CEQA analysis of effects of GHG emissions in the environmental review of projects funded by the Highway Safety, Traffic Reduction, Air Quality and Port Security Bond Act of 2006 or the Disaster Preparedness and Flood Protection Bond Act of 2006 (Proposition 1B or 1E). This provision will be repealed by operation of law on January 1, 2010; at that time, any such projects that remain unapproved will no longer be protected against litigation claims of failure to adequately address climate change issues. In the future, this bill will only protect a handful of public agencies from CEQA challenges on certain types of projects, and only for a few years time.

As set forth more fully below, in June 2008, OPR published a technical advisory recommending that CEQA lead agencies make a good-faith effort to estimate the quantity of GHG emissions that would be generated by a proposed project. Specifically, based on available information, CEQA lead agencies should estimate the emissions associated with project-related vehicular traffic, energy consumption, water usage, and construction activities to determine whether project-level or cumulative impacts could occur, and should mitigate the impacts where feasible.[30] OPR requested CARB technical staff to recommend a method for setting CEQA thresholds of significance as described in Section 15064.7 of the CEQA Guidelines that will encourage consistency and uniformity in the CEQA analysis of GHG emissions throughout the state.

On December 30, 2009, the Natural Resources Agency adopted the CEQA Guidelines Amendments prepared by OPR, as directed by SB 97. On February 16, 2010, the Office of Administration Law approved the CEQA Guidelines Amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The CEQA Guidelines Amendments became effective on March 18, 2010.

[30] Governor's Office of Planning and Research, *CEQA AND CLIMATE CHANGE: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review*, June 19, 2008.

SENATE BILLS 1078 AND 107 AND EXECUTIVE ORDER S-14-08

SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010. In November 2008, Executive Order S-14-08 was signed, which expands the state's Renewable Energy Standard to 33 percent renewable power by 2020. Additionally, Executive Order S-21-09 (signed on September 15, 2009) directs CARB to adopt regulations requiring 33 percent of electricity sold in the state come from renewable energy by 2020. CARB adopted the "Renewable Electricity Standard" on September 23, 2010, which requires 33 percent renewable energy by 2020 for most publicly owned electricity retailers.

SENATE BILL 375

SB 375, signed in September 2008 (Chapter 728, Statutes of 2008), aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a sustainable communities strategy (SCS) or alternative planning strategy (APS) that will address land use allocation in that MPOs regional transportation plan. CARB, in consultation with MPOs, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every 8 years but can be updated every 4 years if advancements in emissions technologies affect the reduction strategies to achieve the targets. CARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG reduction targets, transportation projects may not be eligible for funding programmed after January 1, 2012.

This law also extends the minimum time period for the regional housing needs allocation cycle from five years to eight years for local governments located within an MPO that meets certain requirements. City or County land use policies (including general plans) are not required to be consistent with the regional transportation plan (and associated SCS or APS). However, new provisions of CEQA would incentivize (through streamlining and other provisions) qualified projects that are consistent with an approved SCS or APS, categorized as "transit priority projects."

ASSEMBLY BILL 3018

AB 3018, the California Green Collar Jobs Act of 2008, was signed into law by Governor Schwarzenegger on September 26, 2008. AB 3018 established the Green Collar Jobs Council (GCJC) under the California Workforce Investment Board (CWIB). The GCJC will develop a comprehensive approach to address California's emerging workforce needs associated with the emerging green economy. This bill will ignite the development of job training programs in the clean and green technology sectors.[31]

[31] California Workforce Investment Board, http://www.cwib.ca.gov/special_committees/green_collar_jobs_council, accessed on January 13, 2011.

EXECUTIVE ORDER S-13-08

Executive Order S-13-08, issued by Governor Schwarzenegger, seeks to enhance the state's management of climate impacts including sea level rise, increased temperatures, shifting precipitation, and extreme weather events by facilitating the development of State's first climate adaptation strategy. This will result in consistent guidance from experts on how to address climate change impacts in the State of California.[32]

EXECUTIVE ORDER S-21-09

Executive Order S-21-09, 33 percent Renewable Energy for California, (signed into law by Governor Schwarzenegger on September 15, 2009) directs CARB to adopt regulations to increase California's Renewable Portfolio Standard (RPS) to 33 percent by 2020. This builds upon SB 1078 (2002) which established the California RPS program, requiring 20 percent renewable energy by 2017, and SB 107 (2006) which advanced the 20 percent deadline to 2010, a goal which was expanded to 33 percent by 2020 in the 2005 Energy Action Plan II.

CARB SCOPING PLAN

On December 11, 2008, CARB adopted its Scoping Plan, which functions as a roadmap of CARB's plans to achieve GHG reductions in California required by AB 32 through subsequently enacted regulations.[33] CARB's Scoping Plan contains the main strategies California will implement to reduce CO_2eq emissions by 174 MMT, or approximately 30 percent, from the state's projected 2020 emissions level of 596 MMT of CO_2eq under a BAU scenario. This is a reduction of 42 MMT CO_2eq, or almost ten percent, from 2002 to 2004 average emissions, but requires the reductions in the face of population and economic growth through 2020.

CARB's Scoping Plan calculates 2020 BAU emissions as the emissions that would be expected to occur in the absence of any GHG reduction measures. The 2020 BAU emissions estimate was derived by projecting emissions from a past baseline year using growth factors specific to each of the different economic sectors (e.g., transportation, electrical power, commercial and residential, industrial, etc.). CARB used three-year average emissions, by sector, for 2002 to 2004 to forecast emissions to 2020. At the time CARB's Scoping Plan process was initiated, 2004 was the most recent year for which actual data was available. The measures described in CARB's Scoping Plan are intended to reduce the projected 2020 BAU to 1990 levels, as required by AB 32.

CARB's Scoping Plan also breaks down the amount of GHG emissions reductions CARB recommends for each emissions sector of the state's GHG inventory. CARB's Scoping Plan calls for the largest reductions in GHG emissions to be achieved by implementing the following measures and standards:

[32] California Natural Resources Agency. *2009 California Climate Adaptation Strategy*, December 2009.

[33] California Air Resources Board, *Climate Change Scoping Plan, A Framework for Change*, December 2008.

- Improved emissions standards for light-duty vehicles (estimated reductions of 31.7 MMT CO_2eq);
- The LCFS (15.0 MMT CO_2eq);
- Energy efficiency measures in buildings and appliances, and the widespread development of combined heat and power systems (26.3 MMT CO_2eq); and
- A renewable portfolio standard for electricity production (21.3 MMT CO_2eq).

CARB has identified a GHG reduction target of five MMT (of the 174 MMT total) for local land use changes (Table 2 of CARB's Scoping Plan), by Implementation of Reduction Strategy T-3 regarding Regional Transportation-Related GHG Targets. Additional land use reductions may be achieved as SB 375 is implemented. CARB's Scoping Plan states that successful implementation of the plan relies on local governments' land use, planning, and urban growth decisions because local governments have primary authority to plan, zone, approve, and permit land development to accommodate population growth and the changing needs of their jurisdictions. CARB further acknowledges that decisions on how land is used will have large effects on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emission sectors. CARB's Scoping Plan does not include any direct discussion about GHG emissions generated by construction activity.

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

The Southern California Association of Governments (SCAG) is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial Counties, and serves as a forum for regional issues relating to transportation, the economy, community development, and the environment. SCAG serves as the Federally designated metropolitan planning organization for the Southern California region and is the largest metropolitan planning organization in the United States. With respect to air quality planning, SCAG has prepared the *Regional Comprehensive Plan: Helping Communities Achieve a Sustainable Future* for the region, which focuses on transportation and growth management and forms the basis for the land use and transportation control portions of the *2007 Air Quality Management Plan for the South Coast Air Basin*. SCAG is responsible under the Federal Clean Air Act for determining conformity of projects, plans, and programs with the South Coast Air Quality Management District (SCAQMD).

Local

The City of Murrieta has implemented a number of policies and programs to assist the community in preserving the local environment. Existing programs and policies relevant to community GHG emissions reductions include the following:

- **Water Efficient Landscaping Ordinance.** Section 16.27 of the City's Municipal Code, the Water Efficient Landscaping Ordinance, is intended to promote water efficient landscaping, water use management, and water conservation through the use of water efficient landscaping, wise use of turf areas, and appropriate use of irrigation technology

and management; reduce water demands while maintaining landscape quality and quantity; eliminate waste; encourage creative design; and raising public awareness.

- **Alternative Energy Generation – Non-Commercial Wind Energy Conversion Systems (N- WECS).** Conditional Use Permits allow non-commercial wind energy conversion systems N-WECS (also known as windmills) within the City of Murrieta on rural residential lots, pursuant to the standards in Section 16.44.220 of the Municipal Code. The systems allowed include small wind energy systems that are rated to produce no more than 100 kilowatts (kW) and will be used primarily to reduce on-site consumption of power provided by the utility companies. For sites with both N-WEC Systems and connections to power provided by the utility company, excess electrical power generated by the N-WECS and not presently needed for on-site demand, may be used by the utility company in exchange for a reduction in the cost of electrical power provided by that company to that site, as long as no net revenue is produced by the excess power.

- **Solar Panels.** The following describes Municipal Code standards and regulations pertaining to solar panels:

  - Municipal Code Section 16.08.040(C)(3)(d), Multi-Family Residential Design Standard states that solar panels shall be integrated into the roof design, flush with the roof slope. Frames shall be colored to match roof colors. Any support equipment shall be enclosed and screened from view.

  - Section 16.10.030(A)(5)(a) of the Municipal Code states that solar collectors, along with other utility and mechanical equipment, must be concealed from view in compliance with Section 16.18.120(B) (Screening and Buffering).

  - Free-standing solar devices placed directly upon the finish grade and do not exceed a height of 18 inches above the surrounding finish grade at any point are exempt from the minimum setback requirements (Section 16.18.140(B)(2) of the Murrieta Municipal Code).

  - Section 16.18.140 (D)(2) states that solar devices may extend into front, back, and side yard setbacks as long as they do not increase the floor area enclosed by the structure.

  - Section 16.18.140 (D)(4)(a)(2) of the Murrieta Municipal Code states that freestanding solar devices that are placed directly upon the finish grade, and which equal or exceed a height of 18 inches above the surrounding finish grade at any point, shall conform to the setback requirements identified in Article II (Zoning Districts, Allowable Land Uses) for detached accessory structures.

  - 16.28.080(B)(7). Trees and shrubs shall be planted and maintained in a manner that protects the basic rights of adjacent property owners, particularly the right to solar access.

- **Condominium Standards for Energy Conservation.** Municipal Code Section 16.44.080(D)(2)(D)(2) states that the project should include energy and resource conservation measures, including high efficiency thermal insulation, high efficiency heating and cooling equipment, double glazing, water flow restrictors, solar water heating and other similar conservation techniques.

- **Solar Access Easements.** Municipal Code Section 16.106.030(H) states that the subdivider, as a condition of approval of a tentative map, may be required to dedicate easements for the purpose of ensuring that each parcel or unit in the subdivision may have the right to receive sunlight across adjacent parcels or units in the subdivision for any solar energy system, as defined by state law (Civil Code Section 801.5), in compliance with state law (Government Code Section 66475.3). At the time of tentative map approval; the commission may impose conditions which specify the following standards for determining the exact dimensions and locations of the easements; restrictions on structures, vegetation, and other objects which would obstruct the passage of sunlight through the easement; and terms or conditions under which an easement may be revised or terminated.

- **Household and Green Waste.** The City has contracted Waste Management to collect household and green waste. The City offers information on additional waste disposal locations and hazardous waste drop offs.

- **Recycling.** In response to various environmental concerns and the State of California Waste Management Act (AB 939), the City is committed to reduce the amount of waste sent to the landfills. The City also offers a wealth of information on locations for recycling materials, green waste, and construction/demolition debris.

- **Green Schools Leadership Award.** The Murrieta Valley Unified School District (MVUSD) was presented a Green Schools Leadership Award on December 9, 2010, by the Green California Schools Summit. The award was presented to the MVUSD for its "far-reaching sustainability programs and projects." Since 2007, MVUSD has saved nearly $900,000 by reducing energy costs due to their development of the Alliance to Save Energy's Green School Program. The two-year program created student "green teams" that continue to audit energy use and look for ways to use less energy on school campuses. MVUSD is also in the middle of a lighting retrofit program that could save up to $250,000 more per year, including 36,000 light bulb replacements through a Southern California Edison program, and about $1.2 million worth of materials are being installed at no cost to the district.[34]

- **ICLEI Membership.** The City of Murrieta is a committed member of the International Council for Local Environmental Initiatives – Local Governments for Sustainability (ICLEI). ICLEI has been a leader both internationally and domestically for more than ten years, representing over 770 local governments around the world. ICLEI was launched

[34] The Press Enterprise – Murrieta –Menifee Local News, *Murrieta: Schools' energy savings lauded*, December 4, 2010, http://www.pe.com/localnews/murrieta/stories/PE_News_Local_D_sgreen05.24bdacc.html.

in the United States in 1995 and has grown to more than 230 cities and counties providing national leadership on climate protection and sustainable development. In June 2006, ICLEI launched the California Local Government Climate Task Force as a formal mechanism to provide ongoing input and collaboration into the State of California's climate action process.

MURRIETA'S GHG EMISSIONS AND REDUCTION TARGET

Baseline and Projections

In 2009, the City of Murrieta generated 430,842 metric tons of carbon dioxide equivalents ($MTCO_2eq$). Transportation-related activities account for the majority of the City's GHG emissions (approximately 48.3 percent). Approximately 23.5 percent of Murrieta's community-wide GHG emissions are attributed to residential uses. Commercial uses account for approximately 15.4 percent. Office, business park, civic/institutional, industrial, and waste disposal account for the remaining 12.6 percent of community-wide GHG emissions. In the short term, transportation emissions are expected to decrease because of lower emissions from newer vehicles. These decreased emissions would likely outweigh expected increases in VMT. However, in the long term, projected increases in VMT outweigh decreased vehicle emissions resulting from improved fuel efficiency. Thus, the City's GHG emissions would be expected to increase to approximately 833,934 $MTCO_2eq$ in 2020, and continue to increase throughout proposed General Plan Update buildout (2035). Additional information regarding the City's baseline and projected GHG emissions is provided in Chapter 2, *Emissions Inventory*.

IMPLEMENTATION

To meet its GHG emission reduction targets, the City needs to prioritize actions, mobilize residents, business owners, and staff, and work with neighboring jurisdictions and regional agencies to create feasible solutions. Additional information regarding the City's baseline and projected GHG emissions is provided in Chapter 4, *Implementation*.

APPROACH

Applying CAP measures to obtain tangible results requires concrete action steps and the flexibility to change as economic, political, and environmental conditions demand. Chapter 4 outlines the specific action steps that will implement each measure for which GHG emission reductions have been quantified. The City has provided an implementation timeframe and responsible departments for each action step. Additionally, the City has selected performance indicators and monitoring and reporting requirements that will be used to evaluate the success of each measure.

The City's Community Development Department will oversee the tracking and reporting of progress toward achieving the City's GHG emission reduction target of 15 percent below 2009 levels by 2020. The City Council will be provided annual reports to the on the progress made toward achieving the reduction target as a whole, and for each quantified measure. If the

measures do not achieve or surpass the expected GHG reductions, the City will examine ways to increase measure performance or create new measures capable to compensate for missed emission reductions.

PLAN ADJUSTMENTS AND FLEXIBILITY

The CAP represents the City's aggressive effort to respond to the challenge of climate change at the time of preparation. The topic of climate action planning is changing frequently and rapidly evolving. Over the next decade, new information, GHG reduction methods, and legislation are likely to develop. In order to remain effective, the CAP must evolve over time. Therefore, the CAP will be reviewed and modified on a regular basis to identify potential plan update needs. These reviews will evaluate improvements to climate science, explore new opportunities for GHG reduction and climate adaptation, and respond to changes in climate policy.

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Chapter 2

Emissions Inventory

Chapter 2
Emissions Inventory

This section describes Murrieta's greenhouse gas (GHG) emissions inventory. The baseline emissions inventory is based on California Air Resources Board (CARB) and ICLEI—Local Governments for Sustainability (ICLEI) protocols and provides emissions for both community-wide and municipal sources for Year 2009. It should be noted that the comprehensive General Plan Update uses 2009 as the year for the environmental conditions baseline.

The inventory was compiled using ICLEI's Clean Air Climate Protection (CACP) software. The emissions sources represent the total GHG emissions occurring within the City and include the major such as including residential, commercial, and industrial buildings; transportation; water conveyance; solid waste; and municipal operations. The GHG emissions from these sectors are associated with numerous direct and indirect sources. Direct sources are attributed to combustion of fossil fuels and area source emissions from buildings. Indirect sources consist of emissions from electricity generation, solid waste, and water transport.

Once completed, these inventories provide the basis for creating an emissions forecast and reduction target, and enable the quantification of emissions reductions associated with implemented and proposed measures.

METHODOLOGY

An inventory of GHG emissions requires the collection of information from a variety of sectors and sources. Community emissions from electricity and natural gas are based on usage rates specific to each land use type and are calculated using emissions coefficients compiled by ICLEI. Transportation data, including vehicle miles traveled (VMT), are based on traffic data provided by Iteris, whom conducted the traffic analysis for the General Plan Update. Solid waste data was based on generation factors as well as historic and projected generation data identified in the City of *Murrieta General Plan Update Program EIR* and the *California Department of Resources Recycling and Recovery (CalRecycle)*. City staff were instrumental in providing data on municipal operations.

Compiled data were entered into the CACP software to create a community emissions inventory and a municipal emissions inventory. The community inventory represents all the energy used and waste produced within Murrieta and its contribution to GHG emissions. Municipal sources represent all City operated buildings and vehicles, and include government buildings, solid waste, and street lights. The municipal inventory is a subset of the community inventory, and includes emissions derived from internal government operations.

Separate emissions inventories for community and municipal operations are generally created since the government is committed to action on climate change, and has a higher degree of control to achieve reductions in its own municipal emissions than those created by the community at large. Additionally, by proactively reducing emissions generated by its own activities, the City of Murrieta takes a visible leadership role in the effort to address climate change. This is important for inspiring local action in Murrieta, as well as for inspiring other communities.

When calculating the emissions inventory, all energy consumed in the City was included. As a result, even though the electricity used by Murrieta's residents is produced elsewhere, this energy and emissions associated with it appears in the City's inventory. The decision to calculate emissions in this manner reflects the general philosophy that a community should take full ownership of the impacts associated with its energy consumption, regardless of whether the generation occurs within the geographical limits of the community. Additionally, the energy consumption is a result of activities that are within the City's regulatory authority.

CACP Software

The CACP software estimates emissions derived from energy consumption and waste generation within a community. Emissions are determined using specific factors (or coefficients) according to the type of fuel used. Emissions are aggregated and reported in terms of carbon dioxide equivalent units (CO_2eq)[1]. Converting all emissions to CO_2eq units allows for the consideration of different GHGs in comparable terms. For example, methane is 21 times more powerful than CO_2 in its capacity to trap heat, so the model converts one ton of methane emissions to 21 tons of CO_2eq.

The emission coefficients and methodology employed by the software are consistent with national and international inventory standards established by the Intergovernmental Panel on Climate Change (1996 Revised IPCC Guidelines for the Preparation of National GHG Emissions Inventories), the U.S. Voluntary GHG Reporting Guidelines (EIA form1605), and, for emissions generated from solid waste, the U.S. EPA's Waste Reduction Model (WARM).

GHG EMISSIONS SECTORS

CACP separates the GHG emissions inventory into community-wide and government-related emissions. Community-wide emissions represent the total GHG emissions originating from activity within each sector throughout the community. Government-related emissions, although separated in CACP, are considered a subset of the community-wide (i.e., total) GHG emissions. CACP calculates GHG emissions from energy consumption, transportation, and solid waste, which are further discussed below.

[1] Carbon Dioxide Equivalent (CO_2eq) - A metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential.

Energy Consumption

Energy related emissions are from the consumption of both electricity and natural gas. These emissions are both direct (e.g., building energy consumption) and indirect (e.g., produced off-site from energy production and water consumption [including water treatment and delivery]). The emissions inventory used electricity and natural gas usage rates for residential, commercial, and industrial land uses for the year 2009 from the California Energy Commission (CEC) California Grid Average. The energy consumption data separated private users from government-operated facilities (i.e., City owned).

In order to calculate GHG emissions from natural gas and electricity consumption, ICLEI obtained California-specific emission coefficients. For natural gas consumption, a 2009 emission coefficient (kilograms of CO_2 per million British thermal units [kg CO_2/MMBtu]) for natural gas delivery was used within CACP for both community-wide and government-related energy use. The specific natural gas emission coefficient used to calculate GHG emissions was verified by California Climate Action Registry (CCAR) and the CEC. Similar to natural gas consumption, a 2009 emission coefficient (pounds of CO_2 per kilowatt [lbs CO_2/kWh]) was used to calculate GHG emissions associated with electricity delivery, which is also verified by CCAR.

Transportation

Murrieta's transportation sector includes emissions generated from VMT. Iteris provided vehicle activity data (i.e., VMT) occurring on local roadways and freeway ramps within the City limits. The City provided vehicle and VMT data for the government (i.e., City) vehicle fleet.

ICLEI used CARB's Emission Factors model (EMFAC2007) to obtain Riverside County-specific emission coefficients for vehicle fuel distribution, vehicle fuel efficiencies, and emission factors. Riverside County-specific emissions factors data was only used for community-wide transportation data. The City provided municipal vehicle fleet data with specific information regarding fuel and vehicle types. ICLEI also used EMFAC2007 assumptions to generate emission factors for the City vehicle fleet.

Solid Waste

Emissions from waste result primarily from organic waste occurring at landfills where the waste is disposed. Methane (CH_4) is the primary GHG from waste and the emissions result from chemical reactions and microbes acting upon the waste as the biodegradable materials break down. Solid waste generation and disposal data was obtained from CalRecycle (formerly the California Integrated Waste Management Board [CIWMB]). CACP provides GHG emission coefficients for various solid waste categories. These national default emission coefficients were used to calculate GHG emissions associated with solid waste disposal. The only alteration made to these emission coefficients was to set all waste category sequestration rates to zero in order to avoid the City taking credit for downstream emissions sequestration without also accounting for upstream emissions associated with production, transport, and consumption.

BASELINE GHG EMISSIONS INVENTORY

Community Sector

Table 2-1, *Baseline (Year 2009) Community-Wide GHG Emissions Inventory*, presents Murrieta's 2009 community-wide GHG emissions and the percent contribution of each emissions sector. As shown below, transportation-related activities account for the majority of the City's GHG emissions (approximately 48.3 percent). Approximately 23.5 percent of Murrieta's community-wide GHG emissions are attributed to residential uses. Commercial uses account for approximately 15.4 percent. Office, business park, civic/institutional, industrial, and waste disposal account for the remaining 12.6 percent of community-wide GHG emissions.

Table 2-1
Baseline (Year 2009) Community-Wide GHG Emissions Inventory

Community Sector	GHG Emissions	
	Total $MTCO_2eq$/year	CO_2eq (percent)
Residential	91,492	23.5
Commercial		
Commercial	60,153	15.4
Office	12,711	3.3
Business Park	8,332	2.1
Civic/Institutional	9,333	2.4
Industrial	3,463	0.9
Transportation	188,138	48.3
Waste	14,795	3.8
TOTAL[1]	**389,717**	**100**

GHG = greenhouse gas; $MTCO_2eq/yr$ = metric tons of carbon dioxide equivalent per year

Notes:
1. Totals may be slightly off due to rounding.

Source: ICLEI, *Clean Air and Climate Protection 2009 Software Version 2.2.1b*, April 2010.

Municipal Sector

Municipal emissions include energy use from City facilities such as water delivery facilities as well as government buildings, vehicle fleets, streetlights, and City employee commuting. Municipal sector emissions represent an opportunity for the City to demonstrate how to reduce GHG emissions. Table 2-2, *Baseline (Year 2009) Municipal Operations GHG Emissions Inventory*, presents government-related GHG emissions and the percent contribution of each emission sector. Approximately 58.2 percent of government-related GHG emissions are generated from water pumping, treatment, and delivery and wastewater treatment accounts for 14.8 percent. Electricity consumption of streetlights and traffic signals represent 18.6 percent.

GHG emissions from employee commute total approximately 4.2 percent of government-related emissions, while buildings and facilities account for just 1.1 percent of annual GHG emissions.

Table 2-2
Baseline (Year 2009) Municipal Operations GHG Emissions Inventory

Municipal Sector	GHG Emissions	
	Total $MTCO_2eq$/year	CO_2eq (percent)
Buildings and Facilities	466	1.1
Streetlights & Traffic Signals	7,640	18.6
Water Delivery Facilities	23,941	58.2
Wastewater Facilities	6,091	14.8
Employee Commute	1,738	4.2
Vehicle Fleet	1,251	3.0
Total[1]	**41,125**	**100**

GHG = greenhouse gas; $MTCO_2eq/yr$ = metric tons of carbon dioxide equivalent per year

Notes:
1. Totals may be slightly off due to rounding.

Source: ICLEI, *Clean Air and Climate Protection 2009 Software Version 2.2.1b*, April 2010.

Total Baseline GHG Emissions

Total Baseline GHG emissions include both the Community Sector and the Municipal Sector. As indicated in *Table 2-3*, *Total Baseline (Year 2009) GHG Emissions*, the Citywide GHG emissions are 430,842 metric tons (MT) CO_2eq per year. On a per capita basis, the annual emissions for each person in the City is 4.3 $MTCO_2eq$.

Table 2-3
Total Baseline (Year 2009) GHG Emissions

Sector	GHG Emissions	
	Total $MTCO_2eq$/year	CO_2eq (percent)
Community Sector	389,717	90.5
Municipal Sector	41,125	9.5
Total	**430,842**	**100**

GHG = greenhouse gas; $MTCO_2eq/yr$ = metric tons of carbon dioxide equivalent per year

Source: ICLEI, *Clean Air and Climate Protection 2009 Software Version 2.2.1b*, April 2010.

PROJECTED EMISSIONS

To determine the GHG emission reductions necessary to achieve Murrieta's target (15 percent reduction in emissions from 2009 emission levels by 2020), the City's GHG emissions were projected for the General Plan Update buildout year of 2035, then GHG emissions were projected for year 2020 under a trend scenario. The trend scenario is based on future growth and development anticipated in the General Plan Update as well as future year consumption rates for energy, transportation, water transport, and waste. The existing and projected emissions are presented in Table 2-4, *Baseline and Projected 2020 and 2035 Emissions*. The emissions forecast estimates future emissions under a Business As Usual (BAU) scenario. The BAU scenario assumes that no effort has been made to reduce emissions. Therefore, the future emissions depicted in Table 2-4 present how GHG emissions may increase in Murrieta if no reduction programs are implemented.

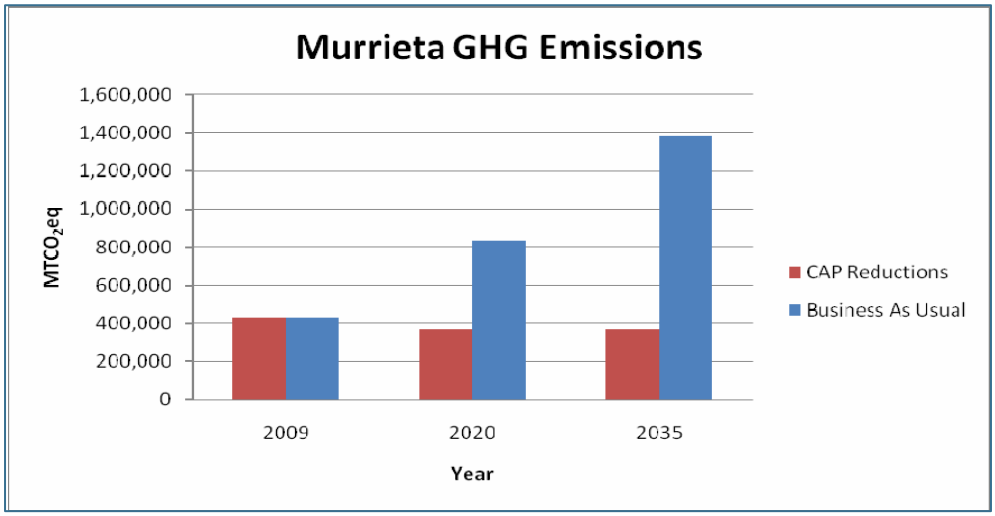
Table 2-4
Baseline and Projected 2020 and 2035 Emissions

Emissions Sector	GHG Emissions					
	2009 Baseline		2020 Projected		2035 Projected	
	$MTCO_2eq/yr$	% of Emissions[1]	$MTCO_2eq/yr$	% of Emissions[1]	$MTCO_2eq/yr$	% of Emissions[1]
COMMUNITY SECTOR						
Residential	91,492	23.5	105,148	13.3	123,770	9.3
Commercial						
Commercial	60,153	15.4	96,636	12.3	146,386	11.0
Office	12,711	3.3	232,750	29.5	532,806	39.9
Business Park	8,332	2.1	23,398	3.0	43,942	3.3
Civic/Institutional	9,333	2.4	8,309	1.1	6,914	0.5
Mixed Use	-	-	3,113	0.4	7,358	0.6
Industrial	3,463	0.9	4,241	0.5	5,302	0.4
Transportation	188,138	48.3	296,651	37.6	444,625	33.3
Waste	14,795	3.8	18,419	2.3	23,363	1.8
Community Sub-Total[2]	**389,717**	**100**	**788,666**	**100**	**1,334,466**	**100**
MUNICIPAL SECTOR						
Buildings and Facilities	466	1.1	485	1.1	513	1.0
Streetlights & Traffic Signals	7,640	18.6	8,125	17.9	8,786	17.3
Water Delivery Facilities	23,941	58.2	26,791	59.2	30,679	60.3
Wastewater Facilities	6,091	14.8	6,864	15.2	7,918	15.6
Employee Commute	1,738	4.2	1,739	3.8	1,740	3.4
Vehicle Fleet	1,251	3.0	1,264	2.8	1,281	2.5
Municipal Sub-Total[2]	**41,125**	**100**	**45,268**	**100**	**50,917**	**100**
Grand Total (Community and Municipal Sectors) [2]	**430,842**	N/A	**833,934**	N/A	**1,385,382**	N/A

GHG = greenhouse gas; $MTCO_2eq/yr$ = metric tons of carbon dioxide equivalent per year

Notes:
1. The percentage of emissions refers to the respective sectors (either community or municipal) and not to the combined total.
2. Totals may be slightly off due to rounding.

Source: ICLEI, *Clean Air and Climate Protection 2009 Software Version 2.2.1b*, April 2010.



Growth and development under a 2035 BAU scenario would continue along a similar trend as under the 2020 BAU conditions. Assuming that the same type of current emissions-generating practices continue to occur within Murrieta, the City's GHG emissions would be anticipated to increase from 430,842 $MTCO_2eq$ in 2009 to 1,385,382 $MTCO_2eq$ in 2035. This represents a 192 percent increase from the 2009 baseline level in 2035. In comparison, the City's projected population is expected to increase 32 percent by 2035 from 2009.[2] Therefore, if current emissions-generating practices continue, Murrieta's GHG emissions are expected to increase at a higher rate than its population in 2035. This trend can be explained by increases in per capita activity levels (i.e., energy consumption, waste disposal, water consumption, and VMT).

Under a BAU scenario, the City's GHG emissions (municipal and community) would be anticipated to increase from 430,842 $MTCO_2eq$ in 2009 to 833,934 $MTCO_2eq$ in 2020. This represents a 75 percent increase from the 2009 baseline level. In comparison, the City's projected population is expected to increase 13 percent by 2020 from 2009.[3] Therefore, if current emissions-generating practices continue, Murrieta's GHG emissions are expected to increase at a higher rate than its population in 2020. This trend can be explained by increases in per capita activity levels (i.e., energy consumption, waste disposal, water consumption, and VMT).

GHG REDUCTION TARGET

The City of Murrieta recognizes the importance of reducing GHG emissions. Clearly defined emissions reduction targets will provide City decision makers and the community with a clear

[2] Southern California Association of Governments (SCAG), *Adopted 2008 RTP Growth Forecast by City*, http://www.scag.ca.gov/forecast/index.htm. Accessed January 17, 2010.

[3] Ibid.

direction for Murrieta's GHG emissions management efforts, and will provide milestones against which progress can be evaluated over time. This quantitative target coupled with strategies and actions in this CAP the will allow Murrieta to have greater control of the amount of GHGs emitted into the atmosphere.

Under AB 32, the State has committed to reducing GHG emissions to 1990 levels by 2020. Based on the CARB *Scoping Plan*, reducing GHG emissions to 1990 levels means cutting approximately 30 percent from BAU emission levels projected for 2020, or about 15 percent from today's levels.[4] The CARB *Scoping Plan* projects future emissions by comparing potential reductions from various measures to a BAU scenario. The BAU scenario represents future GHG emissions without the implementation of reduction measures. As a result, the CARB *Scoping Plan* outlines the State's strategy to achieve the 2020 GHG emissions limit with a comprehensive set of actions that will be developed by 2012.

Consistent with the CARB Scoping Plan, the City of Murrieta has chosen a reduction target of 15 percent below their current (2009 baseline) emissions levels by 2020. This reduction trend would continue through the General Plan buildout year of 2035. The 15 percent below current emissions reduction target will contribute to the stabilization of global GHG emission concentrations and achievement of AB 32 goals. To attain the adopted target, Murrieta will need to reduce Citywide GHG emissions by 468,469 $MTCO_2eq$ by 2020; refer to Table 2-5, *GHG Emissions Summary and Reduction Target*. This represents a 56 percent reduction from projected 2020 GHG emissions levels which take into account population growth and BAU emissions generation.

Table 2-5
GHG Emissions Summary and Reduction Target

Scenario[1]	GHG Emissions (MT CO_2eq/yr)
Total 2009 Baseline GHG Emissions	430,842
Total 2020 BAU projected GHG Emissions	833,934
Total 2035 General Plan Buildout projected GHG Emissions	1,385,382
Emissions Reduction Target (15 percent below 2009 emissions)	366,218
2020 GHG Emissions Reductions from BAU	468,469

GHG = greenhouse gas; $MTCO_2eq/yr$ = metric tons of carbon dioxide equivalent per year; BAU = Business As Usual

Notes:
1. All scenarios refer to both community-wide and municipal emissions as the "total" amount of GHG emissions.

To achieve these emissions reductions, the City will implement reduction strategies for each category of GHG emissions (e.g., transportation, energy and water consumption, and waste disposal). Chapter 3 identifies GHG reduction measures capable of achieving this target, and describes the relationship of the City's local actions to statewide efforts to curb GHG emissions.

[4] In the CARB Scoping Plan, "today's levels" are based on the statewide GHG inventory for 2005. However, cities and counties are encouraged to set a 15 percent GHG reduction target for both municipal operations and the community as a whole based on the most current GHG inventory conducted.

Chapter 3

Climate Actions Strategies

Chapter 3
Climate Actions Strategies

Assembly Bill 32, the Global Warming Solutions Act of 2006, requires a reduction of greenhouse gas (GHG) emissions to 1990 levels by 2020. The California Air Resources Board (CARB) is the lead agency for implementing AB 32, which set the major milestones for establishing the program. CARB met the first milestones in 2007: developing a list of discrete early actions to begin reducing GHG emissions, assembling an inventory of historic emissions, establishing GHG reporting requirements, and setting the 2020 emissions limit. As part of its mandate, CARB developed a Scoping Plan which outlined the State's strategy to achieve the 2020 GHG emissions limit. This Scoping Plan proposes a comprehensive set of actions designed to reduce overall GHG emissions in California, improve the environment, reduce dependence on oil, diversify energy sources, save energy, create new jobs, and enhance public health. This "Approved Scoping Plan" was adopted by CARB at its December 11, 2008 meeting. In setting the reduction goal, the Scoping Plan identifies that reducing GHG emissions to 1990 levels means cutting approximately 30 percent from business-as-usual emission levels projected for 2020, or about 15 percent from today's levels. In response, the City of Murrieta has established a goal to reduce community-wide GHG emissions to 15 percent below baseline levels by 2020. It should be noted that the comprehensive General Plan Update uses 2009 as the year for the environmental conditions baseline.

This chapter describes the seven strategies that Murrieta has crafted to achieve this target. Combined, these strategies will decrease GHG emissions by approximately 469,386 metric tons of carbon dioxide equivalent ($MTCO_2eq$) by 2020, enabling the community to contribute to global efforts to combat climate change. It should be noted that the strategies and emissions reductions measures take into account projected growth within the City. Each of the strategies contains emission reduction measures from municipal and non-municipal operations. These measures are consistent with and build upon the Goals and Policies within the City's General Plan Update. Although this section includes GHG inventories for Year 2035 (Buildout year associated with the general Plan Update), these are included only for informational purposes, as the reduction strategy that was chosen is set to comply with the AB 32 benchmark of Year 2020. However, implementation of the GHG reduction measures in the CAP would ensure the GHG emissions are significantly reduced from a Year 2035 business as usual scenario.

The measures were developed from evaluating the General Plan Update Existing Conditions Report, identifying emission reduction opportunities – especially those embraced by the community realized through community outreach, reviewing best practices from other jurisdictions and organizations, and incorporating State and regional laws, guidelines, and recommendations. The selected measures were recommended on the following criteria:

- Is it technically possible to implement the measure and would the community support it?

- Does this measure create additional co-benefits (i.e., quality of life, public health, jobs/housing balance)?

The seven emission reduction strategies are as follows:

- **Community Involvement Strategy.** The community involvement strategy is intended to foster a sense of ownership of the ideas and actions to be carried out within the City. To create a successful plan that is supported by the community, who will ultimately make these changes.

- **Land Use and Community Vision Strategy.** The land use and community vision strategy encourages changes in the land use pattern to enable residents to reduce dependence on their cars to get around town.

- **Transportation and Mobility Strategy.** The transportation and mobility strategy identifies opportunities to improve mobility such as walking, bicycling, and transit use, and to decrease the need to drive.

- **Energy Use and Conservation Strategy.** The energy use and efficiency strategy recommends ways to increase energy efficiency in existing buildings, enhance energy performance for new construction, and increase use of renewable energy.

- **Water Use and Efficiency Strategy.** The intent of this strategy is to conserve water through efficient use and conservation.

- **Waste Reduction and Recycling Strategy.** The strategy builds on past City successes by increasing waste diversion, reducing consumption of materials that otherwise end up in landfills, and increasing recycling.

- **Open Space Strategy.** This strategy expands the utilization of open spaces for habitat, storm water management, soil retention, air filtration, and cooling, aesthetic and economic value, local food security, increased and improved parks, preservation, and to create new open spaces.

Each strategy recommends measures and actions that will make the vision of the CAP a reality. Measures define the direction that the City will take to accomplish its GHG reduction goals. Actions define the specific steps that City staff and decision-makers will take over time.

SECTION STRUCTURE

This section is organized by strategy, measures, and actions. Each of the seven strategies represents the primary ways to reduce GHG emissions in Murrieta. Each strategy begins with an introduction to the overarching concepts that tie that particular strategy to GHG emission generation and potential reductions. This introduction is then followed by the component measures and actions that translate to the City's vision to implementation. The following identifies the major component of each GHG reduction measure:

- **GHG Reduction Measures.** Measures define the programs, policies, and projects that the City will undertake to accomplish its GHG reduction targets.

  - ***Measure Description.*** Measure descriptions provide important background information and describe the City's rationale and policy direction. Additionally, some descriptions provide detailed guidance that will be used in program implementation.

  - ***Action and Performance Criteria.*** Detailed action steps and performance criteria are provided in a table following each measure description. Actions identify specific steps that the City will take to implement the measure. The table also identifies the responsible departments and establishes an implementation schedule for each action.

  - ***GHG Reduction Potential.*** GHG reduction potential for each measure was calculated based on research data, findings, and guidance from public agencies, associations, and research institutes such as the Center for Clean Air Policy (CCAP), the Victoria Transport Institute (VTI), and the California Air Pollution Control Officers Association (CAPCOA). In several instances, combining measures lead to better emissions reductions than implementing a single measure by itself. These measures have been identified as "supporting measures." Supporting measures do not necessarily have a quantifiable GHG reduction potential of their own, but facilitate reductions of other associated measures. Therefore, measures that contribute to the reductions of other measures have been identified as supporting measures.

Table 3-1, *City Departments Responsible for Implementing the CAP*, indicates the various City departments and divisions that will be responsible for implementing the CAP. Performance criteria and targets provided with each measure, enable staff, the City Council, and the public to track implementation and monitor overall CAP progress.

RESPONSIBILITY

The City's Community Development Department will oversee the implementation and monitoring of the GHG reduction strategies. Through this process, additional City Departments (i.e., Public Works, Building and Safety, Engineering, Maintenance, etc.) would be engaged to ensure the goal and reduction measures are achieved to realize the City's reduction target.

1. COMMUNITY INVOLVEMENT STRATEGY

Community involvement, public education, and effective participation are key to successful implementation of the CAP. During the CAP implementation period, the City will conduct outreach programs that involve residents and businesses in GHG-reducing activities, assessments, and actions. Effective public participation will increase the likelihood that the GHG reduction measures recommended in this plan achieve estimated participation rates. The outreach and education programs should be adapted over time to meet the changing needs of the community. Residents of all ages should have access to public education on these programs. Educating both children and their parents will reinforce the message. Education programs can include workshops, seminars, consultations, presentations, brochures, and flyers. Specific measures related to municipal operations are described in this section.

Increase Public Education

Goal CIR-6 Alternative travel modes and facilities are available to serve residents and employers/employees and reduce vehicle miles traveled.

Measure Description: According to the 2000 US Census, 79 percent of residents drove alone to work, 12 percent carpooled, and seven percent traveled by other means or worked from home.[1] Automobiles are the most widely utilized mode of transportation amongst residents of Murrieta. For most residents, driving is the quickest and most convenient way to get around or out of town. Murrieta is looking to expand alternative modes of transportation with the City, such as bicycle and bus systems. Participation in utilizing alternative modes of transportation would increase with outreach workshops and presentations. Through the increased use of bus services and bicycle infrastructure, GHG emissions would be reduced through the reduction of vehicle miles traveled.

[1] U.S. Census Bureau, *Census 2000 Summary File 3* (SF 3) Sample Data, Table P35 Private Vehicle Occupancy for Workers 16 Years and Over, July 2007.

Number	Measure
CIR-6.12	Increase public education about public transit options.
Action	**Target/Performance Criteria**
Provide public workshops/presentations about public transportation options.	At least one workshop per quarter.
GHG Reduction Potential	Supporting Measure

Green the City Operations

Goal CSV-15 A community taking a leadership role in resource conservation and reduction of greenhouse gas emissions by implementing programs to improve municipal operations.

Measure Description: The City of Murrieta has an opportunity to serve as an example for the community by taking a leadership role in greening municipal operations by transitioning to more energy-efficient buildings and operations.

In order to begin making City operations more efficient, energy audits will be conducted by the City to identify areas where the highest consumption of natural resources occurs. The City can continue to implement and develop new waste reduction programs at municipal facilities. To conserve water, the City can retrofit and/or install water- and energy-efficient fixtures and appliances in all municipal facilities as well as use recycled water where appropriate and feasible in City parks and landscaped areas. The City can demonstrate cutting-edge green building techniques when constructing and retrofitting municipal buildings. To conserve energy, the City can use energy-efficient lighting in parks, streets, and other public places as well as considering renewable energy generation systems on City-owned property. Over time, this information can facilitate more efficient use of energy and water in municipal operations.

Number	Measure
CSV-15.1	Consider renewable energy generation systems on City-owned property for use in municipal operations.
CSV-15.2	Reduce fuel consumption and emissions from municipal fleet vehicles.
CSV-15.3	Continue to implement waste reduction programs at municipal facilities.
CSV-15.4	Consider retrofitting and/or installing water- and energy-efficient fixtures and appliances in all municipal facilities, where appropriate and feasible.
CSV-15.5	Encourage the use of recycled water where appropriate and feasible in City parks and landscaped areas, and demonstrate preferred techniques for water-efficient landscaping, including the use of native plants.
CSV-15.6	Demonstrate cutting-edge green building techniques when constructing and retrofitting municipal buildings.
CSV-15.7	Use energy-efficient lighting in parks, streets and other public places.

Action	Target/Performance Criteria
Percentage of energy efficiency improvement through retrofits and conservation measures.	20 percent improvement by 2020 40 percent improvement by 2035
GHG Reduction Potential	97 $MTCO_2eq$

Green the City Fleet

Goal HC-1 Application of innovative and model best practices in the community health field.

Measure Description: This is a supporting measure for Greening the City Operations measure to 'reduce fuel consumption and emissions from municipal fleet vehicles'. The integration of these fuel-efficient and low-emissions vehicle will set an example to residents and businesses within the City that Murrieta is serious about reducing GHGs.

Number	Measure
HC-1.3	Encourage that the municipal vehicle fleet achieve the highest possible number of fuel-efficient and low emissions vehicles commercially available.

Action	Target/Performance Criteria
Incorporate hybrid and/or electric vehicles into the City fleet.	20 percent alternative fuel vehicles by 2020 50 percent alternative fuel vehicles by 2035
GHG Reduction Potential	253 $MTCO_2eq$

2. LAND USE AND COMMUNITY VISION STRATEGY

As a community with vacant lots and development potential, the land use strategy focuses on improving existing areas and increasing the density of new mixed use developments to shape walkable areas throughout the community. A series of community workshops were conducted by the City for the General Plan update. Through this visioning process, community priorities were identified such as 'preserving the elements of Murrieta's rural heritage' and 'protecting and fostering a strong sense of community and safety, as well as the "home town" feeling'. The community envisions a network of bicycle paths they can use to get around town without a car.

Land use patterns and urban design can impact climate change by the type of lifestyle the people who dwell there can enjoy. In areas of low density, such as suburban development, travel patterns are auto-oriented, meaning that it is most convenient to drive everywhere, and walking, biking, or transit may take longer to reach your destination. Auto-oriented development is comprised of wide streets, long stretches of sidewalks, dominant garages, and great distances between homes and jobs, schools, and retail. Vehicle miles traveled and vehicle trips are reduced when jobs, schools, and retail are closer to home. According to the U.S. Census Bureau, in 2008 approximately 21 percent of individuals employed within the City of Murrieta also lived in the City. In high density areas, residents can easily walk, bicycle, or ride public transit to the places they need to go and their lives depend less on the automobile.

The GHG inventory accounts for specific land-use related emissions, and considers the effects of land use comprehensively within the transportation sector. Where people live determines how far they will travel to work, shop, and other destinations. It also influences whether they will choose to walk, bike, use public transit, or drive. If residents live near bus stops, neighborhood-serving commercial centers, or their work places, they are more likely to use alternative lower-emission travel modes than to drive.

Balance of Land Uses to Reduce Vehicle Miles Traveled

Goal LU-1 **A complementary balance of land uses throughout the community that meets the needs of existing residents and businesses as well as anticipated growth, and achieves the community's vision.**

Measure Description: How far we travel to work, shop, and recreate depends on the urban/suburban environment. When all of the things we need are close to home and within the City, it reduces the distance to travel, therefore, reducing vehicle miles traveled. The community envisions an abundance of parks and facilities for recreational activities; cultural amenities; improved health care; and excellent school, police, fire, library, and recreation services. A built environment that caters to mobility through multiple modes of transportation such as walking and biking reduces dependency on cars. With services and recreational facilities within a 0.5 mile walk from home, residents are more able to leave their cars at home and their quality of life is enhanced.

Number	Measure
LU-1.6	Promote future patterns of development and land use that reduce infrastructure construction costs and make better use of existing and planned public facilities.
Action	**Target/Performance Criteria**
Amend the City's Development Code to include design standards that: • Space development areas a minimum of ¼ to ½ mile apart so that 2- and 4-lane roads can be used and the reliance on large arterials can be reduced. • Have internal connectivity such that there are at least 200 intersections per square mile. • Requires adequate pedestrian access through all commercial, residential, and mixed-used development. • Includes a pedestrian or bicycle through-connection in any new cul-de-sacs, except where prohibited by topographical conditions. • Establish a 0.5-mile walkability standard for residents to access services and recreational facilities.	Incorporate the design standards into the Development Code by 2013.
GHG Reduction Potential	18,674 $MTCO_2eq$

Improve Jobs/Housing Balance

Goal LU-4 A housing stock that meets the diverse needs of Murrieta's existing and future residents.

Measure Description: Currently the City of Murrieta has more housing than jobs which causes residents to commute to work outside of the City. The City would benefit greatly from attracting quality development that provides local employment opportunities. With more local employment opportunities, the City would be able to provide a greater variety of services to its residents, further reducing vehicle miles traveled and capturing sales tax revenues.

Number	Measure
LU-4.3	Locate multiple-family housing adjacent to jobs, retail, schools, open space, public transportation, and transportation corridors.
Action	**Target/Performance Criteria**
Ensure new development is located as close to existing development as possible and maximize the density and mix of uses.	Ongoing.
GHG Reduction Potential	Supporting Measure

Improve Jobs/Housing Balance

Goal LU-5 Promotion of quality industrial development that provides local employment opportunities.

Measure Description: The jobs/housing balance in Murrieta would be further balanced by ensuring that new multi-family housing developments are located near jobs, retail, schools, open space, and transportation. This increase in density would enable residents to enjoy alternative modes of transportation.

Number	Measure
LU-5.1	Support redevelopment and transition of obsolete industrial and manufacturing sites for commercial, flex-tech, and/or mixed-use development, reflective of current market demand.
LU-5.2	Promote quality design and development practices that reduce environmental impacts.
Action	**Target/Performance Criteria**
Create a redevelopment plan that identifies potential sites for redevelopment.	Complete redevelopment plan by 2014.
Update the City's Development Code to incorporate quality design and development practices.	Update Development Code by 2013.
GHG Reduction Potential	3,641 $MTCO_2eq$

Improve Jobs/Housing Balance

Goal LU-6 Land use policy that encourages job retention and attraction.

Measure Description: Being flexible in land use regulations would enable the City to adapt to emerging businesses and industry, especially with the changing economy. A city must adapt to changing economies to be able to keep a healthy workforce and remain sustainable.

Number	Measure
LU-6.1	Encourage flexibility in land use regulations to respond to requirements of new and emerging business and industry types.
Action	**Target/Performance Criteria**
Update the Development Code to allow for emerging business and industry types.	Update Development Code by 2013.
GHG Reduction Potential	52,288 $MTCO_2eq$

Transit Oriented Development

Goal LU-7 Economically viable, vital, and attractive commercial centers throughout the City that serve the needs of the community.

Measure Description: The era of disjointed strip malls with seas of parking are coming to a quick end as we realize the benefits of transit oriented development. Transit oriented development is building shopping, entertainment, work, or school near transit stops, which encourages people to walk, bike, or take the bus to these places. Transit oriented development discourages driving and reduces emissions.

Number	Measure
LU-7.4	Discourage the construction of marginal, disjointed strip center commercial development within the City.
LU-7.8	Encourage consolidation of parking and reciprocal access agreements between adjacent business and commercial center property owners.
Action	**Target/Performance Criteria**
Update the City's Development Code to include design standards to reflect the City's desire to create quality commercial development.	Update Development Code by 2013.
Evaluate the parking requirements and the height setback requirements for commercial uses.	Complete evaluation by 2014.
GHG Reduction Potential	Supporting Measure

Transit Oriented Development

Goal LU-8 A community that provides opportunities for mixed use and/or transit-oriented development.

Measure Description: Transit oriented development is a new urban form for Murrieta which will help the City transition into the future. These measures will enable Murrieta to make these transitions while maintaining the qualities of the City that the residents support.

Number	Measure
LU-8.1	Encourage integrated development that incorporates a mix of uses (residential, commercial, office) in mixed use or transit-oriented development areas.
LU-8.2	Encourage workplace development in close proximity to residences in mixed use or transit-oriented development areas.
LU-8.4	Design mixed uses or transit-oriented development projects to: • Create a pleasant walking environment to encourage pedestrian activity. • Create lively streetscapes, interesting urban spaces, and attractive landscaping. • Provide convenient shopping opportunities for residents close to their residence. • Integrate with surrounding uses to become a part of the neighborhood rather than an isolated project. • Use architectural elements or themes from the surrounding area, as appropriate. • Provide appropriate transition between land use designations to minimize neighbor compatibility conflicts.
LU-8.5	Encourage the creation of multi-modal transit opportunities with a healthy mix of businesses, childcare, senior services, and housing.
LU-8.6	Encourage higher density residential, commercial, and employment development near a future Metrolink or High Speed Rail Station, along other major public transportation routes, and at other suitable locations.
LU-8.7	Amend the Development Code to implement mixed use zoning districts that provide development standards for mixed use development, which should address minimum density and intensity requirements; allowable uses; horizontal and/or vertical mix of uses, building heights; and parking standards.
LU-8.8	Evaluate mixed use projects to ensure that there is an adequate mix of uses on the site and in the area.
Action	**Target/Performance Criteria**
Update the Development Code to include the above policies as design standards.	Update Development Code by 2013.
GHG Reduction Potential	784 $MTCO_2eq$

Pedestrian-Friendly Environment

Goal LU-9 Land use patterns and urban design that support healthy and sustainable lifestyles and businesses.

Measure Description: Pedestrian-friendly environments are those that support walking trips along human scaled urban design in contrast to auto-oriented urban design. This measure contributes emissions reductions when implemented in conjunction with the other measures within this strategy.

Number	Measure
LU-9.1	Encourage human-scale urban design on the neighborhood, block, and building scale.
LU-9.2	Encourage active and inviting pedestrian-friendly street environments that include a variety of uses within commercial, mixed use or transit-oriented development areas.

Number	Measure
LU-9.3	Encourage new neighborhoods to be built on a pedestrian-scale, within walking distance of parks, neighborhood-serving commercial areas, and other neighborhood amenities.
LU-9.4	Differentiate between areas zoned as neighborhood commercial and community commercial, encouraging unique, pedestrian-oriented, and neighborhood-serving uses in the neighborhood commercial zone.
LU-9.5	Promote commercial uses near residential neighborhoods that serve local residents and create neighborhood-gathering places.
LU-9.6	Provide pedestrian-oriented urban design through creative use of site development standards.
LU-9.7	Encourage development patterns to become more conducive to short, local, and walkable trips, which could increase opportunities for physical activity and decrease time spent driving.
LU-9.8	Consider infill locations for higher education facilities to capitalize upon existing or create synergies with surrounding uses.
Action	**Target/Performance Criteria**
Update the Development Code to reflect the City's desire to create sustainable development.	Update Development Code by 2013.
GHG Reduction Potential	2,334 $MTCO_2eq$

Pedestrian-Friendly Environment

Goal LU-10 A community that provides pedestrian-friendly environments for residential, commercial, business, and recreation uses.

Measure Description: Pursue economic vitality and longevity by attracting higher education and growing a base of clean industry, while maintaining the current housing affordability.

Number	Measure
LU-10.1	Prepare and use design guidelines to encourage high-quality, pedestrian-oriented design that enhances the public realm.
LU-10.2	Consider preparation and adoption of a Street Master Plan that addresses walkability and streetscape.
LU-10.3	Consider that the development of new residential block lengths are no more than 800 feet on any one side, and no longer than 600 feet on average per side, creating a street network that enables multiple routes for pedestrians, cyclists, and vehicles through a neighborhood.
LU-10.4	Discourage physical barriers, such as arterial streets, transit or utility rights-of-way, or very long blocks without through-streets, between and within neighborhoods and neighborhood centers. If physical barriers are unavoidable, provide safe and comfortable crossings for pedestrians and cyclists.
LU-10.5	Update the Development Code to create walkability, and interesting and varied pedestrian environments.
LU-10.6	Encourage new businesses to have a pedestrian-accessible main entrance that faces the street, as appropriate.
LU-10.7	Encourage well-designed covered or structured parking instead of surface parking lots.
LU-10.8	Encourage new surface off-street parking to be located behind or to the side of buildings, as appropriate.
LU-10.9	Encourage ground-floor structured parking to be buffered from the pedestrian environment through

Number	Measure
	strategies such as wrapping the structure with active retail uses, placing entrances off the street, and screening with landscaping or art.
Action	**Target/Performance Criteria**
Update the City's Development Code to include the above policies as design standards.	Update Development Code by 2013.
Prepare design guidelines for pedestrian-friendly environments.	Complete design guidelines by 2014.
Prepare a Street Master Plan.	Complete Street Master Plan by 2015.
GHG Reduction Potential	Supporting Measure

Sustainable Economy

Goal ED-3 A sound, stable, and diversified economic base.

Measure Description: A stable economic base can support the range of businesses needed to achieve a jobs/housing balance in the City. With more local employment opportunities, the City would be able to provide a greater variety of services to its residents, further reducing vehicle miles traveled and capturing sales tax revenues.

Number	Measure
ED-3.1	Support a diverse range of business activities including professional/technical, information, technology-focused manufacturing, research and development, including medical research institutions, educational services, medical/health services, and financial services.
ED-3.2	Promote Murrieta as a center for medical/health services and technology through active encouragement and recruitment of medical office, medical research, and health care facilities around the Loma Linda University Medical Center, South Murrieta Business Corridor, and confluence of the I-15/I-215 Freeways.
ED-3.3	Create incentives to attract new businesses and industries that provide employment opportunities that match the education and occupational skill levels of Murrieta residents.
ED-3.4	Develop an economic base that attracts jobs and exports products and services by capitalizing on the City's strategic location and relatively lower land prices between greater Los Angeles/Orange County metro and San Diego market regions.
Action	**Target/Performance Criteria**
Achieve a jobs to housing ratio as close to 1.0 as possible (the existing jobs to housing ratio is 0.59).	Jobs to housing ratio of at least 0.8 by 2020 and 1.0 by 2035.
GHG Reduction Potential	Supporting Measure

Sustainable Economy

Goal ED-4 Positive balance between the supply of retail opportunities and demand for goods and services.

Measure Description: A balanced between the supply of retail opportunities and demand for goods and services will reduce the need to travel outside of the City.

Number	Measure
ED-4.2	Encourage retail development, expansion, and remodeling projects that can effectively reverse or minimize outflows of local resident expenditures to retail facilities beyond the City limit.
Action	**Target/Performance Criteria**
Conduct a study to determine the appropriate ratio of retail services to other development.	Complete retail services study by 2015.
GHG Reduction Potential	Supporting Measure

Improve Jobs/Housing Balance

Goal ED-5 An improved jobs/housing balance.

Measure Description: The jobs/housing ratio in Murrieta would be further balanced by encouraging and properly locating flex-tech and higher intensity office within the City. This measure would increase the job opportunities within the City.

Number	Measure
ED-5.1	Encourage flex-tech buildings within business corridors and higher intensity office uses along freeway corridors with adequate visibility, convenient access, and future transit-oriented opportunities.
Action	**Target/Performance Criteria**
Achieve a jobs to housing ratio as close to 1.0 as possible (the existing jobs to housing ratio is 0.59).	Jobs to housing ratio of at least 0.8 by 2020 and 1.0 by 2035.
GHG Reduction Potential	Supporting Measure

Improve Jobs/Housing Balance

Goal ED-6 An educated and highly-skilled labor force.

Measure Description: An educated and highly-skilled labor force within the City will be able to take advantage of the City's planned employment opportunities. This measure supports a jobs/housing balance within the City.

Number	Measure
ED-6.1	Encourage and support the development of institutions of higher education to serve educational pursuits of area residents and provide a highly skilled employment pool attractive to business investment and economic growth.
ED-6.2	Support the development of technical colleges and training institutions that build job skills commensurate with the growth of the economic base, particularly in the emerging health care services industry and the need for doctors, nurses, and other trained personnel.
Action	**Target/Performance Criteria**
Achieve a jobs to housing ratio as close to 1.0 as possible (the existing jobs to housing ratio is 0.59).	Jobs to housing ratio of at least 0.8 by 2020 and 1.0 by 2035.
GHG Reduction Potential	Supporting Measure

Improve Jobs/Housing Balance

Goal ED-8 Strategic approach to economic growth.

Measure Description: Office and research and development uses within the City help maintain quality employment opportunities. With more local employment opportunities, the City would be able to provide a greater variety of services to its residents, further reducing vehicle miles traveled.

Number	Measure
ED-8.1	Encourage and market to employers that provide employment opportunities commensurate with the education and skills of Murrieta residents.
Action	**Target/Performance Criteria**
Achieve a jobs to housing ratio as close to 1.0 as possible (the existing jobs to housing ratio is 0.59).	Jobs to housing ratio of at least 0.8 by 2020 and 1.0 by 2035.
GHG Reduction Potential	Supporting Measure

Sustainable Economy

Goal ED-10 A revitalized and economically stable Historic Downtown Murrieta.

Measure Description: Higher-density and mixed-use development within Historic Downtown Murrieta would allow this area of the City to grow as a viable and self sustaining district.

Number	Measure
ED-10.6	Consider opportunities for the development of higher-density and mixed-use residential uses to support commercial development within the Historic Downtown.

Action	Target/Performance Criteria
Develop an incentives program for higher-density and mixed-use development in the Historic Downtown.	Develop incentives program by 2014.
GHG Reduction Potential	Supporting Measure

Green Economy

Goal AQ-6 Stationary source pollution (point source and area source) are minimized through existing and future regulations and new technology.

Measure Description: The inclusion of non-polluting industry and clean green technology would contribute to the diverse economic base envisioned for the City. The inclusion of employment opportunities would also reduce commuting.

Number	Measure
AQ-6.3	Encourage non-polluting industry and clean green technology companies to locate to the City.
Action	**Target/Performance Criteria**
Develop an incentives program to locate clean green technology companies within the City.	Develop incentives Program by 2014.
GHG Reduction Potential	Supporting Measure

3. TRANSPORTATION AND MOBILITY STRATEGY

Reducing the number and length of vehicle trips and engine idling reduces those emissions. Efficient transportation systems also conserve fuel and reduce travel costs and expensive road repairs. Generally, there are three methods to reduce GHG emissions from the transportation sector. One method is to implement policies that reduce dependence on personal motor vehicles and encourage alternative modes of transportation, such as public transit, cycling, and walking. Another method is to utilize vehicles that release fewer GHGs, such as hybrids, more fuel efficient vehicles, and vehicles that run on alternative fuels. A final method is to encourage 'smart growth' or policies that promote efficient land use development. Smart growth reduces the need to travel long distances, facilitates transit and other non-automotive travel, increases the availability of affordable housing, employs existing infrastructure capacity, promotes social equity, helps protect natural assets, and maintains and reinforces existing communities.

Increase Trail Connectivity

Goal LU-22 Natural and visual resources are valued resources to maintain the rural character of the Los Alamos Hills.

Measure Description: A City-wide pedestrian master plan will establish connectivity throughout the City. Various improvements identified within the master plan supports biking and walking along trails that connect to end-uses. This measure supports the other measures within this strategy.

Number	Measure
LU-22.6	Encourage the development of an trail system within the Multiple Species Habitat Conservation Plan (MSHCP) and other open space areas that connects to a trails system within or adjacent to the existing and future street systems, including linkage through areas east of Warm Springs Creek (such as but not limited to a transitional buffer area) to the open space corridor along Adobe Creek. Trails adjacent to streets should allow for multiple users and provide buffers between vehicles and trail users.

Action	Target/Performance Criteria
Develop a City-wide pedestrian master plan that improves the convenience, safety, and attractiveness of and access to pedestrian ways. Update the plan on a regular basis to ensure that walkability improves over time.	Complete Pedestrian Master Plan by 2015.
GHG Reduction Potential	Supporting Measure

Reduce Driving

Goal LU-24 Historic Murrieta as the City's cultural, civic and community center.

Measure Description: Traditional town development patterns include short distances between destinations, reduce distances of vehicle trips, and encourage walking. This measure supports the other measures within this strategy.

Number	Measure
LU-24.2	Continue the expansion of a traditional town development pattern with a grid street design and urban land use intensities to support a pedestrian-oriented environment.
LU-24.6	Encourage mixed-use development projects within the Historic Downtown that create a pedestrian style living environment and encourage use of mass transit.
Action	**Target/Performance Criteria**
Update the Development Code to include provisions for traditional development patterns.	Update Development Code by 2013.
GHG Reduction Potential	Supporting Measure

Support High Speed Rail

Goal LU-25 Collaboration with Federal, State, County, and other regional agencies and authorities to ensure compliance with existing and future legislation that affects the City of Murrieta.

Measure Description: According to the California High Speed Rail Authority, a High Speed Rail (HSR) station is planned to be located at the I-15/I-215 interchange. Approximately 8,000 boardings per day are planned at this station.[2] The HSR would reduce the number of region- and state-wide trips that begin and end in the City.

Number	Measure
LU-25.2	Establish a strong role in the implementation of Proposition 1A with the California High Speed Rail Authority (CHSRA).

[2] California High Speed Rail Authority, *Interactive Map*, http://www.cahighspeedrail.ca.gov/trip_planner.aspx, Accessed January 17, 2011.

Action	Target/Performance Criteria
Work with the Riverside Transit Agency (RTA) to expand transit routes to connect with the potential high speed rail site and other destinations within the City.	By 2020 determine necessary transit route expansion/ modifications prior to the completion of the high speed rail station.
GHG Reduction Potential	Supporting Measure

Support Multi-Modal Transportation

Goal CIR-1 A circulation system that serves the internal circulation needs of the City, while also addressing the inter-community or through travel needs.

Measure Description: A well-designed and connected transportation system reduces traffic delays and allows traffic to flow efficiently throughout the City.

Number	Measure
CIR-1.1	Ensure the transportation system can adequately serve the concentrations of population and employment activities identified by the Land Use Element.
CIR-1.9	Provide a coordinated traffic control system that moves traffic within and through the City in an efficient and orderly manner. Upgrade systems as technology evolves.
CIR-1.11	Support the implementation of complete streets through a multi-modal transportation network that balances the needs of pedestrians, bicyclists, transit riders, mobility-challenged persons, older people, children, and vehicles while providing sufficient mobility and abundant access options for existing and future users of the street system.

Action	Target/Performance Criteria
Conduct a transportation study to determine system adequacy.	Complete study by 2015.
Implement Intelligent Transportation System (ITS) elements to coordinate traffic signals along major transportation corridors.	Complete improvements by 2018.
Construct pedestrian, bicycle, and transit improvements on major thoroughfares.	Complete improvements by 2018.
GHG Reduction Potential	7,470 $MTCO_2eq$

Promote Pedestrian Safety

Goal CIR-2 A comprehensive circulation system that promotes safety.

Measure Description: A safe and efficient circulation network reduces travel time and distance and encourages bicycle/pedestrian travel. Roadway network improvements reduce traffic, and provide a citywide system of bicycle lanes and recreational trails that improve accessibility without a car.

Number	Measure
CIR-2.3	Provide a circulation network that accommodates the safe and efficient movement of all forms of non-motorized travel.
CIR-2.5	Include paved shoulders on all roads in non-urban areas that can be used by cyclists and pedestrians.
CIR-2.6	Explore the use of traffic calming measures on streets with high incidences of speeding and/or history of collisions.
CIR-2.7	Publish and promote safe pedestrian and bike routes through creating an accurate citywide map and posting pedestrian/cyclist-scale wayfinding signage.
CIR-2.12	Consider the development and implementation of Pedestrian Safety Guidelines that also include streetscape standards that emphasize pedestrian and cyclist safety (lighting, trees, greenery, traffic calming measures, etc.).

Action	Target/Performance Criteria
Install circulation and traffic calming improvements.	Install improvements for 10 percent of the circulation system by 2020. Install improvements for 25 percent of the circulation system by 2035.
GHG Reduction Potential	14,939 $MTCO_2eq$

Improve Public Transportation

Goal CIR-5 A supported regional transportation system that serves existing and future travel between Murrieta and other population and employment centers within southwest Riverside County and the larger region, and that accommodates the regional travel needs of developing areas outside the City.

Measure Description: Development of a Metrolink station within the City would reduce vehicle trips that originate or end within the City.

Number	Measure
CIR-5.9	Coordinate with Western Riverside Council of Governments, Riverside County, and Riverside County Transportation Commission to identify, protect, and pursue opportunities for public transit along major transportation corridors, and future high speed rail service, which connect Murrieta to other population centers.
CIR-5.10	Support the siting and development of a Metrolink Station(s) within Murrieta along the I-15 and/or I-215 corridors.
CIR-5.11	Coordinate with California High Speed Rail Authority, Riverside Transit Authority, and City of Temecula on the siting and development of a California High Speed Rail Intermodal Transit Center.
Number	**Measure**
CIR-5.14	Encourage new large residential, commercial, or employment developments to locate on existing and planned transit routes.

Action	Target/Performance Criteria
Work with the Riverside Transit Authority to expand transit routes to connect with the potential high speed rail site and other destinations within the City.	By 2020 determine necessary transit route expansion/ modifications prior to the completion of the high speed rail station.
GHG Reduction Potential	1,867 $MTCO_2eq$

Reduce Driving

Goal CIR-6 Alternative travel modes and facilities are available to serve residents and employers/employees and reduce vehicle miles traveled.

Measure Description: Travel mode alternatives to the single-occupant automobile reduce vehicle trips, miles traveled, and congestion on the transit network.

Number	Measure
CIR-6.1	Encourage alternatives to single-occupancy vehicle transportation such as public transit, paratransit, walking, cycling, and ridesharing.
CIR-6.2	Support a variety of transit vehicle types and technologies to serve different transportation needs.
CIR-6.3	Work with the Riverside Transit Agency, Murrieta Chamber of Commerce, and/or the City's Economic Development Department to conduct a travel/commute survey with the intent of creating vanpools, carpools, and employment center shuttles to reduce single occupant vehicles.
CIR-6.4	Seek opportunities for funding that goes to support alternative forms of transportation.
CIR-6.5	Support the dedication and/or construction of appropriate facilities in support of a public transportation system.
CIR-6.6	Identify opportunities to implement the Western Riverside County Non-Motorized Transportation Plan within key activity centers of the City through the development of non-motorized transportation corridors and facilities (i.e., neighborhood electric vehicle routes, bikeways, pedestrian paths, sidewalks/paths).

Action	Target/Performance Criteria
Conduct a travel/commute survey to reduce single occupant vehicles.	Complete survey by 2015.
Upgrade transit access and expand transit network.	Increase transit network coverage by 25 percent by 2020.
GHG Reduction Potential	37,345 $MTCO_2eq$

Increase Walking

Goal CIR-7 Residential areas and activity centers are accessible to all pedestrians, including persons with disabilities or having special accessibility needs.

Measure Description: Internal pedestrian linkages and pedestrian friendly design reduces the need for vehicle trips.

Number	Measure
CIR-7.1	Encourage future developments to provide an internal system of sidewalks/pathways linking schools, shopping centers, and other public facilities with residences.
CIR-7.2	Require pedestrian access from the interior of new residential areas to public transit stops.
CIR-7.3	Encourage safe pedestrian walkways and ensure compliance with the Americans with Disabilities Act (ADA) requirements within all developments.
CIR-7.4	Consider the development and implementation of Pedestrian Friendly Street Standards.
CIR-7.5	Provide pedestrian amenities such as benches, trees, landscaping, and shade trees to encourage people to walk to destinations.
CIR-7.6	Promote improved demand responsive transit services for elderly and disabled persons.
CIR-7.7	Ensure visibility and access for pedestrians and encourage the removal of barriers (walls, fences) to allow for safe and convenient movement.
CIR-7.8	Work with Riverside County Transportation Commission, local retirement homes, the Senior Center, and other community groups to expand affordable and reliable transportation options for older adults and disabled persons.
Action	**Target/Performance Criteria**
Incorporate pedestrian friendly street standards into the Development Code.	Update Development Code by 2013.
GHG Reduction Potential	934 $MTCO_2eq$

Increase Trail Connectivity

Goal CIR-8 Development, expansion, and maintenance of a network of bicycle, pedestrian, and multi-use trails that allows residents to travel between parks, schools, neighborhoods, and other major destinations without driving.

Measure Description: Interconnected trails improve connectivity within the City, accommodate biking and walking, and provide alternatives to single-occupancy automobile travel. Connectivity between major destinations can reduce vehicle trips.

Number	Measure
CIR-8.1	Create, update, and implement a master plan for non-motorized travel throughout the City, including multi-use trails, off-street paved bikeways, on-street bikeways, and related amenities.
CIR-8.2	Promote bicycle and pedestrian trails along major home to work and other travel routes.
CIR-8.10	Work with adjacent property owners to create an interconnected trail that extends along the public right-of-way, which will benefit business by increasing exposure and access, and benefit the community through encouraging fitness, improved access, and a connected community.
CIR-8.11	Coordinate the location of multi-use trails to connect with regional trail systems where feasible.
CIR-8.12	Pursue funding or grant opportunities to plan, construct, and maintain pedestrian, bicycle, and multi-use trails.

Number	Measure	
CIR-8.13	Maintain a map or maps of current bikeways and multi-use trails, and make the map(s) available to the public.	
Action		**Target/Performance Criteria**
Develop a pedestrian and bicycle trail plan.		Develop plan by 2015.
GHG Reduction Potential		6,536 $MTCO_2eq$

Goal AQ-4 Mobile source emissions are reduced by providing a balance of jobs and housing that serve the needs of the community.

Measure Description: A balance of jobs and housing allows residents to live and work within the City. Local employment opportunities that mach the needs of the residents reduces commuting time, vehicle trips, and vehicle miles traveled.

Number	Measure	
AQ-4.1	Cooperate with local, regional, State, and Federal agencies to reduce vehicle miles traveled (VMT) and consequent emissions through job creation.	
AQ-4.2	Improve jobs/housing balance by encouraging the development, expansion, and retention of business.	
AQ-4.3	Improve access of businesses to institutions that provide education and job training to prepare local residents to fill the jobs local industries create.	
AQ-4.4	Encourage a mix of housing types that are affordable to all segments of the population and are near job opportunities to further reduce vehicle trips.	
Action		**Target/Performance Criteria**
Amend the Municipal Code to include a TDM ordinance to reduce VMT.		Amend the Municipal Code by 2013.
Achieve a jobs to housing ratio as close to 1.0 as possible (the existing jobs to housing ratio is 0.59).		Jobs to housing ratio of at least 0.8 by 2020 and 1.0 by 2035.
GHG Reduction Potential		18,674 $MTCO_2eq$

Improve Air Quality by Reducing Driving

Goal AQ-5 Air quality is improved through an efficient circulation system, reduced traffic congestion, and reduced vehicle miles traveled.

Measure Description: The implementation of Transportation Demand Management (TDM) measures reduces vehicle trips and vehicle miles traveled throughout the City. TDM measures improve the efficiency of transportation resources and also focus on providing alternatives to vehicle trips.

Number	Measure
AQ-5.1	Encourage employers to implement transportation demand management (TDM) measures, such as the following programs to reduce trips and vehicle miles traveled: • Transient subsidies • Bicycle facilities • Alternative work schedules • Ridesharing • Telecommuting and work-at-home programs • Employee education • Preferential parking for carpools/vanpools
AQ-5.3	Promote use of fuel-efficient and low-emissions vehicles, including Neighborhood Electric Vehicles.
AQ-5.4	Encourage the use of lowest emission technology buses in public transit fleets.
AQ-5.6	Manage the municipal vehicle fleet to achieve the highest possible number of fuel-efficient and low emissions vehicles commercially available. staff to check with public works
AQ-5.7	Reduce industrial truck idling by enforcing California's five (5) minute maximum law, requiring warehouse and distribution facilities to provide adequate on site truck parking, and requiring refrigerated warehouses to provide generators for refrigerated trucks.

Action	Target/Performance Criteria
Amend the Municipal Code to include a TDM ordinance.	Amend the Municipal Code by 2013.
Implement Neighborhood Electric Vehicle networks in new developments.	Include Neighborhood Electric Vehicle networks in 5 percent of new developments.
GHG Reduction Potential	47 $MTCO_2eq$

4. ENERGY USE AND CONSERVATION STRATEGY

Energy Efficiency

Energy generation is the second largest source of GHG emissions. Thus, strategies to conserve energy and use it more efficiently in Murrieta's operations and the community help reduce GHG emissions. In addition, energy efficiency and conservation measures save money and resources. City buildings, equipment, and infrastructure all use energy. Typically, newer purchases and installations tend to be more energy efficient, but opportunities to enhance efficiency still exist. Buildings can be made more efficient by upgrading insulation and installing low emissive glass, using high-efficiency lighting with timers and sensors, installing cool roofs, and simply adjusting heating and cooling levels. Additionally, movement, storage, and treatment of water and wastewater use significant amounts of energy. Murrieta can reduce municipal water use by installing low-flow fixtures and by inspecting, repairing, and replacing leaking components. Landscaping irrigation measures such as water reclamation systems and xeriscaping can also reduce water usage.

Increasing energy efficiency throughout the community has immense potential to both reduce GHG emissions and save money. A wealth of resources exists to assist municipalities in this regard. For example, the Energy Star program offers energy efficient products and tools for improving energy management. Promoting Energy Star resources to both businesses and residents is a good way to achieve increased energy efficiency. Other methods to increase community energy efficiency include subsidizing energy management services such as energy audits for residents and businesses. Ensuring that developers and building contractors are trained on energy conservation and efficiency is also within the City's purview.

A commitment to highly efficient construction in municipal facilities is one way the City can reduce GHG emissions from the built environment. Building or retrofitting facilities to Leadership in Energy and Environmental Design (LEED) certification standards and siting new facilities to improve access would improve efficiency. In addition, the City could adopt the 2010 California Green Building Standards Code (CALGreen Building Standards) voluntary measures for residential and non-residential buildings as mandatory.

Alternative Energy

Sources of renewable energy include solar, wind, biomass and geothermal. Hydrogen fuel cells and tidal current power are renewable energy sources that hold promise but require further research and innovation before they are as practical and possible to implement as other options.

Renewable energy sources offer the potential for a clean, decentralized energy source that can significantly impact the municipality's GHG emissions. Murrieta will work to build on current efforts to integrate alternative energy into the community's power scheme. Alternative energy sources can be developed, such as installation of solar arrays, or landfill gas to energy projects. Energy generated from renewable sources produces less GHG emissions than energy generated from conventional sources; low carbon fuels are those that are formulated to produce fewer GHG emissions.

Renewable Energy and Efficiency

Goal CSV-12 Energy conservation and the generation of energy from renewable sources is prioritized as part of an overall strategy to reduce greenhouse gas emissions.

Measure Description: Energy conservation is the simplest method to reduce GHG emissions from energy usage. Conservation entails modification of behaviors as well as energy retrofits. Energy efficiency improvements to residential and commercial structures can reduce energy bills and GHG emissions. Obtaining energy from renewable resources can complement energy conservation and can further increase sustainability. The City will ensure that all developments comply with energy efficiency requirements and encourage the installation of renewable energy generation systems. Community awareness of opportunities to conserve energy and use renewable energy will be promoted by the City.

Number	Measure
CSV-12.1	Ensure that all developments comply with energy efficiency requirements as mandated by the applicable Building Code.
CSV-12.2	Work with energy utilities to encourage and incentivize the retrofitting of building systems with energy-conserving fixtures and appliances.
CSV-12.3	Support the on-site installation and use of renewable energy generation systems for residential, commercial, institutional, and industrial uses.
CSV-12.4	Explore options for addressing aesthetic concerns about renewable energy systems that do not unreasonably restrict the use of these systems, remaining consistent with State law.
CSV-12.5	Consider non-commercial solar power generation in residential areas.
CSV-12.6	Encourage new development projects and significant rehabilitation or expansion projects to incorporate innovative energy conservation or generation amenities such as electric vehicle charging stations, solar canopies, and carports.

Number	Measure
CSV-12.7	Support bulk purchasing or financing packages of renewable energy purchasing for residential, business and government facilities.
CSV-12.8	Promote community awareness of opportunities to conserve energy and use renewable energy.

Action	Target/Performance Criteria
Update the City's website to include links to information for energy efficiency rebates, incentives, and case studies.	Update website by 2013.
Work with Southern California Edison and community organizations to develop energy efficiency outreach programs for homes and businesses. The outreach programs should target such programs as smart grid integration, and incentives for voluntary inefficient appliance replacement.	Develop outreach programs by 2014.
Develop a group of required improvements that achieves a 15 percent improvement in efficiency. Such improvements can include: • Point-of-sale energy efficiency upgrades. • Use of cool roofs or any roof used to shade or cover parking have a Solar Reflectance Index (SRI) of at least 29. • Require outdoor lighting fixtures to be energy efficient. • Encourage participation in the California Energy Commission's New Solar Homes Partnership. • Encourage that new projects or rehabilitations of commercial, office, or industrial development incorporate solar or other renewable energy generation to provide 15 percent or more of the project's energy needs.	Develop required improvements by 2015.
Encourage the development of alternative energy projects.	Ongoing.
GHG Reduction Potential	54,588 $MTCO_2eq$

Green Building

Goal CSV-14 A community that encourages and incentivizes the sustainable development of buildings and neighborhoods, particularly with respect to durability, energy and water use, and transportation impacts.

Measure Description: Sustainable developments reduce the amount of energy and water required to operate and reduce transportation impacts, reduce GHG emissions. This measure

will ensure that Green Building is a priority in Murrieta's future. Citywide adoption of the California Green Building Standards is the simplest and most comprehensive way to reduce building energy demand. As a large proportion of the projected GHG emissions within the City are from building energy usage, this sector provides a great opportunity for emissions reductions.

Number	Measure
CSV-14.1	Ensure all applicable construction projects comply with the California State Green Building Standards Code.
CSV-14.2	Encourage the integration of other principles of green building into development standards and guidelines, looking for opportunities to realize other benefits such as improved health and increased bicycle transportation.
CSV-14.3	Identify and reduce regulatory barriers to green building.
CSV-14.4	Raise community awareness regarding green building methods, incentives, and benefits at community events, the planning counter, and on the City's website.
Action	**Target/Performance Criteria**
Amend the City's Development Code to include California Green Building Standards.	Amend the Development Code by 2013.
GHG Reduction Potential	120,120 $MTCO_2eq$

Energy Efficient Design

Housing Element

Goal 2: Conserve and enhance the quality of existing housing and residential neighborhoods in Murrieta.

Measure Description: This is a supporting measure that encourages energy conservation and highlights opportunities available in various government programs. Energy efficiency retrofitting of existing housing will require public outreach by the City to residents.

Number	Measure
Housing Element Policy 2.3:	Encourage energy efficient design in existing and new residential units and promote sustainability upgrades in existing and proposed residential complexes.
Housing Element Action 2.5– Energy Efficient Design	The City will review ordinances and recommend changes where necessary to encourage energy efficient housing design and practices that are consistent with state regulations. The City will periodically distribute literature or post information on their website regarding energy conservation, including solar power, energy efficient insulation, and subsidies available from utility companies, and encourage homeowners and landlords to incorporate these features into construction and remodeling projects. When possible the City will encourage energy conservation devices including, but not limited to lighting, water heater treatments, and solar energy systems for all residential projects. The Planning and Housing divisions will encourage maximum utilization of Federal, State, and local government programs, such as the

Number	Measure
	County of Riverside Home Weatherization Program, that assist homeowners in providing energy conservation measures. Additionally as part of the economic stimulus package offered by the federal government, the City of Murrieta is eligible for $881,500 in Energy Efficiency Community Development Block Grants (EECDBG). The City intends to apply for this funding in order to focus on sustainability, energy efficiency and greenhouse gas emission analysis in the General Plan update. • Responsible Agency: Murrieta Planning and Redevelopment and Housing Divisions • Timeframe: Ongoing, 2008-2014 • Potential Funding Source: EECDBG funds • Objective: Apply for $881,500 in funding to focus on energy efficiency and sustainability in the General Plan update.

Action	Target/Performance Criteria
Adopt an Energy Conservation Ordinance to ensure that new residential and commercial buildings are energy efficient.	Adopt Energy Conservation Ordinance by 2014.
GHG Reduction Potential	Supporting Measure

5. WATER USE AND EFFICIENCY STRATEGY

Water related emissions are mostly caused by energy used to pump, transport, heat, cool, and treat water and wastewater. In a dry climate, water demand and resulting emissions are magnified due to a relative shortage of naturally occurring water sources. Therefore, water conservation strategies have a double benefit of reducing energy demand and managing a limited resource. Approximately 58 percent of Murrieta's municipal emissions (6 percent of the total emissions) are related to water treatment and delivery.

The City will work with the local water purveyors (Western Municipal Water District, Eastern Municipal Water District, Rancho California Water District, and the Elsinore Valley Municipal Water District) to identify community actions that can reduce potable water demand, minimize wastewater generation, explore viable alternative sources of water, manage stormwater runoff, and help to maintain a healthy balance in the local aquatic ecosystem.

Increase Use of Recycled Water

Goal INF-2 Infrastructure for recycled water is expanded throughout Murrieta for irrigation and other non-potable uses.

Measure Description: The water purveyors for the City of Murrieta already utilize recycled water for irrigation and other purposes. This measure increases the use of recycled water by expanding the infrastructure necessary for treatment and distribution. Implementation of this measure would effectively reduce the demand for potable water.

Number	Measure
INF-2.1	Support water district efforts to promote the use of recycled water where infrastructure is available, and to expand infrastructure where it does not currently exist.
INF-2.2	Work with the water districts to explore options for expanding recycled water pipelines to serve City parks and facilities that are near existing infrastructure, such as California Oaks Sports Park and Town Square.
INF-2.3	Continue to require installation of recycled water systems for landscaping, unless there is an exemption from the applicable water district.
INF-2.4	Encourage other major users of irrigation, such as schools and private golf courses, to connect to nearby recycled water pipelines.
INF-2.5	Coordinate with water districts to encourage innovative demonstrations of non-potable uses for recycled water and/or groundwater recharge in City facilities and industrial applications.

Action	Target/Performance Criteria
Work with the water districts that serve the City to expand recycled water infrastructure throughout the City.	Expand infrastructure to supply at least 25 percent of the City's demands by 2020 (outdoor water use only).
GHG Reduction Potential	4,019 $MTCO_2eq$

Increase Water Conservation

Goal CSV-1 A community that conserves, protects, and manages water resources to meet long-term community needs, including surface waters, groundwater, imported water supplies, storm water, and waste water.

Measure Description: This measure focuses on the efficient use of water to reduce demand. Improvement of water use efficiency in Murrieta can reduce energy usage associated with water pumping, treatment, and distribution. Implementation of the California Green Building Standards Code results in substantial water savings.

Number	Measure
CSV-1.2	Promote the maximization of water supplies through conservation, water recycling, and groundwater recharge.
CSV-1.4	Support water purveyors in promoting a City-wide recycled water system through project review and coordination with water districts.

Action	Target/Performance Criteria
Adopt a water conservation strategy for new development that would reduce water consumption consistent with the voluntary standards in the California Green Building Standards Code.	Adopt water conservation strategy by 2014.
GHG Reduction Potential	10,097 $MTCO_2eq$

Reduce Water for Landscaping

Goal CSV-2 Murrieta promotes compliance with requirements from the State and appropriate agencies regarding comprehensive water conservation measures in buildings and landscaping.

Measure Description: Landscape irrigation water requires large amounts of energy to pump, treat, and distribute. Reducing landscape water consumption contributes to the GHG emissions reductions in the associated measures.

Number	Measure
CSV-2.1	Ensure that all developments comply with water efficiency requirements, as mandated by the applicable Building Code.
CSV-2.2	Work with water districts to encourage and incentivize the retrofitting of building systems, both indoor and outdoor, with water-conserving fixtures and appliances.
CSV-2.4	Promote water efficient landscaping practices through outreach efforts, project review, and enforcement of City, regional, or State code requirements.

Action	Target/Performance Criteria
Adopt a landscape water ordinance for new development that includes the water conservation practices of the California Green Building Standards Code.	Adopt landscape water ordinance by 2014.
GHG Reduction Potential	Supporting Measure

6. WASTE REDUCTION AND RECYCLING STRATEGY

The largest source of human-generated methane comes from improperly managed landfills. Organic waste that is trapped within a landfill without oxygen decomposes and creates methane gas, a GHG that is 23 times more potent than carbon dioxide. In addition, there are GHG emissions associated with foam products and refrigerants. Thus, waste reduction and recycling activities reduce the potential to generate methane at landfills, as well as reducing pollutants generated from transporting waste to disposal sites. Waste reduction and recycling activities also conserve natural resources. Emissions from this portion of the waste stream can be reduced through methane recovery, recovery of potent GHGs from foam and refrigerant systems, and other adjustments to collection systems.

The City of Murrieta currently disposes of 58.7 thousand tons of solid waste per year at 11 landfill sites within the region, and as far as Bakersfield and Simi Valley. Reducing the amount of waste sent to landfills would reduce transportation costs, landfill tipping fees, and methane gas production. The success of these measures is dependent on inducing change in the waste management practices of each citizen in the community.

Reduce Waste through Education

Goal INF-1 New development and redevelopment is coordinated with the provision of adequate infrastructure for water, sewer, storm water, and energy.

Measure Description: The City has the opportunity to reduce waste at the source by educating residents and businesses. Implemented best management practices for waste reduction can save the City money and reduce GHG emissions.

Number	Measure
INF-1.15	Continue to implement the City's residential informational and outreach program by providing homeowners with Best Management Practices (BMP) for activities such as, but not limited to: • Disposal of fats, oils, and grease • Disposal of garden waste • Disposal of household hazardous waste • Disposal of pet waste

Number	Measure
	• Garden care and maintenance • Vehicular repair and maintenance • Vehicular washing
Action	**Target/Performance Criteria**
Continue to implement solid waste informational and outreach programs.	Ongoing.
Continue to implement recycling programs in Municipal and Community Sectors.	Ongoing.
GHG Reduction Potential	Supporting Measure

Increase Waste Diversion

Goal CSV-13 Solid waste is diverted from landfills through waste reduction, re-use and recycling.

Measure Description: Educational programs and waste audits can be conducted in order to ensure that waste reduction and diversion targets are met. Food waste makes up approximately 20 percent of the waste stream. Compost made from food scraps can be sold to farms and vineyards for rebuilding soils and fertilizers. These measures would enable the City to continue on their waste reduction spree.

Number	Measure
CSV-13.1	Continue to comply with the landfill diversion requirements of the Integrated Waste Management Program.
CSV-13.2	Ensure that non-residential and multi-family developments provide readily accessible areas for recycling (at a minimum) paper, corrugated cardboard, glass, plastics and metals, as required by California law.
CSV-13.3	Maximize community reuse and recycling of products and materials through waste management contracts and public education.
CSV-13.4	Incentivize businesses that provide solutions for recycling and re-use of specific waste streams such as food waste and cooking oils.
CSV-13.5	Work with local landfills or green waste centers to develop the infrastructure for a composting program.
CSV-13.6	Provide public outreach and education workshops and information on new composting program.
CSV-13.7	Work with local landfills or green waste centers, or other interested parties, as appropriate, to implement a community wide food scrap collection and composting program.
Action	**Target/Performance Criteria**
Increase participation in the recycling services offered to residential and commercial customers.	Increase the City's waste stream diversion rate to 60 percent by 2020 and 75 percent by 2035.
GHG Reduction Potential	7,009 $MTCO_2eq$

7. OPEN SPACE STRATEGY

Open spaces in Murrieta consist of a variety of places throughout the City from the wild rolling hills to neighborhood parks, landscaped medians to natural waterway landscapes. Open spaces within the City can help improve stormwater quality, create a cooler microclimate, reduce building energy use, and improve public health. The policies within this strategy describe actions to increase and utilize open spaces within the City.

Increase Suburban Open Space

Goal CSV-9 **A community that promotes the growth of an urban forest and water-efficient landscaping, recognizing that plants provide natural services such as habitat, storm water management, soil retention, air filtration, and cooling, and also have aesthetic and economic value.**

Measure Description: Urban tree planting can promote shade, passively cool structures, and reduce the urban heat island effect. Additionally, over time, urban trees have the ability to sequester carbon and further reduce GHG emissions.

Number	Measure
CSV-9.1	Identify and protect native trees, trees of historic or cultural significance, and mature trees, consistent with the Tree Preservation Ordinance.
CSV-9.2	Consider the establishment of street tree standards and a program for street tree planting, maintenance, and replacement.
CSV-9.3	Promote the use of street trees as a buffer between pedestrians and motorized traffic.
CSV-9.4	Encourage the planting of street trees in linear planting beds rather than tree wells in order to support long-living healthy trees.
CSV-9.5	Encourage the planting of street trees in private yards and properties.
CSV-9.6	Maintain a guide to preferred trees, shrubs, and ground cover plants of non-invasive species, or refer private parties to an existing guide that meets City needs to assist private landscaping efforts.

Number	Measure
CSV-9.8	Encourage any new landscaped areas requiring permits to respect and incorporate the distinctive elements of the existing community landscape, including the retention of existing trees, to the maximum extent feasible.
CSV-9.9	Promote the use of native plant species in public landscaping of parks, schools, medians and planter strips, as well as in private development throughout the City.
Action	**Target/Performance Criteria**
Develop a landscape program based on the above policies.	Increase tree planting in the City 10 percent by 2020 and 20 percent by 2035.
GHG Reduction Potential	1,590 $MTCO_2eq$

Improve Local Food Security

Goal CSV-10 Fresh food is grown locally and made available through multiple venues that maintain a link to the City's agricultural heritage and promote healthy eating.

Measure Description: Local agriculture promotes the availability of fresh produce and reduces the demand for these goods to be transported into the City.

Number	Measure
CSV-10.1	Allow agricultural uses to continue in rural residential areas.
CSV-10.2	Consider ways to allow small-scale urban agriculture in parks, schools, and neighborhoods.
CSV-10.3	Ensure that residents are permitted to grow fruits and vegetables in their yards, so long as there are not significant negative impacts to adjacent property owners.
CSV-10.4	Encourage and support the use of public lands for community gardens and other food production facilities, when feasible.
CSV-10.5	Support opportunities for local food production and access, such as farmers' markets, community gardens, harvest sharing programs, and community-supported agriculture programs.
CSV-10.6	Encourage local farmers to sell fresh food locally.
CSV-10.7	Allow public facilities such as schools, libraries, and community centers to be used as Community Supported Agriculture pick-up sites.
Action	**Target/Performance Criteria**
N/A	N/A
GHG Reduction Potential	Supporting Measure

Preserve Open Space

Goal ROS-7 Open space areas are planned to protect, conserve, and utilize resources of unique character and value for the community.

Measure Description: Planned open space can expand the utilization of these areas for habitat, storm water management, soil retention, air filtration, and cooling, aesthetic and economic value, local food security, increased and improved parks, and preservation.

Number	Measure
ROS-7.1	Preserve and enhance open space resources in Murrieta.
ROS-7.2	Designate open space to preserve habitat and scenic views of natural areas.
ROS-7.3	Seek opportunities to designate open space along waterways, while also providing for the development of trails.
ROS-7.4	When possible, link open space and parks for the movement of wildlife and people.
Action	**Target/Performance Criteria**
Preserve the Open Space land use designations as outlined in the Open Space Element of the General Plan.	Ongoing.
GHG Reduction Potential	Supporting Measure

Integrate New Development and Open Space

Goal ROS-8 New development is part of a coordinated system of open space, parkland, recreation facilities, and trails.

Measure Description: Open spaces are also recreational destinations that are incorporated in bicycle/pedestrian plans. Open space areas can promote connectivity between locations and act as amenities along multi-use trails.

Number	Measure
ROS-8.1	Encourage the provision of parks, recreation facilities, and/or open space in new development and redevelopment projects.
ROS-8.2	Ensure that new residential developments provide for recreation needs of residents through development fees and park dedication.
ROS-8.3	Encourage development that promotes outdoor activity.
ROS-8.4	When reviewing new development or redevelopment projects, refer to the Trails Plan to determine whether right-of-way is needed for trails on the project site.

Action	Target/Performance Criteria
Preserve the Open Space land use designations as outlined in the Open Space Element of the General Plan.	Ongoing.
GHG Reduction Potential	Supporting Measure

Create New Open Spaces

Goal ROS-9 Public plazas or green spaces provide additional open space opportunities for existing and future residents and employees.

Measure Description: Public plazas and green spaces provide amenities and are linked with trails and pedestrian paths to promote connectivity.

Number	Measure
ROS-9.1	Continue to require that adequate, usable, and permanent private open space is provided in residential developments.
ROS-9.2	Encourage new and existing commercial, office, and industrial development to provide outdoor green spaces that may be used by employees.
ROS-9.3	Encourage new development and redevelopment projects to incorporate gardens and green spaces with various cultural influences throughout the community to bridge cultures and provide education opportunities.
ROS-9.4	Encourage green spaces planted with a diverse plant palette in order to promote natural variety, ecosystem services, and enhance the well-being of community residents.
ROS-9.5	Review and modify as necessary, open space requirements for different types of development projects.

Action	Target/Performance Criteria
Preserve the Open Space land use designations as outlined in the Open Space Element of the General Plan.	Ongoing.
GHG Reduction Potential	Supporting Measure

ADDITIONAL EMISSIONS REDUCTIONS FROM STATEWIDE LEGISLATION

Implementation of the recommended measures and actions will result in a potential reduction in GHG emissions of up to 885,247 $MTCO_2eq$. As a result, the City of Murrieta would not achieve the emission reduction target of 15 percent below 2009 emission levels with these measures alone. Therefore, the community will assume credit for a portion of the GHG emission reductions that will occur through legislation being implemented at the state-wide level.

The State of California has established companion legislation that will reduce statewide generation of GHG emissions across all emissions sectors in order to implement AB 32. Senate Bill 107 (SB 107) establishes performance standards for GHG emission reductions from electric utilities. Assembly Bill 1493 (AB 1493) establishes performance standards for GHG emission reductions from motor vehicles. Executive Order S-1-07 (EO S-1-07) establishes performance standards for the carbon intensity of transportation fuels. At the time of CAP preparation, the City only has confidence in estimating the GHG emission reductions associated with SB 107, AB 1493, and EO S-1-07. As the regulatory framework surrounding AB 32 grows in the future, it may be possible to evaluate a wider range of statewide reductions.

Senate Bill 1078 and Senate Bill 107

California utilities must meet increasingly stringent renewable energy requirements set by SB 1078 and SB 107. SB 1078 required investor-owned utilities to provide at least 20 percent of their electricity from renewable resources by 2020. SB 107 accelerated the timeframe by ten years to take effect in 2010. Sources of renewable energy include wind, solar, geothermal, or any Renewable Portfolio Standard (RPS) eligible sources.

Southern California Edison (SCE), Murrieta's electricity provider, delivered 16 percent of its electricity from renewable sources in 2008, and has contracts in place to deliver 20 percent by 2020 as required by law. At a minimum, this performance criterion would also be in effect at the CAP target year (2020) as well as the General Plan buildout year (2035). Additionally, EO S-14-08 would increase the RPS further to 33 percent by 2020. In response to EO S-14-08, CARB adopted the "Renewable Electricity Standard" on September 23, 2010, which requires 33 percent renewable energy by 2020 for most publicly owned electricity retailers.

Table 3-2, Electricity Emission Reductions from State Legislation, provides the estimated emissions reduction effect of SB 107 and EO S-14-08 on Murrieta's 2020 and 2035 GHG emissions.

Table 3-2
Electricity Emissions Reductions from State Legislation

Emissions Sector	Building Energy Emissions				
	BAU (16 Percent Renewable) ($MTCO_2eq$/year)			33 Percent Renewable ($MTCO_2eq$/year)	
	2009	2020	2035	2020	2035
Residential	80,172	92,483	109,272	76,761	90,696
Commercial	61,855	149,594	269,238	124,163	223,467
Industrial	1,858	2,276	2,846	1,889	2,362
Municipal	38,039	42,164	47,788	34,996	39,664
Total	*143,885*	*244,353*	*381,356*	237,809	356,189

BAU = business as usual; RPS = renewable portfolio standard; $MTCO_2eq$/year = metric tons of carbon dioxide equivalent
Source: ICLEI Clean Air and Climate Protection Software.

Assembly Bill 1493

GHG emissions will be reduced from on-road passenger motor vehicles sold in California with the implementation of Assembly Bill 1493 (AB 1493). The emission reduction potential associated with implementation of the vehicle emission standards would vary depending on the first regulated model year and vehicle turnover between the present fleet and the fleet in 2020 and 2035.

To provide an estimate of the reasonably foreseeable GHG emission reduction potential of motor vehicle emission regulations, the GHG emission reductions associated with AB 1493 were estimated using the California Air Resources Board (CARB) Pavley + Low Carbon Fuel Standard Postprocessor software (Version 1.0). It is expected that implementation of AB 1493 would reduce on-road mobile-source GHG emissions by approximately 17.66 percent by 2020 and approximately 20.66 percent by 2035. *Table 3-3*, *Transportation Emissions Reductions from State Legislation*, shows the estimated GHG emission reduction potential of AB 1493 in Murrieta.

Table 3-3
Transportation Emissions Reductions from State Legislation

Year	Murrieta Transportation Sector Emissions	GHG Emissions Reductions ($MTCO_2eq$/year)	GHG Emissions After Reductions ($MTCO_2eq$/year)	Percent Change[1]
2020	296,652	52,382	244,270	17.66%
2035	444,625	91,842	352,783	20.66%

GHG = Greenhouse Gas; $MTCO_2eq$/year = metric tons of carbon dioxide equivalent per year

Notes:
1. Transportation emissions in this instance are based on an EMFAC2007 model run and were not calculated using the ICLEI CACP software. As a result, transportation emissions may not match the results from the CACP software presented in the emissions inventory. Emissions provided in this table have been included to depict the percent emissions reductions achieved in Murrieta due to the implementation of the Pavley standards.

Source: California Air Resources Board, *Pavley I and Low Carbon Fuel Standard Postprocessor Software (Version 1.0)*, April 2010, California Air Resources Board, *EMFAC2007*, November 2006, and VMT data for the City of Murrieta provided by Iteris.

Executive Order S-1-07

Under Executive Order S-1-07 (EO S-1-07), ARB has developed a Low Carbon Fuel Standard (LCFS) to reduce the carbon intensity of transportation fuels in California's by at least ten percent by 2020. The development of a diverse set of clean, low-carbon transportation fuel options to reduce GHG emissions is incentivized by the LCFS which is a performance standard with flexible compliance mechanisms. *Table 3-3*, also includes the estimated GHG emission reduction potential of EO S-1-07 on Murrieta's 2020 and 2035 GHG emissions.

Statewide Reductions in Relation to the CAP

The emission reductions shown above in *Table 3-2* and *Table 3-3* represent the upper bound of the potential emission reductions associated with SB 107 and AB 1493. Similar to the method used to quantify the City's CAP measures, the statewide emissions reduction estimates assume that no other emission reduction activities would occur. In reality, implementation of the City's CAP measures and the State regulations could occur, simultaneously or one preceding another. Thus, GHG reductions from emissions sectors affected by both City CAP measures and State regulations would not have a purely additive effect.

Rather, emission reductions achieved by one (i.e., CAP measures or State regulations) would reduce the capacity of the other to reduce emissions. For example, if SB 107 reduces electricity consumption-related emissions by 6 percent then the potential for additional GHG reduction by the City's electricity conservation-related CAP measures would be reduced. Conversely if the City's CAP measures reduce the quantity of electricity consumption-related GHG emissions the overall effectiveness of SB 107 is reduced.

The timing and synergistic effect of the State regulations in relation to the City's CAP measures are uncertain. Nonetheless, because the focus of the CAP is on actions the City can take to reduce community-wide GHG emissions, the emission reductions achieved by the City's actions were determined first and independent of Statewide reductions.

SUMMARY OF RESULTS

Table 3-4, *Summary of GHG Reduction Measures,* summarizes the GHG reductions anticipated by implementing the quantified measures recommended in the CAP, and provides subtotals for each strategy. This level of GHG reduction can only be realized if the targets and performance criteria are achieved throughout the course of implementing the CAP.

The GHG reduction strategies and measures were based on the Goals and Policies in the General Plan Update and were designed to include performance criteria that would allow the City to achieve its GHG reduction target of 15 percent below 2009 levels by 2020. As proposed, the CAP meets this target, with a projected 15.21 percent reduction. The CAP includes other supporting measures that contribute to the GHG emission reductions of other related measures. Other measures could not be quantified, due either to a lack of substantial evidence or limitations inherent in quantifying the effect of less tangible programs and policies. For the CAP to successfully guide Murrieta toward meeting its GHG reduction target, the City must play a prominent role in implementing the CAP's programs and policies. The public also has a role by participating in and ensuring success of the measures and actions.

Table 3-4
Summary of GHG Reduction Measure Performance

Number	Strategy and Measure	2020 GHG Reductions ($MTCO_2eq$ per Year)	Percent Reduction
Community Involvement Strategy			
CIR-6	Alternative travel modes and facilities are available to serve residents and employers/employees and reduce vehicle miles traveled.	Supporting Measure	N/A
CSV-15	A community taking a leadership role in resource conservation and reduction of greenhouse gas emissions by implementing programs to improve municipal operations.	97	0.02%
HC-1	Application of innovative and model best practices in the community health field.	253	0.05%
	Subtotal	**350**	**0.07%**
Land Use and Community Vision Strategy			
LU-1	A complementary balance of land uses throughout the community that meets the needs of existing residents and businesses as well as anticipated growth, and achieves the community's vision.	18,674	3.98%
LU-4	A housing stock that meets the diverse needs of Murrieta's existing and future residents.	Supporting Measure	N/A

Table 3-4 [continued]
Summary of GHG Reduction Measure Performance

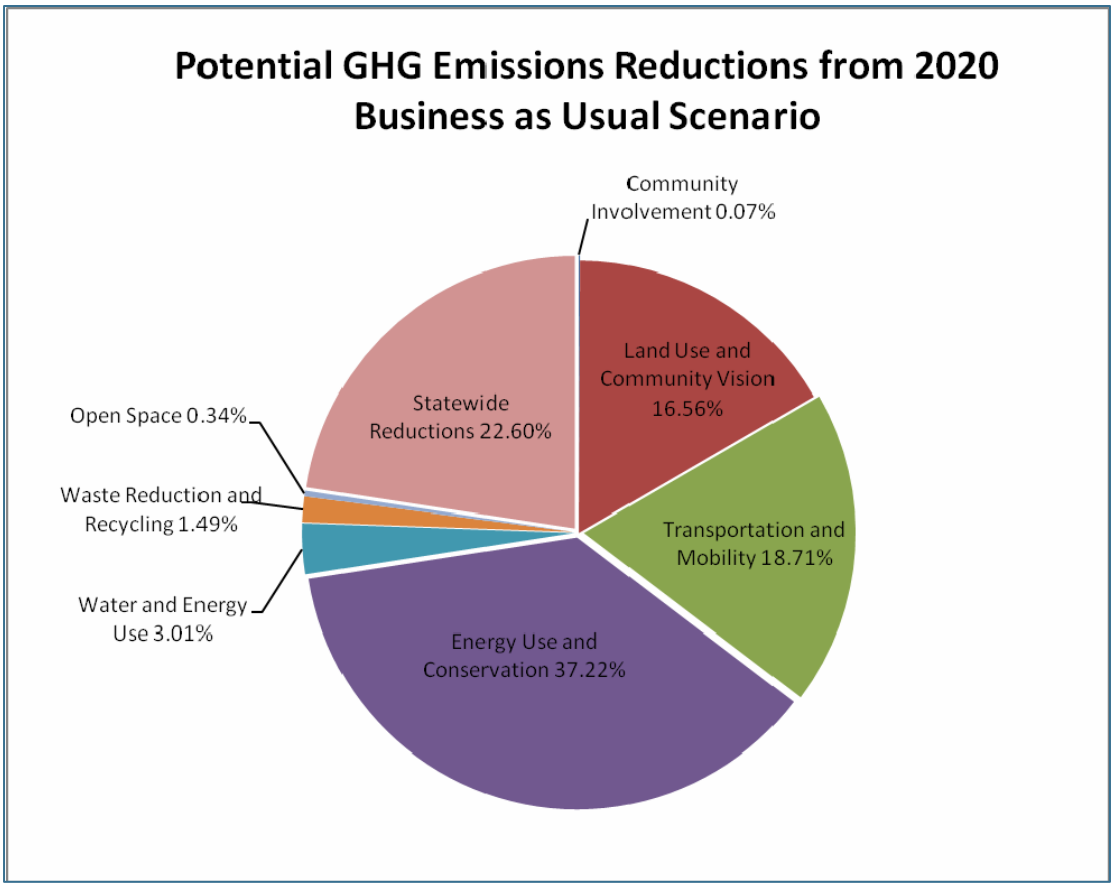
Number	Strategy and Measure	2020 GHG Reductions ($MTCO_2eq$ per Year)	Percent Reduction
LU-5	Promotion of quality industrial development that provides local employment opportunities.	3,641	0.78%
LU-6	Land use policy that encourages job retention and attraction.	52,288	11.14%
LU-7	Economically viable, vital, and attractive commercial centers throughout the City that serve the needs of the community.	Supporting Measure	N/A
LU-8	A community that provides opportunities for mixed use and/or transit-oriented development.	784	0.17%
LU-9	Land use patterns and urban design that support healthy and sustainable lifestyles and businesses.	2,334	0.50%
LU-10	A community that provides pedestrian-friendly environments for residential, commercial, business, and recreation uses.	Supporting Measure	N/A
ED-3	A sound, stable, and diversified economic base.	Supporting Measure	N/A
ED-4	Positive balance between the supply of retail opportunities and demand for goods and services.	Supporting Measure	N/A
ED-5	An improved jobs/housing balance.	Supporting Measure	N/A
ED-6	An educated and highly-skilled labor force.	Supporting Measure	N/A
ED-8	Strategic Approach to Economic Growth	Supporting Measure	N/A
ED-10	A revitalized and economically stable Historic Downtown Murrieta.	Supporting Measure	N/A
AQ-6	Stationary source pollution (point source and area source) are minimized through existing and future regulations and new technology.	Supporting Measure	N/A
	Subtotal	**77,721**	**16.56%**
Transportation and Mobility Strategy			
LU-22	Natural and visual resources are valued resources to maintain the rural character of the Los Alamos Hills.	Supporting Measure	N/A
LU-24	Historic Murrieta as the City's cultural, civic and community center.	Supporting Measure	N/A
LU-25	Collaboration with Federal, State, County, and other regional agencies and authorities to ensure compliance with existing and future legislation that affects the City of Murrieta.	Supporting Measure	N/A
CIR-1	A circulation system that serves the internal circulation needs of the City, while also addressing the inter-community or through travel needs.	7,470	1.59%
CIR-2	A comprehensive circulation system that promotes safety.	14,939	3.18%
CIR-5	A supported regional transportation system that serves existing and future travel between Murrieta and other population and employment centers within southwest Riverside County and the larger region, and that accommodates the regional travel needs of developing areas outside the City.	1,867	0.40%

Table 3-4 [continued]
Summary of GHG Reduction Measure Performance

Number	Strategy and Measure	2020 GHG Reductions ($MTCO_2eq$ per Year)	Percent Reduction
CIR-6	Alternative travel modes and facilities are available to serve residents and employers/employees and reduce vehicle miles traveled.	37,345	7.96%
CIR-7	Residential areas and activity centers are accessible to all pedestrians, including persons with disabilities or having special accessibility needs.	934	0.20%
CIR-8	Development, expansion, and maintenance of a network of bicycle, pedestrian, and multi-use trails that allows residents to travel between parks, schools, neighborhoods, and other major destinations without driving.	6,536	1.39%
AQ-4	Mobile source emissions are reduced by providing a balance of jobs and housing that serve the needs of the community.	18,674	3.98%
AQ-5	Air quality is improved through an efficient circulation system, reduced traffic congestion, and reduced vehicle miles traveled.	47	0.01%
	Subtotal	**87,812**	**18.77%**
Energy Use and Conservation Strategy			
CSV-12	Energy conservation and the generation of energy from renewable sources is prioritized as part of an overall strategy to reduce greenhouse gas emissions.	54,588	11.63%
CSV-14	A community that encourages and incentivizes the sustainable development of buildings and neighborhoods, particularly with respect to durability, energy and water use, and transportation impacts.	120,120	25.59%
Housing Element Goal 2	Conserve and enhance the quality of existing housing and residential neighborhoods in Murrieta.	Supporting Measure	N/A
	Subtotal	**174,708**	**37.22%**
Water Use and Efficiency Strategy			
INF-2	Infrastructure for recycled water is expanded throughout Murrieta for irrigation and other non-potable uses.	4,019	0.86%
CSV-1	A community that conserves, protects, and manages water resources to meet long-term community needs, including surface waters, groundwater, imported water supplies, storm water, and waste water.	10,097	2.15%
CSV-2	Murrieta promotes compliance with requirements from the State and appropriate agencies regarding comprehensive water conservation measures in buildings and landscaping.	Supporting Measure	N/A
	Subtotal	**14,116**	**3.01%**

Table 3-4 [continued]
Summary of GHG Reduction Measure Performance

Number	Strategy and Measure	2020 GHG Reductions ($MTCO_2eq$ per Year)	Percent Reduction
Waste Reduction and Recycling Strategy			
INF-1	New development and redevelopment is coordinated with the provision of adequate infrastructure for water, sewer, storm water, and energy.	Supporting Measure	N/A
CSV-13	Solid waste is diverted from landfills through waste reduction, re-use and recycling.	7,009	1.50%
	Subtotal	**7,009**	**1.49%**
Open Space Strategy			
CSV-9	A community that promotes the growth of an urban forest and water-efficient landscaping, recognizing that plants provide natural services such as habitat, storm water management, soil retention, air filtration, and cooling, and also have aesthetic and economic value.	1,590	0.34%
CSV-10	Fresh food is grown locally and made available through multiple venues that maintain a link to the City's agricultural heritage and promote healthy eating.	Supporting Measure	N/A
ROS-7	Open space areas are planned to protect, conserve, and utilize resources of unique character and value for the community.	Supporting Measure	N/A
ROS-8	New development is part of a coordinated system of open space, parkland, recreation facilities, and trails.	Supporting Measure	N/A
ROS-9	Public plazas or green spaces provide additional open space opportunities for existing and future residents and employees.	Supporting Measure	N/A
	Subtotal	**1,590**	**0.34%**
Statewide Reductions			
	SB 1078 and SB 107	53,691	11.44%
	AB 1493 and EO S-1-07	52,389	11.16%
	Subtotal Statewide Reductions	**106,080**	**22.60%**
	Total Reductions	**469,386**	**100%**
		15.21% from 2009 baseline	


Potential GHG Emissions Reductions from 2020 Business as Usual Scenario
Community Involvement 0.07%
Land Use and Community Vision 16.56%
Transportation and Mobility 18.71%
Energy Use and Conservation 37.22%
Water and Energy Use 3.01%
Waste Reduction and Recycling 1.49%
Open Space 0.34%
Statewide Reductions 22.60%

Chapter 4

Implementation

Chapter 4 Implementation

APPROACH

The Climate Action Plan (CAP) strategies for reducing GHG emissions and adapting to climate change are described only at a schematic level of detail in Chapter 3, *Climate Action Strategies*. While this level of detail is sufficient for some strategies, others will require an additional, more in-depth round of planning prior to implementation. In this later round of planning, strategies will be described in more detail, including specific priorities for implementation, costs, funding sources, and staffing. A major concern with implementing the CAP is limitations on funding and staffing. Due to the current state of the economy, it is essential to focus the CAP on affordable solutions while implementing strategies that will move the City closer to the GHG reduction goal of the CAP. By taking a realistic approach and setting achievable goals, the City will increase its chances of implementing a successful plan and demonstrating tangible progress in the future.

Public education is by far the most powerful and affordable tool to overcome this hurdle. In addition to the programs and policies the City has already put in place or is in the process of developing under the General Plan Update, strategies may include incorporating relevant information and ideas in existing publications and events, such as the City's website. The schools can be a powerful instrument for change, and working with schools on climate change education programs is considered an essential strategy. Additionally, much can be accomplished by supporting community groups interested in promoting and implementing the CAP.

The CAP provides a high-level road map to begin the community's transition to a low-carbon future. It provides a critical foundation for action, but it is only a first step. Moving forward, the City will need to take specific steps to advance and monitor the CAP's implementation. These include:

1. **Assign Responsibility.** Designate a city-wide climate change staff liaison to coordinate and implement the CAP and associated measures. Resources should also be (such as funding and staff) to assist with implementing and ensuring that climate change-related considerations are included as requirements in all relevant decision making processes (e.g., the entitlement process). It is critical that the City clearly assign responsibility for the City's carbon budget and implementation of the CAP roadmap to achieve the goals for 2020. Training and support will be required to ensure city staff has the necessary skills and expertise to understand and manage emissions within and between sectors to support a break from business-

as-usual for municipal and community-wide practices. Now that the City is a member of ICLEI, this can be accomplished through their Climate Resiliency process.

2. **Study the Costs and benefits of the CAP Implementation.** Conduct a formal cost estimation study for the most effective emission reduction strategies identified in the CAP.

3. **Develop and Implement a Performance Monitoring Process.** To ensure the community stays on course to meet GHG reduction targets, it is ultimately necessary to track progress by conducting regular inventories and monitoring procedures. This should be done on an annual basis, with the results presented to the City Council.

4. **Communication and Collaboration.** Work with energy utilities to create durable and interoperable exchanges of city-wide energy performance data. The City should also partners with local, regional, and state agencies to ensure collaboration and achieve future reduction goals.

Chapter 5

Public Participation

Chapter 5
Public Participation

Murrieta residents have played an important role in the formulation of this Climate Action Plan (CAP) through the City's General Plan Update community workshops. Community members provided their input and have stressed several points of change they would like to see in their City. Community support is vital to the success of this CAP and community members will need to take an active role in implementing the CAP and monitoring its success over time.

COMMUNITY OUTREACH THROUGH WORKSHOPS AND SURVEYS

A variety of outreach tools allowed all who wished to participate to do so in a manner with which they felt comfortable. Outreach efforts included a web-based community survey and several community workshops. The community workshops included presentations, surveys, group activities, and comments. The General Plan Update website, www.murrietaplan.info, provided the public with information on past and upcoming events, as well as links to documents and reports.

The City conducted three General Plan community visioning workshops in January 2010. On January 22, 2010, the City held a workshop and collected input from forty-eight students from Vista Murrieta High School. On January 28 and 30, 2010, the City held workshops attended by over sixty community members. Ten meetings were held from March through June focusing on community involvement in the development of the Land Use Alternatives in each of the focus areas and to refine the vision and community priorities. Opinions were also gathered through several online surveys throughout the General Plan Update process.

Community members participated in small group discussion and presentation sessions, a 'Treasures, Challenges, and Visions' Post-it Note exercise, surveys, and open discussions. The information gathered from these meetings and surveys was used to formulate goals and policies in the General Plan Update, as well as the strategies and actions in the CAP. Through the workshops and surveys, community members have provided valuable input that has been used to select GHG reduction measures.

KEY FINDINGS

The following topics were brought to light through public outreach and various reports.

Sustainable Economy. One of ten community priorities developed through the community visioning workshops is to *"pursue economic vitality and longevity by attracting higher education and growing a base of clean industry, while maintaining the current housing affordability."*

Community members expressed a desire for economic development that would lead to more jobs, including high-paying jobs and jobs for teens, and fully occupied retail centers. Participants hoped to see development in the Golden Triangle. They noticed local signs of the economic downturn, expressing concerns about commercial vacancies, foreclosures, and lower housing values. However, participants also considered the affordability of housing in Murrieta to be an asset.

To stimulate economic development, workshop groups suggested providing higher education, infrastructure, and incentives, as well as promoting downtown. One group felt that high-speed rail could provide an opportunity. Another group suggested constructing office buildings for large employers. Some areas of growth the groups identified were medical and bio-tech industries, "green" businesses, mixed use, and hotels. Hotel locations were suggested near the Loma Linda University Medical Center and in the Golden Triangle, north of Murrieta Hot Springs Road. Participants saw opportunities for Murrieta due to assets such as freeway access and an educated workforce.

Participants recognized the role of the City and the General Plan in directing land use and growth. They expressed the need to manage growth in order to provide adequate infrastructure and services, or to preserve certain qualities of the community that they value.

Comments also pertained to the residents' desire for a sustainable economy including a vision for "a thriving, well planned community with an ability to attract well paying professional jobs." Residents also wanted to have the "opportunity to live, work, grow old, [and] recreate" within Murrieta and for the City to attract "high end industry – health care, clean energy/water businesses, and tourism." Residents would like their City to target green industries with extra incentives to locate there.

Economic development is strongly linked to two other major themes of the General Plan Update: sustainability, and becoming a healthy community. Commuting is one example of a connection between these themes. When there are more jobs available closer to home, Murrieta residents can reduce the amount of time that they spend commuting. This would reduce emissions from vehicle travel, which benefits both the environment and human health. It would also provide residents with more time to spend in healthy activities with their families.

Commuting to Work. Residents have shown a concern for their jobs/housing balance and would like to see more job opportunities within Murrieta. According to 2008 US Census data cited in the *Economic Trends and Conditions* study prepared by Stanley R. Hoffman Associates, Inc.,(January 7, 2010), about 13 percent of individuals employed in Murrieta, live in Murrieta. In comparison, an overwhelming majority of Murrieta residents (87 percent) commute out of the City for work. Sixteen percent of residents commute to Temecula for work, 20 percent commute to other parts of Riverside County, and 22 percent commute to San Diego County.

Transportation. Another community priority pertains to transportation. Residents would like to see the City *"improve roadway networks to reduce traffic, and provide a citywide system of bicycle lanes and recreational trails that improve accessibility without a car."*

Transportation systems are important to Murrieta residents to help them reach other regional destinations and to travel within the City. Participants said that Murrieta was conveniently located, but many would rather be able to work, shop, dine, and recreate in Murrieta instead of driving out of town. Time spent in the car is clearly an issue for Murrieta residents, with many participants citing traffic as a concern on local streets and freeway interchanges. As individuals and in groups, participants suggested more connections for Clinton Keith Road, Diaz Road, Winchester Road, Washington Avenue, and Ynez Road, as well as more freeway overpasses and north/south connectivity to Temecula.

Community members also hoped to see a City-wide system of bicycle lanes. They sought recreational trails (including equestrian trails) that connect parks and open space, hoping that they could access these amenities without needing to drive. As discussed in the Natural Environment section above, a workshop group proposed a park with trails along the river from Wildomar to Temecula. Another group echoed this group's suggestion of linking trails to Old Town. Groups discussing transportation also suggested developing other modes of transportation: Safe Routes to School, wheelchair-accessible connectivity, a trolley, golf carts in Old Town, improved bus service, and rail connections to San Diego and Orange County.

The addition of a well connected trail network and better public transportation was a common theme throughout the community workshops. Community member comments included the desire for "Implementing a safe and well connected bike path system" and that "transit lines should be included on major north/south corridors and major east/west corridors." Another community member commented that: "We are there when I can walk and get on a trail within 5 to10 minutes from home."

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the future of southern california
Murrieta
General Plan Update

Appendix

ICLEI Clean Air Climate Protection (CACP) Software (Version 2.2.1b) Input Summary

City of Murrieta

Year 2009 Baseline

COMMUNITY

	Electricity (kWh)	Natural Gas (thousand cu ft)
Residential		
Rural Residential	3,055,190	3,619
Single Family	157,890,843	187,033
Multi-Family	22,686,048	16,174
NonResidential		
Commercial	93,077,067	356,532
Industrial	4,256,340	29,354
Business Park	9,406,149	77,195
Civic/Institutional	13,249,690	64,829
Office	25,947,111	49,011

Transportation

	Annual Vehicle Miles Traveled				
Facility Type	Total VMT	Heavy Duty Vehicles (diesel)	Heavy Duty Vehicles (gasoline)	Light Trucks (gasoline)	Passenger cars (gasoline)
Freeway Ramps	19,167,245	345,010	555,850	7,858,570	10,407,814
Principal Arterial	79,936,225	1,438,852	2,318,151	32,773,852	43,405,370
Minor Arterial	133,760,854	2,407,695	3,879,065	54,841,950	72,632,144
Major Collector	71,268,884	1,282,840	2,066,798	29,220,242	38,699,004
Minor Collector	9,604,128	172,874	278,520	3,937,692	5,215,042
Total	*313,737,336*	*5,647,272*	*9,098,383*	*128,632,308*	*170,359,373*

Waste (tons)	
Residential	25,865
Non Residential	32,918
Total	*58,783*

	Residential	Non Residential
Paper	27.5%	31.1%
Food Waste	20.0%	18.2%
Plant Debris	10.5%	31.2%
Wood or Textiles	14.5%	17.3%
Other	27.5%	2.2%

MUNICIPAL

Energy Usage	Electricity	Natural Gas
Municipal Buildings	842,136 kWh	18,501 therms (data from city)
Streetlights and Traffic Signa	17,500 MWh	N/A
Water Delivery/Treatment	54,835 MWh	N/A
Wastewater	13,950 MWh	N/A

Municipal Vehicle Fleet	Vehicle Miles
Heavy Duty Vehicles (diesel)	179,600
Passenger Cars (gasoline)	2,065,400
Employee Commute	
Passenger Cars (gasoline)	3,733,600

Community Greenhouse Gas Emissions in 2009
Detailed Report

	CO_2 (tons)	N_2O (lbs)	CH_4 (lbs)	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)
Residential						
Murrieta, California						
Multi-Family						
Electricity	10,872	250	658	10,918	2.5	77,427
Natural Gas	973	4	183	976	0.2	16,643
Subtotal Multi-Family	11,846	253	841	11,894	2.8	94,070
Rural Residential						
Electricity	1,464	34	89	1,470	0.3	10,427
Natural Gas	218	1	41	218	0.1	3,724
Subtotal Rural Residential	1,682	34	130	1,689	0.4	14,151
Single Family						
Electricity	75,668	1,737	4,579	75,986	17.7	538,877
Natural Gas	11,257	42	2,121	11,285	2.6	192,457
Subtotal Single Family	86,925	1,779	6,700	87,271	20.3	731,334
Subtotal Residential	100,453	2,067	7,671	100,853	23.5	839,555
Commercial						
Murrieta, California						
Business Park						
Electricity	4,508	103	273	4,527	1.1	32,103
Natural Gas	4,646	18	876	4,658	1.1	79,434
Subtotal Business Park	9,154	121	1,148	9,185	2.1	111,537
Civic/Institutional						
Electricity	6,350	146	384	6,376	1.5	45,221
Natural Gas	3,902	15	735	3,912	0.9	66,709
Subtotal Civic/Institutional	10,252	160	1,120	10,288	2.4	111,930

Community Greenhouse Gas Emissions in 2009
Detailed Report

	CO_2 (tons)	N_2O (lbs)	CH_4 (lbs)	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)
Commercial						
Electricity	44,607	1,024	2,699	44,794	10.4	317,669
Natural Gas	21,458	81	4,044	21,513	5.0	366,871
Subtotal Commercial	66,065	1,105	6,743	66,307	15.4	684,541
Office						
Electricity	12,435	285	752	12,487	2.9	88,557
Natural Gas	2,950	11	556	2,957	0.7	50,432
Subtotal Office	15,385	297	1,308	15,444	3.6	138,989
Subtotal Commercial	100,855	1,683	10,320	101,224	23.6	1,046,996
Industrial						
Murrieta, California						
Industrial						
Electricity	2,040	47	123	2,048	0.5	14,527
Natural Gas	1,767	7	67	1,768	0.4	30,205
Subtotal Industrial	3,806	53	190	3,817	0.9	44,732
Subtotal Industrial	3,806	53	190	3,817	0.9	44,732
Transportation						
Murrieta, California						
Freeway Ramps						
Diesel	612	4	4	613	0.1	7,594
Gasoline	11,803	1,551	1,334	12,057	2.8	151,059
Subtotal Freeway Ramps	12,415	1,555	1,338	12,670	2.9	158,653
Major Collector						
Diesel	2,277	14	14	2,279	0.5	28,237
Gasoline	43,885	5,768	4,961	44,831	10.4	561,678
Subtotal Major Collector	46,162	5,782	4,976	47,110	11.0	589,915

Community Greenhouse Gas Emissions in 2009
Detailed Report

	CO_2 (tons)	N_2O (lbs)	CH_4 (lbs)	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)
Minor Arterial						
Diesel	4,273	25	27	4,278	1.0	52,997
Gasoline	82,365	10,826	9,311	84,141	19.6	1,054,183
Subtotal Minor Arterial	86,639	10,851	9,339	88,419	20.6	1,107,180
Minor Collector						
Diesel	307	2	2	307	0.1	3,805
Gasoline	5,914	777	669	6,041	1.4	75,691
Subtotal Minor Collector	6,221	779	671	6,349	1.5	79,496
Principal Arterial						
Diesel	2,554	15	16	2,556	0.6	31,671
Gasoline	49,222	6,470	5,565	50,283	11.7	629,986
Subtotal Principal Arterial	51,776	6,485	5,581	52,839	12.3	661,657
Subtotal Transportation	203,212	25,452	21,904	207,387	48.3	2,596,901
Waste						
Murrieta, California						
Non Residential						*Disposal Method - Managed Landfill*
Paper Products	0	0	521,201	5,473	1.3	
Food Waste	0	0	172,648	1,813	0.4	
Plant Debris	0	0	167,715	1,761	0.4	
Wood or Textiles	0	0	82,055	862	0.2	
Subtotal Non Residential	0	0	943,620	9,908	2.3	
Residential						*Disposal Method - Managed Landfill*
Paper Products	0	0	362,124	3,802	0.9	
Food Waste	0	0	149,073	1,565	0.4	
Plant Debris	0	0	44,349	466	0.1	
Wood or Textiles	0	0	54,039	567	0.1	
Subtotal Residential	0	0	609,585	6,401	1.5	
Subtotal Waste	0	0	1,553,206	16,309	3.8	
Total	408,325	29,255	1,593,290	429,589	100.0	4,528,184

Government Greenhouse Gas Emissions in 2009
Detailed Report

	CO_2 (tons)	N_2O (lbs)	CH_4 (lbs)	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
Buildings and Facilities							
Murrieta, California							
Municipal Buildings							
Electricity	404	9	24	405	0.9	2,874	0
Natural Gas	108	0	20	108	0.2	1,850	0
Subtotal Municipal Buildings	512	10	45	514	1.1	4,724	0
Subtotal Buildings and Facilities	512	10	45	514	1.1	4,724	0
Streetlights & Traffic Signals							
Murrieta, California							
Streetlights, Traffic Signals							
Electricity	8,387	193	508	8,422	18.6	59,727	0
Subtotal Streetlights, Traffic Si	8,387	193	508	8,422	18.6	59,727	0
Subtotal Streetlights & Traffic Si	8,387	193	508	8,422	18.6	59,727	0
Water Delivery Facilities							
Murrieta, California							
Water Pumping, Treatment, Delivery							
Electricity	26,279	603	1,590	26,390	58.2	187,150	0
Subtotal Water Pumping, Treat	26,279	603	1,590	26,390	58.2	187,150	0
Subtotal Water Delivery Facilities	26,279	603	1,590	26,390	58.2	187,150	0
Wastewater Facilities							
Murrieta, California							
Wastewater							
Electricity	6,685	153	405	6,714	14.8	47,611	0
Subtotal Wastewater	6,685	153	405	6,714	14.8	47,611	0
Subtotal Wastewater Facilities	6,685	153	405	6,714	14.8	47,611	0

Government Greenhouse Gas Emissions in 2009
Detailed Report

	CO_2 (tons)	N_2O (lbs)	CH_4 (lbs)	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
Vehicle Fleet							
Murrieta, California							
Heavy Duty Vehicles							
Diesel	319	2	2	319	0.7	3,953	0
Subtotal Heavy Duty Vehicles	319	2	2	319	0.7	3,953	0
Passenger Cars							
Gasoline	1,038	134	127	1,060	2.3	13,280	0
Subtotal Passenger Cars	1,038	134	127	1,060	2.3	13,280	0
Subtotal Vehicle Fleet	1,356	136	129	1,379	3.0	17,233	0
Employee Commute							
Murrieta, California							
Passenger Cars							
Gasoline	1,876	242	229	1,916	4.2	24,006	0
Subtotal Passenger Cars	1,876	242	229	1,916	4.2	24,006	0
Subtotal Employee Commute	1,876	242	229	1,916	4.2	24,006	0
Total	45,095	1,337	2,905	45,333	100.0	340,451	0

ICLEI Clean Air Climate Protection (CACP) Software (Version 2.2.1b) Input Summary

City of Murrieta

Year 2035

COMMUNITY

	Electricity (kWh)	Natural Gas (thousand cu ft)
Residential		
Rural Residential	5,497,091	6,512
Single Family	177,690,497	210,487
Multi-Family	67,101,639	47,841
NonResidential		
Commercial	226,510,735	867,651
Industrial	6,517,605	44,949
Business Park	49,606,156	407,113
Civic/Institutional	9,814,300	48,020
Office	317,651,090	600,008
Mixed-Use	13,107,565	29,887

Transportation

		Annual Vehicle Miles Traveled			
Facility Type	Total VMT	Heavy Duty Vehicles (diesel)	Heavy Duty Vehicles (gasoline)	Light Trucks (gasoline)	Passenger cars (gasoline)
Freeway Ramps	3,694,895	66,508	107,152	1,514,907	2,006,328
Principal Arterial	374,483,857	6,740,709	10,860,032	153,538,381	203,344,734
Minor Arterial	353,264,159	6,358,755	10,244,661	144,838,305	191,822,438
Major Collector	30,415,592	547,481	882,052	12,470,393	16,515,667
Minor Collector	12,883,361	231,901	373,617	5,282,178	6,995,665
Total	*774,741,864*	*13,945,354*	*22,467,514*	*317,644,164*	*420,684,832*

Waste (tons)	
Residential	21,824
Non Residential	67,619
Total	*89,443*

	Residential	Non Residential
Paper	27.5%	31.1%
Food Waste	20.0%	18.2%
Plant Debris	10.5%	31.2%
Wood or Textiles	14.5%	17.3%
Other	27.5%	2.2%

MUNICIPAL

Energy Usage	Electricity	Natural Gas
Municipal Buildings	926,350 kWh	20,351 therms (data from city)
Streetlights and Traffic Signals	20,125 MWh	N/A
Water Delivery/Treatment	70,270 MWh	N/A
Wastewater	18,135 MWh	N/A

Municipal Vehicle Fleet	Vehicle Miles
Heavy Duty Vehicles (diesel)	197,560
Passenger Cars (gasoline)	2,271,940
Employee Commute	
Passenger Cars (gasoline)	4,106,960

Community Greenhouse Gas Emissions in 2035
Detailed Report

	CO_2 (tons)	N_2O (lbs)	CH_4 (lbs)	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)
Residential						
Murrieta, California						
Multi-Family						
Electricity	32,158	738	1,946	32,293	2.2	229,016
Natural Gas	2,879	11	543	2,887	0.2	49,228
Subtotal Multi-Family	35,037	749	2,489	35,180	2.4	278,244
Rural Residential						
Electricity	2,634	60	159	2,645	0.2	18,761
Natural Gas	392	1	74	393	0.0	6,701
Subtotal Rural Residential	3,026	62	233	3,038	0.2	25,462
Single Family						
Electricity	85,157	1,955	5,153	85,514	5.8	606,452
Natural Gas	12,668	48	2,388	12,701	0.9	216,591
Subtotal Single Family	97,825	2,002	7,541	98,215	6.7	823,043
Subtotal Residential	135,889	2,813	10,262	136,433	9.3	1,126,750
Commercial						
Murrieta, California						
Business Park						
Electricity	23,774	546	1,439	23,873	1.6	169,304
Natural Gas	24,502	92	4,618	24,565	1.7	418,919
Subtotal Business Park	48,276	638	6,056	48,438	3.3	588,224
Civic/Institutional						
Electricity	4,703	108	285	4,723	0.3	33,496
Natural Gas	2,890	11	545	2,897	0.2	49,413
Subtotal Civic/Institutional	7,594	119	829	7,621	0.5	82,908

Community Greenhouse Gas Emissions in 2035
Detailed Report

	CO_2 (tons)	N_2O (lbs)	CH_4 (lbs)	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)
Commercial						
Electricity	108,554	2,492	6,569	109,009	7.4	773,074
Natural Gas	52,219	197	9,842	52,353	3.6	892,813
Subtotal Commercial	160,774	2,688	16,410	161,363	11.0	1,665,887
Mixed-Use						
Electricity	6,282	144	380	6,308	0.4	44,736
Natural Gas	1,799	7	339	1,803	0.1	30,754
Subtotal Mixed-Use	8,080	151	719	8,111	0.6	75,489
Office						
Electricity	152,233	3,494	9,212	152,871	10.4	1,084,133
Natural Gas	433,336	1,633	81,669	434,447	29.5	7,408,894
Subtotal Office	585,569	5,128	90,881	587,318	39.9	8,493,027
Subtotal Commercial	810,292	8,724	114,896	812,850	55.3	10,905,536
Industrial						
Murrieta, California						
Industrial						
Electricity	3,124	72	189	3,137	0.2	22,244
Natural Gas	2,705	10	102	2,708	0.2	46,253
Subtotal Industrial	5,829	82	291	5,845	0.4	68,497
Subtotal Industrial	5,829	82	291	5,845	0.4	68,497
Transportation						
Murrieta, California						
Freeway Ramps						
Diesel	118	1	1	118	0.0	1,464
Gasoline	2,170	299	257	2,219	0.2	27,777
Subtotal Freeway Ramps	2,288	300	258	2,337	0.2	29,241

Community Greenhouse Gas Emissions in 2035
Detailed Report

	CO_2 (tons)	N_2O (lbs)	CH_4 (lbs)	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)
Major Collector						
Diesel	972	6	6	973	0.1	12,051
Gasoline	17,865	2,462	2,117	18,269	1.2	228,651
Subtotal Major Collector	18,837	2,467	2,123	19,241	1.3	240,702
Minor Arterial						
Diesel	11,286	67	71	11,297	0.8	139,965
Gasoline	207,494	28,591	24,592	212,184	14.4	2,655,689
Subtotal Minor Arterial	218,780	28,658	24,663	223,481	15.2	2,795,653
Minor Collector						
Diesel	412	2	3	412	0.0	5,104
Gasoline	7,567	1,043	897	7,738	0.5	96,852
Subtotal Minor Collector	7,979	1,045	899	8,150	0.6	101,956
Principal Arterial						
Diesel	11,964	71	76	11,976	0.8	148,372
Gasoline	219,957	30,309	26,069	224,929	15.3	2,815,209
Subtotal Principal Arterial	231,921	30,380	26,145	236,905	16.1	2,963,581
Subtotal Transportation	479,805	62,851	54,089	490,115	33.3	6,131,133
Waste						
Murrieta, California						
Non Residential						*Disposal Method - Managed Landfill*
Paper Products	0	0	1,070,634	11,242	0.8	
Food Waste	0	0	354,648	3,724	0.3	
Plant Debris	0	0	344,515	3,617	0.2	
Wood or Textiles	0	0	168,555	1,770	0.1	
Subtotal Non Residential	0	0	1,938,352	20,353	1.4	

Community Greenhouse Gas Emissions in 2035
Detailed Report

	CO_2 (tons)	N_2O (lbs)	CH_4 (lbs)	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)
Residential						*Disposal Method - Managed Landfill*
Paper Products	0	0	305,548	3,208	0.2	
Food Waste	0	0	125,783	1,321	0.1	
Plant Debris	0	0	37,420	393	0.0	
Wood or Textiles	0	0	45,596	479	0.0	
Subtotal Residential	0	0	514,347	5,401	0.4	
Subtotal Waste	0	0	2,452,699	25,753	1.8	
Total	1,431,815	74,470	2,632,237	1,470,996	100.0	18,231,916

Government Greenhouse Gas Emissions in 2035
Detailed Report

	CO_2 (tons)	N_2O (lbs)	CH_4 (lbs)	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
Buildings and Facilities							
Murrieta, California							
Municipal Buildings							
Electricity	444	10	27	446	0.8	3,162	0
Natural Gas	119	0	22	119	0.2	2,035	0
Subtotal Municipal Buildings	563	11	49	565	1.0	5,197	0
Subtotal Buildings and Facilities	563	11	49	565	1.0	5,197	0
Streetlights & Traffic Signals							
Murrieta, California							
Streetlights, Traffic Signals							
Electricity	9,645	221	584	9,685	17.3	68,686	0
Subtotal Streetlights, Traffic Si	9,645	221	584	9,685	17.3	68,686	0
Subtotal Streetlights & Traffic Si	9,645	221	584	9,685	17.3	68,686	0
Water Delivery Facilities							
Murrieta, California							
Water Pumping, Treatment, Delivery							
Electricity	33,677	773	2,038	33,818	60.3	239,829	0
Subtotal Water Pumping, Treat	33,677	773	2,038	33,818	60.3	239,829	0
Subtotal Water Delivery Facilities	33,677	773	2,038	33,818	60.3	239,829	0
Wastewater Facilities							
Murrieta, California							
Wastewater							
Electricity	8,691	199	526	8,728	15.6	61,894	0
Subtotal Wastewater	8,691	199	526	8,728	15.6	61,894	0
Subtotal Wastewater Facilities	8,691	199	526	8,728	15.6	61,894	0

Government Greenhouse Gas Emissions in 2035
Detailed Report

	CO_2 (tons)	N_2O (lbs)	CH_4 (lbs)	Equiv CO_2 (tons)	Equiv CO_2 (%)	Energy (MMBtu)	Cost ($)
Vehicle Fleet							
Murrieta, California							
Heavy Duty Vehicles							
Diesel	351	2	2	351	0.6	4,349	0
Subtotal Heavy Duty Vehicles	351	2	2	351	0.6	4,349	0
Passenger Cars							
Gasoline	1,036	147	139	1,061	1.9	13,266	0
Subtotal Passenger Cars	1,036	147	139	1,061	1.9	13,266	0
Subtotal Vehicle Fleet	1,387	149	141	1,412	2.5	17,614	0
Employee Commute							
Murrieta, California							
Passenger Cars							
Gasoline	1,874	266	252	1,918	3.4	23,980	0
Subtotal Passenger Cars	1,874	266	252	1,918	3.4	23,980	0
Subtotal Employee Commute	1,874	266	252	1,918	3.4	23,980	0
Total	55,836	1,620	3,590	56,125	100.0	417,201	0

CO2 Emission Reductions from the Pavley I Regulation & the Low Carbon Fuel Standard for Statewide totals - 2020 (Statewide totals Avg Annual CYr 2020 Default Title)

Vehicle Category	Vehicle Population	Weekday VMT from EMFAC (VMT/day)	Weekday CO2 Emissions from EMFAC (tons/day)	Weekday CO2 Emission Reduction from Pavley I (tons/day)	Weekday CO2 Emissions after adopting Pavley I (tons/day)	% CO2 Emission Reduction from LCFS	Weekday CO2 Emission Reduction from LCFS (tons/day)	Weekday CO2 Emissions after adopting Pavley I & LCFS (tons/day)	Annual CO2 Emissions after adopting Pavley I & LCFS (MMTCO2/year)
LDA	15,695,341	698,392	294.39	61.29	233.10	10.00%	23.31	209.79	0.07
LDT1	3,480,904	161,392	83.64	15.93	67.70	10.00%	6.77	60.93	0.02
LDT2	6,644,752	311,535	166.52	22.52	144.00	10.00%	14.40	129.60	0.04
MDV	2,953,681	140,340	101.86	13.33	88.53	10.00%	8.85	79.68	0.03
Total	**28,774,678**	**1,311,659**	**646.40**	**113.07**	**533.33**	**10.00%**	**53.33**	**479.99**	**0.15**

CO2 Emission Reductions from the Pavley I Regulation & the Low Carbon Fuel Standard for Statewide totals - 2035 (Statewide totals Avg January CYr 2035 Default Title)

Vehicle Category	Vehicle Population	Weekday VMT from EMFAC (VMT/day)	Weekday CO2 Emissions from EMFAC (tons/day)	Weekday CO2 Emission Reduction from Pavley I (tons/day)	Weekday CO2 Emissions after adopting Pavley I (tons/day)	% CO2 Emission Reduction from LCFS	Weekday CO2 Emission Reduction from LCFS (tons/day)	Weekday CO2 Emissions after adopting Pavley I & LCFS (tons/day)	Annual CO2 Emissions after adopting Pavley I & LCFS (MMTCO2/year)
LDA	18,479,622	1,025,651	419.35	136.28	283.07	10.00%	28.31	254.76	0.08
LDT1	4,387,662	258,883	131.06	41.29	89.77	10.00%	8.98	80.79	0.03
LDT2	8,241,417	482,146	253.89	57.87	196.02	10.00%	19.60	176.42	0.06
MDV	3,713,622	218,966	156.46	35.25	121.21	10.00%	12.12	109.09	0.03
Total	**34,822,323**	**1,985,646**	**960.75**	**270.69**	**690.07**	**10.00%**	**69.01**	**621.06**	**0.20**

Electricity Emissions Emissions Reductions from State Legislation

Sector	City-Wide Electricity Emissions (MTCO2eq) (Business as Usual)			Emissions with SB 1078 and SB 107		
				16% Renewabl	33% Renewable	33% Renewable
	2009	2020	2035	2009	2020	2035
Residential	80,172	92,483	109,272	80,172	76,761	90,696
Commercial	61,855	149,594	269,238	61,855	124,163	223,467
Industrial	1,858	2,276	2,846	1,858	1,889	2,362
Municipal	38,039	42,164	47,788	38,039	34,996	39,664
Total	*143,885*	*244,353*	*381,356*	*181,924*	*237,809*	*356,189*

GHG Inventory and Reductions

Community Emissions

	2009		2020		2035	
	$MTCO_2eq$	percent	$MTCO_2eq$	percent	$MTCO_2eq$	percent
Residential	91,492	23%	105,148	13%	123,770	9.3%
Commercial	91,829	24%	364,957	46%	737,405	55.3%
Industrial	3,463	1%	4,241	1%	5,302	0.4%
Transportation	188,138	48%	296,652	38%	444,625	33.3%
Waste	14,795	4%	18,420	2%	23,363	1.8%
Total	*389,717*	*100%*	*789,418*	*100%*	*1,334,465*	*100%*

Community	2020	2035
Reduction Target	458,159	1,003,205
Total Reduction	469,389	1,020,233

Total	2020	2035
Reduction Target	468,469	1,019,164
Total Reduction	469,389	1,020,233
Percent Reduction	0.1521	0.1525

Municipal Emissions

	2009		2020		2035	
	$MTCO_2eq$	percent	$MTCO_2eq$	percent	$MTCO_2eq$	percent
Buildings and Facilities	466	1%	486	1%	513	1%
Streetlights and Traffic Signals	7,640	19%	8,125	18%	8,786	17%
Water Delivery Facilities	23,941	58%	26,792	59%	30,679	60%
Wastewater Facilities	6,091	15%	6,864	15%	7,918	16%
Vehicle Fleet	1,251	3%	1,264	3%	1,281	3%
Employee Commute	1,738	4%	1,739	4%	1,740	3%
Total	*41,127*	100%	*45,269*	100%	*50,917*	100%

Community + Municipal Total	430,845	834,687	1,385,382
15%	*64,627*	*125,203*	*207,807*

			Estimated Annual Reduction ($MTCO_2eq$)	
Goal/Policy			2020	2035
STATE AND FEDERAL REDUCTIONS				
AB 1493 and EO S-1-07			52,389	91,859
17.66% reduction by 2020				
20.66% reduction by 2035				
SB 1079 and 107			53,691	80,419
33% RPS By 2020				
COMMUNITY INVOLVEMENT STRATEGY (Municipal Measures)				
CIR-6	Increase Public Education	Supporting Measure		
CSV-15	Reduce Municipal Emissions		97	103
20% energy efficiency retrofits by 2020				
40% energy efficiency retrofits by 2035				
HC-1	Green City Fleet		253	256
20% alt fuel vehicles by 2020				
50% alt fuel vehicles by 2035				

LAND USE STRATEGIES

LU-1	Balance Land Uses	18,674	44,462

Suburban Center: 10% reduction in VMT
CAPCOA 3.1.2 (p. 171)

Source: Holtzclaw, et al. 2002. Location Efficiency: Neighborhood and Socioeconomic Characteristics Determine Auto Ownership and Use - Studies in Los Angeles and Chicago." Transportation Planning and Technology, Vol. 25, pp.1-27.

LU-4	Diverse Housing Stock	Supporting Measure

LU-5	Redevelopment - Create Local Employment Opportunities	3,641	8,670

39% VMT reduction for redevelopment

Center for Clean Air Policy, CCAP Transportation Emissions Guidebook, 2007.
http://www.ccap.org/safe/guidebook.php

LU-6	Jobs/Housing - LU Policy that encourages job retention and attraction	52,288	124,495

Centeredness 40-60% reduction in commercial VMT
Victoria Transport Policy Institute, Online TDM Encyclopedia,Land Use Impact on Transport, November 2010.
http://www.vtpi.org/tdm/tdm20.htm

LU-7	Transit Oriented Development	Suipporting Measure

Discourage disjointed commercial development/strip malls
Shared Parking

Center for Clean Air Policy, CCAP Transportation Emissions Guidebook, 2007.
http://www.ccap.org/safe/guidebook.php

LU-8	TOD - provide opportunities for mixed use and/or transit-oriented developr	784	1,867

21% TOD VMT Reduction
Center for Clean Air Policy, CCAP Transportation Emissions Guidebook, 2007.
http://www.ccap.org/safe/guidebook.php

LU-9	Pedestrian-Friendly Environment	2,334	5,558

1% VMT reduction (CCAP)
Center for Clean Air Policy, CCAP Transportation Emissions Guidebook, 2007.
http://www.ccap.org/safe/guidebook.php

LU-10	Pedestrian-Friendly Environment	Supporting Measure

ED-3	Sustainable Economy - Jobs/Housing Balance	Supporting Measure

Jobs housing balance
Increase ratio from 0.59 to 0.8 by 2020
Increase ratio to 1.0 by 2035

ED-4	Balance Retail and Demand for Goods	Supporting Measure

ED-5	Jobs Housing Balance	Supporting Measure

Flex-tech, and higher intensity along fwy corridors

ED-6	Highly Skilled Labor Force	Supporting Measure

Higher education institutions
Technical colleges

ED-8	Pursue office and R&D	Supporting Measure

ED-10	Economically Stable Historic Downtown	Supporting Measure

Higher density in downtown

AQ-6	Green Economy	Supporting Measure

Encourage non polluting industry and clean green tech to locate in the City

TRANSPORTATION AND MOBILITY STRATEGIES			
LU-22	Increase Trail Connectivity	Supporting Measure	
Trail masterplan Ped Linkages			
LU-24	Reduce Driving	Supporting Measure	
Expand traditional town dev pattern - grid streets Mixed use in downtown			
LU-25	High Speed Rail	Supporting Measure	
see CIR-5			
CIR-1	Multi-Modal Transportation	7,470	17,785
complete streets albany TL-1.1 4% VMT reduction Center for Clean Air Policy, CCAP Transportation Emissions Guidebook, 2007. http://www.ccap.org/safe/guidebook.php			
CIR-2	Pedestrian Safety	14,939	35,570
circulation and traffic calming improvements CAPCOA 3.2.2 1% of VMT			
CIR-5	Improve Public Transit	1,867	4,446
Metrolink - regional connections 1-2% reduction in VMT Center for Clean Air Policy, CCAP Transportation Emissions Guidebook, 2007. http://www.ccap.org/safe/guidebook.php			
CIR-6	Expand Transit Network	37,348	88,925
expand by 25% CAPCOA 3.5.3 Increase in transit ridership: 0.5% per 1% improvement in transit frequency Center for Clean Air Policy, CCAP Transportation Emissions Guidebook, 2007. http://www.ccap.org/safe/guidebook.php			
CIR-7	Increase Walking	934	2,223
Trails/ped connectivity			
CIR-8	Increase Trail Connectivity	6,536	15,562
coordinate multi-use trails trails along major home to work and other travel routes CAPCOA 3.2.9 Area-level VMT Reduction: 1-5% railstotrails.org, calbike.org Center for Clean Air Policy, CCAP Transportation Emissions Guidebook, 2007. http://www.ccap.org/safe/guidebook.php			
AQ-4	Jobs/Housing Balance	18,674	44,462
CAPCOA - Suburban Center 10% reduction			
AQ-5	Reduce Driving/efficient circulation, reduce congestion	47	111
CAPCOA 3.2.3 NEV Network (p 68, p205) Low penetration = 0.5% VMT reduction			

ENERGY USE AND CONSERVATION STRATEGY			
CSV-12	Renewable Energy and Efficiency	54,588	129,972
Provide information for incentives and rebates			
Develop improvements that achieve additional energy efficiency			
CSV-14	Green Building	120,120	285,999
include green buildnig standards			
Housing Element Goal 2	Energy Efficient Design	Supporting Measure	
Energy Conservation Ordinance			
WATER USE AND EFFICIENCY			
INF-2	Increase Use of Recycled Water (MUNI)	4,019	4,602
Expand recycled water infrastructure to cover 25 percent of the City by 2020			
(outdoor use only)			
CSV-1	Increase Water Conservation	10,097	11,579
Adopt water conservation strategy			
Green Building Code			
CSV-2	Reduce Water for Landscaping	Supporting Measure	
Adopt landscape water ordinance			
WASTE REDUCTION AND RECYCLING			
INF-1	Reduce Waste	Supporting Measure	
Education, informational, and outreach programs			
CSV-13	Increase Waste Diversion	7,009	17,522
increase waste stream diversion rate by 10% in 2020 and by 25% in 2035			
20 percent compost by 2020			
50 percent compost by 2035			
OPEN SPACE STRATEGY			
CSV-9	Increase Suburban Open Space	1,590	3,785
street trees, protect native trees			
Carbon sequestration, urban tree planting, CAPCOA 7.1.1 (p420)			
Plant urban shade trees CAPCOA 10.1.4			
Reduce urban heat island 10.1.5			
CSV-10	Improve Local Food	Supporting Measure	
CAPCOA 10.1.2			
Ros-7	Preserve Open Space	Supporting Measure	
Ros-8	Integrate New Development and Open Space	Supporting Measure	
Ros-9	Create New Open Space	Supporting Measure	

Appendix Q:

Murrieta Office & Industrial Data Review Report

OFFICE AND INDUSTRIAL DATA REVIEW

Prepared for

City of Murrieta

General Plan Update

Prepared by

Stanley R. Hoffman Associates, Inc.

November 25, 2009

INTRODUCTION

The following report presents findings and conclusions from a review of the Industrial and Office segments of the commercial real estate market in the Inland Empire, including specific information regarding Southwest Riverside County and the city of Murrieta. The study involved an analysis of data obtained primarily from Costar Group, Inc., a provider of real estate information that maintains a national database of commercial properties. In addition, regional data were obtained from Grubb & Ellis, a commercial real estate brokerage firm.

Inland Empire is defined as the entire counties of Riverside and San Bernardino. For purposes of this analysis, Southwest Riverside County has been divided into four subareas, including: the city of Murrieta; the city of Temecula; an area along Interstate 15 running from Lake Elsinore south to the northern boundary of the city of Murrieta; and an area north of the northern edge of the city of Murrieta, running north to and including the city of Menifee along Interstate 215, and north along Highway 79 through French Valley to the Winchester area.

A number of commercial real estate terms are used throughout the report. They are defined by Costar Group as follows:

Available Space: The total amount of space that is currently being marketed as available for lease in a given time period. It includes any space that is available, regardless of whether the space is vacant, occupied, available for sublease, or available at a future date.

Deliveries: Buildings that complete construction during a specified period of time. In order for space to be considered delivered, a certificate of occupancy must have been issued for the property.

Existing Inventory: The square footage of buildings that have received a certificate of occupancy and are able to be occupied by tenants. It does not include space in buildings that are either planned, under construction or under renovation.

Net Absorption: The net change in occupied space over a given period of time. Unless otherwise noted Net Absorption includes direct and sublease space.

Rentable Building Area: (RBA) The total square footage of a building that can be occupied by, or assigned to a tenant for the purpose of determining a tenant's rental obligation.

Vacant Space: Space that is not currently occupied by a tenant, regardless of any lease obligation that may be on the space. Vacant space could be space that is either available or not available.

INLAND EMPIRE

INLAND EMPIRE OVERVIEW

- Inland Empire includes Riverside County and San Bernardino County, encompassing 485 square miles
- 4.2 million residents (2.1 million in Riverside County)
- By 2030, expect 7 million total residents; second fastest-growing area (behind Los Angeles County) in Southern California region
- Inland Empire lost over 76,000 non-farm jobs in past 12 months
- Unemployment rate currently 14.2%, versus 12.0% statewide
- Costar's comprehensive office property database (all office properties, regardless of size) shows that Southwest Riverside County (as defined in the following pages) contains 7.9% of total Inland Empire office space and 1.0% of total Inland Empire vacant office space
- Costar's industrial property database (all industrial properties, regardless of size) indicates that Southwest Riverside County contains 4.3% of total Inland Empire industrial space and 3.9% of total Inland Empire vacant industrial space
- According to Grubb & Ellis, which reports quarterly on commercial properties in market areas throughout Southern California (surveying office buildings of 20,000 square feet or larger and industrial properties of 10,000 square feet or larger), Inland Empire office and industrial rents are lowest of any Southern California region.
- Inland Empire is a significant factor in Southern California industrial development, but has only emerged in recent years as a location for office development
- The Inland Empire industrial market has been impacted far more than the office market in the current slowdown, in terms of vacancies and rental rates. As shown on the following tables, Inland Empire offers lower lease rates than any market in the region, while at the same time experiencing higher vacancy rates than any other area, both for Industrial and Office properties,

Southern California Office Market Summary by Area Third Quarter 2009					
	Inland Empire	**Los Angeles County**	**Orange County**	**San Diego County**	**Totals/ Weighted Averages**
Total Square Feet	27,455,544	189,628,548	86,210,904	71,864,453	375,159,449
Vacant Square Feet	6,476,443	29,519,994	16,696,282	15,550,492	68,243,211
Vacancy Rate (Total)	23.6%	15.6%	19.4%	21.6%	18.2%
Net Absorption (YTD)	(69,607)	(4,384,630)	(1,568,918)	(940,463)	(6,963,618)
Under Construction SF	493,684	1,522,978	82,042	358,462	2,457,166
Asking Rent					
Class A	$2.17	$3.06	$2.50	$2.87	$2.83
Class B	$1.63	$2.26	$2.01	$2.25	$2.15

Southern California Industrial Market Summary by Area Third Quarter 2009					
	Inland Empire	**Los Angeles County**	**Orange County**	**San Diego County**	**Totals/ Weighted Averages**
Total Square Feet	430,928,985	987,735,183	265,985,670	172,724,235	1,857,374,073
Vacant Square Feet	55,189,414	31,665,632	17,352,117	20,597,647	124,804,810
Vacancy Rate (Total)	12.8%	3.2%	6.5%	12.0%	6.7%
Net Absorption (YTD)	(6,414,027)	(7,745,956)	(3,029,385)	(3,319,143)	(20,508,511)
Under Construction SF	1,453,768	369,563	0	246,050	2,069,381
Asking Rent					
WH/Dist	$0.32	$0.48	$0.58	$0.66	$0.47
Flex	$0.64	$0.86	$1.05	$1.27	$0.87

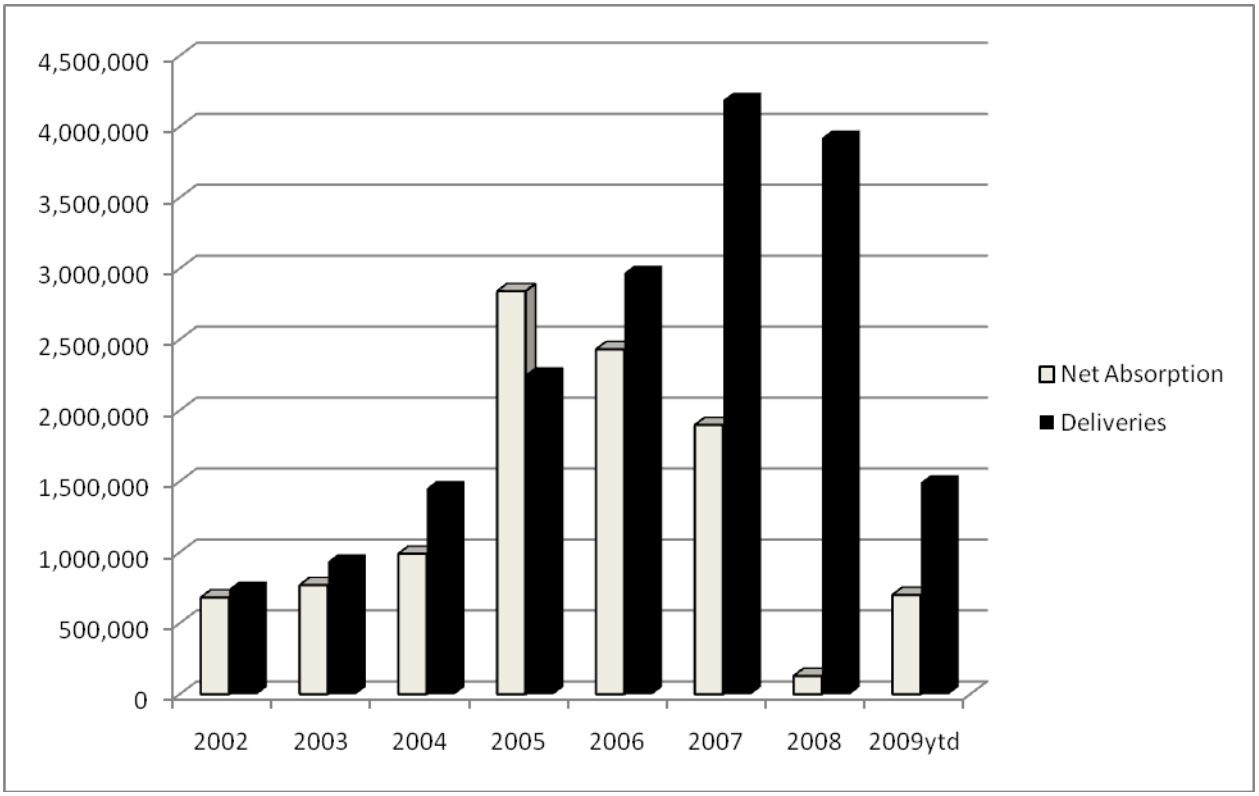
Sources: Grubb & Ellis, Stanley R. Hoffman Associates, Inc.

Inland Empire Office Market-Third Quarter 2009

	Class A	Class B	Class C	Totals
Existing Inventory				
Buildings	125	3,137	2,022	5,284
Rentable Area (SF)	9,079,003	41,138,879	14,789,590	65,007,472
Vacant Space				
Square Feet	3,099,444	6,770,053	1,325,356	11,194,853
Vacancy Rate	34.1%	16.5%	9.0%	17.2%
YTD Net Absorption (SF)	197,142	593,871	-91,292	699,721
YTD Deliveries (SF)	573,702	918,507	0	1,492,209
Under Construction (SF)	192,078	195,773	0	387,851
Quoted Rates ($/SF/mo)	$2.32	$1.79	$1.36	$1.87

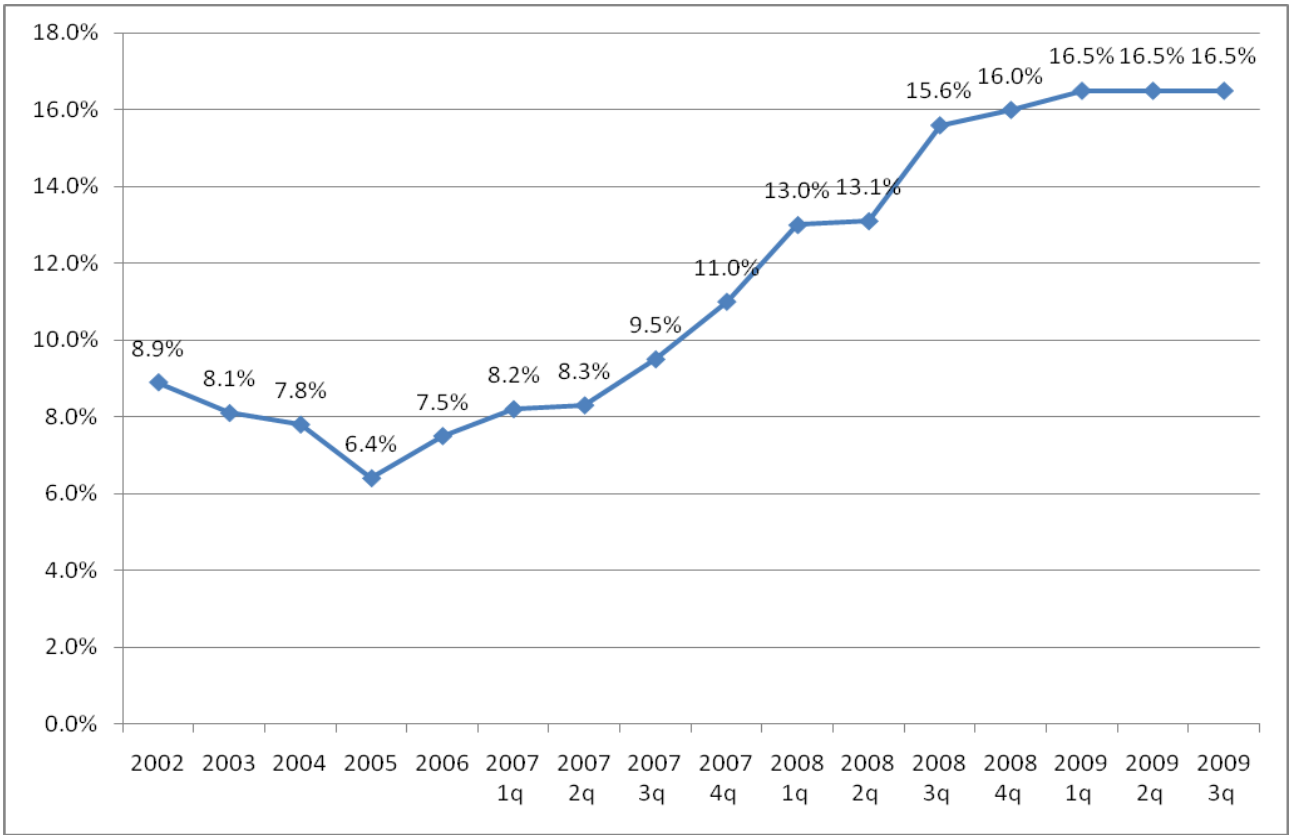
Source: Costar Group, Inc., Stanley R. Hoffman Associates, Inc.

Office Absorption and Delivery History – Inland Empire



Source: Costar Group, Inc., Stanley R. Hoffman Associates, Inc.

Office Vacancy Rate History – Inland Empire



Source: Costar Group, Inc., Stanley R. Hoffman Associates, Inc.

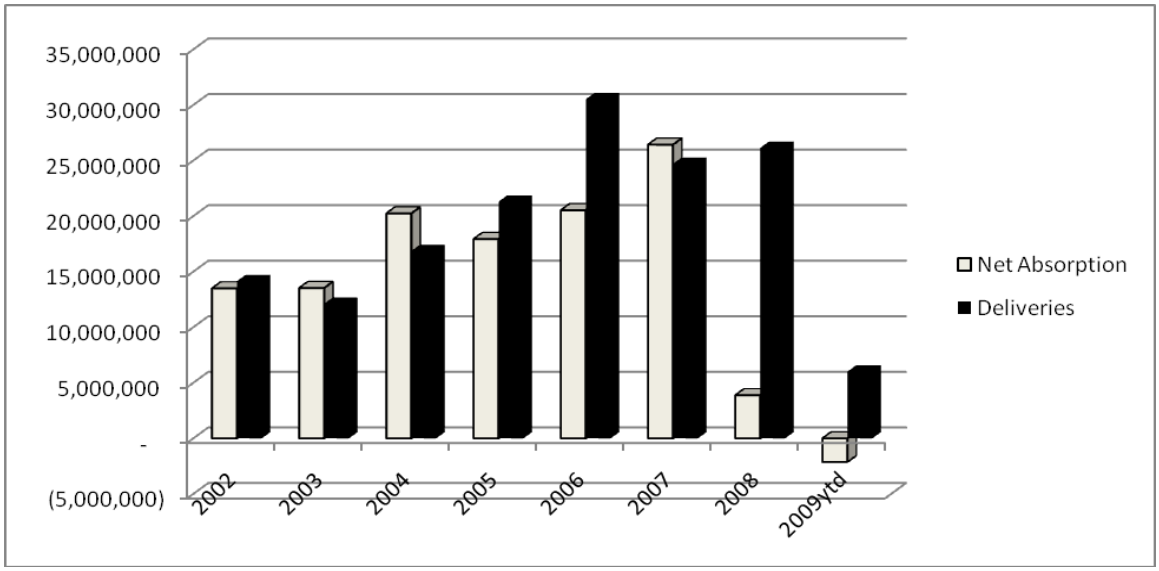
Inland Empire Industrial Market-Third Quarter 2009

	Flex	Warehouse	Totals
Existing Inventory			
Buildings	898	11,208	12,106
Rentable Area (SF)	18,500,803	469,245,404	487,746,207
Vacant Space			
Square Feet	3,095,039	56,638,402	61,733,441
Vacancy Rate	16.7%	12.5%	12.7%
YTD Net Absorption (SF)	-237,548	-1,878,529	-2,116,077
YTD Deliveries (SF)	123,449	5,882,011	6,005,460
Under Construction (SF)	0	405,611	405,611
Quoted Rates ($/SF/mo)	$0.90	$0.43	$0.45

Source: Costar Group, Inc., Stanley R. Hoffman Associates, Inc.

Industrial Absorption and Delivery History

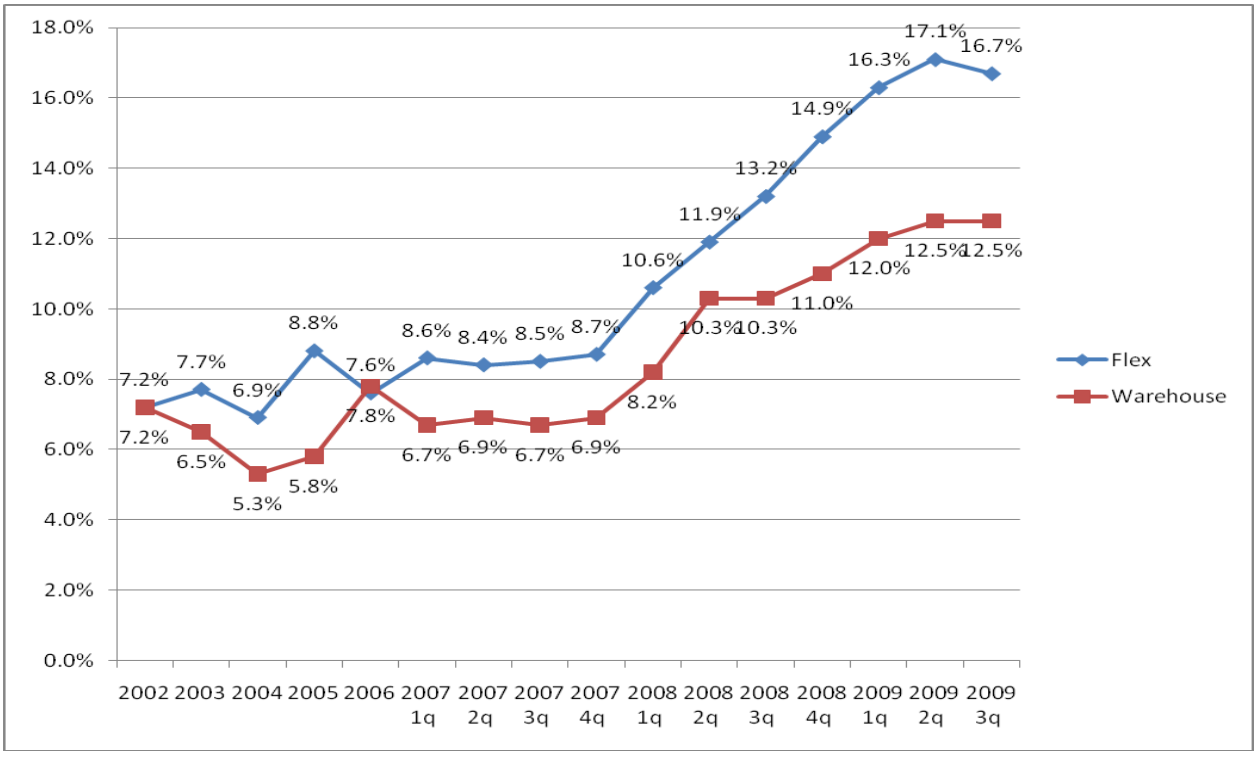
Inland Empire



Source: Costar Group, Inc., Stanley R. Hoffman Associates, Inc.

Industrial Vacancy Rate History

Inland Empire



Source: Costar Group, Inc., Stanley R. Hoffman Associates, Inc.

Recent Period Absorption Analysis
Inland Empire

	Office		Industrial	
Period	Total Square Feet	Average per Quarter	Total Square Feet	Average per Quarter
2009 YTD (3 quarters)	699,721	233,240	-2,116,077	-705,359
2008 (4 quarters)	128,423	32,105	3,877,134	969,284
2007 (4 quarters)	1,896,969	474,242	26,430,933	6,607,733
11 quarter totals	2,725,113	247,738	28,191,990	2,562,908

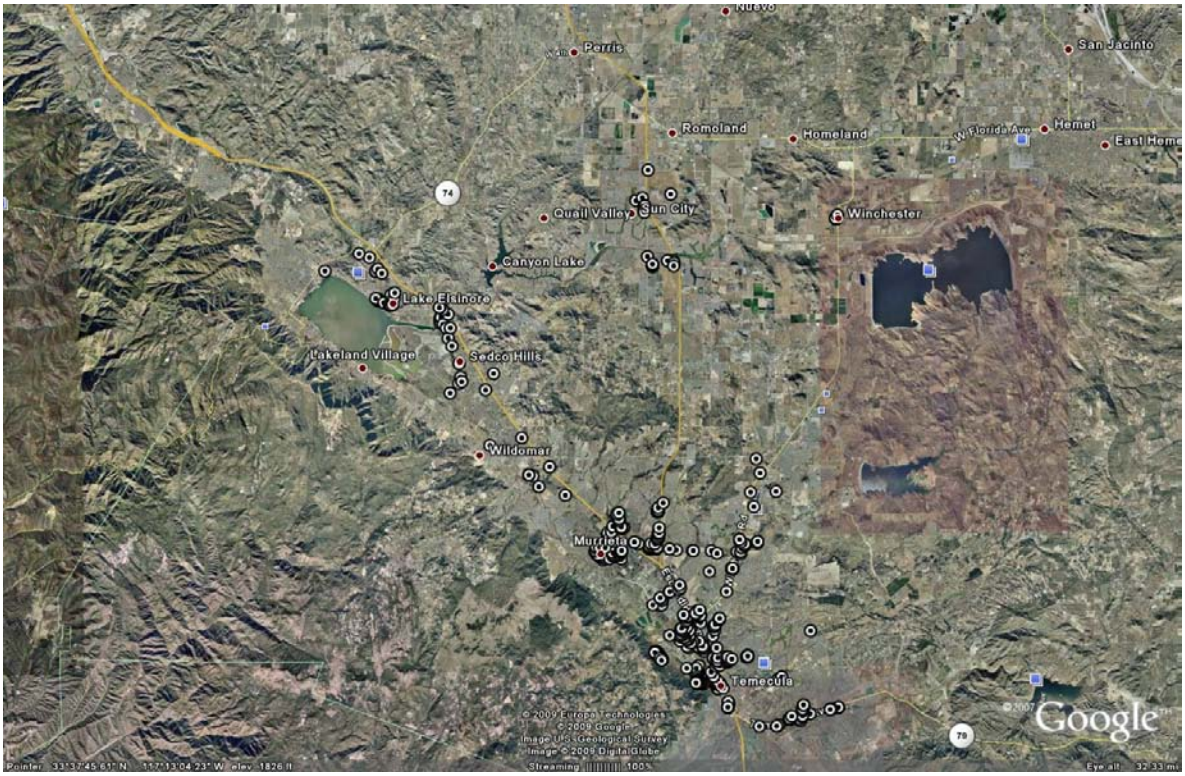
Source: Costar Group, Inc., Stanley R. Hoffman Associates

SOUTHWEST RIVERSIDE COUNTY

SOUTHWEST RIVERSIDE COUNTY OVERVIEW

- Includes areas between San Diego County line and Lake Elsinore on I-15, from Menifee south on I-215 to intersection with I-15, and from Winchester south on Highway 79 to intersection with I-15
- Includes cities of Murrieta, Temecula, Wildomar, and Lake Elsinore, and unincorporated communities such as French Valley, Winchester and surrounding areas
- Most significant concentrations of office buildings: city of Lake Elsinore along I-15 near Highway 74 and between I-15 and Lake Elsinore; city of Murrieta west of I-15, Highway 79 near Murrieta Hot Springs Road, and along I-215 near Golden Triangle; city of Temecula along I-15 (especially to the west near Rancho California Road) and along Highway 79
- Most significant concentrations of industrial buildings: city of Lake Elsinore near I-15; city of Murrieta west of I-15 and in Golden Triangle; city of Temecula along I-215 (especially to west) and east of I-15 near county line; French Valley along Highway 79

Southwest Riverside County Office Buildings



Southwest Riverside County Office Market by Area

Third Quarter 2009

	Murrieta	Temecula	I-15 Corridor	I-215 & SR 79	Totals
Existing Inventory					
Buildings	106	182	44	19	351
Rentable Area (SF)	1,728,772	2,699,505	410,985	272,145	5,111,407
Vacant Space					
Square Feet	398,258	566,030	94,985	63,576	1,122,849
Vacancy Rate	23.0%	21.0%	23.1%	23.4%	22.0%
YTD Net Absorption (SF)	38,307	90,480	25,296	26,880	180,963
YTD Deliveries (SF)	57,961	44,845	23,434	32,958	159,198
Under Construction (SF)	0	0	0	0	0
Quoted Rates ($/SF/mo)	$1.84	$1.59	$2.04	$2.12	$1.60

Source: Costar Group, Inc., Stanley R. Hoffman Associates, Inc.

Southwest Riverside County Office Market by Class

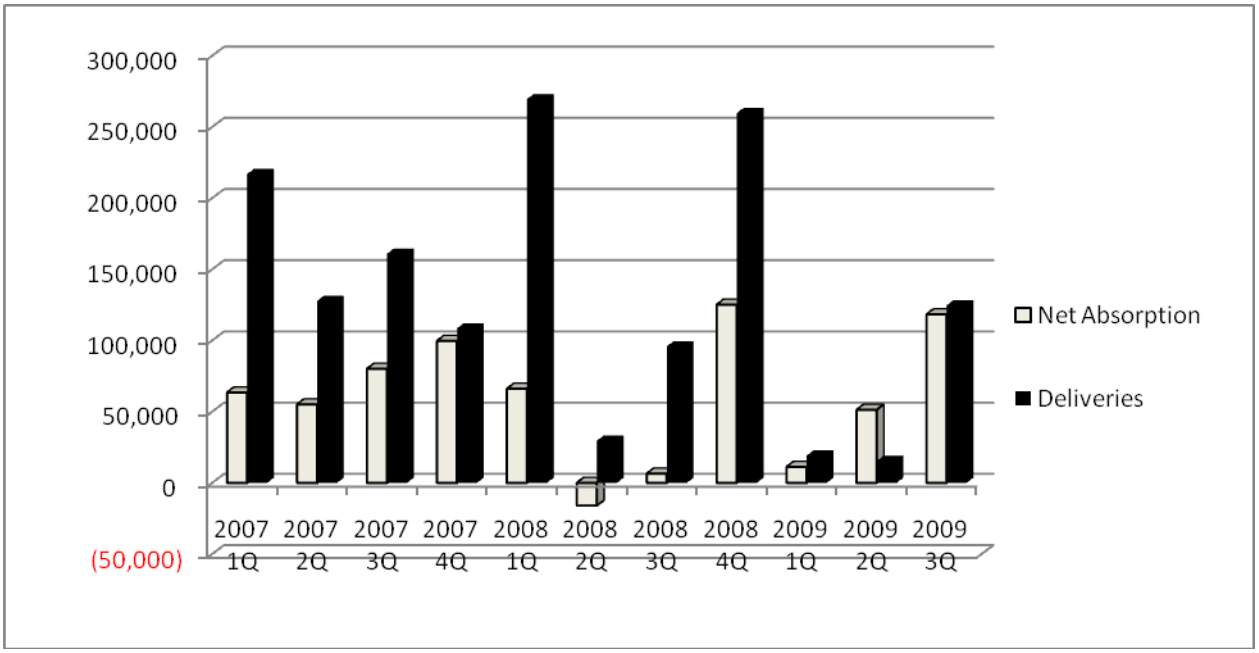
Third Quarter 2009

	Class A	Class B	Class C	Totals
Existing Inventory				
Buildings	17	238	96	351
Rentable Area (SF)	924,749	3,479,210	707,448	5,111,407
Vacant Space				
Square Feet	315,016	727,893	79,940	1,122,849
Vacancy Rate	34.1%	20.9%	11.3%	22.0%
Quoted Rates ($/SF/mo)	$1.74	$1.60	$1.36	$1.60

Source: Costar Group, Inc., Stanley R. Hoffman Associates, Inc.

Office Absorption and Delivery History

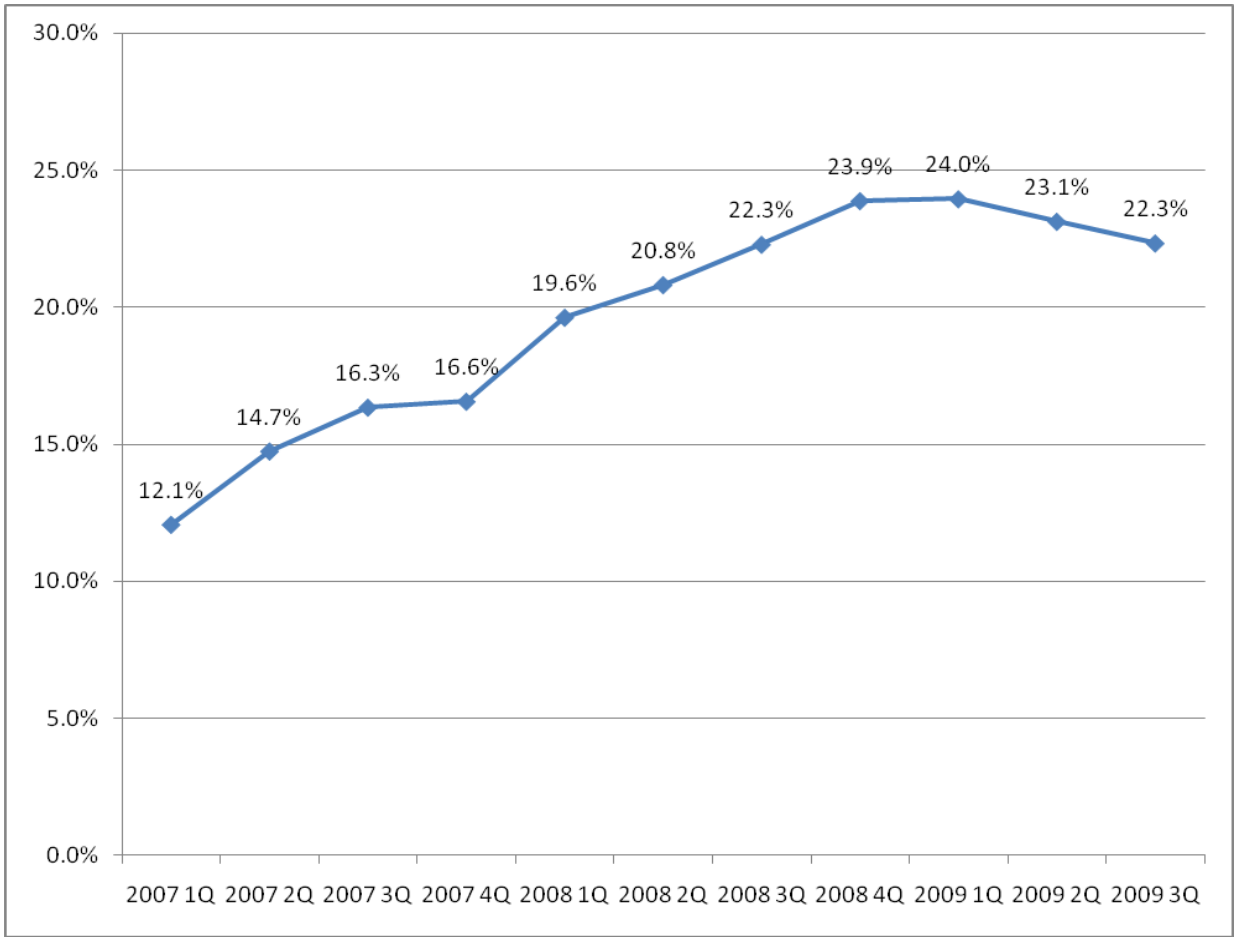
Southwest Riverside County



Source: Costar Group, Inc., Stanley R. Hoffman Associates, Inc.

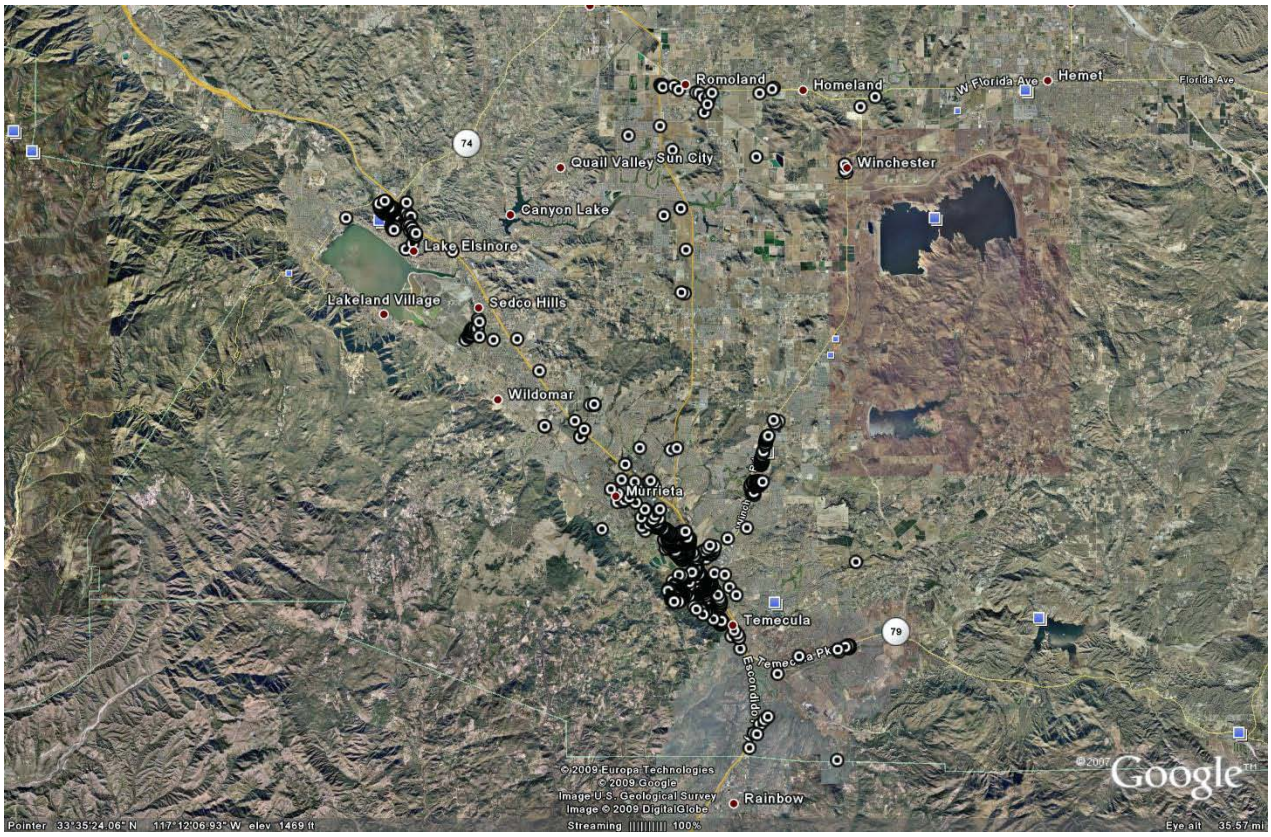
Office Vacancy Rate History

Southwest Riverside County



Source: Costar Group, Inc., Stanley R. Hoffman Associates, Inc.

Southwest Riverside County Industrial Buildings



Southwest Riverside County Industrial Market by Area

Third Quarter 2009

	Murrieta	Temecula	I-15 Corridor	I-215 & SR 79	Total
Existing Inventory					
Buildings	416	422	180	26	1,044
Rentable Area (SF)	6,063,356	11,687,450	2,556,296	733,852	21,040,954
Vacant Space					
Square Feet	801,775	1,349,450	244,145	1,350	2,396,720
Vacancy Rate	13.2%	11.5%	9.6%	0.2%	11.4%
YTD Net Absorption (SF)	-105,952	-252,525	-69,902	4,650	-423,729
YTD Deliveries (SF)	0	0	9,200	0	9,200
Under Construction (SF)	0	0	0	0	0
Quoted Rates ($/SF/mo)	$0.81	$0.58	$0.74	na	$0.71

Source: Costar Group, Inc., Stanley R. Hoffman Associates, Inc.

Southwest Riverside County Industrial Market by Type

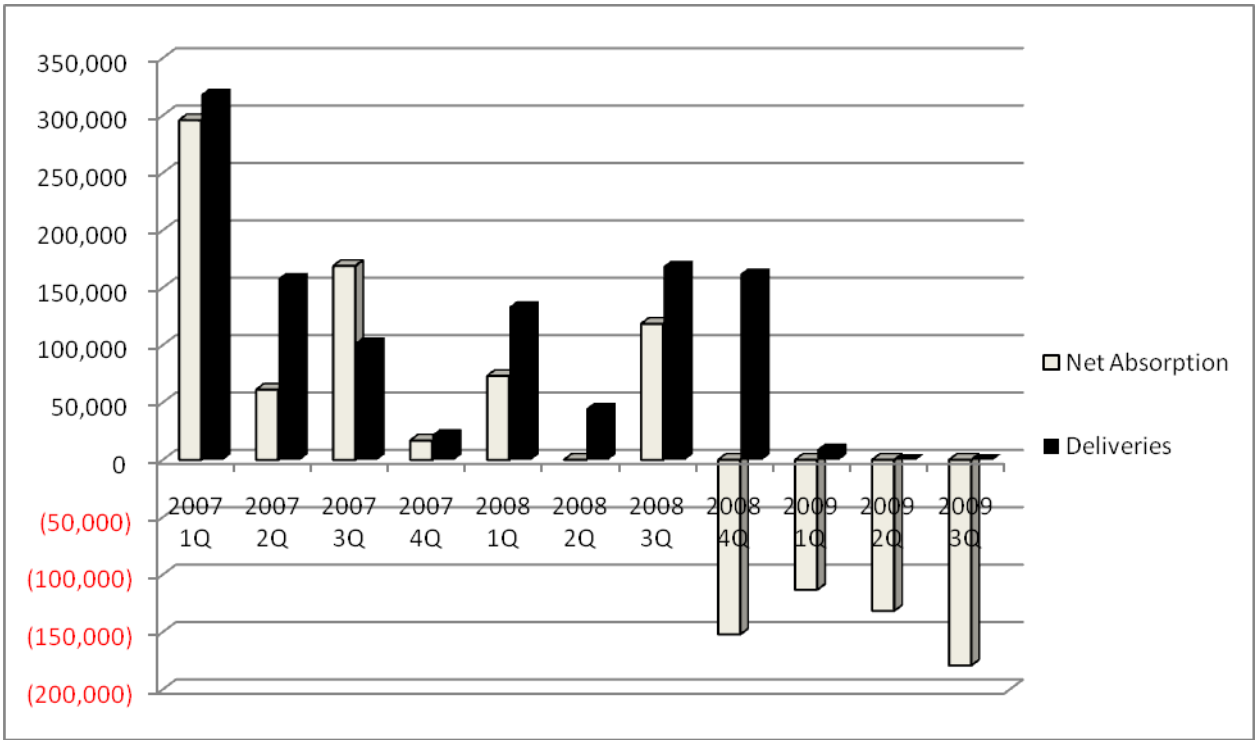
Third Quarter 2009

	Flex	Warehouse	Total
Existing Inventory			
Buildings	120	924	1,044
Rentable Area (SF)	2,364,256	18,676,698	21,040,954
Vacant Space			
Square Feet	541,373	1,855,347	2,396,720
Vacancy Rate	22.9%	9.7%	11.4%
Quoted Rates ($/SF/mo)	$0.69	$0.71	$0.71

Source: Costar Group, Inc., Stanley R. Hoffman Associates, Inc.

Industrial Absorption and Delivery History

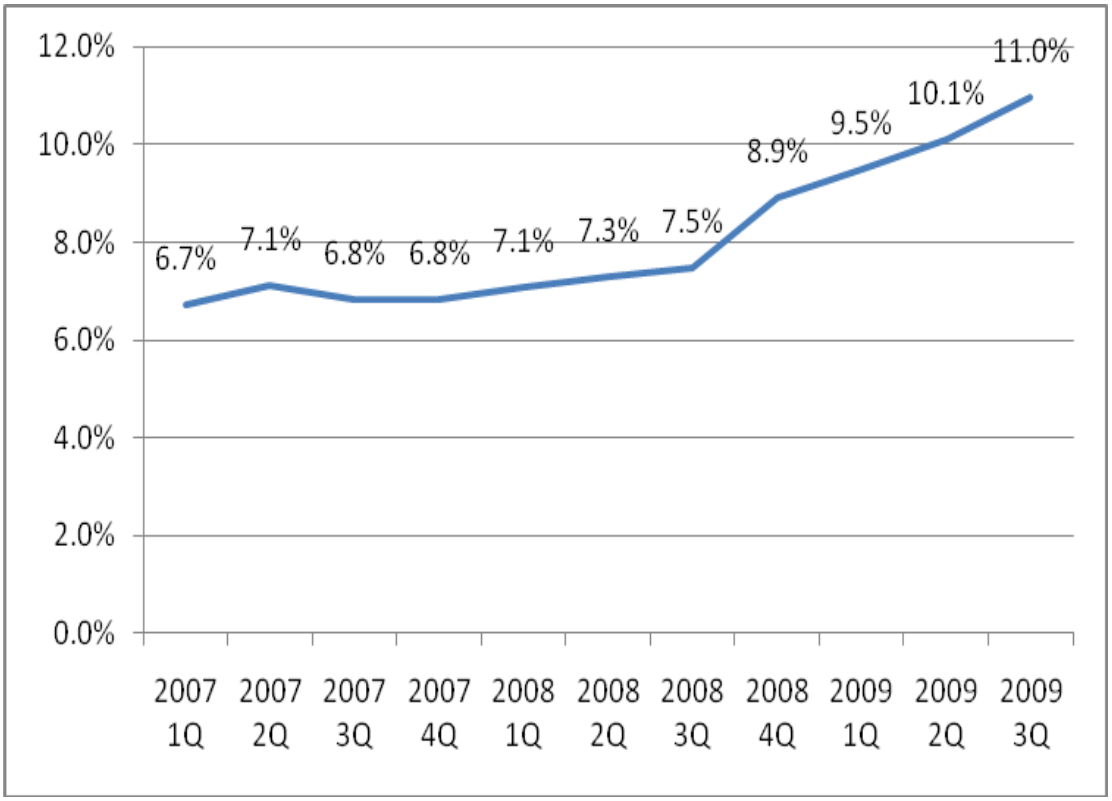
Southwest Riverside County



Source: Costar Group, Inc., Stanley R. Hoffman Associates, Inc.

Industrial Vacancy Rate History

Southwest Riverside County



Source: Costar Group, Inc., Stanley R. Hoffman Associates, Inc.

Recent Period Absorption Analysis
Southwest Riverside County

	Office		Industrial	
Period	Total Square Feet	Average per Quarter	Total Square Feet	Average per Quarter
2009 YTD (3 quarters)	180,963	60,321	-423,729	-141,243
2008 (4 quarters)	181,857	45,464	39,696	9,924
2007 (4 quarters)	298,413	74,603	542,699	135,675
11 quarter totals	661,233	60,112	158,666	14,424

CITY OF MURRIETA

City of Murrieta Office Buildings - Existing

City of Murrieta Office Market by Class

Third Quarter 2009

	Class A	Class B	Class C	Totals
Existing Inventory				
Buildings	8	68	30	106
Rentable Area (SF)	404,701	1,184,617	139,454	1,728,772
Vacant Space				
Square Feet	144,045	246,881	7,332	398,258*
Vacancy Rate	35.6%	20.8%	12.4%	23.0%
Quoted Rates ($/SF/mo)	$1.90	$1.59	$0.95	$1.63

*Total available space of 457,801 square feet includes any space that is currently offered as available for lease, whether vacant, occupied, available for sublease, or available at a future date.

Source: Costar Group, Inc., Stanley R. Hoffman Associates, Inc.

City of Murrieta Office Market by Use Type

Third Quarter 2009

	General Office	Medical Office	Total
Existing Inventory			
Buildings	70	36	106
Rentable Area (SF)	1,028,167	700,605	1,728,772
Vacant Space			
Square Feet	287,927	110,331	398,258*
Vacancy Rate	28.0%	15.9%	23.0%
Quoted Rates ($/SF/mo)	$1.90	$1.59	$1.63

*Total available office space of 457,801 square feet includes any space that is currently offered as available for lease, whether vacant, occupied, available for sublease, or available at a future date.

Source: Costar Group, Inc., Stanley R. Hoffman Associates, Inc.

City of Murrieta Office Rent* Analysis
Third Quarter 2009

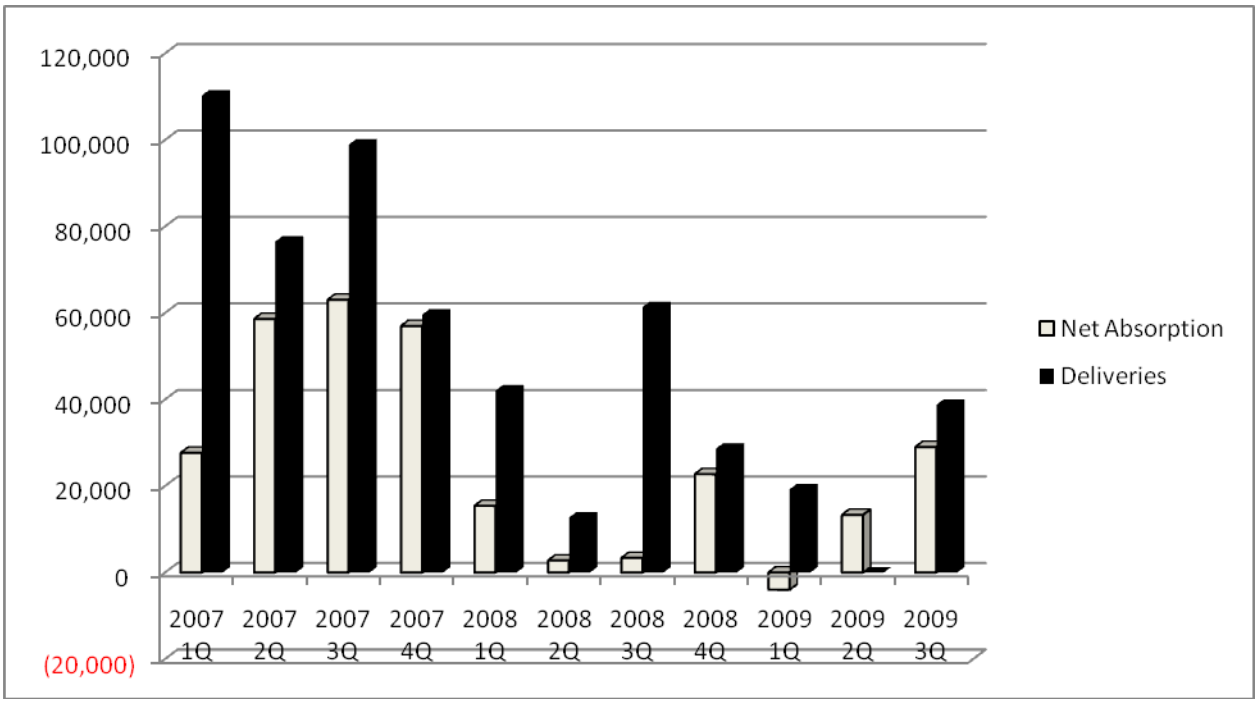
	Direct Spaces				Sublet Spaces				Total
Building & Rent Type	**# Spaces**	**Min**	**Avg**	**Max**	**# Spaces**	**Min**	**Avg**	**Max**	**Avg**
Medical									
Modified Gross	1	$ 1.15	$ 1.15	$ 1.15	0	-	-	-	$ 1.15
Triple Net	1	$ 1.95	$ 1.95	$ 1.95	0	-	-	-	$ 1.95
Office/Medical									
Full Service Gross	0	-	-	-	12	$ 2.86	$ 3.18	$ 3.96	$ 3.18
Modified Gross	3	$ 1.10	$ 1.21	$ 1.50	0	-	-	-	$ 1.21
Triple Net	13	$ 1.40	$ 1.58	$ 2.00	0	-	-	-	$ 1.58
Office/Retail									
Triple Net	2	$ 0.95	$ 0.95	$ 0.95	0	-	-	-	$ 0.95
Office									
Full Service Gross	13	$ 1.00	$ 1.86	$ 5.39	0	-	-	-	$ 1.86
Modified Gross	83	$ 0.75	$ 1.65	$ 4.17	4	$ 0.95	$ 1.35	$ 2.20	$ 1.63
Negotiable	56	-	-	-	0	-	-	-	-
TBD	7	-	-	-	0	-	-	-	-
Triple Net	27	$ 0.95	$ 1.83	$ 2.35	0	-	-	-	$ 1.83

*Numbers indicate asking face rent, without concessions, based on listings for lease. Rental rate data in other tables reflects terms of existing leases.

Source: Costar Group, Inc., Stanley R. Hoffman Associates, Inc.

Office Absorption and Delivery History

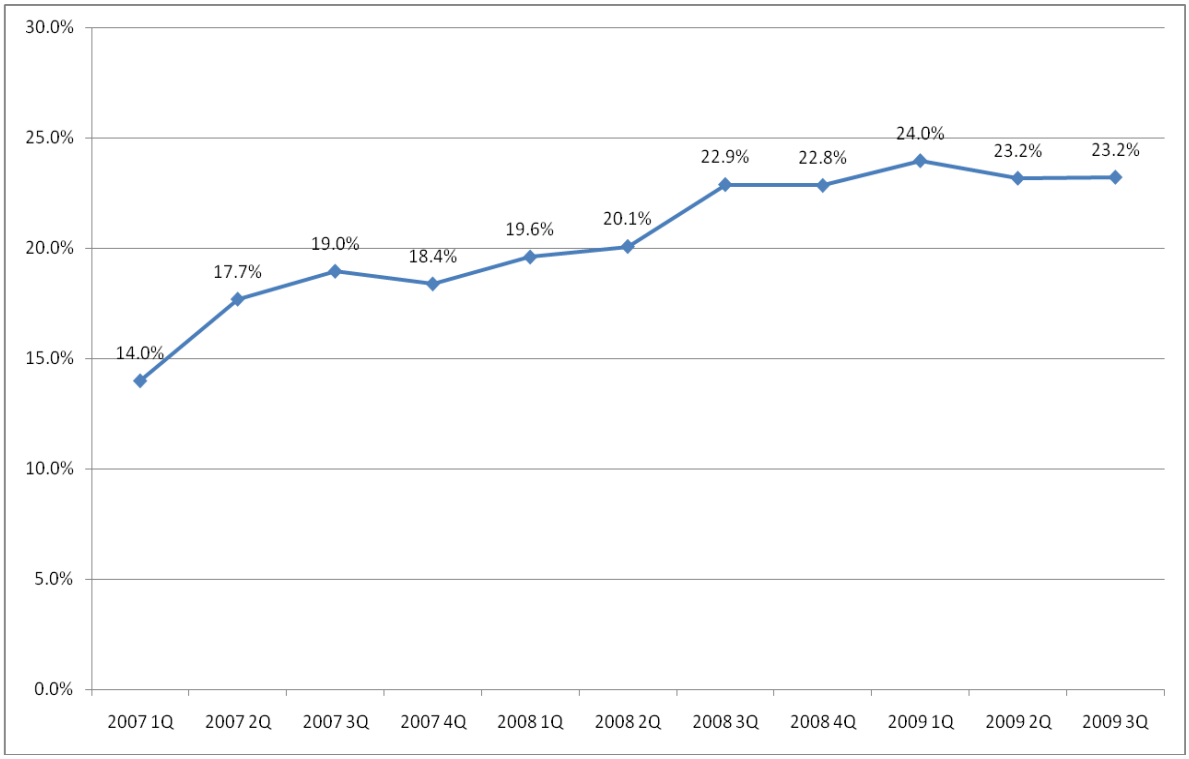
City of Murrieta



Sources: Costar Group, Inc., Stanley R. Hoffman Associates, Inc.

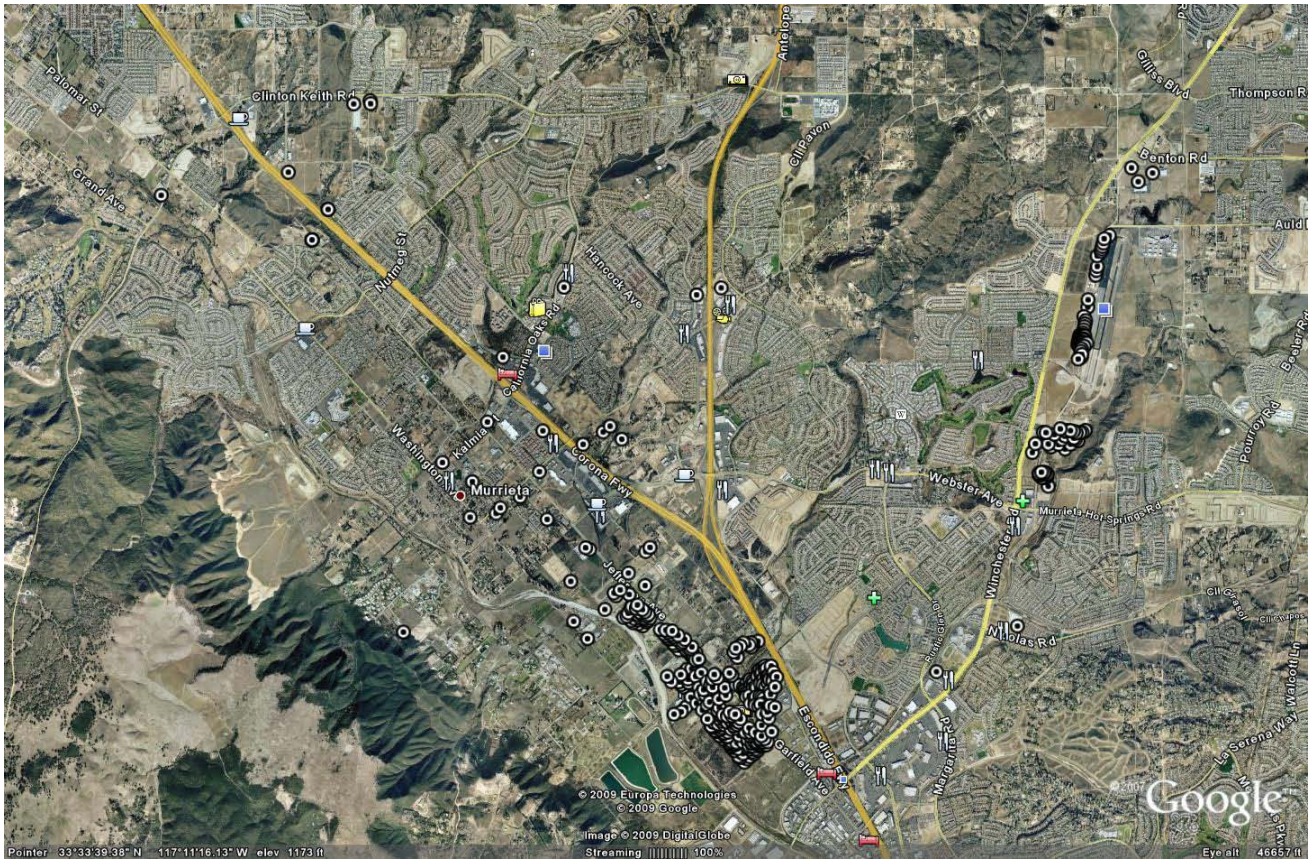
Office Vacancy Rate History

City of Murrieta



Sources: Costar Group, Inc., Stanley R. Hoffman Associates, Inc.

City of Murrieta Industrial Buildings - Existing



City of Murrieta Industrial Market by Building Type

Third Quarter 2009

	Flex	Warehouse	Total
Existing Inventory			
Buildings	74	342	416
Rentable Area (SF)	1,022,048	5,041,308	6,063,356
Vacant Space			
Square Feet	164,458	637,317	801,775*
Vacancy Rate	16.1%	12.6%	13.2%
Quoted Rates ($/SF/mo)	$0.80	$0.73	$0.74

*Total available industrial space of 998,958 square feet includes any space that is currently offered as available for lease, whether vacant, occupied, available for sublease, or available at a future date.

Source: Costar Group, Inc., Stanley R. Hoffman Associates, Inc.

City of Murrieta Industrial Rent* Analysis

Third Quarter 2009

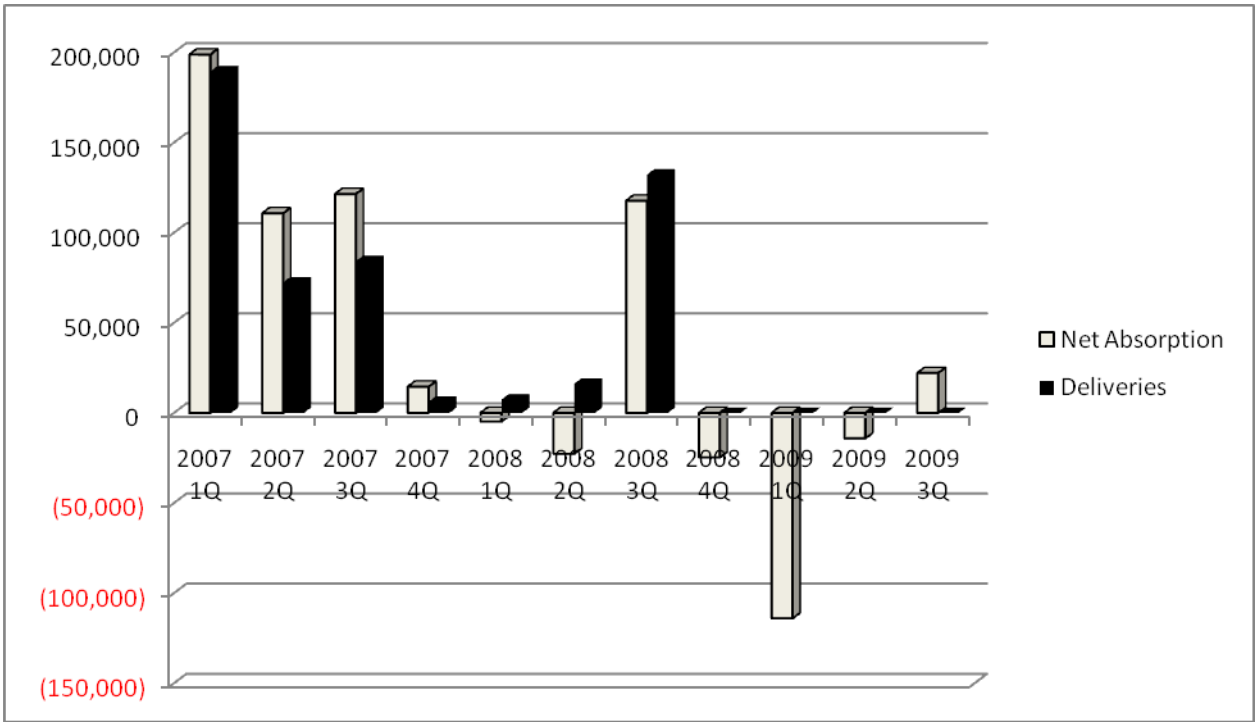
	Direct Spaces				Sublet Spaces				Total
Building & Rent Type	**# Spaces**	**Min**	**Avg**	**Max**	**# Spaces**	**Min**	**Avg**	**Max**	**Avg**
Flex									
Full Service Gross	1	$ 0.65	$ 0.65	$ 0.65	0	-	-	-	$ 0.65
Industrial Gross	2	$ 0.80	$ 0.90	$ 1.00	0	-	-	-	$ 0.90
Modified Gross	36	$ 0.69	$ 0.86	$ 1.34	0	-	-	-	$ 0.86
Negotiable	17	-	-	-	5	-	-	-	-
Triple Net	8	$ 0.95	$ 1.07	$ 1.25	0	-	-	-	$ 1.07
Office									
Full Service Gross	2	$ 1.09	$ 1.14	$ 1.15	0	-	-	-	$ 1.14
Modified Gross	53	$ 0.65	$ 1.00	$ 1.75	1	$ 1.00	$ 1.00	$ 1.00	$ 1.00
Plus Electric	2	$ 0.75	$ 0.77	$ 0.80	0	-	-	-	$ 0.77
Triple Net	7	$ 0.58	$ 0.87	$ 1.35	0	-	-	-	$ 0.87
Retail									
Modified Gross	4	$ 0.95	$ 1.31	$ 1.50	0	-	-	-	$ 1.31
Triple Net	1	$ 1.35	$ 1.35	$ 1.35	0	-	-	-	$ 1.35
Warehouse									
Full Service Gross	2	$ 0.39	$ 0.44	$ 0.50	0	-	-	-	$ 0.44
Industrial Gross	28	$ 0.45	$ 0.56	$ 1.65	2	$ 0.68	$ 0.68	$ 0.68	$ 0.57
Modified Gross	82	$ 0.39	$ 0.66	$ 1.50	3	$ 0.45	$ 0.52	$ 0.60	$ 0.65
Negotiable	26	-	-	-	0	-	-	-	-
TBD	3	-	-	-	0	-	-	-	-
Triple Net	19	$ 0.32	$ 0.52	$ 0.95	3	$ 0.44	$ 0.48	$ 0.49	$ 0.51

*Numbers indicate asking face rent, without concessions, based on listings for lease. Rental rate data in other tables reflects terms of existing leases.

Source: Costar Group, Inc., Stanley R. Hoffman Associates, Inc.

Industrial Absorption and Delivery History

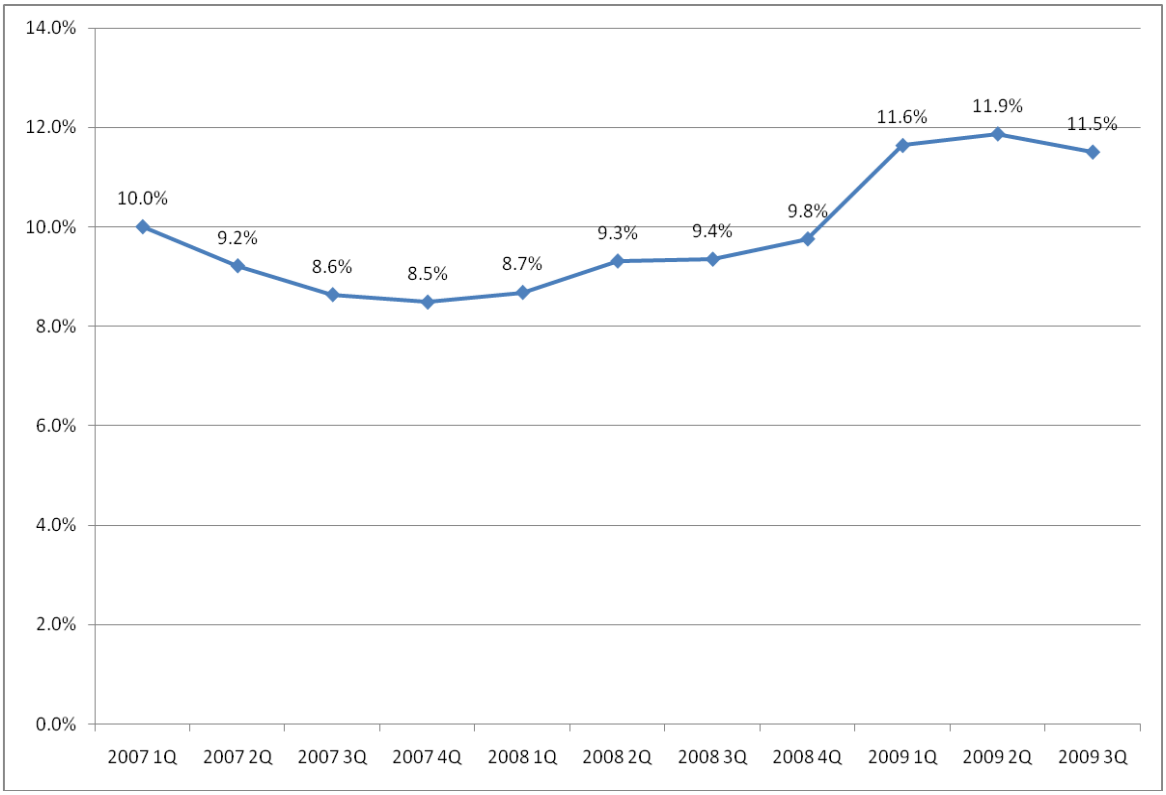
City of Murrieta



Source: Costar Group, Inc., Stanley R. Hoffman Associates, Inc.

Industrial Vacancy History

City of Murrieta



Source: Costar Group, Inc., Stanley R. Hoffman Associates, Inc.

Proposed Office Development – City of Murrieta

Building Address	Building Class	Rentable Building Area	Building Park	Developer Name	Number Of Stories
25230 Hancock Ave	A	78,000	Crossroads Corporate Center	Whitaker Investment Corporation	3
25250 Hancock Ave	A	39,018	Crossroads Corporate Center	Whitaker Investment Corporation	3
25480 Medical Center Dr	A	26,000	Murrieta Pointe II		2
23151 Palomar Rd	A	58,000	Palomar Office Center	Kal Pacific & Associates	2
Jackson Ave	B	80,322	Creekside Corporate Center	Truax Development	3
Jackson Ave	B	80,322	Creekside Corporate Center	Truax Development	3
Jackson Ave	B	80,322	Creekside Corporate Center	Truax Development	3
Jefferson Ave @ Murrieta Hot Springs	B	12,000		The Garrett Group	1
Kalmia St	B	47,817		Rossi Properties, Inc.	2
41864 Kalmia St	B	9,150			1
NEC Murrieta Hot Springs Rd	B	47,756	Springs Plaza		1
Winchester Rd	B	9,535	French Valley Crossings		1
City Total		**568,242**			

Source: Costar Group, Inc., Stanley R. Hoffman Associates, Inc.

Proposed Office Development Locations

City of Murrieta

Proposed Industrial Development

City of Murrieta

Building Address	Building Class	Rentable Building Area	Building Park	Property Type	Secondary Type
41166 Elm St	B	17,622		Flex	
SW Jefferson Ave @ Fig St.	A	8,300	Jefferson Business Park	Industrial	Showroom
Madison Ave @ Golden Gate Circle	B	7,500	Madison & Golden Gate Business Park	Industrial	Distribution
Madison Ave @ Golden Gate Circle	B	7,500	Madison & Golden Gate Business Park	Industrial	Distribution
City Total		**40,922**			

Sources: Costar Group, Inc., Stanley R. Hoffman Associates, Inc.

Proposed Industrial Development Locations

City of Murrieta

Recent Period Absorption Analysis
City of Murrieta

	Office		Industrial	
Period	Total Square Feet	Average per Quarter	Total Square Feet	Average per Quarter
2009 YTD (3 quarters)	38,307	12,769	-105,952	-35,317
2008 (4 quarters)	44,253	11,063	65,599	16,400
2007 (4 quarters)	206,263	51,566	445,532	111,383
11 quarter totals	288,823	26,257	405,179	36,834

Source: Costar Group, Inc., Stanley R. Hoffman Associates

Summary of Findings and Conclusions

Office

- The overall Inland Empire market office slowed significantly in 2008, absorbing space at an average net rate of just 32,105 square feet per quarter (128,423 square feet over 12 months) compared to 474,242 square feet average per quarter (1,896,969 square feet over 12 months) in 2007. For the first 3 quarters of 2009, Inland Empire office absorption is averaging 233,240 per quarter (932, 960 square feet annualized).
- Murrieta total office space of 1,728,772 square feet is 33.8% of total in Southwest Riverside County and 2.7% of total Inland Empire.
- Murrieta office space vacancy rate is 23.0%, compared to 22.0% for Southwest Riverside County and 17.2% for Inland Empire.
- Murrieta currently vacant office space of 398,258 square feet is 35.5% of total in Southwest Riverside County and 3.6% of total Inland Empire.
- Murrieta office inventory is 23.4% Class A, 68.5% Class B and 8.1% Class C.
- Medical office space is 40.5% of Murrieta office inventory; Medical office vacancy rate is 15.9%, compared to 28.0% for general office space.
- Currently proposed office development in Murrieta totals 568,242 square feet.
- In Murrieta, at the average rate of absorption experienced over the past 11 quarters (26,257 square feet average), currently available space (457,801 square feet) represents a 17 quarter (4 ¼ year) supply. At rate of absorption experienced in peak year of 2007 (51,566 square feet per quarter), current available space represents a 9 quarter (2 ¼ year) supply.
- As the Murrieta office market improves and evolves over future years, it will attract a growing proportion of professional, medical and technical employment, particular in buildings along major highway corridors and in the city's Golden Triangle area.

Summary of Findings and Conclusions

Industrial

- The overall Inland Empire market office dropped dramatically in 2008, absorbing space at an average net rate of just 969,284 square feet per quarter (3,877,134 square feet for 12 months) compared to 6,607,733 square feet average per quarter (26,430,933 square feet for 12 months) in 2007. For the first 3 quarters of 2009, Inland Empire office net absorption is averaging *negative* 705,309 per quarter (*negative* 2,821,236 square feet annualized).
- Murrieta total industrial space of 6,097,506 square feet is 28.8% of total in Southwest Riverside County and 1.2% of total Inland Empire.
- Murrieta industrial space vacancy rate is 10.8%, compared to 11.4% for Southwest Riverside County and 12.7% for Inland Empire.
- Murrieta currently vacant industrial space of 801,775 square feet is 33.5% of total in Southwest Riverside County and 1.3% of total Inland Empire.
- Murrieta industrial inventory is 83.1% warehouse/manufacturing and 16.9% flex.
- Currently proposed industrial development in Murrieta totals 40,922 square feet.
- In Murrieta, at the average rate of absorption experienced over the past 11 quarters (36,834 square feet average), currently available space (998,958 square feet) represents a 28 quarter (7 year) supply. At rate of absorption experienced in peak year of 2007 (111,383 square feet per quarter), current available space represents a 9 quarter (2 ¼ year) supply.
- As the Murrieta Industrial market improves and evolves over future years, it is well- positioned in both geographic and demographic terms to attract a range of Research & Development (R&D) and Light Industrial users.

Appendix R:

Murrieta Economic Trends & Conditions Report

DRAFT

Economic Trends and Conditions
Murrieta General Plan Update

Prepared for:

The City of Murrieta
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Attn: Mary D. Lanier, Community Development Director

January 7, 2010

SRHA Job # 1200

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CHAPTER 1
INTRODUCTION

1.1 Overview/Purpose

The purpose of this report is to provide an understanding of the demographic and economic conditions and trends in the City of Murrieta and its surrounding region. This information provides the background for evaluating significant economic issues, goals and policies related to the City of Murrieta's General Plan update process.

This economic trends report presents key findings from analyses of employment, demographic, residential and commercial market trends. These findings will facilitate discussion of existing and future economic development efforts and provide the framework for preparing the General Plan Economic Element goals and policies. These goals and policies will be developed in consultation with City Staff to ensure that the City recognizes and takes advantage of opportunities in the economic growth context of the surrounding Temecula Valley Sub-region, San Diego County and Riverside County.

The current General Plan update process is especially challenging given the recent economic downturn. Historically Murrieta benefitted from the housing boom preceding the downturn, which resulted in growth in household demand for local services and retail development. The City is now faced with the challenge of identifying new sources of growth which are more diversified and adaptable to recessionary pressures. In this context, one policy thrust is to encourage the expansion of the City's export base employment that would provide local job options to its highly skilled and educated workforce, currently experiencing high levels of out-commuting. Further, a diversified economy would provide local job opportunities to the City's workforce with the potential for increased wage levels, thus stimulating further demand for local services and retail development, particularly regional retail development.

Expansion of economic activity can lead to the increased generation of public revenues for ongoing services and capital improvements in order to maintain a high quality of life. Infrastructure investments will need to be prioritized along with new financing sources in addition to redevelopment property tax increment.

1.2 Murrieta and its Regional Context

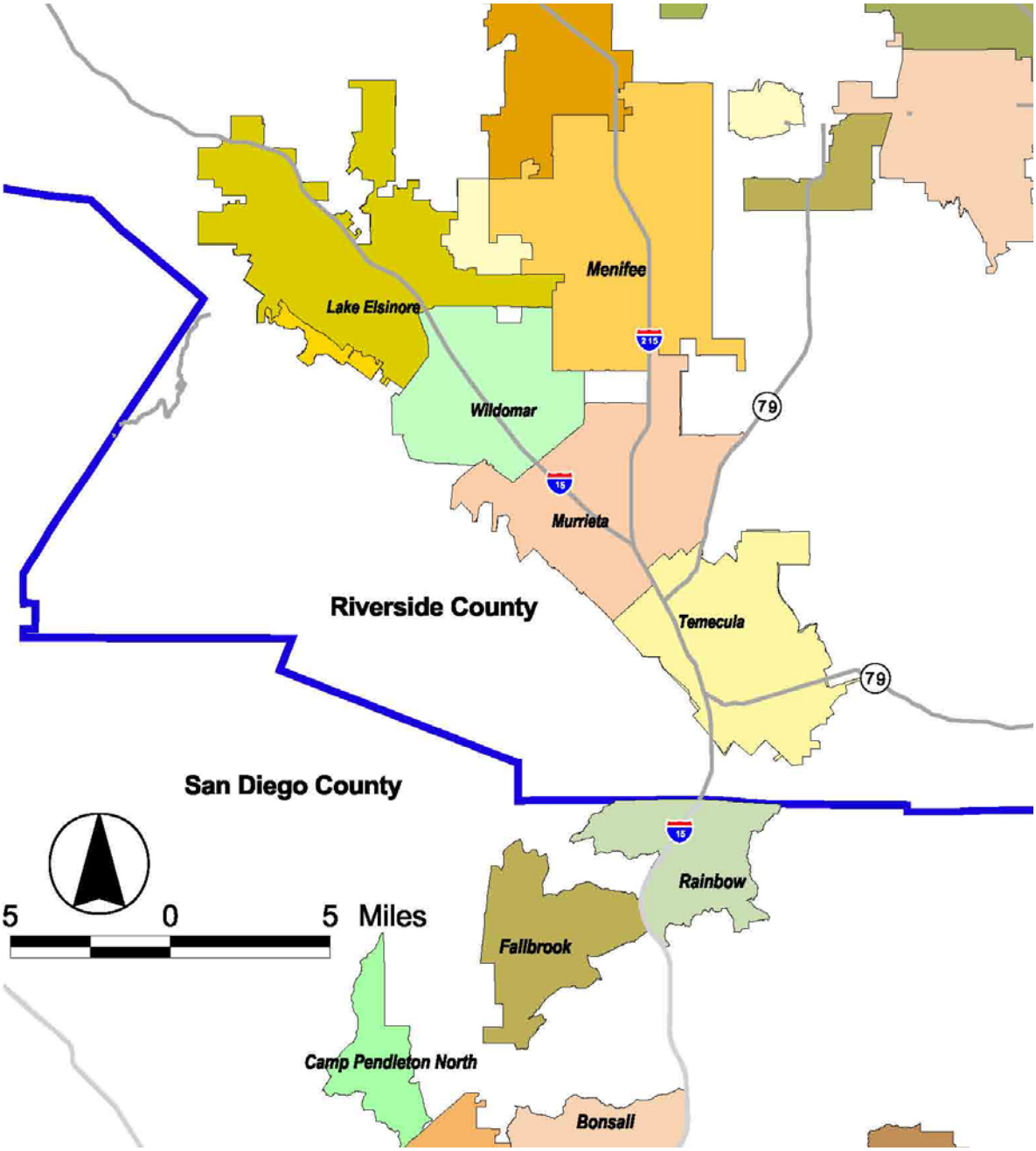
The City of Murrieta is located in southwestern Riverside County, immediately north of the City of Temecula and San Diego County border, as shown in Figure 1-1. Murrieta and the surrounding cities of Temecula to the southeast, Menifee to the northeast and Wildomar to the northwest, along with the unincorporated areas northerly and easterly of Murrieta along the I-215 and Highway 79 corridors, taken together are defined in this study as the Temecula Valley Sub-region.

As shown in Figure 1-1, the city is well served by two freeways that traverse the city in a generally north-south direction: 1) Interstate Highway 15; and 2) Interstate Highway 215. The city is also served by the north-south Winchester Corridor (Highway 79). This corridor begins to the south in Temecula at its intersection with Interstate Highway 15 and proceeds northerly along the eastern side of Murrieta and continues through the City of Menifee, eventually reaching Interstate Highway 10, which is a major east-west interstate corridor.

At present, rail transportation to other Southern California locations is accessed from the Metrolink station located in the City of Corona 31 miles north of Murrieta. Plans to extend the rail network to southwest Riverside County are currently underway. Further, several stations along the California High Speed Rail are planned within the Temecula Valley Region, with one station being located somewhere within the City of Murrieta in the general vicinity of the confluence of Interstate 15 and Interstate 215. This area, called the "Golden Triangle", is positioned to become a major regional node of business, retail and residential development.

Further, the Temecula Valley sub-region is served by several major airports, including the Ontario International Airport in San Bernardino County to the north located within 49 miles of Murrieta, the John Wayne Airport in Orange County at about 65 miles, the San Diego International Airport at 68 miles to the southwest and the Los Angeles International Airport located in the City of Los Angeles about 68 miles from Murrieta.

Figure 1-1
Regional Context Map



Source: Stanley R. Hoffman Associates, Inc.

1.3 Sources of Information

This study is based upon information from several sources including:

- Annual employment data from 2005 to 2008 and the first quarter of 2009 from the California Employment Development Department (EDD) and the Census Longitudinal Employee Household Dynamics (LEHD).
- Demographic data from the 2000 U.S. Bureau of the Census, American Community Survey 2008, and the California Department of Finance, 1991 to 2009;
- Taxable sales data for Murrieta and nearby communities for the 1997 to 2007 time period from the California State Board of Equalization;
- Office and industrial market trends data for Murrieta and the Temecula Valley sub-region from Co Star for the 2007 to 2009 time period.
- Residential building activity data from 1996 to 2008 from the Census Bureau for Murrieta and Temecula.
- Retail market inventory data from CB Richard Ellis, Co Star and field surveys undertaken by the consultants in Murrieta and its surrounding areas through December 2009.
- Revenue and expenditure trends from fiscal years 2000-01 to 2009-10 for the City's General Fund, Library Fund, Community Services District and Fire Fund.

1.4 Overview of the Report

The following sections of the report address the existing demographics and market conditions in the City, as well as economic trends:

- Chapter 2 summarizes key findings and conclusions of this study.
- Chapter 3 examines the economic base of Murrieta and provides comparisons with the Temecula Valley Sub-region, Riverside County, San Diego County and Southern California;
- Chapter 4 provides information on demographic conditions and trends for the City and surrounding areas;
- Chapter 5 presents data on residential trends including housing price, construction trends and permitting activity for the City and surrounding areas;
- Chapter 6 provides information on commercial trends and conditions, including taxable retail sales, retail inventory and office and industrial development activity for the City and surrounding areas;
- Chapter 7 discusses revenue and expenditure trends from fiscal years 2000-01 to 2009-10 for the City's General Fund, Library Fund, Community Services District and Fire Fund;
- Appendix A presents technical tables used in the economic base analysis;
- Appendix B is the list of contacts and references used in this study.

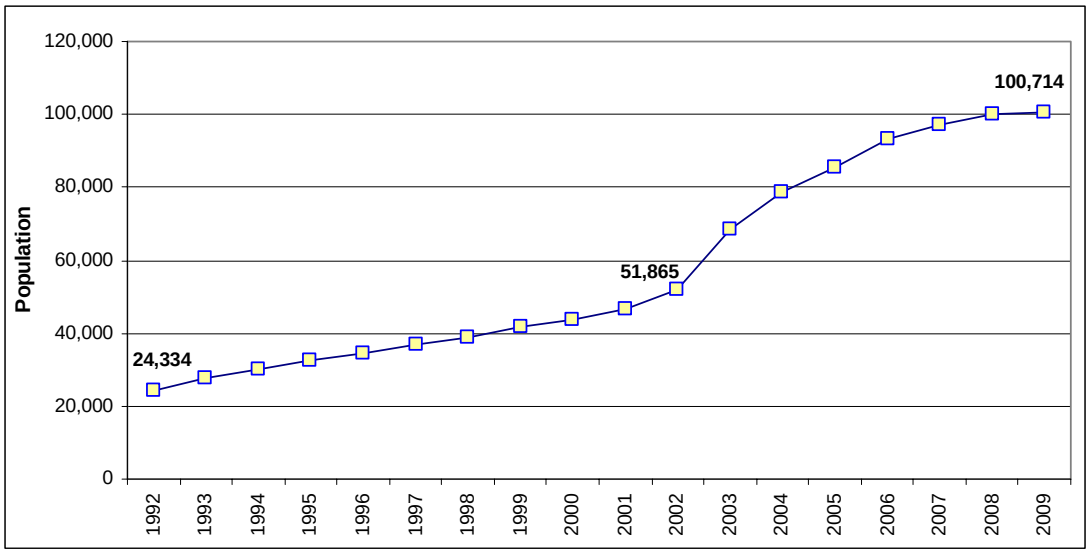
CHAPTER 2
SUMMARY AND KEY FINDINGS

The findings and conclusions of this study are summarized here under the various sub-heading as detailed further in the chapters of this study. The points presented below emphasize the most critical dimensions of the City's present state of affairs and identifies key challenges and opportunities for future growth prospects. These critical dimensions include the City's economic base, demographic attributes, regional location and accessibility, and commercial trends.

Demographic Trends

- The City of Murrieta was incorporated in 1991with an estimated population of 24,334 at the beginning of 1992, according to the California Department of Finance (DOF).
- As shown in Figure 2-1, the City's population grew to 51,865 in 2002, more than doubling over a 10-year period.
- Population growth rate accelerated rapidly over the 2002 to 2007 time period, with population almost doubling from 51,865 in 2002 to 97,329 in 2007 in just 5 years.
- The City's population was estimated to have reached 100,714 by January 2009.

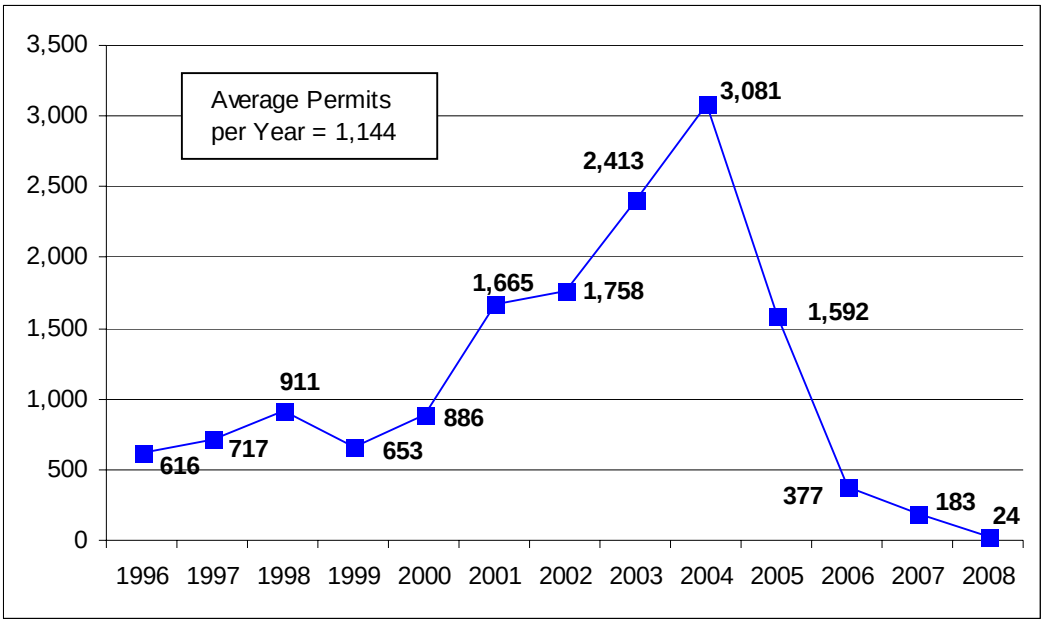
Figure 2-1
Historic Population
City of Murrieta
1992 to 2009



Source: Stanley R. Hoffman Associates, Inc.
California Department of Finance, 1992 to 2009

- As shown in Figure 2-2, this rapid population growth over the 2002 to 2007 time period was led by high levels of residential construction, as shown by permitting activity over 2001 to 2005 relative to the preceding 5-year time period.
- As shown in Figure 2-2, residential permitting activity slowed down beginning 2006.
- Residential permitting activity declined from 1,592 units in 2005 to 377 units in 2006, well below the1996 to 2008 average of 1,144 per year.
- This decline continued into 2008 when permits for only 24 residential units were granted.
- The City's population grew at an annual average growth rate of 8.71 percent over the 1992 to 2009 time period compared to overall Riverside County, which grew at 3.0 percent per annum over this time period.
- The number of households in the City of Murrieta increased from 7,538 in 1992 to 32,677 in 2009 with the average household size decreasing from 3.22 in 1992 to 3.06 in 2009.

Figure 2-2
Residential Building Units Permitting Activity
City of Murrieta
1996 to 2008

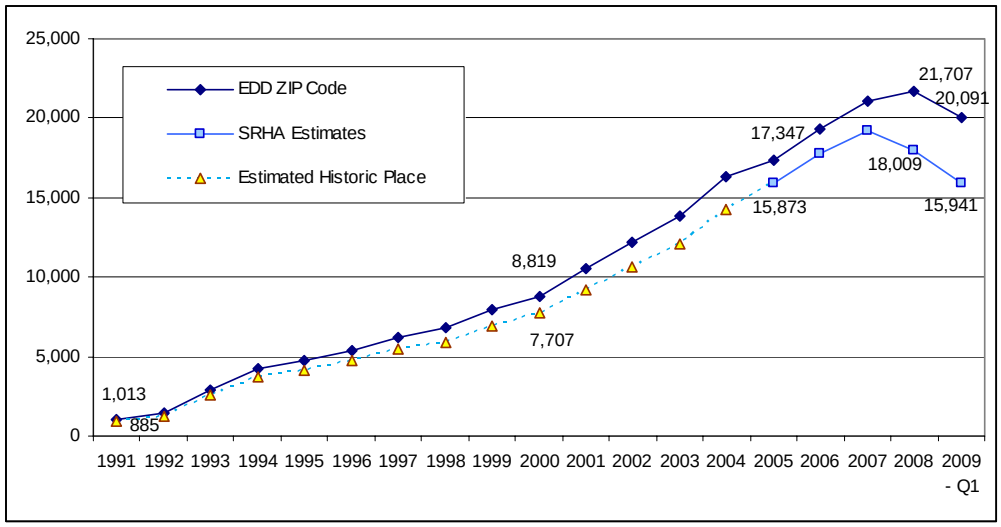


Source: Stanley R. Hoffman Associates, Inc.
U.S. Census Bureau

Historic Employment Trend: 1991 to First Quarter 2009

- Employment estimates for the City prepared for this report by Stanley R. Hoffman Associates, Inc. (SRHA estimates) based on data obtained from the California Employment Department (EDD) at the place code level indicate that employment in the City grew from 885 jobs in 1991 to an annual average of 18,009 jobs by 2008, as shown in Figure 2-3.
- In an earlier study prepared for the City in 2006 by Economics and Politics, Inc. employment estimates for the City were assembled by aggregating ZIP codes in the City, which would then also include areas in unincorporated Riverside County. This data showed employment growing from 1,013 in 1991 to 17,347 in 2005. Data update for this geography indicates employment to have reached a peak of 21,707 by 2008, declining to 20,091 by the first quarter of 2009.
- Based on recent place code data from EDD for the first quarter of 2009, the SRHA estimates indicate a significant decline of 2,068 jobs from the year 2008 in City employment to 15,941 jobs, reflecting the ongoing national economic downturn.
- Most of the recent job losses in the City have been concentrated in local serving sectors like Retail, Construction, and Accommodation and Food services.

Figure 2-3
Long-term Employment Trend
City of Murrieta
Annual 1991 to First Quarter 2009



1. EDD ZIP code data is included here to draw comparisons with the Economic and Politics, Inc. report prepared for the City in 2006. Zip code data from 1991 to 2005 was obtained from the Economics and Politics, Inc. report and ZIP code updates for 2005 to 2009 Q1 were obtained from EDD.
2. SRHA estimates prepared for the present report is based on EDD place code employment estimates adjusted for self-employment rate from 2005 to 2009 Q1.
3. Estimated Historic Place trend is based on the relationship between SRHA Estimates and EDD ZIP Code data over the 2005 to 2009 Q1 time period, as applied to the historic 1991 to 2005 ZIP code data.

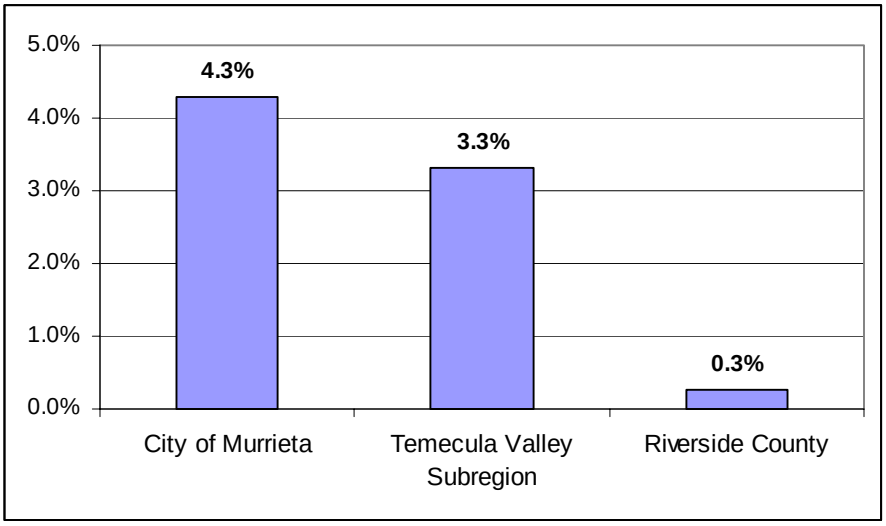
Source: Stanley R. Hoffman Associates, Inc.
Economics and Politics, Inc.
California Employment Development Department (EDD).

Regional Employment Growth Comparison: 2005 to 2008

- Based on the SRHA estimates, total employment in the City grew from 15,873 in 2005 to 18,009 in 2008 at an annual average growth rate of 4.3 percent, as shown in Figure 2-4.
- In comparison, employment in the surrounding Temecula Valley Region grew at 3.3 percent, while Riverside County stayed flat.
- A shown, the City's share of the surrounding Temecula Valley sub-region increased slightly from 20.8 percent in 2005 to 21.4 percent in 2008.

Figure 2-4
Regional Employment Growth
Murrieta and Surrounding Areas
2005 to 2008

	2005	2006	2007	2008	Annual Average Growth Rate 2005 to 2008
City of Murrieta	15,873	17,780	19,253	18,009	4.3%
Temecula Valley Sub-region	76,387	83,917	86,331	84,296	3.3%
City as % Sub-region	20.8%	21.2%	22.3%	21.4%	
Riverside County	662,712	693,857	694,155	667,844	0.3%
Sub-region as % County	11.5%	12.1%	12.4%	12.6%	

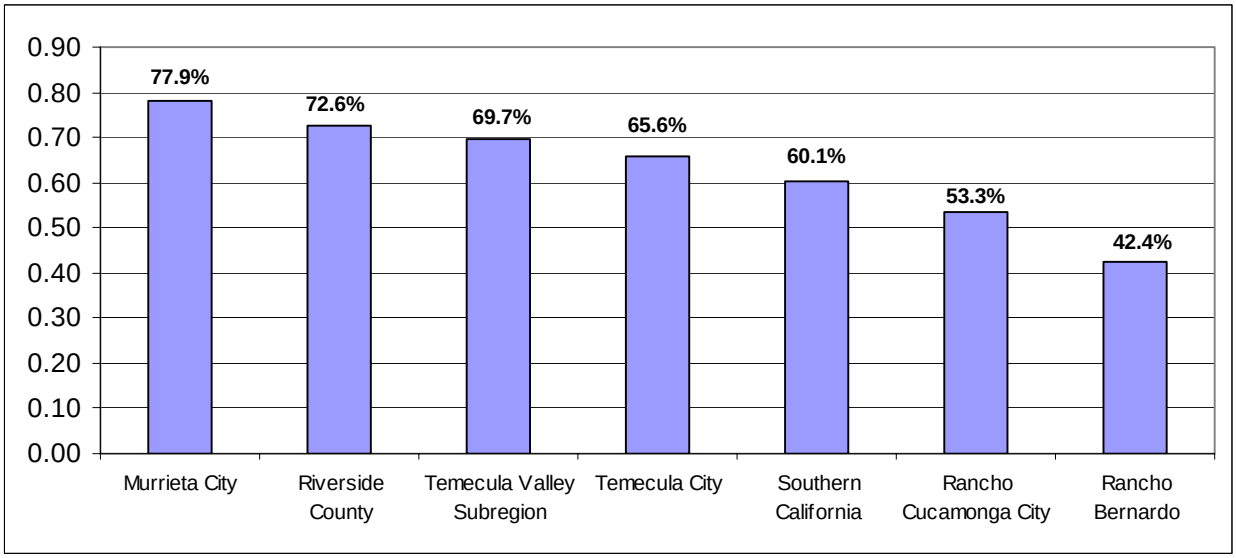


Source: Stanley R. Hoffman Associates, Inc.
California Employment Development Department (EDD).

Local Serving Employment

- The employment structure in the City is dominated by sectors that have a predominantly local serving orientation. Growth in these sectors is primarily driven by local household demand for products and services.
- These sectors include Retail, Construction, Accommodation and Food Services, Educational Services, Health Care and Social Assistance, Arts and Entertainment, Other Services and Government, which comprised nearly 78 percent of the total employment in the City in 2008, as shown in Figure 2-5.
- The largest sectors in the City in 2008 included the Retail Trade (19.2 percent), Local Government (14.4 percent), Health Care and Social Assistance (13.4 percent), Construction (9.7 percent) and Accommodation and Food Services (9.6 percent).
- In comparison to other surrounding regions and communities, Murrieta had a noticeably higher share of local serving jobs, as shown in Figure 2-5.
- As a result of jobs concentration in lower to medium skills, average wages in the City in 2008 were about 28 percent lower, at around $36,000, compared to Southern California at around $50,000.
- Local serving jobs in the City were estimated to have an average wage of $34,400.

Figure 2-5
Local Serving Jobs as Percent of Total [1]
City of Murrieta and Surrounding Communities
2008



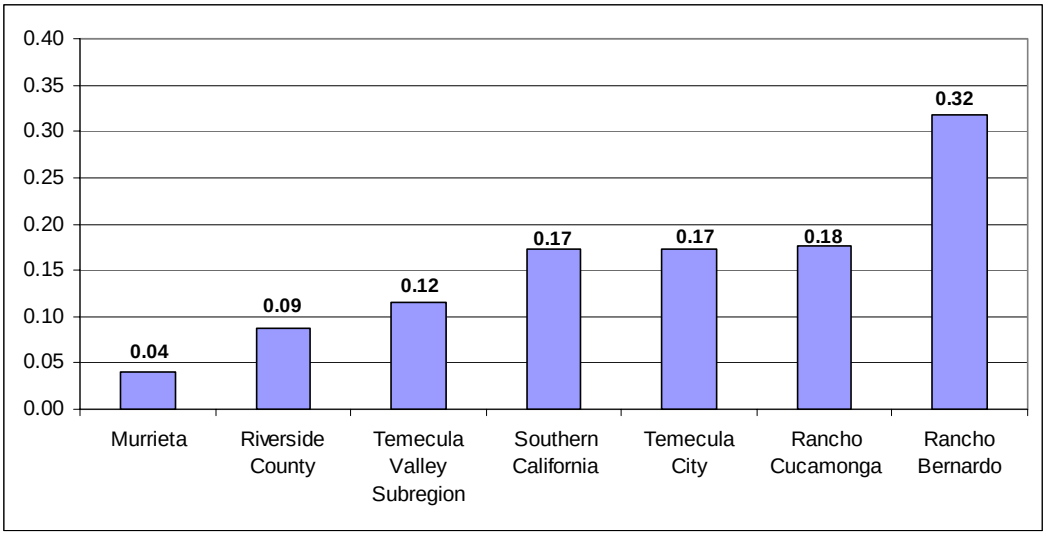
1. Includes employment in Retail, Construction, Accommodation and Food Services, Educational Services, Health Care and Social Assistance, Arts and Entertainment, Other Services and Government

Source: Stanley R. Hoffman Associates, Inc.
California Employment Development Department (EDD).
Census Longitudinal Employee Household Dynamics (LEHD).

Export-Base Employment

- Conversely, sectors with a predominantly export-base orientation comprised the remaining 22 percent of the City's employment base. Such jobs serve a wider market, and therefore, are impacted by larger dynamics at the regional and higher levels.
- These sectors include Manufacturing, Transportation and Warehousing, Wholesale Trade, Professional, Scientific and Technical, Information, Management of Companies, and Administration and Waste Management.
- When examined on a per capita basis, as shown in Figure 2-6, Murrieta had only 0.04 jobs per capita or 40 jobs per 1000 city residents in export base industries.
- This was lower compared to the Riverside County estimate of 0.09 jobs per capita, and significantly lower compared to the neighboring communities of Temecula City at 0.17 jobs per capita, the Rancho Bernardo community in San Diego City at 0.32 jobs per capita and Rancho Cucamonga at 0.18 jobs per capita.
- Export-base jobs in the City were estimated to have an average wage of $41,600, higher than the overall average wage of about $36,000.

Figure 2-6
Estimated Annual Average Export Base Jobs [1]Per Capita
Murrieta and Surrounding Communities
2008



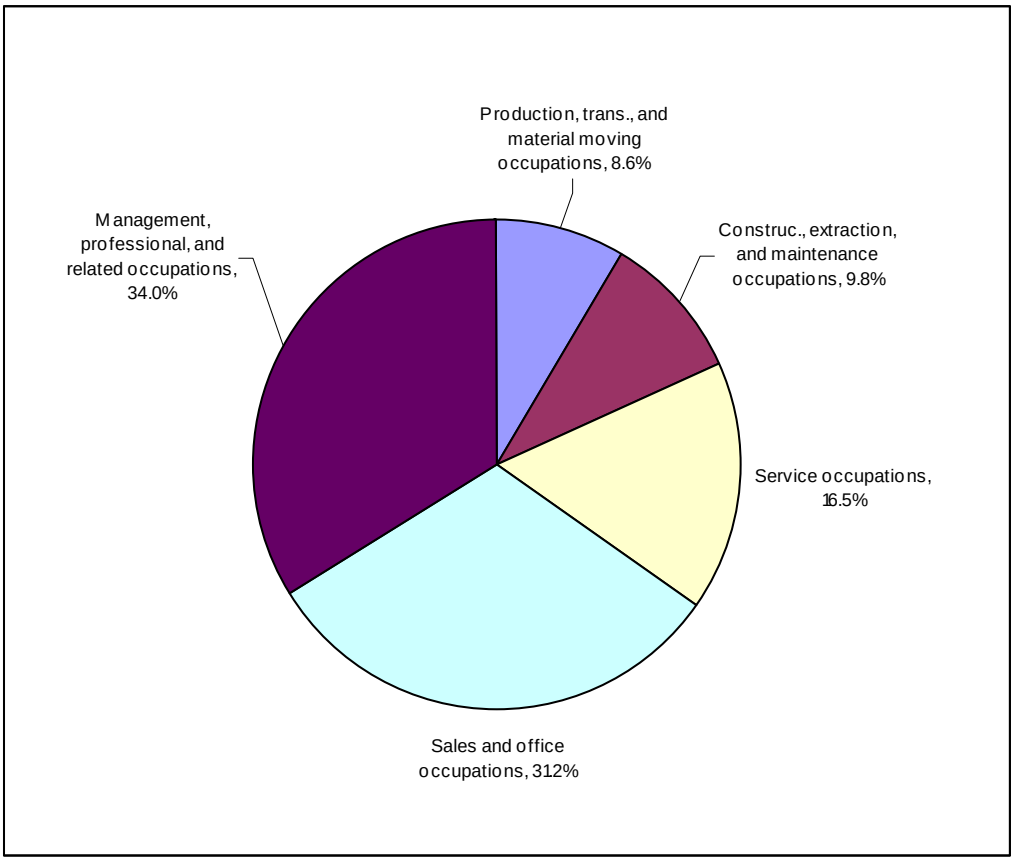
1. Includes employment in the Manufacturing, Wholesale Trade, Transportation and Warehousing, Professional, Scientific and Technical, Information, Finance and Insurance, Management of Companies and Administration, Support Services and Waste Management.

Source: Stanley R. Hoffman Associates, Inc.

City Labor Force Strengths

- Nearly 37 percent of City residents 16 years or older had at least associate or college education in 2008, of which 27.4 percent had a college, graduate or professional degree.
- In comparison, in the surrounding counties of Riverside, San Diego and San Bernardino, about 33 percent of population 16 years or older had at least an associate or college degree, of which 25.3 percent had a college, graduate or professional degree.
- Further, only about 9 percent of the population had no high school diploma compared to about 19 percent in the surrounding counties of Riverside, San Diego and San Bernardino.
- As a percent of total jobs in 2008, management, service and sales related jobs comprised 81.7 percent of the total labor force, as shown in Figure 2-7.

Figure 2-7
Labor Force Composition in 2008
City of Murrieta

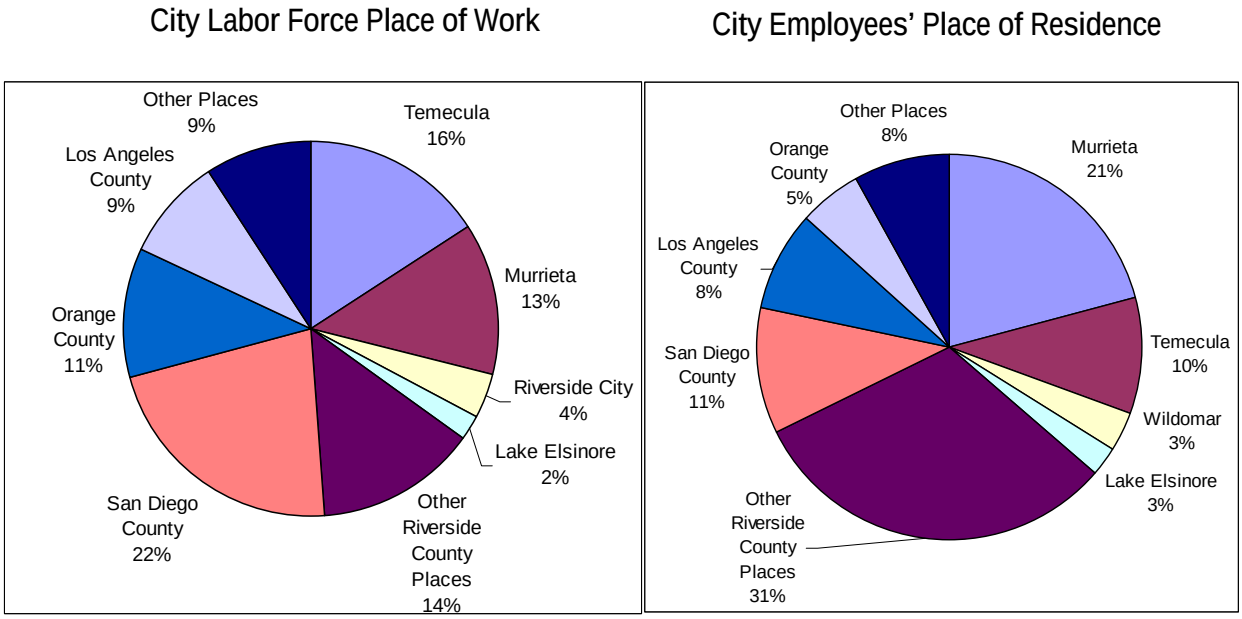


Source: Stanley R. Hoffman Associates, Inc.
American Community Survey 2006-2008

Labor Force and Commuting

- As shown in Figure 2-8 (left panel), only about 13 percent of the City's labor force is employed in jobs within Murrieta or 87 percent of the labor force commutes to areas outside the City.
- About 16 percent of the labor force commutes to Temecula City for employment, while another 22 percent commutes into San Diego County.
- In comparison, as shown in Figure 2-8 (right panel), of individuals employed within the City, about 21 percent also live within Murrieta.
- About 10 percent of individuals working in Murrieta commute from Temecula, 3 percent from Wildomar and another 3 percent from Lake Elsinore, with about 31 percent commuting in from other parts of Riverside County.
- About 11 percent of employees in Murrieta commute in from San Diego County followed by Los Angeles County (8 percent) and Orange County (5 percent).
- The employment, labor and commute data indicate that residents with higher education and occupational skills are largely commuting out of the City for work.

Figure 2-8
Commute Patterns in 2008
City of Murrieta



Source: Stanley R. Hoffman Associates, Inc.
Census Longitudinal Employee Household Dynamics (LEHD), 2008.

Regional Economic Growth Opportunities

- A look at the surrounding regional economy indicates that the City has the potential to attract firms that offer higher skilled jobs especially due to its educated and skilled resident labor force, land use development opportunities, existing regional freeway accessibility and future transit development programs.
- For example, as shown in Table 2-1, the nearby communities of Temecula City in Riverside County and Rancho Bernardo in San Diego City have relatively higher shares of export-base jobs, which are medium to high skill and therefore offer higher wages, on average.
- Rancho Bernardo, at a distance of about 42 miles from the City along the Interstate-15, has nearly 60 percent of its job base in export base activities, especially in Manufacturing and Professional, Scientific and Technical services (see Appendix Table A-4).
- Given that Murrieta has a significant share of residents with both higher education and higher skill levels, there is the potential for growth in the export-base industries within the City.
- Additionally, the mismatch between the type of local jobs and the resident labor force skills is evident in the high share of out-commute to work (about 86 percent of resident labor force). The diversification of the economic base through the attraction of export-base jobs will also help address this imbalance, especially given the impetus and recent legislation to reduce vehicle miles travelled and greenhouse gas emissions.

Table 2-1
Regional Employment Structure
Murrieta and Comparison Communities
2008

	Murrieta City	Temecula City	Temecula Valley Region	Rancho Cucamonga City	Rancho Bernardo City	Riverside County	Southern California
Population	100,714	102,604	221,183	177,736	70,780	2,107,653	20,874,212
Total Jobs	18,009	51,738	84,296	66,868	39,137	667,844	9,043,269
Local Serving Jobs [1]	14,032	33,947	58,726	35,637	16,607	484,613	5,437,092
Local Serving Jobs per Capita	0.14	0.33	0.27	0.20	0.23	0.23	0.26
Local Serving as Percent Total	78%	66%	70%	53%	42%	73%	60%
Export Base Jobs [2]	3,978	17,791	25,570	31,231	22,530	183,231	3,606,178
Export Base Jobs per Capita	0.04	0.17	0.12	0.18	0.32	0.09	0.17
Export Base as Percent Total	22%	34%	30%	47%	58%	27%	40%

1. Includes Construction, Retail, Health Care and Social Assistance, Accommodation and Food Services, Government, Educational Services, Arts and Entertainment and Other Services.

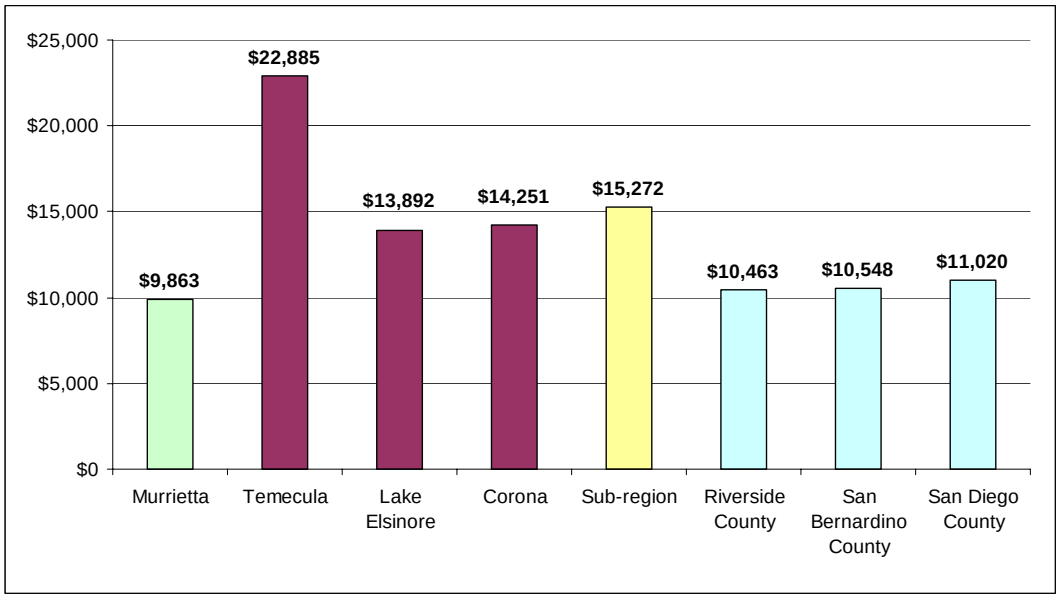
2. Includes Manufacturing, Wholesale Trade, Transportation and Warehousing, Information, Professional, Scientific and Technical Services, Finance and Insurance, Management of Companies, and Administration, Support Services and Waste Mangement.

Source: Stanley R. Hoffman Associates, Inc.

Retail Trends

- Total taxable sales increased over the 1994 to 2007 time period from about $231 million in 1994 to about $1.14 billion in 2007 with an annualized growth rate of 13.05 percent in constant 2008 dollars.
- Retail taxable sales increased from about $207 million in 1994 to about $991 million in 2007.
- Non-retail taxable sales increased from about $24 million or 10 percent of total in 1994 to about $146 million, or 13 percent of the total in 2007.
- While the bulk of taxable sales are still generated primarily from households, this trend suggests that businesses that generated taxable sales to other businesses were increasing within the City's economic base.
- Retail sales per capita in the City increased from $6,840 in 1994 to $9,863 in 2007, in constant 2008 dollars.
- As shown in Figure 2-9, Murrieta's retail sales per capita is performing about 6 percent below the County of Riverside average of $10,463 and about 35 percent below the comparison sub-region (comprised of the neighboring cities of Temecula, Lake Elsinore and Corona), which was estimated to have a retail per capita average of $15,272.
- Murrieta's retail centers are generally comprised of community oriented, "big-box" centers including anchors such as Target, WalMart and Kohl's. The City noticeably lacks a regional shopping center although one is planned for the Golden Triangle area where Interstate 15 and Interstate 215 meet.

Figure 2-9
Regional Per Capita Retail Sales
City of Murrieta and Surrounding Communities
2007
(in Constant 2008 Dollars)

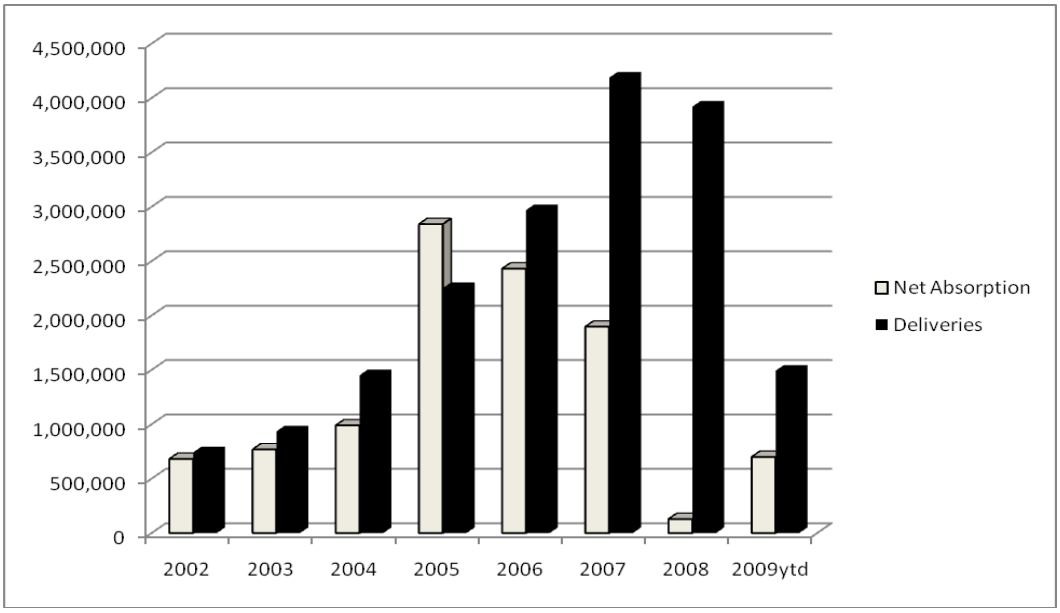


Source: Stanley R. Hoffman Associates, Inc.

Office Market Trends

- According to Grubb & Ellis, the Inland Empire office and industrial rents are lowest of any Southern California region.
- Inland Empire is a significant factor in Southern California industrial development, but has only emerged in recent years as a location for office development.
- The Inland Empire offers lower lease rates than any market in the region, while at the same time experiencing higher vacancy rates than any other area, both for industrial and office properties.
- The overall Inland Empire office market slowed significantly in 2008, absorbing space at an average net rate of just 32,105 square feet per quarter (128,423 square feet over 12 months) compared to 474,242 square feet average per quarter (1,896,969 square feet over 12 months) in 2007, as shown in Figure 2-10.
- In Murrieta, at the average rate of absorption experienced over the past 11 quarters (26,257 square feet average), currently available space (457,801 square feet) represents a 17 quarter (4 ¼ year) supply. At the rate of absorption experienced in peak year of 2007 (51,566 square feet per quarter), current available space represents a 9 quarter (2 ¼ year) supply.
- As the Murrieta office market improves and evolves over future years, it will attract a growing proportion of professional, medical and technical employment, particular in buildings along major highway corridors and in the city's Golden Triangle area.

Figure 2-10
Office Space Net Absorption and Deliveries
Inland Empire
2002 to 2009 YTD

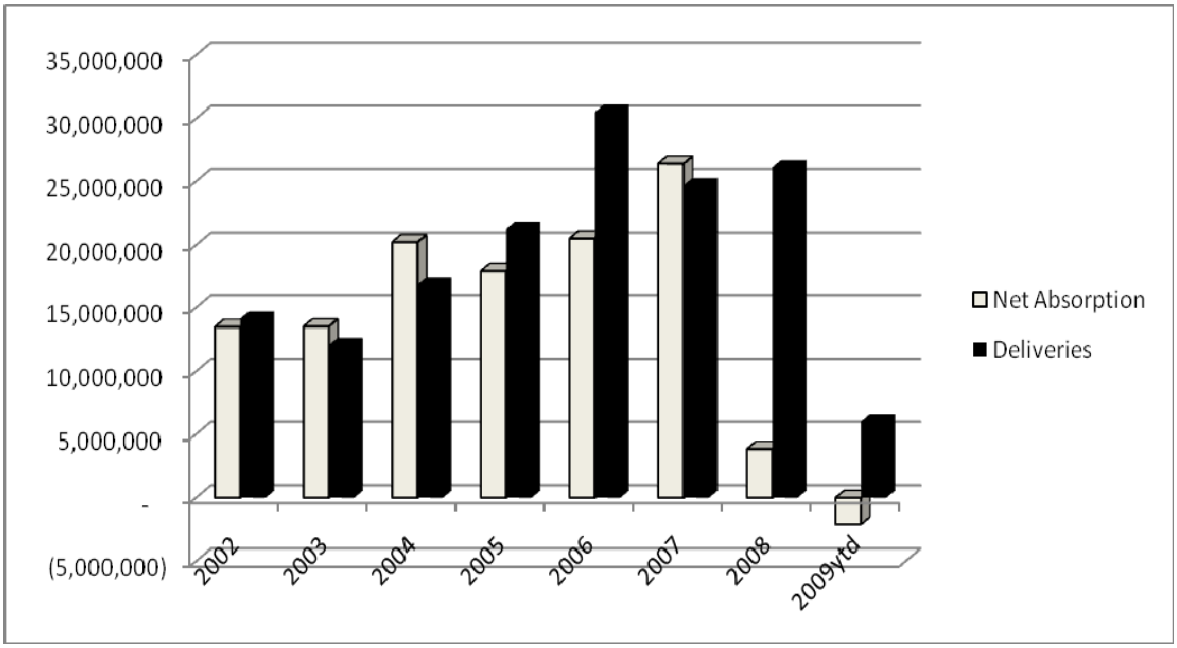


Source: Stanley R. Hoffman Associates, Inc.

Industrial Market Trends

- The Inland Empire industrial market has been impacted far more than the office market in the current slowdown, in terms of vacancies and rental rates.
- The overall Inland Empire industrial market dropped dramatically in 2008, absorbing space at an average net rate of just 969,284 square feet per quarter (3,877,134 square feet for 12 months) compared to 6,607,733 square feet average per quarter (26,430,933 square feet for 12 months) in 2007, as shown in Figure 2-11.
- In Murrieta, at the average rate of absorption experienced over the past 11 quarters (36,834 square feet average), currently available space (998,958 square feet) represents a 28 quarter (7 year) supply. At the rate of absorption experienced in peak year of 2007 (111,383 square feet per quarter), current available space represents a 9 quarter (2 ¼ year) supply.
- As the Murrieta Industrial market improves, it will be well- positioned in both geographic and demographic terms to attract a range of Research & Development (R&D) and Light Industrial users.

Figure 2-11
Industrial Space Net Absorption and Deliveries
Inland Empire
2002 to 2009 YTD



Source: Stanley R. Hoffman Associates, Inc.

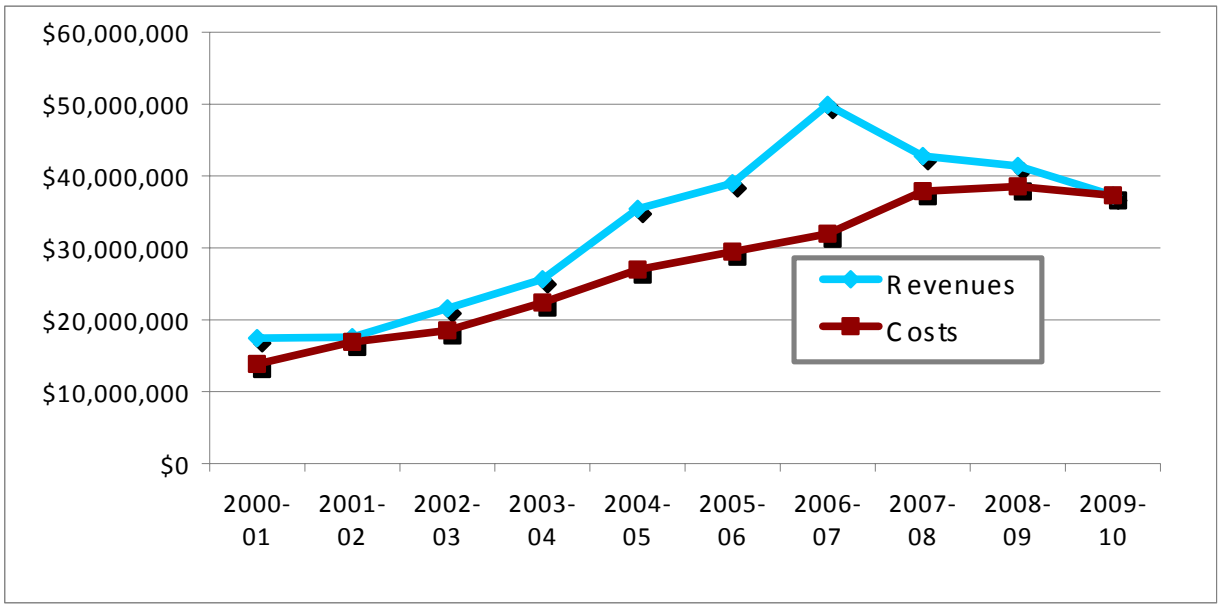
Hotel Market Trends

- Of the total hotel/motel inventory of 1,698 rooms in 16 facilities in the cities of Murrieta and Temecula, as of December 2009, Murrieta had one 65-room hotel in the City, which represents about 4 percent of the total Murrieta-Temecula inventory.
- The occupancy rate is estimated at about 67 percent for the one hotel in Murrieta and relatively less at 55 percent for the facilities in Temecula. Generally, a vibrant lodging market is considered to have at least 70 to 75 percent occupancy rates. However, the lack of lodging facilities in Murrieta does suggest some opportunities at good locations, particularly with freeway visibility and access.

Municipal Finance Trends

- As shown in Figure 2-11, General Fund revenues grew faster than expenditures until fiscal year 2006-07; then declined to essentially breakeven with expenditures by fiscal year 2009-10.

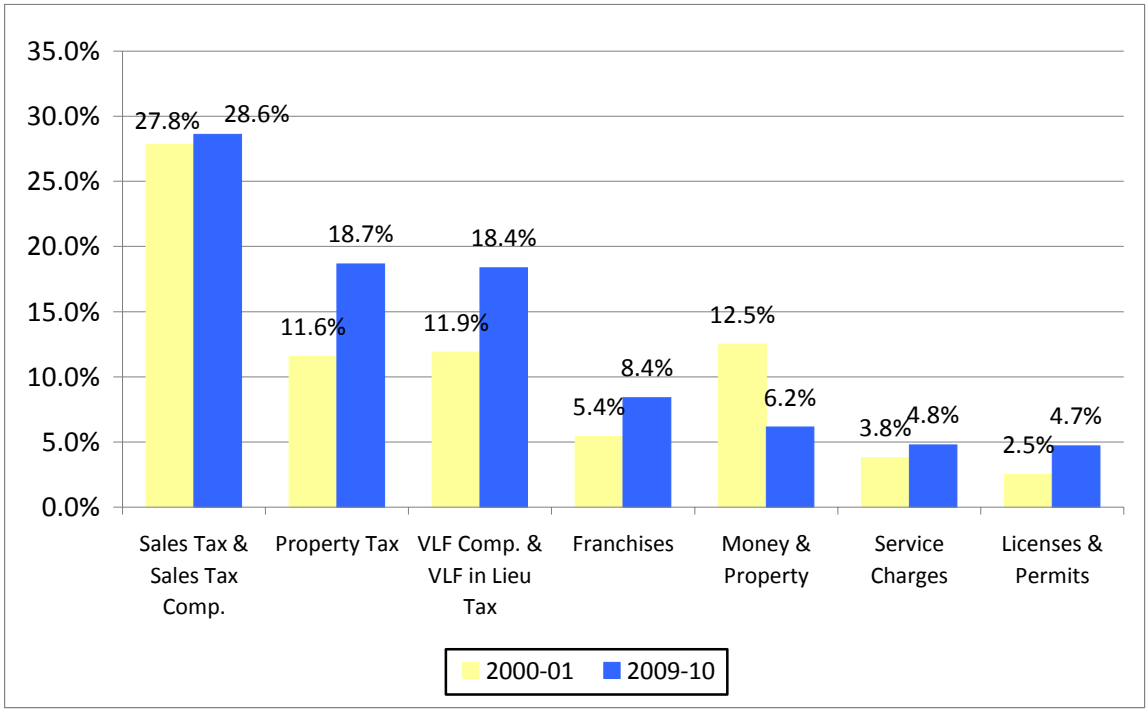
Figure 2-11
General Fund Growth Trends, 2000-01 to 2009-10
City of Murrieta Public Financial Trends Analysis
(In Current Dollars)



Source: Stanley R. Hoffman Associates, Inc.

- General Fund revenues increased from $17.46 million in 2000-01 to about $37.31 million in 2009-10 in current dollars, growing at an average annual rate of 8.8 percent.
- As shown in Figure 2-12, the major categories of revenues in the fiscal year 2009-10 included Sales Tax and Sales Tax Compensation (28.6 percent), Property Tax (18.7 percent), Motor Vehicle License Fee (VLF) and VLF in Lieu (18.4 percent), Franchise Fees (8.4 percent), Money and Property (6.2 percent), Service Charges (4.8 percent) and Licenses and Fees (4.7 percent).
- Per capita General Fund revenues decreased in current dollars from $394.35 per capita in 2000-01 to $370.45 per capita in 2009-10, representing an average annual decrease of 0.7 percent.

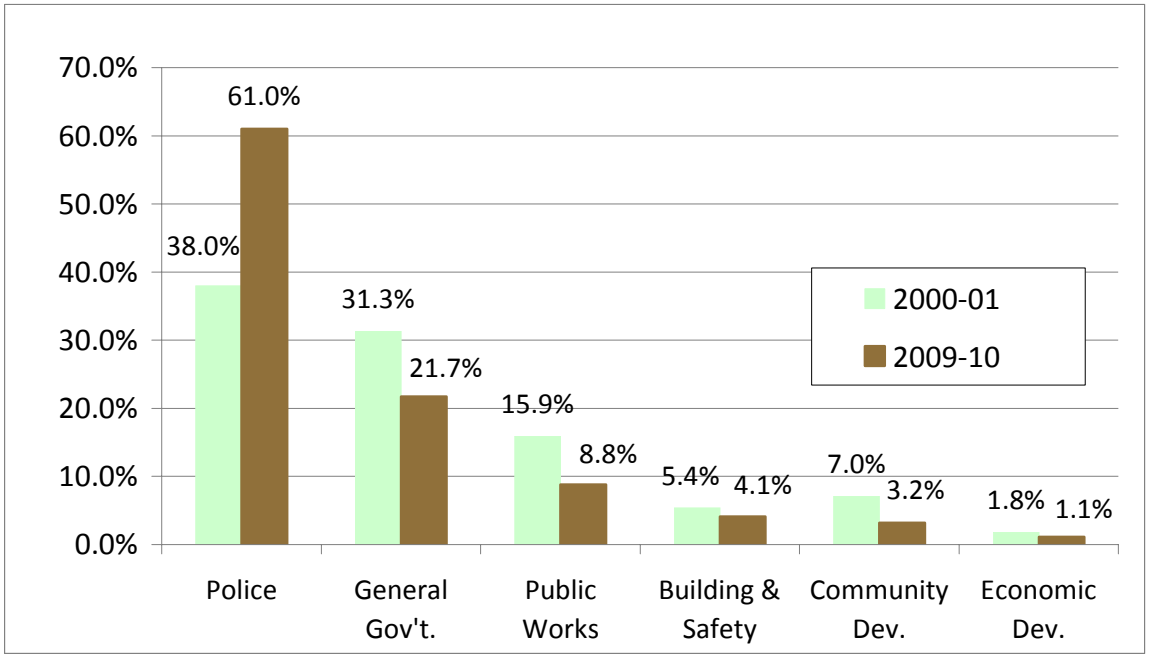
Figure 2-12
Top Seven General Fund Revenues, 2000-01 and 2009-10
City of Murrieta Public Financial Trends Analysis
(In Current Dollars)



Source: Stanley R. Hoffman Associates, Inc.

- General Fund expenditures increased from $13.83 million in 2000-01 to about $37.31 million in 2009-10 at an average annual rate of 11.7 percent.
- As shown in Figure 2-13, the major categories of expenditures in the fiscal year 2009-10 included Police (61.0 percent), General Government (21.7 percent), Public Works (8.8 percent), Building Safety (4.1percent), Community Development (3.2 percent) and Economic Development (1.1 percent).
- Police expenditures showed the largest increase growing from 38 percent of the total expenditures in 2000-01 to 61 percent in 2009-10, while Public Works declined during this time from 16 percent to 9 percent.
- General Fund costs increased in current dollars from about $312.40 per capita in 2000-01 to $370.45 per capita in 2009-10, at an average annual growth rate of 1.9 percent.

Figure 2-13
Distribution of General Fund Expenditures, 2000-01 and 2009-10
City of Murrieta Public Financial Trends Analysis
(In Current Dollars)



Source: Stanley R. Hoffman Associates, Inc.

CHAPTER 3
ECONOMIC PROFILE

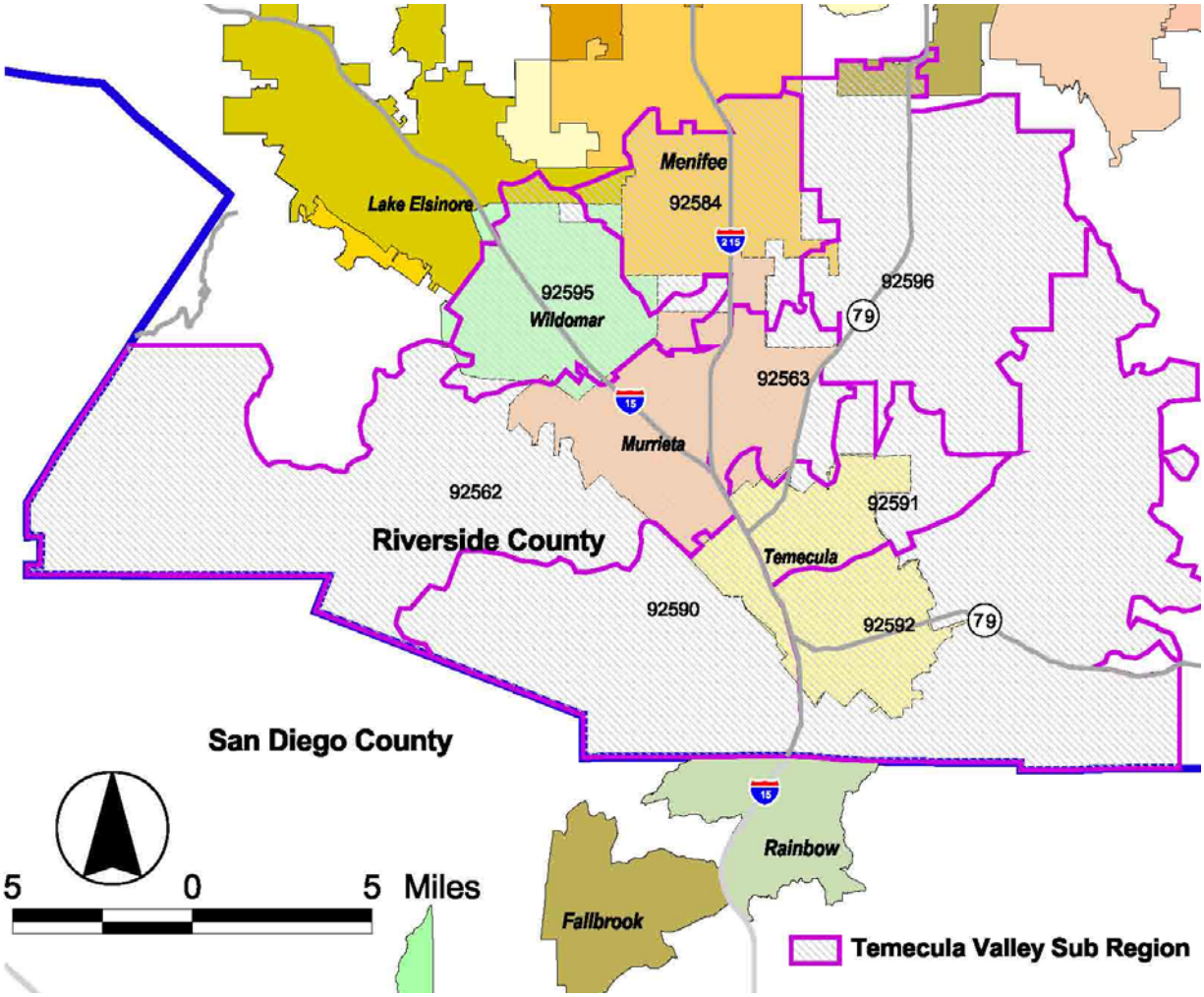
This chapter presents an analysis of the economy of the City of Murrieta over a historic period of 2005 to 2008. Information is also provided for the Temecula Valley sub-regional economy and Riverside County. Jobs and wages data for the City, the Temecula Valley sub-region and the County are obtained from the California Employment Development Department (EDD) ES-202 employment and payroll database. These data have been adjusted to include Census estimates of self-employment for Riverside County. All wage data is presented in constant 2008 dollars.

3.1 Geographic Units of Analysis

Jobs and wages data for the City, the Temecula Valley sub-region and the County are obtained from the California Employment Development Department (EDD) ES-202 employment and payroll database. The employment and payroll information over the 2005 to 2008 time period is provided by the EDD based on a place code basis for the City and as an aggregation of ZIP codes for the Temecula Valley sub-region, as shown in Figure 3-1 and Appendix Table A-1. These data have been adjusted to include Census ACS 2006-2008 estimates of self-employment for Riverside County, as shown in Appendix Table A-2 for the City. All wage data is presented in constant 2008 dollars. Additionally, the City and the sub-region are compared to Riverside County and the Southern California region for economic specialization and wage distribution. The information at county-level was also obtained from the EDD. Data for Southern California was assembled by aggregating the counties of Los Angeles, Orange, San Bernardino, Riverside and San Diego. Also presented are comparison of the City's economy to surrounding communities in the Inland Empire and San Diego County to provide benchmarks of relative performance and opportunities to inform policy recommendations.

Data is analyzed for the 2005 to 2008 time period for Murrieta to identify industries that grew historically and those that have been impacted by the recent downturn in the U.S. economy. Further, the relative growth of jobs in the City classified into local-serving and export-base jobs is examined to facilitate an understanding of the strengths and opportunities of the City's economy. Local serving jobs, by definition, are driven primarily by local residential demand, which is affected by cycles of high vacancies and foreclosures. In comparison, export base jobs serve a wider market, and therefore, are impacted by larger dynamics at the regional and higher levels.

Figure 3-1
Economic Regions of Analysis
Murrieta and Temecula Valley Sub-region

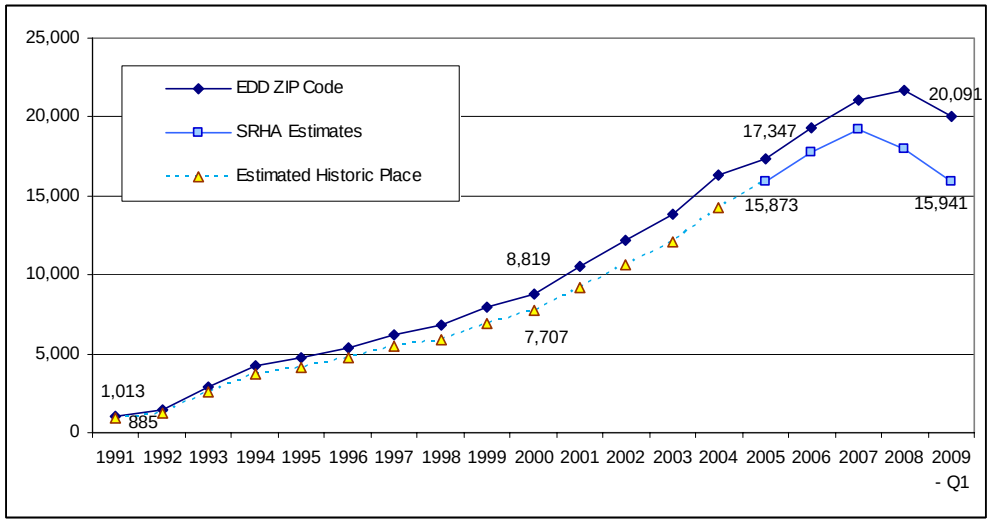


Source: Stanley R. Hoffman Associates, Inc.

The employment estimates prepared for the City in this report (SRHA estimates) were also compared to employment estimates presented previously in a report prepared for the City by Economics and Politics, Inc in August 2006 for the 1991 to 2005 time period. The SRHA estimates differ from the above mentioned 2006 report in three ways – a) these estimates have been assembled on a place code basis as opposed to ZIP codes for the City of Murrieta for Annual 2005 to First Quarter 2009; b) these data were procured from the EDD by the North American Industrial Classification System (NAICS) categories, as opposed to Standard Industrial Classification (SIC) codes used in the 2006 study; and c) the current NAICS employment data procured from EDD for the City was adjusted for self-employment rates for Riverside County obtained from the American Community Survey (ACS) 2006 to 2008 3-year estimates, as mentioned earlier.

The SRHA employment estimates over the 2005 to First Quarter 2009 time period for Murrieta prepared for the current report were compared to the Economic and Politics, Inc. numbers by establishing the relationship between current EDD estimates for the City place-code and City ZIP codes. The 2005 to 2008 place to ZIP code proportion (approximately 87 percent) was applied to the historic 1991 to 2005 ZIP code estimates in the 2006 study to get a long-term place trend for the City of Murrieta, as shown in Figure 3-2 and Appendix Table A-3.

Figure 3-2
Long-term Employment Trend
City of Murrieta
Annual 1991 to First Quarter 2009



Source: Stanley R. Hoffman Associates, Inc.
Economics and Politics, Inc., 2006
California Employment Development Department

3.2 City and Regional Economic Trends

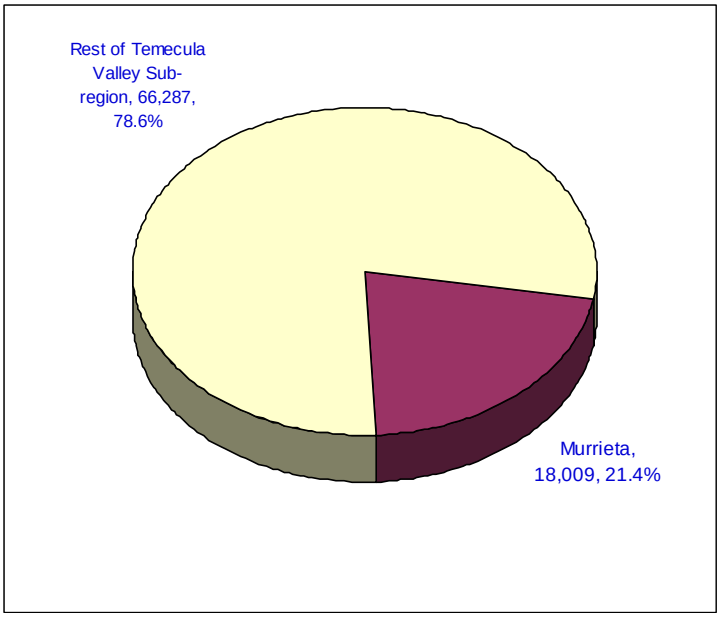
As shown in Table 3-1, total estimated annual average employment in the City grew from 15,873 in 2005 to 18,009 in 2008 at an annual average growth rate of 4.3 percent. In comparison, employment in the Temecula Valley sub-region also increased over this time period from 76,387 to 84,296 at 3.3 percent annual average growth rate, while employment growth in Riverside County remained relatively flat. The City's share of the sub-regional economy grew marginally from 20.8 percent in 2005 to 21.4 percent in 2008, as shown in Figure 3-3. Provisional First Quarter 2009 data shows a decline to 15,941 jobs, as shown later in this chapter.

Table 3-1
Regional Comparison of Employment Trends
City, Temecula Valley Sub-region and Riverside County
2005 to 2008

	2005	2006	2007	2008	Annual Average Growth Rate 2005 to 2008
City of Murrieta	15,873	17,780	19,253	18,009	4.3%
Temecula Valley Sub-region	76,387	83,917	86,331	84,296	3.3%
City as % Sub-region	20.8%	21.2%	22.3%	21.4%	
Riverside County	662,712	693,857	694,155	667,844	0.3%
Sub-region as % County	11.5%	12.1%	12.4%	12.6%	

Source: Stanley R. Hoffman Associates, Inc.
California Employment Development Department (EDD)

Figure 3-3
City Share of Temecula Valley Sub-region
2008

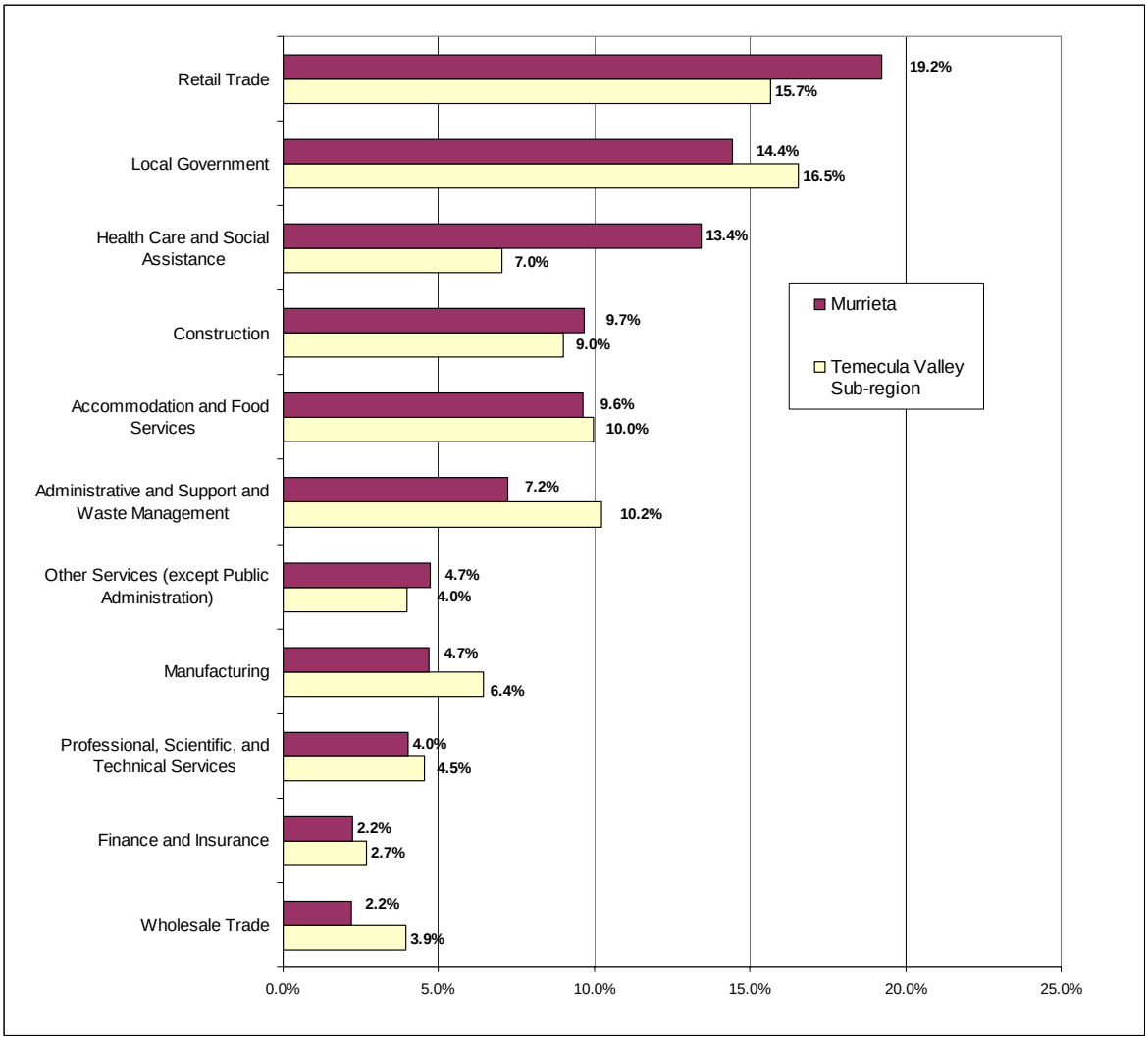


Source: Stanley R. Hoffman Associates, Inc.

As shown in Figure 3-4 and Table 3-2, in 2008, the Retail Trade sector comprised 19.2 percent (3,446 jobs) of the total jobs in the City, followed by Local Government at 14.4 percent (2,601 jobs) and Health Care and Social Assistance at 13.4 percent (2,417 jobs). These sectors are followed by Construction at 9.7 percent (1,739 jobs) and Accommodation and Food Services at 9.6 percent (1,736 jobs). The above sectors have a large component of local serving activities, with the exception of a portion of Health Care and Social Services, which provides specialized medical services to a larger regional base and Accommodation and Food Services, which serves visitors as well as local residents. Taken together with Real Estate, Rental and Leasing (1.5 percent), Arts and Entertainment, Educational Services, Government and Other Services, primarily local serving sectors comprised nearly 77.9 percent of the total employment in the City, as shown in Table 3-2.

In comparison, in 2008, activities like Manufacturing (4.7 percent), Professional Scientific and Technology (4.0 percent), Wholesale Trade (2.2 percent) and Transportation and Warehousing (0.9 percent) comprised only about 12 percent of the total jobs in the City. The above categories together with intermediary support services like Administrative, Support and Waste Management (7.2 percent) and Finance and Insurance (2.2 percent) comprised the balance, i.e., 22.1 percent of total employment in the City, as shown in Table 3-2, an approximation for the export base of the City.

Figure 3-4
Distribution of Annual Average Employment
Murrieta and Temecula Valley Sub-region
2008



Source: Stanley R. Hoffman Associates, Inc.

Table 3-2
Annual Average Employment Distribution and Specialization by NAICS Sectors
Murrieta and Surrounding Regions
2008

	Murrieta		Temecula Valley [1]		Riverside County		Southern California [2]	
	Jobs	% Distr.	Jobs	% Distr.	Jobs	% Distr.	Jobs	% Distr.
EMPLOYMENT BY SECTORS: 2008								
Construction	1,739	9.7%	7,582	9.0%	63,269	9.5%	489,122	5.4%
Manufacturing	844	4.7%	5,433	6.4%	49,070	7.3%	835,653	9.2%
Wholesale Trade	398	2.2%	3,327	3.9%	21,473	3.2%	439,222	4.9%
Retail Trade	3,466	19.2%	13,198	15.7%	89,759	13.4%	951,951	10.5%
Transportation and Warehousing	155	0.9%	791	0.9%	19,553	2.9%	266,890	3.0%
Information	156	0.9%	1,230	1.5%	7,954	1.2%	310,942	3.4%
Finance and Insurance	405	2.2%	2,243	2.7%	13,568	2.0%	328,107	3.6%
Real Estate and Rental and Leasing	270	1.5%	2,049	2.4%	13,141	2.0%	203,724	2.3%
Professional, Scientific, and Technical Services	723	4.0%	3,832	4.5%	25,479	3.8%	645,328	7.1%
Management of Companies and Enterprises	0	0.0%	80	0.1%	3,486	0.5%	109,832	1.2%
Administrative and Support and Waste Management	1,298	7.2%	8,633	10.2%	42,647	6.4%	670,204	7.4%
Educational Services	104	0.6%	1,039	1.2%	5,483	0.8%	161,075	1.8%
Health Care and Social Assistance	2,417	13.4%	5,924	7.0%	55,201	8.3%	763,318	8.4%
Arts, Entertainment, and Recreation	328	1.8%	1,209	1.4%	11,224	1.7%	181,978	2.0%
Accommodation and Food Services	1,736	9.6%	8,418	10.0%	64,631	9.7%	745,313	8.2%
Other Services (except Public Administration)	849	4.7%	3,370	4.0%	32,037	4.8%	549,893	6.1%
Federal Government	129	0.7%	331	0.4%	6,691	1.0%	123,942	1.4%
Local Government	2,601	14.4%	13,940	16.5%	105,941	15.9%	922,211	10.2%
Other Employment	393	2.2%	1,667	2.0%	37,236	5.6%	344,566	3.8%
TOTAL	18,009	100.0%	84,296	100.0%	667,844	100.0%	9,043,269	100.0%
Estimated Local Serving Sectors [3]	14,032	77.9%	58,726	69.7%	484,613	72.6%	5,437,092	60.1%
Estimated Population	100,714		84,296		2,107,653		20,874,212	
Estimated Local Serving Jobs per Capita	0.14		0.70		0.23		0.26	
Estimated Export Base Sectors [4]	3,978	22.1%	25,570	30.3%	183,231	27.4%	3,606,178	39.9%
Estimated Population	100,714		84,296		2,107,653		20,874,212	
Estimated Export Base Jobs per Capita	0.04		0.30		0.09		0.17	
LOCATION QUOTIENTS: 2008								
Construction		**1.79**		1.66		1.75		1.00
Manufacturing		0.51		0.70		0.80		1.00
Wholesale Trade		0.46		0.81		0.66		1.00
Retail Trade		**1.83**		1.49		1.28		1.00
Transportation and Warehousing		0.29		0.32		0.99		1.00
Information		0.25		0.42		0.35		1.00
Finance and Insurance		0.62		0.73		0.56		1.00
Real Estate and Rental and Leasing		0.67		1.08		0.87		1.00
Professional, Scientific, and Technical Services		0.56		0.64		0.53		1.00
Management of Companies and Enterprises		0.00		0.08		0.43		1.00
Administrative and Support and Waste Management		0.97		1.38		0.86		1.00
Educational Services		0.33		0.69		0.46		1.00
Health Care and Social Assistance		**1.59**		0.83		0.98		1.00
Arts, Entertainment, and Recreation		0.90		0.71		0.84		1.00
Accommodation and Food Services		**1.17**		1.21		1.17		1.00
Other Services (except Public Administration)		0.78		0.66		0.79		1.00
Federal Government		0.52		0.29		0.73		1.00
Local Government		**1.42**		1.62		1.56		1.00
Other Employment		0.57		0.52		1.46		1.00

1. As defined by ZIP Codes listed in Appendix A-1.

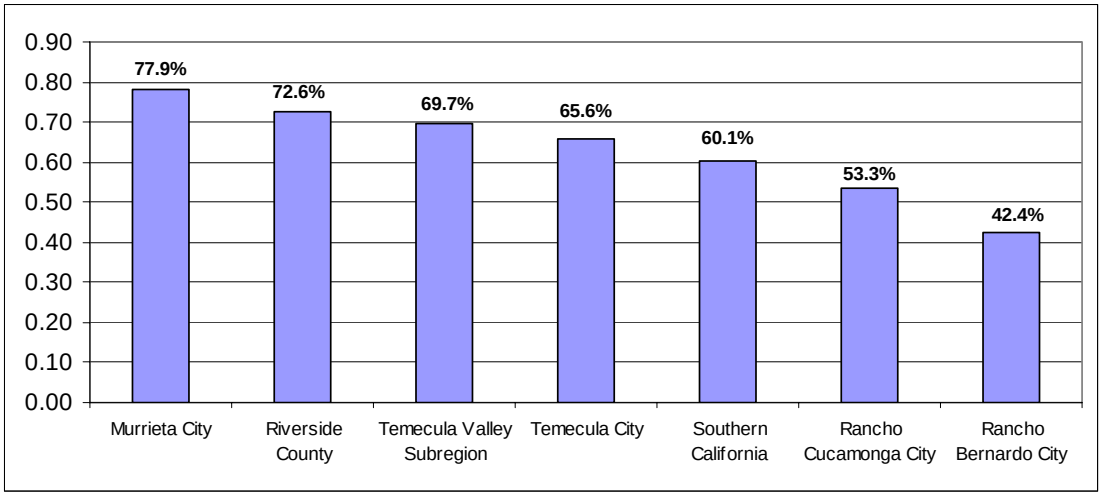
2. Including Riverside County, San Bernardino County, Los Angeles County, Orange County and San Diego County.

3. Includes Construction, Retail, Health Care and Social Assistance, Accommodation and Food Services, Government, Real Estate, Rental and Leasing, Educational Services, Arts and Entertainment and Other Services.

4. Includes Manufacturing, Wholesale Trade, Transportation and Warehousing, Information, Professional, Scientific and Technical Services, Finance and Insurance, Management of Companies, and Administration, Support Services, and Waste Mangement.

Source: Stanley R. Hoffman Associates, Inc.
California Employment Development Department (EDD)

Figure 3-5
Estimated Annual Average Share of Local Serving Jobs [1]
Murrieta and Surrounding Communities
2008



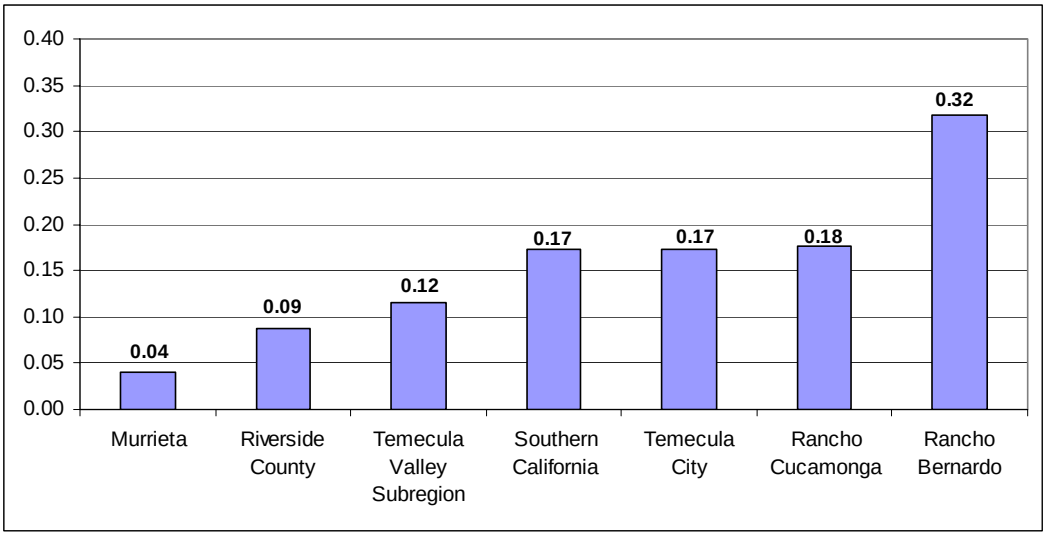
1. Includes employment in Retail, Construction, Accommodation and Food Services, Educational Services, Health Care and Social Assistance, Arts and Entertainment, Other Services and Government.

Source: Stanley R. Hoffman Associates, Inc.

The City had a higher proportion of local serving jobs (77.9 percent) when compared to the Temecula Valley sub-region, Riverside County and the Southern California regional economy. As shown in Figure 3-4, local serving jobs comprised 72.6 percent of the total in Riverside County, 69.7 percent in the Temecula Valley sub-region and 65.6 percent in Temecula City. Southern California on the whole had 60.1 percent share of local serving jobs with communities like Rancho Cucamonga and Rancho Bernardo having even lower shares at 53.3 percent and 42.4 percent, respectively.

Conversely, when examined on a per capita basis, as shown in Figure 3-6, Murrieta had only 0.04 jobs per capita or 40 jobs per 1000 city residents in export base industries. These numbers were slightly lower than the Riverside County estimate of 0.09 jobs per capita but significantly lower than the neighboring communities of Temecula City at 0.17 jobs per capita, Rancho Bernardo in San Diego City at 0.32 jobs per capita and Rancho Cucamonga at 0.18 jobs per capita (for employment details on Temecula City, Rancho Cucamonga and Rancho Bernardo, see Appendix Table A-4).

Figure 3-6
Estimated Annual Average Export Base Jobs [1]Per Capita
Murrieta and Surrounding Communities
2008



1. Includes employment in the Manufacturing, Wholesale Trade, Transportation and Warehousing, Professional, Scientific and Technical, Information, Finance and Insurance, Management of Companies and Administration, Support Services and Waste Management.

Source: Stanley R. Hoffman Associates, Inc.

3.3 Analysis of Industrial Specialization

Also shown previously in Table 3-2 are location quotients by sector, which are indicators of economic specialization for the City relative to the Southern California region. These quotients are calculated by dividing the employment share by sector within the City by the employment share by sector within the Southern California region. A quotient greater than 1.00 for any particular sector indicates that the share of that sector within the City is greater relative to the region, or in other words, the City's economy is relatively more specialized in that sector compared to the region. Location quotients for the Temecula Valley sub-region and Riverside County were similarly estimated relative to the Southern California region.

As shown in Table 3-2, the City's economy is relatively more specialized compared to Southern California in Retail Trade (1.83), Construction (1.79), Health Care and Social Assistance (1.59), Local Government (1.42) and Accommodation and Food Services (1.17). As stated before, these sectors are primarily associated with residential growth. Sectors within the City that are least specialized relative to the region include Information (0.25), Transportation and Warehousing (0.29), Wholesale Trade (0.46), Manufacturing (0.51), Finance and Insurance (0.62) and Professional, Scientific and Technical Services (0.56). In contrast, the surrounding Temecula Valley sub-region is significantly more specialized than the City of Murrieta, as benchmarked to the Southern California region in Real Estate, Rental and Leasing (1.08), Wholesale Trade (0.81) and Manufacturing (0.70).

3.4 Comparative Wage Trends

Further, as shown in Table 3-3, overall wage trends provide another set of indicators to compare the economic performance of the City relative to the Temecula Valley sub-region and the County. Overall wages in the City declined about 4.4 percent in inflation adjusted dollars from $37,730 in 2005 to $36,077 in 2008. Average wages in the Temecula Valley sub-region also declined from $38,098 in 2005 to $36,096 in 2008. This decline is observed at the overall Riverside County and Southern California region, with the latter showing a smaller drop compared to the City, sub-region and County. Further, the average wages in Southern California were significantly higher (38 to 43 percent higher in 2008) compared to the other three areas.

As shown in Table 3-4, average wages vary by sectors, but trend similarly within the Temecula Valley sub-region. For example, within Murrieta wages are estimated to range from a high of 1.25 to 1.45 times the city-wide average in office professional and Federal Government jobs and only about 0.35 to 0.70 times for sectors like Accommodation and Food Services, Educational Services and Retail Trade. These trends are similar for the Temecula Valley sub-region. In Riverside County, the ratio of average sector wages to economy-wide average wages vary from a high of 1.95 (Federal Government) to a low of 0.50 (Accommodation and Food Services). The wage structure of the Southern California regional economy on the whole is different from Riverside County with average sectoral wages ranging from a high of $87,000 in the Information sector to a low of $18,919 in Accommodation and Food Services. This indicates the relatively higher concentration of skilled, thus higher paid jobs on the whole outside the Riverside County area, which explains the greater wage disparities.

Table 3-3
Average Wage Historic Trend
Murrieta and Surrounding Regions
2005 to 2008
(Constant 2008 Dollars)

	2005	2006	2007	2008	Percent Change 2005 to 2008
City of Murrieta	$37,730	$37,550	$36,878	$36,077	-4.4%
Temecula Valley Sub-region	$38,098	$37,541	$37,244	$36,096	-5.3%
City as ratio of Sub-region	1.0	1.0	1.0	1.0	
Riverside County	$35,828	$35,414	$35,406	$34,786	-2.9%
Sub-region as ratio of County	1.1	1.1	1.1	1.0	
Southern California	$50,940	$50,145	$49,560	$49,746	-2.3%

Source: Stanley R. Hoffman Associates, Inc.
California Employment Development Department (EDD)

Table 3-4
Comparison of Average Wage by NAICS Sectors
Murrieta and Surrounding Areas
2008
(Constant 2008 Dollars)

	Murrieta	Temecula Valley Region	Riverside County	Southern California [1]
Construction	$45,906	$47,806	$39,972	$52,919
Manufacturing	43,259	44,895	43,695	56,038
Wholesale Trade	54,214	43,990	44,345	57,818
Retail Trade	26,566	26,114	25,441	30,002
Transportation and Warehousing	37,460	35,947	35,699	44,551
Information	43,297	50,501	45,900	87,070
Finance and Insurance	54,754	55,178	49,432	85,140
Real Estate and Rental and Leasing	39,686	48,665	26,800	50,631
Professional, Scientific, and Technical Services	47,114	53,330	41,444	77,919
Management of Companies and Enterprises	30,023	40,434	43,384	81,972
Administrative and Support and Waste Management	43,812	31,367	22,458	33,201
Educational Services	24,608	32,655	30,037	39,442
Health Care and Social Assistance	47,579	42,932	40,272	47,289
Arts, Entertainment, and Recreation	20,475	19,347	23,422	59,809
Accommodation and Food Services	13,327	14,698	17,221	18,919
Other Services (except Public Administration)	27,851	23,987	17,657	24,147
Federal Government	54,593	51,375	67,827	64,355
Local Government	46,250	41,029	48,469	54,517
Economy-wide Average	**$37,730**	**$36,096**	**$34,786**	**$49,155**
Local Serving Jobs [2]	$34,429	$33,405	$33,714	$40,247
Export Base Jobs [3]	$41,607	$42,080	$36,961	$60,922

1. Including Riverside County, San Bernardino County, Los Angeles County, Orange County and San Diego County.
2. Includes Construction, Retail, Health Care and Social Assistance, Accommodation and Food Services, Government, Real Estate, Rental and Leasing, Educational Services, Arts and Entertainment and Other Services.
3. Includes Manufacturing, Wholesale Trade, Transportation and Warehousing, Information, Professional, Scientific and Technical Services, Finance and Insurance, Management of Companies, and Administration, Support Services, and Waste Mangement.

Source: Stanley R. Hoffman Associates, Inc.
California Emplyoment Development Department (EDD).

3.5 City Historic Trends

As shown in Table 3-5, total employment in the City grew from 15,873 in 2005 to 18,009 in 2008 at an average annual growth rate of 4.3 percent. These figures include estimates for self-employment over the EDD ES-202 employment and payroll department, as explained in Appendix Table A-2. While not large, sectors that experienced the highest annual average growth rates over the 2005 to 2008 time period included Professional, Scientific and Technical (17.7 percent), Finance and Insurance (13.0 percent) and Wholesale Trade (11.5 percent). Sectors that declined significantly over the 2005 to 2008 time period included Real Estate, Rental and Leasing (-4.9 percent), Construction (-2.9 percent) and Information (-1.6 percent). Provisional First Quarter data for 2009 have been provided for information, as shown in Table 3-5.

Table 3-5
Employment Trend[1] by NAICS Sectors
City of Murrieta
Annual 2005 to First Quarter 2009

	Annual 2005	Annual 2006	Annual 2007	Annual 2008	Fisrt Quarter 2009	Change 2005 to 2008	Annual Average Growth Rate 2005 to 2008
Estimates of Total Employment (Incl. Self Employed)							
Construction	1,902	2,254	2,060	1,739	1,333	-163	-2.9%
Manufacturing	798	712	858	844	730	45	1.9%
Wholesale Trade	288	414	363	398	324	111	11.5%
Retail Trade	3,224	3,373	3,811	3,466	3,011	242	2.4%
Transportation and Warehousing	139	175	185	155	115	15	3.5%
Information	171	186	183	156	134	-15	-3.1%
Finance and Insurance	281	420	453	405	356	124	13.0%
Real Estate and Rental and Leasing	314	335	303	270	222	-44	-4.9%
Professional, Scientific, and Technical S	443	522	707	723	567	280	17.7%
Management of Companies and Enterp	64	0	0	0	0	-64	n/a
Administrative and Support and Waste	1,145	1,515	1,525	1,298	1,141	153	4.3%
Educational Services	29	57	74	104	111	75	52.6%
Health Care and Social Assistance	2,005	2,220	2,482	2,417	2,424	412	6.4%
Arts, Entertainment, and Recreation	405	465	468	328	259	-77	-6.8%
Accommodation and Food Services	1,292	1,598	1,813	1,736	1,506	444	10.3%
Other Services (except Public Administr	879	788	963	849	735	-30	-1.1%
Federal Government	24	25	63	129	124	105	75.2%
Local Government	2,210	2,395	2,570	2,601	2,548	391	5.6%
Other Employment	260	327	372	393	300	132	14.7%
TOTAL	**15,873**	**17,780**	**19,253**	**18,009**	**15,941**	**2,136**	**4.3%**

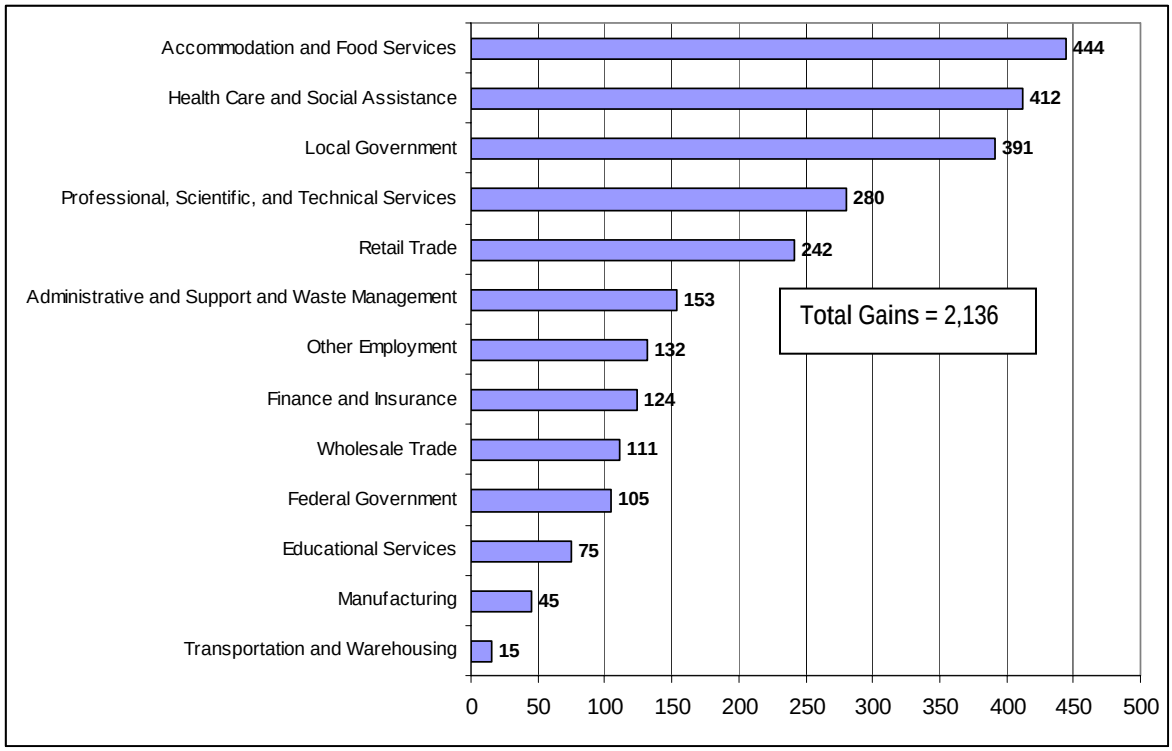
1.Employment data by NAICS industries has been adjusted for self-employment based on estimates from the American Community Survey 2006-2008.

Source: Stanley R. Hoffman Associates, Inc.
California Employment Development Department (EDD)
American Community Survey, 2006-08

As shown in Figure 3-7, about 58 percent of the employment growth of 2,136 over the annual 2005 to annual 2008 period was concentrated in Accommodation and Food Services, Health Care and Social Assistance and Local Government, which are all typically local serving activities. However, Professional, Scientific and Technical Services jobs also grew during this time period, comprising the fourth largest individual sectoral share of growth at 13 percent of the total growth.

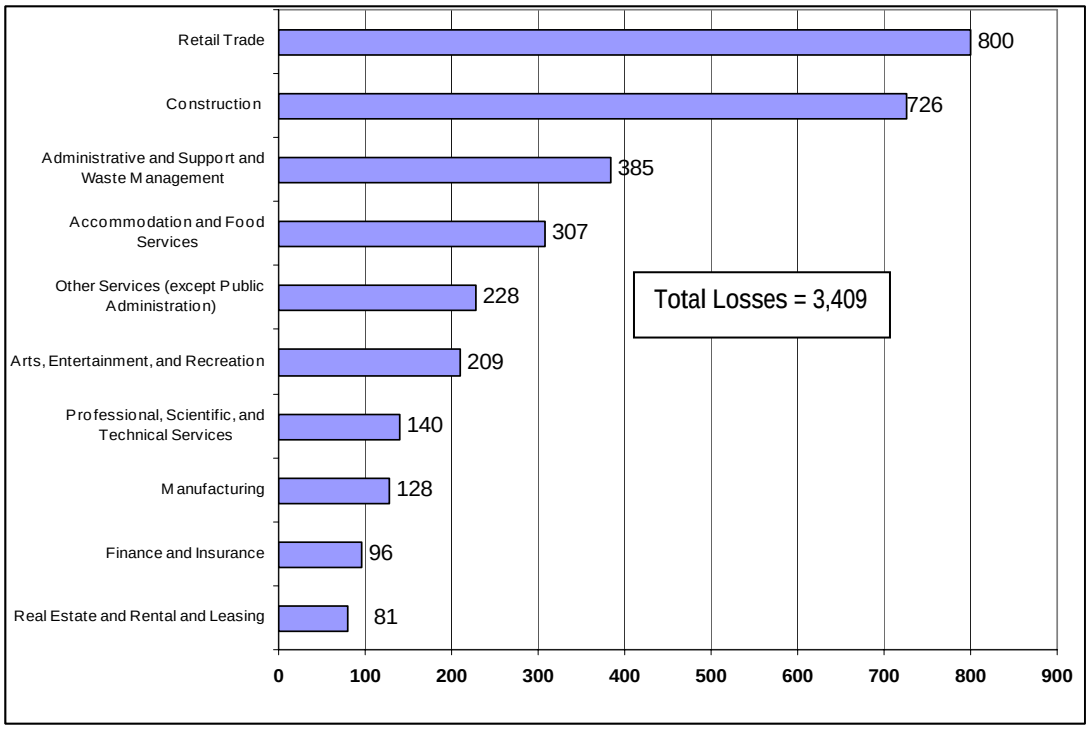
However, the City experienced a net loss of 1,244 jobs between the annual estimates for 2007 and 2008. This declining trend is indicated in provisional data for the first quarter of the year 2009, as obtained from the EDD. This data indicates that there has been a significant decrease of employment from the 2007 peak annual employment estimate of 19,253 to 15,941 jobs reported for the first quarter of 2009 – a net loss of 3,312 jobs (a total loss of 3,409 jobs and total gain of 98 jobs). As shown in Figure 3-8, of the total 3,409 job losses during this period nearly 24 percent was in Retail Trade followed by Construction at 21 percent, Administration, Support and Waste Management at 11 percent and Accommodation and Food Services at 9 percent, totaling for a share of 65 percent.

Figure 3-7
Job Gains by NAICS Sectors
City of Murrieta
Annual 2005 to Annual 2008



Source: Stanley R. Hoffman Associates, Inc.

Figure 3-8
Job Losses by NAICS Sectors
City of Murrieta
Annual 2007 to First Quarter 2009



Source: Stanley R. Hoffman Associates, Inc.

The overall average wage in the City showed a small decline from annual average of $37,730 in 2005 to $36,077 in 2008, as shown in Table 3-6. In 2008, within the private sectors, average wages in Wholesale Trade sector was the highest at around $51,507 followed by Construction at $45,876 and Finance and Insurance at $45,435, as shown in Figure 3-10. However, jobs in the above sectors comprised only 14 percent of the total.

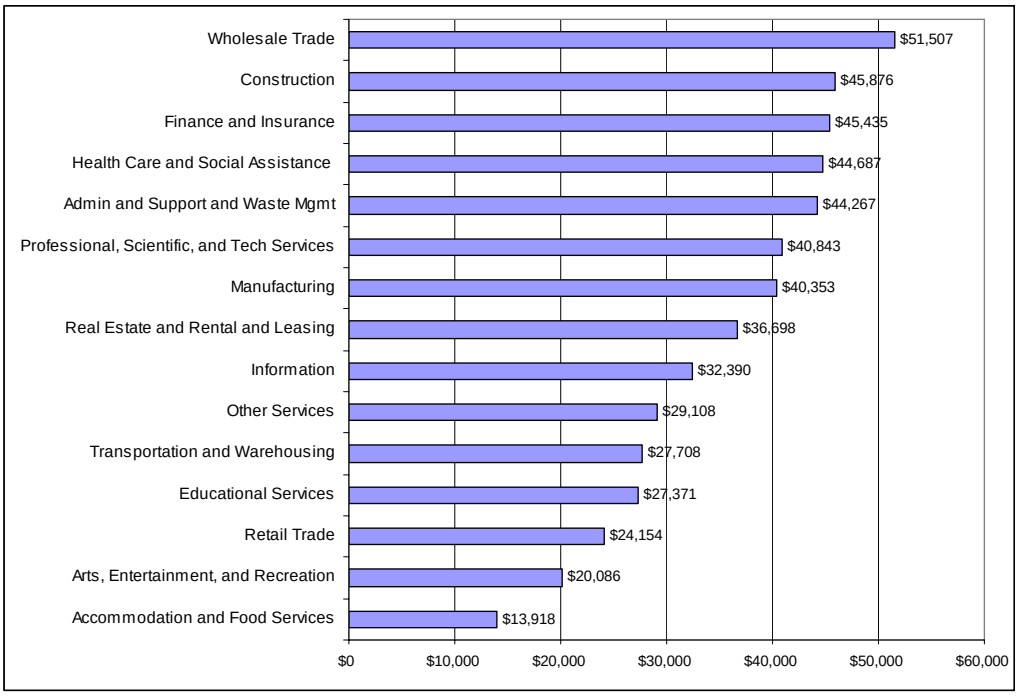
Government jobs (local, state and federal) had average wages around $47,500. Sectors with the lowest average wages in the City included Accommodation and Food Services ($13,918), Arts, Entertainment and Recreation ($20,086) and Retail Trade ($24,154). Jobs in the lowest three wage sectors comprised nearly 31 percent of the total employment in the City. This explains the low overall average wages ($36,077) in the City in 2008.

Table 3-6
Wage Trends by NAICS Sectors
City of Murrieta
2005 to 2008
(Constant 2008 Dollars)

	2005	2006	2007	2008	Percent Change 2005 to 2008
Construction	$45,906	$47,703	$46,849	$45,876	-0.1%
Manufacturing	$43,259	$42,154	$41,262	$40,353	-6.7%
Wholesale Trade	$54,214	$49,950	$54,877	$51,507	-5.0%
Retail Trade	$26,566	$25,443	$25,184	$24,154	-9.1%
Transportation and Warehousing	$37,460	$23,723	$25,902	$27,708	-26.0%
Information	$43,297	$48,142	$41,728	$32,390	-25.2%
Finance and Insurance	$54,754	$49,054	$49,823	$45,435	-17.0%
Real Estate and Rental and Leasing	$39,686	$48,474	$40,492	$36,698	-7.5%
Professional, Scientific, and Technical Services	$47,114	$47,800	$41,920	$40,843	-13.3%
Management of Companies and Enterprises	$30,023	n/a	n/a	n/a	n/a
Administrative and Support and Waste Management	$43,812	$41,026	$44,118	$44,267	1.0%
Educational Services	$24,608	$25,187	$29,897	$27,371	11.2%
Health Care and Social Assistance	$47,579	$46,370	$45,611	$44,687	-6.1%
Arts, Entertainment, and Recreation	$20,475	$20,409	$20,758	$20,086	-1.9%
Accommodation and Food Services	$13,327	$13,652	$13,555	$13,918	4.4%
Other Services (except Public Administration)	$27,851	$28,195	$28,435	$29,108	4.5%
Federal Government	$54,593	$59,176	$49,658	$47,857	-12.3%
Local Government	$46,250	$46,407	$47,172	$47,431	2.6%
TOTAL	**$37,730**	**$37,550**	**$36,878**	**$36,077**	**-4.4%**

Source: Stanley R. Hoffman Associates, Inc.
California Employment Development Department (EDD)

Figure 3-9
Average Wages by NAICS Sectors
City of Murrieta
2008



Source: Stanley R. Hoffman Associates, Inc.

3.5 Murrieta Employees and Labor Force Commute Patterns

As shown in Table 3-7, according to the US Census Bureau, in 2008 about 21 percent of individuals employed in the City of Murrieta also lived in the City. About 10 percent of employees in Murrieta commute from Temecula, while about 31 percent commute from other parts of Riverside County. About 11 percent of the individuals employed in Murrieta commute from San Diego County followed by 8 percent from Los Angeles County.

In comparison, as shown in Table 3-8, an overwhelming majority of Murrieta Residents out-commute to their place of employment. While about 16 percent of Murrieta residents commute to Temecula for work, only about 13 percent work within Murrieta. Another 20 percent of the City residents commute to other parts of Riverside County, while another 22 percent out-commute to San Diego County for employment. The above data suggests that the diverse City workforce is not being absorbed by the existing economic base of the City. Policy would need to address this gap through measures to promote economic diversification, particularly within the manufacturing, professional, scientific and technical, information and finance and insurance sectors.

Table 3-7
Place of Residence of Murrieta Employees
2008

Place of Residence	Murrieta Employees	Percent Share
Riverside County		
Murrieta	3,662	20.9%
Temecula	1,702	9.7%
Wildomar	560	3.2%
Lake Elsinore	454	2.6%
Other Riverside County Places	5,492	31.4%
Riverside County	11,870	67.9%
San Diego County	1,845	10.6%
Los Angeles County	1,436	8.2%
Orange County	945	5.4%
Other Locations	1,389	7.9%
Total	**17,485**	**100.0%**

Source: Stanley R. Hoffman Associates, Inc.
Census Longitudinal Employee Household Dynamics (LEHD), 2008.

Table 3-8
Place of Employment of Murrieta Labor Force
2008

Place of Employment	Murrieta Labor	Percent Share
Riverside County		
Temecula	4,551	15.9%
Murrieta	3,662	12.8%
Riverside City	1,167	4.1%
Lake Elsinore	640	2.2%
Other Riverside County Places	3,920	13.7%
Riverside County	13,940	48.8%
San Diego County	6,318	22.1%
Orange County	3,180	11.1%
Los Angeles County	2,518	8.8%
Other Locations	2,606	9.1%
Total	**28,562**	**100.0%**

Source: Stanley R. Hoffman Associates, Inc.
Census Longitudinal Employee Household Dynamics (LEHD), 2008.

CHAPTER 4
DEMOGRAPHIC TRENDS

This chapter presents information on the demographic trends for the City of Murrieta from the 2000 Census, updated information for 2008, where available from the American Community Survey and to 2009 from the California Department of Finance. These data include information on population, household, housing characteristics, labor force and other demographic indicators. The earliest population estimates provided by the California Department of Finance was for 1992 since the City of Murrieta was officially incorporated as a city on July 1, 1991. Population figures for 1990 for Murrieta Census Designated Place (CDP), which is defined by the U.S. Census Bureau, as a concentration of a population that is the statistical counterpart of an incorporated place is available but was not used. This is due to the fact that the City of Murrieta was not incorporated until July 1, 1991 as stated on the City's website, so population figures provided by the U.S. Census Bureau for 1990 were not reliable and therefore not used in this report.

4.1 Population and Households

As shown in Table 4-1, total population in the City grew from 24,334 in the 1992 to 100,714 in the 2009 at an annual average growth rate of 7.76 percent. Riverside County population grew at a lower rate from 1992 to 2009, experiencing an annual average growth rate of 2.68 percent. Growth rates for household population – which excludes group quarter population -- for both Murrieta and Riverside County were similar to population growth rates for the 1992 to 2009 time period.

By January 2009, according to the California Department of Finance (DOF), population in the City was estimated to have reached 100,714. Household population grew from 24,245 in 1992 to 100,054 in 2009 at an annual average growth of 7.75 percent. Population and household growth rates are almost the same for the 1992 to 2009 time period, based on information from DOF. These trends are similar in Riverside County, where the population and households grew at similar rates at 2.68 percent and 2.70 percent respectively between the 1992 and 2000 time period.

Table 4-1
Historic Population and Household Growth Trends
City of Murrieta and Riverside County
1992 to 2009

	1992	2000	2009	Change 1992 to 2009	Percent Change	AAGR[1] 1992 to 2009
A. City of Murrieta						
Population	24,334	43,902	100,714	76,380	313.9%	7.76%
Household Population	24,245	43,719	100,054	75,809	312.7%	7.75%
Housing Units	9,712	14,793	34,293	24,581	253.1%	6.87%
Households	7,538	14,136	32,677	25,139	333.5%	8.03%
Persons Per Household	3.22	3.09	3.06			
Vacancy	22.38%	4.44%	4.71%			
B. Riverside County						
Population	1,275,484	1,535,125	2,107,653	832,169	65.2%	2.68%
Household Population	1,248,956	1,500,903	2,072,532	823,576	65.9%	2.70%
Housing Units	512,830	581,089	780,112	267,282	52.1%	2.23%
Households	430,421	502,782	677,582	247,161	57.4%	2.42%
Persons Per Household	2.90	2.99	3.06			
Vacancy	16.07%	13.48%	13.14%			

1. AAGR is defined as Average Annual Growth Rate

Sources: Stanley R. Hoffman Associates, Inc.
California Department of Finance, 1992, 2000 and 2009

As shown in Table 4-1, the population of the City almost doubled for the 1990 to 2000 time period, and then more than doubled for the 1992 to 2009 time period. Persons per household experienced a decline from 3.22 in 1990 to 3.06 in 2009. However, Riverside County population and household population steadily increased from 1992 to 2009. This trend can be seen in persons per household for the 1992 to 2009 period which increased from 2.90 to 3.06 persons per household.

Table 4-2 shows the population growth from 1992 to 2009 for the City of Murrieta, surrounding cities and surrounding counties. These cities are: Temecula, Lake Elsinore and Corona, and the counties are: Riverside County, San Bernardino County and San Diego County. The lowest annual average growth rate is at 1.24 percent for the San Diego County and the highest growth rate is at 8.71 percent for the City of Murrieta for the 1992 to 2009 time period.

Figure 4-1 shows the historic population of the City of Murrieta from 1992 to 2009. Based on the City's website, the City of Murrieta was incorporated July 1, 1991. The City experienced a steady growth from 24,334 to 43,902 in the 1992 to 2000 time period. Then from the 2000 to 2009 time period, there was a more rapid population growth from 43,902 to 100,714, more than doubling the 2000 population.

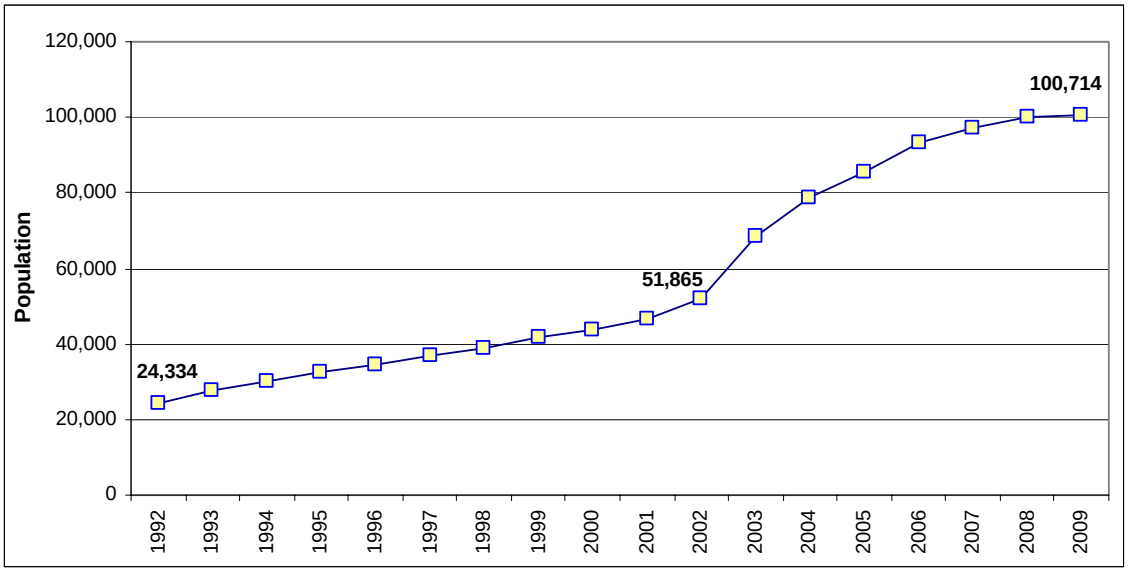
Table 4-2
Historic Population Growth Trends
City of Murrieta and Surrounding Cities and Counties
1992 to 2009

	1992	2000	2009	Change 1992 to 2009	Percent Change	AAGR[1] 1992 to 2009
City of Murrieta	**24,334**	**43,902**	**100,714**	**76,380**	**313.9%**	**8.71%**
Surrounding Cities						
Temecula	31,622	56,607	102,604	70,982	224.5%	7.17%
Lake Elsinore	21,605	28,756	50,267	28,662	132.7%	5.09%
Corona	86,850	123,757	148,597	61,747	71.1%	3.21%
Riverside County	1,275,484	1,535,125	2,107,653	832,169	65.2%	3.00%
San Bernardino County	1,516,475	1,701,374	2,060,950	544,475	35.9%	1.82%
San Diego County	2,572,449	2,801,336	3,173,407	600,958	23.4%	1.24%

1. AAGR - Average Annual Growth Rate

Sources: Stanley R. Hoffman Associates, Inc.
California Department of Finance, 1992, 2000 and 2009

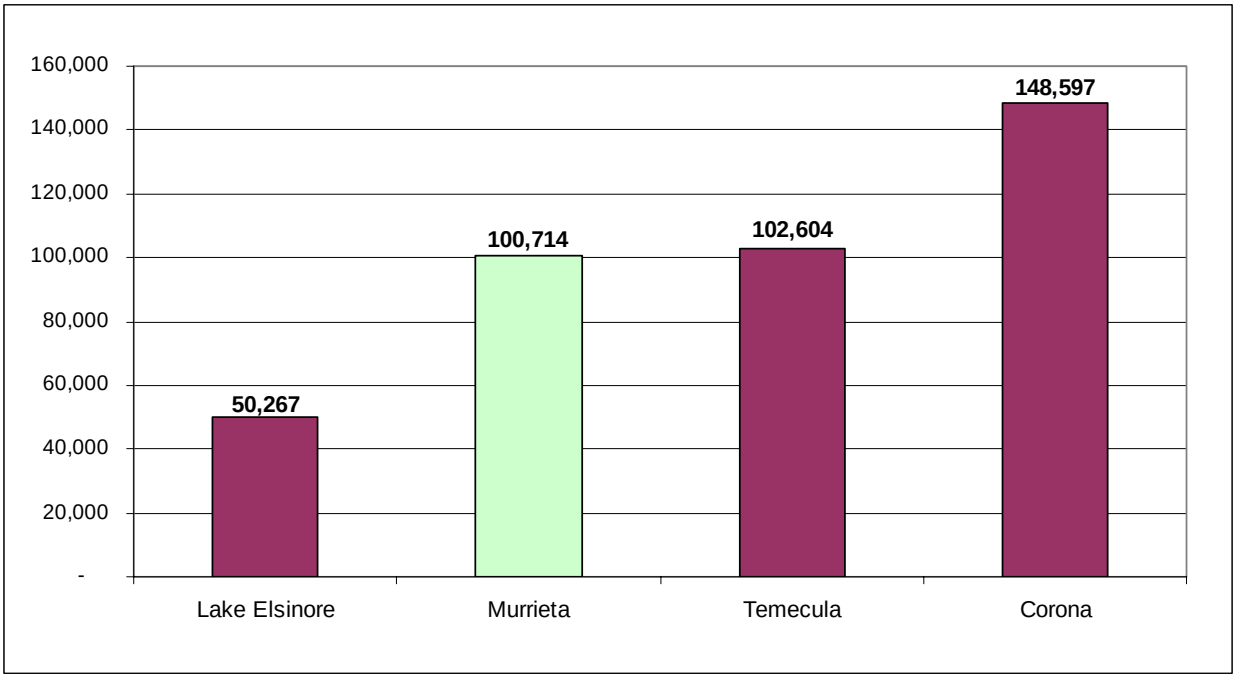
Figure 4-1
Historic Population
City of Murrieta
1992 to 2009



Source: Stanley R. Hoffman Associates, Inc.
California Department of Finance, 1992 to 2009

Figure 4-2 displays population characteristics for the City of Murrieta and surrounding cities. The City has the third largest population at 100,714 among the surrounding cities falling just below Temecula's population of 102, 604. Within this sub-region, the City of Corona has the largest estimated population with 148,597. Lake Elsinore has the smallest population of the four compared cities at 50,267.

Figure 4-2
Population Characteristics
City of Murrieta and Surrounding Cities and Counties
2009

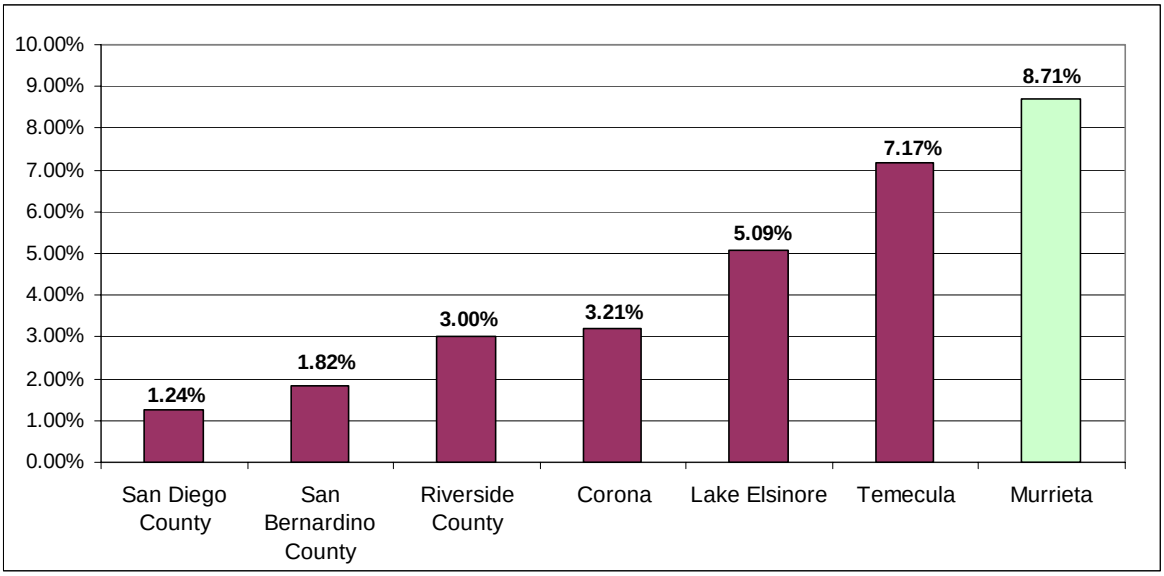


Source: Stanley R. Hoffman Associates, Inc.
California Department of Finance, 2009

As shown in Figure 4-3, the City of Murrieta has the largest average annual growth rates at 8.71 percent. The County of San Diego has the lowest growth rate at 1.24 percent. The Counties had lower average annual growth rates that ranged from 1.24 percent to 3.00 percent compared to the cities of Corona, Lake Elsinore and Temecula that ranged from 3.21 percent to 8.71 percent average annual growth rate.

As shown in Table 4-3 and Figure 4-4, the household population of Murrieta is the second smallest among the four cities with 100,054 households which is slightly below Temecula's household population of 102,582. Figure 4-4 reflects the cities' household population in relation to each other. Household population trends for the cities were similar to that of population trends. Corona, Temecula, Murrieta and Lake Elsinore had household populations that ranged from 50,194 households to 147,965 households.

Figure 4-3
Average Annual Growth Rate of Population
City of Murrieta and Surrounding Cities and Counties
1992 to 2009



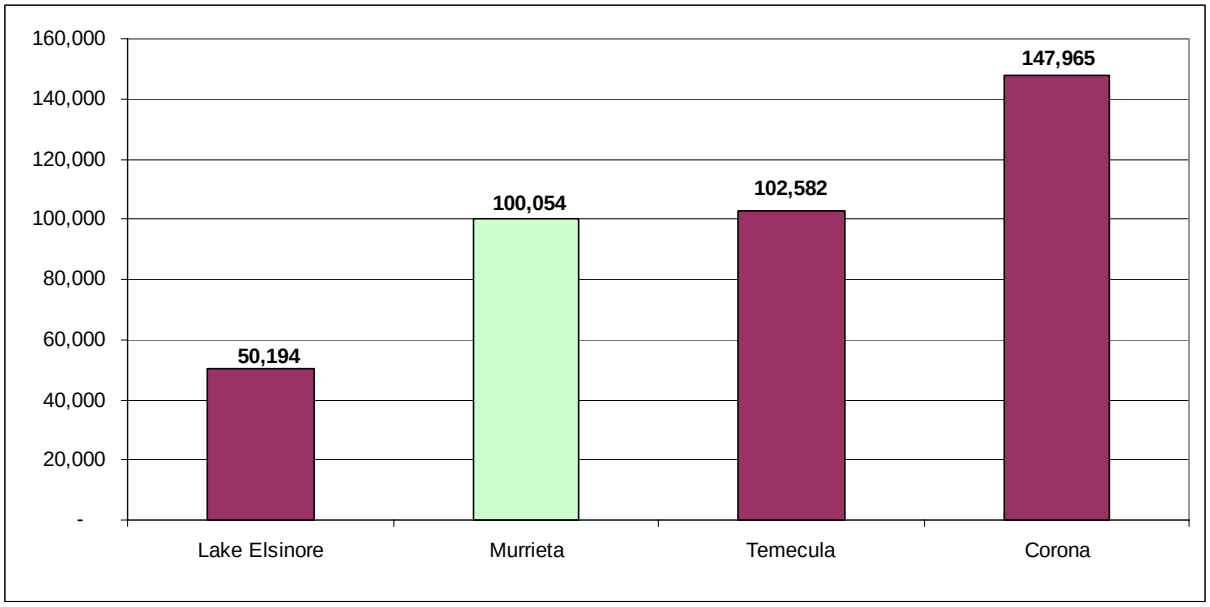
Source: Stanley R. Hoffman Associates, Inc.
California Department of Finance, 2009

Table 4-3
Population and Household Characteristics
City of Murrieta and Surrounding Cities and Counties: 2009

	Population	Household Population	Occupied Units	Persons Per Household
City of Murrieta	**100,714**	**100,054**	**32,677**	**3.20**
Surrounding Cities				
Temecula	102,604	102,582	31,560	3.13
Lake Elsinore	50,267	50,194	15,014	4.79
Corona	148,597	147,965	43,949	2.41
Riverside County	2,107,653	2,072,532	677,582	2.87
San Bernardino County	2,060,950	2,008,900	610,352	3.44
San Diego County	3,173,407	3,074,598	1,099,130	2.98

Sources: Stanley R. Hoffman Associates, Inc.
California Department of Finance

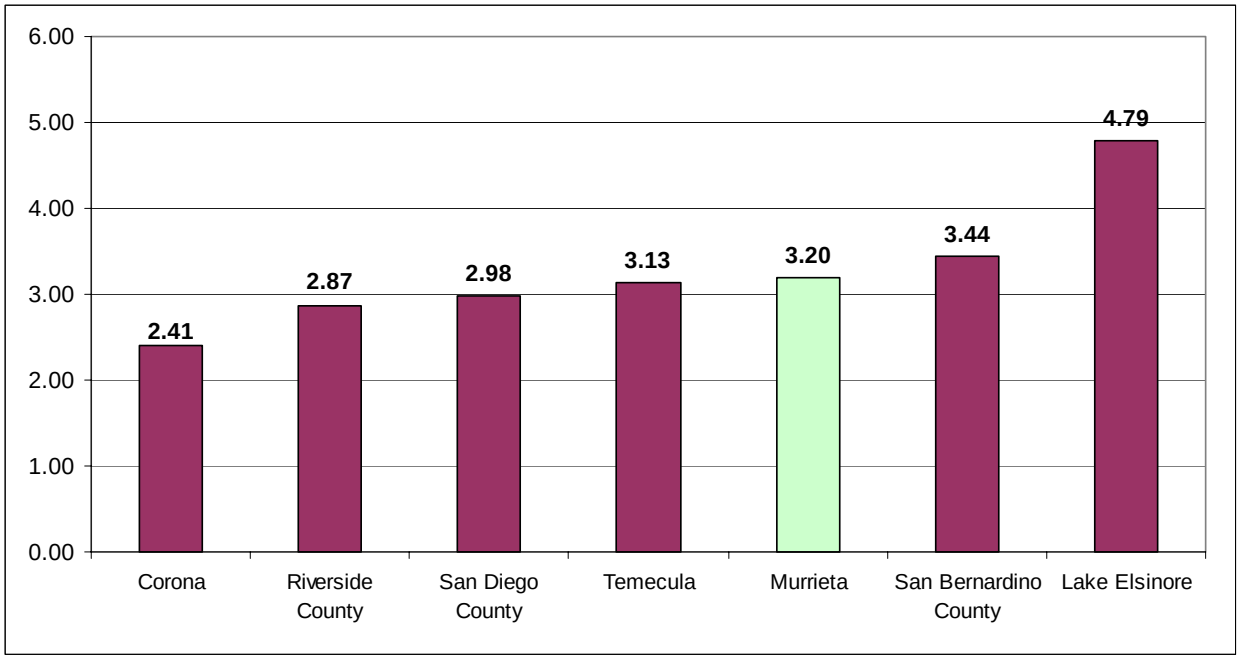
Figure 4-4
Household Population
City of Murrieta and Surrounding Cities and Counties: 2009



Source: Stanley R. Hoffman Associates, Inc.

Figure 4-5 shows the persons per household for the City of Murrieta and surrounding cities and counties. Murrieta has the third highest persons per household at 3.20. Lake Elsinore had the highest persons per household at 4.79 followed by San Bernardino County with 3.44 persons per household. Corona had the lowest persons per household at 2.41 compared to the other cities and counties. Riverside County, San Diego County and Temecula had persons per household at 2.87, 2.98 and 3.13 respectively.

Figure 4-5
Persons per Household
City of Murrieta and Surrounding Cities and Counties: 2009



Source: Stanley R. Hoffman Associates, Inc.
California Department of Finance, 2009

4.2 Racial and Ethnic Distribution

As shown in Table 4-4, ethnic composition in the City has shifted over the 2000 to 2008 time period. While the Hispanic, Asian, Black and other populations in the City experienced general growth, the non Hispanic White population in the City declined. The non Hispanic White population in the City declined from 80.1 percent in 1990 to 71.2 percent in 2000 to 56.4 percent in 2008. The Hispanic or Latino population and the Asian population in the City experienced an opposite trend as both populations increased from the 1990 to 2008 time period. The Hispanic or Latino population increased from 17.2 percent in 1990 to 18.0 percent in 2000 to 26.4 percent in 2008 and the Asian

population increased from 0.4 percent in 1990 to 3.3 in 2000 to 7.9 percent in 2008. The Black population increased from 0.6 percent in 1990 to 4.8 percent in 2008 and all Other Races comprised 1.7 percent of the population in 1990 and increased to 4.5 percent of the population in 2008.

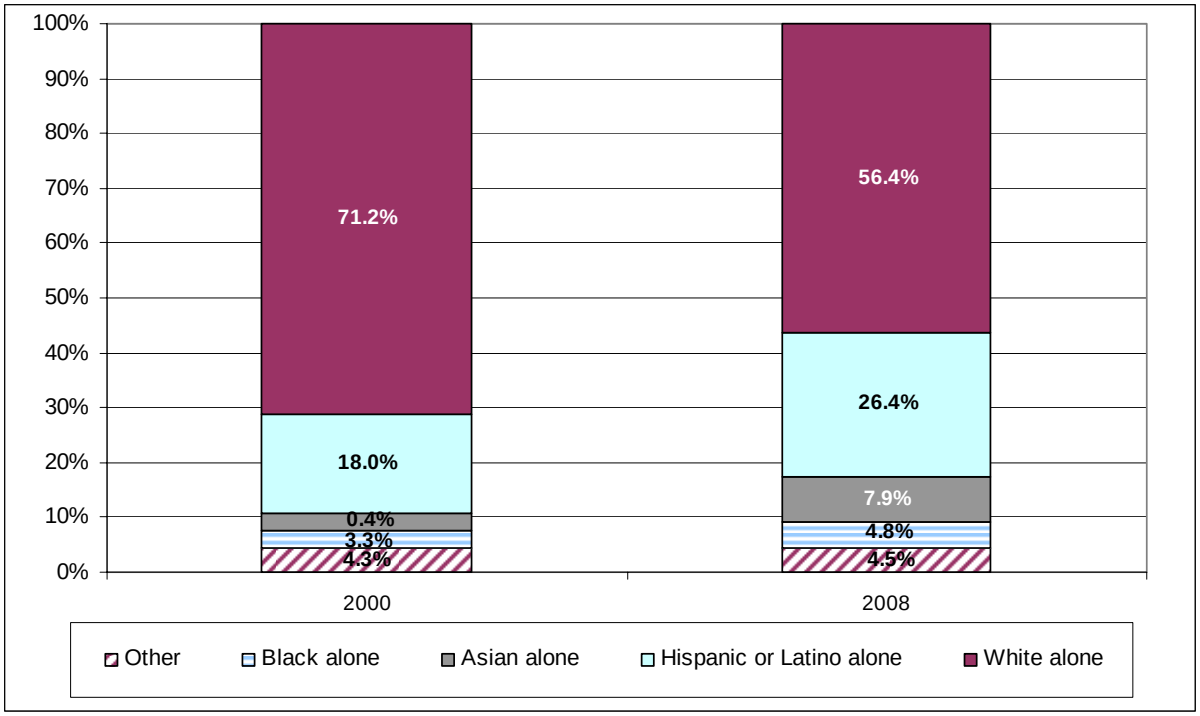
In Figure 4-6, the White population comprises the majority of the total population in the City. The White population decreased from about 80 percent in 1990 to about 56 percent in 2008. The next highest ethnic group in Murrieta is the Hispanic or Latino population. In 1990, the Hispanic or Latino population comprised about 17 percent of the total City population but increased to about 26 percent of the total population in 2008. In 2008, the White population and the Hispanic population comprised about 83 percent of the total population in the City.

Table 4-4
Race and Ethnicity
City of Murrieta
2000 to 2008

	2000		2008	
	Total	Percent Total	Total	Percent Total
White alone	31,591	71.2%	54,702	56.4%
Hispanic or Latino alone	7,961	18.0%	25,592	26.4%
Asian alone	1,449	3.3%	7,710	7.9%
Black alone	1,448	3.3%	4,691	4.8%
Other	1,901	4.3%	4,334	4.5%
Total	**44,350**	**100.0%**	**97,029**	**100.0%**

Source: Stanley R. Hoffman Associates, Inc.
U.S. Bureau of the Census, 2000 Decennial Census
2006-2008 American Community Survey

Figure 4-6
Race and Ethnicity
City of Murrieta
1990 to 2008



Source: Stanley R. Hoffman Associates, Inc.
U.S. Bureau of the Census, Decennial Census 2000, American Community Survey 2006-2008

Table 4-5 and Figure 4-7 displays the ethnic breakdown of the City of Murrieta and surrounding cities and counties. The City of Murrieta has the second highest percentage of the White population in the City compared to all the other cities and counties at 56.4 percent with only the City of Temecula have a higher percent of non Hispanic Whites at 61.0 percent. San Diego County has a comparable percentage of the White population with 51.2 percent. Riverside County, the City of Corona, the City of Lake Elsinore and San Bernardino County had lower percentages of the White population at 42.6 percent, 41.8 percent, 41.1 percent and 36.3 percent, respectively.

San Bernardino County, the City of Lake Elsinore, and Riverside County have the highest distribution of Hispanics at 46.7 percent, 46.5 percent and 43.1 percent respectively. The cities with the lowest percentage of Hispanic populations are Temecula at 22.3 percent and Murrieta at 26.4 percent.

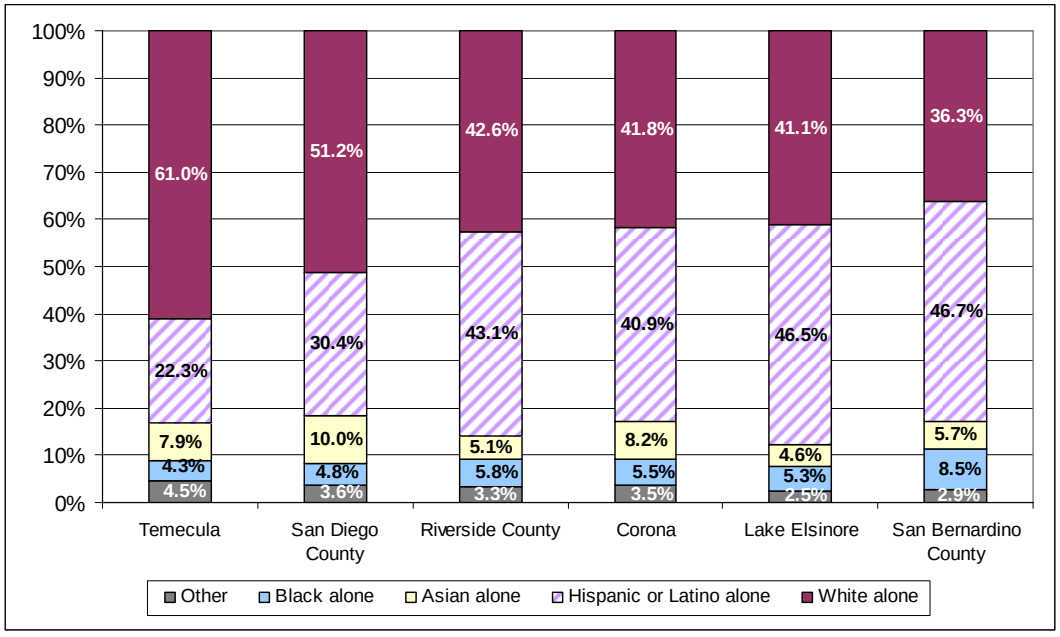
Table 4-5
Race and Ethnicity
City of Murrieta and Surrounding Cities and Counties
2008

	Murrieta	Temecula	Lake Elsinore	Corona	Riverside County	San Bernardino County	San Diego County
White alone	54,702	57,182	17,115	65,454	876,498	725,194	1,520,037
Hispanic or Latino alone	25,592	20,926	19,362	64,012	885,934	933,875	901,183
Asian alone	7,710	7,413	1,896	12,893	104,541	114,173	295,849
Black alone	4,691	4,047	2,217	8,612	119,517	169,301	141,925
Other	4,334	4,243	1,027	5,554	68,742	57,210	106,949
Total	97,029	93,811	41,617	156,525	2,055,232	1,999,753	2,965,943

	Murrieta	Temecula	Lake Elsinore	Corona	Riverside County	San Bernardino County	San Diego County
White alone	56.4%	61.0%	41.1%	41.8%	42.6%	36.3%	51.2%
Hispanic or Latino alone	26.4%	22.3%	46.5%	40.9%	43.1%	46.7%	30.4%
Asian alone	7.9%	7.9%	4.6%	8.2%	5.1%	5.7%	10.0%
Black alone	4.8%	4.3%	5.3%	5.5%	5.8%	8.5%	4.8%
Other	4.5%	4.5%	2.5%	3.5%	3.3%	2.9%	3.6%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Stanley R. Hoffman Associates, Inc.
U.S. Bureau of the Census, 1990 and 2000 Decennial Census
2006-2008 American Community Survey

Figure 4-7
Race and Ethnicity
City of Murrieta and Surrounding Cities and Counties
2008



Source: Stanley R. Hoffman Associates, Inc.
American Community Survey 2006-2008

4.3 Age Distribution

The following tables and figures display the age distribution of the population in the City of Murrieta in 2000 and 2008. Estimates are from the 2000 Decennial Census and from the 2006 to 2008 American Community Survey.

Table 4-6 shows the age distribution in the City from 2000 to 2008. The population in the age group from 35 to 64 years of age has the highest distribution of the City's population from the 2000 to 2008 population from 38.0 percent in 2000 then decreasing to 34.8 percent in 2008. Population in the age group less than 18 years of age also shows a decline from 33.5 percent in 2000 to 31.2 percent in 2008. In contrast, the population of people ranging from 18 to 34 years of age experienced an increase from 17.2 percent in 2000 to 2008 time period to 24.7 percent. The population group over 65 years of age experienced a decline over the 2000 to 2008 time period from 11.3 percent in 2000 to 9.4 percent in 2008.

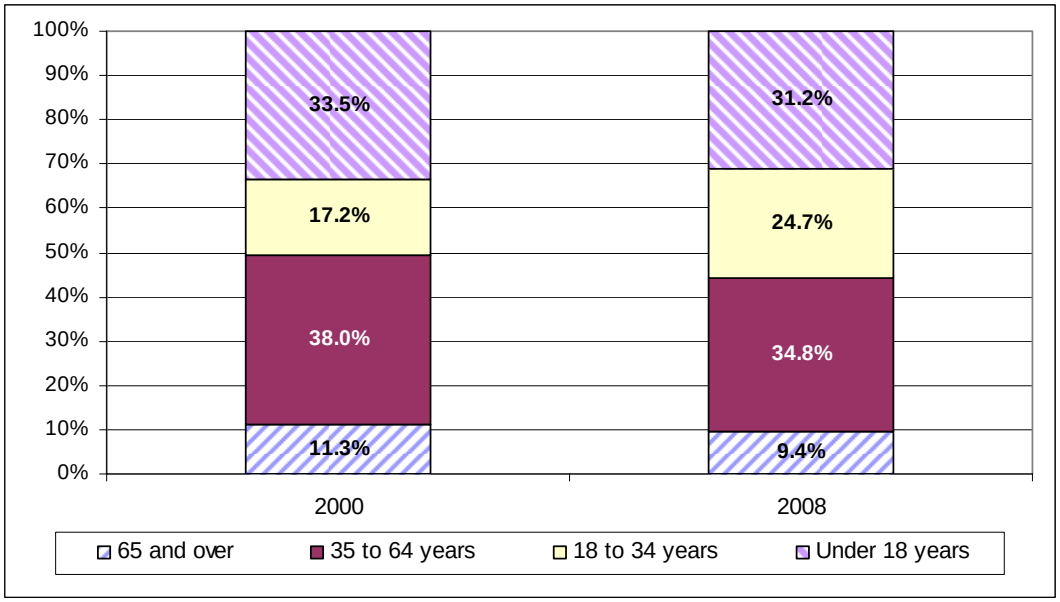
As shown in Figure 4-8, the largest age group for the City of Murrieta is age group ranging from 35 to 64 years of age. This is also the mature working age population, as well. In 2008, this age group comprised about 35 percent of the total population in the City. The second largest age group is population in the age group less than 18 years of age at about 31 percent. The third largest age group is the age group of 18 to 34 years at about 25 percent. This group constitutes the entry level and less experienced working age population. The population of people greater than 65 years of age is the smallest age group for the City of Murrieta at 9.4 percent in 2008.

Table 4-6
Age Distribution
City of Murrieta
1990 to 2008

	2000		2008	
	Total	Percent Total	Total	Percent Total
Under 18 years	14,876	33.5%	30,243	31.2%
18 to 34 years	7,610	17.2%	23,947	24.7%
35 to 64 years	16,872	38.0%	33,749	34.8%
65 and over	4,992	11.3%	9,090	9.4%
Total	**44,350**	**100.0%**	**97,029**	**100.0%**

Source: Stanley R. Hoffman Associates, Inc.
U. S. Census Bureau, Decennial Census 2000
American Community Survey, 2006-2008

Figure 4-8
Age Distribution
City of Murrieta
2000 to 2008



Source: Stanley R. Hoffman Associates, Inc.
U.S. Bureau of the Census, Decennial Census 2000, American Community Survey 2006-2008

Table 4-7
Age Distribution
City of Murrieta and Surrounding Cities and Counties
2008

	Murrieta	Temecula	Lake Elsinore	Corona	Riverside County	San Bernardino County	San Diego County
Under 18 years	30,243	27,810	13,095	45,429	576,261	593,719	740,346
18 to 34 years	23,947	24,441	12,297	44,289	552,127	539,022	776,240
35 to 64 years	33,749	34,567	14,020	57,378	693,003	701,271	1,118,051
65 and over	9,090	6,993	2,205	9,429	233,841	165,741	331,306
Total	**97,029**	**93,811**	**41,617**	**156,525**	**2,055,232**	**1,999,753**	**2,965,943**

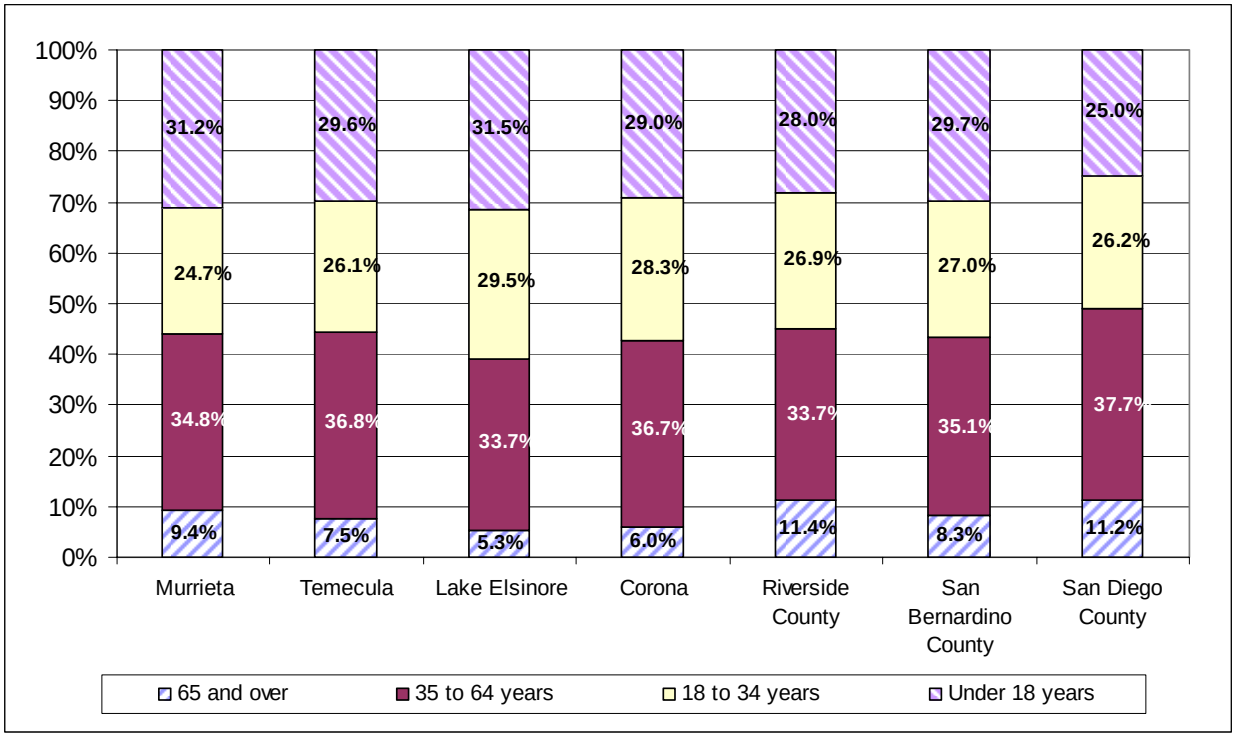
	Murrieta	Temecula	Lake Elsinore	Corona	Riverside County	San Bernardino County	San Diego County
Under 18 years	31.2%	29.6%	31.5%	29.0%	28.0%	29.7%	25.0%
18 to 34 years	24.7%	26.1%	29.5%	28.3%	26.9%	27.0%	26.2%
35 to 64 years	34.8%	36.8%	33.7%	36.7%	33.7%	35.1%	37.7%
65 and over	9.4%	7.5%	5.3%	6.0%	11.4%	8.3%	11.2%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Median Age (in yrs)	**30.7**	**31.9**	**28.7**	**30.0**	**31.6**	**30.3**	**34.2**

Source: Stanley R. Hoffman Associates, Inc.
American Community Survey, 2006-2008

Table 4-7 compares the age distribution of age groups in the City of Murrieta and surrounding cities and counties. Similar to the City of Murrieta in 2008, all the other cities and counties displayed the population in the age group from 35 to 64 years of age to be the largest in their cities and the population greater than 65 years of age to be the smallest in their cities.

Figure 4-9 displays the age distribution for the City of Murrieta and surrounding cities and counties. Murrieta has the lowest distribution of persons from 18 to 34 years of age at 24.7 percent compared to all the other cities and counties. The City of Lake Elsinore has the highest percentage of this age group in its City with 29.5 percent of the total city population. In contrast, Murrieta has the second highest percentage of persons less than 18 years of age compared to other cities with 31.2 percent of the total city population in this age group. The only other City with a higher percentage in this age group is Lake Elsinore at 31.5 percent. Murrieta with a median age of 30.7 years is roughly in the middle of the range of 28.7 years for Lake Elsinore to 34.2 years for San Diego County.

Figure 4-9
Age Distribution
City of Murrieta and Surrounding Cities and Counties
2008



Source: Stanley R. Hoffman Associates, Inc.
U.S. Bureau of the Census, Decennial Census 1990 and 2000, American Community Survey 2006-2008

4.4 Income

Table 4-8 displays the median and average household incomes and the average annual growth rates from 2000 to 2008 for the City of Murrieta and surrounding cities and counties for the years 2000 and 2008. Average household income is defined as the mean income of all households in the City, while the median income is the income statistic for the 50th percentile household within the City.

As shown in Table 4-8, the median household income in actual dollars for the City of Murrieta went from about $61,000 in 2000 to about $79,000 in 2008 with an average annual growth rate of 3.33 percent in the 2000 to 2008 time period. The average household income went from about $73,000 in 2000 to about $84,000 in 2008. Temecula had a similar average annual growth rate for median income at 3.34 percent.

Table 4-8
Household Income Characteristics
City of Murrieta and Surrounding Cities and Counties
1990 to 2008 (in Actual Dollars)

Household Income	In Actual Dollars			In Constant Dollars		
	2000	2008	AAGR[1] from 2000 to 2008	2000	2008	AAGR[1] from 2000 to 2008
City of Murrieta						
Median	**$60,911**	**$79,135**	**3.33%**	**$79,869**	**$79,135**	**-0.12%**
Average	**$72,929**	**$84,331**	**1.83%**	**$95,627**	**$84,331**	**-1.56%**
Temecula						
Median	$59,516	$77,394	3.34%	$78,039	$77,394	-0.10%
Average	$68,852	$87,604	3.06%	$90,281	$87,604	-0.38%
Lake Elsinore						
Median	$41,884	$58,496	4.26%	$54,920	$58,496	0.79%
Average	$51,522	$59,717	1.86%	$67,557	$59,717	-1.53%
Corona						
Median	$59,615	$78,120	3.44%	$78,169	$78,120	-0.01%
Average	$69,028	$95,832	4.19%	$90,512	$95,832	0.72%
Riverside County						
Median	$42,887	$58,168	3.88%	$56,235	$58,168	0.42%
Average	$56,445	$72,473	3.17%	$74,013	$72,473	-0.26%
San Bernardino County						
Median	$42,066	$56,575	3.77%	$55,158	$56,575	0.32%
Average	$53,251	$69,016	3.29%	$69,824	$69,016	-0.15%
San Diego County						
Median	$47,067	$63,727	3.86%	$61,716	$63,727	0.40%
Average	$63,468	$80,789	3.06%	$83,222	$80,789	-0.37%

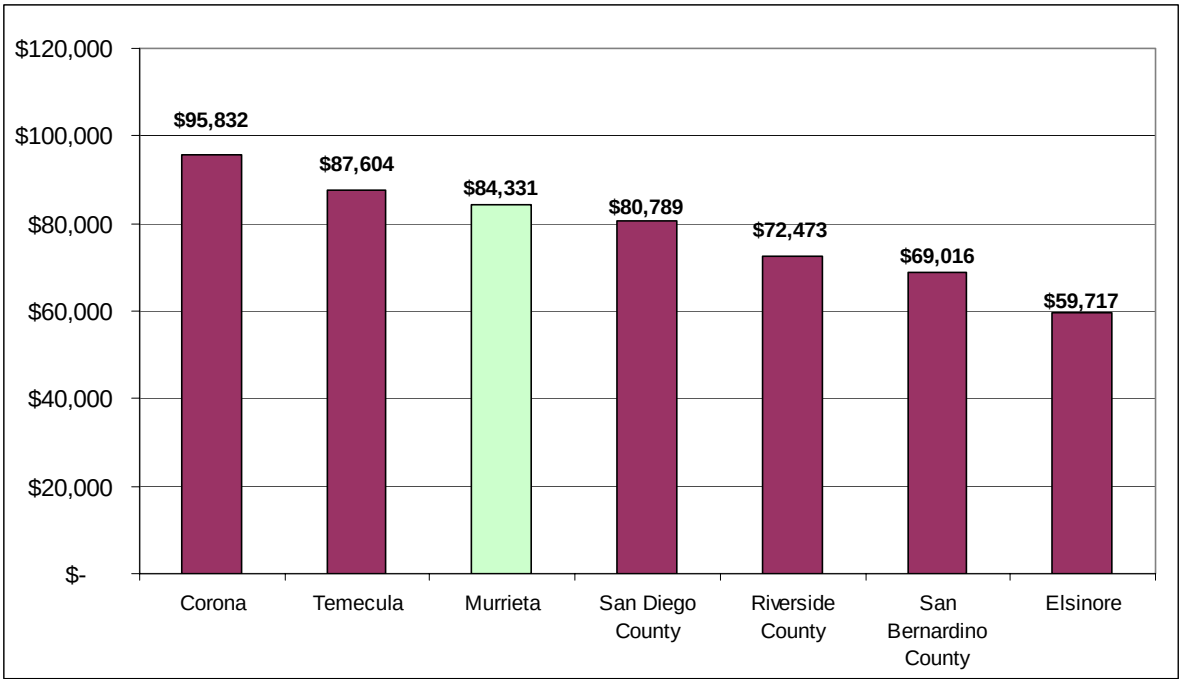
1. AAGR - Average Annual Growth Rate

Source: Stanley R. Hoffman Associates, Inc.
U. S. Census Bureau, Decennial Census 2000, American Community Survey, 2006-2008

In constant 2008 dollars, median household income slightly decreased from $79,869 in 2000 to $79,135 in 2008. The average annual growth rates decreased for average incomes for all cities and counties except for Corona which increased slightly at an annual rate of 0.72 percent. The cities with negative average annual growth rates for median incomes were Temecula at -0.10 percent and Murrieta at -0.12 percent.

Figure 4-10 displays average household income for the City of Murrieta and surrounding cities and counties. The City of Elsinore, San Bernardino County, and Riverside County had the lowest average household incomes at $59,717, $69,016 and $72,473 respectively. Murrieta had an average household income of $84,331 which is between the average income for San Diego County at $80,789 and Temecula at $87,604. The city with the highest average income is Corona at $95,832.

Figure 4-10
Average Household Income
City of Murrieta and Surrounding Cities and Counties: 2008

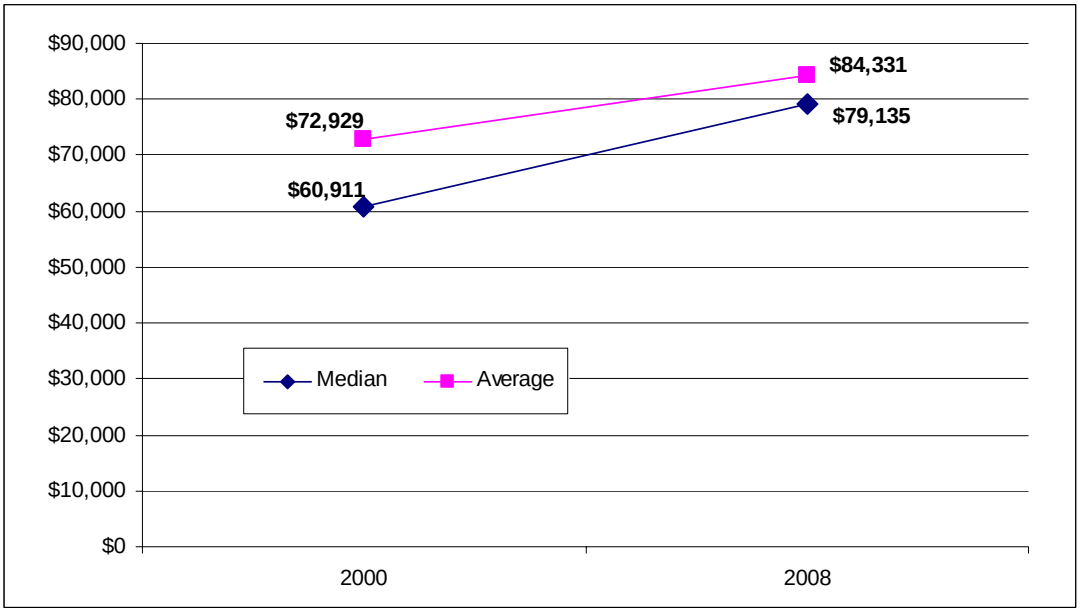


Source: Stanley R. Hoffman Associates, Inc.
U.S. Bureau of the Census, American Community Survey 2006-2008

Figure 4-11 compares the median and average household income for Murrieta in actual dollars for the years 2000 and 2008. Average household income is higher than median household income for the 2000 to 2008 time period. Average income estimates were not provided by the U.S. Census Bureau, Decennial Census for the year 1990 since the City was not incorporated until July, 1991.

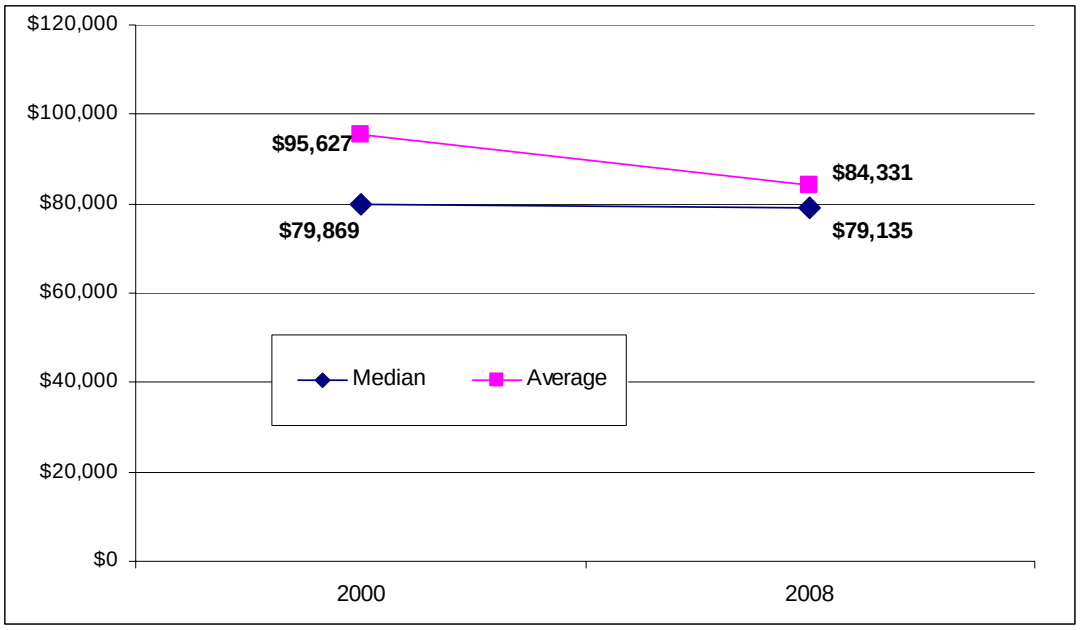
Figure 4-12 compares the median and average household income for Murrieta in 2008 constant dollars. Average household income decreased from about $95,627 in 2000 to about $84,331 in 2008. Median income slightly decreased over the 2000 to 2008 time period from about $79,869 in 2000 to $79,135 in 2008.

Figure 4-11
Median and Average Income, in Actual Dollars
City of Murrieta
(in Actual Dollars)



Source: Stanley R. Hoffman Associates, Inc.
U.S. Bureau of the Census, American Community Survey 2006-2008

Figure 4-12
Median and Average Income, in Constant Dollars
City of Murrieta
(in Constant 2008 Dollars)



Source: Stanley R. Hoffman Associates, Inc.
U.S. Bureau of the Census, American Community Survey 2006-2008

4.5 Education

The following tables and figures display the educational attainment of Murrieta and surrounding cities and counties. Estimates are based on the 2000 Decennial Census and 2006 to 2008 American Community Survey.

Table 4-9 shows the educational attainment for the City of Murrieta for the years 2000 and 2008. Overall, the increasing educational attainment of the City was positive. As shown in the table, individuals with some college, no degree comprised the largest educational grouping in the City at 28.7 percent in 2008. The percentage of individuals in the City that had at least a Bachelor's degree had an overall increase from 23.0 percent in 2000 to 27.4 percent in 2008. This trend was the same for the percentage of individuals in the city with Associates degrees which increased from 8.9 percent in 2000 to 9.4 percent in 2008.

The percentage of individuals in the total City population that had at least an Associates degree increased from about 32.0 percent in 2000 to about 37.0 percent in 2008. The percent of individuals with no High School diplomas dropped from 10.0 percent in 2000 to 8.7 percent in 2008. This shows that over the 2000 to 2008 time period, individuals in the City received more advanced degrees as the distribution of the population increased for individuals with Bachelor's degrees and decreased for individuals with no high school diploma.

Table 4-9
Educational Attainment
City of Murrieta
2000 to 2008

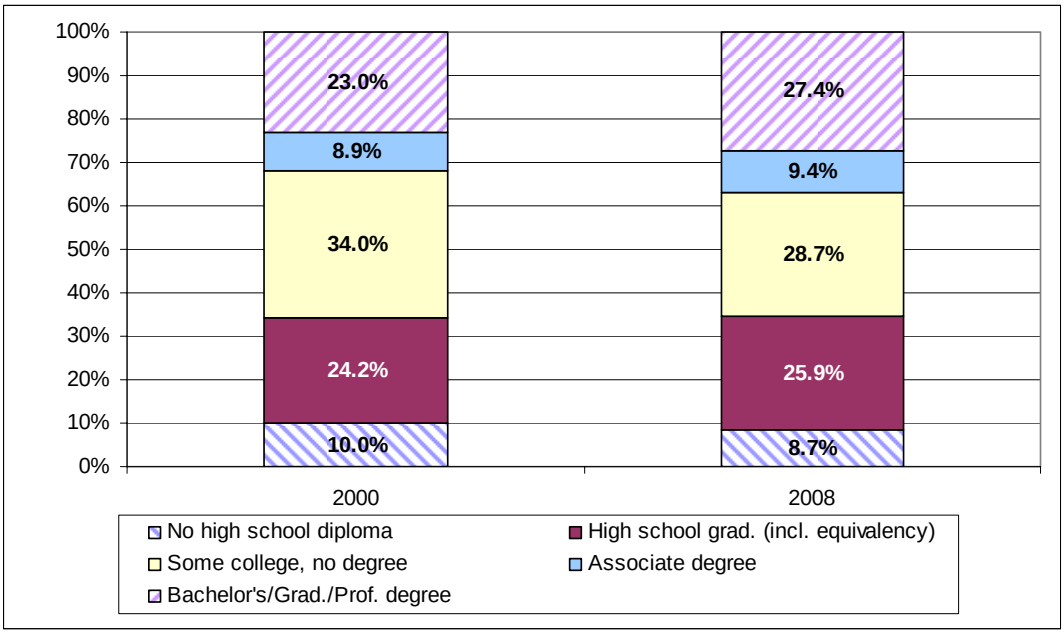
Educational Level	2000 Total	2000 Percent Total	2008 Total	2008 Percent Total
City of Murrieta				
Bachelor's/Grad./Prof. degree	6,131	23.0%	15,781	27.4%
Associate degree	2,362	8.9%	5,385	9.4%
Some college, no degree	9,060	34.0%	16,513	28.7%
High school grad. (incl. equivalency)	6,450	24.2%	14,871	25.9%
No high school diploma	2,661	10.0%	4,977	8.7%
Total Persons	**26,664**	**100.0%**	**57,527**	**100.0%**

Source: Stanley R. Hoffman Associates, Inc.
U. S. Census Bureau, Decennial Census 2000, American Community Survey, 2006-2008

As shown in Figure 4-13, the percent of individuals with a Bachelor's or Graduate/Professional degree increased from 23.0 percent in 2000 to 27.4 percent in 2008. In 2008, the percentage of individuals with at least an Associate's degree comprised just under 37 percent of the total City.

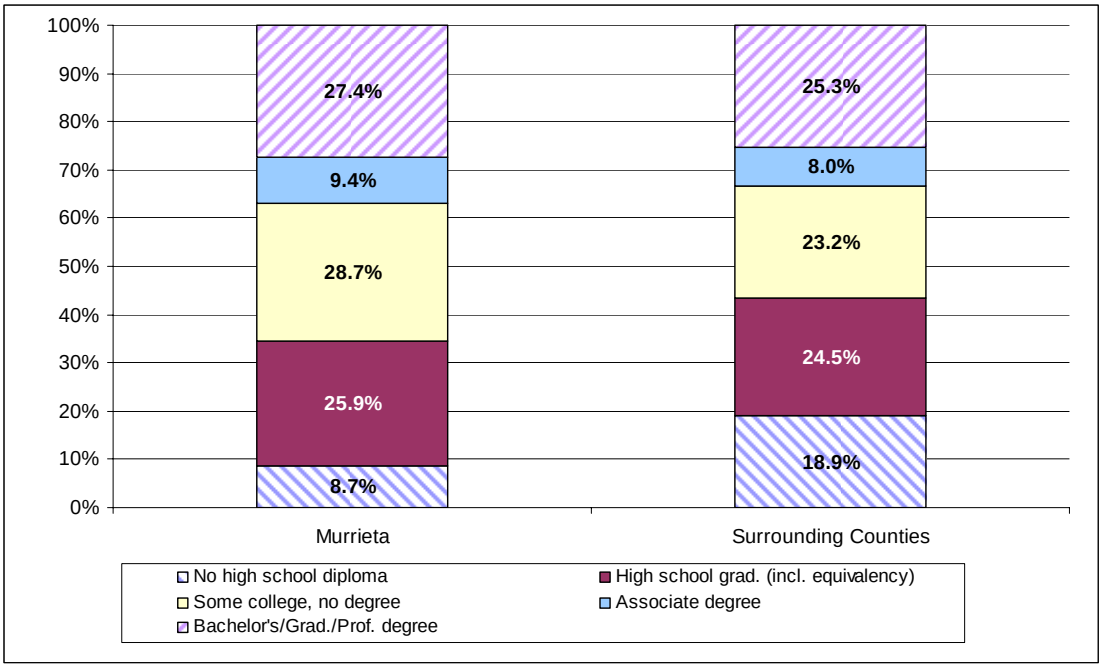
Figure 4-14 shows a comparison of educational attainment between the City of Murrieta and surrounding counties in 2008. The percent of individuals with no high school diploma was about 10 percentage points lower in Murrieta than in the other counties. The other significant groups that differ between Murrieta and surrounding counties are the percent of individuals that have some college but no degree comprising about 29 percent in the City and 23.4 percent in surrounding counties.

Figure 4-13
Educational Attainment
City of Murrieta
2000 to 2008



Source: Stanley R. Hoffman Associates, Inc.
U.S. Bureau of the Census, Decennial Census 1990 and 2000,
American Community Survey 2006-08.

Figure 4-14
Educational Attainment
City of Murrieta and Surrounding Counties
2008



Source: Stanley R. Hoffman Associates, Inc.
U.S. Bureau of the Census, American Community Survey 2006-2008

Table 4-10
Educational Attainment
City of Murrieta and Surrounding Cities and Counties
2008

	Murrieta	Temecula	Lake Elsinore	Corona	Riverside County	San Bernardino County	San Diego County	Surrounding Counties
Bachelor's/Grad./Prof. degree	15,781	16,845	4,123	22,406	249,407	210,337	635,228	1,094,972
Associate degree	5,385	5,432	1,248	8,512	93,877	98,940	153,141	345,958
Some college, no degree	16,513	15,115	5,932	22,971	299,993	274,956	430,039	1,004,988
High school grad. (incl. equivalency)	14,871	14,128	8,107	22,798	350,239	326,685	383,257	1,060,181
No high school diploma	4,977	5,052	4,762	17,364	270,600	266,917	279,732	817,249
Total Persons	57,527	56,572	24,172	94,051	1,264,116	1,177,835	1,881,397	4,323,348

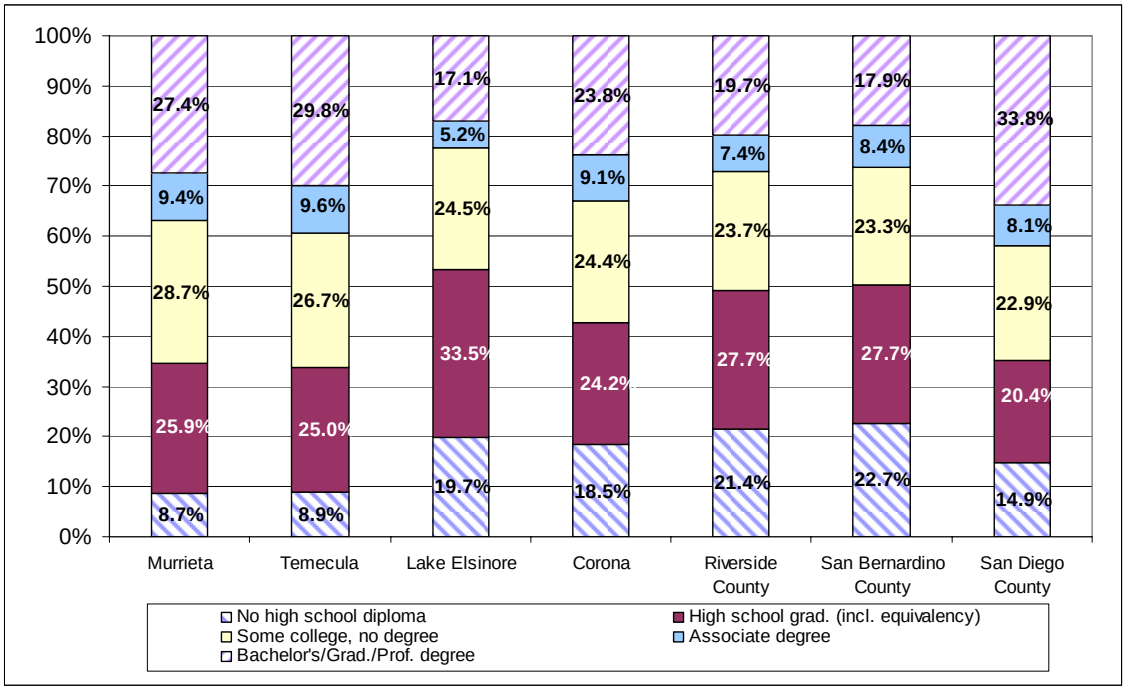
	Murrieta	Temecula	Lake Elsinore	Corona	Riverside County	San Bernardino County	San Diego County	Surrounding Counties
Bachelor's/Grad./Prof. degree	27.4%	29.8%	17.1%	23.8%	19.7%	17.9%	33.8%	25.3%
Associate degree	9.4%	9.6%	5.2%	9.1%	7.4%	8.4%	8.1%	8.0%
Some college, no degree	28.7%	26.7%	24.5%	24.4%	23.7%	23.3%	22.9%	23.2%
High school grad. (incl. equivalency)	25.9%	25.0%	33.5%	24.2%	27.7%	27.7%	20.4%	24.5%
No high school diploma	8.7%	8.9%	19.7%	18.5%	21.4%	22.7%	14.9%	18.9%
Total Persons	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Stanley R. Hoffman Associates, Inc.
American Community Survey 2006-2008

Table 4-10 displays the educational attainment of individuals in the City of Murrieta and surrounding cities and counties in 2008. San Diego County has the largest composition of individuals with Bachelor's or Graduate/Professional degrees at 33.8 percent. Temecula and Murrieta have the next largest compositions of individuals with Bachelor's or Graduate/Professional degrees at 29.8 percent and 27.4 percent respectively. The jurisdictions that have the lowest percentage of this educational attainment level are San Bernardino County at 17.9 percent and the City of Lake Elsinore at 17.1 percent.

As shown in Figure 4-15, jurisdictions with higher percentages of individuals with Bachelor's or Graduate/Professional degrees have lower percentages of individuals with no high school diplomas which is the case for San Diego County, Temecula, Murrieta and Corona. Also, the reverse of this trend which is that cities with higher percentage of individuals with no high school diplomas have lower percentages of individuals with Bachelor's or Graduate/Professional degrees holds true for San Bernardino County and Lake Elsinore.

Figure 4-15
Educational Attainment
City of Murrieta and Surrounding Cities and Counties
2008



Source: Stanley R. Hoffman Associates, Inc.
U.S. Bureau of the Census, American Community Survey 2006-2008

4.6 Labor Force

Table 4-11 displays the labor force composition of Murrieta from 2000 to 2008. The employed population, or labor force, in the City of Murrieta, age 16 years and over, more than doubled from 18,817 in 2000 to 42,448 in 2008, based on the 2006-2008 American Community Survey.

During the 2000 to 2008 time period, labor force increased in management, service and sales related occupations whereas the construction and production related occupations decreased. As shown in Figure 4-16, residents in management related services increased in absolute numbers from an estimated 6,529 jobs in 2000 to an estimated 14,436 jobs in 2008. Following the same trend, sales related occupations increased from an estimated 5,692 jobs in 2000 to an estimated 13,230 jobs in 2008. As percent of total jobs in 2008, management, service and sales related jobs comprised of an estimated 84.0 percent of the total labor force whereas construction and production related jobs comprised about 16.5 percent of the labor force.

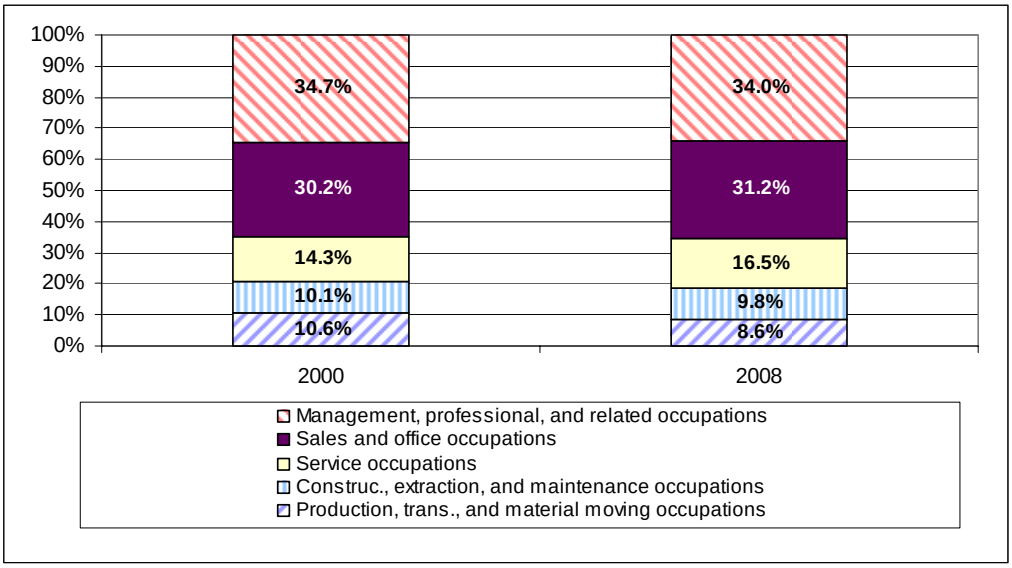
Figure 4-17 shows the change of labor force in the City of Murrieta for the 2000 to 2008 time period. There was a noticeable increase in all occupations especially in management and sales related occupations by an estimated of 7,907 and 7,538 jobs respectively. Service related jobs also increased by an estimated 4,283 jobs.

Table 4-11
Labor Force Composition
City of Murrieta
2000 to 2008

Labor Force Category	2000 Total	2000 Percent of Total	2008 Total	2008 Percent of Total	Percent Change 2000-2008
City of Murrieta					
Management, professional, and related occupations	6,529	34.7%	14,436	34.0%	121.1%
Service occupations	2,700	14.3%	6,983	16.5%	158.6%
Sales and office occupations	5,692	30.2%	13,230	31.2%	132.4%
Construc., extraction, and maintenance occupations	1,907	10.1%	4,158	9.8%	118.0%
Production, trans., and material moving occupations	1,989	10.6%	3,641	8.6%	83.1%
Total	**18,817**	**100.0%**	**42,448**	**100.0%**	**125.6%**

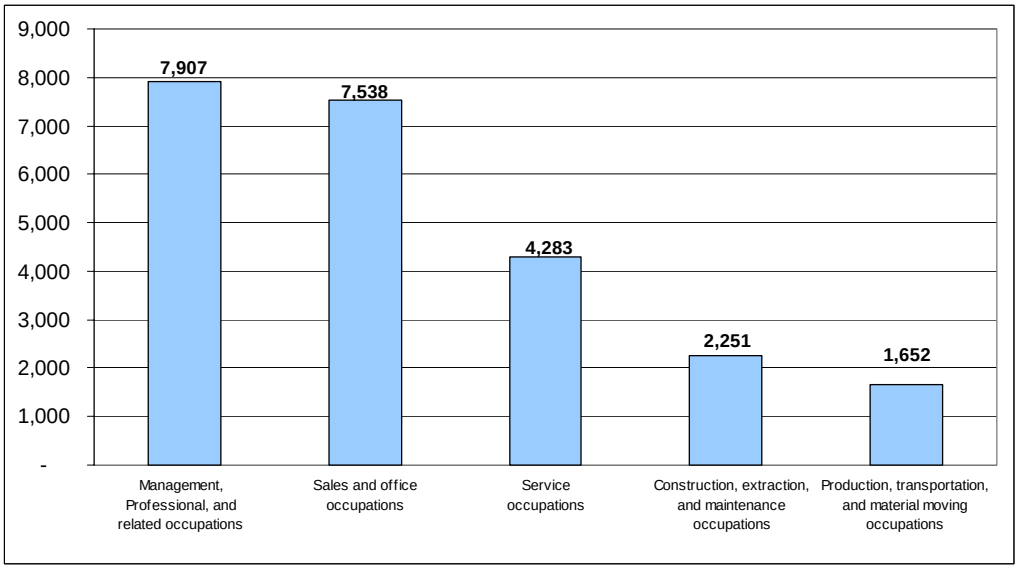
Source: Stanley R. Hoffman Associates, Inc.
U.S. Census Bureau, Decennial Census 1990 and 2000, American Community Survey 2006-2008

Figure 4-16
Labor Force Composition
City of Murrieta
2000 to 2008



Source: Stanley R. Hoffman Associates, Inc.
U.S. Bureau of the Census, Decennial Census 1990 and 2000, American Community Survey 2006-2008

Figure 4-17
Change in Labor Force Composition
City of Murrieta
2000 to 2008

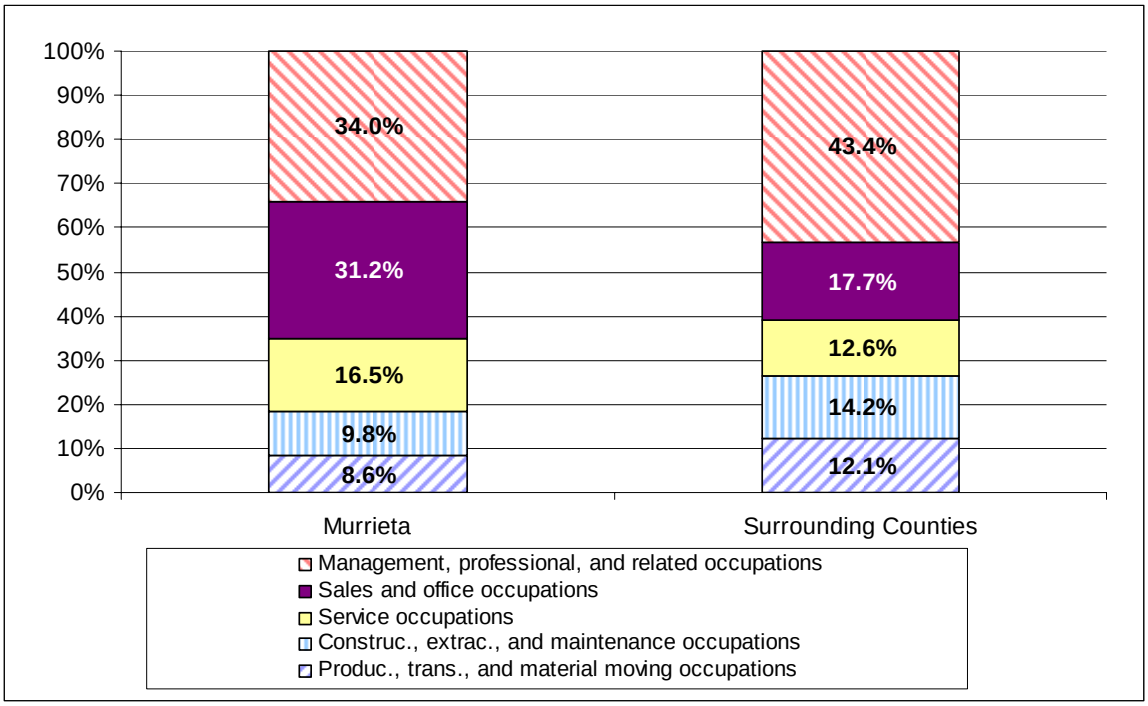


Source: Stanley R. Hoffman Associates, Inc.
American Community Survey 2006-2008

Figure 4-18 shows the relative similarity of the labor force composition between the City of Murrieta and surrounding counties in 2008. The biggest differences between Murrieta and the sub-region are the percent of individuals in management related occupations and sales and office occupations. For Murrieta, management related occupations, as percent of total, are 34.0 percent of the City total and 43.3 percent for the surrounding counties. The composition of sales and office occupations, as percent of the total, is 31.2 percent for the City of Murrieta and 18.0 percent for surrounding counties.

Table 4-12 displays the labor force composition for the City of Murrieta and surrounding cities and counties. San Diego County, Temecula, and Corona have the largest composition of management, professional, and related occupations at 51.0 percent, 48.5 percent and 42.5 percent respectively. Murrieta and Corona have the highest composition of sales and office related occupations at 31.2 percent and 20.5 percent respectively.

Figure 4-18
Labor Force Composition
City of Murrieta and Surrounding Counties
2008



Source: Stanley R. Hoffman Associates, Inc.
American Community Survey 2006-2008

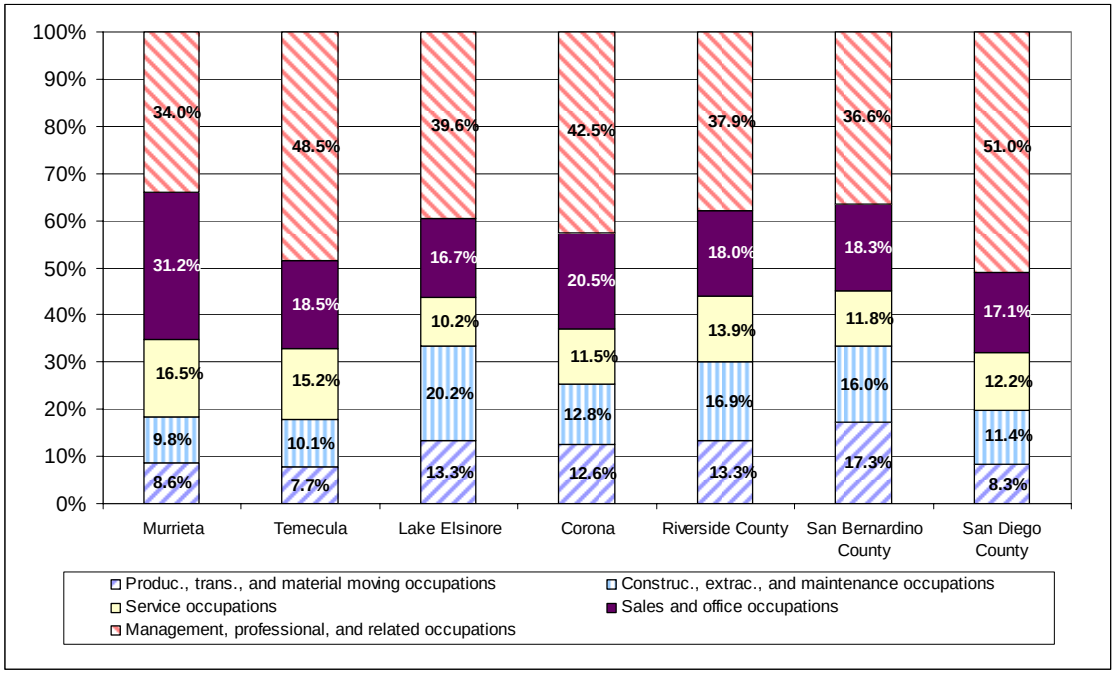
Table 4-12
Labor Force Composition
City of Murrieta and Surrounding Cities and Counties
2008

Labor Force Category	Murrieta	Temecula	Lake Elsinore	Corona	Riverside County	San Bernardino County	San Diego County	Surrounding Counties
Management, prof., and related occup.	14,436	17,021	5,711	24,724	249,797	232,507	537,830	1,020,134
Service occupations	6,983	5,347	1,471	6,704	91,849	74,720	128,793	295,362
Sales and office occupations	13,230	6,491	2,405	11,947	118,722	116,081	180,409	415,212
Construc., extrac., and maintenance occup.	4,158	3,528	2,915	7,455	111,159	101,725	120,711	333,595
Produc., trans., and material moving occup.	3,641	2,702	1,921	7,333	87,409	109,911	87,445	284,765
Total	42,448	35,089	14,423	58,163	658,936	634,944	1,055,188	2,349,068

Labor Force Category	Murrieta	Temecula	Lake Elsinore	Corona	Riverside County	San Bernardino County	San Diego County	Surrounding Counties
Management, prof., and related occup.	34.0%	48.5%	39.6%	42.5%	37.9%	36.6%	51.0%	43.4%
Service occupations	16.5%	15.2%	10.2%	11.5%	13.9%	11.8%	12.2%	12.6%
Sales and office occupations	31.2%	18.5%	16.7%	20.5%	18.0%	18.3%	17.1%	17.7%
Construc., extrac., and maintenance occup.	9.8%	10.1%	20.2%	12.8%	16.9%	16.0%	11.4%	14.2%
Produc., trans., and material moving occup.	8.6%	7.7%	13.3%	12.6%	13.3%	17.3%	8.3%	12.1%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Stanley R. Hoffman Associates, Inc.
U. S. Census Bureau, American Community Survey 2006-2008

Figure 4-19
Labor Force Composition
City of Murrieta and Surrounding Cities and Counties
2008



Source: Stanley R. Hoffman Associates, Inc.
American Community Survey 2006-2008

CHAPTER 5
HOUSING TRENDS

This chapter presents information on the housing trends for the City of Murrieta from the California Department of Finance, U.S. Census Bureau American Community Survey (ACS) 2008. These data include information on the housing stock, housing tenure, building permit and construction cost data. Housing estimates from the California Department of Finance (DOF) were based on 1992 figures, rather than 1990 figures, because that was the first year that DOF provided housing estimates for the City due to the City's incorporation on July of 1991.

5.1 Housing Stock

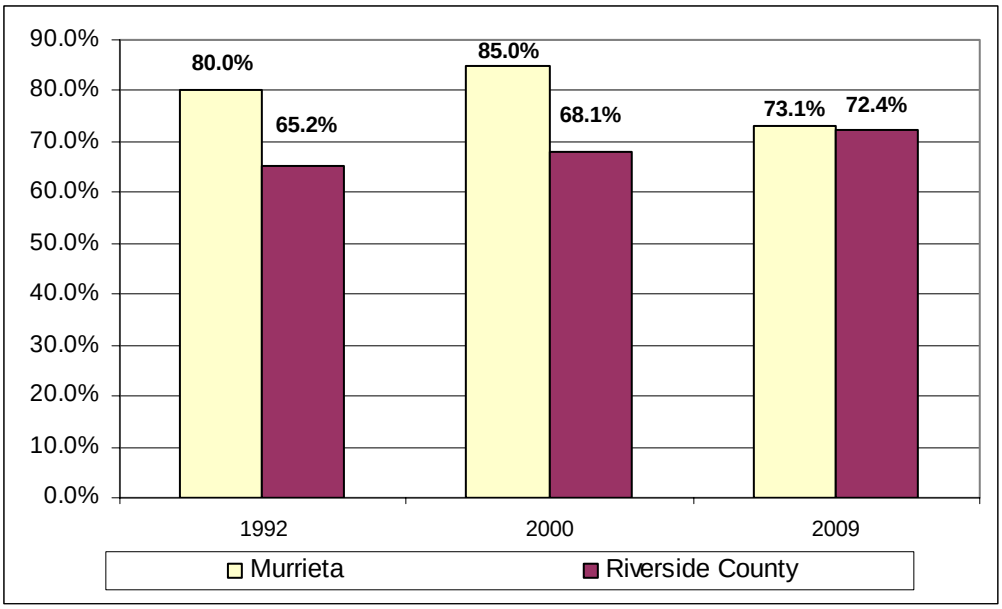
As shown in Table 5-1, housing stock dramatically increased over the 1992 to 2009 period by about17,307 units from 7,768 in 1992 to 25,075 in 2009, as reported by the Department of Finance. As of 2009, the majority of housing units in Murrieta were single-family homes comprising 73.1 percent of the total housing units. The number of single family homes initially increased from 7,768 (80.0 percent) in 1990 to 12,580 (85.0 percent) in 2000 to 25,075 (73.1 percent) in 2009. Multi-family homes comprised 21.9 percent of the total housing in 2009 which increased from 13.3 percent in 1990. Riverside County, similar to Murrieta, had a majority of single-family housing units at 72.4 percent in 2009 which increased from 65.2 percent in 1990. Multi-family housing decreased in the 1992 to 2009 time period for Riverside County from 19.8 percent in 1992 to 16.5 percent in 2009.

Table 5-1
Housing Stock by Type
City of Murrieta and Riverside County
1992 to 2009

Housing Unit Type	1992		2000		2009	
	Units	Percent	Units	Percent	Units	Percent
City of Murrieta						
Single	7,768	80.0%	12,580	85.0%	25,075	73.1%
Multiple	1,292	13.3%	1,672	11.3%	7,513	21.9%
Mobile Homes	652	6.7%	541	3.7%	1,705	5.0%
Total	9,712	100.0%	14,793	100.0%	34,293	100.0%
Riverside County						
Single	334,184	65.2%	395,578	68.1%	564,836	72.4%
Multiple	101,523	19.8%	102,918	17.7%	128,592	16.5%
Mobile Homes	77,123	15.0%	82,593	14.2%	86,684	11.1%
Total	512,830	100.0%	581,089	100.0%	780,112	100.0%

Source: Stanley R. Hoffman Associates, Inc.
California Department of Finance (DOF), 1992, 2000, and 2009

Figure 5-1
Percentage of Single Family Housing
City of Murrieta and Riverside County
1992 to 2009



Source: Stanley R. Hoffman Associates, Inc.
California Department of Finance, 1992, 2000 and 2009

5.2 Housing Tenure

Table 5-2 shows the comparison in housing tenure of Murrieta and surrounding cities and counties based on the 2008 American Community Survey. The City of Murrieta had 75.5 percent of the housing units as owner occupied and 24.5 percent of the housing units were renter occupied in 2008. Compared to the surrounding cities and counties, the City had the highest proportion of housing units occupied by owners at 75.5 percent. Corona had the lowest proportion of owner occupied housing units at 67.3 percent.

Figure 5-2 displays the percentage of owner occupied housing units for the City of Murrieta compared to other surrounding cities and counties cities. Murrieta has the largest proportion of owner occupied housing units at 75.5 percent. Of the counties, Riverside County had the highest proportion of owner occupied housing units at 67.7 percent. The lowest proportion of owner occupied housing units was for San Diego County at 56.4 percent.

Table 5-2
Housing Tenure
City of Murrieta and Surrounding Cities and Counties
2008

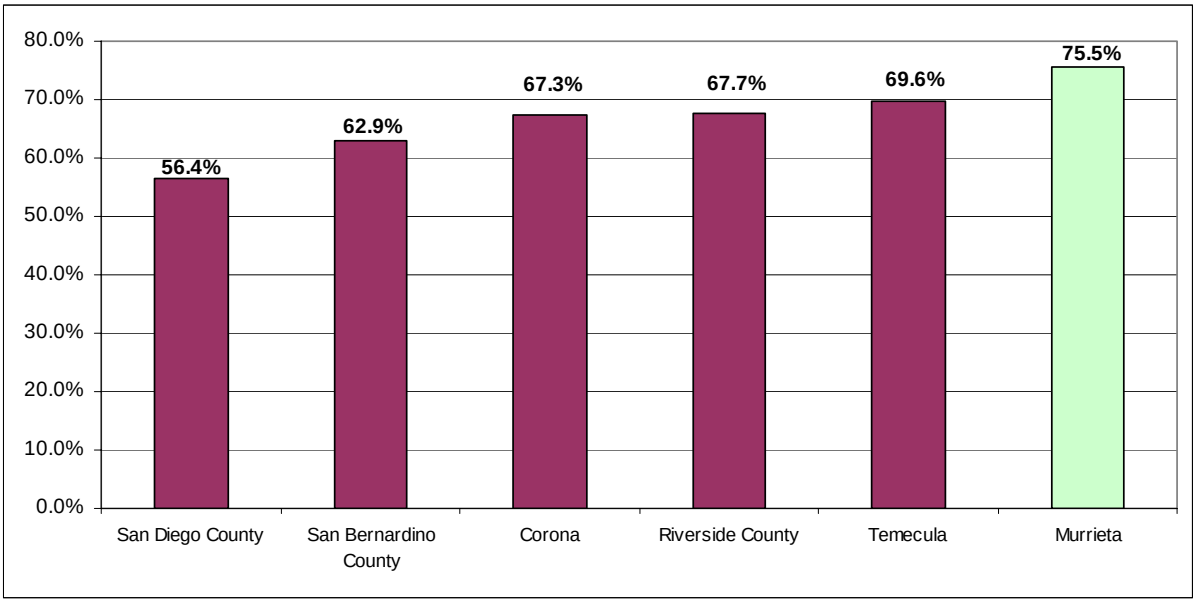
	Murrieta	Temecula	Lake Elsinore	Corona	Riverside County	San Bernardino County	San Diego County
Owner Occupied	22,546	20,607	n/a	31,579	438,193	365,279	585,307
Renter Occupied	7,318	8,992	n/a	15,356	209,250	215,082	452,651
Total	**29,864**	**29,599**	**n/a**	**46,935**	**647,443**	**580,361**	**1,037,958**

	Murrieta	Temecula	Lake Elsinore	Corona	Riverside County	San Bernardino County	San Diego County
Owner Occupied	75.5%	69.6%	n/a	67.3%	67.7%	62.9%	56.4%
Renter Occupied	24.5%	30.4%	n/a	32.7%	32.3%	37.1%	43.6%
Total	**100.0%**	**100.0%**	**n/a**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

1. Information was not provided for Lake Elsinore by ACS 2008.

Source: Stanley R. Hoffman Associates, Inc.
U.S. Census Bureau, American Community Survey (ACS), 2008

Figure 5-2
Percentage Owner Occupied Housing Units
City of Murrieta and Surrounding Cities and Counties
2008



Source: Stanley R. Hoffman Associates, Inc.
U.S. Census Bureau, American Community Survey (ACS), 2008

5.3 Building Permits

Table 5-3 shows the number of residential single-family and multi-family building permits for Murrieta from 1996 to 2008 from the U.S. Census Bureau. Of the total residential units, 81.2 percent of the building permits were for single-family homes while 18.8 percent were for multi-family units in the 1996 to 2008 time period. The annualized growth rate of single-family homes in the same time period was 1,007 units per year. The majority of multi-family permits were for buildings with more than five units or more.

Figure 5-3 displays the total number of residential building permits from 1996 to 2008. The City experienced a sizable growth in the 2002 to 2004 time period as the number of annual building permits went from 1,758 in 2002 to 3,081 in 2004. However, just as the number of annual building permits hit its peak in 2004, there was a sharp decline from 3,081 permits in 2004 to just 377 permits in 2006 and less in 2007 and 2008.

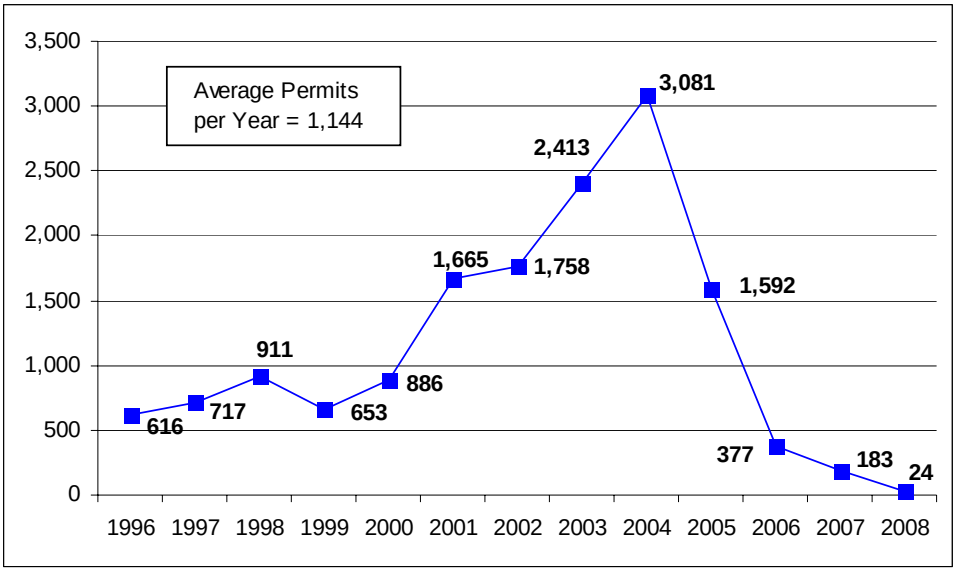
Figure 5-4 displays the number of single family and multi-family residential building permits from 1996 to 2008. The number of single-family building permits steadily increased over the 1996 to 2001 time period, then increased overall from the 2001 to 2004 time period, then declined sharply from the 2004 to 2008 time period. There were not as many multi-family building permits as single family building permits in the 1996 to 2008 time period. Most multi-family building permits were filed during the 2000 to 2006 time period.

Table 5-3
Residential Building Permits
City of Murrieta
1996 to 2008

Year	Number of Permitted Units					Total Units	Percent Single Family	Percent Multi-family
	Single Family	Multi-family	2 Family	3-4 Family	5+ Family			
1996	616	0	0	0	0	616	100.0%	0.0%
1997	713	4	4	0	0	717	99.4%	0.6%
1998	833	78	14	0	64	911	91.4%	8.6%
1999	653	0	0	0	0	653	100.0%	0.0%
2000	886	0	0	0	0	886	100.0%	0.0%
2001	1,069	596	12	0	584	1,665	64.2%	35.8%
2002	1,648	110	8	48	54	1,758	93.7%	6.3%
2003	1,530	883	90	96	697	2,413	63.4%	36.6%
2004	2,509	572	2	132	438	3,081	81.4%	18.6%
2005	1,137	455	4	203	248	1,592	71.4%	28.6%
2006	377	0	0	0	0	377	100.0%	0.0%
2007	93	90	0	90	0	183	50.8%	49.2%
2008	15	9	0	9	0	24	62.5%	37.5%
Total	**12,079**	**2,797**	**134**	**578**	**2,085**	**14,876**	**81.2%**	**18.8%**
Avg. permits per yr.	**929**	**215**	**10**	**44**	**160**	**1,144**	**6.2%**	**1.4%**

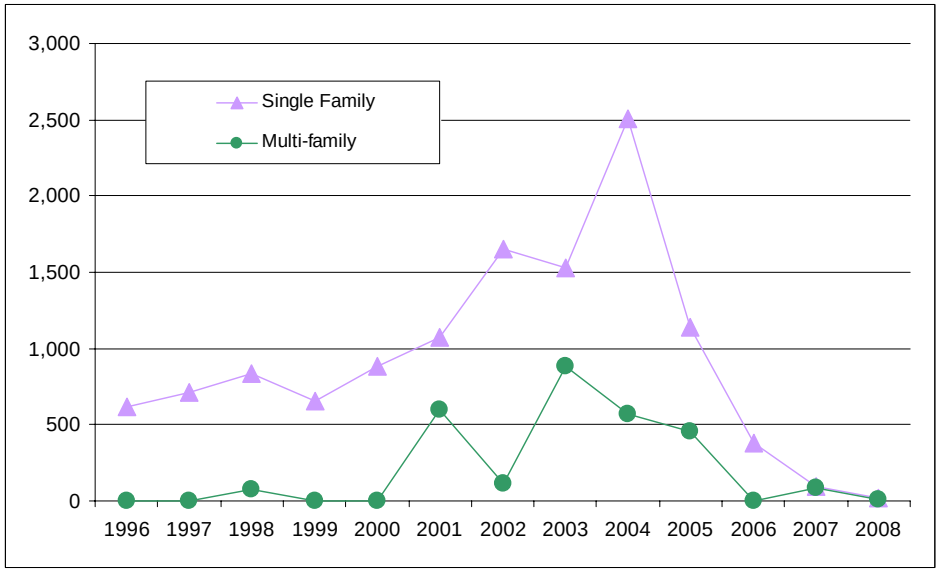
Sources: Stanley R. Hoffman Associates, Inc.
U.S. Census Bureau

Figure 5-3
Residential Building Units
City of Murrieta
1996 to 2008



Source: Stanley R. Hoffman Associates, Inc.
U.S. Census Bureau

Figure 5-4
Single and Multi-Family Units
City of Murrieta
1996 to 2008



Source: Stanley R. Hoffman Associates, Inc.
U.S. Census Bureau

Table 5-4 shows the construction costs for residential units in the City of Murrieta for the 1996 to 2008 time period from the U.S. Census Bureau. In 1996, the average construction cost per single-family unit was $222,452 and in 2008, the average construction cost per single-family unit was $375,142 in constant 2008 dollars. For multi-family units with more than five units in a building, the average construction cost per unit was $48,959 in 1998 and $100,411 in 2005.

Figure 5-5 displays the construction cost of single-family homes in Murrieta in 2008 constant dollars for the 1996 to 2008 time period. In 2008, based on total construction costs from the U.S. Census Bureau, the average construction costs for single-family was $375,142. The lowest average construction cost for a single-family unit was in 2005 at $193,438. From 2005 to 2006, the City experienced a sharp increase in average construction cost for a single-family unit from $193,438 to $375,577 respectively.

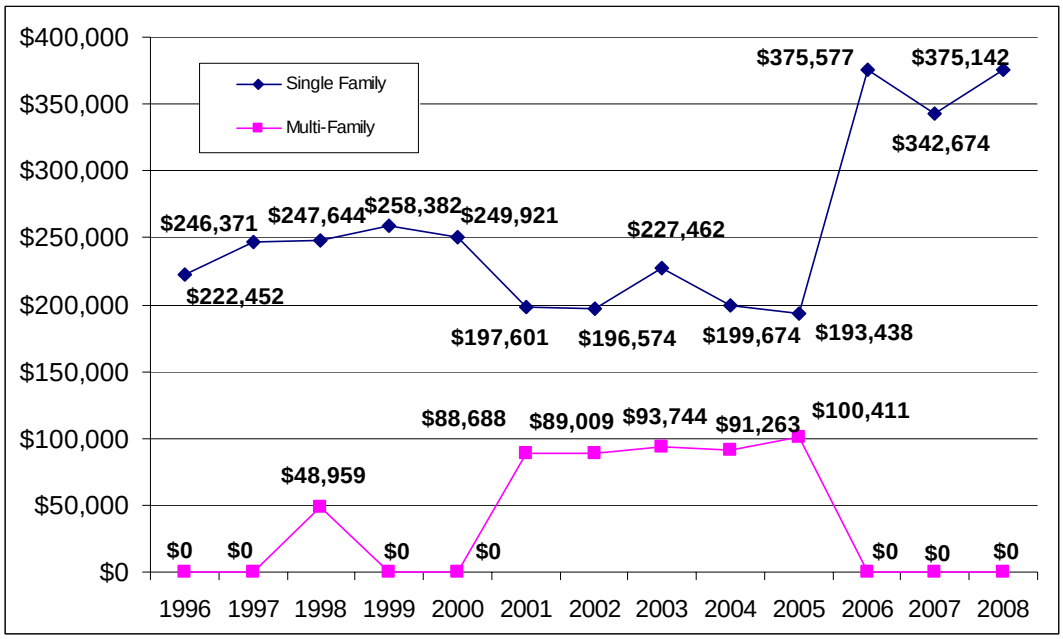
The average construction costs of multi-family units for the same time are also shown in Figure 5-5. In 1998, the first year that multi-family building permits were filed during the 1996 to 2008 time period, the average construction cost of a multi-family unit was $48,959 in 2008 constant dollars. Highest average construction costs for multi-family units were highest in 2005 at $100,411 per unit. There were no average construction costs for the years 1996, 1997, 1999, 2000, 2006, 2007 and 2008 because no multi-family building permits were filed for those years.

Table 5-4
Average Unit Construction Cost
City of Murrieta
1996 to 2008
(in Constant 2008 Dollars)

Year	Total Construction Costs				Number of Permitted Units				Average Unit Construction Cost			
	Single Family	2 Family	3-4 Family	5+ Family	Single Family	2 Family	3-4 Family	5+ Family	Single Family	2 Family	3-4 Family	5+ Family
1996	$137,030,329	$0	$0	$0	616	0	0	0	$222,452	$0	$0	$0
1997	$175,662,420	$490,326	$0	$0	713	4	0	0	$246,371	$122,582	$0	$0
1998	$206,287,291	$3,387,955	$0	$3,133,369	833	14	0	64	$247,644	$241,997	$0	$48,959
1999	$168,723,586	$0	$0	$0	653	0	0	0	$258,382	$0	$0	$0
2000	$221,430,152	$0	$0	$0	886	0	0	0	$249,921	$0	$0	$0
2001	$211,235,268	$1,525,067	$0	$51,794,057	1,069	12	0	584	$197,601	$127,089	$0	$88,688
2002	$323,953,820	$991,211	$5,278,786	$4,806,491	1,648	8	48	54	$196,574	$123,901	$109,975	$89,009
2003	$348,016,314	$10,710,605	$17,786,505	$65,339,233	1,530	90	96	697	$227,462	$119,007	$185,276	$93,744
2004	$500,982,575	$237,046	$13,419,519	$39,973,016	2,509	2	132	438	$199,674	$118,523	$101,663	$91,263
2005	$219,938,968	$428,577	$20,514,660	$24,902,048	1,137	4	203	248	$193,438	$107,144	$101,057	$100,411
2006	$141,592,479	$0	$0	$0	377	0	0	0	$375,577	$0	$0	$0
2007	$31,868,712	$0	$9,528,541	$0	93	0	90	0	$342,674	$0	$105,873	$0
2008	$5,627,127	$0	$2,009,910	$0	15	0	9	0	$375,142	$0	$223,323	$0
Total	**$2,692,349,040**	**$17,770,787**	**$68,537,921**	**$189,948,213**	**12,079**	**134**	**578**	**2,085**				

Sources: Stanley R. Hoffman Associates, Inc.
U.S. Census Bureau

Figure 5-5
Average Construction Cost of Single and Multi-Family Homes
City of Murrieta
1996 to 2008
(in Constant 2008 Dollars)



Source: Stanley R. Hoffman Associates, Inc.
U.S. Census Bureau

5.4 Home Price Trends

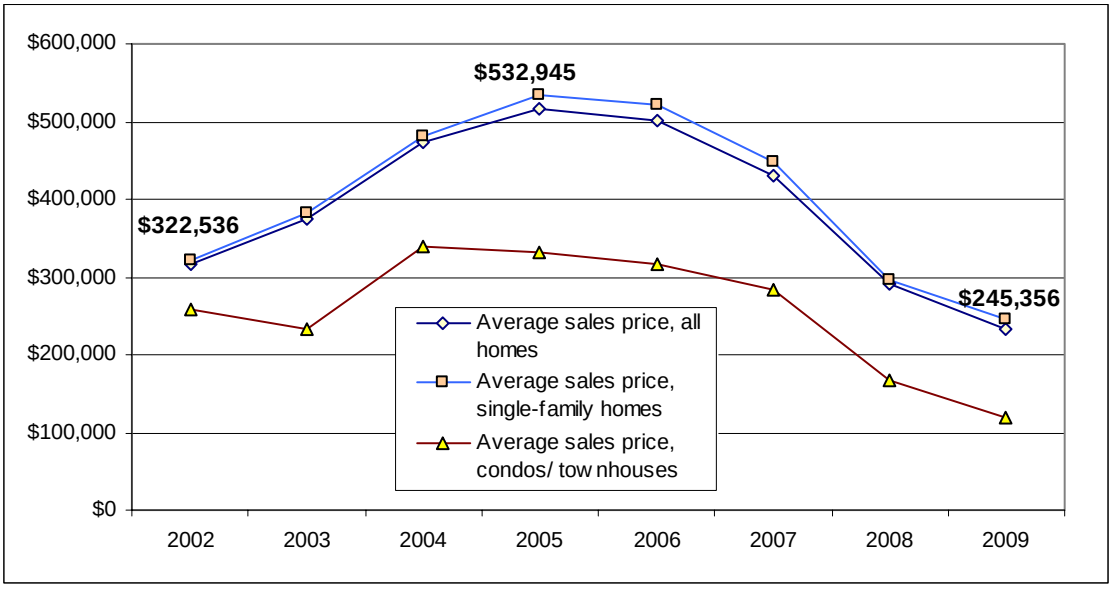
The following tables show home price trends for the City of Murrieta from RAND California and Data Quick News data. Table 5-5 shows average home price trends for the City from 2002 to 2009 in constant 2009 dollars. In 2002, the average sales price of single family homes in the City was about $322,500. From 2002 to 2005, the average single family home prices increased to about $533,000. After 2005, average single family home prices declined to about $245,000 in 2009, or a 54 percent decline. This trend was the same for average condominium and townhouse prices as they increased from about $258,000 in 2002 to about $339,000 in 2004, and then declined to about $120,000 in 2009, or a 65 percent decline. Similarly to Murrieta as shown in Table 5-6, Riverside County experienced an increase in average single family home prices from about $252,000 in 2002 to about $469,000 in 2004, and then declining to about $245,000 in 2009 resulting in about a 48 percent decline. Average condominium and townhouse prices for Riverside County increased from about $181,000 in 2002 to about $326 in 2005, then decreased to about $153,000 in 2009, or a 53 percent decline.

Table 5-5
Average Home Price Trends
City of Murrieta
2002 to 2009
(in Constant 2009 Dollars)

	Average sales price, all homes	Number of sales, all homes	Average sales price, single-family homes	Number of sales, single-family homes	Average sales price, condos/ townhouses	Number of sales, condos/ townhouses
2002	$317,490	380	$322,536	336	$258,228	33
2003	$373,497	388	$382,585	339	$232,378	34
2004	$473,324	351	$479,995	317	$338,753	24
2005	$516,411	500	$532,945	425	$331,292	68
2006	$501,959	292	$522,257	246	$315,261	29
2007	$429,123	146	$447,254	128	$284,611	18
2008	$290,522	266	$295,568	235	$166,221	24
2009	$234,125	264	$245,356	222	$119,875	33

Source: Stanley R. Hoffman Associates, Inc.
RAND California.
California Association of Realtors and DataQuick News

Figure 5-6
Average Home Price Trend
City of Murrieta
2002 to 2009
(in Constant 2009 Dollars)



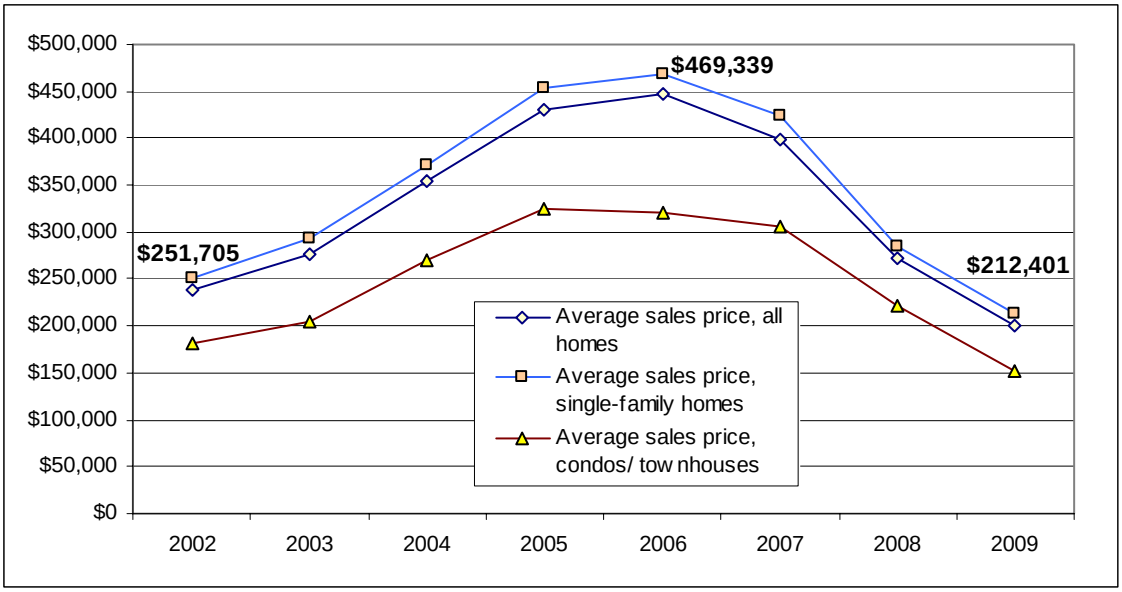
Source: Stanley R. Hoffman Associates, Inc.
RAND California from California Association of Realtors and DQ News.

Table 5-6
Average Home Price Trends
Riverside County
2002 to 2009
(in Constant 2009 Dollars)

	Average sales price, all homes	Number of sales, all homes	Average sales price, single-family homes	Number of sales, single-family homes	Average sales price, condos/ townhouses	Number of sales, condos/ townhouses
2002	$239,341	4,570	$251,705	3,935	$181,231	532
2003	$276,896	4,890	$292,863	4,156	$204,656	544
2004	$353,389	5,525	$371,645	4,750	$271,087	604
2005	$429,766	6,358	$453,457	5,623	$325,744	636
2006	$447,587	4,765	$469,339	3,728	$321,513	395
2007	$399,123	2,951	$423,868	2,575	$306,581	355
2008	$271,770	3,560	$284,811	3,115	$221,200	292
2009	$200,449	4,209	$212,401	3,642	$152,720	352

Source: Stanley R. Hoffman Associates, Inc.
RAND California.
California Association of Realtors and DataQuick News

Figure 5-7
Average Home Price Trend
Riverside County
2002 to 2009
(in Constant 2009 Dollars)



Source: Stanley R. Hoffman Associates, Inc.
RAND California from California Association of Realtors and DQ News.

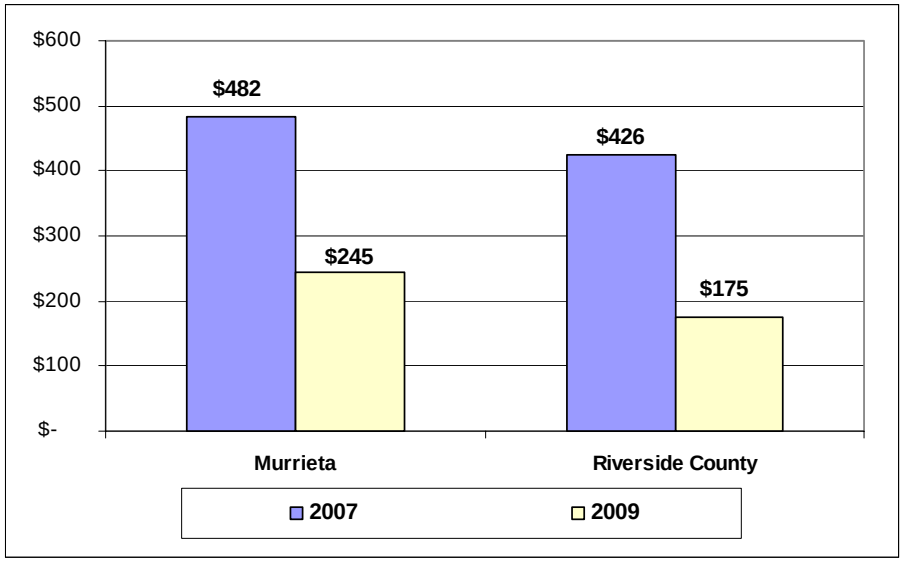
Table 5-7 and Figure 5-8 show that the bulk of the change was from 2007 to 2009 with single family home median prices declining about 49 percent in Murrieta and about 59 percent in Riverside County. Similarly, the bulk of the median condo price decline was from 2007 to 2009 with Table 5-8 and Figure 5-9 showing about a 60 percent decline for Murrieta and a 54 percent decline for Riverside County.

Table 5-7
Single Family Home Median Price Trends
City of Murrieta and Riverside County
2007 and 2009
(in Constant 2009 Dollars)

		March 2007		March 2009		Percent Change in Median SFR Price
		Sales of Single Family Homes	Price Median SFR ($1,000)	Sales of Single Family Homes	Price Median SFR ($1,000)	
Murrieta	92562	67	502.9	108	250.0	-50.3%
	92563	63	461.8	146	240.0	-48.0%
	Estimated Median	*130*	*482.4*	*254*	*245.0*	*-49.2%*
Riverside County		1,894	425.9	3,726	175.0	*-58.9%*

Source: Stanley R. Hoffman Associates, Inc.
DataQuick News

Figure 5-8
Single Family Home Median Price Trends
City of Murrieta and Riverside County
2007 and 2009
(in Constant 2009 Dollars)



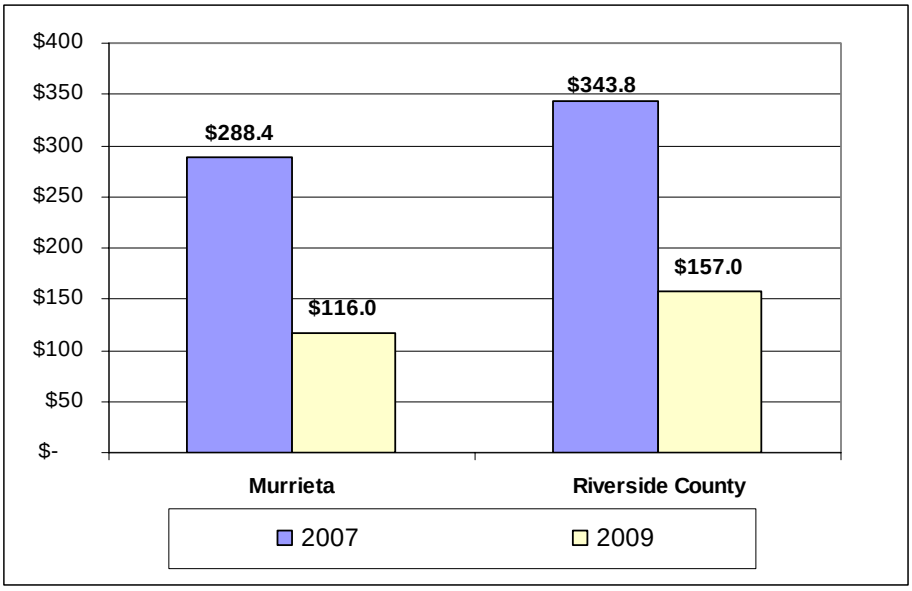
Source: Stanley R. Hoffman Associates, Inc.
DataQuick News.

Table 5-8
Condominium Median Price Trends
City of Murrieta and Riverside County
2007 and 2009
(in Constant 2009 Dollars)

		March 2007		March 2009		Percent Change in Median SFR Price
		Sales Count Condos	Price Median Condos ($1,000)	Sales Count Condos	Price Median Condos ($1,000)	
Murrieta	92562	11	$282.2	11	$105.0	-62.8%
	92563	16	$294.5	14	$127.0	-56.9%
	Estimated Median	*27*	*$288.4*	*25*	*$116.0*	*-59.8%*
Riverside County		310	$343.8	248	$157.0	*-54.3%*

Source: Stanley R. Hoffman Associates, Inc.
DataQuick News

Figure 5-9
Condominium Median Price Trends
City of Murrieta and Riverside County
2007 and 2009
(in Constant 2009 Dollars)



Source: Stanley R. Hoffman Associates, Inc.
DataQuick News.

CHAPTER 6
COMMERCIAL TRENDS

This Chapter presents retail and office/industrial trends for the City of Murrieta for the 1994 to 2007 time period. Data was gathered from the 1994 to 2007 State Board of Equalization, 2007 California Department of Finance and CB Richard Ellis for retail taxable sales data, Co Star for office and industrial data and AAA and travel websites for hotel and motel data.

6.1 Retail Market

Taxable Retail Sales Trends. The following tables present historic taxable retail sales trends for the City and taxable retail sales trends for Murrieta and surrounding cities and counties for 2007 which is the latest year for which these data have been published by the California Board of Equalization. These tables present the data for Murrieta and surrounding cities and counties including Temecula, Lake Elsinore, Corona, Riverside County, San Bernardino County, and San Diego County.

Table 6-1 shows the historic taxable sales transactions of Murrieta from 1994 to 2007 in constant 2008 dollars. Total taxable sales increased over the 1994 to 2007 time period from about $231 million in 1994 to about $1.14 billion in 2007 with an annualized growth rate of 13.05 percent. Retail taxable sales increased from about $207 million in 1994 to about $991 million in 2007. Non-retail taxable sales increased from about $24 million in 1994 to about $146 million in 2007.

As shown in Figure 6-1, non-retail, or business-to-business taxable sales increased as a percentage of total taxable sales from 10 percent in 1994 to 13 percent in 2007. While the bulk of taxable sales is still generated primarily from households, this trend suggests that businesses that generated taxable sales to other businesses were increasing within the City's economic base.

Table 6-1
Historic Taxable Sales Transactions
City of Murrieta
1994 to 2007
(in Thousands of Constant 2008 Dollars)

Year	Retail	Non-Retail	Total
1994	$207,248	$23,569	$230,817
1995	$242,122	$25,615	$267,738
1996	$294,878	$33,055	$327,933
1997	$307,885	$34,404	$342,289
1998	$349,257	$41,421	$390,678
1999	$391,884	$48,590	$440,474
2000	$411,417	$53,089	$464,506
2001	$512,124	$62,855	$574,979
2002	$586,188	$72,973	$659,161
2003	$759,848	$84,145	$843,993
2004	$917,032	$114,466	$1,031,499
2005	$1,004,531	$139,193	$1,143,724
2006	$1,051,523	$147,000	$1,198,523
2007	$990,765	$146,430	$1,137,195
AAGR	**12.79%**	**15.09%**	**13.05%**

Source: Stanley R. Hoffman Associates, Inc.
California State Board of Equalization, 1994 - 2007

Figure 6-1
Historic Taxable Sales Transactions
City of Murrieta
1994 to 2007
(in Constant 2008 Dollars)

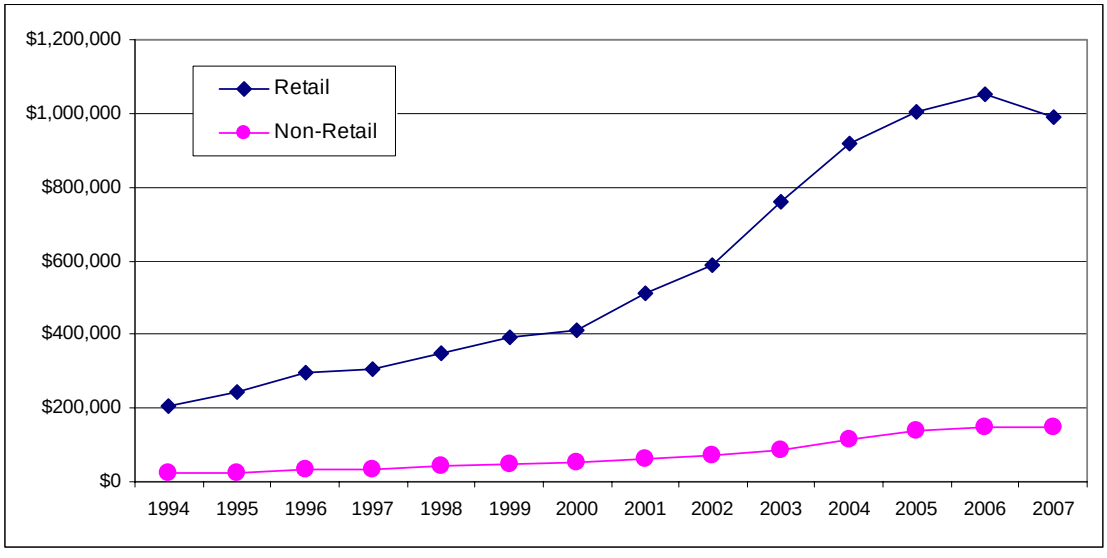


Table 6-2
Comparison of per capita Taxable Sales Transactions
City of Murrieta
1994 to 2007
(in Constant 2008 Dollars)

Retail Group	1994	2007	1994-2007 Difference in Sales	1994-2007 % Change	Average Annual Rate of Growth
Apparel Stores	$234	$316	$82	35.2%	2.3%
General Merchandise	275	1,810	1,535	557.9%	15.6%
Food Stores	782	762	(20)	-2.6%	-0.2%
Eating & Drinking Places	595	912	318	53.4%	3.3%
Home Furnishings & Appliances	23	873	850	3670.5%	32.2%
Bldg. Mtrls. & Farm Implements	2,677	1,157	(1,520)	-56.8%	-6.3%
Auto Dealers & Auto Supplies	27	1,187	1,159	4237.6%	33.6%
Service Stations	719	1,019	300	41.7%	2.7%
Other Retail Stores	1,507	1,827	320	21.2%	1.5%
Retail Subtotal	$6,840	$9,863	$3,023	44.2%	2.9%
All Other Outlets	$778	$1,458	$680	87.4%	4.9%
Total Taxable Sales	$7,618	$11,320	$3,703	48.6%	3.1%
Retail as % of Total	89.8%	87.1%			
Population	30,300	97,031			

Sources: Stanley R. Hoffman Associates, Inc.
California Department of Finance, 1994, 2007
California State Board of Equalization, 1994, 2007

Table 6-2 shows a comparison of per capita taxable sales from 1994 to 2007 in constant 2008 dollars. Per capita total taxable sales increased from $7,618 in 1994 to $11,320 in 2007 with an annualized growth rate of 3.1 percent. Retail taxable sales comprised 89.8 percent of total taxable sales in 1994 then decreased to 87.1 percent of total taxable sales in 2007. Retail sales per capita increased from $6,840 in 1994 to $9,863 in 2007. General Merchandise retail group had the highest increase by $1,535 per capita over the 1994 to 2007 time period. The Building Materials retail group declined the most over the same time period from $2,677 in 1994 to 1,157 in 2007 in constant 2008 dollars.

As shown in Table 6-3, on a retail per capita basis, Murrieta is performing below both the County of Riverside's and the sub-regional averages. In addition to Murrieta, for comparison purposes, the sub-region is defined as the neighboring cities of Temecula to the south and Lake Elsinore to the north plus Corona farther north along the I-15 corridor. Murrieta at an overall retail sales per capita ratio of $9,863 is performing about 6 percent below the County of Riverside's retail per capita average of $10,463 and about 35 percent below the sub-regional retail per capita average of $15,272.

Murrieta is not capturing its fair share of household expenditures from within the City and its environs. This is particularly striking for General Merchandise and Apparel, as shown in Table 6-3. Murrieta's General Merchandise per capita sales of $1,810 is only 57 percent of Temecula's per capita sales of $4,255. Murrieta's Apparel per capita estimate of $316 is even lower at 23 percent of Temecula's per capita sales of $1,357. The Other Retail Stores category is also about 44 percent of the Temecula average per capita. These striking differences have implications for the potential of regional retailing opportunities in Murrieta, particularly since General Merchandise, Apparel and Other Retail Stores comprise key components of regional retail centers. This also has implications for the City's fiscal health given the importance of sales tax revenues.

Murrieta appears to be performing at or near the area per capita average for Home Furnishings and Appliances and Building Materials, but is estimated to be lagging in per capita sales in Eating and Drinking Places. The Eating and Drinking Places per capita average of $912 is about 57 percent of Riverside County's average per capita estimate of $1,612 and even lower at 37 percent of Temecula average per capita of $2,445.

And finally, in the retail sales tax category of Auto Dealers and Auto Supplies, Murrieta's per capita average of $1,187 is about 39 percent of the Riverside County per capita average and only 22 percent of Temecula's per capita average. While retail sales of automobiles, trucks and recreational vehicles have slowed considerably during the recessionary downturn from 2007 through 2010, Murrieta should evaluate its long term opportunities to capture a higher proportion of the automotive retail category in the future.

Table 6-3
Per Capita Taxable Sales Transactions
City of Murrieta and Surrounding Cities and Counties
2007
(in thousands of Constant 2008 Dollars)

PANEL A - Taxable Retail Transactions by Jurisdiction (in thousands)

Retail Group	Murrietta	Temecula	Lake Elsinore	Corona	Sub-Region Total[1]	Riverside County	San Bernardino County	San Diego County
Apparel Stores	$30,681	$131,852	$47,041	$99,002	$308,576	$1,171,013	$987,164	$2,034,512
General Merchandise	$175,595	$413,334	$148,174	$358,707	1,095,810	$3,593,134	$3,293,664	$5,673,538
Food Stores	$73,911	$73,193	$37,512	$89,216	273,832	$1,352,609	$1,273,368	$1,994,237
Eating & Drinking Places	$88,534	$237,481	$65,855	$232,780	624,650	$2,388,039	$2,297,322	$4,784,500
Home Furnishings & Appliances	$84,735	$88,162	$9,138	$84,808	266,843	$843,945	$895,732	$1,420,933
Building Materials & Farm Implem.	$112,226	$130,488	$68,201	$296,914	607,829	$1,961,911	$1,791,105	$2,768,385
Auto Dealers & Auto Supplies	$115,128	$523,215	$141,161	$409,244	1,188,748	$4,301,385	$4,383,392	$6,321,987
Service Stations	$98,864	$218,835	$102,905	$313,504	734,108	$2,835,690	$3,268,798	$3,755,121
Other Retail Stores	$177,318	$406,487	$40,848	$194,352	819,005	$2,794,790	$3,145,279	$5,285,332
Retail Subtotal	$956,992	$2,223,047	$660,835	$2,078,527	$5,919,401	$21,242,516	$21,335,824	$34,038,545
% of Sub-Region	16.2%	37.6%	11.2%	35.1%	100.0%			
% of Riverside County	4.5%	10.5%	3.1%	9.8%	27.9%	100.0%	100.4%	160.2%

PANEL B - Per Capita Taxable Retail Transactions

Retail Group	Murrietta	Temecula	Lake Elsinore	Corona	Sub-Region Total[1]	Riverside County	San Bernardino County	San Diego County
Apparel Stores	$316	$1,357	$989	$679	$796	$577	$488	$659
General Merchandise	1,810	4,255	3,115	2,459	2,827	1,770	1,628	1,837
Food Stores	762	753	789	612	707	666	630	646
Eating & Drinking Places	912	2,445	1,384	1,596	1,612	1,176	1,136	1,549
Home Furnishings & Appliances	873	908	192	581	688	416	443	460
Building Materials & Farm Implem.	1,157	N/A	1,434	2,036	1,568	966	885	896
Auto Dealers & Auto Supplies	1,187	5,386	2,968	2,806	3,067	2,119	2,167	2,047
Service Stations	1,019	2,253	2,163	2,150	1,894	1,397	1,616	1,216
Other Retail Stores	1,827	4,185	859	1,333	2,113	1,377	1,555	1,711
Retail Subtotal	$9,863	$22,885	$13,892	$14,251	$15,272	$10,463	$10,548	$11,020
2007 Population	97,031	97,141	47,568	145,847	387,587	2,030,315	2,022,710	3,088,891

PANEL C - Comparison of Riverside County Cities to County Per Capita Retail Transactions

Retail Group	Murrietta	Temecula	Lake Elsinore	Corona	Sub-Region Total[1]	Riverside County	San Bernardino County	San Diego County
Apparel Stores	0.55	2.35	1.71	1.18	1.38	1.00	0.85	1.14
General Merchandise	1.02	2.40	1.76	1.39	1.60	1.00	0.92	1.04
Food Stores	1.14	1.13	1.18	0.92	1.06	1.00	0.94	0.97
Eating & Drinking Places	0.78	2.08	1.18	1.36	1.37	1.00	0.97	1.32
Home Furnishings & Appliances	2.10	2.18	0.46	1.40	1.66	1.00	1.07	1.11
Building Materials & Farm Implem.	1.20	N/A	1.48	2.11	1.62	1.00	0.92	0.93
Auto Dealers & Auto Supplies	0.56	2.54	1.40	1.32	1.45	1.00	1.02	0.97
Service Stations	0.73	1.61	1.55	1.54	1.36	1.00	1.16	0.87
Other Retail Stores	1.33	3.04	0.62	0.97	1.54	1.00	1.13	1.24
Retail Subtotal	0.94	2.19	1.33	1.36	1.46	1.00	1.01	1.05

1. Sub Region represents a sum of taxable sales for the listed cities of Murrieta, Temecula, Lake Elsinore, and Corona only.

Sources: Stanley R. Hoffman Associates, Inc.
California State Board of Equalization, 2007
California Department of Finance, 2007

Table 6-4 displays the per capita taxable sales for General Merchandise, Apparel, Home Furnishings and Other retail groups, which is referred to by the acronym "GAFO" or retailing categories generally found in regional type retail centers. Murrieta's per capita GAFO ratio of $4,827 is about 17 percent higher than Riverside County's ratio, but is just 75 percent of the sub-regional ratio and only 45 percent of Temecula's ratio.

Table 6-5 displays the identified GAFO retail centers in Murrieta, Temecula, Menifee and Lake Elsinore. The four cities have a total of about 7.9 million square feet of gross leasable area (GLA). Of the 7.9 million, more than half or 4.7 million square feet of GLA is GAFO type retail. Temecula holds the bulk of the total retail with 3.7 million square feet of GLA (46.3 percent). Temecula is also home to a 1.0 million square foot regional shopping center which plays a factor in their having the largest share of GAFO type retailers at 42.3 percent of total retail. Murrieta has about 3.0 million square feet (38.4 percent) of total retail GLA with 37.0 percent GAFO type retail. Murrieta's retail centers are generally comprised of community oriented, "big-box" centers including anchors such as Target, Walmart and Kohl's. The City noticeably lacks a regional shopping center although one is planned for the Golden Triangle area where Interstate 15 and Interstate 215 meet. Lake Elsinore and Menifee have less retail shopping centers than Temecula or Murrieta comprising about 11.5 percent of the total retail GLA for Lake Elsinore and 3.7 percent for Menifee. However, Lake Elsinore does have a retail outlet mall adjacent to Interstate I-15 and three centers anchored by a Wal-Mart, Target and Costco, respectively. The major GAFO and Building Materials retailers in the Murrieta, Temecula, Menifee and Lake Elsinore are listed in Table 6-5.

Table 6-4
GAFO[1] Per Capita Taxable Sales
City of Murrieta and Surrounding Cities and Counties
2007
(in Constant 2008 Dollars)

Retail Group	Murrietta	Temecula	Lake Elsinore	Corona	Sub-Region Total[1]	Riverside County	San Bernardino County	San Diego County
General Merchandise	$1,810	$4,255	$3,115	$2,459	$2,827	$1,770	$1,628	$1,837
Apparel Stores	316	1,357	989	679	796	577	488	659
Home Furnishings & Appliances	873	908	192	581	688	416	443	460
Other Retail Stores	$1,827	$4,185	$859	$1,333	$2,113	$1,377	$1,555	$1,711
GAFO Total	$4,827	$10,704	$5,155	$5,052	$6,425	$4,139	$4,114	$4,667

1. GAFO is defined as General Merchandise, Apparel Stores, Home Furnishings and Other Retail

Sources: Stanley R. Hoffman Associates, Inc.
California State Board of Equalization, 2007

Table 6-5
Major GAFO[1] Retail Centers
Murrieta, Temecula, Menifee and Lake Elsinore
December 2009

Store	Location	City	Total Center GLA (Sq.Ft.)	GAFO GLA [2] 2007 (Sq.Ft.)
MURRIETA				
Murrieta Springs Plaza	25320 Madison Ave	Murrieta	272,905	106,448
Cal Oaks Plaza	41090 California Oaks Road	Murrieta	320,000	153,172
California Oaks Center	40414 California Oaks Road	Murrieta	92,593	32,955
Murrieta Town Center	39885 Alta Murrieta Drive	Murrieta	390,702	91,510
Corning Plaza	26540 Jefferson Avenue	Murrieta	95,000	16,300
Gateway Centre	26341 Jefferson Avenue	Murrieta	112,058	53,036
Jefferson Plaza	26755 Jefferson Avenue	Murrieta	42,155	22,305
Jefferson Business Park	26835 Jefferson Avenue	Murrieta	454,799	279,864
Jefferson Gateway	26019 Jefferson Avenue	Murrieta	39,034	11,700
Madison Square	25080 Madison Avenue	Murrieta	106,600	89,625
Village Walk	41451 Kalmia St	Murrieta	311,575	256,472
Murrieta Spectrum	25125 Madison Ave	Murrieta	175,000	118,360
Murrieta Plaza	40396 Murrieta Hot Springs Rd	Murrieta	215,000	142,376
Kohls	24661 Madison Ave	Murrieta	79,625	79,625
Super Target Center	NWC I-215 and Clinton Keith	Murrieta	180,000	150,000
Wal-Mart Store #2952	41200 Murrieta Hot Springs Rd	Murrieta	144,000	144,000
			3,031,046	1,747,748
		Share of Subregion Total	38.4%	37.1%
TEMECULA				
Winchester Meadows	40405 Winchester Road	Temecula	200,000	33,563
Commons At Temecula	40500 Winchester Road	Temecula	320,550	231,280
Bel Villagio	41577 Margarita Road	Temecula	116,470	34,000
Palm Plaza Shopping Center	26495 Ynez Road	Temecula	341,612	217,083
Tower Plaza	27511 Ynez Road	Temecula	134,510	28,000
32425 Highway 79 S	32425 Highway 79 S	Temecula	101,784	40,000
Vail Ranch Shopping Center	SEC 31845 Hwy 79 S	Temecula	204,204	35,902
Staples	32120 Highway 79 South	Temecula	23,942	23,942
Redhawk Towne Center	32797 Redhawk Pky	Temecula	345,113	149,500
Temecula Town Center	29720 Rancho California Road	Temecula	542,822	204,097
Promenade In Temecula	40820 Winchester Road	Temecula	1,013,000	830,207
Etco Plaza	27270 Madison Avenue	Temecula	25,794	11,564
Butterfield Station	33145 State Highway 79	Temecula	75,000	63,750
Butterfield Ranch	43842 Butterfield Stage Road	Temecula	55,685	16,305
Costco	26610 Ynez Road	Temecula	152,452	76,226
			3,652,938	1,995,419
		Share of Subregion Total	46.3%	42.4%
MENIFEE				
Menifee Town Center	30145 Antelope Road	Menifee	114,562	54,188
Super Target	30340 Haun Rd	Menifee	180,000	135,000
			294,562	189,188
		Share of Subregion Total	3.7%	4.0%
LAKE ELSINORE				
Lake Elsinore Outlet Center	17600 Collier Ave.	Lake Elsinore	368,785	368,785
Lake Elsinore City Center	31700 Grape St.	Lake Elsinore	215,000	125,000
Oak Grove Crossing	18287 Collier Ave.	Lake Elsinore	176,000	130,000
Costco	29315 Central Ave.	Lake Elsinore	150,000	150,000
			909,785	773,785
		Share of Subregion Total	11.5%	16.4%
		Subregion Total Gross Leasable Area	**7,888,331**	**4,706,140**

1. GAFO is defined as General Merchandise, Apparel, Furniture and Other
2. GLA stands for Gross Leasable Area.

Sources: Stanley R. Hoffman Associates, Inc.
MyMurrieta.com
CB Richard Ellis

Table 6-6
Major GAFO[1] and Building Material Retailers
Murrieta, Temecula, Menifee and Lake Elsinore
December 2009

Name	Address	City	Zip	Center Name	Sq Ft
GAFO RETAILERS					
MURRIETA					
Target	41040 California Oaks Rd	Murrieta	92562	Cal Oaks Plaza	126,750
Kohls	24661 Madison Ave	Murrieta	92562	Free Standing Store	79,625
Wal-Mart Store #2952	41200 Murrieta Hot Springs Rd	Murrieta	92562	Free Standing Store	144,000
Sam's Club	40500 Murrieta Hot Springs Rd	Murrieta	92562	Free Standing Store	155,000
Best Buy	25080 Madison Ave	Murrieta	92562	Madison Square	43,750
Staples	25070 Madison Ave.	Murrieta	92562	Madison Square	42,875
Big Lots	25260 Madison Ave.	Murrieta	92562	Murrieta Springs Plaza	52,250
Ross Dress For Less	39845 Alta Murrieta Dr	Murrieta	92563	Murrieta Town Center	26,250
Super Target	NWC I-215 and Clinto Keith Rd	Murrieta	92562	Orchard	180,000
TEMECULA					
Best Buy	32937 Hwy 79	Temecula	92592	Butterfield Station	40,500
Costco	26610 Ynez Road	Temecula	92591	Free Standing Store	152,425
Staples	32120 Highway 79 South	Temecula	92592	Free Standing Store	23,942
Kmart	26471 Ynez Road	Temecula	92591	Kmart Shopping Center	79,875
JC Penney	40640 Winchester Road	Temecula	92591	Promenade at Temecula	124,656
Macy's Promenade Mall	40900 Winchester Road	Temecula	92591	Promenade at Temecula	165,000
Macy's Temecula	40780 Winchester Road	Temecula	92591	Promenade at Temecula	200,000
Sears	40710 Winchester Road	Temecula	92591	Promenade at Temecula	111,392
Mervyns (Ex)	26443 Ynez Road	Temecula	92591	Promenade at Temecula	76,186
Kohls	32085 Redhawk Pkwy	Temecula	92592	Redhawk Towne Center	80,000
Wal-Mart Store #2708	32225 Highway 79 South	Temecula	92592	Redhawk Towne Center	149,500
Ross Dress For Less	32155 State Highway 79	Temecula	92592	Redhawk Towne Center	30,000
Marshalls	32155 Hwy 79 South	Temecula	92592	Redhawk Towne Center	31,000
Target	29676 Rancho California Rd	Temecula	92591	Temecula Town Center	98,000
Big Lots	27411 Ynez Road	Temecula	92592		40,000
MENIFEE					
Super Target	30340 Haun Rd	Menifee	92584	Free Standing Store	180,000
Kohls	30252 Haun Rd.	Menifee	92584	Countryside Marketplace	80,000
Best Buy	30178 Haun Rd.	Menifee	92584	Countryside Marketplace	40,500
Lowe's		Menifee	92584	Countryside Marketplace	130,000
LAKE ELSINORE					
WalMart	31700 Grape St.	Lake Elsinore	92530	Lake Elsinore City Center	120,000
Target	18287 Collier Ave.	Lake Elsinore	92530	Oak Grove Crossing	130,000
Costco	29315 Central Ave.	Lake Elsinore	92532	Free Standing Store	150,000
Big Lots	32241 Mission Road	Lake Elsinore	92530	Lake Elsinore Town Center	30,000
BUILDING MATERIALS					
MURRIETA					
Home Depot	25100 Madison Ave	Murrieta	92562		140,000
Lowes	24701 Madison Ave	Murrieta	92562		182,000
Dixieline Lumber	27826 Clinton Keith Road	Murrieta	92562		27,540
ICI Dulex Paint	41604 Date St.	Murrieta	92562		5,000
Sherwin-Williams	26499 Jefferson Ave. #L	Murrieta	92562		4,600
RCP Block & Brick[1]	25725 Jefferson Ave	Murrieta	92562		n/a
Primo Floors	26199 Jefferson Ave	Murrieta	92562		1,000
J & W Lumber Company	25217 Jefferson Ave	Murrieta	92562		21,600
Murrieta Landscape Materials[1]	24975 Adams Ave	Murrieta	92562		n/a
Standards of Excellence	41379 Date St. South	Murrieta	92564		8,000
TEMECULA					
Vista Paint Windows and Covering	27250 Madison Ave # F	Temecula	92590		6,400
Frazee Paint & Wallcovering	27355 Jefferson Ave # G	Temecula	92590		4,500
Hobknob	27488 Enterprise Cir W # 3	Temecula	92590		4,500
Temecula Valley Building Mtrls	43189 Business Park Dr	Temecula	92590		9,000
Sherwin-Williams	41662 Enterprise Cir N # A	Temecula	92590		7,500
Dan's Feed & Seed	41065 1st St	Temecula	92590		2,000
Brandel Masonry Supplies	42368 Rio Nedo	Temecula	92590		2,400
Dunn-Edwards Paint #54	41680 Enterprise Circle, South	Temecula	92590		10,000
Lowes	40390 Winchester Road	Temecula	92591		168,000
Home Depot	32020 Hwy 79 South	Temecula	92592		150,000

Sources: Stanley R. Hoffman Associates, Inc.
MyMurrieta.com
CB Richard Ellis

Table 6-7 displays total and vacant retail square footage provided by Costar at an aggregate level for Murrieta, Temecula, the Interstate 15 Corridor which is defined as the area along the Interstate 15 running from Lake Elsinore, south to the northern boundary of the City of Murrieta and the Interstate 215 Corridor which is defined as the area north of the northern edge of Murrieta, running north to and including the City of Menifee along Interstate 215, and north along Highway 79 through French Valley to the Winchester area. Vacancy is defined as currently vacant space as well as short-term, occupied space that is available for lease.

This total area had an overall estimated retail space of 23.0 million square feet and a vacancy rate of 20.2 percent. Community, neighborhood and strip commercial retail, that primarily serves the local community, had about 13.0 million square feet of retail space with a 23.5 percent vacancy rate. All Other Retail, which includes regional, power centers and theme/festival centers had a total of about 10.0 million square feet and a vacancy rate of about 16.0 percent. The vacancy rate for All Other Retail is lower than Community retail possibly because the retail shopping centers that are relatively larger with national chain retailers are probably better able to handle economic downturns than the smaller, locally owned retailers and shopping centers.

Overall, Temecula was estimated to have the lowest vacancy rate of about 14 percent. The vacancy rates for the I-15 and I-215 corridors ranged from about 20 to 30 percent. Murrieta was estimated to fall roughly within the middle of this range at about 24 percent.

Table 6-7
Total and Vacant Retail Square Footage
Murrieta, Temecula and Surrounding Areas
December 2009

	Murrieta	Temecula	I-15 Corridor[1]	I-215 Corridor[2]	Total Square Footage
Community, Neighborhood and Strip Commercial					
Vacant Space	1,176,013	729,196	373,318	819,213	3,097,740
Total Rentable Space	4,690,688	3,973,638	2,410,023	2,091,670	13,166,019
Vacancy Rate	25.1%	18.4%	15.5%	39.2%	23.5%
All Other Retail [3]					
Vacant Space	652,991	452,243	380,087	121,072	1,606,393
Total Rentable Space	2,877,595	4,713,204	1,438,550	1,065,608	10,094,957
Vacancy Rate	22.7%	9.6%	26.4%	11.4%	15.9%
Total Retail					
Vacant Space	1,829,004	1,181,439	753,405	940,285	4,704,133
Total Rentable Space	7,568,283	8,686,842	3,848,573	3,157,278	23,260,976
Vacancy Rate	24.2%	13.6%	19.6%	29.8%	20.2%

1. I -15 Corridor is defined as the area along the Interstate 15 running from Lake Elsinore south to the northern boundary of the City of Murrieta.
2. I -215 Corridor is defined as the area north of the northern edge of the City of Murrieta, running north to and including the City of Menifee along Interstate 215, and north along Highway 79 through French Valley to the Winchester area.
3. Includes Regional, Power Center and Theme/Festival Centers.

Sources: Stanley R. Hoffman Associates, Inc.
Costar, December 2009.

6.2 Office/Industrial Park Market

The following section presents findings and conclusions from a review of the Industrial and Office segments of the commercial real estate market in the Inland Empire, including specific information regarding Southwest Riverside County and the city of Murrieta. The study involved an analysis of data obtained primarily from Costar Group, Inc., a provider of real estate information that maintains a national database of commercial properties. In addition, regional data were obtained from Grubb & Ellis, a commercial real estate brokerage firm.

Inland Empire is defined as the entire counties of Riverside and San Bernardino. For purposes of this analysis, Southwest Riverside County has been divided into four sub-areas, including: the city of Murrieta; the city of Temecula; an area along Interstate 15 running from Lake Elsinore south to the

northern boundary of the city of Murrieta; and an area north of the northern edge of the city of Murrieta, running north to and including the city of Menifee along Interstate 215, and north along Highway 79 through French Valley to the Winchester area.

A number of commercial real estate terms are used throughout the report. They are defined by Costar Group as follows:

- Available Space**:** The total amount of space that is currently being marketed as available for lease in a given time period. It includes any space that is available, regardless of whether the space is vacant, occupied, available for sublease, or available at a future date.
- Deliveries**:** Buildings that complete construction during a specified period of time. In order for space to be considered delivered, a certificate of occupancy must have been issued for the property.
- Existing Inventory**:** The square footage of buildings that have received a certificate of occupancy and are able to be occupied by tenants. It does not include space in buildings that are either planned, under construction or under renovation.
- Net Absorption**:** The net change in occupied space over a given period of time. Unless otherwise noted Net Absorption includes direct and sublease space.
- Rentable Building Area**:** (RBA) The total square footage of a building that can be occupied by, or assigned to a tenant for the purpose of determining a tenant's rental obligation.
- Vacant Space**:** Space that is not currently occupied by a tenant, regardless of any lease obligation that may be on the space. Vacant space could be space that is either available or not available.

Inland Empire Market Area. The key findings for the Inland Empire industrial and office markets are summarized below and in Tables 6-8, 6-9 and 6-10:

- Inland Empire includes Riverside County and San Bernardino County, encompassing 485 square miles
- 4.2 million residents (2.1 million in Riverside County)
- By 2030, expect 7 million total residents; second fastest-growing area (behind Los Angeles County) in Southern California region
- Inland Empire lost over 76,000 non-farm jobs in past 12 months
- Unemployment rate currently 14.2%, versus 12.0% statewide
- Costar's comprehensive office property database (all office properties, regardless of size) shows that Southwest Riverside County (as defined in the following pages) contains 7.9% of total Inland Empire office space and 1.0% of total Inland Empire vacant office space

- Costar's industrial property database (all industrial properties, regardless of size) indicates that Southwest Riverside County contains 4.3% of total Inland Empire industrial space and 3.9% of total Inland Empire vacant industrial space
- According to Grubb & Ellis, which reports quarterly on commercial properties in market areas throughout Southern California (surveying office buildings of 20,000 square feet or larger and industrial properties of 10,000 square feet or larger), Inland Empire office and industrial rents are lowest of any Southern California region.
- Inland Empire is a significant factor in Southern California industrial development, but has only emerged in recent years as a location for office development
- The Inland Empire industrial market has been impacted far more than the office market in the current slowdown, in terms of vacancies and rental rates. As shown on the following, the Inland Empire offers lower lease rates than any market in the region, while at the same time experiencing higher vacancy rates than any other area, both for Industrial and Office properties.

Table 6-8
Office and Industrial Market
Southern California Area
Third Quarter 2009

Southern California Office Market Summary by Area
Third Quarter 2009

	Inland Empire	Los Angeles County	Orange County	San Diego County	Totals/ Weighted Averages
Total Square Feet	27,455,544	189,628,548	86,210,904	71,864,453	375,159,449
Vacant Square Feet	6,476,443	29,519,994	16,696,282	15,550,492	68,243,211
Vacancy Rate (Total)	23.60%	15.60%	19.40%	21.60%	18.20%
Net Absorption (YTD)	-69,607	-4,384,630	-1,568,918	-940,463	-6,963,618
Under Construction SF	493,684	1,522,978	82,042	358,462	2,457,166
Asking Rent					
Class A	$2.17	$3.06	$2.50	$2.87	$2.83
Class B	$1.63	$2.26	$2.01	$2.25	$2.15

Southern California Industrial Market Summary by Area
Third Quarter 2009

	Inland Empire	Los Angeles County	Orange County	San Diego County	Totals/ Weighted Averages
Total Square Feet	430,928,985	987,735,183	265,985,670	172,724,235	1,857,374,073
Vacant Square Feet	55,189,414	31,665,632	17,352,117	20,597,647	124,804,810
Vacancy Rate (Total)	12.80%	3.20%	6.50%	12.00%	6.70%
Net Absorption (YTD)	-6,414,027	-7,745,956	-3,029,385	-3,319,143	-20,508,511
Under Construction SF	1,453,768	369,563	0	246,050	2,069,381
Asking Rent					
WH/Dist	$0.32	$0.48	$0.58	$0.66	$0.47
Flex	$0.64	$0.86	$1.05	$1.27	$0.87

Source: Stanley R. Hoffman Associates, Inc.
Grub & Ellis

Table 6-9
Inland Empire Office Market
Third Quarter 2009

	Class A	Class B	Class C	Totals
Existing Inventory				
Buildings	125	3,137	2,022	5,284
Rentable Area (SF)	9,079,003	41,138,879	14,789,590	65,007,472
Vacant Space				
Square Feet	3,099,444	6,770,053	1,325,356	11,194,853
Vacancy Rate	34.1%	16.5%	9.0%	17.2%
YTD Net Absorption (SF)	197,142	593,871	-91,292	699,721
YTD Deliveries (SF)	573,702	918,507	0	1,492,209
Under Construction (SF)	192,078	195,773	0	387,851
Quoted Rates ($/SF/mo)	$2.32	$1.79	$1.36	$1.87

Source: Stanley R. Hoffman Associates, Inc.
Grub & Ellis

Table 6-10
Recent Period Absorption Analysis
Inland Empire
2007 to 2009

	Office		Industrial	
Period	Total Square Feet	Average per Quarter	Total Square Feet	Average per Quarter
2009 YTD (3 quarters)	699,721	233,240	-2,116,077	-705,359
2008 (4 quarters)	128,423	32,105	3,877,134	969,284
2007 (4 quarters)	1,896,969	474,242	26,430,933	6,607,733
11 quarter totals	2,725,113	247,738	28,191,990	2,562,908

Source: Stanley R. Hoffman Associates, Inc.
Co Star Group, Inc.

Southwest Riverside County Market Area. The key findings for the Southwest Riverside County industrial and office markets are summarized below and in Tables 6-11, 6-12, 6-13 and 6-14:

- Includes areas between San Diego County line and Lake Elsinore on I-15, from Menifee south on I-215 to intersection with I-15, and from Winchester south on Highway 79 to intersection with I-15
- Includes cities of Murrieta, Temecula, Wildomar, and Lake Elsinore, and unincorporated communities such as French Valley, Winchester and surrounding areas
- Most significant concentrations of office buildings: city of Lake Elsinore along I-15 near Highway 74 and between I-15 and Lake Elsinore; city of Murrieta west of I-15, Highway 79 near Murrieta Hot Springs Road, and along I-215 near Golden Triangle; city of Temecula along I-15 (especially to the west near Rancho California Road) and along Highway 79
- Most significant concentrations of industrial buildings: city of Lake Elsinore near I-15; city of Murrieta west of I-15 and in Golden Triangle; city of Temecula along I-215 (especially to west) and east of I-15 near county line; French Valley along Highway 79

Table 6-11
Recent Period Absorption Analysis
Southwest Riverside County
2007 to 2009

	Office		Industrial	
Period	Total Square Feet	Average per Quarter	Total Square Feet	Average per Quarter
2009 YTD (3 quarters)	180,963	60,321	-423,729	-141,243
2008 (4 quarters)	181,857	45,464	39,696	9,924
2007 (4 quarters)	298,413	74,603	542,699	135,675
11 quarter totals	661,233	60,112	158,666	14,424

Source: Stanley R. Hoffman Associates, Inc.
Co Star Group, Inc.

Table 6-12
Proposed Office Development
City of Murrieta
2007 to 2009

Building Address	Building Class	Rentable Building Area	Building Park	Developer Name	Number Of Stories
25230 Hancock Ave	A	78,000	Crossroads Corporate Center	Whitaker Investment Corporation	3
25250 Hancock Ave	A	39,018	Crossroads Corporate Center	Whitaker Investment Corporation	3
25480 Medical Center Dr	A	26,000	Murrieta Pointe II		2
23151 Palomar Rd	A	58,000	Palomar Office Center	Kal Pacific & Associates	2
Jackson Ave	B	80,322	Creekside Corporate Center	Truax Development	3
Jackson Ave	B	80,322	Creekside Corporate Center	Truax Development	3
Jackson Ave	B	80,322	Creekside Corporate Center	Truax Development	3
Jefferson Ave @ Murrieta Hot Springs	B	12,000		The Garrett Group	1
Kalmia St	B	47,817		Rossi Properties, Inc.	2
41864 Kalmia St	B	9,150			1
NEC Murrieta Hot Springs Rd	B	47,756	Springs Plaza		1
Winchester Rd	B	9,535	French Valley Crossings		1
City Total		**568,242**			

Source: Stanley R. Hoffman Associates, Inc.
Co Star Group, Inc.

Table 6-13
Proposed Industrial Development
City of Murrieta
2007 to 2009

Building Address	Building Class	Rentable Building Area	Building Park	Property Type	Secondary Type
41166 Elm St	B	17,622		Flex	
SW Jefferson Ave @ Fig St.	A	8,300	Jefferson Business Park	Industrial	Showroom
Madison Ave @ Golden Gate Circle	B	7,500	Madison & Golden Gate Business Park	Industrial	Distribution
Madison Ave @ Golden Gate Circle	B	7,500	Madison & Golden Gate Business Park	Industrial	Distribution
City Total		**40,922**			

Source: Stanley R. Hoffman Associates, Inc.
Co Star Group, Inc.

Table 6-14
Recent Period Absorption Analysis
City of Murrieta
2007 to 2009

	Office		Industrial	
Period	Total Square Feet	Average per Quarter	Total Square Feet	Average per Quarter
2009 YTD (3 quarters)	38,307	12,769	-105,952	-35,317
2008 (4 quarters)	44,253	11,063	65,599	16,400
2007 (4 quarters)	206,263	51,566	445,532	111,383
11 quarter totals	288,823	26,257	405,179	36,834

Source: Stanley R. Hoffman Associates, Inc.
Co Star Group, Inc.

Summary of Industrial and Office Market Findings

Office. The overall Inland Empire market office slowed significantly in 2008, absorbing space at an average net rate of just 32,105 square feet per quarter (128,423 square feet over 12 months) compared to 474,242 square feet average per quarter (1,896,969 square feet over 12 months) in 2007.

- For the first 3 quarters of 2009, Inland Empire office absorption is averaging 233,240 per quarter (932, 960 square feet annualized).
- Murrieta total office space of 1,728,772 square feet is 33.8% of total in Southwest Riverside County and 2.7% of total Inland Empire.
- Murrieta office space vacancy rate is 23.0%, compared to 22.0% for Southwest Riverside County and 17.2% for Inland Empire.
- Murrieta currently vacant office space of 398,258 square feet is 35.5% of total in Southwest Riverside County and 3.6% of total Inland Empire.
- Murrieta office inventory is 23.4% Class A, 68.5% Class B and 8.1% Class C.
- Medical office space is 40.5% of Murrieta office inventory; Medical office vacancy rate is 15.9%, compared to 28.0% for general office space.
- Currently proposed office development in Murrieta totals 568,242 square feet.
- In Murrieta, at the average rate of absorption experienced over the past 11 quarters (26,257 square feet average), currently available space (457,801 square feet) represents a 17 quarter (4 ¼ year) supply. At rate of absorption experienced in peak year of 2007 (51,566 square feet per quarter), current available space represents a 9 quarter (2 ¼ year) supply.
- As the Murrieta office market improves and evolves over future years, it will attract a growing proportion of professional, medical and technical employment, particular in buildings along major highway corridors and in the city's Golden Triangle area.

Industrial. The overall Inland Empire market office dropped dramatically in 2008, absorbing space at an average net rate of just 969,284 square feet per quarter (3,877,134 square feet for 12 months) compared to 6,607,733 square feet average per quarter (26,430,933 square feet for 12 months) in 2007.

- For the first 3 quarters of 2009, Inland Empire office net absorption is averaging *negative* 705,309 per quarter (*negative* 2,821,236 square feet annualized).
- Murrieta total industrial space of 6,097,506 square feet is 28.8% of total in Southwest Riverside County and 1.2% of total Inland Empire.
- Murrieta industrial space vacancy rate is 10.8%, compared to 11.4% for Southwest Riverside County and 12.7% for Inland Empire.
- Murrieta currently vacant industrial space of 801,775 square feet is 33.5% of total in Southwest Riverside County and 1.3% of total Inland Empire.
- Murrieta industrial inventory is 83.1% warehouse/manufacturing and 16.9% flex.
- Currently proposed industrial development in Murrieta totals 40,922 square feet.
- In Murrieta, at the average rate of absorption experienced over the past 11 quarters (36,834 square feet average), currently available space (998,958 square feet) represents a 28 quarter (7 year) supply. At rate of absorption experienced in peak year of 2007 (111,383 square feet per quarter), current available space represents a 9 quarter (2 ¼ year) supply.
- As the Murrieta Industrial market improves and evolves over future years, it is well-positioned in both geographic and demographic terms to attract a range of Research & Development (R&D) and Light Industrial users.

6.3 Hotel Market Survey

Table 6-15 presents the inventory of an estimated 1,698 hotel/motel rooms in 16 facilities in the Cities of Murrieta and Temecula as of December 2009. As shown on Table 6-15, Murrieta has one 65-room hotel in the City which represents about 4 percent of the total inventory. Also, Temecula is reported to have another 142-room hotel scheduled to open in 2010. Hotel room rates in Murrieta and Temecula range from an estimated amount of $54 to $130 per night. The occupancy rate is estimated at about 67 percent for the one hotel in Murrieta (Figure 6-16) and relatively less at 55 percent for the facilities in Temecula (Figure 6-17). Generally, a vibrant lodging market is considered to have at least 70 to 75 percent occupancy rates. However, the lack of lodging facilities in Murrieta does suggest some opportunities at good locations, particularly with freeway visibility and access.

Table 6-15
Hotel Inventory
City of Murrieta and Temecula
December 2009

Name	Address	Average Rates	Rooms
Murrieta			
Comfort Inn and Suites	41005 California Oaks Rd.	$99	65
		Total Rooms	**65**
		Average Room Rate	**$99**
Temecula			
Best Western County Inn	27706 Jefferson Ave.	$67	74
Embassy Suites	29345 Rancho California Rd.	$119	176
Extended Stay America	27622 Jefferson Ave.	$74	107
Fairfield Inn & Suites	27416 Jefferson Ave.	$89	94
Hampton Inn & Suites	28190 Jefferson Ave.	$108	99
Holiday Inn Express	27660 Jefferson Ave.	$81	90
La Quinta Inn & Suites	27330 Jefferson Ave.	$89	56
Loma Vista Bed & Breakfast	33350 La Serena Way	$130	10
Pechanga Resort & Casino	45000 Pechanga Pkwy.	$99	522
Quality Inn	27338 Jefferson Ave.	$69	74
Ramada Inn	28980 Old Town Front St.	$55	70
Rancho California Inn	41873 Moreno Rd.	$54	24
Rodeway Inn	28718 Old Town Front St.	$54	39
Springhill Suites	28220 Jefferson Ave.	$99	134
Temecula Creek Inn	44501 Ranbow Canyon Rd.	$99	129
		Total Rooms	**1,698**
		Average Room Rate	**$86**

Source: Stanley R. Hoffman Associates, Inc.
AAA Southern California & Las Vegas Tour Book
www.tripadvisor.com
www.priceline.com

Table 6-16
Estimated Average Occupancy Rate
City of Murrieta
December 2009

	Actual FY 2006-07	Actual FY 2007-08	Estimated FY 2008-09	Estimated FY 2009-10
Transient Occupancy Tax (TOT)	$181,873	$159,397	$150,000	$125,000
TOT Rate	10%	10%	10%	10%
Estimated Gross Receipts[1]	$1,818,730	$1,593,970	$1,500,000	$1,250,000
Gross Receipts in 2009 Constant $'s	$1,932,601	$1,625,669	$1,514,094	$1,250,000
Average Gross Receipts[2]				**$1,580,591**
Estimated Maximum Gross Receipts[3]				**$2,348,775**
Estimated Average Occupancy Rate				**67.3%**

1. This is the estimated annual gross hotel receipts based on the average TOT rate.
2. This is the average of estimated gross receipts over the 4-year period in constant 2009 dollars.
3. This is the estimated maximum annual gross hotel receipts based on average gross receipts, total rooms and the average room rate. The total rooms and average room rates can be found in Table 6-14.

Source: Stanley R. Hoffman Associates, Inc.
City of Murrieta, Operating Budget 2009-10

Table 6-17
Estimated Average Occupancy Rate
City of Temecula
December 2009

	Actual FY 2006-07	Actual FY 2007-08	Estimated FY 2008-09	Estimated FY 2009-10
Transient Occupancy Tax (TOT)	$2,284,168	$2,417,726	$2,100,000	$2,336,801
TOT Rate	8%	8%	8%	8%
Estimated Gross Receipts[1]	$28,552,100	$30,221,575	$26,250,000	$29,210,013
Gross Receipts in 2009 Constant $'s	$30,339,751	$30,822,591	$26,496,637	$29,210,013
Average Gross Receipts[2]				**$29,217,248**
Estimated Maximum Gross Receipts[3]				**$53,134,948**
Estimated Average Occupancy Rate				**55.0%**

1. This is the estimated annual gross hotel receipts based on the average TOT rate.
2. This is the average of estimated gross receipts over the 4-year period in constant 2009 dollars.
3. This is the estimated maximum annual gross hotel receipts based on average gross receipts, total rooms and the average room rate. The total rooms and average room rates can be found in Table 6-14.

Source: Stanley R. Hoffman Associates, Inc.
City of Temecula, Annual Operating Budget 2009-10

CHAPTER 7
FINANCIAL CONDITIONS

This chapter addresses financial trends in the City of Murrieta over a ten-year period, from fiscal years 2000-01 to 2009-10 for the City General Fund and other key funds. The funds for providing the ongoing operations and maintenance costs for the City are the focus of the financial trends presented in this chapter. The required capital financing of infrastructure will be addressed during later phases of the General Plan update.

The General Fund is the main operating fund of the City and provides the majority of the revenues to fund public services for the City's residents and businesses. The services provided through the General Fund include police, public works, building and safety, community development and economic development. Some operational costs for street engineering and street maintenance are paid through the Gas Tax budget unit whose revenues largely consist of State gasoline tax.

The operating budget for the City also includes several other key funds. The Library Fund provides library services; the Community Services District (CSD) provides parks, recreation, lighting and landscaping services; and the Fire District provides fire protection. This chapter is based on information from the City of Murrieta, *Operating Budget, Fiscal Years 2009/10 and 2010/11* and historic information provided by the City's Finance department.

7.1 General Fund

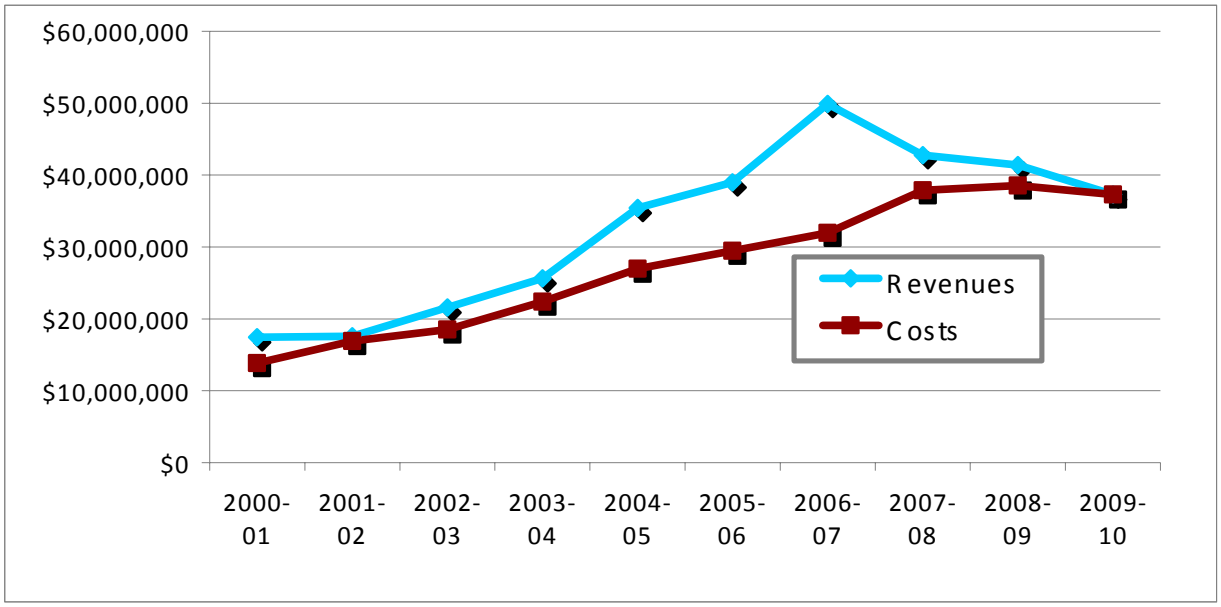
Table 7-1 and Figure 7-1 present General Fund growth trends over the ten-year period from fiscal year 2000-01 to adopted budget Fiscal Year 2009-10 in current dollars. As shown, revenues grew at an average annual rate of 8.8 percent over this time period, more slowly than expenditures, which grew at an average annual rate of 11.7 percent. During this time period, net General Fund revenues have fluctuated and outpaced expenditures until 2009-10, when revenues and costs are the same, as indicated by the revenue/cost ratio of 1.00. As shown in Table 7-1, net General Fund revenues decreased from about $3.63 million in 2000-01 to about $2.84 million in 2008/09. The largest net surplus reported was in 2006-07 at $17.97 million, followed by the years 2005-06 and 2004-05, when net surpluses were about $9.50 million and about $8.47 million, respectively.

Table 7-1
General Fund Growth Trends, 2000-01 to 2009-10
City of Murrieta Public Financial Trends Analysis
(In Current Dollars)

Fiscal Year	General Fund Revenues	General Fund Costs	Net General Fund	General Fund Revenue/Cost Ratio
2000-01	$17,462,547	$13,833,586	$3,628,961	1.26
2001-02	17,598,574	16,929,180	669,393	1.04
2002-03	21,588,048	18,506,582	3,081,466	1.17
2003-04	25,639,753	22,387,092	3,252,661	1.15
2004-05	35,435,401	26,968,541	8,466,861	1.31
2005-06	38,970,605	29,473,782	9,496,823	1.32
2006-07	49,907,382	31,939,382	17,967,999	1.56
2007-08	42,778,512	37,878,199	4,900,313	1.13
2008-09	41,396,350	38,560,938	2,835,412	1.07
2009-10	37,309,125	37,309,125	0	1.00
Average Annual Growth Rate	8.8%	11.7%	n/a	

Sources: Stanley R. Hoffman Associates, Inc.
City of Murrieta, Finance Department, General Fund Revenues and Expenditures, Fiscal Years 2000/01 through 2004/05
City of Murrieta, *Annual Operating Budget, Fiscal Year 2008-2009*
City of Murrieta, *Operating Budget, Fiscal Years 2009/10 and 2010/11*
California Department of Finance, *E-4 Population Estimates, 2001-2009*

Figure 7-1
General Fund Growth Trends, 2000-01 to 2009-10
City of Murrieta Public Financial Trends Analysis
(In Current Dollars)



Source: Stanley R. Hoffman Associates, Inc.

General Fund Revenue Growth Trends. Table 7-2 shows the detailed General Fund revenues over the ten-year period from fiscal years 2000-01 to 2009-10. As shown, revenues increased from $17.46 million in 2000-01 to about $37.31 million in 2009-10, growing at an average annual rate of 8.8 percent. The major categories of revenues that grew at a faster rate than the total General Fund revenues were Fines and Forfeitures (23.1 percent), Licenses and Permits (16.7 percent), Intergovernmental Revenues (12.1 percent) and Taxes (11.2 percent).

When combined, Vehicle in Lieu Tax (VLF) Revenues and VLF Compensation grew at an average annual rate of about 14.2 percent from 2000-01 to 2009-10. The decrease shown in VLF Revenues is due to the impacts of the VLF for Property Tax swap that the California Legislature approved in 2004, which reduced City VLF by about 90.0 percent, but backfilled a compensatory amount in property tax revenues. These lost VLF revenues are reflected in the VLF Compensation category beginning in fiscal year 2004-05. Similarly, the State reduced by 25 percent, the amount of sales tax received by jurisdictions, but replaced it with an equal amount in compensation. Thus, the combined Sales Tax and Sales Tax Compensation revenues grew at an average annual rate of about 9.1 percent over this same period.

General Fund Distribution of Revenues. Table 7-3 presents the overall distribution of the General Fund revenue amounts by the categories presented in Table 7-2. In 2000-01, about 46.9 percent of General Fund revenues were comprised of taxes (including property tax, sales tax, and franchise tax) and about 11.9 percent of revenues were comprised of VLF tax. In 2009-10, about 56.1 percent of the revenues were comprised of taxes and 18.4 percent were comprised of VLF Use of Money and Property represented about 12.5 percent of total revenues in 2000-01 and about 6.1 percent of total revenues in 2009-10.

The distribution of major General Fund revenues by type of revenue for 2000-01 and 2009-10 is shown in Table 7-4. Figure 7-2 presents the top seven General Fund revenues. Sales Tax and Sales Tax Compensation represent the largest share of revenues in both 2000-01 and 2009-10. These revenues increased slightly from 27.8 percent of the total General Fund revenues in 2000-01 to 28.6 percent in 2009-10.

Property Tax revenues increased from 11.6 percent of the total General Fund revenues in 2000-01 to 18.7 percent of the total General Fund revenues in 2009-10. VLF Tax revenue and VLF

Table 7-2 (page 1 of 2)
General Fund Revenue Trends, 2000-01 to 2009-10
City of Murrieta Public Financial Trends Analysis
(In Current Dollars)

General Fund Revenue Category	2000-01 Actual	2001-02 Actual	2002-03 Actual	2003-04 Actual	2004-05 Actual[1]	2005-06 Actual	2006-07 Actual	2007-08 Actual	2008-09 Actual	2009-10 Adopted	Average Annual Growth: 2000-01 to 2009-10
Taxes											
Property Tax	$2,021,095	$2,373,729	$2,746,191	$3,554,292	$4,668,907	$6,297,872	$8,163,445	$8,007,644	$7,550,000	$6,965,000	14.7%
Sales Tax	4,863,314	5,050,165	5,956,185	8,517,836	8,480,169	8,830,898	9,576,785	8,949,259	8,006,900	7,956,762	5.6%
Sales Tax Compensation Fund	0	0	0	0	2,152,067	2,654,233	3,240,999	3,216,325	2,769,034	2,713,653	4.7%
Transient Occupancy Tax	0	0	0	129,355	157,343	164,164	181,873	159,397	150,000	125,000	-0.6%
Property Transfer Taxes	362,659	430,456	779,776	1,122,127	1,427,062	1,609,138	700,985	439,614	400,000	400,000	1.1%
Franchises	944,914	1,037,986	1,198,423	1,703,356	1,881,766	2,157,628	2,521,913	3,130,531	3,100,000	3,130,000	14.2%
Total Taxes	*$8,191,982*	*$8,892,336*	*$10,680,575*	*$15,026,966*	*$18,767,314*	*$21,713,933*	*$24,386,000*	*$23,902,770*	*$21,975,934*	*$21,290,415*	11.2%
Fines & Forfeitures											
Animal Administration Citations	$0	$5,620	$0	$0	$0	$0	$0	$1,800	$7,500	$500	-47.3%
Miscellaneous Fines	2,735	2,790	5,266	8,651	17,316	19,725	20,450	22,503	20,000	20,000	24.7%
Administrative Citations	9,250	17,575	0	0	0	58,575	28,630	20,715	40,000	20,000	8.9%
False Alarm	0	0	0	0	0	0	0	0	45,000	0	n/a
Fines - P.C. 1202.5	0	0	0	0	0	254,121	307,699	337,889	225,000	340,000	7.5%
Traffic Safety Fines	112,439	203,125	0	0	0	258,574	246,495	185,981	500,000	430,000	16.1%
Total Fines & Forfeitures	*$124,424*	*$229,110*	*$5,266*	*$8,651*	*$17,316*	*$590,996*	*$603,274*	*$568,888*	*$837,500*	*$810,500*	23.1%
Licenses & Permits											
Building Permits/Non-Residential	$0	$0	$0	$0	$0	$628,404	$697,757	$536,912	$460,386	$783,363	5.7%
Miscellaneous Permits	0	0	0	0	0	0	0	0	231,198	18,496	n/a
Permit Issuance Fee	0	0	0	0	0	393,758	315,785	207,017	255,250	199,796	-15.6%
Residential Building Permits	0	0	0	0	0	346,588	45,850	23,570	130,429	26,112	-47.6%
Business Licenses	267,300	303,520	381,733	488,716	564,025	633,817	642,955	597,638	550,000	551,250	8.4%
Development Services Fees	0	0	0	0	0	0	192,357	247,869	0	100,000	n/a
Vacant Home Property	0	0	0	0	0	0	0	17,290	70,000	50,000	n/a
Permit Fee Revenue	167,102	0	0	0	0	0	0	0	15,000	15,000	-23.5%
Transportation Permit Fee	5,301	7,507	0	0	0	18,473	19,871	15,420	15,000	15,000	12.3%
Bingo Licenses/Fees	100	100	100	150	150	200	0	300	0	0	n/a
Total Licenses & Permits	*$439,803*	*$311,127*	*$381,833*	*$488,866*	*$564,175*	*$2,021,240*	*$1,914,575*	*$1,646,017*	*$1,727,263*	*$1,759,017*	16.7%
Charges for Services											
Plan Checks - Building	$0	$0	$0	$0	$0	$203,819	$82,321	$70,787	$0	$132,737	-10.2%
Miscellaneous	0	0	0	0	0	85,670	71,988	145,933	14,700	3,700	-54.4%
Administrative Cost Reimb.	0	0	0	0	0	0	0	0	494,000	591,220	19.7%
CFD Administrative Charges	0	0	0	0	0	0	0	0	51,175	60,000	17.2%
Citywide Overhead	0	0	0	353,532	572,126	129,762	651,037	342,942	300,000	200,000	-9.1%
Planning-Inspection/Plan Check	335,207	435,226	635,774	367,215	671,792	638,751	585,186	559,640	600,000	540,000	5.4%
Inspections Charges	0	0	0	0	0	173,838	158,047	114,947	200,000	200,000	3.6%
Building and Safety	0	0	1,867,186	1,532,470	4,075,695						
Public Works Charges	319,397	441,728	792,431	682,431	566,934	98,756	44,768	31,177	50,000	50,000	-18.6%
Abatement Reimbursement	6,812	15,253	742	13,655	2,977	0	5,621	3,687	0	0	n/a
GIS Processing Fees	0	0	0	11,951	124,564	102,513	34,312	16,983	0	0	n/a
Residential Building Plan Check	0	0	0	0	0	276,507	11,960	0	0	0	n/a
Total Charges for Services	*$661,416*	*$892,207*	*$3,296,133*	*$2,961,255*	*$6,014,088*	*$1,709,615*	*$1,645,241*	*$1,286,096*	*$1,709,875*	*$1,777,657*	11.6%
Other Revenue											
Miscellaneous	22,452	6,171	24,300	$268,637	$15,073	$632,357	$54,599	$147,898	$3,550	$6,300	-13.2%
Donations	0	0	0	0	0	0	0	0	50,000	0	n/a
Total Other Revenue	*$22,452*	*$6,171*	*$24,300*	*$268,637*	*$15,073*	*$632,357*	*$54,599*	*$147,898*	*$53,550*	*$6,300*	-13.2%
Transfer in Accounts											
Transfer In-Fire Fund	$92,000	$92,000	$40,000	$40,000	$40,000	$85,000	$85,000	$290,000	$628,268	$300,000	14.0%
Transfer In-Library Fund	8,500	8,500	29,691	0	0	1,000	10,000	18,000	64,000	44,000	20.0%
Transfer In-Low/Moderate Hous.	0	0	0	0	0	0	0	0	469,169	500,000	6.6%
Transfer In-Redevelopment	0	344,450	0	0	0	0	0	0	0	0	n/a
Transfer In-Reserve Account	0	0	0	0	0	202,385	0	18,000	120,095	30,000	0
Transfer In-NPDES Fund	47,000	46,600	0	0	0	4,000	42,250	90,250	4,000	4,000	0
Transfer In-DIF Fund	170,973	180,007	107,651	0	0	1,347,257	549,163	1,107,713	260,000	0	n/a
Transfer In-CSD Fund	120,597	39,595	45,000	58,166	56,845	102,897	118,910	122,125	115,868	0	n/a
Transfer In-Building Department	0	0	0	0	0	159,830	175,917	182,700	0	0	n/a
Transfer In-CFD	0	0	0	0	0	248,336	0	140,282	0	0	n/a
Transfer In-Seized Assets Fund	52,025	56,400	0	0	0	0	0	0	0	0	n/a
Transfer In-Impound Yard Fund	10,000	10,000	0	0	0	175,400	74,300	60,000	0	0	n/a
Transfer In-SLEFS Fund	294,021	100,247	0	0	0	124,334	180,882	180,882	0	0	n/a
Transfer In-Traffic Safety	10,000	10,000	0	0	0	9,500	14,880	4,550	0	0	n/a
Transfer In-Area Drainage Fund	0	0	0	0	0	0	7,491,524	0	0	0	n/a
Transfer In-Gas Tax Fund	450,000	450,000	0	0	0	0	0	0	0	0	n/a
Transfer In-Measure A Fund	317,966	344,938	0	0	0	0	0	0	0	0	n/a
Transfer In-Trust Fund	75,000	0	0	0	0	0	0	0	0	0	n/a
Transfer In-Block Grant Fund	0	0	0	0	5,635	0	0	0	0	0	n/a
Transfer In-Foundation	0	0	0	0	0	15,000	0	0	0	0	n/a
Total Transfers In	*$1,648,082*	*$1,682,738*	*$222,342*	*$98,166*	*$102,480*	*$2,474,939*	*$8,742,826*	*$2,214,501*	*$1,661,400*	*$878,000*	-6.8%

Table 7-2 (page 2 of 2)
General Fund Revenue Trends, 2000-01 to 2009-10
City of Murrieta Public Financial Trends Analysis
(In Current Dollars)

General Fund Revenue Category	2000-01 Actual	2001-02 Actual	2002-03 Actual	2003-04 Actual	2004-05 Actual[1]	2005-06 Actual	2006-07 Actual	2007-08 Actual	2008-09 Actual	2009-10 Adopted	Average Annual Growth: 2000-01 to 2009-10
Use of Money & Property											
Directional Sign Program	$19,825	$29,824	$9,892	$99,417	$194,160	$182,210	$110,460	$85,430	$100,000	$85,000	17.6%
Interest Income	1,073,892	1,147,214	965,473	232,269	1,058,599	1,534,908	3,118,910	3,587,643	1,050,000	2,000,000	7.2%
Lease/Rental Income	0	0	0	0	0	13,411	152,113	134,690	133,430	211,670	99.3%
Proceeds of Fixed Asset Deposits	1,071,863	3,256	0	273	8,122	4,233	10,313	1,981	0	1,000	-53.9%
Unclaimed Funds	7,322	21,407	28,817	32,398	13,430	3,996	11,206	8,349	15,000	0	n/a
Vendor Remuneration	11,525	11,672	11,955	11,181	12,379	6,658	6,336	12,073	0	0	n/a
Total Use of Money & Property	*$2,184,427*	*$1,213,373*	*$1,016,137*	*$375,537*	*$1,286,690*	*$1,745,416*	*$3,409,338*	*$3,830,167*	*$1,298,430*	*$2,297,670*	0.6%
Intergovernmental Revenue											
VLF Tax [1]	$2,080,100	$2,572,905	$3,035,262	$3,081,503	$836,941	$505,884	$615,029	$438,628	$300,000	$300,000	-18.6%
VLF Compensation [1]	0	0	0	0	4,108,392	5,603,743	6,825,684	7,666,122	7,259,818	6,551,914	9.8%
Federal Reimbursement	265,558	183,542	0	0	0	225,664	248,956	0	0	64,945	-14.5%
State Reimbursements	163,841	238,321	0	689,500	1,189,967	50,310	288,678	160,154	38,379	33,609	-16.1%
Off Highway License Fees	860	1,100	1,364	2,033	2,670	3,200	0	0	0	0	n/a
County Reimbursement	88,930	120,778	0	0	0	139,864	157,844	200,951	136,000	0	n/a
Other Agency Reimbursement	327	0	0	0	0	0	0	0	0	317,822	114.8%
Total Intergovernmental Revenue	*$2,599,616*	*$3,116,646*	*$3,036,626*	*$3,773,036*	*$6,137,970*	*$6,528,665*	*$8,136,191*	*$8,465,855*	*$7,734,197*	*$7,268,290*	12.1%
Use of Reserves											
Use of Reserves	$0	$0	$0	$0	$0	$0	$0	$0	$1,301,139	$949,313	n/a
Fund Balance Carry Over	0	0	0	0	0	0	0	0	2,362,340	0	n/a
Total Use of Reserves	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$3,663,479*	*$949,313*	n/a
General Fund Program Revenues											
Program Revenues	$1,320,096	$885,406	$1,497,626	$1,300,208	$1,180,580	$0	$0	$0	$0	$0	-2.8%
General Plan Fee	15,932	22,165	0	0	0	71,375	44,800	27,500	30,000	27,000	6.0%
Vehicle Abatement	30,479	72,198	0	0	0	85,467	70,045	100,705	90,000	90,000	12.8%
Waste Management	0	0	0	0	0	0	0	57,372	82,655	8,250	-62.1%
Police Services	204,366	241,904	1,427,193	1,338,431	1,349,716	312,663	338,495	477,715	487,067	116,713	-6.0%
State P.O.S.T.	19,476	33,193	0	0	0	28,522	27,171	52,823	40,000	25,000	2.8%
Facility Indicator Fee	0	0	0	0	0	660	0	0	5,000	5,000	65.9%
Total General Fund Program	*$1,590,349*	*$1,254,866*	*$2,924,820*	*$2,638,639*	*$2,530,295*	*$498,687*	*$480,511*	*$716,114*	*$734,722*	*$271,963*	-17.8%
Miscellaneous Revenue											
Cash Received-Over or Short	($4)	$0	$16	$0	$0	($76)	($72)	$18	$0	$0	n/a
Govpartner Prior Year Revenue	0	0	0	0	0	554,833	0	0	0	0	n/a
Transfer In-Telecomm. Fund	0	0	0	0	0	0	25,000	0	0	0	n/a
Total Miscellaneous	*($4)*	*$0*	*$16*	*$0*	*$0*	*$554,757*	*$24,928*	*$18*	*$0*	*$0*	n/a
CIP Revenues											
Area Drainage Fees	$0	$0	$0	$0	$0	$0	$0	$187	$0	$0	n/a
Development Impact Fee	0	0	0	0	0	500,000	509,900	0	0	0	n/a
Total CIP Revenue	*$0*	*$0*	*$0*	*$0*	*$0*	*$500,000*	*$509,900*	*$187*	*$0*	*$0*	n/a
General Fund Total	*$17,462,547*	*$17,598,574*	*$21,588,048*	*$25,639,753*	*$35,435,401*	*$38,970,605*	*$49,907,382*	*$42,778,512*	*$41,396,350*	*$37,309,125*	8.8%

Note: 1. Average annual growth rate for Vehicle License Fee (VLF) Compensation, Sales Tax Compensation and Admissions taxes is based on 5 years, to start in fiscal year 2004-05 when these revenues were first received.

Sources: Stanley R. Hoffman Associates, Inc.
City of Murrieta, Finance Department, General Fund Revenues and Expenditures, Fiscal Years 2000/01 through 2004/05
City of Murrieta, *Annual Operating Budget, Fiscal Year 2008-2009*
City of Murrieta, *Operating Budget, Fiscal Years 2009/10 and 2010/11*

Table 7-3 (page 1 of 2)
Distribution of General Fund Revenues, 2000-01 to 2009-10
City of Murrieta Public Financial Trends Analysis
(In Current Dollars)

Revenue Category	2000-01 Actual	2001-02 Actual	2002-03 Actual	2003-04 Actual	2004-05 Actual[1]	2005-06 Actual	2006-07 Actual	2007-08 Actual	2008-09 Actual	2009-10 Adopted
Taxes										
Property Tax	11.6%	13.5%	12.7%	13.9%	13.2%	16.2%	16.4%	18.7%	18.2%	18.7%
Sales Tax	27.8%	28.7%	27.6%	33.2%	23.9%	22.7%	19.2%	20.9%	19.3%	21.3%
Sales Tax Compensation Fund	0.0%	0.0%	0.0%	0.0%	6.1%	6.8%	6.5%	7.5%	6.7%	7.3%
Transient Occupancy Tax	0.0%	0.0%	0.0%	0.5%	0.4%	0.4%	0.4%	0.4%	0.4%	0.3%
Property Transfer Taxes	2.1%	2.4%	3.6%	4.4%	4.0%	4.1%	1.4%	1.0%	1.0%	1.1%
Franchises	5.4%	5.9%	5.6%	6.6%	5.3%	5.5%	5.1%	7.3%	7.5%	8.4%
Total Taxes	46.9%	50.5%	49.5%	58.6%	53.0%	55.7%	48.9%	55.9%	53.1%	57.1%
Fines & Forfeitures										
Animal Administration Citations	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Miscellaneous Fines	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%	0.0%	0.1%
Administrative Citations	0.1%	0.1%	0.0%	0.0%	0.0%	0.2%	0.1%	0.0%	0.1%	0.1%
False Alarm	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%
Fines - P.C. 1202.5	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.6%	0.8%	0.5%	0.9%
Traffic Safety Fines	0.6%	1.2%	0.0%	0.0%	0.0%	0.7%	0.5%	0.4%	1.2%	1.2%
Total Fines & Forfeitures	0.7%	1.3%	0.0%	0.0%	0.0%	1.5%	1.2%	1.3%	2.0%	2.2%
Licenses & Permits										
Building Permits/Non-Residential	0.0%	0.0%	0.0%	0.0%	0.0%	1.6%	1.4%	1.3%	1.1%	2.1%
Miscellaneous Permits	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%
Permit Issuance Fee	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	0.6%	0.5%	0.6%	0.5%
Residential Building Permits	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	0.1%	0.1%	0.3%	0.1%
Business Licenses	1.5%	1.7%	1.8%	1.9%	1.6%	1.6%	1.3%	1.4%	1.3%	1.5%
Development Services Fees	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.6%	0.0%	0.3%
Vacant Home Property	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%
Permit Fee Revenue	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Transportation Permit Fee	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bingo Licenses/Fees	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total Licenses & Permits	2.5%	1.8%	1.8%	1.9%	1.6%	5.2%	3.8%	3.8%	4.2%	4.7%
Charges for Services										
Plan Checks - Building	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.2%	0.2%	0.0%	0.4%
Miscellaneous	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%	0.3%	0.0%	0.0%
Administrative Cost Reimbursem	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.2%	1.6%
CFD Administrative Charges	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%
Citywide Overhead	0.0%	0.0%	0.0%	1.4%	1.6%	0.3%	1.3%	0.8%	0.7%	0.5%
Planning-Inspection/Plan Check	1.9%	2.5%	2.9%	1.4%	1.9%	1.6%	1.2%	1.3%	1.4%	1.4%
Inspections Charges	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.3%	0.3%	0.5%	0.5%
Building and Safety	0.0%	0.0%	8.6%	6.0%	11.5%	0.0%	0.0%	0.0%	0.0%	0.0%
Public Works Charges	1.8%	2.5%	3.7%	2.7%	1.6%	0.3%	0.1%	0.1%	0.1%	0.1%
Abatement Reimbursement	0.0%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
GIS Processing Fees	0.0%	0.0%	0.0%	0.0%	0.4%	0.3%	0.1%	0.0%	0.0%	0.0%
Residential Building Plan Check	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.0%	0.0%	0.0%	0.0%
Total Charges for Services	3.8%	5.1%	15.3%	11.5%	17.0%	4.4%	3.3%	3.0%	4.1%	4.8%
Other Revenue										
Miscellaneous	0.1%	0.0%	0.1%	1.0%	0.0%	1.6%	0.1%	0.3%	0.0%	0.0%
Donations	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%
Total Other Revenue	0.1%	0.0%	0.1%	1.0%	0.0%	1.6%	0.1%	0.3%	0.1%	0.0%
Transfer in Accounts										
Transfer In-Fire Fund	0.5%	0.5%	0.2%	0.2%	0.1%	0.2%	0.2%	0.7%	1.5%	0.8%
Transfer In-Library Fund	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%
Transfer In-Low/Moderate Hous.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	1.3%
Transfer In-Redevelopment	0.0%	2.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Transfer In-Reserve Account	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.3%	0.1%
Transfer In-NPDES Fund	0.3%	0.3%	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%	0.0%	0.0%
Transfer In-DIF Fund	1.0%	1.0%	0.5%	0.0%	0.0%	3.5%	1.1%	2.6%	0.6%	0.0%
Transfer In-CSD Fund	0.7%	0.2%	0.2%	0.2%	0.2%	0.3%	0.2%	0.3%	0.3%	0.0%
Transfer In-Building Department	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.4%	0.4%	0.0%	0.0%
Transfer In-CFD	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.3%	0.0%	0.0%
Transfer In-Seized Assets Fund	0.3%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Transfer In-Impound Yard Fund	0.1%	0.1%	0.0%	0.0%	0.0%	0.5%	0.1%	0.1%	0.0%	0.0%
Transfer In-SLEFS Fund	1.7%	0.6%	0.0%	0.0%	0.0%	0.3%	0.4%	0.4%	0.0%	0.0%
Transfer In-Traffic Safety	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Transfer In-Area Drainage Fund	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	15.0%	0.0%	0.0%	0.0%
Transfer In-Gas Tax Fund	2.6%	2.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Transfer In-Measure A Fund	1.8%	2.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Transfer In-Trust Fund	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Transfer In-Block Grant Fund	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Transfer In-Foundation	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total Transfers In	9.4%	9.6%	1.0%	0.4%	0.3%	6.4%	17.5%	5.2%	4.0%	2.4%

Table 7-3 (page 2 of 2)
Distribution of General Fund Revenues, 2000-01 to 2009-10
City of Murrieta Public Financial Trends Analysis
(In Current Dollars)

Revenue Category	2000-01 Actual	2001-02 Actual	2002-03 Actual	2003-04 Actual	2004-05 Actual[1]	2005-06 Actual	2006-07 Actual	2007-08 Actual	2008-09 Actual	2009-10 Adopted
Use of Money & Property										
Directional Sign Program	0.1%	0.2%	0.0%	0.4%	0.5%	0.5%	0.2%	0.2%	0.2%	0.2%
Interest Income	6.1%	6.5%	4.5%	0.9%	3.0%	3.9%	6.2%	8.4%	2.5%	5.4%
Lease/Rental Income	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.3%	0.3%	0.6%
Proceeds of Fixed Asset Dep.	6.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Unclaimed Funds	0.0%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Vendor Remuneration	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total Use of Money & Property	12.5%	6.9%	4.7%	1.5%	3.6%	4.5%	6.8%	9.0%	3.1%	6.2%
Intergovernmental Revenue										
VLF Tax[1]	11.9%	14.6%	14.1%	12.0%	2.4%	1.3%	1.2%	1.0%	0.7%	0.8%
VLF Compensation[1]	0.0%	0.0%	0.0%	0.0%	11.6%	14.4%	13.7%	17.9%	17.5%	17.6%
Federal Reimbursement	1.5%	1.0%	0.0%	0.0%	0.0%	0.6%	0.5%	0.0%	0.0%	0.2%
State Reimbursements	0.9%	1.4%	0.0%	2.7%	3.4%	0.1%	0.6%	0.4%	0.1%	0.1%
Off Highway License Fees	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
County Reimbursement	0.5%	0.7%	0.0%	0.0%	0.0%	0.4%	0.3%	0.5%	0.3%	0.0%
Other Agency Reimbursement	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%
Total Intergovernmental Revenue	14.9%	17.7%	14.1%	14.7%	17.3%	16.8%	16.3%	19.8%	18.7%	19.5%
Use of Reserves										
Use of Reserves	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.1%	2.5%
Fund Balance Carry Over	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.7%	0.0%
Total Use of Reserves	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.8%	2.5%
General Fund Program Revenues										
Program Revenues	7.6%	5.0%	6.9%	5.1%	3.3%	0.0%	0.0%	0.0%	0.0%	0.0%
General Plan Fee	0.1%	0.1%	0.0%	0.0%	0.0%	0.2%	0.1%	0.1%	0.1%	0.1%
Vehicle Abatement	0.2%	0.4%	0.0%	0.0%	0.0%	0.2%	0.1%	0.2%	0.2%	0.2%
Waste Management	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%	0.0%
Police Services	1.2%	1.4%	6.6%	5.2%	3.8%	0.8%	0.7%	1.1%	1.2%	0.3%
State P.O.S.T.	0.1%	0.2%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%
Facility Indicator Fee	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total General Fund Program	9.1%	7.1%	13.5%	10.3%	7.1%	1.3%	1.0%	1.7%	1.8%	0.7%
Miscellaneous Revenue										
Cash Received-Over or Short	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Govpartner Prior Year Revenue	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	0.0%	0.0%	0.0%	0.0%
Transfer In-Telecommunication F	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
Total Miscellaneous	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	0.0%	0.0%	0.0%	0.0%
CIP Revenues										
Area Drainage Fees	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Development Impact Fee	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	1.0%	0.0%	0.0%	0.0%
Total CIP Revenue	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	1.0%	0.0%	0.0%	0.0%
General Fund Total	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*

Note: 1. Average annual growth rate for Vehicle License Fee (VLF) Compensation, Sales Tax Compensation and Admissions taxes is based on 5 years, to start in fiscal year 2004-0 when these revenues were first received.

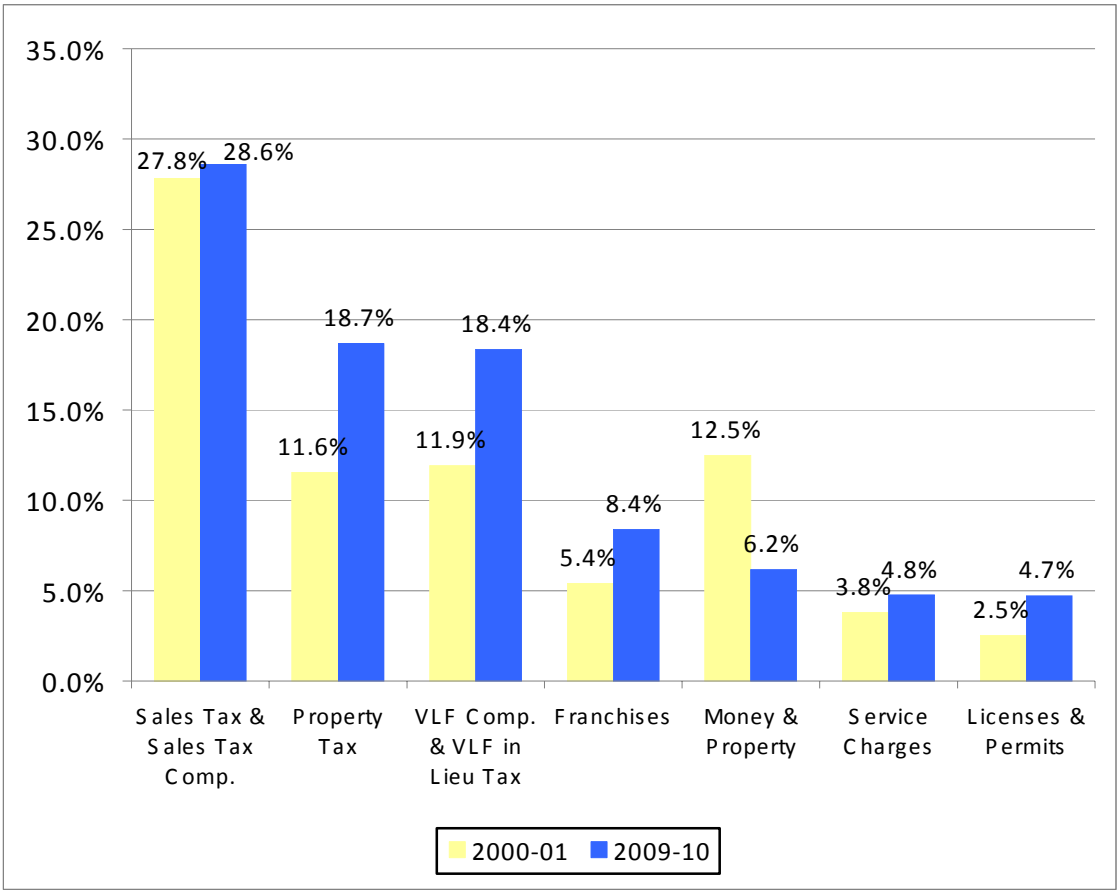
Sources: Stanley R. Hoffman Associates, Inc.
City of Murrieta, Finance Department, General Fund Revenues and Expenditures, Fiscal Years 2000/01 through 2004/05
City of Murrieta, *Annual Operating Budget, Fiscal Year 2008-2009*
City of Murrieta, *Operating Budget, Fiscal Years 2009/10 and 2010/11*

Table 7-4
Distribution of Key General Fund Revenues, 2000-01 and 2009-10
City of Murrieta Public Financial Trends Analysis
(In Current Dollars)

Revenue Category	2000-01	2009-10
Sales Tax & Sales Tax Compensation	27.8%	28.6%
Property Tax	11.6%	18.7%
VLF Comp. & VLF in Lieu Tax	11.9%	18.4%
Franchises	5.4%	8.4%
Use of Money & Property	12.5%	6.2%
Charges for Services	3.8%	4.8%
Licenses & Permits	2.5%	4.7%
Use of Reserves	0.0%	2.5%
Transfers In	9.4%	2.4%
Fines & Forfeitures	0.7%	2.2%
Intergovernmental Revenue	3.0%	1.1%
Property Transfer Tax	2.1%	1.1%
General Fund Program Revenues	9.1%	0.7%
Transient Occupancy Tax	0.0%	0.3%
Miscellaneous & Other Revenue	0.1%	0.0%
CIP Revenue	0.0%	0.0%
	100.0%	100.0%

Sources: Stanley R. Hoffman Associates, Inc.
City of Murrieta, Finance Department, General Fund Revenues and Expenditures, Fiscal Year 2000/01 through 2009/10
City of Murrieta, *Annual Operating Budget, Fiscal Year 2008-2009*
City of Murrieta, *Operating Budget, Fiscal Years 2009/10 and 2010/11*

Figure 7-2
Top Seven General Fund Revenues, 2000-01 and 2009-10
City of Murrieta Public Financial Trends Analysis
(In Current Dollars)



Source: Stanley R. Hoffman Associates, Inc.

Compensation combined also increased, from 11.9 percent to 18.4 percent of the total. Franchises increased from 5.4 percent of total revenues in 2000-01 to 8.4 percent of total revenues in 2009-10. Charges for Services and Licenses and Permits also increased their share of total General Fund revenues over the period. Use of Money and Property's share decreased from 12.5 percent in 2000-01 to 6.2 percent in 2009-10.

General Fund Expenditures Growth Trends. Table 7-5 shows trends in General Fund expenditures from fiscal years 2000-01 to 2009-10. General Fund expenditures increased from $13.83 million in 2000-01 to about $37.31 million in 2009-10. As mentioned earlier, the total General Fund expenditures grew faster than General Fund revenues, at an average annual rate of 11.7 percent compared with 8.8 percent. Expenditures are grouped into two categories, as shown in panel A and panel B in Table 7-5: A) General Government citywide costs and B) Non-General Government direct service delivery costs. Non-General Government expenditures grew faster than General Government expenditures, at an average annual rate of 13.3 percent compared with 7.2 percent. As a result, General Government costs, as a percentage of total General Fund expenditures, decreased from 31.3 percent in 2000-01 to 21.7 percent in 2009-10. Of the Non-General Government expenditures, police services grew at an annual average rate of 17.7 percent over the period.

General Fund Distribution of Expenditures. As shown in Table 7-6 and Figure 7-3, police costs represent the largest share of the budget in both years, followed by General Government. In 2000-01, about 38.0 percent of the total General Fund expenditures were allocated for Police services, followed by General Government at 31.3 percent of the total. Combined, these two categories comprised just over 69.0 percent of the total General Fund expenditures in 2000-01. In 2009-10, about 61.0 percent of the expenditures were allocated for Police services alone, followed by General Government at 21.7 percent of the total expenditures, or 82.7 percent of total expenditures.

In the distribution of other Non-General Government services, Public Works is the third largest cost in both 2000-01 and 2009-10, however Public Works' share of the total General Fund expenditures decreased to 8.8 percent in 2009-10 from 15.9 percent in 2000-01. Some of the decrease in Public Works' share of total costs is attributable to the shift of operational costs for Public Works engineering and maintenance costs directly related to streets that are covered in the

Table 7-5
General Fund Expenditure Trends, 2000-01 to 2009-10
City of Murrieta Public Financial Trends Analysis
(In Current Dollars)

General Fund Expenditures	2000-01 Actual	2001-02 Actual	2002-03 Actual	2003-04 Actual	2004-05 Actual	2005-06 Actual	2006-07 Actual	2007-08 Actual	2008-09 Budget	2009-10 Adopted	Average Annual Growth 2000-01 to 2009-10
A. General Government											
City Council	$133,564	$153,803	$263,794	$296,498	$241,490	$223,241	$235,806	$251,500	$280,492	$250,614	7.2%
City Attorney	133,484	194,522	202,304	183,341	197,819	207,849	367,464	860,934	600,000	600,066	18.2%
Administration - General	386,192	428,126	492,922	508,320	829,321	744,447	868,488	1,180,676	678,992	715,750	7.1%
Human Resources	196,344	221,488	301,272	350,531	477,473	533,442	616,339	647,940	928,598	740,574	15.9%
Risk Management	848,027	76,259	383,542	230,393	626,198	584,384	0	0	0	0	-7.2%
Animal Control	0	0	0	0	0	0	0	132,858	171,400	172,800	14.0%
Information Services	359,823	298,906	409,330	408,142	182,863	428,036	0	0	0	0	3.5%
City Clerk	282,576	362,786	326,434	453,111	485,443	512,520	704,411	722,026	821,231	751,385	11.5%
Finance	381,747	393,255	449,518	566,154	1,004,948	1,271,779	1,368,902	1,559,598	3,176,040	2,001,291	20.2%
Business Licenses	51,539	50,391	82,367	89,140	104,822	94,573	0	0	0	0	n/a
Purchasing	0	0	0	0	0	0	0	72,611	186,340	219,278	73.8%
Solid Waste Management	12,737	13,663	15,159	24,510	37,096	49,284	24,399	59,484	41,002	8,000	-5.0%
Community Events & Promotions	137,399	130,619	164,857	234,115	266,353	257,860	360,436	153,356	288,057	236,171	6.2%
Non-Departmental	1,405,483	1,363,767	1,852,856	4,130,725	4,093,212	2,663,238	4,141,829	4,890,628	3,018,554	2,408,953	6.2%
Total	$4,328,914	$3,687,586	$4,944,356	$7,474,981	$8,547,038	$7,570,653	$8,688,074	$10,531,611	$10,190,706	$8,104,882	7.2%
B. Non-General Government											
Development Services (Planning, GIS)	974,931	986,982	814,396	937,437	1,108,260	1,328,287	1,152,587	1,428,763	1,168,208	1,188,614	2.2%
Economic Development	243,841	226,136	257,970	415,526	295,453	482,284	416,161	235,104	411,923	424,366	6.3%
Fire District	91,000	0	0	0	0	0	0	0	0	0	n/a
Library Fund	0	0	65,000	0	0	0	0	0	0	0	n/a
Building & Safety	741,673	751,838	1,164,070	1,409,819	2,451,083	2,134,651	1,767,411	1,824,454	1,589,292	1,543,658	8.5%
Public Works	2,199,676	1,906,036	2,391,506	2,487,693	2,794,319	3,295,649	3,715,311	3,802,259	3,811,594	3,277,271	4.5%
Police	5,253,551	9,370,603	8,869,284	9,661,636	11,772,387	14,662,258	16,199,838	20,056,008	21,389,215	22,770,334	17.7%
Total	$9,504,672	$13,241,594	$13,562,226	$14,912,111	$18,421,503	$21,903,129	$23,251,308	$27,346,588	$28,370,232	$29,204,243	13.3%
GRAND TOTAL GENERAL FUND	**$13,833,586**	**$16,929,180**	**$18,506,582**	**$22,387,092**	**$26,968,541**	**$29,473,782**	**$31,939,382**	**$37,878,199**	**$38,560,938**	**$37,309,125**	**11.7%**
CALCULATION OF GENERAL GOVERNMENT COSTS											
General Government Costs	$4,328,914	$3,687,586	$4,944,356	$7,474,981	$8,547,038	$7,570,653	$8,688,074	$10,531,611	$10,190,706	$8,104,882	
divided by											
Total General Fund Expenditures	$13,833,586	$16,929,180	$18,506,582	$22,387,092	$26,968,541	$29,473,782	$31,939,382	$37,878,199	$38,560,938	$37,309,125	
equals											
General Government as a Percent Total General Fund Expenditures	31.3%	21.8%	26.7%	33.4%	31.7%	25.7%	27.2%	27.8%	26.4%	21.7%	

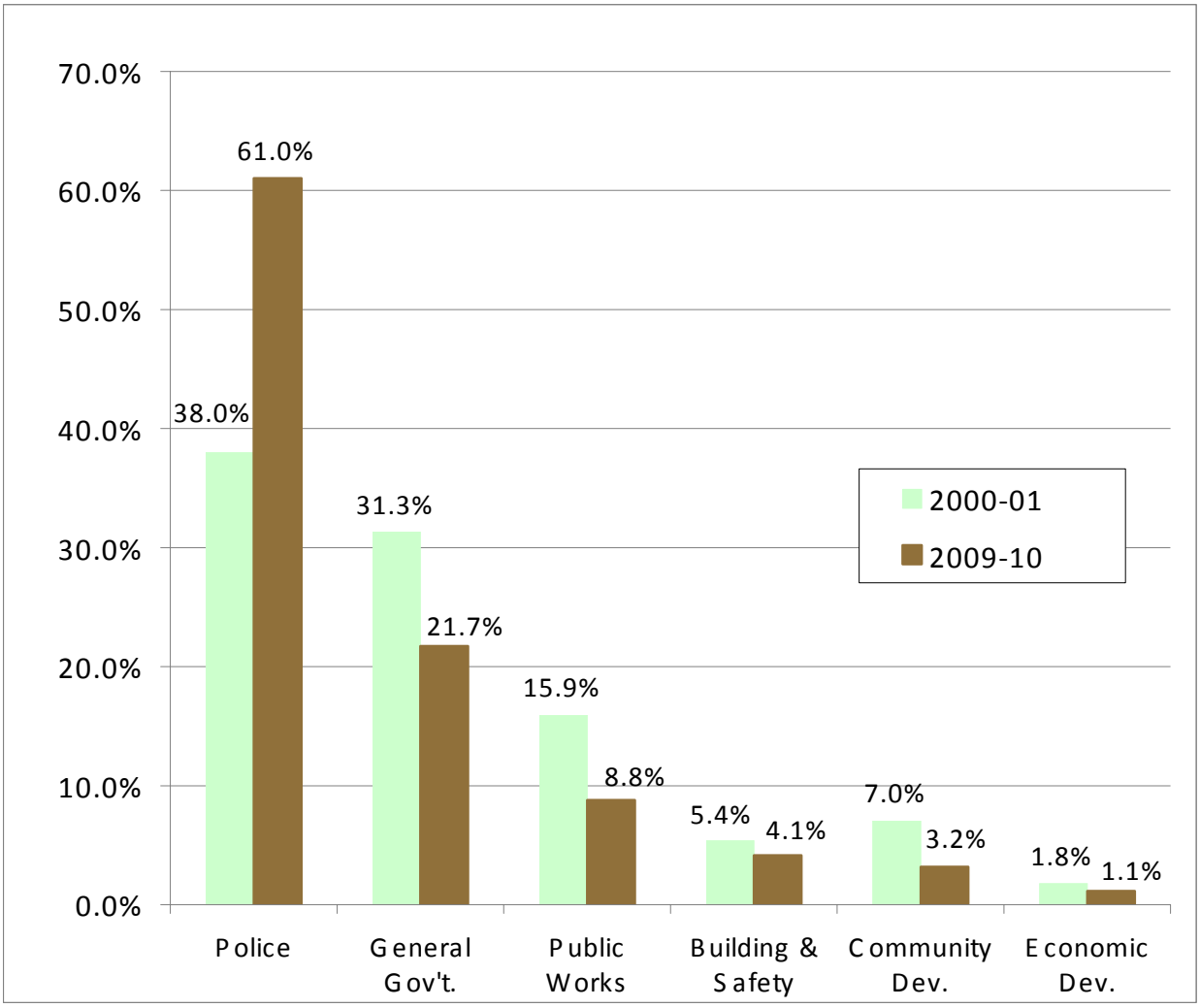
Sources: Stanley R. Hoffman Associates, Inc.
City of Murrieta, Finance Department, General Fund Revenues and Expenditures, Fiscal Years 2000/01 through 2004/05
City of Murrieta, *Annual Operating Budget, Fiscal Year 2008-2009*
City of Murrieta, *Operating Budget, Fiscal Years 2009/10 and 2010/11*

Table 7-6
Distribution of General Fund Expenditures, 2000-01 to 2009-10
City of Murrieta Public Financial Trends Analysis
(In Current Dollars)

Expenditure Category	2000-01 Actual	2001-02 Actual	2002-03 Actual	2003-04 Actual	2004-05 Actual	2005-06 Actual	2006-07 Actual	2007-08 Actual	2008-09 Actual	2009-10 Adopted
General Government										
City Council	1.0%	0.9%	1.4%	1.3%	0.9%	0.8%	0.7%	0.7%	0.7%	0.7%
City Attorney	1.0%	1.1%	1.1%	0.8%	0.7%	0.7%	1.2%	2.3%	1.6%	1.6%
Administration - General	2.8%	2.5%	2.7%	2.3%	3.1%	2.5%	2.7%	3.1%	1.8%	1.9%
Human Resources	1.4%	1.3%	1.6%	1.6%	1.8%	1.8%	1.9%	1.7%	2.4%	2.0%
Risk Management	6.1%	0.5%	2.1%	1.0%	2.3%	2.0%	0.0%	0.0%	0.0%	0.0%
Animal Control	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.4%	0.5%
Information Services	2.6%	1.8%	2.2%	1.8%	0.7%	1.5%	0.0%	0.0%	0.0%	0.0%
City Clerk	2.0%	2.1%	1.8%	2.0%	1.8%	1.7%	2.2%	1.9%	2.1%	2.0%
Finance	2.8%	2.3%	2.4%	2.5%	3.7%	4.3%	4.3%	4.1%	8.2%	5.4%
Business Licenses	0.4%	0.3%	0.4%	0.4%	0.4%	0.3%	0.0%	0.0%	0.0%	0.0%
Purchasing	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.5%	0.6%
Solid Waste Management	0.1%	0.1%	0.1%	0.1%	0.1%	0.2%	0.1%	0.2%	0.1%	0.0%
Community Events & Promotions	1.0%	0.8%	0.9%	1.0%	1.0%	0.9%	1.1%	0.4%	0.7%	0.6%
Non-Departmental	10.2%	8.1%	10.0%	18.5%	15.2%	9.0%	13.0%	12.9%	7.8%	6.5%
Total	31.3%	21.8%	26.7%	33.4%	31.7%	25.7%	27.2%	27.8%	26.4%	21.7%
Non-General Government										
Development Services (Planning, GIS)	7.0%	5.8%	4.4%	4.2%	4.1%	4.5%	3.6%	3.8%	3.0%	3.2%
Economic Development	1.8%	1.3%	1.4%	1.9%	1.1%	1.6%	1.3%	0.6%	1.1%	1.1%
Fire District	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Library Fund	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Building & Safety	5.4%	4.4%	6.3%	6.3%	9.1%	7.2%	5.5%	4.8%	4.1%	4.1%
Public Works	15.9%	11.3%	12.9%	11.1%	10.4%	11.2%	11.6%	10.0%	9.9%	8.8%
Police	38.0%	55.4%	47.9%	43.2%	43.7%	49.7%	50.7%	52.9%	55.5%	61.0%
Total	68.7%	78.2%	73.3%	66.6%	68.3%	74.3%	72.8%	72.2%	73.6%	78.3%
General Fund Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Sources: Stanley R. Hoffman Associates, Inc.
City of Murrieta, Finance Department, General Fund Revenues and Expenditures, Fiscal Years 2000/01 through 2004/05
City of Murrieta, *Annual Operating Budget, Fiscal Year 2008-2009*
City of Murrieta, *Operating Budget, Fiscal Years 2009/10 and 2010/11*

Figure 7-3
Distribution of General Fund Expenditures, 2000-01 and 2009-10
City of Murrieta Public Financial Trends Analysis
(In Current Dollars)



Source: Stanley R. Hoffman Associates, Inc.

Gas Tax budget unit in 2009-10. Community Development was the fourth largest cost in 2000-01 and dropped to fifth largest cost in 2009-10. Building and Safety became the fourth largest cost in 2009-10.

General Fund Per Capita Revenues and Costs. Per capita revenues and costs are presented in Table 7-7 and Table 7-8. As shown in Table 7-7, per capita General Fund revenues decreased from $394.35 per capita in 2000-01 to $370.45 per capita in 2009-10, representing an average annual decrease of 0.7 percent. General Fund costs increased from about $312.40 per capita in 2000-01 to $370.45 per capita in 2009-10, at an average annual growth rate of 1.9 percent. As shown, the revenue/cost ratio was about 1.07 in the 2008-09 budget and at 1.00, or break-even, in the 2009-10 budget.

Population increased at an average annual rate of about 9.6 percent annually over the 2000-01 to 2009-10 period. Inflation averaged about 2.7 percent per year over this time period. As shown in Table 7-8 when the per capita revenues and expenditures are adjusted for inflation, per capita revenues decreased in constant dollars at about 3.6 percent annually. Per capita expenditures decreased at about 1.1 percent annually.

7.2 Library Fund

The Library Fund provides library services to the City utilizing a dedicated portion of the property tax as the major source of revenue. Table 7-9 and Figure 7-4 present Library Fund growth trends over the ten-year period from fiscal year 2000-01 to fiscal year 2009-10 in current dollars. As shown, Library Fund revenues grew at an average annual rate of 16.0 percent over this time period, and expenditures grew at a faster average annual rate of 18.6 percent. During this time period, net General Fund revenues have outpaced expenditures until 2008-09 and 2009-10, when revenues and costs are the same, as indicated by the revenue/cost ratio of 1.00.

As shown in Table 7-10, in current dollars per capita Library Fund revenues increased from $13.97 per capita in 2000-01 to $23.28 per capita in 2009-10, representing an average annual increase of 5.8 percent. Library Fund costs increased from about $11.37 per capita in 2000-01 to $23.28 per capita in 2009-10, at an average annual growth rate of 8.3 percent. As shown, the revenue/cost ratio was about 1.23 in 2000-01 and at 1.00, or break-even, in the year 2009-10. As shown in Table 7-11, when the per capita revenues and expenditures are adjusted for inflation, per capita revenues increased in constant dollars at about 2.8 percent annually and per capita expenditures increased faster at about 5.1 percent annually.

Table 7-7
General Fund Per Capita Revenues and Expenditures, 2000-01 to 2009-10
City of Murrieta Public Financial Trends Analysis
(In Current Dollars)

Fiscal Year	Population	General Fund Per Capita Revenues	General Fund Per Capita Expenditures	General Fund Revenue/Cost Ratio
2000-01	44,282	$394.35	$312.40	1.26
2001-02	46,437	$378.98	$364.56	1.04
2002-03	51,905	$415.91	$356.55	1.17
2003-04	68,391	$374.90	$327.34	1.15
2004-05	78,783	$449.78	$342.31	1.31
2005-06	85,328	$456.72	$345.42	1.32
2006-07	93,221	$535.37	$342.62	1.56
2007-08	97,031	$440.87	$390.37	1.13
2008-09	99,576	$415.73	$387.25	1.07
2009-10	100,714	$370.45	$370.45	1.00
Average Annual Growth Rate	9.6%	-0.7%	1.9%	n/a

Sources: Stanley R. Hoffman Associates, Inc.
City of Murrieta, Finance Department, General Fund Revenues and Expenditures, Fiscal Years 2000/01 through 2004/05
City of Murrieta, *Annual Operating Budget, Fiscal Year 2008-2009*
City of Murrieta, *Operating Budget, Fiscal Years 2009/10 and 2010/11*
California Department of Finance, *E-4 Population Estimates, 2001-2009*

Table 7-8
General Fund Per Capita Revenues and Expenditures, 2000-01 to 2009-10
City of Murrieta Public Financial Trends Analysis
(In Constant Dollars)

Fiscal Year	Population	General Fund Per Capita Revenues	General Fund Per Capita Expenditures	General Fund Revenue/Cost Ratio
2000-01	44,282	$514.49	$407.57	1.26
2001-02	46,437	$476.13	$458.02	1.04
2002-03	51,905	$511.36	$438.37	1.17
2003-04	68,391	$450.78	$393.60	1.15
2004-05	78,783	$520.97	$396.49	1.31
2005-06	85,328	$507.99	$384.20	1.32
2006-07	93,221	$567.30	$363.06	1.56
2007-08	97,031	$454.17	$402.14	1.13
2008-09	99,576	$405.10	$377.35	1.07
2009-10	100,714	$370.45	$370.45	1.00
Average Annual Growth Rate	9.6%	-3.6%	-1.1%	n/a

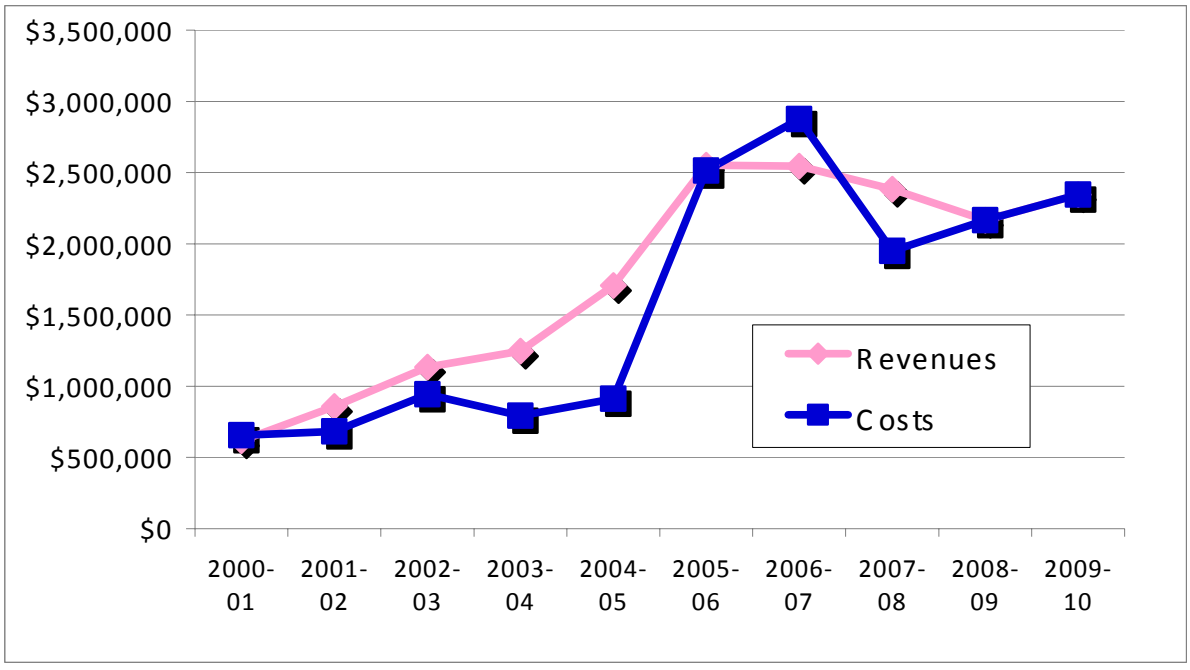
Sources: Stanley R. Hoffman Associates, Inc.
City of Murrieta, Finance Department, General Fund Revenues and Expenditures, Fiscal Years 2000/01 through 2004/05
City of Murrieta, *Annual Operating Budget, Fiscal Year 2008-2009*
City of Murrieta, *Operating Budget, Fiscal Year 2009/10 and 2010/11*
California Department of Finance, *Report E-4 Population Estimates, 2001-2009*
Bureau of Labor Statistics (BLS), *Consumer Price Index-All Urban Consumers, Los Angeles-Riverside-Orange County, CA* , 2009

Table 7-9
Library Fund Growth Trends, 2000-01 to 2009-10
City of Murrieta Public Financial Trends Analysis
(In Current Dollars)

Fiscal Year	Library Fund Revenues	Library Fund Expenditures	Net Library Fund	Library Fund Revenue/Cost Ratio
2000-01	$618,740	$503,307	$115,433	1.23
2001-02	682,723	543,629	139,094	1.26
2002-03	921,843	766,932	154,910	1.20
2003-04	1,037,547	659,476	378,071	1.57
2004-05	1,473,743	787,434	686,309	1.87
2005-06	2,295,404	2,260,079	35,325	1.02
2006-07	2,401,596	2,263,508	138,088	1.06
2007-08	2,314,783	1,893,269	421,514	1.22
2008-09	2,222,779	2,222,779	0	1.00
2009-10	2,344,382	2,344,382	0	1.00
Average Annual Growth Rate	16.0%	18.6%	n/a	

Sources: Stanley R. Hoffman Associates, Inc.
City of Murrieta, Finance Department, Library Fund Revenues and Expenditures, Fiscal Years 2000/01 through 2005/06
City of Murrieta, *Operating Budget, Fiscal Years 2009/10 and 2010/11*
California Department of Finance, *Report E-4 Population Estimates, 2001-2009*

Figure 7-4
Library Fund Growth Trends, 2000-01 to 2009-10
City of Murrieta Public Financial Trends Analysis
(In Current Dollars)



Source: Stanley R. Hoffman Associates, Inc.

Table 7-10
Library Fund Per Capita Revenues and Expenditures, 2000-01 to 2009-10
City of Murrieta Public Financial Trends Analysis
(In Current Dollars)

Fiscal Year	Population	Library Fund Per Capita Revenues	Library Fund Per Capita Expenditures	Library Fund Revenue/Cost Ratio
2000-01	44,282	$13.97	$11.37	1.23
2001-02	46,437	$14.70	$11.71	1.26
2002-03	51,905	$17.76	$14.78	1.20
2003-04	68,391	$15.17	$9.64	1.57
2004-05	78,783	$18.71	$9.99	1.87
2005-06	85,328	$21.04	$26.49	0.79
2006-07	93,221	$25.76	$29.12	0.88
2007-08	97,031	$23.86	$19.51	1.22
2008-09	99,576	$21.55	$22.32	0.97
2009-10	100,714	$23.28	$23.28	1.00
Average Annual Growth Rate	9.6%	5.8%	8.3%	n/a

Sources: Stanley R. Hoffman Associates, Inc.
City of Murrieta, Finance Department, Library Fund Expenditures, Fiscal Years 2000/01 through 2005/06
City of Murrieta, *Operating Budget, Fiscal Years 2009/10 and 2010/11*
California Department of Finance, *Report E-4 Population Estimates, 2001-2009*

Table 7-11
Library Fund Per Capita Revenues and Expenditures, 2000-01 to 2009-10
City of Murrieta Public Financial Trends Analysis
(In Constant Dollars)

Fiscal Year	Population	Library Fund Per Capita Revenues	Library Fund Per Capita Expenditures	Library Fund Revenue/Cost Ratio
2000-01	44,282	$18.23	$14.83	1.23
2001-02	46,437	$18.47	$14.71	1.26
2002-03	51,905	$21.84	$18.17	1.20
2003-04	68,391	$18.24	$11.59	1.57
2004-05	78,783	$21.67	$11.58	1.87
2005-06	85,328	$29.92	$29.46	1.02
2006-07	93,221	$27.30	$30.85	0.88
2007-08	97,031	$24.58	$20.10	1.22
2008-09	99,576	$21.75	$21.75	1.00
2009-10	100,714	$23.28	$23.28	1.00
Average Annual Growth Rate	9.6%	2.8%	5.1%	n/a

Sources: Stanley R. Hoffman Associates, Inc.
City of Murrieta, Finance Department, Library Fund Expenditures, Fiscal Years 2000/01 through 2005/06
City of Murrieta, *Operating Budget, Fiscal Years 2009/10 and 2010/11*
California Department of Finance, *Report E-4 Population Estimates, 2001-2009*
Bureau of Labor Statistics (BLS), *Consumer Price Index-All Urban Customers, Los Angeles-Riverside-Orange County, CA,* November 2009

7.3 Community Services District

The Community Services District (CSD) is funded by parcel assessments and is responsible for all parks and recreation activities, including the lighting and landscape maintenance districts throughout the City. The CSD boundary is contiguous with the City limits. As shown in Table 7-12 and Figure 7-5, CSD revenues grew at an average annual rate of 13.2 percent over this time period and expenditures grew at almost the same average annual rate of 13.3 percent over the fiscal year 2000/01 to fiscal year 2009/10 period.

As shown in Table 7-13, per capita CSD revenues increased from $74.49 per capita in 2000-01 to $99.59 per capita in 2009-10, representing an average annual increase of 3.3 percent. CSD costs increased from about $73.64 per capita in 2000-01 to $99.59 per capita in 2009-10, at an average annual growth rate of 3.4 percent. As shown in Table 7-14, when the per capita revenues and expenditures are adjusted for inflation, per capita revenues increased in constant dollars at about 0.3 percent annually and per capita expenditures increased at about 0.4 percent annually.

7.4 Fire District

The Fire District boundary is also contiguous with the City limits and provides revenue for fire protection with a dedicated portion of the property tax and parcel assessments. Table 7-15 and Figure 7-6 present Fire District growth trends over the ten-year period from fiscal year 2000-01 to fiscal year 2009-10 in current dollars. Fire District revenues grew at an average annual rate of 14.0 percent over this time period, and expenditures grew at almost the same average annual rate of 14.4 percent. During this time period, net General Fund revenues have outpaced expenditures until 2008-09 when expenditures exceeded costs by $478,705. In 2009-10 revenues and costs are the same, as indicated by the revenue/cost ratio of 1.00.

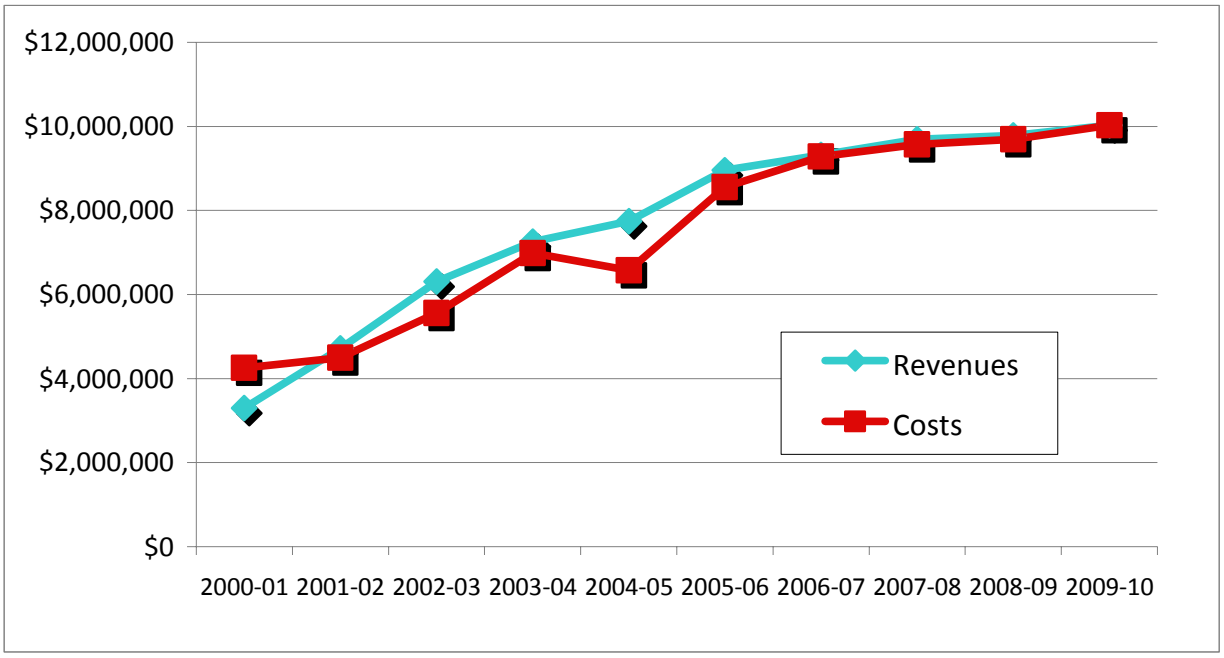
As shown in Table 7-16, per capita Fire District revenues increased at an average annual rate of 4.1 percent, from $90.83 per capita in 2000-01 to $130.00 per capita in 2009-10. Fire District costs increased from about $88.15 per capita in 2000-01 to $130.00 per capita in 2009-10, at an average annual growth rate of 4.4 percent. The revenue/cost ratio was 1.03 in 2000-01 and at 1.00, or break-even, in the year 2009-10. As shown in Table 7-17, when the per capita revenues and expenditures are adjusted for inflation, per capita revenues increased in constant dollars at about 1.0 percent annually and per capita expenditures increased at about 1.4 percent annually.

Table 7-12
Community Services District (CSD) Growth Trends, 2000-01 to 2009-10
City of Murrieta Public Financial Trends Analysis
(In Current Dollars)

Fiscal Year	CSD Revenues	CSD Costs	Net CSD	CSD Revenue/Cost Ratio
2000-01	$3,298,346	$3,260,744	$37,601	1.01
2001-02	3,755,947	3,580,242	$175,705	1.05
2002-03	5,134,423	4,520,018	614,405	1.14
2003-04	6,039,798	5,812,813	226,985	1.04
2004-05	6,689,592	5,677,477	1,012,115	1.18
2005-06	8,056,326	7,695,611	360,715	1.05
2006-07	8,797,163	8,309,286	487,877	1.06
2007-08	9,410,628	9,289,889	120,739	1.01
2008-09	10,040,966	9,946,325	94,641	1.01
2009-10	10,030,269	10,030,269	0	1.00
Average Annual Growth Rate	13.2%	13.3%	n/a	

Sources: Stanley R. Hoffman Associates, Inc.
City of Murrieta, Finance Department, Community Services District Revenues and Expenditures, Fiscal Years 2000/01 through 2005/06
City of Murrieta, *Operating Budget, Fiscal Years 2009/10 and 2010/11*
California Department of Finance, *Report E-4 Population Estimates, 2001-2009*

Figure 7-5
Community Services District (CSD) Growth Trends, 2000-01 to 2009-10
City of Murrieta Public Financial Trends Analysis
(In Current Dollars)



Source: Stanley R. Hoffman Associates, Inc.

Table 7-13
Community Services District (CSD) Per Capita Revenues and Expenditures, 2000-01 to 2009-10
City of Murrieta Public Financial Trends Analysis
(In Current Dollars)

Fiscal Year	Population	CSD Per Capita Revenues	CSD Per Capita Expenditures	CSD Revenue/Cost Ratio
2000-01	44,282	$74.49	$73.64	1.01
2001-02	46,437	$80.88	$77.10	1.05
2002-03	51,905	$98.92	$87.08	1.14
2003-04	68,391	$88.31	$84.99	1.04
2004-05	78,783	$84.91	$72.06	1.18
2005-06	85,328	$88.56	$90.19	0.98
2006-07	93,221	$94.37	$93.97	1.00
2007-08	97,031	$96.99	$95.74	1.01
2008-09	99,576	$100.07	$99.89	1.00
2009-10	100,714	$99.59	$99.59	1.00
Average Annual Growth Rate	9.6%	3.3%	3.4%	n/a

Sources: Stanley R. Hoffman Associates, Inc.
City of Murrieta, Finance Department, Community Services District Expenditures, Fiscal Years 2000/01 through 2005/06
City of Murrieta, *Operating Budget, Fiscal Years 2009/10 and 2010/11*
California Department of Finance, *Report E-4 Population Estimates, 2001-2009*

Table 7-14
Community Services District Per Capita Revenues and Expenditures, 2000-01 to 2009-10
City of Murrieta Public Financial Trends Analysis
(In Constant Dollars)

Fiscal Year	Population	CSD Per Capita Revenues	CSD Per Capita Expenditures	CSD Revenue/Cost Ratio
2000-01	44,282	$97.18	$96.07	1.01
2001-02	46,437	$101.62	$96.86	1.05
2002-03	51,905	$121.62	$107.07	1.14
2003-04	68,391	$106.19	$102.20	1.04
2004-05	78,783	$98.35	$83.47	1.18
2005-06	85,328	$105.02	$100.31	1.05
2006-07	93,221	$100.00	$99.58	1.00
2007-08	97,031	$99.91	$98.63	1.01
2008-09	99,576	$98.26	$97.33	1.01
2009-10	100,714	$99.59	$99.59	1.00
Average Annual Growth Rate	9.6%	0.3%	0.4%	n/a

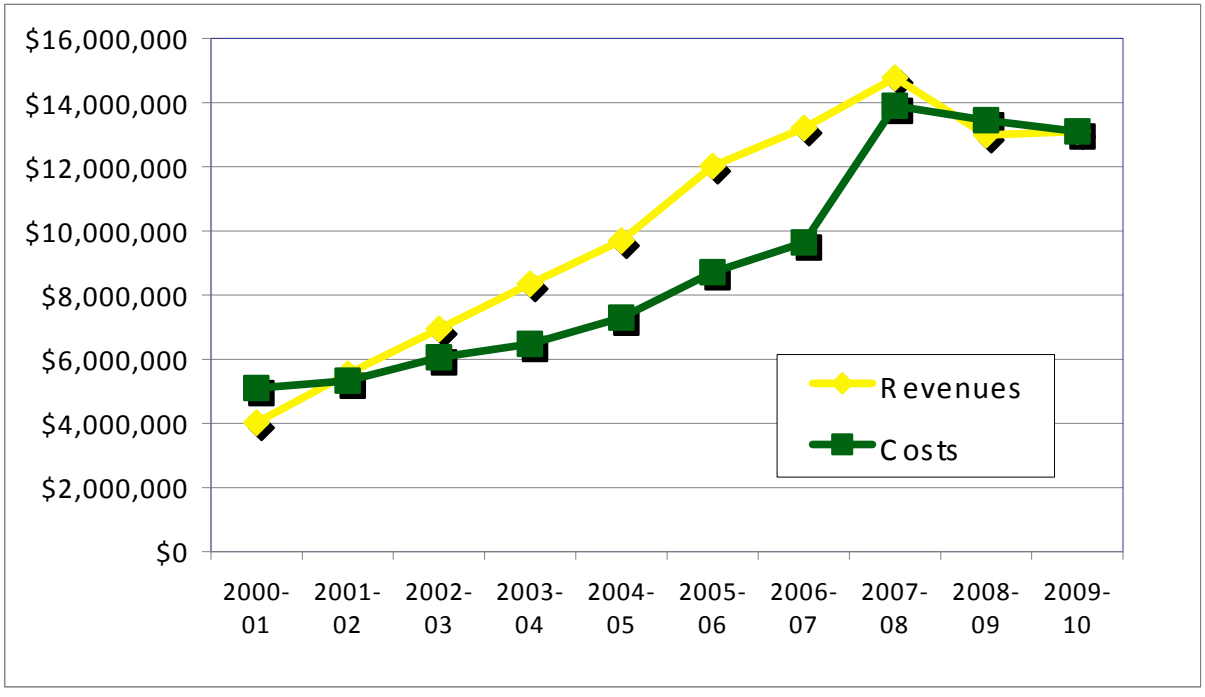
Sources: Stanley R. Hoffman Associates, Inc.
City of Murrieta, Finance Department, Community Services District Expenditures, Fiscal Years 2000/01 through 2005/06
City of Murrieta, *Operating Budget, Fiscal Years 2009/10 and 2010/11*
California Department of Finance, *Report E-4 Population Estimates, 2001-2009*
Bureau of Labor Statistics (BLS), *Consumer Price Index-All Urban Customers, Los Angeles-Riverside-Orange County, CA,* November 2009

Table 7-15
Fire District Growth Trends, 2000-01 to 2009-10
City of Murrieta Public Financial Trends Analysis
(In Current Dollars)

Fiscal Year	Fire District Revenues	Fire District Costs	Net Fire District	Revenue/Cost Ratio
2000-01	$4,021,947	$3,903,373	$118,574	1.03
2001-02	4,412,546	4,240,545	172,001	1.04
2002-03	5,647,992	4,924,629	723,363	1.15
2003-04	6,944,447	5,380,575	1,563,872	1.29
2004-05	8,368,156	6,293,634	2,074,522	1.33
2005-06	10,808,303	7,825,082	2,983,221	1.38
2006-07	12,462,340	8,641,475	3,820,865	1.44
2007-08	14,337,935	13,489,168	848,767	1.06
2008-09	13,323,212	13,801,917	(478,705)	0.97
2009-10	13,093,001	13,093,001	0	1.00
Average Annual Growth Rate	14.0%	14.4%	n/a	

Sources: Stanley R. Hoffman Associates, Inc.
City of Murrieta, Finance Department, Fire District Revenues and Expenditures, Fiscal Years 2000/01 through 2005/06
Fiscal Years2000/01 through 2005/06
City of Murrieta, *Operating Budget, Fiscal Years 2009/10 and 2010/11*
California Department of Finance, *Report E-4 Population Estimates, 2001-2009*

Figure 7-6
Fire District Growth Trends, 2000-01 to 2009-10
City of Murrieta Public Financial Trends Analysis
(In Current Dollars)



Source: Stanley R. Hoffman Associates, Inc.

Table 7-16
Fire District Per Capita Revenues and Expenditures, 2000-01 to 2009-10
City of Murrieta Public Financial Trends Analysis
(In Current Dollars)

Fiscal Year	Population	Fire District Per Capita Revenues	Fire District Per Capita Expenditures	Fire District Revenue/Cost Ratio
2000-01	44,282	$90.83	$88.15	1.03
2001-02	46,437	$95.02	$91.32	1.04
2002-03	51,905	$108.81	$94.88	1.15
2003-04	68,391	$101.54	$78.67	1.29
2004-05	78,783	$106.22	$79.89	1.33
2005-06	85,328	$120.81	$91.71	1.32
2006-07	93,221	$133.69	$97.53	1.37
2007-08	97,031	$147.77	$139.02	1.06
2008-09	99,576	$133.03	$138.61	0.96
2009-10	100,714	$130.00	$130.00	1.00
Average Annual Growth Rate	9.6%	4.1%	4.4%	n/a

Sources: Stanley R. Hoffman Associates, Inc.
City of Murrieta, Finance Department, Fire District Expenditures, Fiscal Years 2000/01 through 2005/06
City of Murrieta, *Operating Budget, Fiscal Years 2009/10 and 2010/11*
California Department of Finance, *Report E-4 Population Estimates, 2001-2009*

Table 7-17
Fire District Per Capita Revenues and Expenditures, 2000-01 to 2009-10
City of Murrieta Public Financial Trends Analysis
(In Constant Dollars)

Fiscal Year	Population	Fire District Per Capita Revenues	Fire District Per Capita Expenditures	Fire District Revenue/Cost Ratio
2000-01	44,282	$118.50	$115.00	1.03
2001-02	46,437	$119.38	$114.73	1.04
2002-03	51,905	$133.78	$116.65	1.15
2003-04	68,391	$122.09	$94.60	1.29
2004-05	78,783	$123.03	$92.53	1.33
2005-06	85,328	$140.89	$102.00	1.38
2006-07	93,221	$141.66	$103.35	1.37
2007-08	97,031	$152.22	$143.21	1.06
2008-09	99,576	$130.38	$135.06	0.97
2009-10	100,714	$130.00	$130.00	1.00
Average Annual Growth Rate	9.6%	1.0%	1.4%	n/a

Sources: Stanley R. Hoffman Associates, Inc.
City of Murrieta, Finance Department, Fire District Expenditures, Fiscal Years 2000/01 through 2005/06
City of Murrieta, *Operating Budget, Fiscal Years 2009/10 and 2010/11*
California Department of Finance, *Report E-4 Population Estimates, 2001-2009*
Bureau of Labor Statistics (BLS), *Consumer Price Index-All Urban Customers, Los Angeles-Riverside-Orange County, CA,* November 2009

7.5 Gas Tax Fund

The City's Gas Tax Fund is a special revenue fund that is earmarked for road related improvements, including costs for Public Works Engineering and Maintenance personnel as well as maintenance supplies, contract services and street lighting. The City's *Fiscal Years 2009/10 and 2010/11 Operating Budget* states that all budgeted and future Gas Tax revenues will be used for operations including personnel and street maintenance costs. Based on the current City Budget, fiscal year 2008-09 Gas Tax revenues are budgeted at about $1.66 million and fiscal year 2009-10 adopted Gas Tax revenues are about $1.60 million. The City Budget states that reserves in the Gas Tax Fund are committed to capital projects.

7.6 Murrieta Redevelopment Agency (RDA)

The City's Redevelopment Agency is fully funded by property tax increment. The funding provides administration for the Murrieta RDA, contributes 20 percent of the tax increment to the Low/Moderate Income Housing Fund and provides property tax increment bond financing for project area infrastructure improvements. Property tax increment to the RDA is budgeted at $6.89 million for fiscal year 2008-2009 and adopted fiscal year 2009-2010 property tax increment revenues are $8.54 million.

APPENDIX A

Table A-1
List of ZIP Codes
Murrieta City and Comparison Areas

	ZIP Codes
City of Murrieta	
	92562
	92563
City of Temecula	
	92590
	92591
	92592
Temecula Valley Sub-Region	
	92562
	92563
	92584
	92590
	92591
	92592
	92595
City of Rancho Cucamonga	
	91701
	91730
	91737
	91739
City of Rancho Bernardo	
	92127
	92128

Source: Stanley R. Hoffman Associates, Inc.

Table A-2
EDD Employment Adjusted for Self-Employment
City of Murrieta

	Annual 2005	Annual 2006	Annual 2007	Annual 2008	Fisrt Quarter 2009
EDD - ES-202 - Quaterly Emplyoment Data					
Construction	1,646	1,950	1,782	1,505	1,154
Manufacturing	777	693	835	821	711
Wholesale Trade	273	393	345	378	307
Retail Trade	3,034	3,175	3,587	3,262	2,834
Transportation and Warehousing	129	162	171	143	106
Information	166	180	177	151	130
Finance and Insurance	256	383	413	369	325
Real Estate and Rental and Leasing	237	253	229	204	168
Professional, Scientific, and Technical Services	359	423	573	586	460
Management of Companies and Enterprises	64	0	0	0	0
Administrative and Support and Waste Management a	912	1,207	1,215	1,034	909
Educational Services	29	56	73	103	109
Health Care and Social Assistance	1,876	2,077	2,322	2,261	2,268
Arts, Entertainment, and Recreation	377	433	436	305	241
Accommodation and Food Services	1,251	1,547	1,756	1,681	1,459
Other Services (except Public Administration)	649	582	711	627	543
Federal Government	24	25	63	129	124
Local Government	2,210	2,395	2,570	2,601	2,548
Other Employment	236	313	334	296	172
TOTAL	**14,505**	**16,247**	**17,593**	**16,456**	**14,567**

American Community Survey - 2006-08 Estimates of Self Employment by Sector	
Construction	13.5%
Manufacturing	2.6%
Wholesale Trade	5.1%
Retail Trade	5.9%
Transportation and Warehousing	7.5%
Information	3.1%
Finance and Insurance	8.8%
Real Estate and Rental and Leasing	24.5%
Professional, Scientific, and Technical Services	19.0%
Management of Companies and Enterprises	0.0%
Administrative and Support and Waste Management a	20.3%
Educational Services	1.3%
Health Care and Social Assistance	6.4%
Arts, Entertainment, and Recreation	6.9%
Accommodation and Food Services	3.2%
Other Services (except Public Administration)	26.2%
Federal Government	0.0%
Local Government	0.0%
TOTAL	8.6%

	Annual 2005	Annual 2006	Annual 2007	Annual 2008	Fisrt Quarter 2009
Estimates of Total Employment (Incl. Self Employed)					
Construction	1,902	2,254	2,060	1,739	1,333
Manufacturing	798	712	858	844	730
Wholesale Trade	288	414	363	398	324
Retail Trade	3,224	3,373	3,811	3,466	3,011
Transportation and Warehousing	139	175	185	155	115
Information	171	186	183	156	134
Finance and Insurance	281	420	453	405	356
Real Estate and Rental and Leasing	314	335	303	270	222
Professional, Scientific, and Technical Services	443	522	707	723	567
Management of Companies and Enterprises	64	0	0	0	0
Administrative and Support and Waste Management	1,145	1,515	1,525	1,298	1,141
Educational Services	29	57	74	104	111
Health Care and Social Assistance	2,005	2,220	2,482	2,417	2,424
Arts, Entertainment, and Recreation	405	465	468	328	259
Accommodation and Food Services	1,292	1,598	1,813	1,736	1,506
Other Services (except Public Administration)	879	788	963	849	735
Federal Government	24	25	63	129	124
Local Government	2,210	2,395	2,570	2,601	2,548
Other Employment	260	327	372	393	300
TOTAL	**15,873**	**17,780**	**19,253**	**18,009**	**15,941**

1.Employment data by NAICS industries has been adjusted for self-employment based on estimates from the American Community Survey 2006-2008.

Source: Stanley R. Hoffman Associates, Inc.
California Employment Development Department (EDD)
American Community Survey, 2006-08

Table A-3
SRHA Estimation of Historic Place Data
City of Murrieta

Year	Murrieta EDD ZIP Code [1]	Murrieta SRHA Estimates [2]	Ratio of SRHA Estimates to EDD ZIP Code	Historic Place Estimates [3]
1991	1,013			885
1992	1,477			1,291
1993	2,935			2,565
1994	4,216			3,685
1995	4,715			4,121
1996	5,399			4,719
1997	6,237			5,451
1998	6,789			5,933
1999	7,978			6,972
2000	8,819			7,707
2001	10,486			9,164
2002	12,167			10,633
2003	13,849			12,103
2004	16,361			14,299
2005	17,347	15,873	91.5%	
2006	19,322	17,780	92.0%	
2007	21,124	19,253	91.1%	
2008	21,707	18,009	83.0%	
2009 - Q1	20,091	15,941	79.3%	
		Average Ratio	***87.4%***	

1.ZIP Code Data for 1991 to 2005 were obtained from the report prepared by Economics and Politics, Inc. for the City in 2006. ZIP Code Updates for 2005 to 2009 Q1 were obtained from the EDD.

2. Estimates prepared by Stanley R. Hoffman Associates, Inc. (SRHA) from 2005 to 2009 Q1 are based on place code data obtained from the EDD, adjusted for self-employment rates.

3. Historic Place Estimates for 1991 to 2005 are based on applying the average 2005 to 2009 - Q1 ratio of 87.4 percent between the SRHA Estimates and and EDD ZIP Code data to the historic 1991 to 2005 ZIP Code data.

Source: Stanley R. Hoffman Associates, Inc.
Economics and Politics, Inc., 2006.
California Employment Development Department (EDD).

Table A-4
EDD Employment Estimates
City of Murrieta and Other Surrounding Communities

	Murrieta		Temecula City		Rancho Cucamonga		Rancho Bernardno		Southern California [1]	
	Jobs	% Distr.	Jobs	% Distr.	Jobs	% Distr.	Jobs	% Distr.	Jobs	% Distr.
EMPLOYMENT BY SECTORS: 2008										
Construction	1,739	9.7%	3,747	7.2%	4,341	6.5%	1,357	3.5%	489,122	5.4%
Manufacturing	844	4.7%	4,262	8.2%	9,504	14.2%	9,157	23.4%	835,653	9.2%
Wholesale Trade	398	2.2%	2,772	5.4%	3,172	4.7%	921	2.4%	439,222	4.9%
Retail Trade	3,466	19.2%	8,336	16.1%	8,422	12.6%	3,497	8.9%	951,951	10.5%
Transportation and Warehousing	155	0.9%	429	0.8%	2,657	4.0%	275	0.7%	266,890	3.0%
Information	156	0.9%	746	1.4%	579	0.9%	857	2.2%	310,942	3.4%
Finance and Insurance	405	2.2%	1,576	3.0%	3,025	4.5%	2,325	5.9%	328,107	3.6%
Real Estate and Rental and Leasing	270	1.5%	1,518	2.9%	2,295	3.4%	681	1.7%	203,724	2.3%
Professional, Scientific, and Technical Services	723	4.0%	2,352	4.5%	2,605	3.9%	6,339	16.2%	645,328	7.1%
Management of Companies and Enterprises	0	0.0%	0	0.0%	634	0.9%	372	1.0%	109,832	1.2%
Administrative and Support and Waste Management	1,298	7.2%	5,655	10.9%	9,055	13.5%	2,283	5.8%	670,204	7.4%
Educational Services	104	0.6%	919	1.8%	579	0.9%	818	2.1%	161,075	1.8%
Health Care and Social Assistance	2,417	13.4%	2,010	3.9%	4,343	6.5%	3,180	8.1%	763,318	8.4%
Arts, Entertainment, and Recreation	328	1.8%	383	0.7%	612	0.9%	838	2.1%	181,978	2.0%
Accommodation and Food Services	1,736	9.6%	5,208	10.1%	6,206	9.3%	4,227	10.8%	745,313	8.2%
Other Services (except Public Administration)	849	4.7%	1,678	3.2%	2,838	4.2%	973	2.5%	549,893	6.1%
Federal Government	129	0.7%	171	0.3%	216	0.3%	129	0.3%	123,942	1.4%
Local Government	2,601	14.4%	8,824	17.1%	5,018	7.5%	0	0.0%	922,211	10.2%
Other Employment	393	2.2%	1,151	2.2%	766	1.1%	906	2.3%	344,566	3.8%
TOTAL	18,009	100.0%	51,738	100.0%	66,868	100.0%	39,137	100.0%	9,043,269	100.0%
Estimated Local Serving Sectors [2]	14,032	77.9%	33,947	65.6%	35,637	53.3%	16,607	42.4%	5,437,092	60.1%
Estimated Population	100,714		102,604		177,736		70,780		20,874,212	
Estimated per Capita Local Serving Jobs	0.14		0.33		0.20		0.23		0.26	
Estimated Export Base Sectors [3]	3,978	22.1%	17,791	34.4%	31,231	46.7%	22,530	57.6%	3,606,178	39.9%
Estimated Population	100,714		102,604		177,736		70,780		20,874,212	
Estimated per Capita Export Base Jobs	0.04		0.17		0.18		0.32		0.17	
LOCATION QUOTIENTS: 2008										
Construction		1.79		1.34		1.20		0.64		1.00
Manufacturing		0.51		0.89		1.54		2.53		1.00
Wholesale Trade		0.46		1.10		0.98		0.48		1.00
Retail Trade		1.83		1.53		1.20		0.85		1.00
Transportation and Warehousing		0.29		0.28		1.35		0.24		1.00
Information		0.25		0.42		0.25		0.64		1.00
Finance and Insurance		0.62		0.84		1.25		1.64		1.00
Real Estate and Rental and Leasing		0.67		1.30		1.52		0.77		1.00
Professional, Scientific, and Technical Services		0.56		0.64		0.55		2.27		1.00
Management of Companies and Enterprises		0.00		0.00		0.78		0.78		1.00
Administrative and Support and Waste Management		0.97		1.47		1.83		0.79		1.00
Educational Services		0.33		1.00		0.49		1.17		1.00
Health Care and Social Assistance		1.59		0.46		0.77		0.96		1.00
Arts, Entertainment, and Recreation		0.90		0.37		0.45		1.06		1.00
Accommodation and Food Services		1.17		1.22		1.13		1.31		1.00
Other Services (except Public Administration)		0.78		0.53		0.70		0.41		1.00
Federal Government		0.52		0.24		0.24		0.24		1.00
Local Government		1.42		1.67		0.74		0.00		1.00
Other Employment		0.57		0.58		0.30		0.61		1.00
TOTAL		1.00		1.00		1.00		1.00		1.00

1. Including Riverside County, San Bernardino County, Los Angeles County, Orange County and San Diego County.
2. Includes Construction, Retail, Health Care and Social Assistance, Accommodation and Food Services, Government, Educational Services, Arts and Entertainment and Other Services.
3. Includes Manufacturing, Wholesale Trade, Transportation and Warehousing, Information, Professional, Scientific and Technical Services, Finance and Insurance, Management of Companies, and Administration, Support Services and Waste Mangement.

Source: Stanley R. Hoffman Associates, Inc.
California Employment Development Department (EDD)

APPENDIX B
PROJECT REFERENCES

CITY OF MURRIETA

Land Use Planning

One Town Square, 24601 Jefferson Ave.
Murrieta, CA 92562
(951) 461-6061

Mary Lanier, Community Development Director

Cynthia Kinser, Assistant Director

Elaine Blackburn, Contract Planner

Greg Smith, Associate Planner

Economic Development

One Town Square, 24601 Jefferson Ave.
Murrieta, CA 92562

Bruce Coleman, Economic Development Director
(951) 461-6021

Kimberly Davidson, Business Development Manager
(951) 461-6003

Finance Department

One Town Square, 24601 Jefferson Ave.
Murrieta, CA 92562

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Appendix S:

Fiscal Analysis

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Memorandum

To: Mary Lanier, Community Development Director
City of Murrieta

cc: Collette Morse, Vice President, Planning/Environmental Services
RBF Consulting

From: Stan Hoffman
Marcine Osborn

Date: January 10, 2011

SUBJECT: **General Plan Update Fiscal Analysis, City of Murrieta**

SRHA Job No.: 1200

This memorandum presents the fiscal analysis of the Murrieta General Plan Update. Fiscal impacts are projected for the General Plan Update Recommended Scenario and for an alternative entitled Scenario B. Fiscal impacts are projected for the City General Fund, the Murrieta Fire District, the Murrieta Community Services District (CSD) and the Library Fund. The one percent property tax increment to the Murrieta Redevelopment Agency for each scenario is also projected.

Summary of Projected Fiscal Impacts

Table 1 presents a summary of the projected impacts to the City General Fund and the other funds for the total General Plan Update after buildout. As shown in Table 1, when the projected impacts for the funds analyzed in the fiscal analysis are combined, a substantial annual recurring surplus is projected for both the Recommended Scenario ($9.75 million) and Scenario B ($9.36 million) of the General Plan Update. While there is no policy at this time to combine the projected impacts for the different funds that provide services to the City, the funds are combined in Table 1 to show the overall impacts of the General Plan Update after buildout.

Table 1
Summary of Projected Fiscal Impacts after Buildout
General Plan Update Fiscal Analysis, City of Murrieta
(In Constant 2011 Dollars)

City Fund or District	Annual Recurring Surplus or (Deficit)	
	Recommended Scenario	Scenario B
General Fund	$17,445,602	$18,088,916
Fire District	($4,201,301)	($4,663,131)
Community Services District	($2,917,905)	($3,000,955)
Library Fund	($572,334)	($1,060,290)
Total Surplus	**$9,754,062**	**$9,364,540**
Surplus per Unit	***$217***	***$178***

Source: Stanley R. Hoffman Associates, Inc.

Table 2 presents a summary of the projected recurring revenues, costs and fiscal balance to the City General Fund and the other funds for the total General Plan Update after buildout.

General Fund. The City's General Fund provides general government; police protection; development services; economic development; building and safety and public works services to the City.

As shown in Panel A of Table 2, an annual recurring surplus is projected to the City General Fund after buildout for both the Recommended Scenario and Scenario B of the General Plan Update. The projected annual recurring surplus is about $17.45 million, or $388 per unit, for the Recommended Scenario and the projected annual recurring surplus is about $18.09 million, or $343 per unit for Scenario B. Projected sales and use tax accounts for about 45 percent of total projected recurring revenues and police protection accounts for about 65 percent of total projected recurring costs after buildout.

Redevelopment Agency. The one percent property tax levy on the assessed valuation for development located within redevelopment project areas is projected at about $43.94 million for the Recommended Scenario and about $40.96 million after buildout.

Fire District. The Murrieta Fire District is the operating fund for the City's Fire Department. The Fire District is a separate legal entity with its own sources of funding and has a separate budget from the General Fund.

As shown in Panel B of Table 2, a recurring annual deficit is projected for the Fire District after buildout of both the Recommended Scenario and Scenario B of the General Plan Update. The annual recurring deficit is projected at about $4.20 million for the Recommended Scenario (about $93 per unit) and the annual projected deficit for Scenario B is about $4.66 million (about $88 per unit).

Community Services District. The Murrieta Community Services District (CSD) boundaries are coterminous with the City. The CSD pays for all parks and recreation activities, including the lighting and landscaping maintenance districts throughout the City. The CSD also pays for drainage, flood control and street sweeping.

As shown in Panel C of Table 2, an annual recurring deficit of about $2.92 million, or $65 per unit, is projected for the CSD for the Recommended Scenario. An recurring annual deficit of about $3.00 million, or $57 per unit, is projected to the CSD after buildout of Scenario B.

Library Fund. The Murrieta Library Fund is the operating fund for the City's Public Library. It is a separate legal entity with its own sources of funding and has a separate budget from the General Fund.

As shown in Panel D of Table 2, a recurring annual deficit is projected for both the Recommended Scenario and for Scenario B after buildout. The projected annual deficit for the Recommended Scenario is $572,334, or about $13 per unit. The projected annual deficit for Scenario B is about $1.06 million, or $20 per unit.

Table 2
Summary of Projected Fiscal Impacts after Buildout
General Plan Update Fiscal Analysis, City of Murrieta
(In Constant 2011 Dollars)

Development Alternative	Annual Recurring Revenues	Annual Recurring Costs	Annual Surplus or (Deficit)	Annual Revenue/Cost Ratio
A. GENERAL FUND				
Recommended Scenario	$80,077,336	$62,631,734	$17,445,602	1.28
per Unit	*$1,779*	*$1,391*	*$388*	
Scenario B	$85,782,897	$67,693,981	$18,088,916	1.27
per Unit	*$1,627*	*$1,284*	*$343*	
B. FIRE DISTRICT				
Recommended Scenario	$19,071,235	$23,272,536	($4,201,301)	0.82
per Unit	*$424*	*$517*	*($93)*	
Scenario B	$20,630,606	$25,293,737	($4,663,131)	0.82
per Unit	*$391*	*$480*	*($88)*	
C. COMMUNITY SERVICES DISTRICT				
Recommended Scenario	$14,911,159	$17,829,064	($2,917,905)	0.84
per Unit	*$331*	*$396*	*($65)*	
Scenario B	$16,376,601	$19,377,556	($3,000,955)	0.85
per Unit	*$311*	*$367*	*($57)*	
D. LIBRARY FUND				
Recommended Scenario	$2,510,001	$3,082,335	($572,334)	0.81
per Unit	*$56*	*$68*	*($13)*	
Scenario B	$2,557,040	$3,617,330	($1,060,290)	0.71
per Unit	*$48*	*$69*	*($20)*	
	Annual Recurring Property Tax Increment			
E. REDEVELOPMENT AGENCY				
Recommended Scenario (@ 1% of Assessed Valuation)	$43,940,174			
Scenario B (@ 1% of Assessed Valuation)	$40,962,562			

Source: Stanley R. Hoffman Associates, Inc.

General Fund Detailed Fiscal Projections

The projected recurring revenues and recurring costs for the incremental growth for the sum of the Focus Areas and the Rest of the City are presented in Table 3 (Recommended Scenario) and Table 4 (Scenario B).

Sales and use tax accounts for about 44 percent of the total projected annual recurring revenues for the Recommended Scenario and for about 45 percent of the total projected recurring revenues for Scenario B. In lieu property tax (VLF) is projected at about 16 percent of total recurring revenues for both scenarios. Property tax accounts for about 13 percent of the total projected recurring revenues for both scenarios.

Police protection is the major recurring cost, projected at about 65 percent of total projected annual costs for both scenarios. General government accounts for about 19 percent of total projected recurring costs for both scenarios, and public works costs are projected at about 9 percent of total projected annual costs for both scenarios.

Detailed Fiscal Projections of Other Funds

The projected recurring revenues and recurring costs for the incremental growth for the Fire District, the CSD and the Library Fund for the sum of the Focus Areas and the Rest of the City are presented in Table 5 (Recommended Scenario) and Table 6 (Scenario B).

Development Descriptions

The residential units, population and employment after buildout of the General Plan Update for Recommended Scenario and Scenario B are summarized in Table 7. The detailed development description for the Recommended Scenario is presented in Table 8 and the detailed development description for Scenario B is presented in Table 9.

The Recommended Scenario for the General Plan Update includes 10,739 new units resulting in an estimated 44,484 units in the City after buildout. Scenario B includes 7,720 more units with 18,459 new units and an estimated 52,204 units after buildout.

New population for the Recommended Scenario is projected at 31,946 resulting in a buildout population of 133,261. New population for Scenario B is projected at 55,106 with a projected buildout population of 156,421.

New employment for the Recommended Scenario is projected at 110,265 compared with new employment for Scenario B projected at 98,524. Employment at buildout is projected at 130,153 for the Recommended Scenario compared with the lower projected employment of 118,412 after buildout of Scenario B.

Employment for incremental growth is projected based on the following factors:

- Business Park 500 square feet per employee
- Commercial 500 square feet per employee
- Industrial 1,000 square feet per employee
- Mixed Use and Multiple Use 375 square feet per employee
- Professional and Office 250 square feet per employee

Table 3
Detailed Projected Recurring Fiscal Impacts after Buildout: General Fund, Recommended Scenario
General Plan Update Fiscal Analysis, City of Murrieta
(In Constant 2011 Dollars)

Categories	City Existing Development[1]	City Incremental Development			City Buildout	
		Focus Areas	Rest of City	Total Increment	Buildout Amount	Percent of Buildout
A. GENERAL FUND						
Annual Recurring Revenues						
Property Tax - General Fund	$6,965,000	$750,285	$2,591,140	$3,341,425	$10,306,425	12.9%
Property Transfer Tax	400,000	117,010	146,442	263,452	663,452	0.8%
Property Tax in Lieu of MVLF	6,551,914	3,201,147	3,299,637	6,500,785	13,052,699	16.3%
Sales and Use Tax	7,956,762	8,985,373	9,484,352	18,469,725	26,426,487	33.0%
Sales Tax Compensation Fund	2,713,653	2,995,124	3,161,451	6,156,575	8,870,228	11.1%
Transient Occupancy Tax	125,000	0	0	0	125,000	0.2%
Franchise Taxes	3,130,000	1,296,684	1,137,174	2,433,858	5,563,858	6.9%
Business License Tax	551,250	2,120,748	771,503	2,892,251	3,443,501	4.3%
Traffic Safety Fines	430,000	178,149	156,234	334,383	764,383	1.0%
Other Fines and Forfeitures	380,500	157,736	138,332	296,068	676,568	0.8%
Motor Vehicle License Fees	300,000	17,662	76,898	94,560	394,560	0.5%
Lease/Rental Income	211,670	12,471	54,296	66,767	278,437	0.3%
Program and Miscellaneous Fees	131,300	54,280	47,603	101,883	233,183	0.3%
Interest Earned on Investments	2,000,000	636,373	674,082	1,310,455	3,310,455	4.1%
Subtotal Annual Recurring Revenues	$31,847,049	$20,523,042	$21,739,144	$42,262,187	$74,109,236	92.5%
State Gasoline Tax[2]	$1,607,639	$94,517	$411,507	$506,024	$2,113,663	2.6%
Other Revenues[3]	$3,854,437	$0	$0	$0	$3,854,437	4.8%
Total Annual Recurring Revenues	$37,309,125	$20,617,559	$22,150,651	$42,768,211	$80,077,336	100.0%
Annual Recurring Costs						
General Government	$7,932,082	$2,244,759	$1,975,676	$4,220,435	$12,152,517	19.4%
Police	22,770,334	9,432,161	8,271,871	17,704,032	40,474,366	64.6%
Animal Control	172,800	10,144	44,164	54,308	227,108	0.4%
Development Services	1,188,614	200,418	175,764	376,182	1,564,796	2.5%
Economic Development	424,366	175,829	154,200	330,029	754,395	1.2%
Building and Safety	1,543,658	157,272	137,926	295,198	1,838,856	2.9%
Public Works	3,277,271	1,247,972	1,094,453	2,342,425	5,619,696	9.0%
Total Annual Recurring Costs	$37,309,125	$13,468,555	$11,854,054	$25,322,609	$62,631,734	100.0%
Annual Surplus or (Deficit)	**$0**	**$7,149,004**	**$10,296,597**	**$17,445,602**	**$17,445,602**	
Revenue/Cost Ratio	1.00	1.53	1.87	1.69	1.28	
Units	*34,280*	*2,006*	*8,733*	*10,739*	*45,019*	
Annual Surplus or (Deficit) per Unit	***$0***	***$3,564***	***$1,179***	***$1,625***	***$388***	
B. REDEVELOPMENT AGENCY						
Recurring Property Tax Increment (@ 1% of Assessed Valuation)	**$8,544,575**	**$30,217,032**	**$5,178,567**	**$35,395,599**	**$43,940,174**	

Note: 1. The recurring revenues and costs for existing development are based on the current City budget.
2. These funds are specially earmarked for maintenance of City streets, including services provided by Public Works staff.
3. These revenues represent revenues that are transferred from other funds and sources, including reserves, in the current budget. Because of the uncertainty of these revenues for the future, these revenues are not assumed to be recurring and are not projected.

Sources: Stanley R. Hoffman Associates, Inc.
City of Murrieta, *Operating Budget, Fiscal Years 2009/10 and 2010/11*

Table 4
Detailed Projected Recurring Fiscal Impacts after Buildout: General Fund, Scenario B
General Plan Update Fiscal Analysis, City of Murrieta
(In Constant 2011 Dollars)

Categories	City Existing Development[1]	City Incremental Development			City Buildout	
		Focus Areas	Rest of City	Total Increment	Buildout Amount	Percent of Buildout
A. GENERAL FUND						
Annual Recurring Revenues						
Property Tax - General Fund	$6,965,000	$1,428,764	$2,664,480	$4,093,244	$11,058,244	12.9%
Property Transfer Tax	400,000	154,976	150,152	305,128	705,128	0.8%
Property Tax in Lieu of MVLF	6,551,914	3,726,256	3,381,569	7,107,825	13,659,739	15.9%
Sales and Use Tax	7,956,762	10,461,161	10,553,022	21,014,183	28,970,945	33.8%
Sales Tax Compensation Fund	2,713,653	3,487,054	3,517,674	7,004,728	9,718,381	11.3%
Transient Occupancy Tax	125,000	0	0	0	125,000	0.1%
Franchise Taxes	3,130,000	1,816,359	1,100,755	2,917,114	6,047,114	7.0%
Business License Tax	551,250	1,786,342	797,943	2,584,285	3,135,535	3.7%
Traffic Safety Fines	430,000	249,546	151,231	400,777	830,777	1.0%
Other Fines and Forfeitures	380,500	220,952	133,902	354,854	735,354	0.9%
Motor Vehicle License Fees	300,000	91,565	71,549	163,114	463,114	0.5%
Lease/Rental Income	211,670	64,652	50,519	115,171	326,841	0.4%
Program and Miscellaneous Fees	131,300	36,193	28,281	64,474	195,774	0.2%
Interest Earned on Investments	2,000,000	752,762	723,234	1,475,996	3,475,996	4.1%
Subtotal Annual Recurring Revenues	$31,847,049	$24,276,582	$23,324,311	$47,600,893	$79,447,942	92.6%
State Gasoline Tax[2]	$1,607,639	$489,995	$382,884	$872,879	$2,480,518	2.9%
Other Revenues[3]	$3,854,437	$0	$0	$0	$3,854,437	4.5%
Total Annual Recurring Revenues	$37,309,125	$24,766,577	$23,707,195	$48,473,772	$85,782,897	100.0%
Annual Recurring Costs						
General Government	$7,932,082	$3,152,071	$1,912,072	$5,064,143	$12,996,225	19.2%
Police	22,770,334	13,212,304	8,006,958	21,219,262	43,989,596	65.0%
Animal Control	172,800	52,588	41,092	93,680	266,480	0.4%
Development Services	1,188,614	280,740	170,135	450,875	1,639,489	2.4%
Economic Development	424,366	246,297	149,262	395,559	819,925	1.2%
Building and Safety	1,543,658	220,303	133,508	353,811	1,897,469	2.8%
Public Works	3,277,271	1,748,123	1,059,403	2,807,526	6,084,797	9.0%
Total Annual Recurring Costs	$37,309,125	$18,912,426	$11,472,430	$30,384,856	$67,693,981	100.0%
Annual Surplus or (Deficit)	**$0**	**$5,854,151**	**$12,234,765**	**$18,088,916**	**$18,088,916**	
Revenue/Cost Ratio	1.00	1.31	2.07	1.60	1.27	
Units	*34,280*	*10,362*	*8,097*	*18,459*	*52,739*	
Annual Surplus or (Deficit) per Unit	***$0***	***$565***	***$1,511***	***$980***	***$343***	
B. REDEVELOPMENT AGENCY						
Recurring Property Tax Increment (@ 1% of Assessed Valuation)	**$8,544,575**	**$27,239,420**	**$5,178,567**	**$32,417,987**	**$40,962,562**	

Note: 1. The recurring revenues and costs for existing development are based on the current City budget.
2. These funds are specially earmarked for maintenance of City streets, including services provided by Public Works staff.
3. These revenues represent revenues that are transferred from other funds and sources, including reserves, in the current budget. Because of the uncertainty of these revenues for the future, these revenues are not assumed to be recurring and are not projected.

Sources: Stanley R. Hoffman Associates, Inc.
City of Murrieta, *Operating Budget, Fiscal Years 2009/10 and 2010/11*

Table 5
Detailed Projected Recurring Fiscal Impacts after Buildout: Other Funds, Recommended Scenario
General Plan Update Fiscal Analysis, City of Murrieta
(In Constant 2011 Dollars)

Categories	City Existing Development[1]	City Incremental Development: Focus Areas	City Incremental Development: Rest of City	City Incremental Development: Total Increment	City Buildout: Buildout Amount	City Buildout: Percent of Buildout
A. MURRIETA FIRE DISTRICT						
Annual Recurring Revenues						
Property Tax - Fire District	$9,869,727	$1,232,611	$4,256,872	$5,489,483	$15,359,210	80.5%
Fire Assessment[2]	1,525,130	80,240	349,320	$429,560	$1,954,690	10.2%
Interest Earned on Investments	100,000	13,129	46,062	$59,191	$159,191	0.8%
Subtotal Annual Recurring Revenues	$11,494,857	$1,325,980	$4,652,254	$5,978,234	$17,473,091	91.6%
Other Revenues[3]	$1,598,144	$0	$0	$0	$1,598,144	8.4%
Total Annual Recurring Revenues	$13,093,001	$1,325,980	$4,652,254	$5,978,234	$19,071,235	100.0%
Annual Recurring Costs						
Fire Protection	$13,093,001	$5,423,342	$4,756,193	$10,179,535	$23,272,536	
Total Annual Recurring Costs	$13,093,001	$5,423,342	$4,756,193	$10,179,535	$23,272,536	
Annual Surplus or (Deficit)	$0	($4,097,362)	($103,939)	($4,201,301)	($4,201,301)	
Revenue/Cost Ratio	1.00	0.24	0.98	0.59	0.82	
Units	*34,280*	*2,006*	*8,733*	*10,739*	*45,019*	
Annual Surplus or (Deficit) per Unit	***$0***	***($2,043)***	***($12)***	***($391)***	***($93)***	
B. COMMUNITY SERVICES DISTRICT						
Annual Recurring Revenues						
Parks and Recreation Assessment	$2,774,603	$90,270	$392,985	$483,255	$3,257,858	21.8%
LLD Assessments	3,550,165	1,484,576	1,301,952	2,786,528	6,336,693	42.5%
Flood & Drainage Control/Street Sweeping	1,783,787	415,511	598,204	1,013,715	2,797,502	18.8%
Charges for Recreation Services	419,000	24,644	107,293	131,937	550,937	3.7%
Transfer from General Fund	1,027,313	60,386	262,907	323,293	1,350,606	9.1%
Interest Earned on Investments	255,000	62,262	79,900	142,162	397,162	2.7%
Subtotal Annual Recurring Revenues	$9,809,868	$2,137,649	$2,743,241	$4,880,890	$14,690,758	98.5%
Other Revenues[3]	$220,401	$0	$0	$0	$220,401	1.5%
Total Annual Recurring Revenues	$10,030,269	$2,137,649	$2,743,241	$4,880,890	$14,911,159	100.0%
Annual Recurring Costs						
Parks and Recreation	$3,453,685	$1,430,760	$1,254,756	$2,685,516	$6,139,201	34.4%
Lighting and Landscaping	4,879,587	2,021,343	1,772,689	3,794,032	8,673,619	48.6%
Drainage and Flood Control	1,696,997	702,854	616,393	1,319,247	3,016,244	16.9%
Total Annual Recurring Costs	$10,030,269	$4,154,957	$3,643,838	$7,798,795	$17,829,064	100.0%
Annual Surplus or (Deficit)	$0	($2,017,308)	($900,597)	($2,917,905)	($2,917,905)	
Revenue/Cost Ratio	1.00	0.51	0.75	0.63	0.84	
Units	*34,280*	*7,913*	*2,879*	*10,792*	*45,072*	
Annual (Deficit) per Unit	***$0***	***($255)***	***($313)***	***($270)***	***($65)***	
C. LIBRARY FUND						
Annual Recurring Revenues						
Property Tax - Library Fund	$1,692,790	$32,155	$111,049	$143,204	$1,835,994	73.1%
Charges for Services	61,300	3,580	15,587	$19,167	$80,467	3.2%
Interest Earned on Investments	45,000	715	2,533	$3,248	$48,248	1.9%
Subtotal Annual Recurring Revenues	$1,799,090	$36,450	$129,169	$165,619	$1,964,709	78.3%
Other Revenues[3]	$545,292	$0	$0	$0	$545,292	21.7%
Total Annual Recurring Revenues	$2,344,382	$36,450	$129,169	$165,619	$2,510,001	100.0%
Annual Recurring Costs						
Library Services	$2,344,382	$137,838	$600,115	$737,953	$3,082,335	
Total Annual Recurring Costs	$2,344,382	$137,838	$600,115	$737,953	$3,082,335	
Annual (Deficit)	$0	($101,388)	($470,946)	($572,334)	($572,334)	
Revenue/Cost Ratio	1.00	0.26	0.22	0.22	0.81	
Units	*34,280*	*2,006*	*8,733*	*10,739*	*45,019*	
Annual (Deficit) per Unit	***$0***	***($51)***	***($54)***	***($53)***	***($13)***	

Note: 1. The recurring revenues and costs for existing development are based on the current City budget.
2. These revenues represent the $40 per unit voter-approved assessment to supplement fire protection services.
3. These revenues represent revenues that are transferred from other funds and sources, including reserves, in the current budget. Because of the uncertainty of these revenues for the future, these revenues are not assumed to be recurring and are not projected.

Sources: Stanley R. Hoffman Associates, Inc.
City of Murrieta, *Operating Budget, Fiscal Years 2009/10 and 2010/11*

Table 6
Detailed Projected Recurring Fiscal Impacts after Buildout: Other Funds, Scenario B
General Plan Update Fiscal Analysis, City of Murrieta
(In Constant 2011 Dollars)

Categories	City Existing Development[1]	City Incremental Development: Focus Areas	City Incremental Development: Rest of City	City Incremental Development: Total Increment	City Buildout: Buildout Amount	City Buildout: Percent of Buildout
A. MURRIETA FIRE DISTRICT						
Annual Recurring Revenues						
Property Tax - Fire District	$9,869,727	$2,347,255	$4,377,361	$6,724,616	$16,594,343	80.4%
Fire Assessment[2]	1,525,130	414,480	323,880	$738,360	$2,263,490	11.0%
Interest Earned on Investments	100,000	27,617	47,012	$74,629	$174,629	0.8%
Subtotal Annual Recurring Revenues	$11,494,857	$2,789,352	$4,748,253	$7,537,605	$19,032,462	92.3%
Other Revenues[3]	$1,598,144	$0	$0	$0	$1,598,144	7.7%
Total Annual Recurring Revenues	$13,093,001	$2,789,352	$4,748,253	$7,537,605	$20,630,606	100.0%
Annual Recurring Costs						
Fire Protection	$13,093,001	$7,596,863	$4,603,873	$12,200,736	$25,293,737	
Total Annual Recurring Costs	$13,093,001	$7,596,863	$4,603,873	$12,200,736	$25,293,737	
Annual (Deficit)	$0	($4,807,511)	$144,380	($4,663,131)	($4,663,131)	
Revenue/Cost Ratio	1.00	0.37	1.03	0.62	0.82	
Units	*34,280*	*10,362*	*8,097*	*18,459*	*52,739*	
Annual (Deficit) per Unit	***$0***	***($464)***	***$18***	***($253)***	***($88)***	
B. COMMUNITY SERVICES DISTRICT						
Annual Recurring Revenues						
Parks and Recreation Assessment	$2,774,603	$466,290	$364,365	$830,655	$3,605,258	22.0%
LLD Assessments	3,550,165	2,079,552	1,260,256	3,339,808	6,889,973	42.1%
Flood & Drainage Control/Street Sweeping	1,783,787	752,042	453,722	1,205,764	2,989,551	18.3%
Charges for Recreation Services	419,000	127,757	99,830	227,587	646,587	3.9%
Transfer from General Fund	1,027,313	313,052	244,621	557,673	1,584,986	9.7%
Interest Earned on Investments	255,000	112,161	72,684	184,845	439,845	2.7%
Subtotal Annual Recurring Revenues	$9,809,868	$3,850,854	$2,495,478	$6,346,332	$16,156,200	98.7%
Other Revenues[3]	$220,401	$0	$0	$0	$220,401	1.3%
Total Annual Recurring Revenues	$10,030,269	$3,850,854	$2,495,478	$6,346,332	$16,376,601	100.0%
Annual Recurring Costs						
Parks and Recreation	$3,453,685	$2,004,168	$1,214,572	$3,218,740	$6,672,425	34.4%
Lighting and Landscaping	4,879,587	2,831,440	1,715,917	4,547,357	9,426,944	48.6%
Drainage and Flood Control	1,696,997	984,538	596,652	1,581,190	3,278,187	16.9%
Total Annual Recurring Costs	$10,030,269	$5,820,146	$3,527,141	$9,347,287	$19,377,556	100.0%
Annual Surplus	$0	($1,969,292)	($1,031,663)	($3,000,955)	($3,000,955)	
Revenue/Cost Ratio	1.00	0.66	0.71	0.68	0.85	
Units	*34,280*	*10,362*	*8,097*	*18,459*	*52,739*	
Annual Surplus per Unit	***$0***	***($190)***	***($127)***	***($163)***	***($57)***	
C. LIBRARY FUND						
Annual Recurring Revenues						
Property Tax - Library Fund	$1,692,790	$61,233	$114,192	$175,425	$1,868,215	73.1%
Charges for Services	61,300	18,560	14,503	$33,063	$94,363	3.7%
Interest Earned on Investments	45,000	1,596	2,574	$4,170	$49,170	1.9%
Subtotal Annual Recurring Revenues	$1,799,090	$81,389	$131,269	$212,658	$2,011,748	78.7%
Other Revenues[3]	$545,292	$0	$0	$0	$545,292	21.3%
Total Annual Recurring Revenues	$2,344,382	$81,389	$131,269	$212,658	$2,557,040	100.0%
Annual Recurring Costs						
Library Services	$2,344,382	$714,575	$558,373	$1,272,948	$3,617,330	
Total Annual Recurring Costs	$2,344,382	$714,575	$558,373	$1,272,948	$3,617,330	
Annual (Deficit)	$0	($633,186)	($427,104)	($1,060,290)	($1,060,290)	
Revenue/Cost Ratio	1.00	0.11	0.24	0.17	0.71	
Units	*34,280*	*10,362*	*8,097*	*18,459*	*52,739*	
Annual (Deficit) per Unit	***$0***	***($61)***	***($53)***	***($57)***	***($20)***	

Note: 1. The recurring revenues and costs for existing development are based on the current City budget.
2. These revenues represent the $40 per unit voter-approved assessment to supplement fire protection services.
3. These revenues represent revenues that are transferred from other funds and sources, including reserves, in the current budget. Because of the uncertainty of these revenues for the future, these revenues are not assumed to be recurring and are not projected.

Sources: Stanley R. Hoffman Associates, Inc.
City of Murrieta, *Operating Budget, Fiscal Years 2009/10 and 2010/11*

Table 7
Summary of General Plan after Buildout
General Plan Update Fiscal Analysis, City of Murrieta

Category	City Existing	City Incremental Development			City Buildout
		Focus Areas	Rest of City	Total Increment	
Recommended Scenario					
Residential Units	33,745	2,006	8,733	10,739	44,484
Population	101,315	5,967	25,979	31,946	133,261
Employment	19,888	80,852	29,413	110,265	130,153
Scenario B					
Residential Units	33,745	10,362	8,097	18,459	52,204
Population	101,315	30,934	24,172	55,106	156,421
Employment	19,888	68,103	30,421	98,524	118,412

Sources: Stanley R. Hoffman Associates, Inc.
RBF Consulting

Table 8
Incremental Development: Recommended Scenario
General Plan Update Fiscal Analysis, City of Murrieta

Category	City Incremental Development		
	Focus Areas	Rest of City	Total Increment
A. RESIDENTIAL DEVELOPMENT			
Units			
Rural	39	266	305
Single Family	150	5,807	5,957
Multiple Family	1,817	2,660	4,477
Total Residential Units	2,006	8,733	10,739
Population	5,967	25,979	31,946
B. NON RESIDENTIAL DEVELOPMENT			
Square Feet			
Business Park	3,143,765	2,333,015	5,476,780
Commercial	3,215,848	8,905,590	12,121,438
Industrial	0	1,384,855	1,384,855
Mixed Use	0	11,366	11,366
Professional and Office	15,054,892	660,267	15,715,159
Total Square Feet	21,414,505	13,295,093	34,709,598
Employment	80,852	29,413	110,265
C. SERVICE POPULATION[1]			
Population	5,967	25,979	31,946
Employment Weighted at 50 Percent	40,426	14,707	55,133
Total Service Population	46,393	40,686	87,079

Note: 1. The service population represents the area's total population plus 50% of the area's estimated employment. The weighting factor of 50 percent assumes that an employee would spend roughly half the time in the City as a resident. The service population is used for fiscal factors that are based on both population and employment.

Sources: Stanley R. Hoffman Associates, Inc.
RBF Consulting

Table 9
Incremental Development: Scenario B
General Plan Update Fiscal Analysis, City of Murrieta

Category	City Incremental Development		
	Focus Areas	Rest of City	Total Increment
A. RESIDENTIAL DEVELOPMENT			
Units			
Rural	0	0	0
Single Family	1,458	7,072	8,530
Multiple Family	8,904	1,025	9,929
Total Residential Units	10,362	8,097	18,459
Population	30,934	24,172	55,106
B. NON RESIDENTIAL DEVELOPMENT			
Square Feet			
Business Park	3,143,765	2,832,135	5,975,900
Commercial	3,345,788	0	12,093,925
Industrial	0	2,832,135	1,384,855
Mixed Use	0	0	11,366
Multiple Use 2	0	0	58,500
Professional and Office	12,075,128	0	12,735,395
Total Square Feet	18,564,681	5,664,270	32,259,941
Employment	68,103	30,421	98,524
C. SERVICE POPULATION[1]			
Population	30,934	24,172	55,106
Employment Weighted at 50 Percent	34,052	15,211	49,262
Total Service Population	64,986	39,383	104,368

Note: 1. The service population represents the area's total population plus 50% of the area's estimated employment. The weighting factor of 50 percent assumes that an employee would spend roughly half the time in the City as a resident. The service population is used for fiscal factors that are based on both population and employment.

Sources: Stanley R. Hoffman Associates, Inc.
RBF Consulting

Assessed Valuation

Residential Assessed Valuation. Incremental valuation for residential development for the Recommended Scenario is presented in Table 10 and Table 11 presents the incremental residential valuation for Scenario B. Rural residential and single family units are valued at an average of $250,000 per unit and multiple family units are valued at an average of $122,000 per unit based on information from Zillow.com.

New residential valuation is projected at about $2.11 billion for the Recommended Scenario, with about $2.05 billion of the total new valuation estimated for areas outside of redevelopment project areas. Appendix Table A-1 presents the distribution of residential units to redevelopment project (RDA) for the Recommended Scenario by the geographic areas analyzed in the General Plan Update.

New residential valuation for Scenario B is projected at about $3.43 billion with about $3.29 billion of this total projected for areas outside redevelopment project (RDA) areas. Appendix Table A-2 presents the distribution of new residential units to RDA areas for Scenario B.

Non-Residential Assessed Valuation. Table 12 presents the projected new non-residential valuation for the Recommended Scenario and Table 13 presents the projected new non-residential valuation for Scenario B. New non-residential valuation is projected based on the following valuation assumptions for the City of Murrieta obtained from several commercial real estate websites:

- $200 per square foot for commercial uses
- $180 per square foot for profession and office uses
- $150 per square foot for business park uses
- $100 per square foot for mixed uses
- $90 per square foot for industrial uses

The selected properties for estimating the average non-residential values per square foot are presented in Appendix Table A-3 and Appendix Table A-4.

New non-residential valuation for the Recommended Scenario (Table 12) is projected at $6.20 billion with about $2.72 billion of this total projected for development outside redevelopment project areas. Appendix Table A-5 presents the distribution of non-residential square feet to RDA project areas for the Recommended Scenario by the geographic areas analyzed in the General Plan Update.

New non-residential valuation for Scenario B (Table 13) is projected at about $5.75 billion with about $2.57 billion of this total projected for development outside redevelopment project areas. Appendix Table A-6 presents the distribution of non-residential square feet to RDA project areas for Scenario B.

Table 10
Residential Assessed Valuation for Incremental Development: Recommended Scenario
General Plan Update Fiscal Analysis, City of Murrieta
(In Constant 2011 Dollars)

Category	Factor	City Incremental Development		
		Focus Areas	Rest of City	Total Increment
A. NEW RESIDENTIAL UNITS				
Rural				
Non-RDA		39	266	305
RDA		0	0	0
Total Rural		39	266	305
Single Family				
Non-RDA		150	5,807	5,957
RDA		0	0	0
Total Single Family		150	5,807	5,957
Multiple Family				
Non-RDA		1,817	2,148	3,965
RDA		0	512	512
Total Multiple Family		1,817	2,660	4,477
Total New Units				
Non-RDA		2,006	8,221	10,227
RDA		0	512	512
Total New Units		2,006	8,733	10,739
B. NEW RESIDENTIAL VALUATION	*Average Value per Unit*			
Rural				
Non-RDA	*$250,000*	$9,750,000	$66,500,000	$76,250,000
RDA	*$250,000*	$0	$0	$0
Total Rural		$9,750,000	$66,500,000	$76,250,000
Single Family				
Non-RDA	*$250,000*	$37,500,000	$1,451,750,000	$1,489,250,000
RDA	*$250,000*	$0	$0	$0
Total Single Family		$37,500,000	$1,451,750,000	$1,489,250,000
Multiple Family				
Non-RDA	*$122,000*	$221,674,000	$262,056,000	$483,730,000
RDA	*$122,000*	$0	$62,464,000	$62,464,000
Total Multiple Family		$221,674,000	$324,520,000	$546,194,000
Total New Residential Valuation				
Non-RDA		$268,924,000	$1,780,306,000	$2,049,230,000
RDA		$0	$62,464,000	$62,464,000
Total New Residential Valuation		$268,924,000	$1,842,770,000	$2,111,694,000

Sources: Stanley R. Hoffman Associates, Inc.
RBF Consulting
www.zillow.com, Accessed on January 3, 2011

Table 11
Residential Assessed Valuation for Incremental Development: Scenario B
General Plan Update Fiscal Analysis, City of Murrieta
(In Constant 2011 Dollars)

Category	Factor	City Incremental Development		
		Focus Areas	Rest of City	Total Increment
A. NEW RESIDENTIAL UNITS				
Rural				
Non-RDA		0	0	0
RDA		0	0	0
Total Rural		0	0	0
Single Family				
Non-RDA		1,458	7,072	8,530
RDA		0	0	0
Total Single Family		1,458	7,072	8,530
Multiple Family				
Non-RDA		8,904	513	9,417
RDA		0	512	512
Total Multiple Family		8,904	1,025	9,929
Total New Units				
Non-RDA		10,362	7,585	17,947
RDA		0	512	512
Total New Units		10,362	8,097	18,459
B. NEW RESIDENTIAL VALUATION	*Average Value per Unit*			
Rural				
Non-RDA	*$250,000*	$0	$0	$0
RDA	*$250,000*	$0	$0	$0
Total Rural		$0	$0	$0
Single Family				
Non-RDA	*$250,000*	$364,500,000	$1,768,000,000	$2,132,500,000
RDA	*$250,000*	$0	$0	$0
Total Single Family		$364,500,000	$1,768,000,000	$2,132,500,000
Multiple Family				
Non-RDA	*$122,000*	$1,086,288,000	$62,586,000	$1,148,874,000
RDA	*$122,000*	$0	$62,464,000	$62,464,000
Total Multiple Family		$1,086,288,000	$125,050,000	$1,211,338,000
Total New Residential Valuation				
Non-RDA		$1,450,788,000	$1,830,586,000	$3,281,374,000
RDA		$0	$62,464,000	$62,464,000
Total New Residential Valuation		$1,450,788,000	$1,893,050,000	$3,343,838,000

Sources: Stanley R. Hoffman Associates, Inc.
RBF Consulting
www.zillow.com, Accessed on January 3, 2011

Table 12
Non-Residential Assessed Valuation for Incremental Development: Recommended Scenario
General Plan Update Fiscal Analysis, City of Murrieta
(In Constant 2011 Dollars)

Category	Factor	City Incremental Development: Focus Areas	Rest of City	Total Increment
A. NEW NON-RESIDENTIAL SQUARE FEET				
Business Park				
Non-RDA		850,108	2,333,015	3,183,123
RDA		2,293,657	0	2,293,657
Total Business Park		3,143,765	2,333,015	5,476,780
Commercial				
Non-RDA		1,295,716	6,854,578	8,150,294
RDA		1,920,132	2,051,012	3,971,144
Total Commercial		3,215,848	8,905,590	12,121,438
Industrial				
Non-RDA		0	1,384,855	1,384,855
RDA		0	0	0
Total Industrial		0	1,384,855	1,384,855
Mixed Use				
Non-RDA		0	11,366	11,366
RDA		0	0	0
Total Mixed Use		0	11,366	11,366
Professional and Office				
Non-RDA		2,312,513	409,210	2,721,723
RDA		12,742,379	251,057	12,993,436
Total Professional and Office		15,054,892	660,267	15,715,159
Total New Non-Residential Square Feet				
Non-RDA		4,458,337	10,993,024	15,451,361
RDA		16,956,168	2,302,069	19,258,237
Total New Non-Residential Square Feet		21,414,505	13,295,093	34,709,598
B. NEW NON-RESIDENTIAL VALUATION				
	Average Value per Square Foot			
Business Park				
Non-RDA	*$150*	$127,516,200	$349,952,250	$477,468,450
RDA	*$150*	$344,048,550	$0	$344,048,550
Total Business Park		$471,564,750	$349,952,250	$821,517,000
Commercial				
Non-RDA	*$200*	$259,143,200	$1,370,915,600	$1,630,058,800
RDA	*$200*	$384,026,400	$410,202,400	$794,228,800
Total Commercial		$643,169,600	$1,781,118,000	$2,424,287,600
Industrial				
Non-RDA	*$90*	$0	$124,636,950	$124,636,950
RDA	*$90*	$0	$0	$0
Total Industrial		$0	$124,636,950	$124,636,950
Mixed Use				
Non-RDA	*$190*	$0	$2,159,540	$2,159,540
RDA	*$190*	$0	$0	$0
Total Mixed Use		$0	$2,159,540	$2,159,540
Professional and Office				
Non-RDA	*$180*	$416,252,340	$73,657,800	$489,910,140
RDA	*$180*	$2,293,628,220	$45,190,260	$2,338,818,480
Total Professional and Office		$2,709,880,560	$118,848,060	$2,828,728,620
Total New Non-Residential Valuation				
Non-RDA		$802,911,740	$1,921,322,140	$2,724,233,880
RDA		$3,021,703,170	$455,392,660	$3,477,095,830
Total New Non-Residential Valuation		$3,824,614,910	$2,376,714,800	$6,201,329,710

Sources: Stanley R. Hoffman Associates, Inc.
RBF Consulting
www.zillow.com, Accessed on January 3, 2011

Table 13
Non-Residential Assessed Valuation for Incremental Development: Scenario B
General Plan Update Fiscal Analysis, City of Murrieta
(In Constant 2011 Dollars)

Category	Factor	City Incremental Development: Focus Areas	Rest of City	Total Increment
A. NEW NON-RESIDENTIAL SQUARE FEET				
Business Park				
Non-RDA		850,108	2,832,135	3,682,243
RDA		2,293,657	0	2,293,657
Total Business Park		3,143,765	2,832,135	5,975,900
Commercial				
Non-RDA		1,425,656	6,697,125	8,122,781
RDA		1,920,132	2,051,012	3,971,144
Total Commercial		3,345,788	8,748,137	12,093,925
Industrial				
Non-RDA		0	1,384,855	1,384,855
RDA		0	0	0
Total Industrial		0	1,384,855	1,384,855
Mixed Use				
Non-RDA		0	11,366	11,366
RDA		0	0	0
Total Mixed Use		0	11,366	11,366
Multiple Use 2				
Non-RDA		0	58,500	58,500
RDA		0	0	0
Total Multiple Use 2		0	58,500	58,500
Professional and Office				
Non-RDA		986,978	409,210	1,396,188
RDA		11,088,150	251,057	11,339,207
Total Professional and Office		12,075,128	660,267	12,735,395
Total New Non-Residential Square Feet				
Non-RDA		3,262,742	11,393,191	14,655,933
RDA		15,301,939	2,302,069	17,604,008
Total New Non-Residential Square Feet		18,564,681	13,695,260	32,259,941
B. NEW NON-RESIDENTIAL VALUATION				
	Average Value per Square Foot			
Business Park				
Non-RDA	*$150*	$127,516,200	$424,820,250	$552,336,450
RDA	*$150*	$344,048,550	$0	$344,048,550
Total Business Park		$471,564,750	$424,820,250	$896,385,000
Commercial				
Non-RDA	*$200*	$285,131,200	$1,339,425,000	$1,624,556,200
RDA	*$200*	$384,026,400	$410,202,400	$794,228,800
Total Commercial		$669,157,600	$1,749,627,400	$2,418,785,000
Industrial				
Non-RDA	*$90*	$0	$124,636,950	$124,636,950
RDA	*$90*	$0	$0	$0
Total Industrial		$0	$124,636,950	$124,636,950
Mixed Use				
Non-RDA	*$190*	$0	$2,159,540	$2,159,540
RDA	*$190*	$0	$0	$0
Total Mixed Use		$0	$2,159,540	$2,159,540
Multiple Use 2				
Non-RDA	*$190*	$0	$11,115,000	$11,115,000
RDA	*$190*	$0	$0	$0
Total Multiple Use 2		$0	$11,115,000	$11,115,000
Professional and Office				
Non-RDA	*$180*	$177,656,040	$73,657,800	$251,313,840
RDA	*$180*	$1,995,867,000	$45,190,260	$2,041,057,260
Total Professional and Office		$2,173,523,040	$118,848,060	$2,292,371,100
Total New Non-Residential Valuation				
Non-RDA		$590,303,440	$1,975,814,540	$2,566,117,980
RDA		$2,723,941,950	$455,392,660	$3,179,334,610
Total New Non-Residential Valuation		$3,314,245,390	$2,431,207,200	$5,745,452,590

Sources: Stanley R. Hoffman Associates, Inc.
RBF Consulting
www.zillow.com, Accessed on January 3, 2011

Sales and Use Tax

Table 14 presents the projected new sales and use tax for the Recommended Scenario and Table 15 presents the projected new sales and use tax for Scenario B. As shown in Panel B of each table, total new sales and use tax to the City is projected at about $24.63 million for the Recommended Scenario and at about $28.02 million for Scenario B. The City currently receives about $10.67 million in sales and use tax.

Retail taxable sales are from the *Retail Land Use Market Analysis, Murrieta General Plan Update*, January 10, 2011 prepared by the fiscal consultant. Industrial taxable sales are calculated at $26 per square foot based on the existing occupied square feet in the City and the non-retail taxable sales report by the California State Board of Equalization. The fiscal analysis assumes that about 50 percent of business park uses would generate taxable sales.

Table 14
New Sales and Use Tax: Recommended Scenario
General Plan Update Fiscal Analysis, City of Murrieta
(In Constant 2011 Dollars)

Category	City Incremental Development		
	Focus Areas	Rest of City	Total Increment
A. TAXABLE SALES			
Commercial			
Square Feet	3,215,848	8,905,590	12,121,438
New Commercial Taxable Sales[1]	$1,042,358,615	$1,077,046,280	$2,119,404,895
Industrial			
Square Feet	0	1,384,855	1,384,855
times			
Taxable Sales per Square Foot[2]	$26	$26	$26
equals			
New Industrial Taxable Sales	$0	$36,006,230	$36,006,230
Business Park			
Square Feet	3,143,765	2,333,015	5,476,780
times			
50% Share for Industrial	50%	50%	50%
equals			
Adjusted Taxable Square Feet	1,571,883	1,166,508	2,738,391
times			
Taxable Sales per Square Foot	$26	$26	$26
equals			
New Business Park Taxable Sales	$40,868,958	$30,329,208	$71,198,166
B. TOTAL NEW SALES AND USE TAX			
Commercial Taxable Sales	$1,042,358,615	$1,077,046,280	$2,119,404,895
Industrial Taxable Sales	0	36,006,230	36,006,230
Business Park Taxable Sales	40,868,958	30,329,208	71,198,166
Total New Taxable Sales	$1,083,227,573	$1,143,381,718	$2,226,609,291
times			
Sales Tax Factor	1%	1%	1%
equals			
New Sales Tax	$10,832,276	$11,433,817	$22,266,093
times			
Use Tax (@ 10.6% of Sales Tax)	$1,148,221	$1,211,985	$2,360,206
equals			
Total New Sales and Use Tax	**$11,980,497**	**$12,645,802**	**$24,626,299**
75% Allocated to Sales and Use Tax	*$8,985,373*	*$9,484,352*	*$18,469,725*
25% Allocated to Sales Tax Compensation Fund	*$2,995,124*	*$3,161,451*	*$6,156,575*

Note: 1. Retail taxable sales are from the *Retail Land Use Market Analysis, Murrieta General Plan Update.*
2. Industrial taxable sales per square foot are based on the industrial square feet reported in the *Economic Trends and Conditions, Murrieta General Plan Update* for Murrieta and the non-retail taxable sales for Murrieta reported by the California State Board of Equalization.
3. The fiscal analysis assumes that 50 percent of the Business Park will generate taxable sales.

Sources: Stanley R. Hoffman Associates, Inc.
Stanley R. Hoffman Associates, Inc., *Retail Land Use Market Analysis, Murrieta General Plan Update* , January 10, 2011
Stanley R. Hoffman Associates, Inc., *Economic Trends and Conditions, Murrieta General Plan Update* , January 7, 2010
California State Board of Equalization, *Taxable Sales in California* , 2008

Table 15
New Sales and Use Tax: Scenario B
General Plan Update Fiscal Analysis, City of Murrieta
(In Constant 2011 Dollars)

Category	City Incremental Development: Focus Areas	Rest of City	Total Increment
A. TAXABLE SALES			
Commercial			
Square Feet	3,345,788	0	3,345,788
New Commercial Taxable Sales	$1,220,271,573	$1,161,761,466	$2,382,033,039
Industrial			
Square Feet	0	2,832,135	2,832,135
times			
Taxable Sales per Square Foot	$26	$26	$26
equals			
New Industrial Taxable Sales	$0	$73,635,510	$73,635,510
Business Park			
Square Feet	3,143,765	2,832,135	5,975,900
times			
50% Share for Industrial	50%	50%	50%
equals			
Adjusted Taxable Square Feet	1,571,883	1,416,068	2,987,951
times			
Taxable Sales per Square Foot	$26	$26	$26
equals			
New Business Park Taxable Sales	$40,868,958	$36,817,768	$77,686,726
B. TOTAL NEW SALES AND USE TAX			
Commercial Taxable Sales	$1,220,271,573	$1,161,761,466	$2,382,033,039
Industrial Taxable Sales	0	73,635,510	73,635,510
Business Park Taxable Sales	40,868,958	36,817,768	77,686,726
Total New Taxable Sales	$1,261,140,531	$1,272,214,744	$2,533,355,275
times			
Sales Tax Factor	1%	1%	1%
equals			
New Sales Tax	$12,611,405	$12,722,147	$25,333,553
times			
Use Tax (@ 10.6% of Sales Tax)	$1,336,809	$1,348,548	$2,685,357
equals			
Total New Sales and Use Tax	**$13,948,214**	**$14,070,695**	**$28,018,910**
75% Allocated to Sales and Use Tax	*$10,461,161*	*$10,553,022*	*$21,014,183*
25% Allocated to Sales Tax Compensation Fund	*$3,487,054*	*$3,517,674*	*$7,004,728*

Note: 1. Retail taxable sales are from the *Retail Land Use Market Analysis, Murrieta General Plan Update.*
2. Industrial taxable sales per square foot are based on the industrial square feet reported in the *Economic Trends and Conditions, Murrieta General Plan Update* for Murrieta and the non-retail taxable sales for Murrieta reported by the California State Board of Equalization.
3. The fiscal analysis assumes that 50 percent of the Business Park will generate taxable sales.

Sources: Stanley R. Hoffman Associates, Inc.
Stanley R. Hoffman Associates, Inc., *Retail Land Use Market Analysis, Murrieta General Plan Update* , January 10, 2011
Stanley R. Hoffman Associates, Inc., *Economic Trends and Conditions, Murrieta General Plan Update* , January 7, 2010
California State Board of Equalization, *Taxable Sales in California* , 2008

Fiscal Methodology

The General Plan Update fiscal analysis is based on the fiscal methodology and fiscal assumptions presented in Appendix B. Appendix C presents the project references for the fiscal analysis.

APPENDIX A
DETAILED DEVELOPMENT DESCRIPTIONS AND MARKET ASSUMPTIONS

Table A-1 Detailed Incremental Residential Units, Recommended Scenario

Table A-2 Detailed Incremental Residential Units, Scenario B

Table A-3 Business Park and Industrial Estimated Values per Square Foot

Table A-4 Commercial and Professional/Office Estimated Values per Square Foot

Table A-5 Detailed Incremental Non-Residential Square Feet, Recommended Scenario

Table A-6 Detailed Incremental Non-Residential Square Feet, Scenario B

Table A-1
Detailed Incremental Residential Units: Recommended Scenario
General Plan Update Fiscal Analysis, City of Murrieta

RECOMMENDED SCENARIO

Preferred Land Use Designation	Focus Area (A)						Historic Downtown SP Area (A)	Other Areas Outside GP Focus Areas (B)	Total Increment
	A: North Murrieta Business Corridor	B. Clinton Keith/ Mitchell Area	C. Golden Triangle North	D. South Murrieta Business Corridor	E. Multiple Use 3 (MU-3) Area	Focus Area Subtotal			
RDA Share	**0%**	**0%**	**100%**	**0%**	**0%**		**100%**	**0%**	
Rural Residential Total	0	39	0	0	0	39	0	266	305
Non-RDA	0	39	0	0	0	39	0	266	305
RDA	0	0	0	0	0	0	0	0	0
Single Family Total	0	150	0	0	0	150	0	5,807	5,957
Non-RDA	0	150	0	0	0	150	0	5,807	5,957
RDA	0	0	0	0	0	0	0	0	0
Multiple Family Total	0	680	0	0	1,137	1,817	512	2,148	4,477
Non-RDA	0	680	0	0	1,137	1,817	0	2,148	3,965
RDA	0	0	0	0	0	0	512	0	512
TOTAL UNITS	**0**	**869**	**0**	**0**	**1,137**	**2,006**	**512**	**8,221**	**10,739**
Non-RDA	0	869	0	0	1,137	2,006	0	8,221	10,227
RDA	0	0	0	0	0	0	512	0	512

Sources: Stanley R. Hoffman Associates, Inc.
RBF Consulting

Table A-2
Detailed Incremental Residential Units: Scenario B
General Plan Update Fiscal Analysis, City of Murrieta

SCENARIO B

Preferred Land Use Designation	Focus Area (A)						Historic Downtown SP Area (A)	Other Areas Outside GP Focus Areas (B)	Total Increment
	A: North Murrieta Business Corridor	B. Clinton Keith/ Mitchell Area	C. Golden Triangle North	D. South Murrieta Business Corridor	E. Multiple Use 3 (MU-3) Area	Focus Area Subtotal			
RDA Share	**0%**	**0%**	**100%**	**0%**	**0%**		**100%**	**0%**	
Rural Residential Total	0	0	0	0	0	0	0	0	0
Non-RDA	0	0	0	0	0	0	0	0	0
RDA	0	0	0	0	0	0	0	0	0
Single Family Total	0	1,458	0	0	0	1,458	0	7,072	8,530
Non-RDA	0	1,458	0	0	0	1,458	0	7,072	8,530
RDA	0	0	0	0	0	0	0	0	0
Multiple Family Total	4,238	3,182	0	0	1,484	8,904	512	513	9,929
Non-RDA	4,238	3,182	0	0	1,484	8,904	0	513	9,417
RDA	0	0	0	0	0	0	512	0	512
TOTAL UNITS	**4,238**	**4,640**	**0**	**0**	**1,484**	**10,362**	**512**	**7,585**	**18,459**
Non-RDA	4,238	4,640	0	0	1,484	10,362	0	7,585	17,947
RDA	0	0	0	0	0	0	512	0	512

Sources: Stanley R. Hoffman Associates, Inc.
RBF Consulting

Table A-3
Current Business Park and Industrial Estimated Values
General Plan Update Fiscal Analysis, City of Murrieta

A. BUSINESS PARK

Property Designation	Location	City	Asking Price		
			Total Price	Building Square Feet	Price per Building Square Foot
Business Park	unknown	Murrieta	$1,173,640	9,028	$130
Business Park	Golden Gate Circle 41085	Murrieta	$1,850,000	11,864	$156
Business Park	Jefferson Gateway	Murrieta	$513,000	4,464	$115
Business Park	unknown	Murrieta	$1,190,000	9,000	$132
Business Park	Jefferson Crossroads	Murrieta	$508,800	3,392	$150
Business Park	Reagan Way Building	Murrieta	$1,365,000	10,566	$129
Business Park	unknown	Murrieta	$250,000	2,000	$125
Business Park	unknown	Murrieta	$1,000,000	4,000	$250
Business Park	unknown	Murrieta	$1,864,000	17,256	$108
Business Park	unknown	Murrieta	$2,200,000	13,676	$161
Business Park	unknown	Murrieta	$999,000	7,400	$135
Business Park	Ivy Street	Murrieta	$215,000	1,379	$156
Business Park	Madison Avenue/Pear Street	Murrieta	$295,000	2,076	$142
Business Park Average Value per Building Square Foot [1]					***$150***

B. INDUSTRIAL

Property Designation	Location	City	Asking Price		
			Total Price	Building Square Feet	Price per Building Square Foot
Industrial	38750 Sky Canyon Drive	Murrieta	$639,000	7,722	$83
Industrial	38790 Sky Canyon Drive	Murrieta	$572,000	6,681	$86
Industrial	25783 Jefferson Avenue	Murrieta	$861,000	12,300	$70
Industrial	41715 Elm Street	Murrieta	$934,960	11,687	$80
Industrial	41610 Date Street	Murrieta	$310,420	3,740	$83
Industrial	unknown	Murrieta	$1,395,000	14,567	$96
Industrial	unknown	Murrieta	$3,000,000	32,772	$92
Industrial	unknown	Murrieta	$799,000	8,200	$97
Industrial	unknown	Murrieta	$237,500	2,500	$95
Industrial	Alesco Jefferson Buildings	Murrieta	$1,568,835	17,432	$90
Industrial	29975 Technology Drive	Murrieta	$590,000	5,818	$101
Industrial	French Valley Jet Center	Murrieta	$6,500,000	92,126	$71
Industrial	Rocky Top	Murrieta	$1,395,000	14,567	$96
Industrial	41674 Corning Place	Murrieta	$1,500,000	14,999	$100
Industrial	Murrieta Storage Facility	Murrieta	$9,900,000	124,180	$80
Industrial	41810 McAlby Court Building	Murrieta	$3,000,000	32,771	$92
Industrial	Bank Owned Industrial Warehouse	Murrieta	$998,000	13,676	$73
Industrial	Clifford Business Park	Murrieta	$310,240	3,740	$83
Industrial Average Value per Building Square Foot [1]					***$90***

Note: 1. Average price per building square foot is rounded to the nearest tens.

Sources: Stanley R. Hoffman Associates, Inc.
www.lee-associates.com, January 2011
www.loopnet.com, January 2011
www.showcase.com, January 2011

Table A-4
Current Commercial and Professional/Office Estimated Values
General Plan Update Fiscal Analysis, City of Murrieta

A. COMMERCIAL

Property Designation	Location	City	Total Price	Square Feet	per Building Square Foot
Retail	24831-24843 Jefferson Avenue	Murrieta	$6,500,000	48,787	$133
Retail	40414 California Oaks Road	Murrieta	$1,950,000	11,405	$171
Retail	Former Kia Auto Facility	Murrieta	$1,400,000	6,500	$215
Retail	Margarita Ville	Murrieta	$1,400,000	7,473	$187
Retail	Golden Gate Circle 41085	Murrieta	$2,350,000	11,864	$198
Retail	SK Furniture	Murrieta	$5,900,000	40,000	$148
Retail	unknown	Murrieta	$6,250,000	30,000	$208
Retail	unknown	Murrieta	$375,000	2,500	$150
Retail	unknown	Murrieta	$5,200,000	11,461	$454
Retail	unknown	Murrieta	$995,000	10,000	$100
Retail	unknown	Murrieta	$1,598,000	8,125	$197
Retail	unknown	Murrieta	$4,000,000	16,986	$235
Retail	unknown	Murrieta	$4,900,000	40,000	$123
Retail	unknown	Murrieta	$2,300,000	6,500	$354
Retail	unknown	Murrieta	$1,950,000	11,405	$171
Commercial Average Value per Building Square Foot [1]					***$200***

B. PROFESSIONAL AND OFFICE

Property Designation	Location	City	Total Price	Square Feet	per Building Square Foot
Office Condo	Ivy Springs Business Park	Murrieta	$215,000	1,379	$156
Office Condo	29995 Technology Drive	Murrieta	$349,000	2,599	$134
Medical Office	Rancho Springs Medical Plaza II	Murrieta	$1,262,000	6,310	$200
Office Condo	Silverhawk Summit Office Building	Murrieta	$454,720	3,136	$145
Office Building	unknown	Murrieta	$179,300	1,175	$153
Office Condo	Ivy Springs Business Park	Murrieta	$200,000	1,275	$157
Medical Office	Inland Valley Medical	Murrieta	$6,000,000	36,307	$165
Medical Office	Rancho Springs Medical Condo	Murrieta	$180,000	1,111	$162
Office Condo	Silverhawk Summit Office Building	Murrieta	$795,000	6,259	$127
Office Condo	Jefferson Point Professional Center	Murrieta	$525,000	1,900	$276
Office Condo	Date-Margarita Medical Plaza	Murrieta	$1,154,360	5,131	$225
Office Condo	Silverhawk Summit Office Building	Murrieta	$245,000	1,748	$140
Office Condo	Oak Grove Medical Building	Murrieta	$703,240	2,468	$285
Office Condo	Summit at Silverhawk	Murrieta	$220,000	1,773	$124
Office Condo	Silverhawk Summit Office Building	Murrieta	$674,310	2,366	$285
Office Building	Calistoga Office Park-Building C	Murrieta	$3,487,000	15,850	$220
Office Building	Los Alamos Business Park	Murrieta	$300,000	1,364	$220
Office Condo	unknown	Murrieta	$262,500	1,500	$175
Office Condo	unknown	Murrieta	$150,000	1,000	$150
Professional and Office Average Value per Building Square Foot [1]					***$180***

Note: 1. Average price per building square foot is rounded to the nearest tens.

Sources: Stanley R. Hoffman Associates, Inc.
www.lee-associates.com, January 2011
www.loopnet.com, January 2011
www.showcase.com, January 2011

Table A-5
Detailed Incremental Non-Residential Square Feet: Recommended Scenario
General Plan Update Fiscal Analysis, City of Murrieta

RECOMMENDED SCENARIO

Preferred Land Use Designation	Focus Area (A)						Historic Downtown SP Area (A)	Other Areas Outside GP Focus Areas[1] (B)	City Total
	A: North Murrieta Business Corridor	B. Clinton Keith/ Mitchell Area	C. Golden Triangle North	D. South Murrieta Business Corridor	E. Multiple Use 3 (MU-3) Area	**Focus Area Subtotal**			
RDA Share or Amount	**100%**	**0%**	**100%**	**80%**	**0%**		**100%**	**0%**	**1,780,700**
Business Park	0	0	0	2,867,071	276,694	3,143,765	0	2,333,015	5,476,780
Non-RDA	0	0	0	573,414	276,694	850,108	0	2,333,015	3,183,123
RDA	0	0	0	2,293,657	0	2,293,657	0	0	2,293,657
Commercial	1,675,260	265,155	244,872	0	1,030,561	3,215,848	270,312	8,635,278	12,121,438
Non-RDA	0	265,155	0	0	1,030,561	1,295,716	0	6,854,578	8,150,294
RDA	1,675,260	0	244,872	0	0	1,920,132	270,312	1,780,700	3,971,144
Industrial	0	0	0	0	0	0	0	1,384,855	1,384,855
Non-RDA	0	0	0	0	0	0	0	1,384,855	1,384,855
RDA	0	0	0	0	0	0	0	0	0
Mixed Use[2]	0	0	0	0	0	0	0	11,366	11,366
Non-RDA	0	0	0	0	0	0	0	11,366	11,366
RDA	0	0	0	0	0	0	0	0	0
Professional and Office	7,735,391	1,100,732	2,324,698	3,352,862	541,209	15,054,892	251,057	409,210	15,715,159
Non-RDA	0	1,100,732	0	670,572	541,209	2,312,513	0	409,210	2,721,723
RDA	7,735,391	0	2,324,698	2,682,290	0	12,742,379	251,057	0	12,993,436
TOTAL SQUARE FEET	**9,410,651**	**1,365,887**	**2,569,570**	**6,219,933**	**1,848,464**	**21,414,505**	**521,369**	**12,773,724**	**34,709,598**
Non-RDA	0	1,365,887	0	1,243,986	1,848,464	4,458,337	0	10,993,024	15,451,361
RDA	9,410,651	0	2,569,570	4,975,947	0	16,956,168	521,369	1,780,700	19,258,237

Notes: (A) Source: Column P from All TAZ Growth Worksheet
(B) Source: Column S (2035 SF) - Column D (Existing on Ground SF) from all TAZ Growth Worksheet
1. Includes a total of approximately 2.8 million s.f. distributed between the Golden Triangle TAZ 504 (1.78 million s.f.) and the French Valley Crossings in TAZ 618 (965,900 sf.)
2. Mixed Use for Historic Downtown SP Area (502,113 SF - split 50% commercial, 50% office) - has been included in commercial and professional and office categories.

Sources: Stanley R. Hoffman Associates, Inc.
RBF Consulting

Table A-6
Detailed Incremental Non-Residential Square Feet: Scenario B
General Plan Update Fiscal Analysis, City of Murrieta

SCENARIO B

Preferred Land Use Designation	Focus Area (A)						Historic Downtown SP Area (A)	Other Areas Outside GP Focus Areas[1] (B)	City Total
	A: North Murrieta Business Corridor	B. Clinton Keith/ Mitchell Area	C. Golden Triangle North	D. South Murrieta Business Corridor	E. Multiple Use 3 (MU-3) Area	**Focus Area Subtotal**			
RDA Share or Amount	**100%**	**0%**	**100%**	**80%**	**0%**		**100%**	**0%**	**1,780,700**
Business Park	0	0	0	2,867,071	276,694	3,143,765	0	2,832,135	5,975,900
Non-RDA	0	0	0	573,414	276,694	850,108	0	2,832,135	3,682,243
RDA	0	0	0	2,293,657	0	2,293,657	0	0	2,293,657
Commercial	1,675,260	265,155	244,872	0	1,160,501	3,345,788	270,312	8,477,825	12,093,925
Non-RDA	0	265,155	0	0	1,160,501	1,425,656	0	6,697,125	8,122,781
RDA	1,675,260	0	244,872	0	0	1,920,132	270,312	1,780,700	3,971,144
Industrial	0	0	0	0	0	0	0	1,384,855	1,384,855
Non-RDA	0	0	0	0	0	0	0	1,384,855	1,384,855
RDA	0	0	0	0	0	0	0	0	0
Mixed Use[2]	0	0	0	0	0	0	0	11,366	11,366
Non-RDA	0	0	0	0	0	0	0	11,366	11,366
RDA	0	0	0	0	0	0	0	0	0
Multiple Use 2	0	0	0	0	0	0	0	58,500	58,500
Non-RDA	0	0	0	0	0	0	0	58,500	58,500
RDA	0	0	0	0	0	0	0	0	0
Professional and Office	6,081,162	0	2,324,698	3,352,862	316,406	12,075,128	251,057	409,210	12,735,395
Non-RDA	0	0	0	670,572	316,406	986,978	0	409,210	1,396,188
RDA	6,081,162	0	2,324,698	2,682,290	0	11,088,150	251,057	0	11,339,207
TOTAL SQUARE FEET	**7,756,422**	**265,155**	**2,569,570**	**6,219,933**	**1,753,601**	**18,564,681**	**521,369**	**13,173,891**	**32,259,941**
Non-RDA	0	265,155	0	1,243,986	1,753,601	3,262,742	0	11,393,191	14,655,933
RDA	7,756,422	0	2,569,570	4,975,947	0	15,301,939	521,369	1,780,700	17,604,008

Notes: (A) Source: Column P from All TAZ Growth Worksheet
(B) Source: Column S (2035 SF) - Column D (Existing on Ground SF) from all TAZ Growth Worksheet
1. Includes a total of approximately 2.8 million s.f. distributed between the Golden Triangle TAZ 504 (1.78 million s.f.) and the French Valley Crossings in TAZ 618 (965,900 sf.)
2. Mixed Use for Historic Downtown SP Area (502,113 SF - split 50% commercial, 50% office) - has been included in commercial and professional and office categories.

Sources: Stanley R. Hoffman Associates, Inc.
RBF Consulting

APPENDIX B
FISCAL ASSUMPTIONS

This Appendix presents the revenue and cost assumptions for the General Plan Update fiscal analysis. Based on discussion with the City Finance Director, the adopted 2009-2010 revenues and expenditures in the *City of Murrieta, Operating Budget Fiscal Years 2009/10 and 2010/11* document are the basis for the revenue and cost assumptions presented in this Appendix.

B.1 General Assumptions

General assumptions used in the fiscal analysis are presented in Table B-1. These assumptions include population, housing units and employment estimates for the City of Murrieta. The assumptions are based on California Department of Finance (DOF) population and housing estimates, the employment estimate from the Western Riverside Council of Governments (WRCOG) as reported in the Southern California Association of Government's (SCAG's) RTP 2008 Projections.

Population

Murrieta's population of 101,487 is based on the California DOF estimates as of January 1, 2010.

Housing Units

For calculating per housing unit factors, the City housing unit estimate of 34,280 from DOF for January 1, 2010 is used.

Employment

For fiscal factors that are impacted by employment, the City's 2010 employment is estimated at 25,274. Estimated employment is based on the Western Riverside County Riverside Council of Governments (WRCOG) projections as reported in the Southern California Association of Government (SCAG) RTP 2008 Projections.

Service Population

Several fiscal factors are impacted by both population and employment growth. Therefore, these fiscal factors are estimated by allocating total budgeted revenues or costs to both population and employment. As shown in Table B-1, the service population for the City is estimated at 111,997. The service population estimate includes the resident population of 101,487 and the estimated weighted employment of 10,510 (50 percent of 21,019). Employment is weighted at 50 percent assuming that an employee would spend roughly half the time in the City as a resident.

Table B-1
Socio-Economic Assumptions
General Plan Update Fiscal Analysis, City of Murrieta

Assumption	Description
	Population and Housing[1]
101,487	Total Resident Population
660	Group Quarters Population
100,827	Total Household Population
34,280	Total Housing Units
24,510	Single Family Detached
559	Single Family Attached
814	2 to 4 Units
6,693	5 Plus Units
1,704	Mobile Homes
32,665	Occupied Housing Units
4.71%	Vacancy Rate
3.087	Average Household Size
21,019	**Employment**[2]
	Service Population[3]
101,487	Total Resident Population
10,510	Employment Weighted at 50%
111,997	Total Service Population

Note: 1. Population and housing estimates are from the California Department of Finance (DOF) for January 1, 2010.
2. The 2010 employment estimate is from WRCOGs' *Riverside County Projections (Revised Draft)* as included in SCAGs' RTP 2008 Projections.
3. This analysis defines service population as the resident population plus employment weighted at 50 percent. Employment is weighted at 50%, assuming that an employee would spend about half the time as a resident in the City.

Sources: Stanley R. Hoffman Associates, Inc.
State of California, Department of Finance, *E-5 Population and Housing Estimates for Cities, Counties and the State, 2001-2010, with 2000 Benchmark, Sacramento, California* , May 2010
Southern California Association of Governments (SCAG), *RTP 2008 Projections*

B.2 Murrieta General Fund

General Fund Revenue Assumptions

The General Fund 2009-2010 revenues are presented in Table B-2. Projected recurring revenues to the City General Fund include property tax; in lieu property tax (VLF); sales and use tax; in lieu property tax (sales and use tax); property transfer tax; franchise fees; SB509 sales tax-safety; utility users tax; business licenses tax; traffic safety fines; other fines and forfeitures; motor vehicle license tax; operating transfers from other funds; interest earned on investments; lease/rental income; and program/miscellaneous income. The revenue factors for the recurring revenues projected in the fiscal analysis are summarized in Table B-3 and described in the remainder of this section.

Property Tax. Property tax revenues are projected at the one percent property tax levy on the assessed valuation for development anticipated for the General Plan Update. For the development located in areas outside redevelopment project areas, property tax to the General Fund is projected at 7 percent of the basic one percent property tax levy. Property tax increment to the Murrieta Redevelopment Agency for the development located in redevelopment project areas is also projected at one percent of the assessed valuation.

Property Transfer Tax. Sales of real property are taxed by the County of Riverside at a rate of $1.10 per $1,000 of property value. For property located in the City, property transfer tax is divided equally between the City and the County, with the City receiving $0.55 per $1,000 of transferred property value. As shown in Table B-4, residential development is assumed to change ownership at an average rate of about 8.0 percent per year based on data from the U.S. Census Bureau's, *American Community Survey*, 2009. Non-residential development is assumed to change ownership at an average rate of about 5.0 percent per year.

In Lieu Property Tax (VLF). Cities and counties began receiving additional property tax revenue to replace vehicle license fee (VLF) revenue that was lowered when the state reduced the vehicle license tax in 2004. This property tax in lieu of VLF is projected to grow with the change in the Citywide gross assessed valuation (AV) of taxable property from the prior year. Property tax in lieu of VLF revenue is allocated in addition to other property tax apportionments.

The property tax in lieu of VLF is projected to increase at $782 per million dollars of increased AV, as shown in Table B-5. This factor is based on the change in AV and property in lieu of VLF over the period from fiscal year 2004/2005 to fiscal year 2009/2010, adjusted to current dollars.

Sales and Use Tax. As part of the total sales tax levied by the State, all cities and counties in the State generally receive a basic one percent (1.0 percent) sales tax and have the option to levy additional sales taxes under certain circumstances. In addition to sales tax revenue, the City receives revenues from the use tax, which is levied on shipments into the state and on construction materials for new residential and non-residential development not allocated to a situs location. Use tax is allocated by the State Board of Equalization (BOE) to counties and cities based on each jurisdiction's proportion of countywide and statewide direct taxable sales. Use tax revenues to the City of Murrieta are estimated at an additional 10.6 percent of point-of-sale sales tax, as shown in Table B-6.

Table B-2 (page 1 of 2)
General Fund Revenues: 2009-2010
General Plan Update Fiscal Analysis, City of Murrieta
(In Constant 2010 Dollars)

General Fund Revenue Category	Fiscal Year Adopted 2009-2010	One-Time Revenues	Not Projected	Projected Recurring Revenues
Taxes				
Property Tax	$6,965,000	$0	$0	$6,965,000
Sales Tax	7,956,762	0	0	7,956,762
Sales Tax Compensation Fund	2,713,653	0	0	2,713,653
Transient Occupancy Tax	125,000	0	0	125,000
Property Transfer Taxes	400,000	0	0	400,000
Franchises	3,130,000	0	0	3,130,000
Total Taxes	*$21,290,415*	*$0*	*$0*	*$21,290,415*
Fines & Forfeitures				
Animal Administration Citations	$500	$0	$0	$500
Miscellaneous Fines	20,000	0	0	20,000
Administrative Citations	20,000	0	0	20,000
False Alarm	0	0	0	0
Fines - P.C. 1202.5	340,000	0	0	340,000
Traffic Safety Fines	430,000	0	0	430,000
Total Fines & Forfeitures	*$810,500*	*$0*	*$0*	*$810,500*
Licenses & Permits				
Building Permits - Non-Residential	$783,363	$783,363	$0	$0
Miscellaneous Permits	18,496	18,496	0	0
Permit Issuance Fee	199,796	199,796	0	0
Residential Building Permits	26,112	26,112	0	0
Business Licenses	551,250	0	0	551,250
Development Services Fees	100,000	100,000	0	0
Vacant Home Property	50,000	50,000	0	0
Permit Fee Revenue	15,000	15,000	0	0
Transportation Permit Fee	15,000	15,000	0	0
Bingo Licenses/Fees	0	0	0	0
Total Licenses & Permits	*$1,759,017*	*$1,207,767*	*$0*	*$551,250*
Charges for Services				
Plan Checks - Building	$132,737	$132,737	$0	$0
Miscellaneous	3,700	3,700	0	0
Administrative Cost Reimbursement	591,220	0	591,220	0
CFD Administrative Charges	60,000	0	60,000	0
Citywide Overhead	200,000	0	200,000	0
Planning-Inspection/Plan Check	540,000	540,000	0	0
Contracts for Police Security	16,713	0	16,713	0
Inspections Charges	200,000	200,000	0	0
Public Works Charges	50,000	50,000	0	0
Abatement Reimbursement	0	0	0	0
GIS Processing Fees	0	0	0	0
Residential Building Plan Check	0	0	0	0
Total Charges for Services	*$1,794,370*	*$926,437*	*$867,933*	*$0*
Other Revenue				
Miscellaneous	$6,300	$0	$0	$6,300
Donations	0	0	0	0
Total Other Revenue	*$6,300*	*$0*	*$0*	*$6,300*
Transfer in Accounts				
Transfer In - Fire Fund	$300,000	$0	$300,000	$0
Transfer In - Library Fund	44,000	0	44,000	0
Transfer In - Low/Moderate Housing	500,000	0	500,000	0
Transfer In - Reserve Account	30,000	0	30,000	0
Transfer In - NPDES Fund	4,000	0	4,000	0
Transfer In - DIF Fund	0	0	0	0

Table B-2 (page 2 of 2)
General Fund Revenues: 2009-2010
General Plan Update Fiscal Analysis, City of Murrieta
(In Constant 2010 Dollars)

General Fund Revenue Category	Fiscal Year Adopted 2009-2010	One-Time Revenues	Not Projected	Projected Recurring Revenues
Transfer In - CSD Fund	0	0	0	0
Transfer In - Building Department	0	0	0	0
Transfer In - CFD	0	0	0	0
Transfer In - Impound Yard Fund	0	0	0	0
Transfer In - SLEFS Fund	0	0	0	0
Transfer In - Traffic Safety	0	0	0	0
Transfer In - Area Drainage Fund	0	0	0	0
Transfer In - Foundation	0	0	0	0
Total Transfers In	*$878,000*	*$0*	*$878,000*	*$0*
Use of Money & Property				
Directional Sign Program	$85,000	$0	$85,000	$0
Interest Income	2,000,000	0	0	2,000,000
Lease/Rental Income	211,670	0	0	211,670
Proceeds of Fixed Asset Deposits	1,000	0	1,000	0
Unclaimed Funds	0	0	0	0
Vendor Remuneration	0	0	0	0
Total Use of Money & Property	*$2,297,670*	*$0*	*$86,000*	*$2,211,670*
Intergovernmental Revenue				
VLF Tax	$300,000	$0	$0	$300,000
VLF Compensation	6,551,914	0	0	6,551,914
Federal Reimbursement	64,945	0	64,945	0
State Reimbursements	33,609	0	33,609	0
Off Highway License Fees	0	0	0	0
Other Agency Reimbursement	317,822	0	317,822	0
Total Intergovernmental Revenue	*$7,268,290*	*$0*	*$416,376*	*$6,851,914*
Use of Reserves				
Use of Reserves	$949,313	$0	$949,313	$0
Fund Balance Carry Over	0	0	0	0
Total Use of Reserves	*$949,313*	*$0*	*$949,313*	*$0*
General Fund Program Revenues				
General Plan Fee	$27,000	$0	$27,000	$0
Vehicle Abatement	90,000	0	90,000	0
Waste Management	8,250	0	8,250	0
Police Services	100,000	0	0	100,000
State P.O.S.T.	25,000	0	0	25,000
Facility Indicator Fee	5,000	0	5,000	0
Total General Fund Program	*$255,250*	*$0*	*$130,250*	*$125,000*
Miscellaneous Revenue				
County Reimbursement	$0	$0	$0	$0
Cash Received-Over or Short	0	0	0	0
Govpartner Prior Year Revenue	0	0	0	0
Transfer In-Telecommunication Fund	0	0	0	0
Total Miscellaneous	*$0*	*$0*	*$0*	*$0*
CIP Revenues				
Area Drainage Fees	$0	$0	$0	$0
Development Impact Fee	0	0	0	0
Total CIP Revenue	*$0*	*$0*	*$0*	*$0*
General Fund Total	*$37,309,125*	*$2,134,204*	*$3,327,872*	*$31,847,049*

Note: 1. Revenues, such as grants or one-time fees, are not projected.

Sources: Stanley R. Hoffman Associates, Inc.
City of Murrieta, *Operating Budget, Fiscal Years 2009/10 and 2010/11*

Table B-3
Projected Recurring Revenue Factors, 2009-2010: General Fund and Gas Tax Fund
General Plan Update Fiscal Analysis, City of Murrieta
(In Constant 2010 Dollars)

Revenue Category	Fiscal Year Adopted 2009-2010 Budget	Projection Basis [1]	Projection Factor
General Fund			
Property Taxes- General Fund	$6,965,000	General Fund Share of 1% Property Tax Levy on Assessed Valuation (AV)	7.0% of 1% property tax levy
Property Transfer Tax	$400,000	Property Turnover and Valuation Assumptions	8.0% annual residential turnover rate 5.0% annual non-residential turnover rate $0.55 per $1,000 assessed valuation
Property Tax In Lieu of Motor Vehicle Tax (VLF)[2]	$6,551,914	Assessed Valuation (AV)	$782 per $1.0 million increase in AV
Sales Tax[3]	$7,956,762	Taxable Sales	1.0% of taxable sales times 75%
Sales Tax Compensation Fund[3]	$2,713,653	Taxable Sales	1.0% of taxable sales times 25%
Use Tax	n/a	Sales Tax	10.6% use tax as a percent of sales tax
Transient Occupancy Tax	$125,000	Room Receipts	10.0% of room receipts
Franchise Taxes	$3,130,000	Service Population	$27.95 per service population
Business License Tax	$551,250	Employment	$26.23 per employee
Traffic Safety Fines	$430,000	Service Population	$3.84 per service population
Other Fines and Forfeitures	$380,500	Service Population	$3.40 per service population
Motor Vehicle License Fee	$300,000	Population	$2.96 per capita
Interest Earned on Investments[4]	$2,000,000	Share of Non-Interest Recurring Revenues	3.2% of recurring General Fund revenues
Lease/Rental Income	$211,670	Population	$2.09 per capita
Program and Miscellaneous Income	$131,300	Service Population	$1.17 per service population
Total General Fund Recurring Revenues	$31,847,049		
State Gas Tax Fund[5]			
State Gasoline Tax	$1,607,639	Population	$15.84 per capita

Note: 1. For fiscal factors that are based on population and employment, an estimated Citywide average service population factor is applied to the estimated service population for the projected growth. Service population represents the resident population estimate plus 50 percent of the City's estimated employment. The weighting factor of 50 percent for employment assumes that an employee would spend about half the time as a resident in the City.
2. The State has lowered the MVLF rate, which reduces the amount of MVLF received by cities counties. However, the State is allocating property taxes to offset the MVLF loss. MVLF is projected at $782 per million dollar increase in assessed valuation, as shown in Table B-5.
3. The City of Murrieta receives one percent of the total taxable sales within the City. Of this amount, 25 percent is accounted for in the Sales Tax Compensation Fund, which is a revenue account to track the offset in sales tax taken by the State to secure the Proposition 57 Economic Recovery Bond. The City is compensated for the taken sales tax through the State's Education Revenue Augmentation Funding (ERAF).
4. Interest earned on investments was initially calculated at 6.7 percent of recurring revenues. The fiscal analysis assumes interest earned for future growth at 50 percent of it's current rate, or at 3.2 percent of annual recurring revenues.
5. These funds are specially earmarked for maintenance of City streets, including services provided by Public Works staff.

Sources: Stanley R. Hoffman Associates, Inc.
City of Murrieta, *Operating Budget, Fiscal Years 2009/10 and 2010/11*

Table B-4
Estimated Annual Residential Turnover
General Plan Update Fiscal Analysis, City of Murrieta

	Occupied Housing Units	Percent of Total
Total Owner Occupied:	**21,238**	**100.0%**
Moved in 2005 or later	7,707	36.3%
Moved in 2000 to 2004	8,173	38.5%
Annual Turnover Rate	**1,764**	**8.0%**
Moved in 1990 to 1999	3,855	18.2%
Moved in 1980 to 1989	1,231	5.8%
Moved in 1970 to 1979	272	1.3%
Moved in 1969 or earlier	0	0.0%

Source: Stanley R. Hoffman Associates, Inc.
U.S. Census Bureau, American Community Survey (ACS), 2009

Table B-5
Estimated Change in Property Tax-in Lieu VLF per $1,000,000 Increase in Assessed Valuation
General Plan Update Fiscal Analysis, City of Murrieta
(In Constant 2010 Dollars)

Category	2004/2005	2009/2010	Change in VLF
Nominal Dollars			
Property Tax in Lieu of Vehicle License Fee (VLF)	$4,367,714	$6,551,914	$2,184,200
Assessed Valuation	$7,108,192,223	$9,886,016,688	$2,777,824,465
VLF Increase per Assessed Valuation (AV) Increase			0.000786
VLF Increase per $1,000,000 increase in AV			$786
Consumer Price Index			
July 2005 = 201.400			
July 2010 = 225.991			
Change Factor = 1.122			
2010 Constant Dollars			
Property Tax in Lieu of Vehicle License Fee (VLF)	$4,848,163	$7,351,248	$2,503,085
Assessed Valuation	$7,890,093,368	$11,092,110,724	$3,202,017,356
VLF Increase per Assessed Valuation (AV) Increase			0.000782
VLF Increase per $1,000,000 increase in AV			**$782**

Note: 1. Property tax in lieu of VLF revenues are received by cities and counties to offset the State reduction in motor vehicle license fees which began in 2004. Under State law, the increase in property tax in lieu of VLF is based on the increase in assessed valuation in the jurisdiction.

Sources: Stanley R. Hoffman Associates, Inc.
State Controller's Office, Division of Account and Reporting, *Revenue and Taxation Code Section 97.90 © 1 (B) (i) Vehicle License Fee Adjustment Amounts* , 2004-2005
City of Murrieta, *Operating Budget, Fiscal Years 2009/10 and 2010/11*
Riverside County Assessor, *Assessed Value for Cities, 2009/2010*
Bureau of Labor Statistics, *Consumer Price Index - All Urban Consumers, Los Angeles-Riverside-Orange County, CA*

Table B-6
Calculation of Use Tax Factor
General Plan Update Fiscal Analysis, City of Murrieta
(In Constant 2010 Dollars)

City of Murrieta	Amount
Use Tax	
County Pool	$937,890
State Pool	8,112
Total Use Tax	$946,002
divided by	
Point-of Sale Sales Tax	$8,918,952
equals	
Use Tax Rate	**10.6%**

Note: 1. The use tax rate is the County Pool plus the State Pool divided by point-of-sale taxable sales tax.

Source: The HdL Companies, *Sales Tax Allocation Totals, Calendar Year 2009*

Sales and use tax is projected at 75.0 percent of the total sales and use tax generated because the State has reduced the local sales tax allocation (1.0 percent) by 25.0 percent and replaced this with a dollar-for-dollar allocation of local property tax from County ERAF funds.

Sales Tax Compensation Fund. As of July 1, 2004, the State has reduced the local 1 percent sales tax allocation by 25 percent and replaced this with a dollar-for-dollar allocation of local property tax from County ERAF funds. The City uses the Sales Tax Compensation Fund to track these payments, and the fiscal analysis projects these revenues at 25 percent of the estimated total sales and use tax generated.

Transient Occupancy Tax. The City assesses a tax of 10 percent of the room cost of a hotel, motel or other commercial residence. Transient occupancy tax is not projected in the General Plan Update because the number of new hotel rooms has not been identified.

Franchise Taxes. These taxes are paid by businesses that have a franchise to operate in the City. The businesses include Southern California Edison, The Gas Company, Waste Management of the Inland Empire, Verizon and Time Warner. Each company is assessed between one and ten percent of gross receipts. Based on the City Fiscal Year (FY) 2009-2010 franchise revenues of $3,130,000 and the City service population estimate of 111,997, franchise taxes are projected at $27.95 per service population.

Business License Tax. Business licenses are projected at $26.23 per employee based on FY 2009-2010 business license revenues of $551,250 and the City employment estimate of 21,019.

Traffic Safety Fines. These fines are projected at $3.84 per service population based on FY 2009-2010 adopted revenues of $430,000 and the City's service population estimate of 111,997.

Other Fines and Forfeitures. These revenues are projected at $3.40 per service population based on FY 2009-2010 adopted revenues of $380,500 and the City service population estimate of 111,997. Revenues in this category include court fines and other fines and penalties.

Motor Vehicle License Tax. Motor vehicle license tax revenues are projected at $2.96 per capita based on the City of Murrieta FY 2009-2010 revenues of $300,000 and the City population estimate of 101,487.

Interest Earned on Investments. These revenues are projected at 6.7 percent of recurring General Fund revenues based on FY 2009-2010 estimated interest earnings of $2,000,000 and non-interest General Fund recurring revenues of $31,847,049. The fiscal analysis assumes that interest for future growth will be earned at 50 percent of the current rate, or at 3.2 percent of annual recurring revenues.

Lease/Rental Income. Lease/rental revenues are projected at $2.09 per capita based on FY 2009-2010 adopted revenues of $211,670 and the City population estimate of 101,487.

Program and Miscellaneous Fees. These revenues are projected at $1.17 per service population based on FY 2009-2010 revenues of $131,300 and the City service population estimate of 111,997.

State Gas Tax Fund. State gasoline tax revenues for the City are projected at $15.84 per capita based on FY 2009-2010 adopted revenues of $1,607,639 and the City's estimated population of 101,487. These revenues are shown with the General Fund because they are earmarked for maintenance of City streets and include services provided by Public Works' staff.

General Fund Cost Assumptions

Cost factors are based on the FY 2009-2010 adopted expenditures presented in the *City of Murrieta, Operating Budget Fiscal Years 2009/10 and 2010/11*. Projected General Fund recurring costs include general government; police; development services; economic development; building and safety; and public works.

General Government. General government costs include City Council, City Attorney, General Administration, Human Resources, Risk Management, Information Services, City Clerk, Finance, Business Licenses, Purchasing, Solid Waste Management, Community Events and Promotions and Non-Departmental expenditures. These costs represent generalized services that can't be directly linked to a specific department and usually viewed as citywide overhead and are projected using an overhead rate applied to departmental line costs.

General government costs are projected at about 20.0 percent of direct General Fund for the current budget. As shown in Table B-7, FY 2009-2010 general government costs of $7,932,082 represent about 27.0 percent of direct line costs of $37,309,125. However, overhead costs are not assumed to increase on a one-to-one basis for new development. Based on the fiscal consultants experience with other cities, general government costs are projected at a marginal rate of 75 percent, or at 20.0 percent of direct costs.

Table B-7
General Fund Expenditures, Fiscal Year 2009-2010
General Plan Update Fiscal Analysis, City of Murrieta
(In Constant 2010 Dollars)

General Fund Expenditures		Fiscal Year 2009-2010 Adopted
A. General Government		
City Council		$250,614
City Attorney		600,066
Administration - General		715,750
Human Resources		740,574
Risk Management		0
Information Services		0
City Clerk		751,385
Finance		2,001,291
Business Licenses		0
Purchasing		219,278
Solid Waste Management		8,000
Community Events & Promotions		236,171
Non-Departmental		2,408,953
	Total	$7,932,082
B. Non-General Government		
Animal Control		$172,800
Development Services (Planning, GIS)		1,188,614
Economic Development		424,366
Building & Safety		1,543,658
Public Works		3,277,271
Police		22,770,334
	Total	$29,377,043
GRAND TOTAL GENERAL FUND		**$37,309,125**
CALCULATION OF GENERAL GOVERNMENT COSTS		
Total General Fund Expenditures		$37,309,125
	minus	
General Government Costs		$7,932,082
	equals	
Direct General Fund Costs		$29,377,043
General Government as a Percent of Direct General Fund		27%
Overhead at a Marginal Rate of 75 Percent[1]		20%

Note: 1. Based on the fiscal consultant's experience in other cities, City overhead for the General Plan Update is projected at 75 percent of the current City overhead rate, or at 20 percent of direct departmental costs.

Sources: Stanley R. Hoffman Associates, Inc.
City of Murrieta, *Operating Budget, Fiscal Years 2009/10 and 2010/11*

Table B-8
Projected Recurring Cost Factors, 2009-2010: General Fund
General Plan Update Fiscal Analysis, City of Murrieta
(In Constant 2010 Dollars)

Expenditure Category	Fiscal Year 2009-2010 Adopted Budget: Total Budget	Fiscal Year 2009-2010 Adopted Budget: Adjusted Budget	Projection Basis[1]	Projection Factor
General Government	$7,932,082	n/a	Case Study	20% of direct operating costs
Police	$22,770,334	n/a	Service Population	$203.31 per service population
Animal Control	$172,800	n/a	Population	$1.70 per capita
Development Services[2]	$1,188,614	$483,614	Case Study	$4.32 per service population
Economic Development	$424,366	n/a	Service Population	$3.79 per service population
Building and Safety[3]	$1,543,658	$379,454	Case Study	$3.39 per service population
Public Works[4]	$3,277,271	$3,012,271	Service Population	$26.90 per service population
Total General Fund	$37,309,125			

Note: 1. For fiscal factors that are based on population and employment, an estimated Citywide average service population factor is applied to the estimated service population for the projected growth. Service population represents the resident population estimate plus 50 percent of the City's estimated employment. The weighting factor of 50 percent for employment assumes that an employee would spend about half the time as a resident in the City.

2. Development Services costs are projected at $4.32 per service population, which represents total Development Services expenditures minus estimated one-time planning fees for new development, as shown in Table B-9.

3. Building and Safety costs are projected at $3.39 per service population, which represents total Building and Safety expenditures minus estimated one-time permit and plan check fees for new development, as shown in Table B-10.

4. Public Works costs are projected at $26.90 per service population, which represents total Public Works expenditures minus estimated one-time Public Works fees for new development, as shown in Table B-11.

Sources: Stanley R. Hoffman Associates, Inc.
City of Murrieta, *Operating Budget, Fiscal Years 2009/10 and 2010/11*

Police Protection. As shown in Table B-8, police protection costs are projected at about $203.31 per service population based on FY 2009-2010 expenditures of $22,770,334 and the City service population estimate of 111,997.

Animal Control. The Animal Control division contracts with Animal Friends of the Valley (AFV) for animal control services. The division is overseen by the City Manager's Office. As shown, in Table B-8, animal control costs are projected at $1.70 per capita based on FY 2009-2010 adopted expenditures of $172,800 and the City's estimated population of 101,487.

Development Services. Development services costs are projected at $4.32 per service population based on FY 2009-2010 net costs of $483,614 and the City service population estimate of 111,997. Development services net costs represent the budgeted costs of $1,188,614 minus projected one-time fee and permit revenues of $705,000, as shown in Table B-9.

Economic Development. Economic Development costs are projected at $3.79 per service population based on FY 2009-2010 expenditures of $424,366 and the City's estimated service population of 111,997

Building and Safety. Building and Safety costs are projected at $3.39 per service population based on FY 2009-2010 net costs of $379,454 and the City service population estimate of 111,997. Building and Safety net costs represent the budgeted costs of $1,543,658 minus projected one-time fee and permit revenues of $1,164,204, as shown in Table B-10.

Public Works. Public Works costs are projected at $26.90 per service population based on net costs of $3,012,271 and the City's estimate service population. As shown in Table B-11, one-time public works revenues of $265,000 are subtracted from FY 2009-2010 adopted expenditures of $3,277,271 resulting in net costs of $3,012,771 for Public Works.

Table B-9
Net Recurring Development Services Cost Factor
General Plan Update Fiscal Analysis, City of Murrieta
(In Constant 2010 Dollars)

Category	Amount
Budgeted Development Services Expenditures	$1,188,614
minus	
One-Time Fees	
Licenses and Permits:	
Development Services Fees	$100,000
Vacant Home Property	50,000
Permit Fee Revenue	15,000
Subtotal Building Licenses and Permits	*$165,000*
Charges for Services:	
Planning-Inspection/Plan Check	$540,000
Subtotal Charges for Services	*$540,000*
Total One-Time Fees	**$705,000**
equals	
Recurring Net Development Services Expenditures	**$483,614**
divided by	
Service Population [1]	111,997
equals	
Citywide Net Cost Factor per Service Population	**$4.32**

Note: 1. For fiscal factors that are based on population and employment, an estimated Citywide average service population factor is applied to the estimated service population for the projected growth. Service population represents the City's estimated daytime population.

Sources: Stanley R. Hoffman Associates, Inc.
City of Murrieta, *Operating Budget, Fiscal Years 2009/10 and 2010/11*

Table B-10
Net Recurring Building and Safety Cost Factor
General Plan Update Fiscal Analysis, City of Murrieta
(In Constant 2010 Dollars)

Category	Amount
Budgeted Building and Safety Expenditures	$1,543,658
minus	
One-Time Fees	
Licenses and Permits:	
Building Permits - Non-Residential	$783,363
Miscellaneous Permits	18,496
Permit Issuance Fee	199,796
Residential Building Permits	26,112
Subtotal Building Licenses and Permits	*$1,027,767*
Charges for Services:	
Plan Checks - Building	$132,737
Miscellaneous	3,700
Subtotal Charges for Services	*$136,437*
Total One-Time Fees	**$1,164,204**
equals	
Recurring Net Building and Safety Expenditures	**$379,454**
divided by	
Service Population [1]	111,997
equals	
Citywide Net Cost Factor per Service Population	**$3.39**

Note: 1. For fiscal factors that are based on population and employment, an estimated Citywide average service population factor is applied to the estimated service population for the projected growth. Service population represents the City's estimated daytime population.

Sources: Stanley R. Hoffman Associates, Inc.
City of Murrieta, *Operating Budget, Fiscal Years 2009/10 and 2010/11*

Table B-11
Net Recurring Public Works Cost Factor
General Plan Update Fiscal Analysis, City of Murrieta
(In Constant 2010 Dollars)

Category	Amount
Budgeted Public Works Expenditures	$3,277,271
minus	
One-Time Fees	
Licenses and Permits:	
Transportation Permit Fee	*$15,000*
Charges for Services:	
Inspection Charges	$200,000
Public Works Charges	50,000
Subtotal Charges for Services	*$250,000*
Total One-Time Fees	**$265,000**
equals	
Recurring Net Public Works Expenditures	**$3,012,271**
divided by	
Service Population[1]	111,997
equals	
Citywide Net Cost Factor per Service Population	**$26.90**

Note: 1. For fiscal factors that are based on population and employment, an estimated Citywide average service population factor is applied to the estimated service population for the projected growth. Service population represents the City's estimated daytime population.

Sources: Stanley R. Hoffman Associates, Inc.
City of Murrieta, *Operating Budget, Fiscal Years 2009/10 and 2010/11*

B.3 Murrieta Fire District

The Murrieta Fire District is the operating fund for the City's Fire Department. It is a separate legal entity with its own sources of funding and has a separate budget from the General Fund.

Fire District Revenue Assumptions

As shown in Table B-12, recurring revenues to the Fire District include property tax, fire assessments, charges for services, interest earned on investments, intergovernmental revenues, other revenues and reserves. Intergovernmental revenues, other revenues and reserves are not projected for the General Plan Update because they represent Fire District funding sources that are uncertain for the future.

Property Tax. As discussed previously, property tax revenues are projected at the one percent property tax levy on the assessed valuation for development anticipated for the General Plan Update. For the development located in areas outside redevelopment project areas, property tax to the Murrieta Fire District is projected at 11.5 percent of the basic one percent property tax levy.

Fire Assessment. A fire assessment of $40 per household was approved by voters to supplement fire protection services.

Charges for Services. Based on the FY 2009-2010 adopted revenues of $132,500 and the City's service population estimate of 111,997, Fire District charges for services are projected at $1.19 per service population.

Interest Earned on Investments. Fire District interest is projected at 1.0 percent of recurring Fund revenues based on FY 2009-2010 estimated interest earnings of $100,000 and non-interest Fire District recurring revenues of $12,993,001.

Fire District Cost Assumption

As shown in Table B-13, fire protection costs are projected at $116.90 per service population. This cost is based on FY 2009-2010 adopted Fire District expenditures of $13,093,001 and the City's estimated service population of 111,997.

B.4 Murrieta Community Services District

The Murrieta Community Services District (CSD) pays for all parks and recreation activities, including the lighting and landscaping maintenance districts throughout the City. The CSD also pays for drainage, flood control and street sweeping.

Community Services District Revenue Assumptions

As shown in Table B-12, recurring revenues to the CSD include assessments, charges for recreation services, transfers from the General Fund for parks and recreation, interest earned on investments, trust fund transfers and reserves. Trust fund transfers and reserves are not projected for the General Plan Update because they represent CSD funding sources that are uncertain for the future.

Table B-12
Projected Recurring Revenue Factors, 2009-2010: Other Funds
General Plan Update Fiscal Analysis, City of Murrieta
(In Constant 2010 Dollars)

Revenue Category	Fiscal Year Adopted 2009-2010 Budget	Projection Basis [1]	Projection Factor
Murrieta Fire District			
Property Taxes- Murrieta Fire District	$9,869,727	Fire District Share of 1% Property Tax Levy on Assessed Valuation (AV)	11.5% of 1% property tax levy
Fire Assessment	$1,525,130	Case Study	$40 per unit
Charges for Services	$132,500	Service Population	$1.18 per service population
Intergovernmental Revenues[2]	$400,000	Case Study	n/a not projected
Other Revenue and Reserves[2]	$1,065,644	Case Study	n/a not projected
Interest Earned on Investments	$100,000	Share of Non-Interest Recurring Revenues	1.0% of recurring Fire District revenues
Total Fire District Revenues	$13,093,001		
Murrieta Community Services District			
Parks and Recreation Assessment	$2,774,603	Case Study	$45 per unit
LLD Assessments	$3,550,165	Service Population	$32 per service population
Flood & Drainage Control/Street Sweeping Assessment	$1,783,787	Equivalent Benefit Unit (EBU)	$45.44 per EBU
		EBU Factors	1.0 EBU per residential unit
			3,000 Non-residential square feet per EDU
Charges for Recreation Services	$419,000	Population	$4.13 per capita
Transfer from General Fund for Parks and Recreation	$1,027,313	Population	$10.12 per capita
Interest Earned on Investments	$255,000	Share of Non-Interest Recurring Revenues	3.0% of recurring CSD Fund revenues
Trust Fund Transfer and Reserves[2]	$220,401	Case Study	n/a not projected
Total CSD Revenues	$10,030,269		
Murrieta Public Library			
Property Taxes- Murrieta Public Library	$1,692,790	Library Fund Share of 1% Property Tax Levy on Assessed Valuation (AV)	0.3% of 1% property tax levy
Charges for Services	$61,300	Population	$0.60 per capita
Interest Earned on Investments	$45,000	Share of Non-Interest Recurring Revenues	2.0% of recurring Library Fund revenues
Intergovernmental Revenues[2]	$130,000	Case Study	n/a not projected
Reserves[2]	$415,292	Case Study	n/a not projected
Total Library Fund Revenues	$2,344,382		

Note: 1. For fiscal factors that are based on population and employment, an estimated Citywide average service population factor is applied to the estimated service population for the projected growth. Service population represents the resident population estimate plus 50 percent of the City's estimated employment. The weighting factor of 50 percent for employment assumes that an employee would spend about half the time as a resident in the City.

2. These revenues represent revenues that are transferred from other funds and sources, including reserves, in the current budget. Because of the uncertainty of these revenues for the future, these revenues are not assumed to be recurring and are not projected for incremental growth.

Sources: Stanley R. Hoffman Associates, Inc.
City of Murrieta, *Operating Budget, Fiscal Years 2009/10 and 2010/11*
Wildan Financial Services, *City of Murrieta, Engineer's Annual Levy Report, Murrieta Community Services District, Fiscal Year 2010/2011 Collection Roll*, June 2010

Table B-13
Projected Recurring Cost Factors, 2009-2010: Other Funds
General Plan Update Fiscal Analysis, City of Murrieta
(In Constant 2010 Dollars)

Expenditure Category	Fiscal Year 2009-2010 Adopted Budget		Projection Basis[1]	Projection Factor
	Total Budget	Adjusted Budget		
Murrieta Fire District				
Fire Protection	$13,093,001	$13,093,001	Service Population	$116.90 per service population
Murrieta Community Services District CSD)				
Recreation, Parks and Parkways	$3,453,685	$3,453,685	Case Study	$30.84 per service population
Lighting and Landscaping	$4,879,587	$4,879,587	Case Study	$43.57 per service population
Drainage/Flood Control/Street Sweeping	$1,696,997	$1,696,997	Case Study	$15.15 per service population
Total CSD	$10,030,269	$10,030,269		
Library Fund				
Library Services	$2,344,382	$2,344,382	Population	$23.10 per capita

Note: 1. For fiscal factors that are based on population and employment, an estimated Citywide average service population factor is applied to the estimated service population for the projected growth. Service population represents the resident population estimate plus 50 percent of the City's estimated employment. The weighting factor of 50 percent for employment assumes that an employee would spend about half the time as a resident in the City.

Sources: Stanley R. Hoffman Associates, Inc.
City of Murrieta, *Operating Budget, Fiscal Years 2009/10 and 2010/11*
Wildan Financial Services, *City of Murrieta, Engineer's Annual Levy Report, Murrieta Community Services District*, June 2010

Assessments. Assessments represent about 90 percent of the recurring revenues for the CSD. Three types of assessments are collected:

Parks and Recreation Assessment. An assessment of $45 per household was approved by voters in 1998. Of this amount, about 61 percent goes toward maintenance of City parks and general landscaping and the remaining 39 percent is for recreation services.

LLD Assessments. Based on budget revenues of $3,550,165 and the City's service population estimate of 111,997, LLD assessments are projected at $32 per service population.

Flood Control, Drainage and Street Sweeping. An assessment of $45.44 per equivalent benefit unit (EBU) is charged for these services. One EBU is equal to one residential unit and about 3,000 non-residential square feet are equal to one EBU.

Charges for Recreation Services. As shown in Table B-12, based on the FY 2009-2010 adopted revenues of $419,000 and the City's population estimate of 101,487, CSD charges for recreation services are projected at $4.13 per capita.

Transfer from General Fund for Recreation Services. Based on FY 2009-2010 transfers to the CSD of $1,027,313 from the General Fund and the City's population estimate, these revenues are projected at $10.12 per capita.

Interest Earned on Investments. CSD interest is projected at 3.0 percent of recurring CSD revenues based on FY 2009-2010 estimated interest earnings of $255,000 and non-interest CSD recurring revenues of $9,755,269.

Community Services District Cost Assumptions

Recreation, Parks and Parkways. As shown in Table B-13, these costs are projected at $30.34 per service population. This cost is based on FY 2009-2010 adopted expenditures of $3,453,685 for recreation, parks and parkway maintenance services and the City's estimated service population of 111,997.

Lighting and Landscaping. While the costs vary by benefit zone, the Citywide LLD costs are projected at $43.57 per service population based on FY 2009-2010 adopted expenditures of $4,879,587 and the City's estimated service population.

Drainage, Flood Control and Street Sweeping. Based on the FY 2009-2010 adopted expenditures of $1,696,997 and the City's service population estimate of 111,997, these services are projected at $15.15 per service population.

B.5 Murrieta Public Library

The Murrieta Library Fund is the operating fund for the City's Public Library. It is a separate legal entity with its own sources of funding and has a separate budget from the General Fund.

Library Fund Revenue Assumptions

As shown in Table B-12, recurring revenues to the Library Fund include property tax, charges for services, interest earned on investments, intergovernmental revenues and reserves.

Intergovernmental revenues and reserves are not projected for the General Plan Update because they represent Library funding sources that are uncertain for the future.

Property Tax. For the development located in areas outside redevelopment project areas, property tax to the Murrieta Library Fund are projected at 0.3 percent of the basic one percent property tax levy.

Charges for Services. Based on the FY 2009-2010 adopted revenues of $61,300 and the City's population estimate of 101,487, Library charges for services are projected at $0.60 per capita.

Interest Earned on Investments. Library Fund interest is projected at 2.0 percent of recurring Fund revenues based on FY 2009-2010 estimated interest earnings of $45,000 and non-interest Library recurring revenues of $2,299,382.

Library Services Cost Assumption

As shown in Table B-13, costs for library services are projected at $23.10 per capita. This cost is based on FY 2009-2010 adopted Library Fund expenditures of $2,344,382 and the City's estimated population of 101,487.

APPENDIX C
PROJECT REFERENCES

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Stanley R. Hoffman Associates, Inc., Murrieta Retail Analysis, January 2011

WEBSITES CONSULTED

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www.census.gov, U.S. Census Bureau, *American Community Survey*, 2009, housing turnover
www.boe.ca.gov, California Board of Equalization, *Taxable Sales in California*
www.zillow.com, Murrieta home values
www.lee-associates.com, Murrieta commercial, business park, industrial and office values
www.loopnet.com, Murrieta commercial, business park, industrial and office values
www.showcase.com, Murrieta commercial, business park, industrial and office values

Appendix T:

Murrieta General Plan Update Retail Land Use Market Analysis

Retail Land Use Market Analysis
Murrieta General Plan Update

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EXECUTIVE SUMMARY

The purpose of this study is to evaluate the market viability of the proposed retail land uses under the City of Murrieta General Plan update for build-out conditions by 2035. The proposed General Plan retail land use acreages are analyzed for the constituent amount of regionally competitive retail space which trade in general merchandise, furnishings, apparel and other specialty retail (GAFO) goods. The balance of retail space comprising food stores, eating and drinking, building materials, auto sales and supplies and service stations is also projected.

As shown in Table 1, under the Recommended Scenario, total retail sales are projected to be about $2.4 billion and about $2.7 billion under Scenario B for the City. Retail sales in the GAFO, eating and drinking and service station categories have also been factored up in order to account for increased retail sales due to projected increases in employment, visitors, and some business-to-business sales in Murrieta

As shown on Table 1, based on the total retail sales estimates and the estimated sales per square foot, the projected total retail center square feet is about 4.68 million square feet under the Recommended Scenario and 5.19 million square feet under Scenario B. Also the number of new permits projected for New Auto Dealers range from 14 to 16 while new permits projected for Service Stations range from 40 to 46.

Based on about 9.06 million square feet of existing and proposed retail developments in Murrieta, the projected 4.68 million square feet of demand under the Recommended Scenario represents about 52 percent of the total; the projected 5.19 million square feet of demand under Scenario B represents about 57 percent of the total.

Table 1
Projected Retail Sales and Square Footage for General Plan Growth Scenarios: 2035
City of Murrieta

	Recommended	Scenario B
Projected Total Retail Sales		
GAFO[2]	$1,033,452,925	$1,107,618,943
Food and Groceries[1]	$355,112,077	$416,740,195
Eating and Drinking[2]	$265,445,352	$311,512,210
Building Materials	$153,299,630	$179,904,098
Auto Supplies and Parts	$38,308,336	$44,956,577
Auto Dealers - New	$229,850,017	$269,739,464
Auto Dealers - Used, RV and Other	$51,077,782	$59,942,103
Service Stations[2]	$259,192,834	$304,174,595
Total Retail Sales	$2,385,738,953	$2,694,588,185
Projected Square Feet Increment		
GAFO	2,952,700	3,164,600
Food and Groceries	682,900	801,400
Eating and Drinking	482,600	566,400
Building Materials	425,800	499,700
Auto Supplies and Parts	136,800	160,600
Total Retail Center Square Feet	**4,680,800**	**5,192,700**
Total Existing and Proposed Square Feet	9,058,965	9,058,965
Retail Center to Total Existing and Proposed Square Feet	**52%**	**57%**
Auto Dealers - New		
Taxable Sales per Permit	$16,845,000	$16,845,000
Projected Permits at 2008 Rates	14	16
Service Stations		
Taxable Sales per Permit	$6,558,000	$6,558,000
Projected Permits	40	46

1. Food store sales have been converted to taxable sales using a taxable factor of 25% based on State of California, BOE taxable/non-taxable food sales, 1985.
2. The household retail sales projections for GAFO, Eating and Drinking and Service Stations have been factored by 1.25 to account for increased retail sales due to projected increases in employment, visitors and some business-to-business sales in Murrieta; this is a rough approximation by the retail consultant to account for these uncertain demand sources.

Source: Stanley R. Hoffman Associates, Inc.

CHAPTER 1
INTRODUCTION

1.1 Purpose of the Study

The purpose of this study is to evaluate the market viability of the proposed retail land uses under the City of Murrieta General Plan update. The proposed General Plan retail land use acreages are analyzed for the constituent amount of regionally competitive retail space, which trade in general merchandise, furnishings, apparel and other specialty retail (GAFO) goods. It is assumed that the balance of the retail space, comprising food stores, building materials and retail services, will be sustained by future household growth within the City.

The proposed growth in GAFO retail space supply is analyzed in relation to projected increases in households and their associated retail expenditures over a larger geographic area, encompassing the regional vicinity of Murrieta from which the proposed General Plan GAFO uses could draw potential customers. Household retail expenditures have been calculated for: a. existing conditions (2008); and b. long-term projection (2008 to 2035). The area over which stores draw household retail expenditures is referred to as the 'retail trade area' – typically a 10-mile area for GAFO goods from a given point of analysis.

In this study, the GAFO retail trade area is defined as approximately a 10-mile ring from the Golden Triangle in Murrieta at the intersection of Interstate 215 and Interstate 15. Further, stores outside the City competing with the proposed General Plan GAFO retail for the retail expenditures of the same households residing within the retail trade area could also be located farther beyond the 10-mile GAFO retail trade area. Households residing at the periphery of the 10-mile ring could potentially commute away from the center of the ring to shop for GAFO goods. The larger retail stores geography serving the 10-mile trade area households is defined as the competitive retail store area (CRSA) and includes GAFO stores in Temecula, Lake Elsinore, Menifee, Wildomar and Hemet.

The analytical question being addressed in this market study is to assess the absorption of the projected new GAFO retail space within the CRSA, including that proposed under the General Plan update and projected additions in other CRSA cities, given the projected growth in household retail expenditures, while holding constant assumptions regarding the sales per square foot performance of GAFO retail within the CRSA. Additionally, it is assumed that current vacancies at prevailing market retail sales per square foot performance rates are absorbed first before the absorption of the proposed new GAFO retail space in the CRSA. This analytical question is answered under two sets

of conditions – a) Project Only; and b) Cumulative Impacts.

The Project Only scenario conducts the assessment of the proposed General Plan GAFO retail uses assuming that no other projected retail developments occur outside the City. The Cumulative Impacts scenario assumes that all future retail developments occur, including those within and outside the City in the CRSA.

1.2 Murrieta and its Regional Context

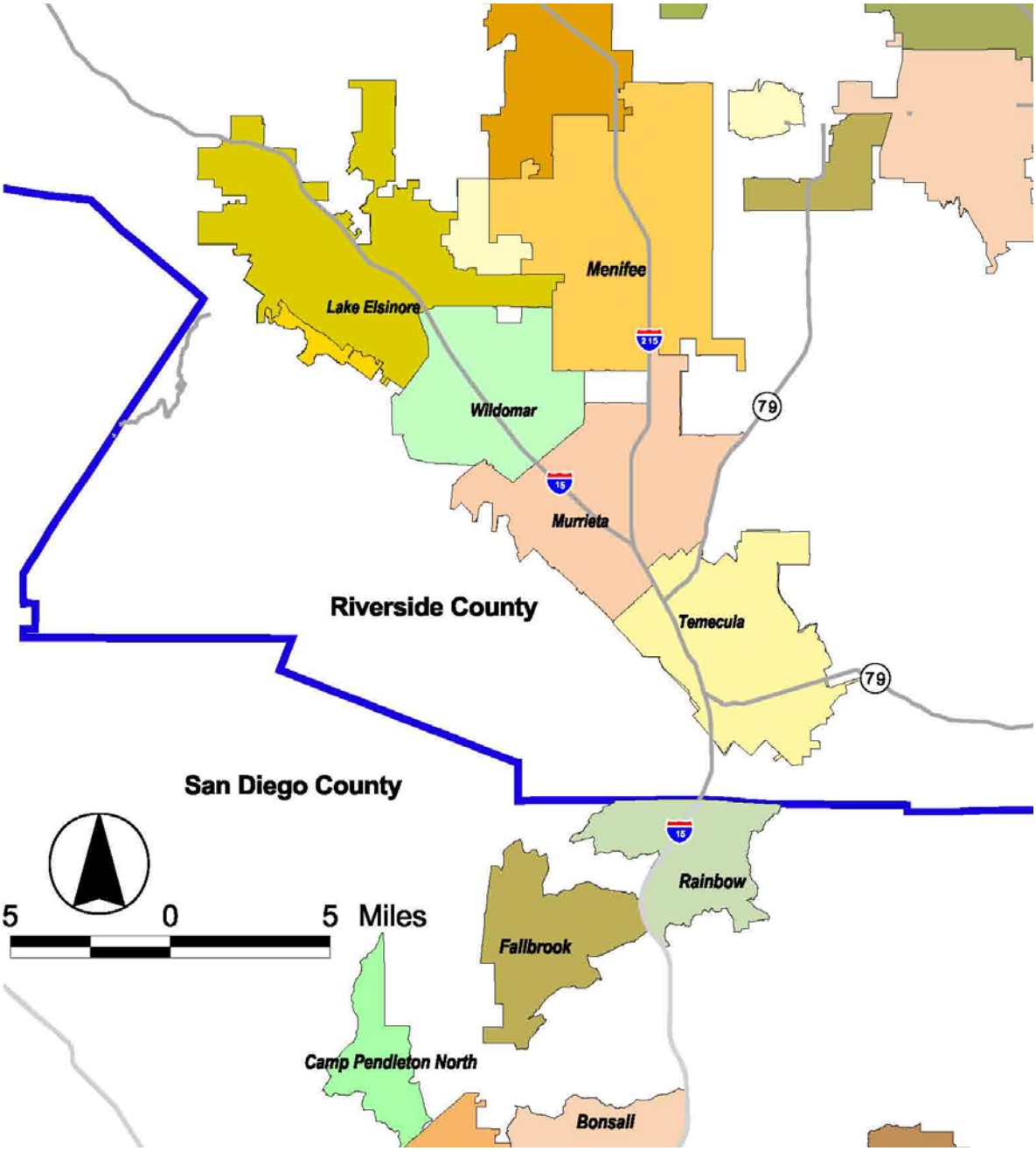
The City of Murrieta is located in southwestern Riverside County, immediately north of the City of Temecula and San Diego County border, as shown in Figure 1-1. Murrieta and the surrounding cities of Temecula to the southeast, Menifee to the northeast and Wildomar to the northwest, along with the unincorporated areas northerly and easterly of Murrieta along the I-215 and Highway 79 corridors, taken together are defined in this study as the Temecula Valley Sub-region.

As shown in Figure 1-1, the city is well served by two freeways that traverse the city in a generally north-south direction: 1) Interstate Highway 15; and 2) Interstate Highway 215. The city is also served by the north-south Winchester Corridor (Highway 79). This corridor begins to the south in Temecula at its intersection with Interstate Highway 15 and proceeds northerly along the eastern side of Murrieta and continues through the City of Menifee, eventually reaching Interstate Highway 10, which is a major east-west interstate corridor.

At present, rail transportation to other Southern California locations is accessed from the Metrolink station located in the City of Corona 31 miles north of Murrieta. Plans to extend the rail network to southwest Riverside County are currently underway. Further, several stations along the California High Speed Rail are planned within the Temecula Valley Region, with one station being located somewhere within the City of Murrieta in the general vicinity of the confluence of Interstate 15 and Interstate 215. This area, called the "Golden Triangle", is positioned to become a major regional node of business, retail and residential development.

Further, the Temecula Valley sub-region is served by several major airports, including the Ontario International Airport in San Bernardino County to the north located within 49 miles of Murrieta, the John Wayne Airport in Orange County at about 65 miles, the San Diego International Airport at 68 miles to the southwest and the Los Angeles International Airport located in the City of Los Angeles about 68 miles from Murrieta.

Figure 1-1
Regional Context Map



Source: Stanley R. Hoffman Associates, Inc.

1.3 Sources of Information

This study is based upon information from several sources including:

Historic Data

- Historic population and household growth data from the U.S. Bureau of the Census, American Community Survey 2008, and the California Department of Finance, 1991 to 2009.
- Baseline (2008) estimates of population and households within the City and the remainder 10-mile GAFO retail trade area is based on statistics provided in the Riverside RIVTAM Traffic Demand model provided by Iteris – the General Plan traffic consultants.
- Household income estimates for the households residing within the 10-mile retail trade area by zones are obtained from the RIVTAM model. The RIVTAM model income statistics are based on the Southern California Association of Governments (SCAG) RTP 2008 socio-economic and demographic (SED) data.
- The RIVTAM/SCAG SED income statistics, dated for 2003, are further calibrated to the most current (2008) estimates of average household income within the retail trade area based on the American Community Survey (ACS) at the Public Use Microdata Area (PUMA) level.
- Current estimates of household retail expenditure spending patterns by household income and household size are assembled from the Bureau of Labor Statistics (BLS) and the American Community Survey (ACS) 2008.
- Taxable sales data for Murrieta for the 1997 to 2008 time period and information on surrounding communities for 2008 from the California State Board of Equalization.
- Retail market inventory data have been assembled based on information obtained from CoStar and field surveys undertaken by the Consultant in Murrieta and its surrounding areas through August 2010.
- Existing levels of vacancy in GAFO retail centers within the competitive retail stores area (CRSA) are based on surveys conducted by the consultant through August 2010.

Growth Projection Data

- Household growth projections at build-out (2035) for the City of Murrieta are obtained from the General Plan update as provided by RBF Consulting – the General Plan update lead consultants;
- Household growth projections for the 10-mile trade area for 2035 for areas outside Murrieta are obtained from the Riverside RIVTAM Traffic Demand model;
- Proposed retail land uses within the City of Murrieta are obtained from the General Plan update as provided by RBF Consulting.
- A list of GAFO retail developments that are currently under construction, planned or proposed within the CRSA has been assembled by Stanley R. Hoffman Associates based on data obtained from the Planning departments of the CRSA cities, including Temecula, Lake Elsinore, Menifee, Wildomar and Hemet.

1.4 Outline of the Report

This report is organized by the following chapters:

- Chapter 2 discusses the definition and assembly of geographies used in this market analysis including the 10-mile GAFO retail trade area and the competitive retail supply area (CRSA).
- Chapter 3 provides estimates of population, households and household size for the baseline (2008) conditions and at projected build-out (2035) for the City and the 10-mile GAFO retail trade area.
- Chapter 4 documents an inventory of existing GAFO retail supply and vacant space within Murrieta and the remainder CRSA, based on available market data and surveys conducted by the Consultant. Data is provided on the average retail sales per square foot performance of popular GAFO retail chains operating in the U.S. Also provided in this chapter is a discussion of the projected Murrieta General Plan update retail land-uses, as provided RBF Consulting, and information on new retail under-construction, planned and proposed within the larger CRSA.
- Chapter 5 provides the estimation of household GAFO retail expenditures within the 10-mile trade area based on the calculation of average household income within the trade area and the household retail expenditure patterns.
- Chapter 6 assesses the projected growth GAFO retail demand in the 10-mile trade area in comparison to the growth in supply of competitive GAFO retail space within the CRSA in order to estimate market viability (absorption) of the proposed GAFO retail under the Murrieta General Plan update.
- Appendix A provides the supporting technical tables on demographic and income estimations used in this market analysis report.
- Appendix B provides support information on the GAFO retail inventory assembled for this study.

CHAPTER 2
RETAIL TRADE AREAS

2.1 Definition of Trade Area

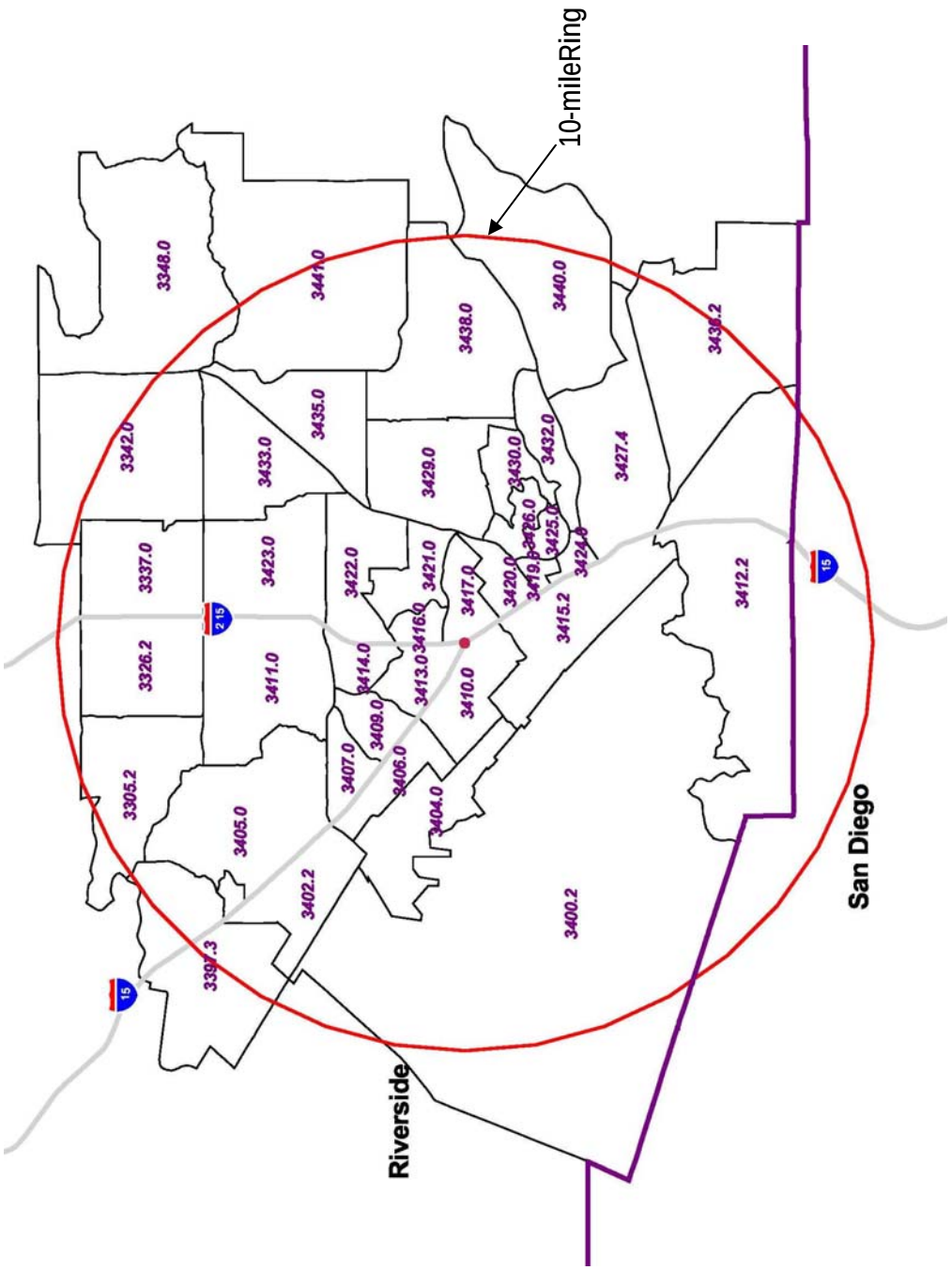
The present study analyzes the market viability of the regionally competitive general merchandise, apparel, furnishing, and other specialty (GAFO) retail space projected under the proposed Murrieta General Plan update land uses. The competitive retail trade area is defined as the area from which the GAFO retail stores are expected to draw most of their retail demand.

According to the International Council of Shopping Center's (ICSC) Dictionary of Shopping Center Terms, a trade area is "……the territory from which 85 percent to 90 percent of retail trade will come on a continuing basis" (2005, p. 157). For GAFO merchandise, a trade area surrounding the City was defined based on SCAG traffic analysis zones (TAZ) that were wholly or partially within 10.0 miles of the intersection of the I-15 and the I-215.

Further each SCAG TAZ is comprised of constituent smaller Riverside RIVTAM Traffic Demand model zones, which formed the basis for the General Plan update demographic data, as provided to the Consultant by Iteris. A map of the study retail trade area definition based on an aggregation of selected SCAG TAZs can be found in Figure 2-1. The households residing within this trade area comprise the majority of the customer base for the proposed competitive GAFO retail space under the Murrieta General Plan update and other competitive retail stores in the region.

The decision was made to conform the trade area definition to the SCAG TAZs because (a) these zones are used by state, regional and local governmental entities in traffic and other planning activities, (b) they are consistent with US Census Bureau census tract definitions and (c) these zones are consistent with ongoing forecast revisions reflecting the local area input as provided by the Riverside RIVTAM model. The distance criterion was selected by the consultants after an assessment of various factors including existing and future residential development, present and future road patterns, the locations of competitive GAFO retail stores and centers, and the trade area draw of typical GAFO store types including discount stores, department stores, specialty hard goods stores and apparel and specialty soft goods stores. The typical draw for these types of stores is in the 5 to 8 mile range in urban settings (See, Ray, 1996, pp. 138-142). The distance criterion has been relaxed to 10 miles to account for the more suburban character of the Temecula Valley region.

Figure 2-1
GAFO Trade Area by SCAG Traffic Analysis Zones



Source: Stanley R. Hoffman Associates, Inc.

2.2 Study GAFO Retail Trade Area

Most of the projected retail demand in GAFO is derived from retail expenditures of households residing within their respective trade areas. Accommodating additional retail space in these trade areas will depend on the growth in retail-space demand from an increase in household retail expenditures in the GAFO categories. These expenditures have been calculated for: a. existing conditions (2008); and b. long-term projections (2008 to 2035).

The growth in household retail expenditures in the trade area over the study time period will depend on growth in the number of households, average household income and average household size. These household characteristics have been estimated from data obtained from the Riverside County RIVTAM Traffic Demand model, the Southern California Association of Governments (SCAG) 2008 Regional Transportation Plan (RTP) and the U.S. Bureau of the Census American Community Survey (ACS). The estimated growth of households and persons per household in the retail trade area is estimated from data provided at the local level in the RIVTAM model at the smaller analysis zones.

Assembling the GAFO Retail Trade Area

The definition and assembly of the retail trade area for this study involve several steps, including the selection of SCAG TAZs and the constituent smaller RIVTAM model zones, followed by a final step to create larger study zones used for the market analysis.

The first step in defining the trade area for this market study involved identifying SCAG TAZs that fell wholly or partially within the 10-mile trade area, as shown in Appendix Figure A-1. This step was followed by selecting the smaller RIVTAM zones that constitute the identified SCAG TAZs, as show in Appendix Figure A-2. Updated base-year (2008) estimates of population and households for the City of Murrieta were provided by Iteris with inputs from City Staff at the smaller RIVTAM zone level. Information for areas outside the City was also taken from the RIVTAM model. As stated earlier, the RIVTAM model is based on SCAG's RTP model template, and it is updated regularly to incorporate local inputs of jurisdictions within Riverside County. The zones within the RIVTAM model, as a consequence, are smaller constituent parts of the SCAG TAZs, which in most Southern California sub-regions are coterminous with Census Tract geographies.

Further, household income statistics reported in the RIVTAM model are actually based directly on numbers reported in the SCAG RTP socio-economic and demographics (SED) TAZ data, with the smaller RIVTAM zones taking on the same value as the parent SCAG TAZ household income

values. However, upon further investigation by the Consultant, it was discovered that the SCAG TAZ household income numbers were not current for the year 2008, and needed further calibration to the Census American Community Survey (ACS) 2008 household income estimates, which will be discussed later in Chapter 5.

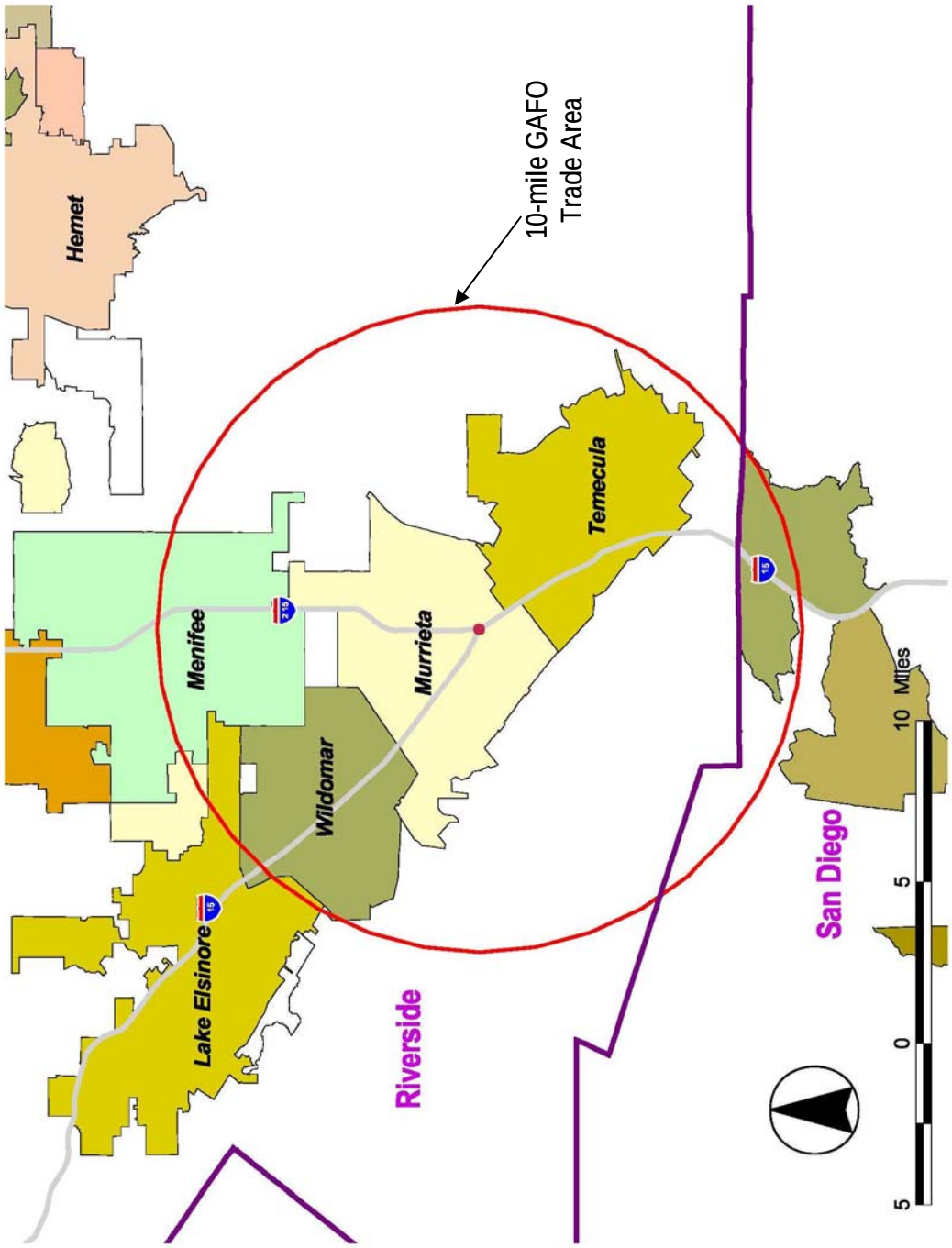
An updated dataset was thus prepared at the SCAG TAZ level, including current estimates of population and household statistics based on local inputs for the City of Murrieta and other Riverside County areas from the RIVTAM model zones, and adjusted average household income statistics based on the ACS 2008.

The last step in the process of defining the retail trade involved the aggregation of few of the selected study 10-mile SCAG TAZs to larger TAZ-based "Demand Zones", based on geographical remoteness from the center of the retail trade area and relative distribution of household density. The final aggregation of the SCAG TAZs to the Demand Zones was displayed previously in Figure 2-1, and this forms the basis for data input and analysis within a spatial framework to assess the impact of the geographical distribution of household retail expenditures within the GAFO retail trade area on existing and future GAFO retail supply.

2.3 Competitive Retail Supply Area

The supply of GAFO retail space is taken in this study over a larger competitive retail supply area (CRSA), which besides including Murrieta also includes the cities of Temecula, Lake Elsinore, Menifee, Wildomar and Hemet. As stated earlier, stores in these other cities would also compete with the projected growth in household retail expenditures within the 10-mile GAFO retail trade area. As explained before, this results in the CRSA being larger than the 10-mile GAFO retail trade area. A schematic of the CRSA is shown in Figure 2-2, indicating the cities in which the competitive retail stores are located. A detailed map of store location within the CRSA cities is shown and discussed later in Chapter 4.

Figure 2-2
Competitive Retail Supply Area Cities



Source: Stanley R. Hoffman Associates, Inc.

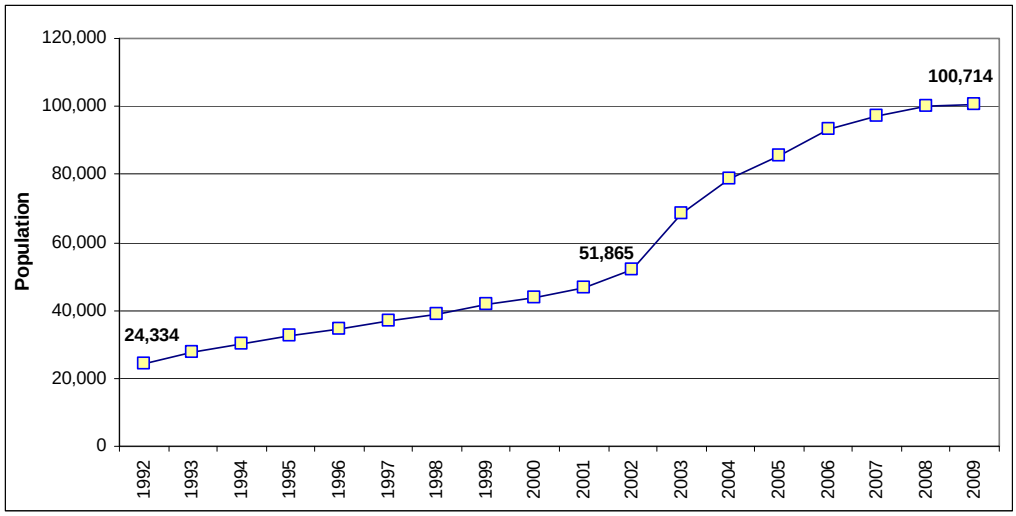
CHAPTER 3
TRADE AREA DEMOGRAPHIC GROWTH

This chapter presents an overview of historic demographic growth and projected future household growth within the City of Murrieta and the 10-mile retail trade area. Historic estimates of population and households for the City are obtained from the Census and the California Department of Finance. The baseline (2008) estimates of population and households within the City and the overall retail trade area used in this market analysis are obtained from the RIVTAM model. This is followed by an estimation of projected household growth at build-out (2035) within the City and the overall retail trade area. Projected household growth for the City of Murrieta at build-out is obtained from RBF Consulting, as proposed under the General Plan update, while population and household growth projections for other parts within the trade area are estimated from the RIVTAM model aggregated to SCAG traffic analysis zones (TAZs).

3.1 City Historic Population and Household Growth: 1990 to 2010

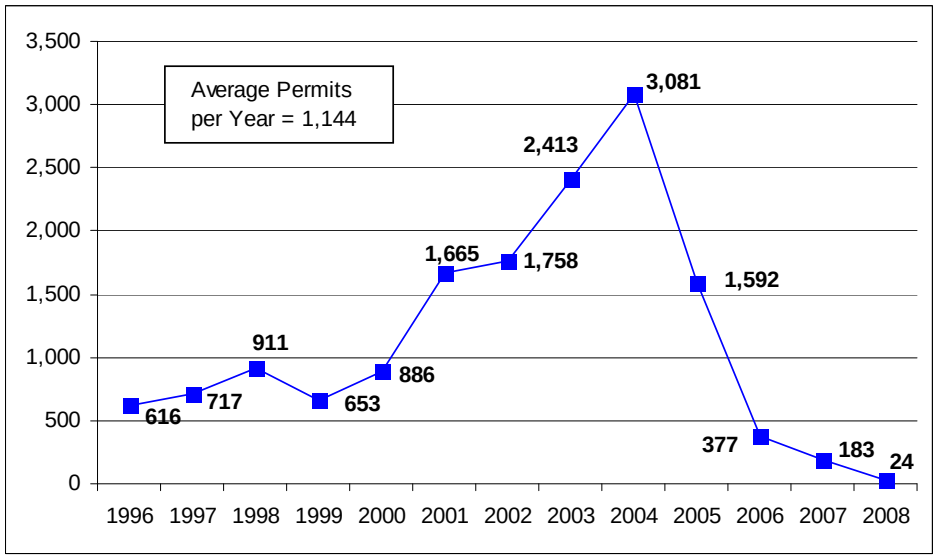
- The City of Murrieta was incorporated in 1991with an estimated population of 24,334 at the beginning of 1992, according to the California Department of Finance (DOF).
- As shown in Figure 3-1, the City's population grew to 51,865 in 2002, more than doubling over a 10-year period.
- Population growth rate accelerated rapidly over the 2002 to 2007 time period, with population almost doubling from 51,865 in 2002 to 97,329 in 2007 in just 5 years.
- The City's population was estimated by the California Department of Finance to have reached 100,714 by January 2009.
- As shown in Figure 3-2, this rapid population growth over the 2002 to 2007 time period was led by high levels of residential construction, as shown by permitting activity over 2001 to 2005 relative to the preceding 5-year time period reported by the U.S. Bureau of the Census .
- As shown in Figure 3-2, residential permitting activity slowed down beginning 2006.
- Residential permitting activity declined from 1,592 units in 2005 to 377 units in 2006, well below the1996 to 2008 average of 1,144 per year.
- This decline continued into 2008 when permits for only 24 residential units were granted.
- The City's population grew at an annual average growth rate of 8.71 percent over the 1992 to 2009 time period compared to overall Riverside County, which grew at 3.0 percent per annum over this time period.
- The number of households in the City of Murrieta increased from 7,538 in 1992 to 32,677 in 2009 with the average household size decreasing from 3.22 in 1992 to 3.06 in 2009.

Figure 3-1
Historic Population
City of Murrieta
1992 to 2009



Source: Stanley R. Hoffman Associates, Inc.
California Department of Finance, 1992 to 2009

Figure 3-2
Residential Building Units Permitting Activity
City of Murrieta
1996 to 2008



Source: Stanley R. Hoffman Associates, Inc.
U.S. Census Bureau

3.2 Retail Trade Area Base-line Estimates: 2008

The baseline (2008) estimates of population and households within the City of Murrieta and the remainder Trade Area are obtained from the Riverside RIVTAM model. Also discussed are current estimates of household size in the City and the remainder trade area. The detailed data by the smaller zones in the RIVTAM model selected within the 10-mile trade area are listed in Appendix Table A-1. This data is summarized for population and households for the City and remainder trade area, as discussed further in Table 3-1 below.

City of Murrieta

As shown in Table 3-1, based on data provided by Iteris to the Consultant on the basis of RIVTAM model zones, the General Plan baseline residential population for the City of Murrieta in 2008 was estimated at 101,315, while households were estimated at 33,745. This translates to an average household size of 3.002 for the City in 2008.

Remainder of 10-mile Trade Area

Residential population in the remainder of the 10-mile trade area in 2008 was estimated at 192,520, while households were estimated at 61,715, as shown in Table 3-1. This translates to an average household size of 3.120 for the remainder of the trade area.

Total 10-mile Trade Area

Total baseline residential population for the 10-mile trade area is estimated at 293,835, while households are estimated at 95,460, as shown in Table 3-1. The overall average household size in the 10-mile retail trade area is estimated at 3.078.

Table 3-1
Baseline 2008 Estimates of Population and Households
10-mile Retail Trade Area

	Murrieta	Remainder 10-mile Trade Area	Total 10-mile Trade Area
Residential Population	101,315	192,520	293,835
Households	33,745	61,715	95,460
Average Household Size	3.002	3.120	3.078

Source: Stanley R. Hoffman Associates, Inc.
Iteris and City Staff
Riverside RIVTAM Traffic Demand Model

3.3 Trade Area Demographic Projections: 2008 to 2035

This section discusses the comparison of population, household, and employment growth for the existing conditions from SCAG-RIVTAM forecasts (SCAG), the Recommended Scenario land uses (Recommended Scenario), and Scenario B land uses (Scenario B). Growth scenarios are shown for the geographies of the City of Murrieta, Outside City, which includes Temecula, Lake Elsinore, Menifee and Wildomar, as well as adjacent unincorporated county areas, and the total trade area. Data was obtained from the SCAG-RIVTAM model, Iteris Inc., and from RBF Consulting.

General Plan Growth Scenarios for Murrieta

Residential population growth from 2008 to 2015 is estimated to range from 31,946 in the Recommended Scenario, 46,976 in the SCAG forecasts, to 55,106 in Scenario B. As shown in Table 3-2, household growth is estimated to range from 10,739 in the Recommended Scenario, 15,877 in the SCAG forecasts, to 18,459 in Scenario B. Growth in Persons per household is estimated to stay relatively the same ranging from 2.96 in the SCAG forecasts, 2.97 in the Recommended Scenario, and 2.99 in Scenario B.

The estimated growth in employment for the two scenarios exceeds the estimated SCAG forecasts at 76,700. As shown in Table 3-2, employment growth for Scenario B is 98,524 and 110,265 for the Recommended Scenario. Retail employment growth, as a percentage of total employment growth, is higher under the SCAG forecasts at an estimated 42 percent; the Recommended Scenario and Scenario B range from an estimated 19 percent to 24 percent, respectively. Therefore, employment in the Recommended Scenario and Scenario B is more focused on growth in non-retail based jobs such as professional/technical, industrial, medical, and research and development type jobs. By 2035, the jobs per household is projected to range from 2.27 in Scenario B to 2.93 in the Recommended Scenario, compared with 1.95 for SCAG forecasts.

General Plan Growth Scenarios for Total Trade Area

The growth scenarios for the total trade area include the communities of Murrieta, Temecula, Lake Elsinore, Menifee, and Wildomar, as well as adjacent unincorporated County areas. The purpose for the retail analysis is to analyze the commercial potential for the GAFO type retail which includes: General Merchandise, Apparel, Home Furnishings and Appliances, and Other Specialty Retail. In addition to the two scenarios for Murrieta, the Recommended Scenario and Scenario B, the SCAG forecasts have been used for the broader market area outside Murrieta.

Table 3-2
Comparison of Growth Scenarios
City of Murrieta

	2008	2035	Change	AAGR[1]
SCAG-RivTAM-Existing				
Resident Population	101,315	148,291	46,976	0.014
Households	33,745	49,622	15,877	0.014
Persons per Household	3.00	2.99	2.96	
Employment	19,888	96,588	76,700	0.060
Retail Employment	10,968	43,012	32,044	0.052
Jobs per Household	0.59	1.95	4.83	
Recommended Scenario				
Resident Population	101,315	133,261	31,946	0.010
Households	33,745	44,484	10,739	0.010
Persons per Household	3.00	3.00	2.97	
Employment	19,888	130,153	110,265	0.072
Retail Employment	10,968	31,633	20,665	0.040
Jobs per Household	0.59	2.93	10.27	
Scenario B				
Resident Population	101,315	156,421	55,106	0.016
Households	33,745	52,204	18,459	0.016
Persons per Household	3.00	3.00	2.99	
Employment	19,888	118,412	98,524	0.068
Retail Employment	10,968	34,762	23,794	0.044
Jobs per Household	0.59	2.27	5.34	

1. AAGR: Annual Average Growth Rate

Source: Stanley R. Hoffman Associates, Inc.
Iteris, Inc.
RBF Consulting
SCAG-RivTAM Forecast Model

As shown in Table 3-3, population in the Recommended Scenario for the City, as a percent of the total trade area, is projected to decrease from 34 percent in 2008 to 31 percent in 2035. This trend is reflected in the projected employment for the City, as a percent of the total trade area, which is estimated to decrease from 52 percent in 2008 to 48 percent in 2035. The projected population growth for the total trade area from the 2008 to 2035 time period for the Recommended Scenario is 139,830, while employment growth is projected at 230,476.

Table 3-3
Recommended Scenario Land Uses
City of Murrieta and Total Trade Area

	2008	2035	Change
CITY			
Resident Population	101,315	133,261	31,946
Households	33,745	44,484	10,739
PPH	3.00	3.00	2.97
Total Employment	19,888	130,153	110,265
Retail Employment	10,968	31,633	20,665
OUTSIDE CITY[1]			
Resident Population	192,520	300,404	107,884
Households	61,715	98,690	36,975
PPH	3.12	3.04	2.92
Total Employment	18,309	138,520	120,211
Retail Employment	10,290	23,733	13,443
TOTAL TRADE AREA			
Resident Population	293,835	433,665	139,830
Households	95,460	143,174	47,714
PPH	3.08	3.03	2.93
Total Employment	38,197	268,673	230,476
Retail Employment	21,258	55,366	34,108

1. Outside City includes the cities of Temecula, Lake Elsinore, Menifee, and Wildomar as well as adjacent unincorporated County areas.

Source: Stanley R. Hoffman Associates, Inc.
Iteris -- RivTAM/Southern California Association of Governments.
RBF Consulting

Scenario B shows population for the City, as a percent of the total trade area, projected to remain fairly the same from 34 percent in 2008 to 34 percent in 2035, as shown in Table 3-4. Unlike this trend, employment for the City, as a percent of the total trade area, is projected to decrease from 52 percent in 2008 to 46 percent in 2035. The projected population growth for the total trade area for Scenario B for the same time period is 162,990, while employment growth is projected at 218,735.

Table 3-4
Scenario B Land Uses
City of Murrieta and Total Trade Area

	2008	2035	Change
CITY			
Resident Population	101,315	156,421	55,106
Households	33,745	52,204	18,459
PPH	3.00	3.00	2.99
Total Employment	19,888	118,412	98,524
Retail Employment	10,968	34,762	23,794
OUTSIDE CITY[1]			
Resident Population	192,520	300,404	107,884
Households	61,715	98,690	36,975
PPH	3.12	3.05	2.92
Total Employment	18,309	138,520	120,211
Retail Employment	10,290	23,733	13,443
TOTAL TRADE AREA			
Resident Population	293,835	456,825	162,990
Households	95,460	150,894	55,434
PPH	3.08	3.03	2.94
Total Employment	38,197	256,932	218,735
Retail Employment	21,258	58,495	37,237

1. Outside City includes the cities of Temecula, Lake Elsinore, Menifee, and Wildomar as well as adjacent unincorporated County areas.

Source: Stanley R. Hoffman Associates, Inc.
Iteris -- RivTAM/Southern California Association of Governments.
RBF Consulting

CHAPTER 4
RETAIL SUPPLY WITHIN TRADE AREA

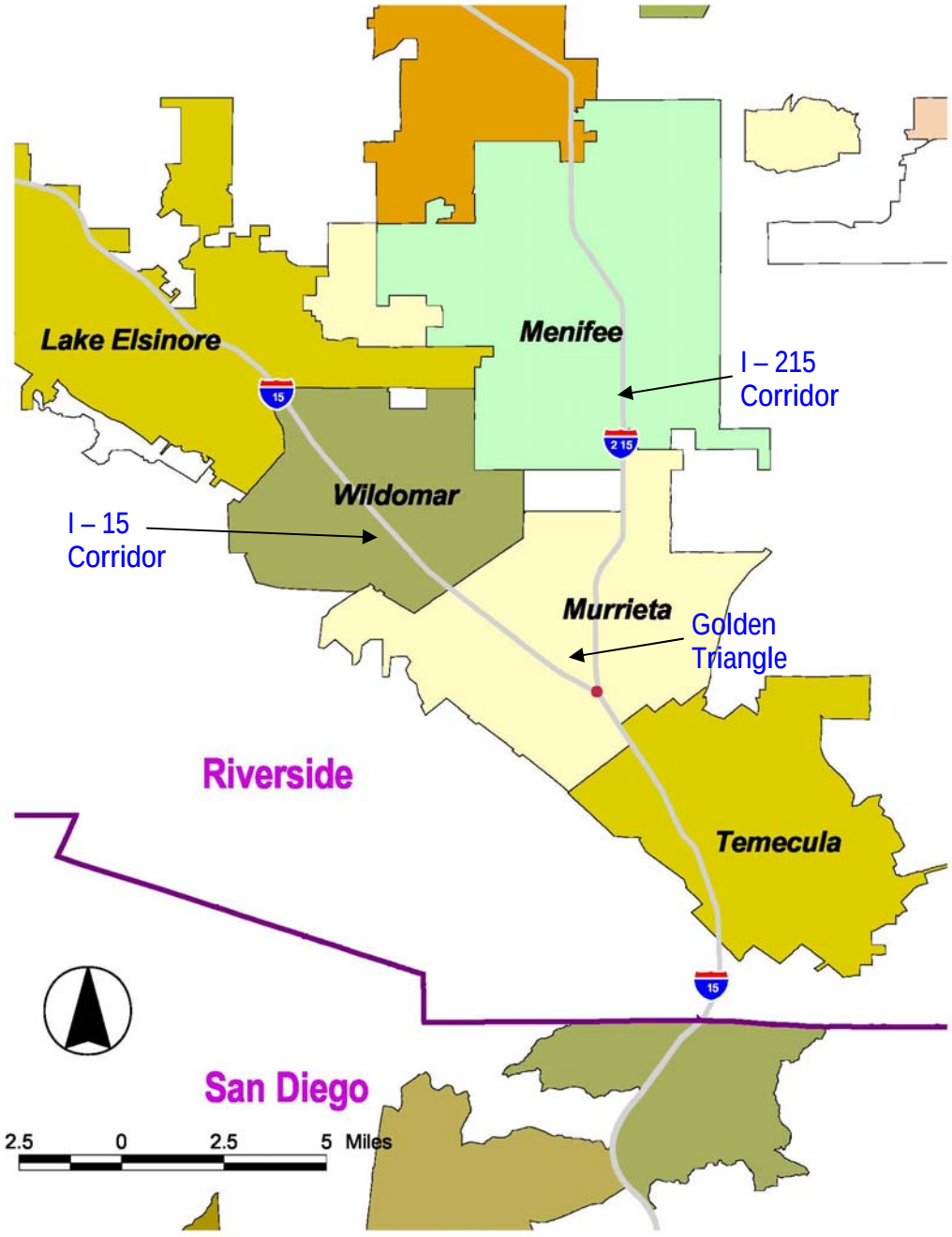
This chapter presents an analysis of the existing and future retail supply within Murrieta and the surrounding trade area. Stanley R. Hoffman Associates (SRHA) has conducted field research and collected data on retail stores that will likely compete for retail expenditures of households located in the overall trade area. Retail stores trading general merchandise, apparel, furnishings, and other specialty retail (GAFO) goods are of particular interest to this study as these retail categories have a wider regional draw. The competitive inventory of GAFO is selected from the competitive retail store areas (CRSAs) that serve households residing within the 10-mile trade area from the Golden Triangle in Murrieta, as defined previously in Chapter 2. The field survey conducted by SRHA was built upon market data on existing inventories and vacancies obtained from Costar and provided by City Staff.

4.1 Existing Overall Retail Supply

Total and vacant retail square footage was provided by Costar at an aggregate level for Murrieta, Temecula, the Interstate 15 (I-15) Corridor, and the Interstate 215 (I-215) Corridor as of December 2009. The geographical boundaries of these four areas are illustrated in Figure 4-1. As shown in the Figure, the I-15 Corridor is defined as the area along I-15 running from Lake Elsinore, south to the northern boundary of the City of Murrieta. The I-215 Corridor is defined as the area north of the northern edge of Murrieta, running north to, and including, the City of Menifee along I-215, and north along Highway 79 through French Valley to the Winchester area. Total and vacant retail square footage is divided into two categories: 1) Community, Neighborhood, and Strip Commercial Retail, which primarily serves the local community, and 2) All Other Retail, which includes regional, power center, and theme/festival centers. Vacancy is defined as currently vacant space as well as short-term, occupied space that is available for lease.

As shown in Table 4-1, the total area had a combined estimated total retail space of about 23.3 million square feet and a vacancy rate of 20.2 percent. Of that, Community, Neighborhood and Strip Commercial Retail had about 13.2 million square feet of retail space and a 23.5 percent vacancy rate. Meanwhile, All Other Retail had a total of about 10.1 million square feet and a vacancy rate of 15.9 percent. The vacancy rate for All Other Retail is lower than Community Retail possibly because the retail shopping centers that are relatively larger with national chain retailers are probably better able to handle economic downturns than the smaller, locally owned retailers and shopping centers.

Figure 4-1
Map of Murrieta, Temecula, I-15 Corridor, and I-215 Corridor



Source: Stanley R. Hoffman Associates, Inc.

Overall, Murrieta was estimated to have total retail space of approximately 7.6 million square feet. Of this, about 4.7 million square feet, or 62.0 percent, was Community, Neighborhood, and Strip Commercial Retail, and about 2.9 million square feet, or 38.0 percent, was All Other Retail. The overall total retail vacancy rate in Murrieta was estimated to be 24.2 percent, which was higher than Temecula (13.6 percent) and the I-15 Corridor (19.6 percent), but less than the I-215 Corridor (29.8 percent).

Table 4-1
Total and Vacant Retail Square Footage
Murrieta, Temecula and Surrounding Areas
December 2009

	Murrieta	Temecula	I-15 Corridor[1]	I-215 Corridor[2]	Total Square Footage
Community, Neighborhood and Strip Commercial					
Vacant Space	1,176,013	729,196	373,318	819,213	3,097,740
Total Rentable Space	4,690,688	3,973,638	2,410,023	2,091,670	13,166,019
Vacancy Rate	25.1%	18.4%	15.5%	39.2%	23.5%
All Other Retail [3]					
Vacant Space	652,991	452,243	380,087	121,072	1,606,393
Total Rentable Space	2,877,595	4,713,204	1,438,550	1,065,608	10,094,957
Vacancy Rate	22.7%	9.6%	26.4%	11.4%	15.9%
Total Retail					
Vacant Space	1,829,004	1,181,439	753,405	940,285	4,704,133
Total Rentable Space	7,568,283	8,686,842	3,848,573	3,157,278	23,260,976
Vacancy Rate	24.2%	13.6%	19.6%	29.8%	20.2%

1. I -15 Corridor is defined as the area along the Interstate 15 running from Lake Elsinore south to the northern boundary of the City of Murrieta.
2. I -215 Corridor is defined as the area north of the northern edge of the City of Murrieta, running north to and including the City of Menifee along Interstate 215, and north along Highway 79 through French Valley to the Winchester area.
3. Includes Regional, Power Center and Theme/Festival Centers.

Sources: Stanley R. Hoffman Associates, Inc.
Costar, December 2009.

4.2 GAFO Retail Supply

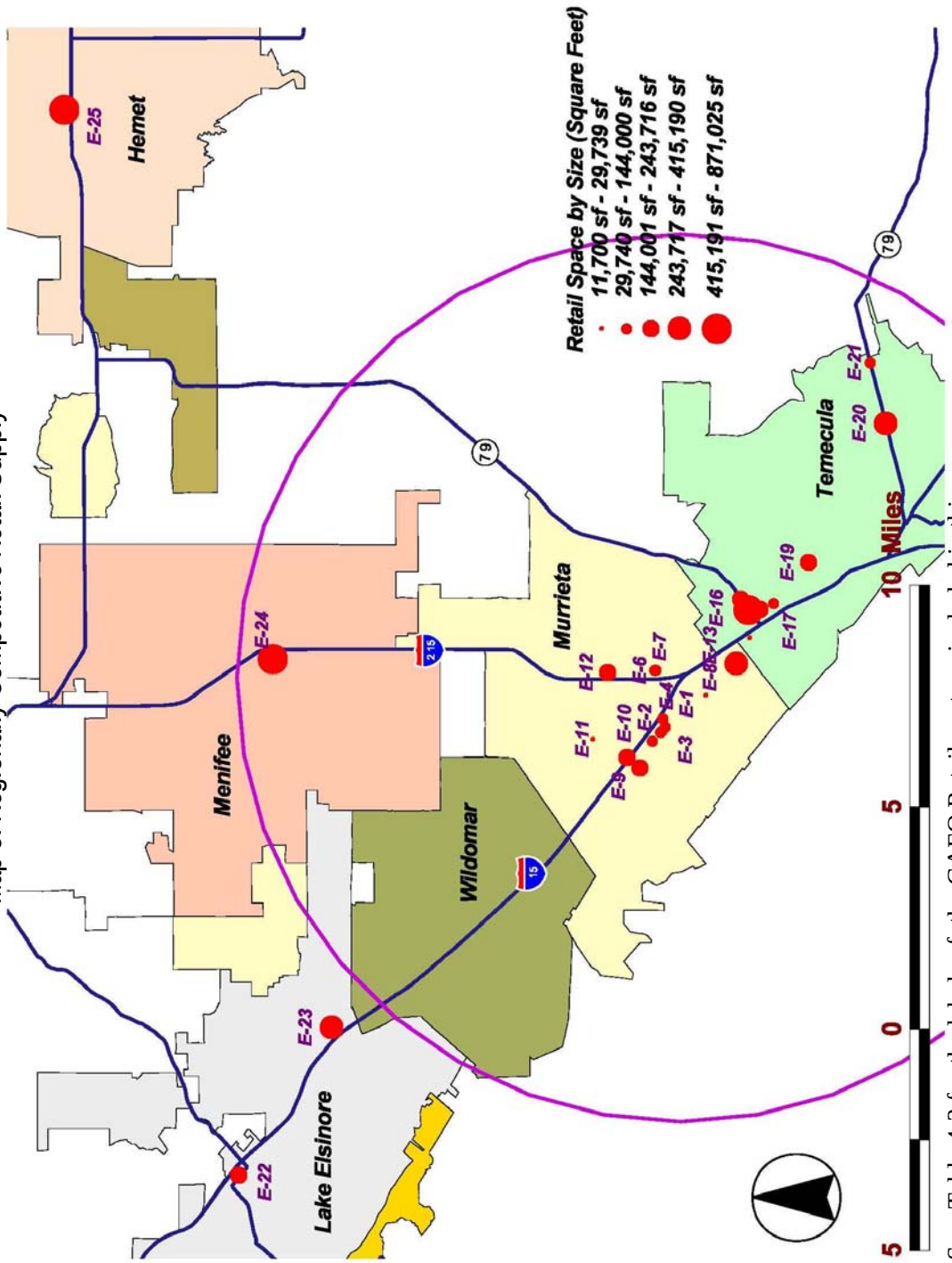
This section examines the existing supply of regionally competitive retail shopping centers and their vacancy rates. A shopping center is considered "regionally competitive" if it contains stores that specialize in General Merchandise, Apparel, Home Furnishings, or Other Retail Merchandise – commonly referred to by the acronym GAFO – which serve a broad, regional market. These retail centers are generally comprised of community oriented, "big-box" centers, including anchor stores such as Target, Walmart, or Kohl's. The trade area analyzed was defined as a circle with a 10 mile radius centered on the intersection of the I-15 and I-215 Freeways, as illustrated in Figure 4-2. Data was collected between January 2010 and May 2010 through site visits and a field survey to confirm anchor tenants, gross leasable area (GLA), and vacancies.

As shown in Table 4-2, regionally competitive retail shopping centers were identified in five cities within the trade area: Murrieta, Temecula, Lake Elsinore, Menifee, and Hemet. Combined, the retail centers in these cities have a GLA totaling about 10.0 million square feet. Of that, approximately 59.3 percent, or about 6.0 million square feet, is dedicated to GAFO. As illustrated in Figure 4-3, Temecula accounts for approximately 34.8 percent of GAFO space in regionally competitive retail centers within the trade area, totaling approximately 2.7 million square feet. This is followed by Murrieta at 31.9 percent (1.9 million square feet) and Menifee at 13.1 percent (782,787 square feet).

Also shown in Table 4-2 is the total center and GAFO vacancy rates in the regionally competitive retail shopping centers within the trade area. Vacancy rates were calculated based on the square footage that was vacant at the time of the site visits and field survey. Overall, the total vacancy rate for the centers identified was estimated to be 8.4 percent (or 840,511 square feet) while the vacancy rate for GAFO space within these centers was slightly higher, at approximately 9.4 percent (or 558,754 square feet). Within the trade area, Menifee had the highest estimated GAFO vacancy rate (21.3 percent), followed by Hemet (14.4 percent), and Murrieta (10.2 percent). However, Murrieta had the largest amount of vacant GAFO space, with an estimated 193,617 square feet available, or about 34.7 percent of the total vacant GAFO space in the trade area, as illustrated in Figure 4-5.

A detailed summary of the regionally competitive retail shopping centers within the trade area arranged by shopping center is presented in Table 4-3. In some cases, the retail shopping centers are referred to as "clusters," which indicates that the data has been aggregated from two or more smaller regional centers or stores in close proximity. Individual data for these clusters is located in Table B-1 in Appendix B.

Figure 4-2
Map of Regionally Competitive Retail Supply [1]



1. See Table 4-3 for the labels of the GAFO Retail centers included in this map .

Source: Stanley R. Hoffman Associates, Inc.

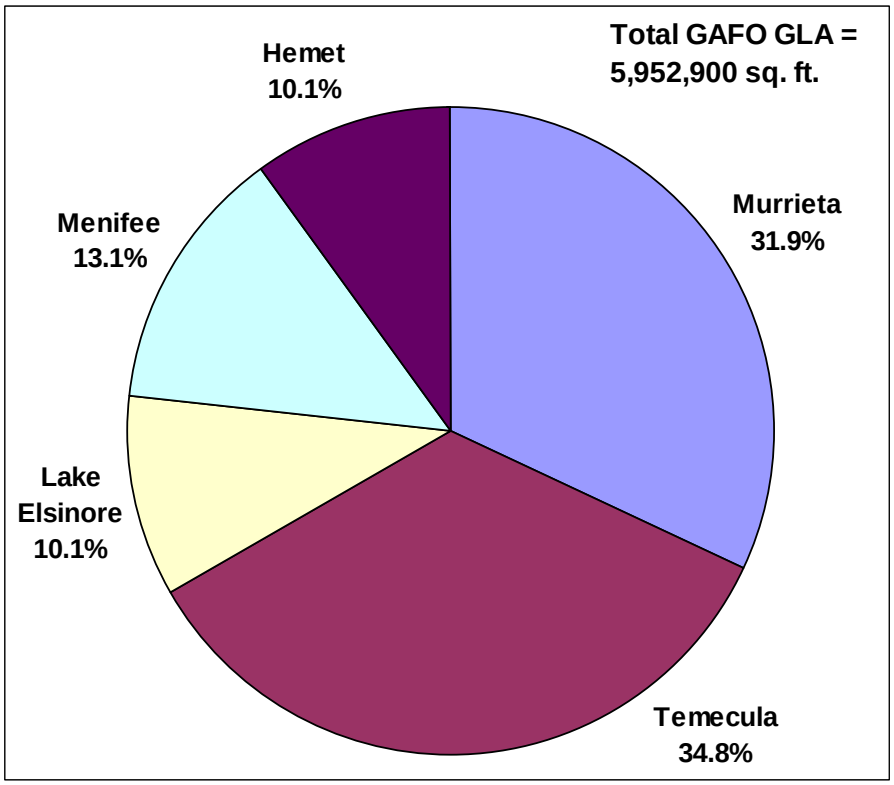
Table 4-2
Summary of GAFO[1] GLA[2] by City
Trade Area[3]
May 2010

City	Total Center GLA (Sq.Ft.)	Total Vacant GLA (Sq.Ft.)	Vacancy Rate	GAFO GLA (Sq.Ft.)	% GAFO	Estimated Occupied GAFO (Sq.Ft.)	Estimated Vacant GAFO (Sq.Ft.)	GAFO Vacancy Rate
Murrieta	3,355,642	330,798	9.9%	1,896,198	56.5%	1,702,581	193,617	10.2%
Temecula	4,057,368	211,573	5.2%	2,069,194	51.0%	1,973,934	95,260	4.6%
Lake Elsinore	1,088,707	32,843	3.0%	602,821	55.4%	585,908	16,913	2.8%
Menifee	941,267	178,797	19.0%	782,787	83.2%	616,323	166,464	21.3%
Hemet	601,900	86,500	14.4%	601,900	100.0%	515,400	86,500	14.4%
Total	**10,044,884**	**840,511**	**8.4%**	**5,952,900**	**59.3%**	**5,394,146**	**558,754**	**9.4%**

1. GAFO is an acronym for General Merchandise, Apparel, Home Furnishings, and Other Retail Merchandise.
2. GLA stands for "gross leasable area."
3. Trade Area is a circle with a 10 mile radius centered on the intersection of the 15 Freeway and 215 Freeway.

Source: Stanley R. Hoffman Associates, Inc.

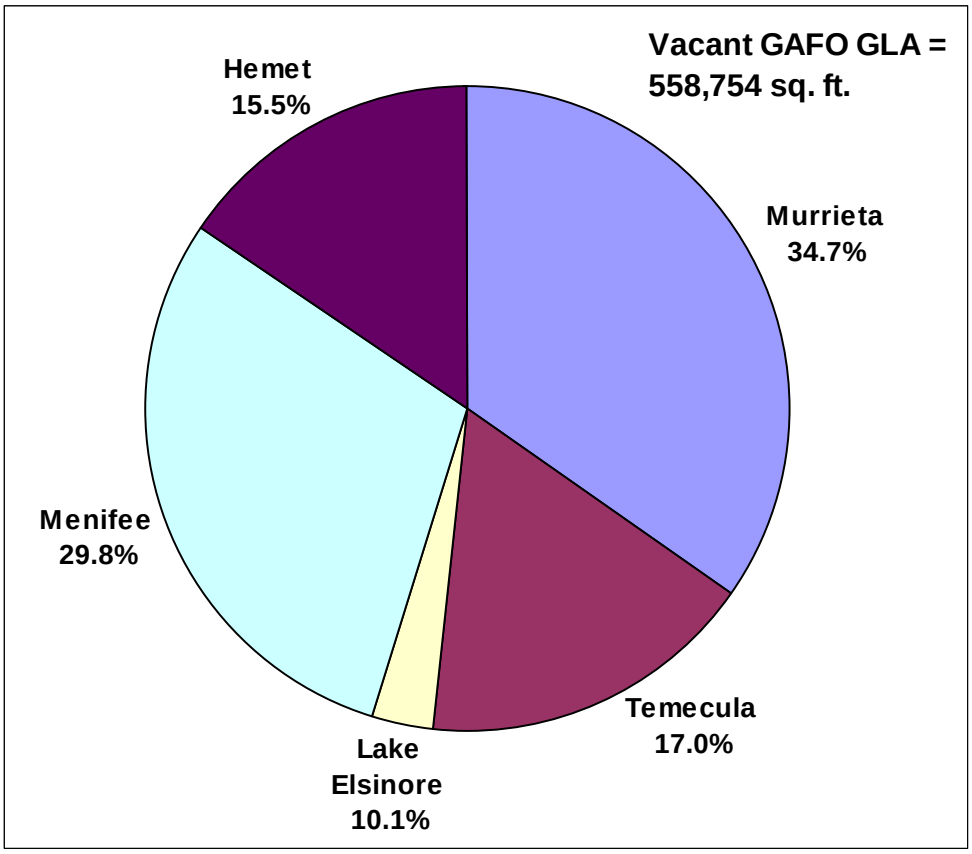
Figure 4-3
Distribution of Total GAFO[1] GLA[2] by City
Trade Area[3]
May 2010



1. GAFO = General Merchandise, Apparel, Home Furnishings, and Other Retail Merchandise.
2. GLA = Gross Leasable Area (in square feet).
3. Trade Area is a circle with a 10 mile radius centered on the intersection of the 15 Freeway and 215 Freeway.

Source: Stanley R. Hoffman Associates, Inc.

Figure 4-4
Distribution of Vacant GAFO[1] GLA[2] by City
Trade Area[3]
May 2010



1. GAFO = General Merchandise, Apparel, Home Furnishings, and Other Retail Merchandise.
2. GLA = Gross Leasable Area (in square feet).
3. Trade Area is a circle with a 10 mile radius centered on the intersection of the 15 Freeway and 215 Freeway.

Source: Stanley R. Hoffman Associates, Inc.

Table 4-3
Detailed GAFO[1] GLA[2] by Retail Center
Trade Area[3]
May 2010

Center ID	Name	Best Representative Address	City	Total Center GLA (Sq.Ft.)	Total Vacant GLA (Sq.Ft.)	Vacancy Rate	GAFO GLA (Sq.Ft.)	% GAFO	Estimated Occupied GAFO (Sq.Ft.)	Estimated Vacant GAFO (Sq.Ft.)	GAFO Vacancy Rate
E-1	Murrieta Springs Plaza	25320 Madison Ave	Murrieta	272,905	2,775	1.0%	106,448	39.0%	105,366	1,082	1.0%
E-2	Madison Square	25080 Madison Avenue	Murrieta	106,600	0	0.0%	89,625	84.1%	89,625	0	0.0%
E-3	Murrieta Spectrum	25125 Madison Ave	Murrieta	175,000	64,793	37.0%	118,360	67.6%	74,538	43,822	37.0%
E-4	Wal-Mart Store #29524	41200 Murrieta Hot Springs Rd	Murrieta	144,000	0	0.0%	144,000	100.0%	144,000	0	0.0%
E-5	Kohls	24661 Madison Ave	Murrieta	79,625	0	0.0%	79,625	100.0%	79,625	0	0.0%
E-6	Murrieta Town Center	39885 Alta Murrieta Drive	Murrieta	390,702	37,460	9.6%	91,510	23.4%	82,736	8,774	9.6%
E-7	Murrieta Plaza	40396 Murrieta Hot Springs Road	Murrieta	215,000	34,200	15.9%	142,376	66.2%	119,728	22,648	15.9%
E-8	Jefferson Gateway	26019 Jefferson Avenue	Murrieta	39,034	0	0.0%	11,700	30.0%	11,700	0	0.0%
E-9	Village Walk Plaza	41451 Kalmia St	Murrieta	311,575	59,666	19.1%	256,472	82.3%	207,358	49,114	19.1%
E-10	Cal Oaks Plaza	41090 California Oaks Road	Murrieta	320,000	3,658	1.1%	153,172	47.9%	151,421	1,751	1.1%
E-11	California Oaks Center	40414 California Oaks Road	Murrieta	92,593	9,036	9.8%	32,955	35.6%	29,739	3,216	9.8%
E-12	HomeCenter Cluster	39665 Avenida Acacias	Murrieta	504,596	101,301	20.1%	298,450	59.1%	243,716	54,734	18.3%
E-13	Jefferson Avenue Cluster	26835 Jefferson Avenue	Murrieta	704,012	17,909	2.5%	371,505	52.8%	363,029	8,476	2.3%
E-14	Etco Plaza	27270 Madison Avenue	Temecula	25,794	0	0.0%	12,897	50.0%	12,897	0	0.0%
E-15	Commons at Temecula Cluster	40500 Winchester Road	Temecula	520,550	37,060	7.1%	264,843	50.9%	238,857	25,986	9.8%
E-16	The Promenade Cluster	40820 Winchester Road	Temecula	1,185,680	17,482	1.5%	880,307	74.2%	871,025	9,282	1.1%
E-17	Palm Plaza	26495 Ynez Road	Temecula	341,612	34,409	10.1%	217,083	63.5%	195,217	21,866	10.1%
E-18	Costco	26610 Ynez Road	Temecula	152,452	0	0.0%	76,226	50.0%	76,226	0	0.0%
E-19	Temecula Town Center Cluster	29720 Rancho California Road	Temecula	677,332	93,484	13.8%	232,097	34.3%	204,219	27,878	12.0%
E-20	Highway 79 Cluster	31845 State Highway 79 South	Temecula	1,023,263	21,469	2.1%	305,686	29.9%	301,957	3,729	1.2%
E-21	Butterfield Cluster	33145 State Highway 79 South	Temecula	130,685	7,669	5.9%	80,055	61.3%	73,536	6,519	8.1%
E-22	Lake Elsinore South Cluster	18248 Collier Ave	Lake Elsinore	417,919	29,543	7.1%	184,635	44.2%	170,718	13,917	7.5%
E-23	Lake Elsinore North Cluster	31700 Grape St	Lake Elsinore	670,788	3,300	0.5%	418,186	62.3%	415,190	2,996	0.7%
E-24	Menifee Cluster	30340 Haun Rd	Menifee	941,267	178,797	19.0%	782,787	83.2%	616,323	166,464	21.3%
E-25	Hemet Cluster	2200 W Florida Ave	Hemet	601,900	86,500	14.4%	601,900	100.0%	515,400	86,500	14.4%
			Total	**10,044,884**	**840,511**	**8.4%**	**5,952,900**	**59.3%**	**5,394,146**	**558,754**	**9.4%**

1. GAFO is an acronym for General Merchandise, Apparel, Home Furnishings, and Other Retail Merchandise.
2. GLA stands for "gross leasable area."
3. Trade Area is a circle with a 10 mile radius centered on the intersection of the 15 Freeway and 215 Freeway.

Source: Stanley R. Hoffman Associates, Inc.

4.3 Current Performance Levels of General Merchandise Retailers

As shown in Table 4-4, retail sales per square foot for the U.S. West Region are shown for Super Regional Shopping Centers, Regional Shopping Centers, and Super Community/Community Shopping Centers. Data is obtained from the *Dollars and Cents of Shopping Centers* published by Urban Land Institute (ULI) for 2008. According to ULI, a Super Regional Shopping Center ranges in size from 500,000 to 1,500,000 square feet that offers a variety in general merchandise, apparel, furniture, and home furnishings, as well as a variety of services and recreational facilities. A Regional Shopping Center ranges in size from 250,000 to more than 900,000 square feet that provides general merchandise, apparel, furniture, and home furnishings, as well as a range of services and recreational facilities. A Super Community/Community Shopping Center ranges in size from 100,000 to 500,000 or more square feet of convenience tenants, while offering a wider range of apparel, hardware, home furnishings, home improvement, and specialty stores.

Average retail sales per square foot in the U.S. west region ranged from $338 per square foot for Super Regional Shopping Centers to $371 per square foot for Regional Shopping Centers, in 2008 dollars. The average of these factors was $350 per square foot, rounded to the nearest tens.

Table 4-4
Average Retail Sales per Square Foot
U.S. West Region
2006
(In 2006 and 2008 Dollars)

Type of Shopping Center	2006 Dollars[1]	2008 Dollars
Super Regional Shopping Centers	$324	$338
Regional Shopping Centers	$356	$371
Super Community/Community Shopping Centers	$331	$345
Average of the Factors[3]	$340	$350

1. According to the *Dollars and Cents of Shopping Centers* by ULI, seventy percent of the centers reported a fiscal year ending in, or at the end of, the fourth quarter of 2006.
2. A factor of 1.04 (214.7/206.2), based on the West Urban region Consumer Price Index (CPI), was applied to the 2006 retail sales per square foot data ($340) which resulted in $350 in average retail sales per square foot in 2008 dollars, rounded to the nearest tens.
3. Rounded to the nearest tens.

Source: Stanley R. Hoffman Associates, Inc.
Dollars and Cents of Shopping Centers, Urban Land Institute (ULI), 2008.
Consumer Price Index (CPI), West Urban region, 2005 to 2006.

Shown on Table 4-5, the average sales per square foot for other retail categories ranged from an estimated $280 to $550 in other retail categories based on data provided by The HdL Companies and *Dollars and Cents of Shopping Centers*, ULI. As shown on Appendix Table D-1, other retail categories include Chain Supermarket, Restaurants/Fast Food/Coffee Shops, Warehouse Building Supply, and Auto Supplies and Parts. Of the other retail categories, only 25 percent of goods in Chain Supermarkets are taxable so the taxable sales have been converted to total sales based on State of California, BOE taxable/non-taxable food sales, 1985.

The average sales per square foot for other retail categories are used in the projection of total retail sales and square footage for the City of Murrieta General Plan growth scenarios for 2035, shown in Table 6-7.

Table 4-5
Other Retail Categories Sales per Square Foot
U.S. National

`	Taxable Sales	Total Sales	Midpoint
Chain Supermarket	$110 - $150	$440 - $600	$520
Restaurants/Fast Food/Coffee Shops	$300 - $800	$300 - $800	$550
Warehouse Building Supply[1]	$325 - $400	$325 - $400	$363
Auto Supplies and Parts[2]	$173 - $387	$173 - $387	$280

1. Rounded to the nearest tens.

2. Range is for Automotive in U.S. Super Community/Community Shopping Centers and U.S. Neighborhood Shopping Centers from the *Dollars and Cents of Shopping Centers,* Urban Land Institute (ULI), 2008.

Source: Stanley R. Hoffman Associates, Inc.
The HdL Companies
Dollars and Cents of Shopping Centers, Urban Land Institute (ULI), 2008.

4.4 New Retail within Other Trade Area Cities

The following is an inventory of retail developments that are either currently under construction, planned or proposed within the Competitive Retail Supply Area (CRSA) for the 10-mile trade area. This area includes, besides Murrieta, the cities of Menifee, Wildomar, Temecula, Hemet and Lake Elsinore. The compilation of a list of future developments was completed by Stanley R. Hoffman Associates, Inc. based on data assembled from the Planning and Community Development Departments of Menifee, Wildomar, Temecula, Hemet and Lake Elsinore. Once the projects were identified and located, the breakdown of gross leasable area for each retail project was found using The Riverside County Land Information System.

A total of 17 new retail centers are either in construction or proposed for the CRSA as shown in Table 4-5. Of the 17 new retail centers, 7 retail centers are proposed to be in Menifee, 5 retail centers are proposed to be in Wildomar, 6 centers proposed for Temecula and 1 center proposed for Hemet. No new or planned retail developments were identified for Lake Elsinore. As shown in the table below, the total GLA of new retail developments in the CRSA will be an estimated 3.0 million square feet ranging from, at the smallest retail center of 10,500 square feet, to the largest retail center at an estimated 1.09 million square feet. Some of the larger scale retail developments are discussed below.

Menifee Shopping Center, located in Menifee on the northeast corner of Scott Road and Haun Road, is planning a retail development anchored by Wal-Mart Super Center. The whole development is estimated to be 236,000 square feet with 3 drive-through restaurants, a gas station, convenience market and a carwash proposed. This retail center is estimated to have 236,000 square feet of GAFO GLA based on examination of other Wal-Mart centers proposed in neighboring cities.

Another large retail development planned in Menifee is Heritage Square Shopping Center with a total GLA of 132,671 square feet of retail development. This development is projected to provide fast food restaurants, multi-tenant retail shops, and a gas station in their list of retail tenants. Heritage Square Shopping Center is estimated to have about 33,629 GLA of GAFO according to Table 4-5. The Shops at Scott center located on Scott Road and Haun Road in Menifee is proposing an 87,733 square foot retail center. This retail center is estimated to have 84,233 square feet of GAFO GLA as shown on Table 4-6. It is also located just south of the proposed Menifee Shopping Center as discussed previously.

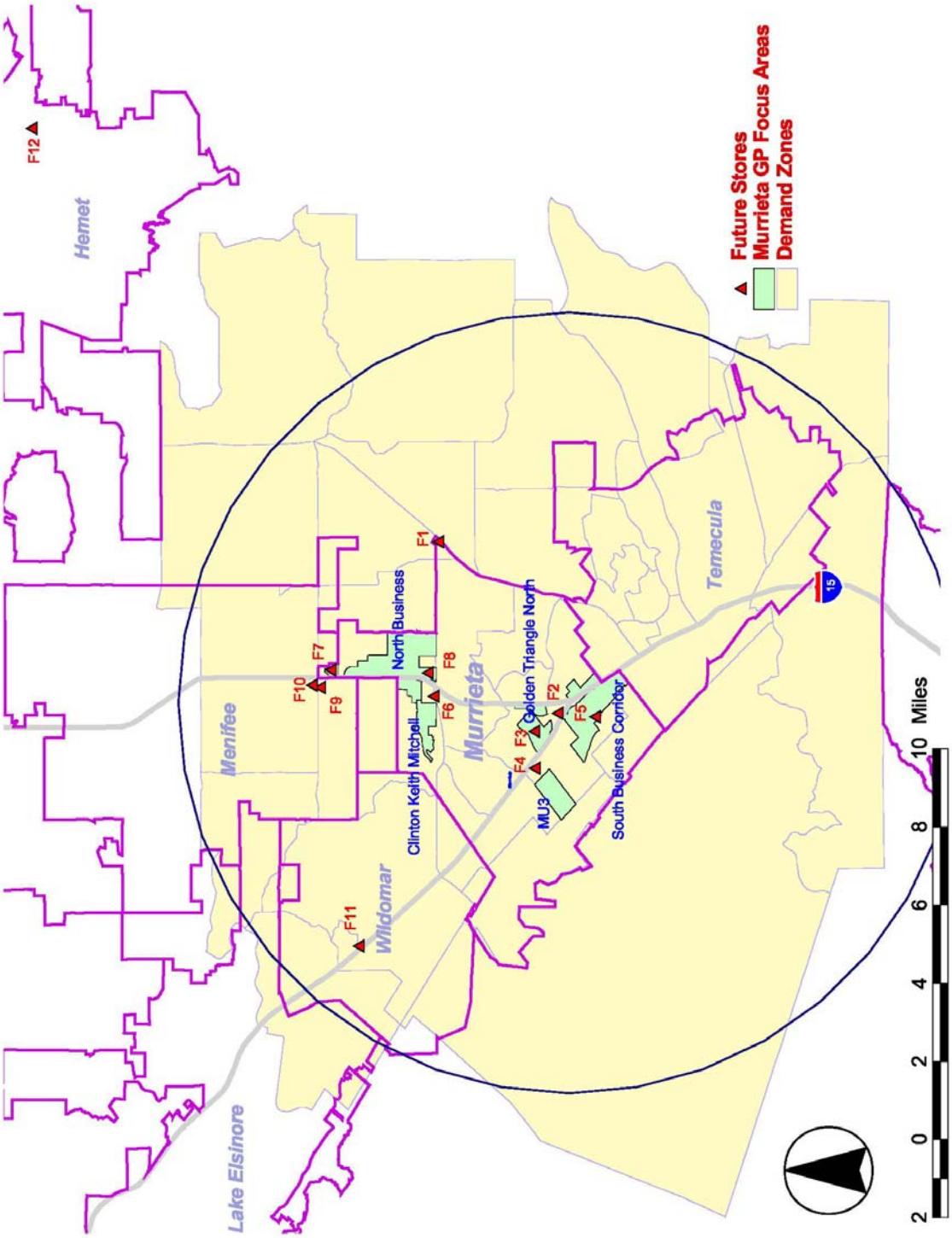
Bundy Canyon Commercial Center located in Wildomar on the southeast corner of Bundy Canyon Road and the I-15 freeway, is projected to be about 1.09 million square feet and anchored by a "big box" retailer. Wal-Mart Inc. is the current property owner and although this retail project completed a preliminary site plan, it is currently on hold due to some controversy over developing a Wal-Mart Super Center within close proximity of other existing Wal-Mart retail centers in neighboring cities such as Menifee, Lake Elsinore and Murrieta. Although it's not certain who the "big box" retailer will be, Wildomar is estimated to develop some level of GAFO retail at the site with the remainder of the site possibly occupied by office or commercial buildings or mixed use residential.

Wildomar Square, located on the southwest intersection of Clinton Keith Road and the I-15 freeway is proposing a multiple use center of 46,600 square feet. The uses will include 2 multi-tenant commercial buildings, restaurants, a fast food restaurant and a tire sales and service store. Another retail center in Wildomar, Clinton Keith Village, is proposing a 46,600 square feet retail center. In Temecula, Vail Ranch Town Square, located on Wolfe Store Road and Luseno Court is proposing a 7 building town center totaling 145,150 square feet.

Table 4-7 displays the estimated retail GAFO square footage based on online survey of retail inventory in the market area, phone interviews with City Planning Departments, Riverside County Land Information System and estimated identification of GAFO retailers in the inventoried retail centers. As shown on Table 4-5, the total market area is projected to have an estimated 3,005,737 square feet of new retail space with GAFO GLA estimated at 1,153,862 square feet, or about 38 percent of the total.

As shown in Table 4-8, the 7 proposed retail centers in Menifee will have an estimated GAFO GLA of 353,862 square feet (38.2 percent) of the total GLA of retail centers in Menifee. Based on the estimated GAFO square footage, Menifee has the highest percent of GAFO GLA in the total market area. Wildomar, with 5 proposed retail centers, will have an estimated GAFO GLA of 300,000 square feet (24.6 percent) of the total retail GLA and Hemet, an estimated 500,000 square feet (24.8 percent) of GAFO space. For Temecula, no new GAFO retail square footage was identified in the proposed retail centers in the City.

Figure 4-5
Map of Future Regionally Competitive Retail Supply [1]



1. See Table 4-5 for the labels of the GAFO Retail centers included in this map.
Source: Stanley R. Hoffman Associates, Inc.

Table 4-6
Future Regionally Competitive Stores
Competitive Retail Supply Area
August 2010

Center ID	Name	Best Representative Intersection	City	Recommended Scenario GAFO[1] GLA[2] (Sq.Ft.)	Scenario B GAFO[1] GLA[2] (Sq.Ft.)
F1	French Valley Cluster	SWC Winchester Rd and Thompson Rd	Murrieta	300,632	300,632
F2	Golden Triangle	I-15 and I-215	Murrieta	427,000	427,000
F3	Golden Triangle North	North of Murrieta Hot Springs Rd	Murrieta	138,353	138,353
F4	MU3	I-15 and Juniper Street	Murrieta	582,267	655,683
F5	South Business Corridor	Fig Street and	Murrieta	0	0
F6	Clinton Keith Mitchell	Clinton Keith and McElwain	Murrieta	149,813	149,813
F7	North Business (North)	SEC I-215 and Scott Rd	Murrieta	473,261	473,261
F8	North Business (South)	NEC I-215 and Clinton Keith	Murrieta	473,261	473,261
F9	Shops at Scott	SEC Scott Rd and Haun Rd	Menifee	84,233	84,233
F10	Menifee Shopping Center	NEC Scott Rd and Haun Rd	Menifee	236,000	236,000
F11	Bundy Canyon Commercial Center	SEC Bundy Canyon Rd and 15 Fwy	Wildomar	300,000	300,000
F12	Hemet Cluster	Florida Ave and Buena Vista St	Hemet	500,000	500,000
			Total	**3,664,819**	**3,738,235**

1. GAFO is an acronym for General Merchandise, Apparel, Home Furnishings, and Other Retail Merchandise.
2. GLA stands for "gross leasable area."

Source: Stanley R. Hoffman Associates, Inc.

Table 4-7
New Retail Development Under-Construction, Approved or Proposed
Menifee, Wildomar, Hemet, Temecula and Lake Elsinore
August 2010

Name	Location	City	Use	Types of Retail	GLA (Sq. Ft.)	GAFO (Sq. Ft.)
Heritage Square Shopping Center	Mccall Blvd and Menifee Rd	Menifee	Retail	Stater Bros.	43,830	
			Retail	Major Retail Bldg with drive-thru	15,661	
			Retail	Multi-tenant shops	15,600	
			Retail	Retail pad	9,973	
			Retail	Fast food restaurant	3,860	
			Retail	Gas Station	3,878	
			Retail	3 major retail bldgs	33,629	33,629
			Retail	Retail pad	6,240	
				Total Center	**132,671**	**33,629**
Menifee Lakes Plaza	Antelope Rd and Newport Rd	Menifee	Hotel	4-story, 70 room hotel	48,500	
			Retail	Bldg for shops	6,500	
			Retail	Gas station	n/a	
			Retail	Drug store	n/a	
				Total Center	**141,500**	
Shops at Scott	Scott Rd and Haun Rd	Menifee	Retail	Smallest bldg	3,500	
			Retail	Largest bldg	18,850	18,850
			Retail	Other bldgs	65,383	65,383
				Total Center	**87,733**	**84,233**
Menifee Shopping Center	Scott Rd and Haun Rd	Menifee	Retail	Walmart Supercenter	206,000	206,000
			Commercial	2 Commercial bldgs	30,000	30,000
			Retail	3 Drive-thru restaurants	n/a	
			Retail	Gas station	n/a	
			Retail	Convenience market	n/a	
			Retail	Car wash	n/a	
				Total Center	**236,000**	**236,000**
Hwy 74 and Briggs Center	Hwy 74 and Briggs Rd	Menifee	Retail	Market	n/a	
			Retail	Drive-thru	n/a	
			Retail	Restaurant	n/a	
			Retail	Drug store	n/a	
				Total Center	**N/A**	
Newport and Bradley Center	Newport Rd and Bradley Rd	Menifee	Retail	Bldg 1	7,516	
			Retail	Bldg 2	7,964	
			Retail	Bldg 3	4,981	
			Other	Not Specified	57,981	
				Total Center	**78,442**	
Newport and Menifee Center	Newport Rd and Menifee Rd	Menifee	Retail	Retail bldgs	61,489	
			Office	Office bldgs	58,800	
			Other	Child Care Center	129,204	
				Total Center	**249,493**	
Renaissance Plaza	32450 Clinton Keith Rd	Wildomar	Retail	Rite Aid Pharmacy	17,272	
			Retail	Multi-tenants	9,595	
				Total Center	**26,867**	
Wildomar Square	Clinton Keith Rd and 15 Fwy	Wildomar	Retail	Restaurant	5,660	
			Commercial	Multi-tenant commercial bldg	16,242	
			Retail	Restaurant	5,375	
			Retail	Tire sales and service store	7,575	
			Retail	Fast food restaurant	3,500	
			Commercial	Multi-tenant commercial bldg	8,248	
				Total Center	**46,600**	
Clinton Keith Village	Clinton Keith Rd and George Avene	Wildomar	Retail	Shopping center	46,600	
				Total Center	**46,600**	
Bundy Canyon Commercial Center	Bundy Canyon Rd and 15 Fwy	Wildomar	Retail	Owned by Wal-Mart	200,000	300,000
				Other bldgs	889,000	
				Total Center	**1,089,000**	**300,000**
Bundy Canyon and 15 Fwy Center	Bundy Canyon Rd and 15 Fwy	Wildomar	Retail	Subway + other stores	10,500	
				Yellow basket	n/a	
				Total Center	**10,500**	
Vail Ranch Town Square	32785 Wolf Store Rd	Temecula	Retail	7 commercial buildings	**145,150**	
Redhawk Pavilion	44060-44066 Margarita Rd	Temecula	Retail	3 buildings	**29,498**	
Gateway Plaza	tract map 29132	Temecula	Retail	1 2-story building	**30,573**	
Butterfield Ranch Shopping Center	33449 Highway 79 South	Temecula	Retail	5 commercial buildings	**42,385**	
Old Town Plaza One	28544 Old Town Front St	Temecula	Retail	3 story building	**29,409**	
Ridge Park Plaza	tract map 18254	Temecula	Office/Retail	office building, some retail	**83,316**	
Hemet Cluster		Hemet	Retail	Consolidated Estimate of GAFO	**500,000**	**500,000**

GAFO Retail	
Menifee	353,862
Wildomar	300,000
Hemet	500,000
Temecula	0
Lake Elsinore	0
Total	**1,153,862**
Other Retail/Uses	
Menifee	571,977
Wildomar	919,567
Hemet	0
Temecula	360,331
Lake Elsinore	0
Total	**1,851,875**
Total Market Area	
Menifee	925,839
Wildomar	1,219,567
Hemet	500,000
Temecula	360,331
Lake Elsinore	0
Total Market Area	**3,005,737**

1. Cases refer to planning cases from The Riverside County Land Information System. (http://www3.tlma.co.riverside.ca.us/pa/rclis/index.html)

Source: Stanley R. Hoffman Associates, Inc.
The Riverside County Land Information System.
(http://www3.tlma.co.riverside.ca.us/pa/rclis/index.html)
Menifee, Wildomar, Hemet, Temecula and Lake Elsinore City Planning Departments

Table 4-8
Projected GAFO[1] Square Footage
Menifee, Wildomar, Hemet, Temecula and Lake Elsinore
August 2010

Jurisdiction	Number of Proposed Retail Centers	Category	Total Center GLA[2] (Sq. Ft.)	Percent of Total
Menifee	7	Estimated GAFO[1]	353,862	38.2%
		All other Retail/Uses	571,977	61.8%
			925,839	**100.0%**
Wildomar	5	Estimated GAFO[1]	300,000	24.6%
		All other Retail/Uses	919,567	75.4%
			1,219,567	**100.0%**
Hemet[3]	0	Estimated GAFO[1]	500,000	24.8%
		All other Retail/Uses	1,520,000	75.2%
			2,020,000	**100.0%**
Temecula	5	Estimated GAFO[1]	0	0.0%
		All other Retail/Uses	360,331	100.0%
			360,331	**100.0%**
Lake Elsinore	0	Estimated GAFO[1]	0	0
		All other Retail/Uses	0	0
			0	**0**
Total Market Area	17	Estimated GAFO[1]	1,153,862	38.4%
		All other Retail/Uses	1,851,875	61.6%
			3,005,737	**100.0%**

1. GAFO is defined as General Merchandise, Apparel, Home Furnishings and Other Retail Groups
2. GLA stands for Gross Leasable Area
3. The square footage of All other Retail/Uses for Hemet is based on existing rate of GAFO square footage to non GAFO square footage in the total market area, excluding Hemet.

Source: Stanley R. Hoffman Associates, Inc.
The Riverside County Land Information System.
(http://www3.tlma.co.riverside.ca.us/pa/rclis/index.html)
Menifee, Wildomar, Hemet, Temecula and Lake Elsinore City Planning Departments

CHAPTER 5
ESTIMATED RETAIL DEMAND WITHIN TRADE AREA

This Chapter presents historic retail expenditure trends and projected retail demand for the trade area. Retail expenditure trends are shown for the City of Murrieta over the 1994 to 2008 time period, and comparisons are made for the year 2008 with other neighboring cities including Temecula and Lake Elsinore. This chapter also examines projected growth in retail demand from household growth within the trade area. This is prepared by first establishing the baseline (current) estimate of households within the defined retail trade area, and their household incomes and retail expenditure patterns. The second step involves estimating the projected household growth within the trade area, which includes the City of Murrieta and balance of the 10-mile trade area falling in other nearby cities and unincorporated Riverside County areas. Projected household growth for the City of Murrieta is obtained from RBF consulting for the proposed land uses for the General Plan update. Data on household growth in other parts of the trade area, outside the City of Murrieta, is estimated from the RIVTAM model organized at SCAG RTP 2008 traffic analysis zone (TAZ) level.

5.1 Taxable Retail Sales Trends

The following tables present historic taxable retail sales trends for the City and taxable retail sales trends for Murrieta and surrounding cities and counties for 2008 which is the latest year for which these data have been published by the California Board of Equalization. These tables present the data for Murrieta and surrounding cities and counties including Temecula, Lake Elsinore, Corona, Riverside County, San Bernardino County, and San Diego County.

Table 5-1 shows the historic taxable sales transactions of Murrieta from 1994 to 2008 in constant 2009 dollars. Total taxable sales increased over the 1994 to 2008 time period from about $229 million in 1994 to about $965 million in 2008 with an annualized growth rate of 11.07 percent. Retail taxable sales increased from about $206 million in 1994 to about $828 million in 2008. Non-retail taxable sales increased from about $23 million in 1994 to about $137 million in 2008.

As shown in Figure 5-1, non-retail, or business-to-business taxable sales increased as a percentage of total taxable sales from 10 percent in 1994 to 14 percent in 2008. While the bulk of taxable sales are still generated primarily from households, this trend suggests that businesses that generated taxable sales to other businesses were increasing within the City's economic base.

Table 5-1
Historic Taxable Sales Transactions
City of Murrieta
1994 to 2008
(in Thousands of Constant 2009 Dollars)

Year	Retail	Non-Retail	Total
1994	$205,600	$23,382	$228,982
1995	$240,197	$25,412	$265,609
1996	$292,533	$32,793	$325,326
1997	$305,438	$34,130	$339,568
1998	$346,480	$41,091	$387,572
1999	$388,768	$48,204	$436,972
2000	$408,146	$52,667	$460,813
2001	$508,052	$62,355	$570,407
2002	$581,527	$72,393	$653,920
2003	$753,807	$83,476	$837,283
2004	$909,741	$113,556	$1,023,297
2005	$996,545	$138,086	$1,134,631
2006	$1,043,163	$145,831	$1,188,993
2007	$982,887	$145,266	$1,128,154
2008	$827,982	$136,860	$964,842
AAGR	**11.31%**	**14.56%**	**11.70%**

Source: Stanley R. Hoffman Associates, Inc.
California State Board of Equalization, 1994 - 2008

Figure 5-1
Historic Taxable Sales Transactions
City of Murrieta
1994 to 2008
(in Constant 2009 Dollars)

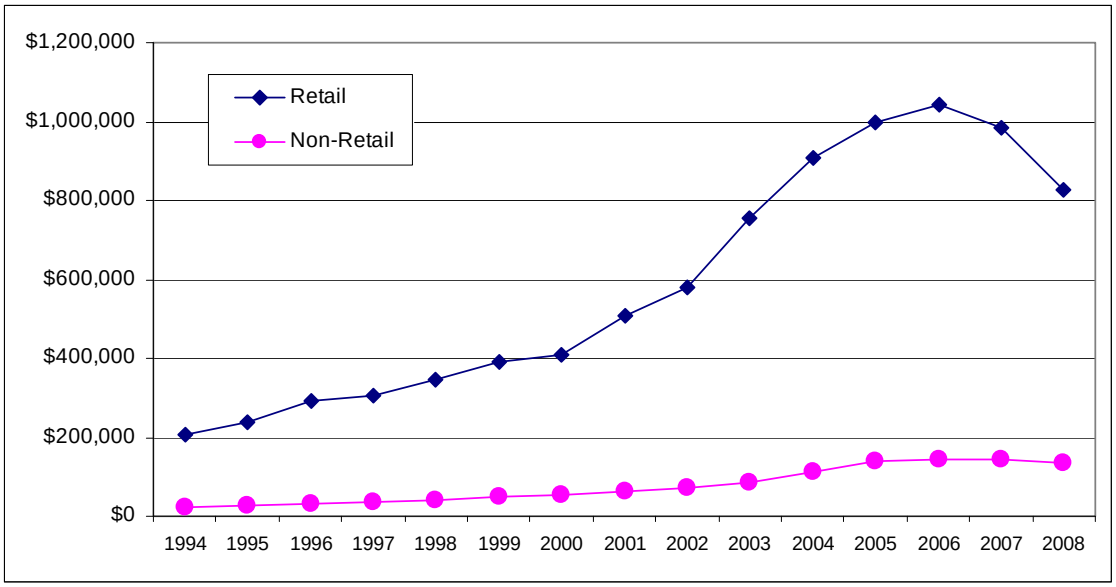


Table 5-2
Comparison of Per Capita Taxable Sales Transactions
City of Murrieta
1994 to 2008
(in Constant 2009 Dollars)

Retail Group	1994	2008	1994-2008 Difference in Sales	1994-2008 % Change	Average Annual Rate of Growth
Apparel Stores	$232	$217	($15)	-6.5%	-0.5%
General Merchandise	273	1,764	1,491	546.4%	15.4%
Food Stores	776	619	(157)	-20.3%	-1.7%
Eating & Drinking Places	590	878	288	48.8%	3.1%
Home Furnishings & Appliances	23	783	760	3307.0%	31.2%
Bldg. Mtrls. & Farm Implements	2,656	854	(1,801)	-67.8%	-8.4%
Auto Dealers & Auto Supplies	27	866	839	3092.4%	30.5%
Service Stations	713	1,140	427	59.8%	3.7%
Other Retail Stores	1,495	1,194	(302)	-20.2%	-1.7%
Retail Subtotal	$6,785	$8,315	$1,530	22.5%	1.6%
All Other Outlets	$772	$1,374	$603	78.1%	4.5%
Total Taxable Sales	$7,557	$9,690	$2,132	28.2%	1.9%
Retail as % of Total	89.8%	85.8%			
Population	30,300	99,576			

Sources: Stanley R. Hoffman Associates, Inc.
California Department of Finance, 1994, 2008
California State Board of Equalization, 1994, 2008

Table 5-2 shows a comparison of per capita taxable sales from 1994 to 2008 in constant 2009 dollars. Per capita total taxable sales increased from $7,557 in 1994 to $9,690 in 2008 with an annualized growth rate of 1.9 percent. Retail taxable sales comprised 89.8 percent of total taxable sales in 1994 then decreased to 85.8 percent of total taxable sales in 2008. Retail sales per capita increased from $6,785 in 1994 to $8,315 in 2008. General Merchandise retail group had the highest increase by $1,491 per capita over the 1994 to 2008 time period. The Building Materials retail group declined the most over the same time period from $2,656 in 1994 to $854 in 2008 in constant 2009 dollars.

As shown in Table 5-3, on a retail per capita basis, Murrieta is performing below both the County of Riverside's and the sub-regional averages. In addition to Murrieta, for comparison purposes, the sub-region is defined as the neighboring cities of Temecula to the south and Lake Elsinore to the north plus Corona farther north along the I-15 corridor. Murrieta at an overall retail sales per capita ratio of $8,315 is performing about 7 percent below the County of Riverside's retail per capita average of $8,920 and about 35 percent below the sub-regional retail per capita average of $12,796. Murrieta is not capturing its fair share of household expenditures from within the City and its

environs. This is particularly striking for General Merchandise and Apparel, as shown in Table 5-3. Murrieta's General Merchandise per capita sales of $1,764 is only 46 percent of Temecula's per capita sales of $3,847. Murrieta's Apparel per capita estimate of $217 is even lower at 20 percent of Temecula's per capita sales of $1,087. The Other Retail Stores category is also about 44 percent of the Temecula average per capita. These striking differences have implications for the potential of regional retailing opportunities in Murrieta, particularly since General Merchandise, Apparel and Other Retail Stores comprise key components of regional retail centers. This also has implications for the City's fiscal health given the importance of sales tax revenues.

Murrieta appears to be performing at or near the area per capita average for Home Furnishings and Appliances and Building Materials, but is estimated to be lagging in per capita sales in Eating and Drinking Places. The Eating and Drinking Places per capita average of $878 is about 79 percent of Riverside County's average per capita estimate of $1,117 and even lower at 40 percent of Temecula average per capita of $2,194.

And finally, in the retail sales tax category of Auto Dealers and Auto Supplies, Murrieta's per capita average of $866 is about 58 percent of the Riverside County per capita average and only 22 percent of Temecula's per capita average. While retail sales of automobiles, trucks and recreational vehicles have slowed considerably during the recessionary downturn from 2007 through 2010, Murrieta should evaluate its long term opportunities to capture a higher proportion of the automotive retail category in the future.

Table 5-3
Per Capita Taxable Sales Transactions
City of Murrieta and Surrounding Cities and Counties
2008
(in thousands of Constant 2009 Dollars)

PANEL A - Taxable Retail Transactions by Jurisdiction (in thousands)

Retail Group	Murrietta	Temecula	Lake Elsinore	Corona	Sub-Region Total[1]	Riverside County	San Bernardino County	San Diego County
Apparel Stores	$21,612	$108,569	$41,468	$80,216	$251,864	$1,112,626	$988,755	$2,188,032
General Merchandise	$175,631	384,250	146,731	344,988	1,051,601	3,362,983	3,061,378	5,263,071
Food Stores	$61,610	67,648	31,690	86,558	247,506	1,244,393	1,135,503	1,853,610
Eating & Drinking Places	$87,442	219,097	65,592	219,902	592,033	2,321,945	2,252,813	4,830,780
Home Furnishings & Appliances	$77,948	79,332	10,916	82,807	251,003	809,888	866,195	1,577,685
Building Materials & Farm Implem.	$85,085	107,777	49,382	185,143	427,388	1,423,925	1,314,986	2,165,649
Auto Dealers & Auto Supplies	$86,262	389,311	93,596	320,838	890,006	3,090,269	3,083,121	4,970,250
Service Stations	$113,542	228,847	110,234	321,174	773,796	2,987,532	3,496,847	4,121,434
Other Retail Stores	$118,849	271,171	34,409	153,658	578,088	2,187,092	2,714,599	4,492,997
Retail Subtotal	$827,982	$1,856,002	$584,017	$1,795,285	$5,063,286	$18,540,653	$18,914,197	$31,463,507
% of Sub-Region	16.4%	36.7%	11.5%	35.5%	100.0%			
% of Riverside County	4.5%	10.0%	3.1%	9.7%	27.3%	100.0%	102.0%	169.7%

PANEL B - Per Capita Taxable Retail Transactions

Retail Group	Murrietta	Temecula	Lake Elsinore	Corona	Sub-Region Total[1]	Riverside County	San Bernardino County	San Diego County
Apparel Stores	$217	$1,087	$837	$547	$636	$535	$484	$699
General Merchandise	$1,764	3,847	2,961	2,352	2,658	1,618	1,497	1,681
Food Stores	$619	677	639	590	625	599	555	592
Eating & Drinking Places	$878	2,194	1,324	1,499	1,496	1,117	1,102	1,543
Home Furnishings & Appliances	$783	794	220	564	634	390	424	504
Building Materials & Farm Implem.	$854	1,079	996	1,262	1,080	685	643	692
Auto Dealers & Auto Supplies	$866	3,898	1,889	2,187	2,249	1,487	1,508	1,587
Service Stations	$1,140	2,291	2,224	2,189	1,955	1,437	1,710	1,316
Other Retail Stores	$1,194	2,715	694	1,047	1,461	1,052	1,328	1,435
Retail Subtotal	$8,315	$18,584	$11,785	$12,238	$12,796	$8,920	$9,249	$10,047
2008 Population	99,576	99,873	49,556	146,698	395,703	2,078,601	2,044,895	3,131,552

PANEL C - Comparison of Riverside County Cities to County Per Capita Retail Transactions

Retail Group	Murrietta	Temecula	Lake Elsinore	Corona	Sub-Region Total[1]	Riverside County	San Bernardino County	San Diego County
Apparel Stores	0.41	2.03	1.56	1.02	1.19	1.00	0.90	1.31
General Merchandise	1.09	2.38	1.83	1.45	1.64	1.00	0.93	1.04
Food Stores	1.03	1.13	1.07	0.99	1.04	1.00	0.93	0.99
Eating & Drinking Places	0.79	1.96	1.18	1.34	1.34	1.00	0.99	1.38
Home Furnishings & Appliances	2.01	2.04	0.57	1.45	1.63	1.00	1.09	1.29
Building Materials & Farm Implem.	1.25	1.58	1.45	1.84	1.58	1.00	0.94	1.01
Auto Dealers & Auto Supplies	0.58	2.62	1.27	1.47	1.51	1.00	1.01	1.07
Service Stations	0.79	1.59	1.55	1.52	1.36	1.00	1.19	0.92
Other Retail Stores	1.13	2.58	0.66	1.00	1.39	1.00	1.26	1.36
Retail Subtotal	0.93	2.08	1.32	1.37	1.43	1.00	1.04	1.13

1. Sub Region represents a sum of taxable sales for the listed cities of Murrieta, Temecula, Lake Elsinore, and Corona only.

Sources: Stanley R. Hoffman Associates, Inc.
California State Board of Equalization, 2008
California Department of Finance, 2008

Table 5-4 displays the per capita taxable sales for General Merchandise, Apparel, Home Furnishings and Other retail groups, which is referred to by the acronym "GAFO" or retailing categories generally found in regional type retail centers. Murrieta's per capita GAFO ratio of $3,957 is about 10 percent higher than Riverside County's ratio, but is just 73 percent of the sub-regional ratio and only 47 percent of Temecula's ratio.

Table 5-4
GAFO[1] Per Capita Taxable Sales
City of Murrieta and Surrounding Cities and Counties
2008
(in Constant 2009 Dollars)

Retail Group	Murrieta	Temecula	Lake Elsinore	Corona	Sub-Region Total[1]	Riverside County	San Bernardino County	San Diego County
General Merchandise	$1,764	$3,847	$2,961	$2,352	$2,658	$1,618	$1,497	$1,681
Apparel Stores	217	1,087	837	547	636	535	484	699
Home Furnishings & Appliances	783	794	220	564	634	390	424	504
Other Retail Stores	$1,194	$2,715	$694	$1,047	$1,461	$1,052	$1,328	$1,435
GAFO Total	$3,957	$8,444	$4,712	$4,510	$5,389	$3,595	$3,732	$4,318

1. GAFO is defined as General Merchandise, Apparel Stores, Home Furnishings and Other Retail

Sources: Stanley R. Hoffman Associates, Inc.
California State Board of Equalization, 2008

5.2 Average GAFO Retail Expenditures of Households Residing within the Trade Area

Household expenditures in their trade areas comprise about 75 to 80 percent of all sales made at GAFO stores. The retail impact analysis in this report uses household expenditures as the main source of revenue for GAFO stores. Expenditure profiles of households residing within the GAFO 10-mile retail trade area based on average household retail expenditure patterns, average household income and persons per household ratios. These expenditure profiles are prepared for existing base-line conditions (2008) and build-out (2035) projections, following several steps. These steps include first estimating the retail expenditure profile for households based on their household size and average household income using the estimated average household incomes and household sizes within the retail trade area.

Estimation of Average Household Income within Trade Area

Current (2008) average household income for the 10-mile trade area was estimated for each of the TAZ-based Demand Zones from the data made available by Iteris through the RIVTAM Traffic Demand model. As shown in Appendix Table A-1, the aggregate and average household incomes for each of the smaller RIVTAM zones were analyzed. These were then aggregated up to the larger SCAG TAZs, as shown in Appendix Table A-2, which were then aggregated up to the final study

Demand Zones, as shown in Appendix Table A-3. The average and aggregate household incomes for each of these steps are also shown in the respective tables. Based on these steps, the average household income for the 10-mile trade area was estimated at about $79,470 based on an estimated 95,460 households residing within the area and aggregate household income of about $7.6 billion.

Further, upon examination of the average household income trends for the region and in talking with the Traffic Consultants, it was discovered that the reported household income data in the RIVTAM model was taken directly from the SCAG RTP socio-economic and demographic (SED) data. However, this reported income data was found to not be current for the year 2008, based on comparison with the 2008 American Community Survey (ACS). As shown in Appendix Table A-4, the reported average household income for the 5 percent Public Use Microdata Area (PUMA5) 08002 – a geography similar to the 10-mile retail trade area -- was estimated at $85,829, which was higher compared to the SCAG income statistic by a factor of 1.08. This estimated factor was used to revise upward the calculated average household incomes for each of the Demand Zones within the 10-mile retail trade area, as shown in Appendix Table A-5.

CHAPTER 6
POTENTIAL IMPACTS OF PROJECTED RETAIL DEVELOPMENT

6.1 Overview of Methodology

This chapter examines the market viability of the proposed GAFO retail uses under the Murrieta General Plan update. As stated before, this analysis involves an assessment of projected increases in household retail expenditures within the 10-mile retail trade area over the 2008 to 2035 time period in comparison to the projected increases in the total GAFO retail space supply within the competitive retail supply area (CRSA).

Additionally, a factor is applied to account for overall increases to the general employment base, visitors traveling to or through Murrieta, and some business-to-business sales. The analysis first projects GAFO-type retail sales and then projects other categories of retail sales, including Food and Groceries, Eating and Drinking, Building Materials, and Automotive Sales and Parts.

6.2 Analysis of Impact on GAFO Retail Stores

As shown in Table 6-1, total household GAFO spending for the retail trade area in the current (2008) year is estimated at $1.04 billion. This estimate was based on the average household income of $85,829 from the reported average household income for the 5 percent Public Use Microdata Area (PUMA5) as described in the previous section, and the General Merchandise, Apparel, Home Furnishings and Appliances, and Other Specialty Retail (GAFO) spending per household. Using the same method, the total GAFO spending for the Recommended Scenario is projected to be about $1.54 billion and about $1.63 for Scenario B.

Also shown in Table 6-1, the estimated supportable GAFO space from household spending for the 10-mile area was 2.97 million square feet for the current (2008) year. Based on Urban Land Institute's (ULI) *2008 Dollars and Cents of Shopping Centers*, the average retail sales per square foot estimate was $350 adjusted to 2008 dollars. By dividing the estimated household GAFO spending potential by the average sales per square foot results in estimated supportable GAFO space from the trade area households before any allocation to retail shopping centers is made. Supportable GAFO space for the Recommended Scenario is projected to be about 4.4 million square feet. It is slightly higher at about 4.6 million square feet for Scenario B.

Table 6-1
Supportable GAFO[1] Space from Residents of
Murrieta Retail Trade Area
(In 2008 Dollars)

	2008	2035 Recommended	Scenario B
Population	293,835	433,665	456,825
Number of Households	95,460	143,174	150,894
Household Size	3.078	3.029	3.027
Average Household Income	$85,829	$85,075	$85,542
GAFO[1] Spending per Household	$10,892	$10,746	$10,773
Total GAFO[1] Spending	$1,039,710,000	$1,538,564,000	$1,625,582,000
Supportable Space at $350/Sq. Ft.[2]	2,971,000	4,396,000	4,645,000

1. GAFO is an acronym that stands for General Merchandise, Apparel, Furnishings and Other stores.
This table uses an extended definition of GAFO, including Electronics & Appliance and Drug stores.

2. According to the 2008 *Dollars and Cents of Shopping Centers* by ULI, seventy percent of the centers reported a fiscal year ending in, or at the end of, the fourth quarter of 2006. A factor of 1.04 (214.7/206.2), based on the West Urban region Consumer Price Index (CPI), was applied to the 2006 retail sales per square foot data ($340) which resulted in $350 in average retail sales per square foot in 2008 dollars, rounded to the nearest tens.

Source: Robert Goldman Based on Consumer Expenditure Survey 2005-06 and U.S. Census of Retail 2002 data.
Dollars and Cents of Shopping Centers, Urban Land Institute (ULI), 2008.
SCAG-RivTAM Forecast Model

As shown in Table 6-2, the estimated sales and sales per square foot are from expenditures by residents who live within the Primary Trade Area. Such sales typically account for 60 to 80 percent of total sales from a shopping center. In 2008, such sales averaged about $239 per square foot of gross leasable area (GLA) for GAFO stores in Murrieta in the estimates shown in Table 6-2. Inflating this estimate by 25 percent to account for sales beyond those attributable to residents of the Primary Trade Area produces an estimate of close to $300 per square foot.

Under the 2035 land use alternative entitled "2035 Recommended" in combination with the projected addition of GAFO retail space identified as projects F-1 through F-8, as shown in Table 4-5, the unadjusted figure declines to $195 per square foot with the adjusted figure at $242 per square foot. For the 2035 land use alternative entitled "Scenario B" with the addition of the same retail projects F-1 through F-8, the unadjusted figure is $209 per square foot and the adjusted number is $261 per square foot.

As shown on Table 6-3, total General Merchandise, Apparel, Home Furnishings and Appliances, and Other Specialty Retail (GAFO) sales totaled about $397 million in 2008 for the City of Murrieta. Based on the 2008 State Board of Equalization, the category of General Merchandise also included Drug Stores. This estimate is about 98 percent of the actual reported GAFO sales of $407 million in 2008 by the State Board of Equalization (SBOE).

Table 6-2
Estimated and Projected Impacts of Residential Growth
Murrieta Retail Trade Area

Center ID	Name	Sales Generated by Primary Trade Area Residents			GLA in Square Feet		Sales per Square Foot		
		2008	2035 Recommended	2035 Scenario B	2008	2035	2008	2035 Recommended	2035 Scenario B
E-1	Murrieta Springs Plaza	$24,571,000	$20,332,000	$21,144,000	105,366	105,366	$233	$193	$201
E-2	Madison Square	$21,072,000	$17,201,000	$17,911,000	89,625	89,625	$235	$192	$200
E-3	Murrieta Spectrum	$17,494,000	$14,313,000	$14,901,000	74,538	74,538	$235	$192	$200
E-4	Wal-Mart Store #29524	$33,858,000	$27,645,000	$28,764,000	144,000	144,000	$235	$192	$200
E-5	Kohls	$19,117,000	$15,330,000	$15,997,000	79,625	79,625	$240	$193	$201
E-6	Murrieta Town Center	$20,318,000	$16,439,000	$17,080,000	82,736	82,736	$246	$199	$206
E-7	Murrieta Plaza	$29,325,000	$23,756,000	$24,681,000	119,728	119,728	$245	$198	$206
E-8	Jefferson Gateway	$2,291,000	$1,992,000	$2,064,000	11,700	11,700	$196	$170	$176
E-9	Village Walk Plaza	$51,588,000	$41,452,000	$43,403,000	207,358	207,358	$249	$200	$209
E-10	Cal Oaks Plaza	$40,782,000	$31,759,000	$33,309,000	151,421	151,421	$269	$210	$220
E-11	California Oaks Center	$9,852,000	$7,180,000	$7,568,000	29,739	29,739	$331	$241	$254
E-12	HomeCenter Cluster	$69,191,000	$53,080,000	$55,532,000	243,716	243,716	$284	$218	$228
E-13	Jefferson Avenue Cluster	$67,890,000	$60,611,000	$62,559,000	363,029	363,029	$187	$167	$172
F1	French Valley Cluster		$59,133,000	$63,096,000		300,632		$197	$210
F2	Golden Triangle		$79,964,000	$83,140,000		427,000		$187	$195
F3	Golden Triangle North		$31,942,000	$33,159,000		138,353		$231	$240
F4	MU3		$114,700,000	$119,990,000		582,267		$197	$206
F5	South Business Corridor					-			
F6	Clinton Keith Mitchell		$30,239,000	$34,189,000		149,813		$202	$228
F7	North Business (North)		$84,301,000	$99,296,000		473,261		$178	$210
F8	North Business (South)		$95,422,000	$108,414,000		473,261		$202	$229
	TOTAL	**$407,349,000**	**$826,791,000**	**$886,197,000**	**1,702,581**	**4,247,167**	**$239**	**$195**	**$209**

Source: Robert Goldman Based on Consumer Expenditure Survey 2005-06 and U.S Census of Retail 2002 data.
Stanley R. Hoffman Associates, Inc.

Table 6-3
GAFO[1] Sales of Murrieta Stores
City of Murrieta
2008

Retail Stores in Murrieta	Taxable Sales[2]
Apparel	$21,785,000
General Merchandise[3]	$177,039,000
Home Furnishings and Appliances	$78,573,000
Other Specialty Retail	$119,802,000
Total GAFO[1] Sales	**$397,199,000**

1. GAFO includes General Merchandise, Apparel, Home Furnishings and Appliances, and Other Specialty Retail Stores.
2. Based on data from the 2008 State Board of Equalization (SBOE) taxable sales for the City of Murrieta.
3. General Merchandise includes General Merchandise and Drug Stores.

6.3 Analysis of Impact on Other Retail Stores

As shown in Table 6-4, total projected Other Retail Sales for the City of Murrieta in the 2035 Recommended Scenario ranged from $1,247,358,390 and $1,463,831,881 based on growth scenarios provided by RBF Consulting and Iteris Inc. Using data from the 2008 State Board of Equalization for the cities of Murrieta, Temecula, Corona, and Lake Elsinore, the average taxable sales per household of other retail categories was calculated. This data was used along with the projected population, household and employment growth to estimate the projected other retail sales. The Food and Groceries retail category is estimated to be 25 percent taxable which has been accounted for in the calculation of total Food and Grocery retail sales.

Table 6-4
Projected Other Retail Sales for General Plan Growth Scenarios: 2035
City of Murrieta

	Recommended	Scenario B
Growth[1]		
Population	133,261	156,421
Households	44,484	52,204
Employment	130,153	118,412
Other Retail Sales Factor[2]		
Food and Groceries[3]	$7,983 per Household	
Eating and Drinking	$4,774 per Household	
Building Materials	$3,446 per Household	
Auto Dealers and Parts	$7,176 per Household	
Service Stations	$4,661 per Household	
Projected Other Retail Sales		
Food and Groceries[3]	$355,112,077	$416,740,195
Eating and Drinking	$212,356,282	$249,209,768
Building Materials	$153,299,630	$179,904,098
Auto Dealers and Parts	$319,236,135	$374,638,144
Service Stations	$207,354,267	$243,339,676
Total	**$1,247,358,390**	**$1,463,831,881**

1. Growth scenarios provided by RBF Consulting and Iteris Inc. from 2008 to 2035.
2. Based on the average taxable sales per household for the sub-region consisting of Murrieta, Temecula, Corona, and Lake Elsinore; data is from the State Board of Equalization (SBOE), 2008.
3. It is estimated that 25% of Food and Grocery sales are taxable in order to estimate total Food and Grocery sales shown here.

Source: Stanley R. Hoffman Associates, Inc.
Iteris, Inc.
RBF Consulting
State Board of Equalization (SBOE).

Shown on Table 6-5 is the projected other retail square footage for the two General Plan 2035 growth scenarios. An estimated 1.6 million square feet of retail is projected under the Recommended Scenario and 1.9 million square feet under Scenario B. This was calculated based on the projected other retail sales shown on Table 6-5 and the estimated sales per square foot, shown previously on Table 4-5. Projected retail sales for Food and Groceries has been adjusted by a taxable factor of 25 percent of food sales based on historic California State Board of Equalization (SBOE) data.

Also, the distribution of the auto-related retail sales such as Auto Supplies and Parts, New Auto Dealers, and Used and Other Auto Dealers, is based on the Riverside County distribution of auto-related sales from SBOE. New Auto Dealers comprised the largest share of retail sales in Riverside County at about 72 percent, followed by about 16 percent for Used and Other Auto Dealers and about 12 percent for Auto Supplies and Parts.

Table 6-5 also shows the projected permits for New Auto Dealers and Service Stations. The number of permits projected for New Auto Dealers under the two scenarios range from 14 to 16 while the number of permits projected for Service Stations range from 32 to 37.

Table 6-5
Projected Other Retail Square Footage for General Plan Growth Scenarios: 2035
City of Murrieta

	Recommended	Scenario B
Projected Other Retail Sales		
Food and Groceries[1]	$355,112,077	$416,740,195
Eating and Drinking	$212,356,282	$249,209,768
Building Materials	$153,299,630	$179,904,098
Auto Supplies and Parts[2]	$38,308,336	$44,956,577
Auto Dealers - New[2]	$229,850,017	$269,739,464
Auto Dealers - Used, RV and Other[2]	$51,077,782	$59,942,103
Service Stations	$207,354,267	$243,339,676
	$1,247,358,390	$1,463,831,881
Estimated Sales per Square Foot[3]		
Food and Groceries	$520	$520
Eating and Drinking	$550	$550
Building Materials	$360	$360
Auto Supplies and Parts	$280	$280
Projected Other Retail Square Feet		
Food and Groceries	682,908	801,423
Eating and Drinking	386,102	453,109
Building Materials	425,832	499,734
Auto Supplies and Parts	136,815	160,559
Subtotal	**1,631,658**	**1,914,825**
Auto Dealers - New		
Taxable Sales per Permit	$16,845,000	$16,845,000
Projected Permits at 2008 Rates	14	16
Service Stations		
Taxable Sales per Permit	$6,558,000	$6,558,000
Projected Permits at 2008 Rates	32	37

1. Food store sales have been converted to total sales using a taxable factor of 25% based on State of California, BOE taxable/non-taxable food sales, 1985.
2. Based on the Countywide State BOE taxable sales distribution for Riverside County, new auto sales are 72%, used auto, RV and other vehicle sales are 16% and auto supplies and parts are 12% of the BOE Motor Vehicle and Parts category.
3. Sales per square foot factors for all categories, except Auto Supplies and Parts, are from The Hdl Companies, 2007 Retail Store Taxable Sales Estimates; the factor for Auto Supplies and Parts is from the ULI Dollars & Cents of Shopping Centers, 2008.

Source: Stanley R. Hoffman Associates, Inc.

Finally, Table 6-6 shows the projected total retail sales and square footages for the 2035 Recommended Scenario and Scenario B in the City of Murrieta. Total retail sales include General Merchandise, Apparel, Home Furnishings and Appliances, and Other Specialty Retail (GAFO) retail sales and other retail sales. Household generated retail sales are projected to be $2.07 billion under the Recommended Scenario and $2.35 million under Scenario B.

Under the Recommended Scenario, total retail sales are projected to be about $2.4 billion and about $2.7 billion under Scenario B for the City. A factor of 1.25 was applied to the retail categories of GAFO, Eating and Drinking, and Service Stations in order to account for increased retail sales due to projected increases in employment, visitors, and some business-to-business sales in Murrieta. The 1.25 factor is an approximation by the retail consultant to account for these uncertain demand sources.

As shown on Table 6-6, based on the total retail sales estimates and the estimated sales per square foot estimates, the projected total retail center square feet is about 4.68 million square feet under the Recommended Scenario and 5.19 million square feet under Scenario B. Also projected, the number of new permits projected for New Auto Dealers range from 14 to 16 while new permits projected for Service Stations range from 32 to 37.

Based on about 9.06 million square feet of existing and proposed retail developments in Murrieta, the projected 4.68 million square feet of demand under the Recommended Scenario represents about 52 percent of the total; the projected 5.19 million square feet of demand under Scenario B represents about 57 percent of the total.

Table 6-6
Projected Retail Sales and Square Footage for General Plan Growth Scenarios: 2035
City of Murrieta

	Recommended	Scenario B
Projected Total Household Generated Retail Sales		
GAFO	$826,762,340	$886,095,154
Food and Groceries[1]	$355,112,077	$416,740,195
Eating and Drinking	$212,356,282	$249,209,768
Building Materials	$153,299,630	$179,904,098
Auto Supplies and Parts	$38,308,336	$44,956,577
Auto Dealers - New	$229,850,017	$269,739,464
Auto Dealers - Used, RV and Other	$51,077,782	$59,942,103
Service Stations	$207,354,267	$243,339,676
Household Generated Retail Sales	$2,074,120,730	$2,349,927,035
Projected Total Retail Sales		
GAFO[2]	$1,033,452,925	$1,107,618,943
Food and Groceries[1]	$355,112,077	$416,740,195
Eating and Drinking[2]	$265,445,352	$311,512,210
Building Materials	$153,299,630	$179,904,098
Auto Supplies and Parts	$38,308,336	$44,956,577
Auto Dealers - New	$229,850,017	$269,739,464
Auto Dealers - Used, RV and Other	$51,077,782	$59,942,103
Service Stations[2]	$259,192,834	$304,174,595
Total Retail Sales	$2,385,738,953	$2,694,588,185
Estimated Sales per Square Foot[3]		
GAFO	$350	$350
Food and Groceries	$520	$520
Eating and Drinking	$550	$550
Building Materials	$360	$360
Auto Supplies and Parts	$280	$280
Projected Square Feet Increment		
GAFO	2,952,700	3,164,600
Food and Groceries	682,900	801,400
Eating and Drinking	482,600	566,400
Building Materials	425,800	499,700
Auto Supplies and Parts	136,800	160,600
Total Retail Center Square Feet	**4,680,800**	**5,192,700**
Total Existing and Proposed Square Feet	9,058,965	9,058,965
Retail Center to Total Existing and Proposed Square Feet	**52%**	**57%**
Auto Dealers - New		
Taxable Sales per Permit	$16,845,000	$16,845,000
Projected Permits at 2008 Rates	14	16
Service Stations		
Taxable Sales per Permit	$6,558,000	$6,558,000
Projected Permits	40	46

1. Food store sales have been converted to taxable sales using a taxable factor of 25% based on State of California, BOE taxable/non-taxable food sales, 1985.
2. The household retail sales projections for GAFO, Eating and Drinking and Service Stations have been factored by 1.25 to account for increased retail sales due to projected increases in employment, visitors and some business-to-business sales in Murrieta; this is a rough approximation by the retail consultant to account for these uncertain demand sources.
3. Sales per square foot factors for all categories, except Auto Supplies and Parts and GAFO, are from The Hdl Companies, 2007 Retail Store Taxable Sales Estimates; the factors for Auto Supplies and Parts and GAFO are from the ULI Dollars & Cents of Shopping Centers, 2008. of Shopping Centers, 2008.

Source: Stanley R. Hoffman Associates, Inc.

Projected retail sales have been translated into taxable retail sales as shown in Table 6-7. This has been prepared by reducing Food and Groceries by the non-taxable component estimated at 75 percent. The next step was to allocate these taxable sales by focus areas and the remainder of the City as shown in Panel B of Table 6-8. The basic assumption that has been made to distribute the taxable sales has been to assume that all non-GAFO retail sales are distributed similar to the GAFO retail as discussed earlier. One exception is the new auto center sales which are allocated 100 percent to the focus areas, as the auto center is located within the South Business Corridor focus area. As shown in Panel B of Table 6-7, about $1.04 billion or 49 percent of the projected total taxable sales is allocated to the focus areas in the Recommended Scenario, while $1.22 billion or 51 percent is allocated to the focus areas in Scenario B.

Table 6-7
Distribution of Total Taxable Sales for All Focus Areas
City of Murrieta

		Recommended	Scenario B
A. Projected Taxable Retail Sales			
GAFO[2]		$1,033,452,925	$1,107,618,943
Food and Groceries[1]		$88,778,019	$104,185,049
Eating and Drinking[2]		$265,445,352	$311,512,210
Building Materials		$153,299,630	$179,904,098
Auto Supplies and Parts		$38,308,336	$44,956,577
Auto Dealers - New		$229,850,017	$269,739,464
Auto Dealers - New, RV and Other		$51,077,782	$59,942,103
Service Stations[2]		$259,192,834	$304,174,595
	Total Taxable Retail Sales	$2,119,404,895	$2,382,033,039
B. Distribution of Total Taxable Sales			
	Focus Areas	**$1,042,358,615**	**$1,220,271,573**
	Rest of City	**$1,077,046,280**	**$1,161,761,466**
Total Taxable Sales		**$2,119,404,895**	**$2,382,033,039**

1. Food store sales have been converted to taxable sales using a taxable factor of 25% based on State of California, BOE taxable/non-taxable food sales, 1985.
2. The household retail sales projections for GAFO, Eating and Drinking and Service Stations have been factored by 1.25 to account for increased retail sales due to projected increases in employment, visitors and some busines-to-business sales in Murrieta; this is a rough approximation by the retail consultant to account for these uncertain demand sources.

Source: Stanley R. Hoffman Associates, Inc.

APPENDIX A
RETAIL INVENTORY TABLES

Table A-1
Detailed GAFO[1] GLA[2] by Cluster[3]
Trade Area[4]
May 2010

Name	Address	City	Total Center GLA (Sq.Ft.)	Total Vacant GLA (Sq.Ft.)	Vacancy Rate	GAFO GLA (Sq.Ft.)	% GAFO	Estimated Occupied GAFO (Sq.Ft.)	Estimated Vacant GAFO (Sq.Ft.)	GAFO Vacancy Rate
HomeCenter Cluster										
HomeCenter Murrieta	Based off Costar Coordinates	Murrieta	351,000	62,000	17.7%	273,000	77.8%	224,778	48,222	17.7%
Murrieta Gateway	Based off Costar Coordinates	Murrieta	153,596	39,301	25.6%	25,450	16.6%	18,938	6,512	25.6%
		Total: HomeCenter Cluster	**504,596**	**101,301**	**20.1%**	**298,450**	**59.1%**	**243,716**	**54,734**	**18.3%**
Jefferson Avenue Cluster										
Corning Plaza	26540 Jefferson Avenue	Murrieta	95,000	0	0.0%	16,300	17.2%	16,300	0	0.0%
Gateway Centre	26341 Jefferson Avenue	Murrieta	112,058	17,909	16.0%	53,036	47.3%	44,560	8,476	16.0%
Jefferson Plaza	26755 Jefferson Avenue	Murrieta	42,155	0	0.0%	22,305	52.9%	22,305	0	0.0%
Jefferson Business Park	26835 Jefferson Avenue	Murrieta	454,799	0	0.0%	279,864	61.5%	279,864	0	0.0%
		Total: Jefferson Avenue Cluster	**704,012**	**17,909**	**2.5%**	**371,505**	**52.8%**	**363,029**	**8,476**	**2.3%**
Commons at Temecula Cluster										
Commons At Temecula	40500 Winchester Road	Temecula	320,550	35,700	11.1%	231,280	72.2%	205,522	25,758	11.1%
Winchester Meadows	40405 Winchester Road	Temecula	200,000	1,360	0.7%	33,563	16.8%	33,335	228	0.7%
		Total: Commons at Temecula Cluster	**520,550**	**37,060**	**7.1%**	**264,843**	**50.9%**	**238,857**	**25,986**	**9.8%**
The Promenade Cluster										
The Promenade	40820 Winchester Road	Temecula	1,013,000	7,956	0.8%	830,207	82.0%	823,687	6,520	0.8%
Bel Villaggio	41577 Margarita Road	Temecula	116,470	5,986	5.1%	34,000	29.2%	32,253	1,747	5.1%
Margarita Promenade	Based off Costar Coordinates	Temecula	56,210	3,540	6.3%	16,100	28.6%	15,086	1,014	6.3%
		Total: The Promenade Cluster	**1,185,680**	**17,482**	**1.5%**	**880,307**	**74.2%**	**871,025**	**9,282**	**1.1%**
Temecula Town Center Cluster										
Tower Plaza Center	27511 Ynez Road	Temecula	134,510	43,326	32.2%	28,000	20.8%	18,981	9,019	32.2%
Temecula Town Center	29720 Rancho California Road	Temecula	542,822	50,158	9.2%	204,097	37.6%	185,238	18,859	9.2%
		Total: Temecula Town Center Cluster	**677,332**	**93,484**	**13.8%**	**232,097**	**34.3%**	**204,219**	**27,878**	**12.0%**
Highway 79 Cluster										
Highway 79 South Cluster										
32425 Highway 79 S	32425 Highway 79 S	Temecula	101,784	0	0.0%	40,000	39.3%	40,000	0	0.0%
Vail Ranch Center	SEC 31845 Hwy 79 S	Temecula	204,204	18,249	8.9%	35,902	17.6%	32,694	3,208	8.9%
Staples	32120 Highway 79 South	Temecula	23,942	0	0.0%	23,942	100.0%	23,942	0	0.0%
		Subtotal: Highway 79 South Cluster	329,930	18,249	5.5%	99,844	30.3%	96,636	3,208	3.2%
Redhawk Towne Center	32797 Redhawk Pky	Temecula	345,113	0	0.0%	149,500	43.3%	149,500	0	0.0%
Villages at Paseo Del Sol	Based off Costar Coordinates	Temecula	348,220	3,220	0.9%	56,342	16.2%	55,821	521	0.9%
		Total: Highway 79 Cluster	**1,023,263**	**21,469**	**2.1%**	**305,686**	**29.9%**	**301,957**	**3,729**	**1.2%**
Butterfield Cluster										
Butterfield Station	33145 State Highway 79	Temecula	75,000	7,669	10.2%	63,750	85.0%	57,231	6,519	10.2%
Butterfield Ranch	43842 Butterfield Stage Road	Temecula	55,685	0	0.0%	16,305	29.3%	16,305	0	0.0%
		Total: Butterfield Cluster	**130,685**	**7,669**	**5.9%**	**80,055**	**61.3%**	**73,536**	**6,519**	**8.1%**
Lake Elsinore South Cluster										
Lake Elsinore City Center	Based off Costar Coordinates	Lake Elsinore	260,151	21,543	8.3%	141,885	54.5%	130,136	11,749	8.3%
Lake Elsinore Town Center	Based off Costar Coordinates	Lake Elsinore	157,768	8,000	5.1%	42,750	27.1%	40,582	2,168	5.1%
		Total: Lake Elsinore South Cluster	**417,919**	**29,543**	**7.1%**	**184,635**	**44.2%**	**170,718**	**13,917**	**7.5%**
Lake Elsinore North Cluster										
Lake Elsinore Marketplace	Based off Costar Coordinates	Lake Elsinore	319,298	0	0.0%	220,936	69.2%	220,936	0	0.0%
Lake Elsinore Square	Based off Costar Coordinates	Lake Elsinore	208,296	0	0.0%	67,250	32.3%	67,250	0	0.0%
Oak Grove Crossing	Based off Costar Coordinates	Lake Elsinore	143,194	3,300	2.3%	130,000	90.8%	127,004	2,996	2.3%
		Total: Lake Elsinore North Cluster	**670,788**	**3,300**	**0.5%**	**418,186**	**62.3%**	**415,190**	**2,996**	**0.7%**
Menifee Cluster										
Target	30251 Antelope Rd	Menifee	111,000	111,000	100.0%	111,000	100.0%	0	111,000	100.0%
Menifee Town Center	30145 Antelope Road	Menifee	114,562	7,795	6.8%	54,188	47.3%	50,501	3,687	6.8%
Countryside Marketplace	Based off Costar Coordinates	Menifee	715,705	60,002	8.4%	617,599	86.3%	565,822	51,777	8.4%
		Total: Menifee Cluster	**941,267**	**178,797**	**19.0%**	**782,787**	**83.2%**	**616,323**	**166,464**	**21.3%**
Hemet Cluster										
JC Penney (Hemet Valley Mall)	2200 W. Florida Ave.	Hemet	124,000	0	0.0%	124,000	100.0%	124,000	0	0.0%
Kmart	220 W. Stetson Ave.	Hemet	86,500	86,500	100.0%	86,500	100.0%	0	86,500	100.0%
Sears	2200 W. Florida Ave.	Hemet	111,400	0	0.0%	111,400	100.0%	111,400	0	0.0%
WalMart	1231 S. Sanderson Ave.	Hemet	130,000	0	0.0%	130,000	100.0%	130,000	0	0.0%
Target (Hemet Valley Shopping Center)	3527 W. Florida Ave.	Hemet	120,000	0	0.0%	120,000	100.0%	120,000	0	0.0%
Ross	3001 W. Florida Ave.	Hemet	30,000	0	0.0%	30,000	100.0%	30,000	0	0.0%
		Total: Hemet Cluster	**601,900**	**86,500**	**14.4%**	**601,900**	**100.0%**	**515,400**	**86,500**	**14.4%**

1. GAFO is an acronym for General Merchandise, Apparel, Home Furnishings, and Other Retail Merchandise.
2. GLA stands for "gross leasable area."
3. A "cluster" refers to an collection of two or more regionally competitive shopping centers or stores in close proximity that were aggregated together.
4. Trade Area is a circle with a 10 mile radius centered on the intersection of the 15 Freeway and 215 Freeway.

Source: Stanley R. Hoffman Associates, Inc.

APPENDIX B
HOUSEHOLD SPENDING TABLES

Table B-1
Average Annual Household Spending on Merchandise
by Type of Merchandise
Murrieta Retail Trade Area[4]
(In 2008 Dollars)

	2008	2035 Recommended	Scenario B
Food			
Food At Home	$5,011	$4,929	$4,932
Food Away from Home	$4,040	$3,987	$3,997
Alcoholic Beverages	$790	$779	$780
Housing Operations and Maintenance			
Maint., repairs, other exp.	$818	$808	$810
Utilities, Fuels and Public Services	$0	$0	$0
Household Operations	$0	$0	$0
Housekeeping Supplies	$885	$872	$873
Household Furnishings and Equipment			
Household Textiles	$235	$232	$233
Furniture & Floor Coverings	$979	$969	$973
Major Appliances	$409	$404	$406
Small Appliances	$190	$188	$189
Misc. Household equip.	$1,308	$1,293	$1,298
Apparel and services			
Men and boys	$676	$667	$669
Women, girls & Children Under 2	$1,169	$1,152	$1,155
Footwear	$449	$442	$443
Other apparel products and services	$462	$456	$458
Transportation			
Vehicle Purchases	$6,134	$6,066	$6,091
Gasoline and Motor Oil	$3,116	$3,073	$3,080
Vehicle Maintenance and Repairs	$1,175	$1,160	$1,163
Health Care			
Drugs and Medical Supplies	$795	$781	$781
Entertainment			
Fees and Admissions			
TV, Radios & Sound Equipment	$1,333	$1,315	$1,318
Pets, Toys & Playground Equipment	$667	$658	$660
Entertainment -- Other	$986	$977	$983
Other			
Personal Care Products and Services	$888	$876	$878
Reading	$205	$203	$203
Education-Books, Supplies & Equipment	$121	$120	$120
Tobacco Products and Smoking Supplies	$345	$338	$337
Total	$33,188	$32,746	$32,829
Household Income	$85,829	$85,075	$85,542
Household Size	3.085	3.029	3.027

Source: Robert Goldman Based on Consumer Expenditure Survey 2005-06 and U.S. Census of Retail 2002 data.

Table B-2
Average Annual Household Spending on Merchandise
by Type of Store
Murrieta Retail Trade Area[4]
(In 2008 Dollars)

	2008	2035 Recommended	Scenario B
Motor vehicle & parts dealers	$7,382	$7,299	$7,327
Furniture & home furnishings stores	$853	$844	$848
Electronics & appliance stores	$962	$950	$952
Bldg. material & garden equip.& supplies dlrs.	$1,059	$1,046	$1,050
Food & beverage stores	$5,537	$5,449	$5,453
Health & personal care stores	$1,453	$1,431	$1,433
Gasoline stations	$3,386	$3,339	$3,345
Clothing & clothing accessories stores	$1,637	$1,615	$1,618
Sporting goods, hobby, book, & music stores	$1,127	$1,114	$1,118
General merchandise stores	$4,481	$4,419	$4,429
Miscellaneous store retailers	$378	$373	$374
Eating Places	$4,040	$3,987	$3,997
Nonstore retailers	$893	$881	$883
Total	$33,188	$32,746	$32,829
Household Income	$85,829	$85,075	$85,542
Household Size	3.085	3.029	3.027

Source: Robert Goldman Based on Consumer Expenditure Survey 2005-06 and U.S. Census of Retail 2002 data.

Table B-3
Average Annual Household Spending on GAFO[1] Merchandise
by Type of Store
Murrieta Retail Trade Area[4]
(In 2008 Dollars)

	2008	2035 Recommended	Scenario B
442 Furniture & home furnishings stores	$853	$844	$848
443 Electronics & appliance stores	$962	$950	$952
448 Clothing & clothing accessories stores	$1,637	$1,615	$1,618
451 Sporting goods, hobby, book, & music stores	$1,127	$1,114	$1,118
452 General merchandise stores	$4,481	$4,419	$4,429
453 Miscellaneous store retailers	$378	$373	$374
446 Health & personal care stores	$1,453	$1,431	$1,433
GAFO[1] Total	$10,892	$10,746	$10,773
Household Income	$85,829	$85,075	$85,542
Household Size	3.085	3.029	3.027

1. GAFO is an acronym that stands for General Merchandise, Apparel, Furnishings and Other stores. This table uses an extended definition of GAFO, including Electronics & Appliance and Drug stores.

Source: Robert Goldman Based on Consumer Expenditure Survey 2005-06 and U.S. Census of Retail 2002 data.

APPENDIX C
RETAIL GROWTH TABLE

Table C-1
Estimated and Projected Impacts of Residential Growth
Murrieta Retail Trade Area

Center ID	Name	Sales Generated by Primary Trade Area Residents			GLA in Square Feet		Sales per Square Foot		
		2008	2035 Recommended	2035 Scenario B	2008	2035	2008	2035 Recommended	2035 Scenario B
E-1	Murrieta Springs Plaza	$24,571,000	$20,332,000	$21,144,000	105,366	105,366	$233	$193	$201
E-2	Madison Square	$21,072,000	$17,201,000	$17,911,000	89,625	89,625	$235	$192	$200
E-3	Murrieta Spectrum	$17,494,000	$14,313,000	$14,901,000	74,538	74,538	$235	$192	$200
E-4	Wal-Mart Store #29524	$33,858,000	$27,645,000	$28,764,000	144,000	144,000	$235	$192	$200
E-5	Kohls	$19,117,000	$15,330,000	$15,997,000	79,625	79,625	$240	$193	$201
E-6	Murrieta Town Center	$20,318,000	$16,439,000	$17,080,000	82,736	82,736	$246	$199	$206
E-7	Murrieta Plaza	$29,325,000	$23,756,000	$24,681,000	119,728	119,728	$245	$198	$206
E-8	Jefferson Gateway	$2,291,000	$1,992,000	$2,064,000	11,700	11,700	$196	$170	$176
E-9	Village Walk Plaza	$51,588,000	$41,452,000	$43,403,000	207,358	207,358	$249	$200	$209
E-10	Cal Oaks Plaza	$40,782,000	$31,759,000	$33,309,000	151,421	151,421	$269	$210	$220
E-11	California Oaks Center	$9,852,000	$7,180,000	$7,568,000	29,739	29,739	$331	$241	$254
E-12	HomeCenter Cluster	$69,191,000	$53,080,000	$55,532,000	243,716	243,716	$284	$218	$228
E-13	Jefferson Avenue Cluster	$67,890,000	$60,611,000	$62,559,000	363,029	363,029	$187	$167	$172
E-14	Etco Plaza	$2,482,000	$2,249,000	$2,314,000	12,897	12,897	$192	$174	$179
E-15	Commons at Temecula Cluster	$54,033,000	$49,379,000	$50,609,000	238,857	238,857	$226	$207	$212
E-16	The Promenade Cluster	$183,786,000	$167,762,000	$172,081,000	871,025	871,025	$211	$193	$198
E-17	Palm Plaza	$39,841,000	$36,617,000	$37,525,000	195,217	195,217	$204	$188	$192
E-18	Costco	$15,463,000	$14,255,000	$14,584,000	76,226	76,226	$203	$187	$191
E-19	Temecula Town Center Cluster	$43,805,000	$41,128,000	$41,863,000	204,219	204,219	$215	$201	$205
E-20	Highway 79 Cluster	$98,186,000	$96,855,000	$97,601,000	301,957	301,957	$325	$321	$323
E-21	Butterfield Cluster	$20,079,000	$19,615,000	$19,792,000	73,536	73,536	$273	$267	$269
E-22	Lake Elsinore North Cluster	$9,550,000	$8,691,000	$9,120,000	170,718	170,718	$56	$51	$53
E-23	Lake Elsinore South Cluster	$56,255,000	$55,259,000	$57,069,000	415,190	415,190	$135	$133	$137
E-24	Menifee Cluster	$92,419,000	$77,719,000	$82,946,000	616,323	616,323	$150	$126	$135
E-25	Hemet Cluster	$16,462,000	$14,972,000	$15,885,000	515,400	515,400	$32	$29	$31
F1	French Valley Cluster		$59,133,000	$63,096,000		300,632		$197	$210
F2	Golden Triangle		$79,964,000	$83,140,000		427,000		$187	$195
F3	Golden Triangle North		$31,942,000	$33,159,000		138,353		$231	$240
F4	MU3		$114,700,000	$119,990,000		582,267		$197	$206
F5	South Business Corridor					-			
F6	Clinton Keith Mitchell		$30,239,000	$34,189,000		149,813		$202	$228
F7	North Business (North)		$84,301,000	$99,296,000		473,261		$178	$210
F8	North Business (South)		$95,422,000	$108,414,000		473,261		$202	$229
F9	Shops at Scott		$14,524,000	$16,775,000		84,233		$172	$199
F10	Menifee Shopping Center		$40,349,000	$46,025,000		236,000		$171	$195
F11	Bundy Canyon Commercial Center		$60,514,000	$62,660,000		300,000		$202	$209
F12	Hemet Cluster		$11,937,000	$12,727,000		500,000		$24	$25
	TOTAL	**$1,039,710,000**	**$1,538,616,000**	**$1,625,773,000**	**5,394,146**	**9,058,965**	**$193**	**$170**	**$179**

Source: Robert Goldman Based on Consumer Expenditure Survey 2005-06 and U.S Census of Retail 2002 data.
Stanley R. Hoffman Associates, Inc.

Table D-1
Retail Store Taxable Sales Estimates
U.S. National

Store Type	Square Feet (in thousands)	Example Stores	Annual Sales Tax (in thousands)	Annual Taxable Sales/Gross SF
Women's Apparel Stores				
Boutique	1.5-3	Chicos, Hot Topic, Cache, B J Vines	$10-25	$400-700
Small Fashion	3-4.5	Ann Taylor, Bebe, BCBG, Pacific Sunwear	10-30	300-750
Mid-Fashion	4-6.5	Coldwater Creek, Avenue, Limited, J Jill, Sizes Unlimited	15-30	250-550
Large Fashion	5-10	Lerner New York, Dress Barn, Fashion Bug, Charlotte Russe	15-25	150-500
Men's Apparel Stores				
Casual	2-7	Casual Male, Patrick James, Rochester Big & Tall	5-12	150-350
Business Attire	6-10	Men's Wearhouse, Jos A Bank, 3 Day Suit Brokers	5-25	200-300
Family Apparel				
Children	2-4.5	Childrens Place, Carters, Gymboree, Naartjie Custom Kids	10-30	300-650
Casual	6-35	Gap, Old Navy, Hollister, Abercrombie & Fitch	25-75	250-425
Discount	25-35	Ross, T. J. Maxx, Marshalls, Nordstrom Rack, H & M	75-225	250-500
Shoe Stores				
Small	1.2-2.5	J. Stephens, Jarman, Naturalizer, Aldo Shoes, Skechers	3-12	250-475
Mid-Sized	3-5.5	Payless, Footlocker, Famous Footwear, Cole Haan, Shoe Inn	6-20	150-325
Large	6+	DSW, Nike, Warehouse Shoe Sale, Shoe Pavillion	40-90	150-325
Department Stores/General Merchandise				
Closeout/Dollar Stores	12-30	Big Lots, 99 Cents Only, Dollar Tree	10-40	100-150
Discount Department	120-140	Target, Wal Mart	300-550	300-450
Membership Warehouse	120-150	Costco, Sam's Club	275-1,000	275-775
Mid-Sized Department	85-110	Mervyns, Gottschalks, Kohls, Burlington Coat Factory	115-185	110-175
Large Department	125-190	Sears, J C Penney, Dillards, Macys	230-450	150-300
Upscale Department	120-180	Nordstrom, Bloomingdales, Neiman Marcus	425-975	425-825
Food Stores				
Convenience	2-3	7 Eleven, Circle K, Fastrip, Shop N Go	10-20	325-650
Specialty Food	10-30	Whole Foods, Wild Oats, Henrys Marketplace	25-40	100-350
Chain Supermarket	40-65	Ralphs, Albertsons, Safeway, Raleys, Stater Bros.	30-60	110-150
High End Supermarket	20-25	Bristol Farms, Gelsons	30-60	175-250
Warehouse Grocery	45-60	Pak N Save, Food 4 Less, Superior Warehouse, Food Maxx	40-60	90-140
Ethnic Market	25-50	99 Ranch, Gigante, Superior Warehouse	10-30	40-115
Drug Stores				
	15-22	Longs, Rite Aid, Walgreens, CVS	20-35	125-215

Source: the HdL Companies

(Continued)

Table D-1 (Continued)
Retail Store Taxable Sales Estimates
U.S. National

Store Type	**Square Feet** (in thousands)	*Example Stores*	**Annual Sales Tax** (in thousands)	***Annual Taxable Sales/Gross SF***
Restaurants				
Coffee/Juice Bars	.5-1	Starbucks, Coffee Bean & Tea Leaf, It's A Grind	$.5-1.8	$75-150
Fast Food	2-3	Mc Donalds, Burger King, Taco Bell, Wendys	10-20	350-750
Fast Casual	1.8-3	Panera Bread, Pasta Bravo, Pick Up Stix, Daphnes Greek Café	6-12	300-700
Coffee Shops	2.5-4	Dennys, IHOP, Cocos, Corner Bakery	10-20	400-600
Buffet	7.5-10	Hometown Buffet, Souplantation, Sweet Tomatoes	20-40	300-400
Family Dining	5-8.5	Applebees, Red Robin, Islands, Chilis, Johnny Carinos	25-40	400-650
Dinner House	6.5-7.5	Outback, P F Changs, Black Angus, El Torito	25-55	325-800
Home Improvement/Furnishings				
Kitchen/Bath/Bedding	30-40	Linens N Things, Bed Bath & Beyond	40-100	110-250
Imports/Accents	10-20	Pier One, Cost Plus, HomeGoods	15-40	200-300
Home Décor/Accessories	10-40	Crate & Barrel, Pottery Barn, Z Gallerie	25-125	300-525
Volume Decorator/Fixtures	50-110	Expo, Great Indoors	125-225	150-250
Paint	3-10	Sherwin Williams,Vista Paint, Dunn Edwards, Frazee Industries	15-45	250-450
Warehouse Building Supply	110-160	Home Depot, Lowes	400-600	325-400
Furniture	15-30	Sit N Sleep, Ethan Allen, Thomasville, Mancinis Sleepworld	20-65	225-325
Large-Format Furniture	40-60	Levitz, Wickes, Bassett, EasyLife, Linders	45-150	200-275
Warehouse Furniture		RC Willey, Living Spaces, IKEA		
Small Electronics	1.3-2.5	Radio Shack, Gamestop, palmOne, Affordable Portables	6-8	325-600
Volume Electronics/Appliances	25-45	Circuit City, Best Buy, Comp USA	75-425	250-950
Miscellaneous Retail				
Bath & Beauty	1-3	Bath & Body Works, Body Shop, L'Occitane, Sally Beauty	5-15	400-800
Book Stores - Small	6-12	B Dalton, Waldenbooks, Family Christian, Half Price Books	10-25	100-300
Book Stores - Large	25-30	Barnes & Noble, Borders	35-90	125-275
Cards/Gifts	1-5	Hallmark, Spencers Gifts, Things Remembered, Sanrio	2-8	150-600
Craft Shops	12-35	Michaels, Joann Fabrics & Crafts, Hancock Fabrics	10-45	100-250
Multi-plex Cinemas	10-20 screens	Edwards, AMC, Pacific	10-20	500-1,000/screen
Music Recordings	20-40	Sam Ash, Tower Records, Virgin Megastore	40-105	200-450
Office Supplies	23-30	Officemax, Staples, Office Depot	40-80	190-260
Party Supplies	6-12	Party America, Party City, Party Concepts	5-40	100-325
Pet Supplies	15-25	Petsmart, Petco, Pet Food Express, Pet Club	20-40	75-225
Sporting Goods	20-55	Sport Mart, Sport Chalet, REI, Copelands, Sports Authority	50-125	150-350
Toys - Mall Stores	2-10	Kay Bee, Hobby Shack, Gamestop	5-30	200-500
Video	3-6	20/20 Video, Hollywood Video, Blockbuster	6-9	150-225

Source: the HdL Companies

APPENDIX E
PROJECT REFERENCES

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